

User's Manual



R-Linux

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I Introduction to R-Linux

R-Linux is a file recover utility for the Ext2/3/4FS file system used in the Linux OS and several Unixes. **R-Linux** uses unique **IntelligentScan** technology and flexible parameter settings to give you real control over the fastest data recovery ever seen. It recovers files from existing partitions even when file records are lost.

R-Linux is a lite version of more powerful file recover utility **R-Studio**. **R-Studio** utilizes the IntelligentScan technology to its full extent, and therefore can recover data from partitions with broken file systems. Also, **R-Studio** recovers data over network. To learn more about **R-Studio**, go to the [R-Studio Features](#) help page. To learn more about the **IntelligentScan** technology, go to the **IntelligentScan** help page.

R-Linux features:

- Standard "Windows Explorer" - style interface.
- Host OS: Linux, kernel 2.6 and above
- Supported file systems: Ext2/3/4FS (created by Linux or other OS).
- Support for known file types. **R-Linux** searches for files with known typical features of their structures allowing the user to search for files on devices with unknown files systems, including an HD, CD, DVD, floppy disk, Compact Flash Card, USB drive, ZIP drive, Memory Sticks, and other removable media.
- Scan process visualization. While scanning an object, **R-Linux** graphically shows items that have been found,.
- Creates image files for an entire hard drive, partition, or its part. Such image files can be processed like regular disks. Images can be either simple exact object copies (Plain images) compatible with the previous versions of **R-Linux**, or compressed images that can be compressed, split into several parts, and password-protected. Such images are fully compatible with the images created by **R-Drive Image**, but incompatible with the previous versions of **R-Linux**. **R-Linux** can scan objects while creating their images.
- Recovers files on damaged or deleted partitions.
- Support for estimation of chances for successful recovery.
- Recovered files can be saved on any (including network) disks visible by the host operating system.
- Support for [Linux mdadm Volumes](#)
- Support for [Linux LVM/LVM2](#)
- A hexadecimal disk and file viewer.
- Patterns (or templates) in the hexadecimal viewer allowing for parsing the data according to specific data structure. Such patterns may be custom-created.

R-Linux recovers files:

- Removed by virus attack or power failure;
- After the partition with the files was reformatted, even for a different file system;
- When the partition structure on a hard drive was changed or damaged. In this case, **R-Linux** can scan the drive trying to find previously existed partitions and recover files from found partitions.
- From disks with bad sectors. In this case, **R-Linux** can first copy the entire disk or its part into an image file and then process such image file.

R-Linux can create image files for an entire hard drive, partition, or its part. Such image files can be processed like regular disks. Images are very useful if there is a risk of total data loss due to hardware

malfunction. If bad blocks are constantly appearing on a hard drive, the only way to save the data is to immediately create an image of that drive. All data search, scan and recovery can be done from this image.

[R-Studio Features](#)

[System Requirements](#)

[Contact Information and Technical Support](#)

[Data Recovery Using R-Linux](#)

[Basic File Recovery](#)

[Advanced Data Recovery](#)

[Mass File Recovery](#)

[Text/Hexadecimal Viewer](#)

[Technical Information and Troubleshooting](#)

1.1 R-Studio Features

R-Studio is a family of file restoring utilities. It recovers files both on local disks and on disks on remote computers over network, even if their partition structures are damaged. A unique *IntelligentScan* technology and flexible parameter settings give you real control over the fastest data recovery ever seen.

R-Studio for Linux features:

- Host OS: Linux, kernel 2.6 and above.
- Automatic check for updates.
- Remotely recovers data over network. Data can be recovered on network computers running Windows, Mac, and Linux and some other UNIX OS.
- Supported [file systems](#):
 - Windows:** FAT12, FAT16, FAT32, exFAT, NTFS, NTFS5, ReFS/ReFS2+ file (Resilient File System); ReFS for Windows Server 2019 (including deduplication).
 - macOS:** HFS, HFS+, HFSX, APFS, FAT/exFAT;
 - Linux and UNIX:** Ext2/3/4FS and XFS (created by Linux or other OS), and UFS1, UFS2, UFS BigEndian (used by the FreeBSD, OpenBSD, and NetBSD operating systems);
 - CD/DVD/Images:** ISO9660;
 - Magnetic tape devices:** UStar/Tar/CPIO/Pax (**R-Studio Technician/T80+**).Please note, that when a file is being deleted on the HFS, HFS+, HFSX file systems, the computer completely removes all system information on it, and there is no way to recover the deleted file except by using the [Extra Search for Known File Types](#) option. Nevertheless, **R-Studio for Linux** is able to read existing files from HFS, HFS+, and HFSX disks.
- Support for [known file types](#). **R-Studio for Linux** searches for files with known typical features of their structures allowing the user to search for files on devices with unknown files systems, including an HD, CD, DVD, floppy disk, Compact Flash Card, USB drive, ZIP drive, Memory Sticks, and other removable media.
- Scan process visualization. While scanning an object, **R-Studio for Linux** graphically shows items that have been found, including files of known types, FAT and NTFS MFT records, boot records, etc.
- Mass file recovery support.
- Support for estimation of chances for successful recovery.
- Support for file recovery lists - lists of files that can be exported from **R-Studio for Linux**, manually edited, and then loaded back. Files from such lists will be automatically marked for recovery.

- APM, Basic and GPT support. **R-Studio for Linux** supports all three partition schemes used to define the low-level organization of data on disks [formatted](#) for use with Macintosh computers.
- Support for [Linux mdadm Volumes](#)
- Support for [Linux LVM/LVM2](#)
- [Dynamic disk](#) support.
- Software RAID, volume set, and stripe set support. Support for RAID 6, RAID 5, and RAID 4 layouts. Support for custom RAID layouts. Parameters like block size and order, offsets, and even the number of stripe blocks can be explicitly specified. Custom RAID configurations can be saved.
- Support for [Windows Storage Spaces](#), created by Windows 8/8.1 and Windows 10/Threshold 2/Anniversary/Fall Creators updates.
- Support for [Apple software RAID](#)s
- Support for [Apple CoreStorage/FileVault/Fusion Drive Volumes](#)
- Support for Intel Software RAID.
- Hardware RAID, volume set, and stripe set support.
- RAID consistency check (check for valid data parity values).
- Automatic RAID parameter recognition.
- Creates image files for an entire drive, [logical disk](#), or its part. Such image files can be processed like regular drives. Images can be either simple exact object copies (Plain images), compatible with VmWare Virtual Machine disks (in the **Technician/T80+** version), or [R-Drive Image](#) compatible that can be compressed, split into several parts, and password-protected. Images may be saved either on the local or remote computer. Image creation can be stopped and then resumed. **R-Studio for Linux** can scan objects while creating their images. **R-Studio Technician/T80+** supports [multi-pass](#) and [runtime](#) imaging. Images can be mounted in the operating system as devices which makes their content accessible to any program including any other data recovery software.
- Creates image files for an entire hard drive, logical disk, or its part. Such image files can be processed like regular disks. Images can be either simple exact object copies (Plain images) compatible with the previous versions of **R-Studio for Linux**, or compressed images that can be compressed, split into several parts, and password-protected. Such images are fully compatible with the images created by **R-Drive Image**, but incompatible with the previous versions of **R-Studio for Linux**. Images may be saved either on the local or remote computer. **R-Studio for Linux** can scan objects while creating their images.
- Recovers files on damaged or deleted partitions.
- Recovers compressed files (NTFS, NTFS5).
- Recovers encrypted files (NTFS5).
- Recovers [alternative data streams](#) (NTFS, NTFS5).
- Support for NTFS deduplication.
- Support for [symbolic links](#). Symbolic link recovery options in the Technician version.
- Support for file system journal on the HFS+ and Ext3/4fs file systems.
- Support for soft updates journal on the UFS file system.
- Support for extended attributes on the HFS+, Ext3/4fs, and UFS file systems.
- Support for compressed files on the HFS+ file system.
- Recognizes localized names.
- Recovered files can be saved on any (including network) disks visible to the host operating system.
- A hexadecimal disk and file viewer/editor supporting NTFS file non-resident attribute editing. Data alteration is available on the **Technician/T80+** version only.

- Patterns (or templates) in the hexadecimal editor allowing for parsing the data according to specific data structure. Such patterns may be custom-created.
- File preview. Most of the file types can be previewed to estimate recovery chances.
- Enhanced remote host scanning procedure. In the new **R-Studio for Linux** network versions, data are analyzed on the remote host rather than on the home host, thereby the speed of recovery procedure greatly increases.
- Recovered files may be saved on a disk on a connected remote computer rather than be transferred over network to the local one. Saving recovered files on a remote computer may be useful when the remote computer has a healthy disk because you do not have to transfer files over network. It may be an external USB hard drive, for example.
- Support for [S.M.A.R.T.](#) (Self-Monitoring, Analysis and Reporting Technology) attribute monitoring.
- **R-Studio Emergency***. The **R-Studio for Linux Emergency** version starts from a floppy or compact disk when it is necessary to recover data on a computer, on which OS cannot start up because its system files are corrupted or deleted.

*The **R-Studio Emergency** is a part of the **R-Studio for Linux** software package. When you buy an **R-Studio for Linux** single license you may run the **R-Studio Emergency** or/and install the **R-Studio for Linux** Windows version on one PC only and you may not transfer the licensed software to another PC.

R-Studio features available in the Technician/T80+ versions:

- Magnetic tape devices file system: **UStar/Tar/CPIO/Pax**.
- [Extended file information](#)
- [Symbolic link recovery options](#)
- Drive Copy Wizard to copy any object in the Drives panel to any other object. In addition to byte to byte copy of any object visible in the Drives panel, smart copy of partitions and drives is available.
- [I/O Monitor and Sector Map files](#).
- [Multi-pass](#) and [Runtime](#) imaging
- [Reverse RAID](#)s: A technique that decomposes real drive objects into virtual RAIDs. Then those components of reverse RAID scan be processed like real objects. They can be viewed, edited, imaged, copied to physical
- Support for [third-party hardware](#).
- [Forensic mode](#).
- [File recovery over Internet](#).

R-Studio for Linux recovers files:

- That have been removed without the **Recycle Bin**, or when the **Recycle Bin** has been emptied;
- Removed by virus attack or power failure;
- After the partition with the files was reformatted, even for a different file system;
- When the partition structure on a hard drive was changed or damaged. In this case, **R-Studio for Linux** can scan the drive trying to find previously existed partitions and recover files from found partitions.
- From disks with [bad sectors](#). In this case, **R-Studio for Linux** can first copy the entire disk or its part into an image file and then process such image file.

R-Studio for Linux can create image files for an entire hard drive, logical disk, or its part. Such image files can be processed like regular disks. Images are very useful if there is a risk of total data loss due to hardware

malfunction. If bad blocks are constantly appearing on a hard drive, the only way to save the data is to immediately create an image of that drive. All data search, scan and recovery can be done from this image.

To learn more about the *IntelligentScan* technology, go to the [IntelligentScan](#) topic .

1.2 R-Linux System Requirements

- An Intel-compatible x86 or 64-bit platform with 32 MB RAM, a mouse, and enough disk space for recovered files, image files, etc.
- Linux: Fedora 12+, Ubuntu/Kubuntu 10.4+ , Debian 4.0+ or any kernel 2.6+ Linux distribution capable of installing .rpm or .deb packages.
- Any Window manager.
- X.Org X server 1.7.6+ installed.
- Root privileges to install and run the program.

1.3 Contact Information and Technical Support

To obtain the latest version of **R-Linux**, go to:

Product Site: <http://www.r-tt.com>

Sales Department: sales@r-tt.com

R-Linux Technical Support Team is available 24 hours a day, seven days a week, and has an average response time less than 4 hours.

Tech. Support: support@r-tt.com

Send your support request to: <http://www.r-tt.com/SupportRequest.shtml>

File Recovery FAQ: http://www.r-tt.com/File_Recovery_FAQ.shtml

R-tt Forum: <http://forum.r-tt.com>

1.4 R-Linux Main Panel

When **R-Linux** starts, its main panel appears on the desktop.

R-Linux Main panel

The screenshot shows the R-Linux Main panel window titled "R-Linux - Device view (as superuser)". The window has a menu bar with "Drive", "Create", "Tools", "View", and "Help". Below the menu bar is a toolbar with icons for Refresh, Show Files, Scan, Create Image, Open Image, Create Region, Remove, and Stop. The main area is divided into two panes. The left pane, titled "Device view", contains a tree view of the system's storage hierarchy. The right pane, titled "Properties", shows detailed information for the selected device, including Drive Type, Name, OS Object, R-Studio Driver, Size, Logical Sector Size, Physical Sector Size, I/O Retries, Drive Control, and Physical Drive Geometry. At the bottom of the window is a "Log" panel showing system messages.

Device/Disk	Label	FS	Start	Size
Local Computer				
└─ KINGSTON SA400S3...	50026B778...	SATA2, SSD		111.79...
└─ /		Ext4	1 MB	111.79...
└─ SAMSUNG HD642J...	S1AFJ1MQ4...	SATA2, HDD		596.17...
└─ /home		Ext4	1 MB	596.17...
└─ ST340015A 3.01	5LA5Y2H1	IDE/ATAPI, HDD		37.27 GB
└─ Partition1	Data1	Ext4	1 MB	18.63 GB
└─ DeletedPart1	Data2	Ext4	18.63 ...	18.64 GB
└─ Empty Space7			18.63 ...	18.64 GB

Name	Value
Drive Type	Physical Drive, Disk
Name	ST340015A 3.01
OS Object	/dev/sda
R-Studio Driver	pata_jmicron
Size	37.27 GB (78165360 Sectors)
Logical Sector Size	512 Bytes
Physical Sector Size	512 Bytes
I/O Retries	Default
Drive Control	
Maximum Transfer	128 KB
I/O Block Size	512 Bytes
Buffer Alignment	4 KB
Physical Drive Geometry	
Cylinders	4865
Tracks Per Cylinder	255
Sectors Per Track	63

Type	Date	Time	Text
System	4/17/23	1:40 PM	File enumeration was completed in 10s.
System	4/17/23	1:40 PM	All file regions are collected.

Drives panel:
can select an object by clicking on it.

Device/Disk	Label	FS	Start	Size
Local Computer				
└─ KINGSTON SA400S37120G 03090005	50026B77843A5628	SATA2, SSD		111.79 GB
└─ /		Ext4	1 MB	111.79 GB
└─ SAMSUNG HD642J 1AA01110	S1AFJ1MQ400283	SATA2, HDD		596.17 GB
└─ /home		Ext4	1 MB	596.17 GB
└─ ST340015A 3.01	5LA5Y2H1	IDE/ATAPI, HDD		37.27 GB
└─ Partition1	Data1	Ext4	1 MB	18.63 GB
└─ DeletedPart1	Data2	Ext4	18.63 GB	18.64 GB
└─ Empty Space7			18.63 GB	18.64 GB

Properties tab:

This tab shows the properties of an object selected on the Drives panel.

Name	Value
Drive Type	Physical Drive.Disk
Name	ST340015A 3.01
OS Object	/dev/sda
R-Studio Driver	pata_micron
Size	37.27 GB (78165360 Sectors)
Logical Sector Size	512 Bytes
Physical Sector Size	512 Bytes
I/O Retries	Default
Drive Control	
Maximum Transfer	128 KB
I/O Block Size	512 Bytes
Buffer Alignment	4 KB
Physical Drive Geometry	
Cylinders	4865
Tracks Per Cylinder	255
Sectors Per Track	63
Sector Size	512 Bytes
Partition Layout Sector Size	512 Bytes
Device Identification	
Product	ST340015A
Firmware	3.01
Serial Number	5LA5Y2H1
IDE Properties	
Size	37.2GB (78165360 LBA)
Sector Size	512
Standard	ATA/ATAPI-6
Features	S.M.A.R.T.
Bus Type	IDE/ATAPI

Depending on the selected object, information on this Properties tab may vary.

The Properties tab names and values are described in detail on the [Properties tab](#) topic.

Log window:

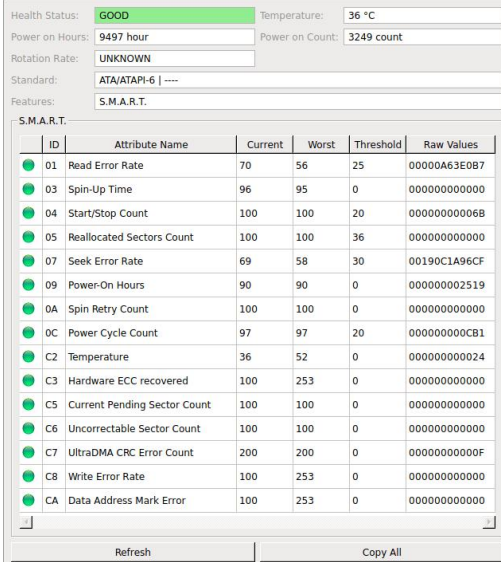
Type	Date	Time	Text
System	4/17/23	1:40 PM	File enumeration was completed in 10s.
System	4/17/23	1:40 PM	All file regions are collected.

S.M.A.R.T. Info for a Hard Drive

R-Linux shows hard drive S.M.A.R.T. states using their icons. You may copy all S.M.A.R.T. attributes and paste them into a text editor.

Hard drive S.M.A.R.T. states and icons

Normal: This state indicates that the hard drive is in good conditions.



Health Status: **GOOD** Temperature: 36 °C

Power on Hours: 9497 hour Power on Count: 3249 count

Rotation Rate: UNKNOWN

Standard: ATA/ATAPI-6 | ---

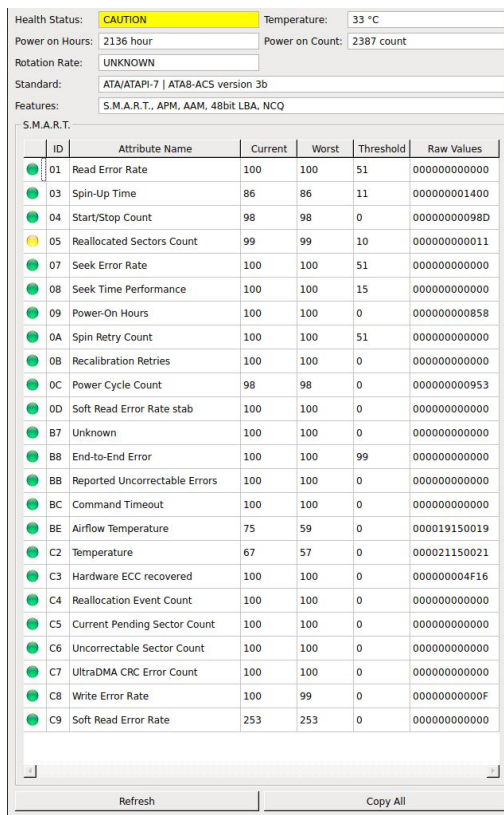
Features: S.M.A.R.T.

S.M.A.R.T.

ID	Attribute Name	Current	Worst	Threshold	Raw Values
01	Read Error Rate	70	56	25	00000A63E0B7
03	Spin-Up Time	96	95	0	000000000000
04	Start/Stop Count	100	100	20	00000000006B
05	Reallocated Sectors Count	100	100	36	000000000000
07	Seek Error Rate	69	58	30	00190C1A96CF
09	Power-On Hours	90	90	0	000000002519
0A	Spin Retry Count	100	100	0	000000000000
0C	Power Cycle Count	97	97	20	000000000CB1
C2	Temperature	36	52	0	000000000024
C3	Hardware ECC recovered	100	253	0	000000000000
C5	Current Pending Sector Count	100	100	0	000000000000
C6	Uncorrectable Sector Count	100	100	0	000000000000
C7	UltraDMA CRC Error Count	200	200	0	00000000000F
C8	Write Error Rate	100	253	0	000000000000
CA	Data Address Mark Error	100	253	0	000000000000

Refresh Copy All

Warning: This state indicates that some small problems with the disk are possible in the future, you may work with it but with cautions and regular check of these parameters. [Disk imaging](#) is strongly recommended.



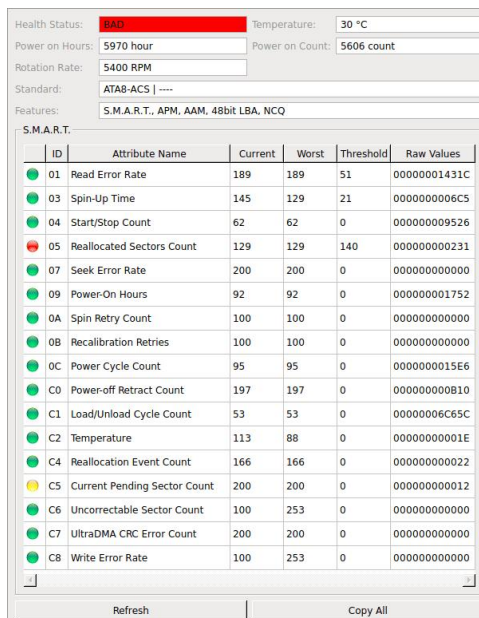
Health Status: **CAUTION** Temperature: 33 °C
 Power on Hours: 2136 hour Power on Count: 2387 count
 Rotation Rate: UNKNOWN
 Standard: ATA/ATAPI-7 | ATAB-ACS version 3b
 Features: S.M.A.R.T., APM, AAM, 48bit LBA, NCQ

S.M.A.R.T.

ID	Attribute Name	Current	Worst	Threshold	Raw Values
01	Read Error Rate	100	100	51	000000000000
03	Spin-Up Time	86	86	11	000000001400
04	Start/Stop Count	98	98	0	0000000098D
05	Reallocated Sectors Count	99	99	10	00000000011
07	Seek Error Rate	100	100	51	000000000000
08	Seek Time Performance	100	100	15	000000000000
09	Power-On Hours	100	100	0	00000000858
0A	Spin Retry Count	100	100	51	000000000000
0B	Recalibration Retries	100	100	0	000000000000
0C	Power Cycle Count	98	98	0	00000000953
0D	Soft Read Error Rate stab	100	100	0	000000000000
B7	Unknown	100	100	0	000000000000
B8	End-to-End Error	100	100	99	000000000000
BB	Reported Uncorrectable Errors	100	100	0	000000000000
BC	Command Timeout	100	100	0	000000000000
BE	Airflow Temperature	75	59	0	000019150019
C2	Temperature	67	57	0	000021150021
C3	Hardware ECC recovered	100	100	0	000000004F16
C4	Reallocation Event Count	100	100	0	000000000000
C5	Current Pending Sector Count	100	100	0	000000000000
C6	Uncorrectable Sector Count	100	100	0	000000000000
C7	UltraDMA CRC Error Count	100	100	0	000000000000
C8	Write Error Rate	100	99	0	00000000000F
C9	Soft Read Error Rate	253	253	0	000000000000

Refresh Copy All

Critical: This state indicates that the hard drive conditions are critical and chances of hardware failure are great. The best recommendation for this case is to stop working with the disk and bring it to professional data recovery specialists. You may though continue to work with the disk at your own risk, but [disk imaging](#) is very strongly recommended.



Health Status: **BAD** Temperature: 30 °C
 Power on Hours: 5970 hour Power on Count: 5606 count
 Rotation Rate: 5400 RPM
 Standard: ATAB-ACS | ----
 Features: S.M.A.R.T., APM, AAM, 48bit LBA, NCQ

S.M.A.R.T.

ID	Attribute Name	Current	Worst	Threshold	Raw Values
01	Read Error Rate	189	189	51	0000001431C
03	Spin-Up Time	145	129	21	0000000006C5
04	Start/Stop Count	62	62	0	000000009526
05	Reallocated Sectors Count	129	129	140	000000000231
07	Seek Error Rate	200	200	0	000000000000
09	Power-On Hours	92	92	0	000000001752
0A	Spin Retry Count	100	100	0	000000000000
0B	Recalibration Retries	100	100	0	000000000000
0C	Power Cycle Count	95	95	0	0000000015E6
0D	Power-off Retract Count	197	197	0	000000000B10
C1	Load/Unload Cycle Count	53	53	0	00000006C65C
C2	Temperature	113	88	0	00000000001E
C4	Reallocation Event Count	166	166	0	000000000022
C5	Current Pending Sector Count	200	200	0	000000000012
C6	Uncorrectable Sector Count	100	253	0	000000000000
C7	UltraDMA CRC Error Count	200	200	0	000000000000
C8	Write Error Rate	100	253	0	000000000000

Refresh Copy All

When a hard drive is selected on the **R-Linux** main panel, an additional S.M.A.R.T. tab will appear. You may view the detailed S.M.A.R.T. data of the drive.

S.M.A.R.T. (Self-Monitoring, Analysis and Reporting Technology) is a technology widely-used in hard drives and solid-state devices that monitors their reliability conditions to predict possible hardware failures.

Changing the program language

You may select the language of **R-Linux** main panel. To do so, select an available language on **Change Language** on the **Help** menu

Panel view options

You may set which panels and bars to enable/disable.

To enable/disable:

Toolbar	Select/clear Toolbar on the View menu
Status bar	Select/clear Status bar on the View menu
Drive pane	Select/clear Device View on the View menu
Properties pane	Select/clear Properties View on the View menu
Log panel	Select/clear Event Log on the View menu
If you have several tabs in the right pane, you may easily switch to any of the tab by selecting on the View menu	
Properties Tab	to view the Properties tab
Scan Information Tab	to view the Scan Information Tab tab
Parents Tab	to view the Parents tab
Properties	Select data types in which the data will be represented

Sometimes, there may be a lot of similar objects on the Drives panel. Those may be components of a RAID, for example. You may turn numerical indexes for such objects to distinguish them better. Those indexes will appear before the object names on the Drives panel.

To turn the numerical indexes on/off, go to the **Device** item on the **View** menu, and select/clear:

Show Physical Drives Indexes to display the indexes only for hard drives

Show All Objects Indexes to display the indexes for all objects on the Drives panel

Device/Disk	Label	FS	Start	Size
[0] Local Computer				
[2] KINGSTON SA400S37120G 0309...	50026B77843A5628	SATA2, SSD		111.79 GB
[9] /		Ext4	1 MB	111.79 GB
[3] SAMSUNG HD642JJ 1AA01110	S1AFJ1MQ400283	SATA2, HDD		596.17 GB
[10] /home		Ext4	1 MB	596.17 GB
[1] ST340015A 3.01	SLAS52H1	IDE/ATAPI, HDD		37.27 GB
[6] Partition1	Data1	Ext4	1 MB	18.63 GB
[8] DeletedPart1	Data2	Ext4	18.63 GB	18.64 GB
[7] Empty Space7			18.63 GB	18.64 GB

You may select the units in which object's start and size are displayed

To select the units

- 1 Select Devices on the **View** menu
- 2 Select the units in which you want to see object sizes.

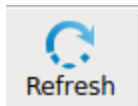
You may select

Show as Bytes

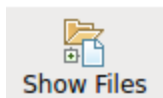
Show as Sectors

Show as Bytes and Sectors

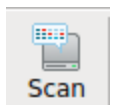
Depending on the task **R-Linux** performs, its panel may vary. Those panels are described in appropriate topics. The Properties tab names and values are described in detail on the [Properties tab](#) topic .

**Refresh**

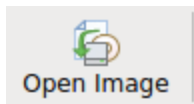
Click this button to refresh the panels.

**Show Files**

Click this button to start searching for files on a selected object.

**Scan**

Click this button to start scanning a selected object.

**Open Image**

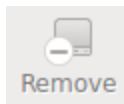
Click this button to open a previously created image.

**Create Image**

Click this button to create an image of a selected area.

**Create Region**

Click this button to create a region on a selected disk.

**Remove**

Click this button to delete a selected object on the main panel.

**Stop**

Click this button to stop the current operation.

You may also copy the object's information displayed on the Drives panel. Right-click the object on the necessary column and select **Copy Device/Disk**, **Copy Label**, and so on.

R-Linux has two operation modes:

File search on a partition (including recently found during disk scan).

In this mode, **R-Linux** analyzes data on the partitions. Then it displays all files which records have been found in the analyzed tables. Then recently deleted files, which records still remain, can be recovered. If files have not been found, that means that their records have been deleted. In this case, the disk must be scanned.

File search supports [file masks](#) and [regular expressions](#). Multiple files in different folders can be found and recovered in one recover session.

R-Linux supports [mass file recovery](#). There is no limit in the number of files that may be recovered during one session.

File content may be [previewed](#) before recovery.

File or disk binary data can be viewed in the [Text/Hexadecimal Viewer](#). Also can be viewed and changed all attributes for NTFS files.

Disk scan, searching for partitions.

In this mode, **R-Linux** scans the entire disk or its part. Using a number of statistic and deterministic criteria known as *IntelligentScan* technology, it determines existing or existed partitions on the disk, and their file systems. It is also possible to add new partitions, by setting manually all required parameters.

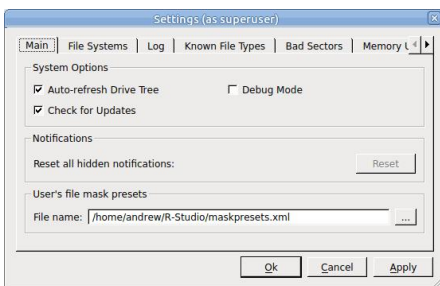
A disk can be scanned through several successive scans, each with its own parameters. **R-Linux** accumulates the information from successive scans and keeps track of changes in the information obtained from different scans. The information obtained from the disc scan can be stored in a file. It may be loaded and processed later at any convenient time.

1.5 R-Linux Settings

You may specify some global setting for **R-Linux** on the Settings dialog box. You may reach it by selecting **Settings** on the **Tools** menu.

Main

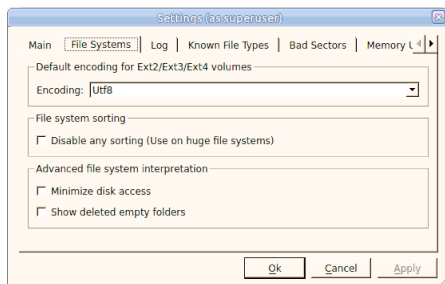
Main dialog box



Main settings

System Options	
Auto-refresh Drive Tree	If this box is selected, R-Linux automatically refreshes the list of connected disks. You may disable it if R-Linux experiences problems with connected devices.
Debug Mode	If this check box is selected, R-Linux displays an additional command Create FS Snapshot on the shortcut menu for an object with a file system. An FS Snapshot contains system data for the file system only (file descriptions without file contents). If a problem appears, this snapshot can be sent to R-Linux technical support to identify the problem. This option greatly slows R-Linux .
Check for update	If this box is selected, R-Studio will automatically check for updates.
Notifications	
Reset all hidden notifications.	Click this button to enable all previously disabled notification messages.
User's file mask presets File name:	Specifies a file name and path to the file with file mask presets.i

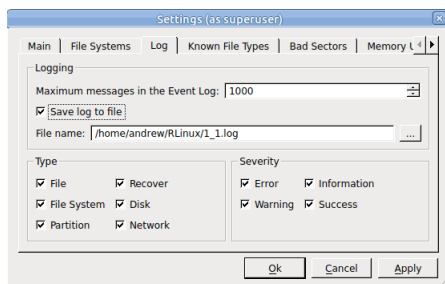
File Systems

File Systems **dialog box**

File Systems

Default encoding for Ext2/Ext3/Ext4 volumes	Select the national encoding for the Ext2, Ext3, and Ext4 partitions.
Disable any sorting	Select this option if the number of files on the disk is so large that R-Linux sorts files in selected folders for too long time.
Minimize disk access	Select this option if a lot of bad sectors are on the hard drive. R-Linux will reduce access to internal files in the file system to speed up the interpretation of file system data.
Show deleted empty folders	Select this option if you want to view empty deleted folders.

Log

Log **dialog box**

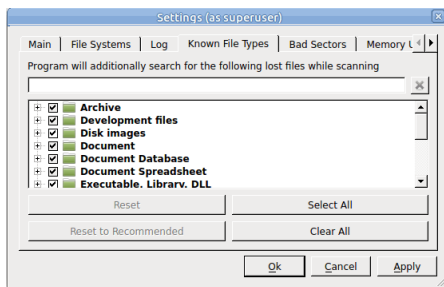
Log options

Logging	
Maximum messages in the Event Log	Specifies the maximum number of messages R-Linux will keep in the event log
Save log to file	If this check box is selected, R-Linux writes its log into a log file specified in the File name field.
File name	Specifies the file name in which the log will be saved.
Type	
File	If this check box is selected, R-Linux logs all events with recovered files.
File System	If this check box is selected, R-Linux logs all events with the file system.
Partition	If this check box selected, R-Linux logs all events with partitions.

Recover	If this check box is selected, R-Linux logs all events with the recovering processes.
Disk	If this check box is selected, R-Linux logs all events with disks.
Network	If this check box is selected, R-Linux logs all events with network operation.
Severity	
Error	If this check box is selected, R-Linux adds error messages into its log.
Warning	If this check box is selected, R-Linux adds warning messages into its log.
Information	If this check box is selected, R-Linux adds information messages into its log.
Success	If this check box is selected, R-Linux adds success messages into its log.
NEVER WRITE A LOG FILE ON THE DISK FROM WHICH YOU RECOVER DATA!!! Or you may obtain unpredictable results and lose all your data.	
Note: If in the Recover dialog box the Condense successful restoration events check box is selected, the Log will display only Error, Warning, and Information event messages.	

Known File Types

Known File Types dialog box



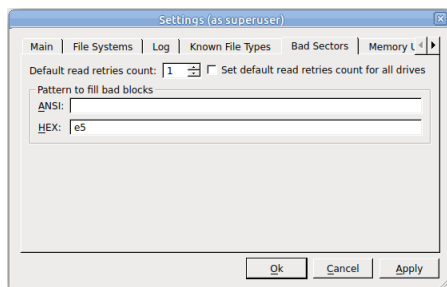
You may specify which **Known File Types** will be enabled/disabled by default. You may also specify know file types to search for during a specific scan session on the [Scan](#) dialog box.

Known File Types

Reset	Click this button to reset the settings to the previous state. Active until the Apply button is clicked.
Select All	Click this button to select all file types in the list.
Clear All	Click this button to clear all file types in the list except some predefined ones.
Reload User's File Types	Click this button to apply new file types after the user's file types file has been changes from the Main tab.

Bad Sectors

Bad Sectors dialog box

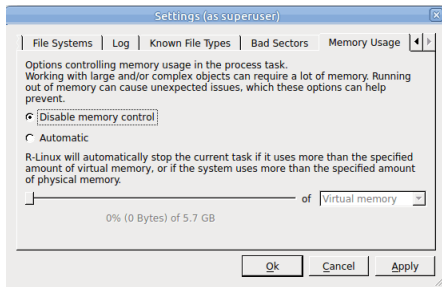


Bad Sectors settings

Default read retries	<p>Specifies a default value for I/O Tries, or how many times R-Linux will try to read a bad sector. You may specify this parameter for each drive separately on the Properties tab.</p> <p>R-Linux treats bad sectors in the following way: It reads a certain part of disk (predefined by Windows) and</p> <ul style="list-style-type: none"> • If Default read retries is set to 0, the entire part with bad sectors will be filled with the specified pattern. • If Default read retries is set to a non-zero value, R-Linux reads again that part sector by sector, repeating the attempts the specified number of times. If R-Linux still cannot read a bad sector, it fills the sectors with the specified pattern. In this case only the bad sectors will be filled with the pattern, but that extremely slows the disk read process. <p>For example, if you set Default read attempts to 1, a bad sector will be read 2 times.</p>
Set for all drives	Click this button to reset I/O Tries for all drives to the default value.
Pattern to fill bad blocks	<p>Specifies a default pattern R-Linux will use to fill bad sectors in files to recover, in images, or when showing data in the Text/Hexadecimal Viewer. You may specify the pattern either in the ANSI or Hex data format.</p> <p>Note: R-Linux will never ever try to write anything on the disk from which data is to recover or an image is to create.</p>

Memory Usage

Memory Usage dialog box



These settings control how much memory **R-Linux** uses for its work. They help preventing **R-Linux** from locking when trying to perform very memory-consuming tasks like scanning large disks or processing file systems with a lot of files.

☒ Memory Usage settings

Disable memory control	If this option is selected, the memory control is disabled.
Automatic	If this option is selected, R-Linux will automatically stop performing the task when the amount of used memory reaches the specified value. You may specify the limit for either the virtual or physical memory.

You may see how much memory **R-Linux** actually uses on the [Memory Usage](#) dialog box.

II Data Recovery Using R-Linux

Depending on the situation, data recovery may vary:








1. Recovery of deleted files that have resided on an existing partition

This can be done using [Basic File Recovery](#).

2. Recovery of files that have resided on a data disk with a damaged file system, or on a previously deleted or re-formatted partition

If the file system on such partition is damaged, the operating system sees that partition as a partition without a valid file system. Such partition should be previously [scanned](#). Also, it should be scanned if you want to recover data on a previously deleted or re-formatted partition.

When the partition is scanned, a number of recognized partitions will appear. **R-Linux** shows them in different colors depending on which elements of the partition have been found.

 Partition	An existing partition
 Recognized	An existing partition after disk scan
 Recognized	Both boot records and file entries are found for this partition
 Recognized	Only file entries are found for this partition
 Recognized	Only boot records are found for this partition
 DeletedPart	A deleted partition
 Empty Space	Empty space on the object
Raw Files	Files that have been found using scan for known file types .

Although such recognized partitions are virtual objects, files can be searched for and recovered from recognized partitions as from real partitions using [Basic File Recovery](#).

To successfully recover files from a recognized partition, it is necessary to find a right one which corresponds to the real partition on which the files resided. No strict rules can be applied to that, but the following considerations should be taken into account:

- If you are going to recover files from a **disk with a damaged file system**, most likely the right recognized partition will be a green one.
- If you are going to recover files from a **previously deleted or re-formatted partition**, most likely the right recognized partition will be a yellow one.

Also always check the recognized partition's file system, start point, and size. They should be the same for the recognized partition and real partition. When in doubt, try to [preview](#) a couple of files from the recognized partition. If the files are seen correctly, this is the right partition.

[R-Studio Features](#)

[Contact Information and Technical Support](#)

[Basic File Recovery](#)

[Advanced Data Recovery](#)

[Mass File Recovery](#)

[Various Disk and Volume Managers](#)

[Text/Hexadecimal Viewer](#)

[Technical Information and Troubleshooting](#)

2.1 Basic File Recovery

NEVER TRY TO SAVE RECOVERED FILES/FOLDERS ON THE SAME PARTITION WHERE THEY RESIDE!!!

Or you may obtain unpredictable results and lose all your data.

Basic file recovery can be made for deleted files that has resided on an existing partition visible to the operating system. In all other cases, [Advanced Data Recovery](#) is required.

To recover deleted files from an existing or recognized partition,

1 **Double-click a partition on the R-Linux's Drives panel to enumerate files on the disk**

Other ways to enumerate files

- Select the disk and click the **Show Files** button,
- or
- **Right-click** the selected disk and select **Open Drive Files** on the context menu,
- or
- Select **Open Drive Files** on the **Drive** menu

If you try to enumerate files on a hard drive or another object without a valid file system on it, a Double-click a logical disk... message will appear. Select a partition on the object or [scan](#) the object.

> **R-Linux will change its panel showing the disk's folders/files structure**

R-Linux analyzes data on the object and displays all files for which records have been found in the analyzed tables. If files have not been found, that means that their records have been deleted. To find such files, [Advanced Data Recovery](#) is required.

Please note that **R-Linux** shows only those files/folders that match a specified [file mask](#).

R-Linux Main panel

The screenshot shows the R-Linux File view window (as superuser) displaying a file list for Partition1 -> ST340015A 3.01 : 5LA5Y2H1. The file list includes columns for Name, Recovery chances, Bad sectors, Size, Bytes, Created, Modified, Accessed, Fileid, and Parentid. The file list is sorted by Real Extensions. The log window at the bottom shows the following entries:

Type	Date	Time	Text
System	8/23/22	4:54 PM	File enumeration was completed in 11 sec
System	8/23/22	4:56 PM	Search has been finished.
System	8/23/22	5:00 PM	Found file: Photos/Diving/IMG_7600.jpg

The status bar at the bottom indicates: Ready. Marked: 85 files and 23 folders. Total size: 7.98 GB. Total 21.63 GB in 832 files in 46 folders.

Panel view options

You may set which panels and bars to enable/disable. To enable/disable

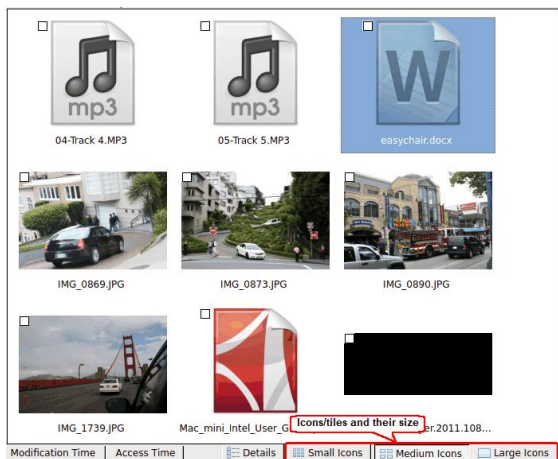
The Toolbar	Select/clear Toolbar on the View menu
The Status bar	Select/clear Status bar on the View menu
The Folders panel	Select/clear Folders View on the View menu
The Files panel	Select/clear Contents View on the View menu
The Log panel	Select/clear Event Log on the View menu
The Find Results panel	Select/clear Find Results on the View menu

You may also arrange the data as required. On the **View** menu, select **Arrange** and then a required arrangement.

You may specify which columns will be visible on the Files panel. On the **View** menu, select **Contents Columns**, and select the columns you want to see.

Files can be shown as a list or as icons/tiles of different sizes.

Files shown as icons/tiles



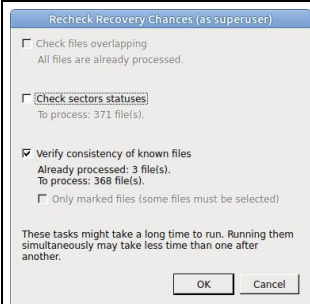
Recovery chances

R-Linux shows its estimates of chances for successful file recovery in the **Rec** column.

Recovery chances

●	Undefined
●	Good
●	Above average
●	Average
●	Below average
●	Bad

When **R-Linux** has enumerated files, those estimates may not be accurate and aren't available for most files. You may improve them by right-clicking any folder on the Content pane and selecting **Recheck Recovery Chances** on the context menu.

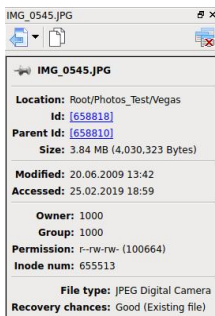


The best estimations are though after scanning the disk/partition.



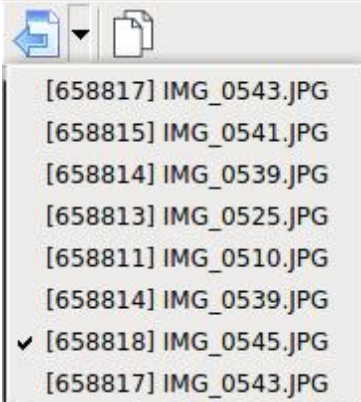

File Information

You may view some information about a file. Right-click the file and select **Get Info** on the context menu.

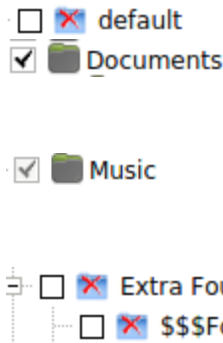
File Information



More information

	<p>Click this button to pin the file information. This panel will show the information about the "pinned" file regardless of the current selected file.</p>
	<p>Click this button to copy all this information</p>
	<p>Click this button to select the file you want to go to.</p>
	<p>Click this button to close all the information.</p>

Folders panel



Deleted folder

Marked folder (all child objects in this folder are marked)

Partially marked folder (some child objects in this folder are marked)

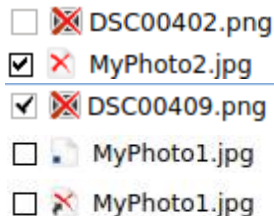
[Extra Found Files](#) folder

Log panel

Type	Date	Time	Text
System	8/23/22	4:54 PM	File enumeration was completed in 11 sec
System	8/23/22	4:56 PM	Search has been finished.
System	8/23/22	5:00 PM	Found file: Photos/Diving/IMG_7600.jpg

Log | Find Results | Ready | Marked: 85 files and 23 folders. Total size: 7.98 GB | Total 21.63 GB in 832 files in 46 folders

Files panel:



Deleted file:

Marked deleted file

Selected deleted file

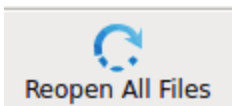
[Target of a hard link](#)

[Hard link to a file](#)

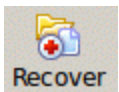
Find Results panel

Find Results	
Find All "File Extensions: doc", "Partition1"	
Root/Documents/Microsoft-files/Word-files/Doc-files/DOCFile_500kb.doc	
Root/Documents/Microsoft-files/Word-files/Doc-files/file-sample-doc_100kB.doc	
Root/Documents/Microsoft-files/Word-files/Doc-files/file-sample-doc_1MB.doc	
Root/Documents/Microsoft-files/Word-files/Doc-files/file-sample-doc_500kB.doc	

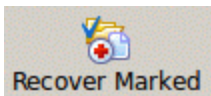
--- Matching files: 4 Total files searched: 344 ---

**Reopen All Files**

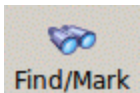
Click this button to list files again.

**Recover**

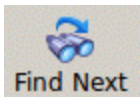
Click this button to recover selected folders/files.

**Recover Marked**

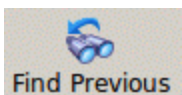
Click this button to recover marked folders/files.

**Find**

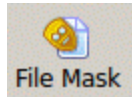
Click this button to find a particular file/folder.

**Find Next**

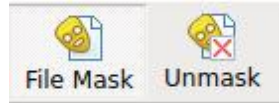
Click this button to find the next object specified in the **Find** dialog window.

**Find Previous**

Click this button to find the previous object specified in the **Find** dialog window.

**File Mask**

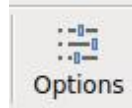
Click this button to specify a file mask.



The **Unmask** button appears when a mask is applied.
Click this button to remove the applied mask.

**Up**

Click this button to move highlighting one folder up.

**Options**

Click this button to change Recovery Options.

**Stop**

Click this button to stop the current operation.

The Log panel will show how many files and folders are on the object, and their size. You may specify which events will be shown in the log pane by setting a [log filter](#).

Note: Metafiles are the file system's internal files invisible to any user, or file system data, which **R-Linux** represents as files. These files do not contain user data directly. Unless you want to scrutinize a disk file system, do not restore them.

If the Too many files... message appears, you may temporarily stop file listing and browse through found files. Then you can resume file listing. You also may skip this file topic and continue. **R-Linux** will keep information about the entire file structure.

You may also copy the information about folders and files.

▣ **For the folder (the Folders pane):**

Click Copy Folder :	To copy the folder's name
Click Copy Path :	To copy the path to the folder

▣ **For the file (the Contents pane):**

Click Copy (Column Name) :	To copy the file's Name, Size, Created , etc., depending on which column is selected
Click Copy Path :	To copy the file path.
Click Copy Selected Text :	To copy all the columns of the selected file.

2 Select a file/folder to recover

You may select several files/folders in the same parent folder by pressing the **Shift** button and clicking the objects simultaneously.

▣ **Marking multiple files/folders from different parent folders manually:**

Mark a file/folder to recover by clicking the box left to the object, or select **Mark** on the context menu. You may mark several files/folders in different parent folders. You may mark all objects in the folder by selecting **Mark All** on the **Tools** or context menu. To unmark an object, click the box left to the object

once more or select **Unmark** on the context menu. You may unmark all objects in the folder by selecting **Unmark All** on the **Tools** or context menu.

The Log panel will show how many files and folders you have marked, and their total size.

R-Linux can search for a particular file. Go to the [Searching for a File](#) topic for details. If you need to find and mark many files, go to the [Find and Mark Multiple Files](#) topic for details.

File content may be previewed before recovery. Go to the [Previewing Files](#) topic for details.

If you do not find files that you want to recover:

Sometimes **R-Linux** can find the files but not the entire file paths to them. It puts such files into the **Extra Found Files** folder. Try to search for the files there. If that does not help, try to find them by using file search globally on the entire disk. Go to the [Searching for a File](#) topic for details

If you still cannot find files that you want to recover but are sure they have existed on the logical disk, you need to use [Advanced Data Recovery](#) to find them.

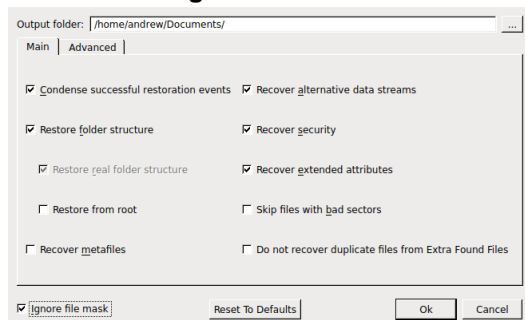
3 Click the **Recover** or **Recover Marked** button

Other ways to recover selected files

- Right-click the selected file/folder and select **Recover** or **Recover Marked** on the context menu, or
- Select **Recover** or **Recover Marked** on the **File** menu

4 Specify recover options and output folder on the **Recover** dialog box and click the **OK** button

Recover dialog box



Recover options

Condense successful restoration events	If this check box is selected, R-Linux recovers the folder structure in which all files to recover reside starting from the common topmost folder.
Restore folder structure	If this check box is selected, R-Linux recovers the entire path to the selected object.
Restore from root	If this check box is selected, R-Linux recovers the entire path to the selected object starting from the root folder of the disk.
Recover real folders structure	Enabled when the files are sorted by their extensions or date. See Find and Mark Multiple Files for details. If this check box is selected, R-Studio recovers the real folders/files structure on the disk rather than that of sorted files.

Recover metafiles	If this check box is selected, R-Linux recovers disk metafiles. Metafiles are the file system's internal files invisible to any user, or file system data, which R-Linux represents as files. These files do not contain user data directly. Unless you want to scrutinize a disk file system, do not restore them.
Recover alternative data streams	If this check box is selected, R-Linux recovers alternative data streams for file systems that support them
Recover security	If this check box is selected, R-Linux recovers security attributes for NTFS files. Has no effect on FAT files.
Recover extended attributes	If this check box is selected, R-Linux recovers extended (HPFS) file attributes.
Skip files with bad sectors	If this check box is selected, R-Linux skips files with bad sectors and displays their list on the Files with bad sectors dialog box when the recovery has been completed. You may separately decide later what to do with those files. See Bad sectors for details. If this check box is cleared, R-Linux tries to read those sectors several times (specified on the Settings/Bad Sectors dialog box), and, if fails, fills bad sectors in the recovered file with the pattern specified on the same box. Information about such files will appear in the Log .
Do not recover duplicate files from Extra Found Files	If this check box is selected, R-Linux does not recover files from Extra Found Files (raw files) that coincide with files recovered from the file system.
Ignore file mask	If this check box is selected, R-Linux recovers all content of a selected folder, ignoring a specified File Mask .
Advanced	Specifies options for mass file recovery

If you want to recover multiple files at once, go to the [Recover Multiple Files](#) for more information

NEVER TRY TO SAVE RECOVERED FILES/FOLDERS ON THE SAME PARTITION WHERE THEY RESIDE!!!

Or you may obtain unpredictable results and lose all your data.

If a file to be recovered appears to have an invalid name, a Broken File Name dialog box will appear. You may correct the name and resume file recovery.

Broken File Name **dialog box**

Broken File Name properties

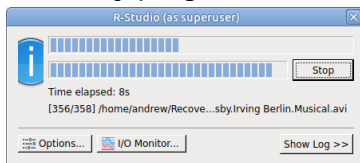
File name	Shows the current incorrect file name.
New name	Field for a new file name.

Edit broken symbols only	If this check box is selected, only invalid symbols may be corrected
Change all invalid symbols to	If this check box is selected, all invalid symbols will be changed to the specified symbol
Buttons	
Rename	Click to resume file recovery
Rename All	Click to resume file recovery. All other files will be renamed according to the specified rule.
Skip	Click to skip this file
Skip All	Click to skip all files and stop file recovery

- > **R-Linux will recover the selected/marked files/folders to the specified folder and show the results in the Log pane**

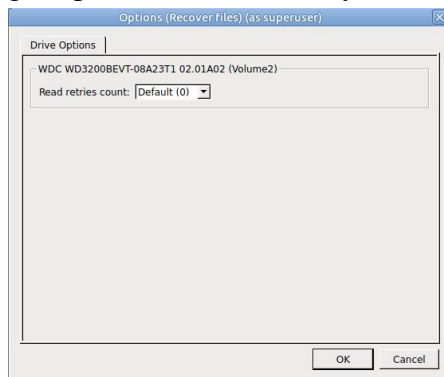
The Recovery progress indicator will show the log and progress of recovery process.

Recovery progress indicator



You may change some options during disk processes in real time

You may change some options during the process of file recovery



Note: R-Linux recovers files from Ext2/3/4FS partitions, but can write them to any local or network disks. R-Linux recovers *symlinks* as files containing the path to files which *symlinks* point to.

[Opening several disk/partitions in one tab](#)

[Searching for a File](#)

[Finding Previous File Versions](#)

[Previewing Files](#)

[File Masks](#)

[Regular Expressions](#)

[Event Log](#)

2.1.1 Opening several partitions in one tab

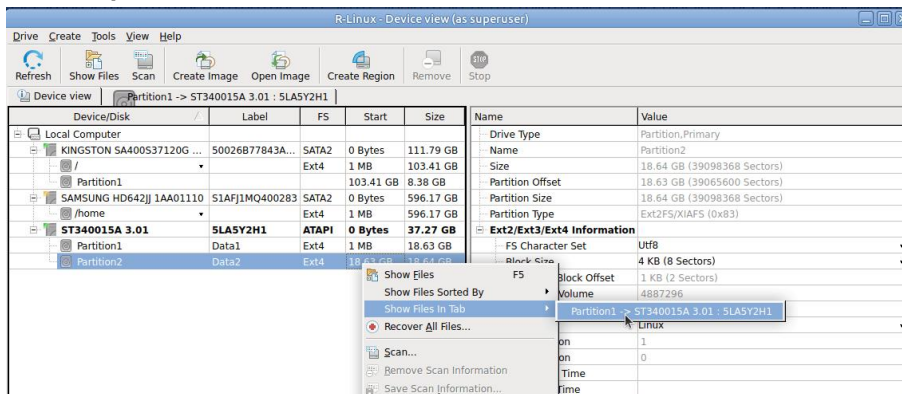
You may open several partitions in one tab. Then you may search for files and recover them from several disks/partitions at once. This is especially useful if files are to be recovered from several recognized partitions found on one real partition or a drive.

To open several partitions in one tab,

- 1 Open one partition in a usual way (double-click a logical disk, for example).
- 2 Right-click the next partition, select **Show Files In Tab**, and select the tab you want the partition appear in, or

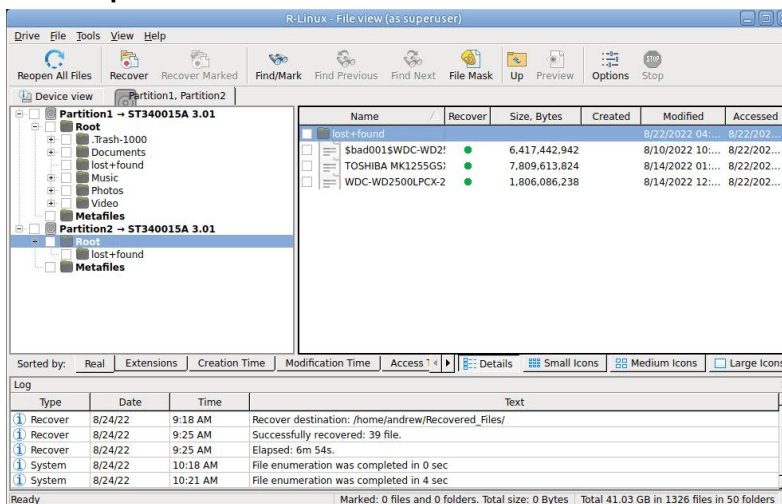
drag the disk/partition from the Device view to the required tab.

Several partitions in one tab



- > R-Studio for Linux will show files from several partitions in one tab

Several partitions in one tab

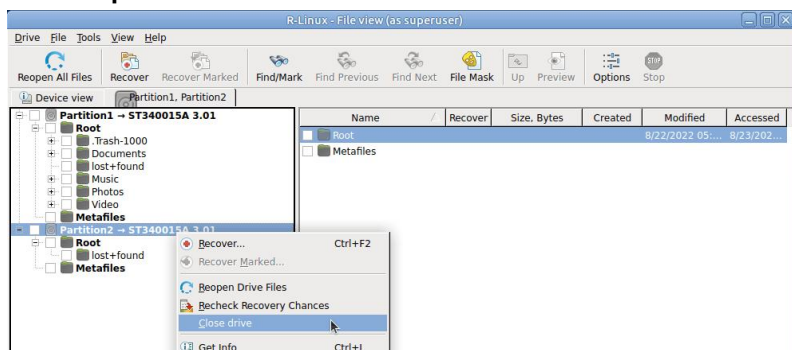


Now files may be searched for, marked for recovery, and recovered.

To remove a partition from the tab,

- 1 Right-click the required partition in the tab and select **Close drive** in the context menu.

Several partitions in one tab



2.1.2 Searching for a File

R-Linux can find a particular file, if it is difficult to find it manually on the Folders or Files panel. You can also automatically mark all found files.

To search for a file,

1 Click the Find button

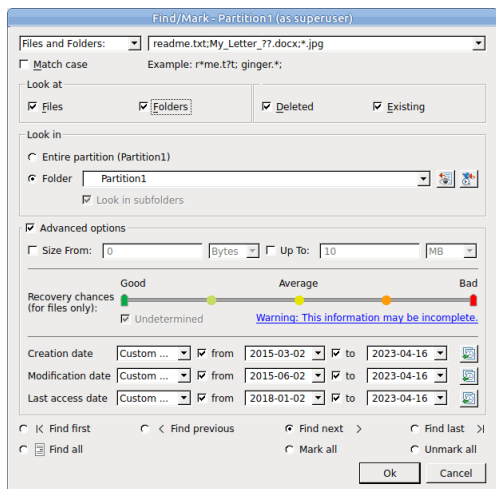
Other ways to search for the file

- Right-click a folder and select **Find** on the context menu,
- or
- Select a folder and select **Find** on the **Tools** menu

2 Specify a file to be found and its options on the Find dialog box, and click the OK button

Note that a [File Mask](#) may be applied.

Find/Mark dialog box

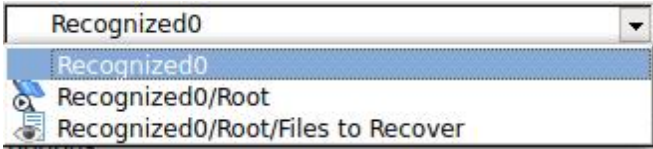







Find/Mark options

You may specify how to treat specified strings. Please note that **R-Linux** stores previously entered search strings.

Files and folders

If this option is selected, **R-Linux** treats specified strings as file or folder names. Use ? for one unspecified character and * for an unlimited number of them to specify file masks.

File Extensions	If this option is selected, R-Linux treats specified strings as file extensions
Regular Expressions	If this option is selected, R-Linux treats specified strings as regular expressions
File Id	Specifies File Id that R-Studio assigns to a file.
All Files	If this option is selected, R-Linux applies Advanced Options to all files.
Match case	If this check box is selected, R-Linux makes a case-sensitive search
Look at	
Files	If this check box is selected, R-Linux includes files into a search.
Folders	If this check box is selected, R-Linux includes folders into a search. Disables when the Mark/Unmark All option is selected.
Deleted files	If this check box is selected, R-Linux makes a search among deleted files/folders.
Existing files	If this check box is selected, R-Linux makes a search among existing files/folders.
Look in	<p>Specifies where R-Linux searches for, and marks, files. It can look for them on the Entire disk, or in/from a certain folder. You may specify the starting folder for the search.</p>  <ul style="list-style-type: none">  identifies current opened folder.  identifies current starting folder for the search.  sets starting folder to the current opened folder.  sets back current starting folder.
Advanced options	If this check box is selected, R-Linux will use the advanced options.
Size from/up to	Specifies file size limits. See the Data Formats and Multipliers topic for more details on data formats.
Recovery Chances	Specifies files with certain recovery chances.
Date	Specifies file date boundaries. Dates for Modified, Created, and Last Accessed timestamps may be set separately.
	The Set for all button sets the specified data for all fields.
Find/Mark options	<p>Specify what R-Linux does with the found files.</p> <p>The Find first/previous/next/last options. R-Linux stops at the first/previous/next/last file that matches the specified search criteria.</p> <p>Find all files. R-Linux searches for all files that matches the specified search criteria..</p> <p>The search results appear on the Find Results panel.</p>

	<p>Mark/Unmark All. R-Linux marks/unmarks all files that match the search criteria. When these options are selected, R-Linux marks/unmarks files only, not folders, regardless of what Look at: Folders specifies.</p> <p>Please note, that when performing a new find and mark/unmark task, R-Linux does not takes into consideration the previous marked/unmarked state of files. For example, if you first mark all doc files, and then all txt files, all doc files remain marked, too. To unmark them, you should specify doc once again and select Unmark files.</p>
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> **R-Linux will show/mark the found file(s)**

If you need to find and mark many files, go to the [Find and Mark Multiple Files](#) topic for details.

To repeat the search,

* **Click the Find Next or Find Previous buttons**

▣ **Other ways to repeat the search**

- Right-click a folder and select **Find Next** or **Find Previous** on the context menu
or
- Select a folder and select **Find Next** or **Find Previous** on the **Tools** menu

To find all files and show them on the Find Results panel,

* **Select Find all on the on the Find dialog box,**

or

select **Find all** on the **Tools** menu

> **R-Linux will show the found files on the Find Results panel**

2.1.3 Finding Previous File Versions

R-Linux can find previous versions of files. It searches for them in the file's current folder and in **Extra Found Files**.

File versions are searched for using file size. If the size of a files is within 10% of the original filesize, the following conditions are checked:

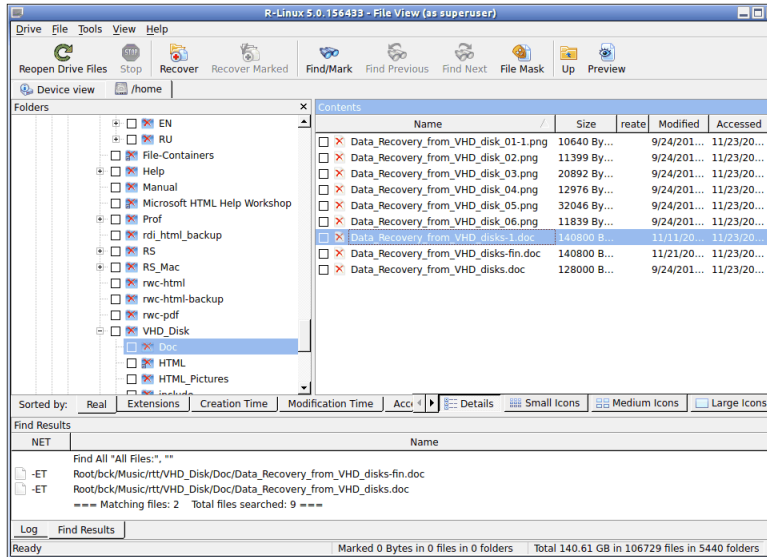
Conditions	Legend
File name	N
File extension	E
Recognized file type	T

To search for previous file versions,

1 Right-click the file and select **Find Previous Versions of the File** on the context menu

* **R-Linux** will show the files in the list:

File versions



This technique can be used to find deleted original files after attacks of file encrypting viruses.

2.1.4 Previewing Files

R-Linux has a built-in file previewer that allows you to preview both existing and deleted files. You may use this feature to estimate recovery or a file to be recovered.

To preview a file

1 Right-click a file to preview on the **Files** panel and select **Preview** on the context menu

Other ways to preview the file

- Select the file on the Files panel and click the **Preview** button,
- or
- Select the file on the Files panel and select **Preview** on the **File** menu

> **R-Linux** will show the content of the file

If you have several files open in the previewer, you may instantly close all of them by selecting **Close All Previews** on the **File** menu.

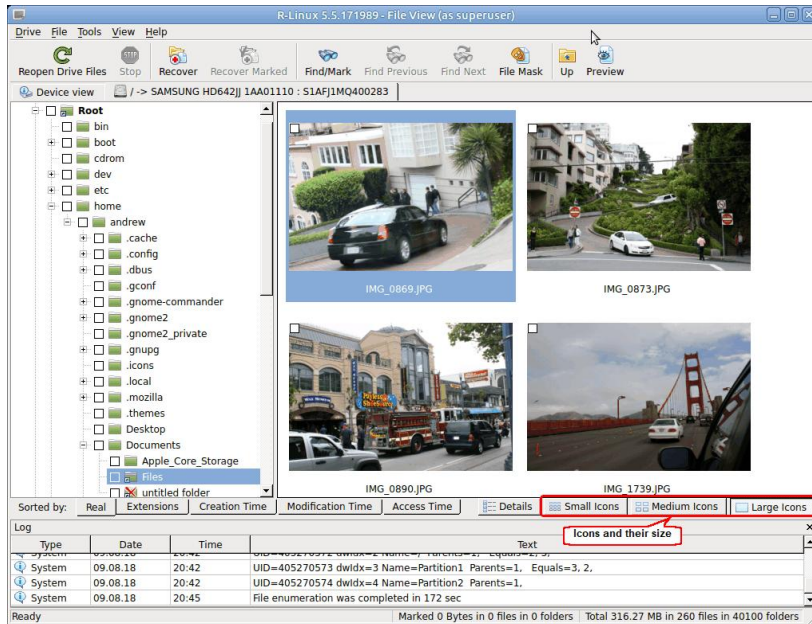
File Previewer for Pictures:

Pictures can be previewed either as tiles within the main window of **R-Linux** or in an external previewer.

Within the main window as tiles:

Tile size can be changed..

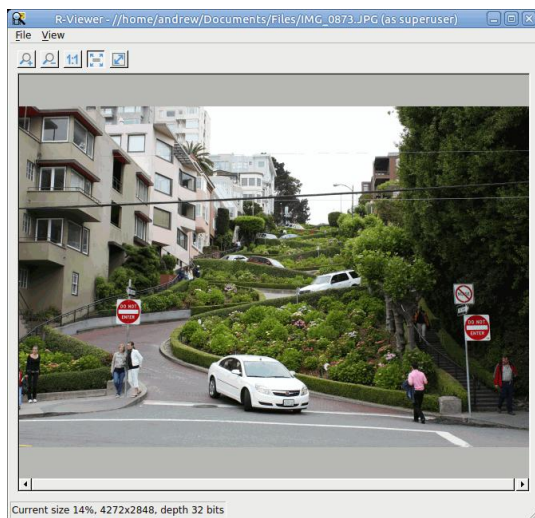
Pictures as tiles



In the external viewer:

Picture files can be zoomed in/out.

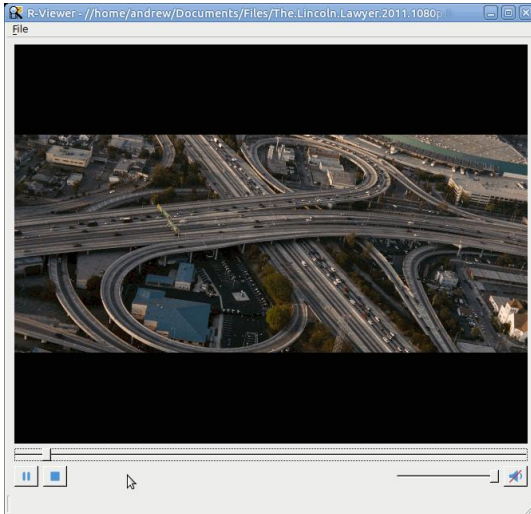
Picture file previewer



File Previewer for Video and Audio files:

Video and audio files can be played even without their respective application installed.

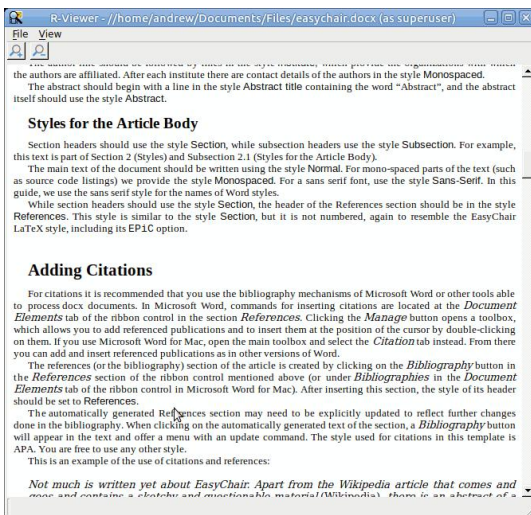
Video file previewer



File Previewer for Microsoft/Open/Libre Office Documents:

Documents can be shown (including embedded pictures) even without their respective applications installed. They can be zoomed in/out for better viewing.

Microsoft/Open/Libre Office document previewer

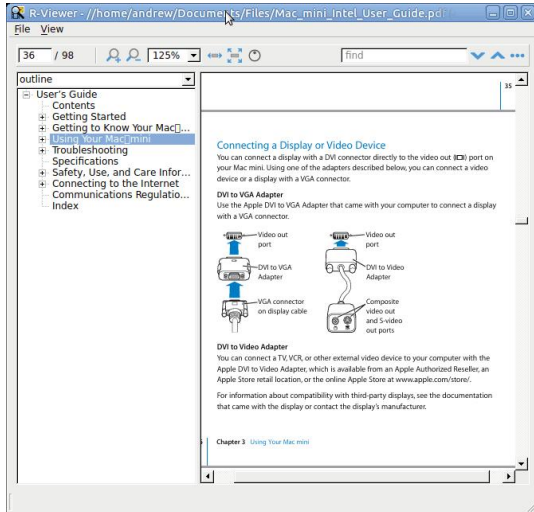


File Previewer for Adobe Acrobat PDF Files:

Files can be shown even without Adobe Acrobat installed.

The previewer allows the users to jump to a required page, zoom the document, and search for a required text.

Adobe Acrobat pdf document previewer



The files can be shown in different layouts and rotated. Click the View menu and select the required options.

Supported File Types:

Documents:

MS Office and Open/Libre Office files, even without the programs installed:

- Word/Writer documents: docx;
- Excel/Calc spreadsheets:.xlsx;
- PowerPoint presentation: pptx.

Office 97-2003, without the program installed:

- Word documents: doc;
- Excel spreadsheets xls;
- PowerPoint presentation ppt.

Adobe Acrobat document: pdf.

Multimedia Files

Video formats:

AIFF, ASF, AVI, BFI, CAF, FLV, GIF, GXF, HLS, QuickTime, 3GP, MP4, Matroska, Maxis XA, MPEG-DASH, MPEG program stream, MPEG transport stream (including AVCHD), MXF, Material eXchange Format, SMPTE, MSN Webcam stream, NUT, Ogg, OMA, RL2, TXD, WTV.

Audio formats:

8SVX, AAC, AAC+, AC-3, ADPCM, AMR-NB, AMR-WB, Amazing Studio PAF Audio, Apple lossless audio, QuickTime, ATRAC, CELT, DCA (DTS Coherent Acoustics), DPCM, DSD (Direct Stream Digital), DSP Group TrueSpeech, DST (Direct Stream Transfer), DV audio, FLAC (Free Lossless Audio Codec), G.723.1, G.729, GSM, IAC (Indeo Audio Coder), iLBC (Internet Low Bitrate Codec), IMC (Intel Music Coder), Interplay ACM, MACE (Macintosh Audio Compression/Expansion), MACE (Macintosh Audio Compression/Expansion), MLP (Meridian

Lossless Packing), Monkey's Audio, MP1 (MPEG audio layer 1), MP2 (MPEG audio layer 2), MP3 (MPEG audio layer 3), MPEG-4 Audio Lossless Coding (ALS), Musepack SV7/SV8, Nellymoser Asao, AVC (Audio for Video Codec), PCM A-law/mu-law, QCELP / PureVoice, QDesign Music Codec, RealAudio, Vorbis, Voxware MetaSound, WavPack, Westwood Audio, Windows Media Audio, Xbox Media Audio

▣ **Graphic files (with file extensions)**

3DS Max thumbnail (max), AAA logo (bpr), ACE texture (ace), ADEX (img, rle), AIM Grey Scale (ima, im), AIPD image (aipd), ARF (arf), AT&T Group 4 (att), AT&T multigen (icn), AVHRR Image (sst), AVT RAW (raw), AWD (awd), Ability Photopaint Image (apx), Access (g4, acc), Aces200 (ace), Acorn Sprite (acorn), AdTech perfectfax (adt), Adobe Illustrator (ai), Adobe PhotoParade(images) (php), Adobe Photoshop (psd), Advanced Art Studio (ocp, art, pic), AirNav (anv), Album bébé (frm), Alias Image File (pix, als, alias), Alpha Microsystems BMP (bmp), Amapi (2d), Amica Paint (ami, [b]), Amiga IFF (iff, blk), Amiga icon (info), Amstrad Cpc Screen (cpc), Analyze (avw), Analyze-7 (img), Andrew Toolkit raster object (atk), Apollo HDRU (hdru, hdr, gn), ArcInfo Binary (hdr), Art Director (art), Artisan (art), Artist 64 (a64), Artrage (ptg), Artweaver Document (awd), Astronomical Research Network (arn), Atari grafik (pcp), Aurora (sim), Auto F/X (afx), AutoCAD DWG (dwg, dwt), AutoCAD DXF (dxf), Autocad CAD-Camera (img), Autodesk Animator (fli, flc), Autodesk QuickCAD thumbnail (cad), Autodesk SKETCH thumbnail (skf), Autodesk SketchUp component (skp, skb), Autologic (gm, gm2, gm4), Award Bios Logo (epa), Axialis Screensaver(images) (ssp), B3D(images) (b3d), BFLI (bfl, bfl_i, fli, flp, afl), BIAS FringeProcessor (msk, img, raw, flt), BLP textures (blp), BMF (bmf), BSB/KAP (kap), BYU SIR (sir), Bert's Coloring (bmg, ibg), Bfx Bitware (bfx), Bio-Rad confocal (pic), Blazing Paddles (pi), Bob Raytracer (bob), Brender (pix), Brooktrout 301 (brk, 301, brt), Brother Fax (uni), Buttonz & Tilez texture (til), CALS Raster (cal, cals, gp4, mil), CDU Paint (cdu), CGM (cgm), CImage (dsi), CMU Window Manager (cmu), CP8 256 Gray Scale (cp8), CSV (csv), Calamus (cpi, crg), Camera RAW (raw), Canon EOS-1D Mark II RAW (cr2), Canon Navigator Fax (can), Canon PowerShot (crw), Cartes Michelin (big), Casio QV-10/100 Camera (cam), Casio RAW (bay, raw), Chinon ES-1000 digital camera (cmt), Cisco IP Phone (cip), Cloe Ray-Tracer (clo, cloe), ColoRIX (rix, sci, scx, sc?), CompW (wlm), CompuServe GIF (gif, giff), Computer Eyes, Digital Vision (ce), ComputerEyes Raw (ce1, ce2), Contax RAW (bay, raw), Core IDC (idc), Corel Draw Bitmap(preview) (cdr), Corel Draw Pattern(preview) (pat), Corel Flow(preview) (bmf), Corel Metafile Exchange(preview) (cmx), Corel PhotoPaint 6.0 (cpt), CoverDesigner(images) (ncd), CoverDesigner Template(images) (nct), Crayola (art), Creative PC-CAM RAW (bay, raw), DBW Render (), DIV Game Studio Map (map), DIV Game Studio Multi Map (fpg), DKB Ray-Tracer (dis), DNG (dng), DPX (dpx), Dali Raw (sd0, sd1, sd2), Datacopy (img), Degas & Degas Elite (pil, pc1, pi2, pc2, pi3, pc3, pi4, pi5, pi6), Deluxe Paint, Electronic Arts (lbn, ilbn), Dicom (dcm, acr, dic, dicom, dc3), Digital F/X (tdim), Digital Research(GEM Paint) (img, gem), Direct Draw Surface (dds), Discorp CMP Image (cmp), DjVu (djvu, djv, iw4), DolphinEd (dol), Doodle Atari (doo), Doodle C64 (dd), Doodle C64(Compressed) (jj), Dr Halo (cut), Draz Paint (drz), EA Sports FSH (fish), EPS Interchange Format (epi, ept), ERI-chan(Entis Rasterized Image) (eri), ESM Software Pix (pix), Ecchi (ecc), Eclipse (tile), Edmics (c4), Egg Paint (trp), Electric Image (ei, eidi), Embroidery (bmc), Encapsulated Postscript (ps, eps), Encapsulated Postscript (Preview) (eps), Enhance Simplex (esm), Enhanced Compressed Wavelet (ecw), Epson RAW (erf), Eroïica (eif), Everex Everfax (efx, ef3), Explore(TDI) & Maya (iff, tdi), FIF(Iterated

System) (fif), FIT (fit), Face Painter (fpt), Fast Piecewise-constant (pwc), Fax Group 3 (g3, fax), Fax man (fmf), Faxable PCX (fcx), Faxable TIFF (ftf), Fenix Map (map), Fenix Multi Map (fpg), FileMagic (mag), Flash Image (fi), FlashCam Frame (ncy), FlashPix Format (fpx), Flexible Image Transport System (fts, fits, fit), Foculus RAW (bay, raw), Fontasy Grafik (bsg), Fremont Fax96 (f96), Fugawi Map (fx3), Fuji S2 RAW (raf), Fun Painter II (fp2, fun), Fun Photor (fpr), Fuzzy bitmap (fbm, cbm), GRS16 (g16), Gamma Fax (gmf), GeoPaint (geo), Gfa Raytrace (sul), GigaPaint Hi-res (gih), GigaPaint Multi (gig), Gimp Bitmap (xcf), Gimp Brush (gbr), Gimp Icon (ico), Gimp Pattern (pat), GoDot (4bt, 4bit, clp), GunPaint (gun, ifl), HD Photo (wdp, hdp), HDRI (hdr, hdri), HF (hf), HP-48/49 GROB (gro, grb), HP-49 OpenFire (gro2, gro4), HPGL-2 (hp, hpg, hgl, plt, hppl, hpgl2, gl2, prn, prt, spl), HRU (hru), HSI Raw (raw), Half-Life Model (mdl), Hasselblad RAW (3fr), Hayes JTFax (jtf), Hemera Photo Image (hpi), Hemera Thumbs (hta), Heretic II MipMap (m8), Hi-Eddi (hed), Hires C64 (hir, hbm), Homeworld Texture (lif), IBM Kips (kps), IBM Printer Page Segment (pse), IM5(Visilog) (im5), IMNET Image (imt), IOCA (ica, ioca, mod), IPLab (ipl), iPod thumb (ithmb), ISS (iss), IcoFX (ifx), Icon Library (icl), Imacon/Hasselblad RAW (fff), Image Capture Board (icb), Image Magick file (mif, miff), Image Speeder (ish), Image System(Hires) (ish), Image System(Multicolor) (ism), Image Systems RLC2 Graphic (rlc), ImageLab (b&w, b_w), ImagePro Sequence (seq), Imaging Fax (g3n), Imaging Technology (img), Img Software Set (img), Inshape (iim), InterPaint(Hires) (iph), InterPaint(Multicolor) (ipt), Intergraph Format (itg, cit, rle), Interleaf (iimg), Iris CT (ct), Iris Graphics (iris), J Wavelet Image Codec (wic), JBIG (jbg, bie, jbig), JBIG-2 (jb2), JFIF based file (jb2), JPEG / JFIF (jpg, jpeg, jif, jiff, J, jpe), JPEG 8BIM header(Mac) (jpg, jpeg, jif, jiff, J, jpe), JPEG XR (jxr), JPEG-2000 Code Stream (jpc), JPEG-2000 JP2 File Format (jp2, j2k, jpx, jpf), JPEG-LS (jls), Jeff's Image Format (jif), Jigsaw (jig), Jovian VI (vi), Jpeg Network Graphics (jng), JustButtons animated bitmap (btn), KONTRON (img), Khoros Visualization Image file (vif, viff, xv), KinuPix Skin (thb), Kiss Cel (cel), Koala Paint (koa, kla), Koala Paint(Compressed) (gg), Kodak Cineon (cin), Kodak DC120 Digital Camera (kdc), Kodak DC25 Camera (k25), Kodak Photo CD (pcd), Kodak Pro Digital RAW (dcr), Kofax Group 4 (kfx), Kolor Raw Format (kro), Konica Camera File (kqp), LSS16 (lss, 16), LView Pro (lvp), LaserData (lda), Leaf RAW (mos), Leica RAW (bay, raw), Light Work Image (lwi), LucasFilm Format (lff), Lumena CEL (cel), LuraDocument Format (ldf), LuraDocument.jpm Format (jpm), LuraWave Format (lwf), LuraWave JPEG-2000 Code Stream (jpc), LuraWave JPEG-2000 Format (jp2, j2k, jpx, jpf), MAKIchan Graphics (mag), MGI Photosuite Project(images) (pzp), MGR bitmap (mgr), MRC(Medical Research Council) (mrc), MTV Ray-Tracer (mtv), Mac Paint (mac, mpnt, macp, pntg, pnt, paint), Mac icon (icns), Macintosh Quickdraw/Pict (pic, pict, pict2, pct), Mac OSX Resource (rsc, rsrc), Maggi Hairstyles & Cosmetics (fff), Male MRI (pd, t1, t2), Male Normal CT (fre), Mamiya RAW (mef), Marks Russel File (mrf), Mavica (411), Maw-Ware Textures (mtx), Mayura Draw (pdx), MegaPaint (bld), Megalux Frame (frm), Micro Dynamics MARS (pbt), Micro Illustrator Uncompressed (mil), Micrografx Picture Publisher 4.0 (pp4), Micrografx Picture Publisher 5.0 (pp5), Micron RAW (bay, raw), Microsoft Image Composer (mic), Microsoft Paint (msp), Microtek Eyestar (img), Mindjongg Format (ipg), Minolta DiMAGE RAW (mrw), Mobile FAX (rfa), MonkeyCard (pdb), MonkeyLogo (pdb), MonkeyPhoto (mph), MrSid (sid), Msx 2 Screen (sc2), Multiple Network Graphics (mng), NCR Image (ncr), NIST ihdr (pct), National Imagery Transmission F. (ntf, nitf), NeoBook Cartoon (car), Neochrome(ST & TT) (neo), Neopaint Mask (npm), Neopaint Stamp (stw), NewsRoom (nsr, ph, bn), Nifti (img), Nikon RAW (nef), Nokia Group Graphics (ngg), Nokia Logo File (nlm), Nokia OTA bitmap (otb), Nokia Operator Logo (nol), OAZ Fax (oaz, xfx), OS/2 Bitmap (bmp, bga), Olicom Fax (ofx), Olympus RAW (orf), Open Image Library Format (oil), OpenEXR (exr), Optigraphics (ctf), Optigraphics Tiled (tff), Optocat (abs), Oric Hires (hir), Oric TAP (tap), Os/2

Warp (bga), PABX background (pix), PAX (pax), PC Paint / Pictor Page (pic, clp), PCO (b16), PM (pm), Page Control Language (pcl), Paint Magic (pmg), PaintShopPro Browser Cache File (jbf), PaintShopPro Brush (pspbrush), PaintShopPro Brush (jbr), PaintShopPro Frame (pfr, pspframe), PaintShopPro Image (psp, pspimage), PaintShopPro Mask (pspmask), PaintShopPro Mask (msk), PaintShopPro Pattern (pat), PaintShopPro Picture Tube (tub, psptube), PaintShopPro Texture (tex), Palm Pilot (pdb), Panasonic DMC-LC1 RAW (srf), Panasonic LX3 RAW (rw2), Panasonic RAW (bay, raw), Pegs (pxs, pxa), Pentax *ist D (pef), Pfs Art Publisher (art), Photo Deluxe (pdd, pdb), Photo Filtre Studio (pfi), PhotoFantasy Image (fsy), PhotoFrame (frm), PhotoStudio File (psf), PhotoStudio Stamp (stm), Photomatrix (cat), Pic2 (p2), Picasso 64 (p64), Picture Gear Pocket (prc), Picture It! (mix), Pixar picture file (pic, pxr, picio, pixar), Pixel Power Collage (ib7, i17, i18, if9), Pixia (pxa), Pixibox (pxb), Planetary Data System (pds, img), Playback Bitmap Sequence (bms), Pocket PC Bitmap (2bp), Pocket PC Themes(images) (tsk), Polychrome Recursive Format (prf), Portable Bitmap (pbm, rpbm, ppma), Portable Document Format (pdf), Portable Greyscale (pgm, rpgm), Portable Image (pnm, rpnm, pbm, rpbm, pgm, rpgm, ppm, rppm), Portable Network Graphics (png, apng), Portable Pixmap (ppm, rppm), Portfolio Graphics (pgf), Portfolio Graphics Compressed (pgc), Portrait (cvp), Poser Bump (bum), Postscript (ps, ps1, ps2, ps3, eps, prn), PowerCard maker (crd), PowerPoint(images) (pps), PowerPoint Presentation(images) (ppt), Print Master (pm), Print Shop (psa, psb), Printfox/Pagefox (bs, pg, gb), Prism (cpa), Prisms (pri), Psion Series 3 Bitmap (pic), Psion Series 5 Bitmap (mbm), Punk Productions Picture (ppp), Puzzle (pzl), Q0 (q0, rgb), Qdv(Random Dot Software) (qdv), Qrt Ray-Tracer (qrt), Quake Texture (wal), Quantel VPB (vpb), QuickTime Image Format (qtif, qti), RAW DVR (raw), RIPTerm Image (icn), Radiance (rad, img, pic), Rainbow Painter (rp), Raw (raw, gry, grey), Rawzor (rwz), Rayshade (pic), Red Storm File Format (rsb), Ricoh Digital Camera (j6i), Ricoh Fax (001, ric), Ricoh IS30 (pig), Rm2K XYZ (xyz), Rollei RAW (rdc, ia), RoverShot RAW (bay, raw), RunPaint(Multicolor) (rpm), Saracen Paint (sar), SBIG CCD camera ST-4 (st4), SBIG CCD camera ST-X (stx, st4, st5, st6, st7, st8), SciFax (sci), SciTex Continuous Tone (sct, ct, ch), Seattle Film Works (sfw), Seattle Film Works multi-image (pwp, sfw), SecretPhotos puzzle (xp0), Sega SJ-1 DIGIO (sj1), Sharp GPB (img), Siemens Mobile (bmx), SIF MICHEL-Soft (sif), Sigma RAW (x3f), Silicon Graphics RGB (rgb, rgba, bw, iris, sgi, int, inta), Sinar RAW (cs1, sti), Skantek (skn), Slow Scan Television (hrz), SmartDraw 6 template (sdt), SmartFax (1), SmoothMove Pan Viewer (pan), Softimage (pic, si), Solitaire Image Recorder (sir), Sony DSC-F1 Cyber-shot (pmp), Sony DSC-F828 RAW (srf), Sony PS2 TIM (tm2), Sony Playstation TIM (tim), Sony RAW (sr2, arw), Spectrum 512 (spu), Spectrum 512(Compressed) (spc), Spectrum 512(Smooshed) (sps), SPOT (dat), SriSun (ssi), Stad (pic, pac, seq), Star Office Gallery (sdg), Starbase (img), Stardent AVS X (x, avs, mbfs, mbfavs), Starlight Xpress SX (RAW), Stereo Image (jps), ST Micro RAW (bay, raw), Structured Fax Format (sff), Sun Icon/Cursor (icon, cursor, ico, pr), Sun Rasterfile (ras, rast, sun, sr, scr, rs), Sun TAAC file (iff, vff, suniff, taac), Syberia texture (syj), Synthetic Universe (syn, synu), SVG (svg), TG4 (tg4), TI Bitmap (92i, 73i, 82i, 83i, 85i, 86i, 89i), TIFF Revision 6 (tif, tim, tiff), TMSat image (imi), TRS 80 (hr), TealPaint (pdb), Teli Fax (mh), Thumbnail (tnl), TilePic (tjp), Tiny (tny, tn1, tn2, tn3), TopDesign Thumbnail (b3d, b2d), Total Annihilation (gaf), Truevision Targa (tga, targa, pix, bpx, ivb), Ulead Pattern (pst), Ulead PhotoImpact (upi), Ulead Texture(images) (pe4), Usenix FaceServer (fac, face), Utah raster image (rle, urt), VIPS Image (v), VITec (vit), VRML2 (wrl), Venta Fax (vfx), Verity (vif), Vicar (vic, vicar, img), Vidcom 64 (vid), Video Display Adapter (vda), Vista (vst), Vivid Ray-Tracer (img), Vort (pix), Vue d'esprit (vob), WAD(Half life) (wad), WSQ (wsq), WaveL (iwc), Wavefront Raster file (rla, rlb, rpf), WebShots(images) (wb1, wbc, wbp, wbz), Weekly Puzzle (jig), WebP (webp, wep), Whypic (ypc), WinFAX (fxs, fxo, wfx, fxr, fxd, fxm), WinMIPS (pic),

Windows & Aldus Metafile (wmf), Windows Animated Cursor (ani), Windows Bitmap (bmp, rle, vga, rl4, rl8, sys), Windows Clipboard (clp), Windows Comp. Enhanced Metafile (emz), Windows Compressed Metafile (wmz), Windows Cursor (cur), Windows DIB (dib), Windows Enhanced Metafile (emf), Windows Icon (ico), Winzle Puzzle (wzl), Wireless Bitmap(level 0) (wbmp, wbm, wap), Word Perfect Graphics(images) (wpg), Worldport Fax (wfx), X Windows System dump (xwd, x11), X11 Bitmap (xbm, bm), X11 Pixmap (xpm, pm), XV Visual Schnauzer (p7), Xara(images) (xar), Xerox DIFF (xif), Ximage (xim), Xionics SMP (smp), YUV 16Bits (yuv, qtl, uyvy), YUV 16Bits Interleaved (yuv, qtl, uyvy), YUV 4:1:1 (yuv, qtl), YUV 4:2:2 (yuv, qtl), YUV 4:4:4 (yuv, qtl), ZX Spectrum Hobetta (\$s, \$c, !s), ZX Spectrum Snapshot(sna), ZX Spectrum standard (screen scr), ZZ Rough (rgh), Zeiss BIVAS (dta), Zeiss LSM (lsm), Zoner Callisto Metafile(zmf), Zoner Zebra Metafile (zbr), Zsoft Multi-page Paintbrush (dcx), Zsoft Publisher's Paintbrush (pcx, pcc, dcx), byLight (bif)

2.1.5 File Masks

R-Linux shows only those files/folders that match the specified file mask. File mask affects files/folders that are processed by the **Recover** and **Find** commands.

To specify a file mask,

1 Click the File Mask button

Other ways to specify the file mask

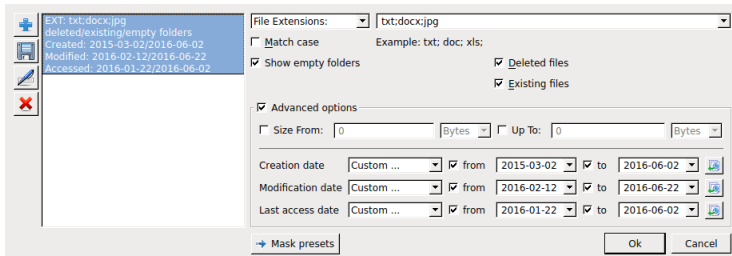
- Right-click a folder and select **File Mask** on the context menu

or

- Select the folder and select **File Mask** on the **Tools** menu


2 Specify the file mask on the File mask dialog box and click the OK button

Mask dialog box



File mask options

You may specify options for All Files, File Extensions, File Masks, and Regular Expressions	
Match case	If this check box is selected, R-Linux makes a case-sensitive search.
Show empty folders	If this check box is selected, R-Linux will show folders with no files matching the mask.
Deleted files	If this check box is selected, R-Linux makes a search among deleted files/folders.
Existing files	If this check box is selected, R-Linux makes a search among existing files/folders.
Use advanced options	If this check box is selected, R-Linux will use the advanced options, even when they are hidden.

Advanced Options	
Size from/up to	Specifies file size limits. See the Data Formats and Multipliers topic for more details on data formats.
Date	Specifies file date boundaries. Dates for Modified, Created, and Last Accessed timestamps may be set separately. The Set for all button sets the specified data for all fields.
	The Set for all button sets the specified data for all fields.

> **R-Linux will show only those files that match the specified file masks**

Mask presets

You may set various presets with different file masks. Just click on the Plus button to add the data from the dialog box to the presets. You may also give presets names, delete them, and store them permanently.

2.1.6 Regular Expressions

Regular expression is a notation for patterns of text, as opposed to exact strings of characters. The notation uses literal characters and metacharacters. Every character which does not have special meaning in the regular-expression syntax is a literal character and matches an occurrence of that character. For example, letters and numbers are literal characters. A metacharacter is a symbol with special meaning (an operator or delimiter) in the regular-expression syntax.

.	Wildcard: any character
*	Repeat: zero or more occurrences of previous character or class
^	Line position: beginning of line
\$	Line position: end of line
[class]	Character class: any character in the set
[^class]	Inverse class: any character not in the set
[x-y]	Range: any characters within the specified range
\x	Escape: literal use of metacharacter x
\<xyz	Word position: beginning of the word
xyz\>	Word position: end of the word

For example, the following regular expression `.*` matches any string of characters, `^a` matches any string beginning with character a.

2.1.7 Event Log

R-Linux logs and displays events in the Log panel. You may set a **Log filter** to display only needed information and to write it to a log file. You may specify the log settings on the [Settings](#) dialog box.

You may clear or save the log

To clear the log,

* **Right-click the Log panel and select Clear Log on the context menu.**

To save the log to a file,

* **Right-click the Log panel and select Save Log to File on the context menu.**

2.2 Advanced Data Recovery

This chapter explains how to perform advanced data recovery operations.

- [Disk Scan](#)
- [Regions](#)
- [Exclusive Regions](#)
- [Images](#)

2.2.1 Disk Scan

In order to completely analyze data structure on an object, it must be scanned. Any object on the Drives panel can be scanned. In addition, you may create a *region* to scan only a part of an object. The [Regions](#) topic explains how to create and work with *regions*. Scan is also greatly improves estimations for chances of successful file recovery.

You may select scan area and some other scan parameters. Scan information may be saved to a file and later this file may be opened.

Attention: Scanning large areas may be a very lengthy process!

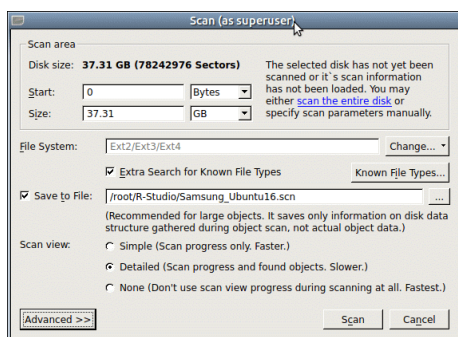
NEVER TRY TO SAVE SCAN INFORMATION ON THE OBJECT BEING SCANNED!!!

Or you may obtain unpredictable results and lose all your data.

To scan an object

- 1 Select an object on the **R-Linux's** Drives panel
- 2 Click the Scan button
 - ▣ **Other ways to start scan**
 - Right-click the selected disk and select **Scan** on the context menu,
 - or
 - Select **Scan** on the **Drive** menu
- 3 Specify the required parameters on the Scan dialog box and click the Scan button

Scan dialog box



▣ Scan options

- Disk Size: Shows the size of the object to be scanned
- Start: Sets the start point of the area to be scanned.
- Size: Sets the size of the area to be scanned.

Numbers in these fields can be in bytes or sectors. See the [Data Formats and Multipliers](#) topic for more details on data formats.

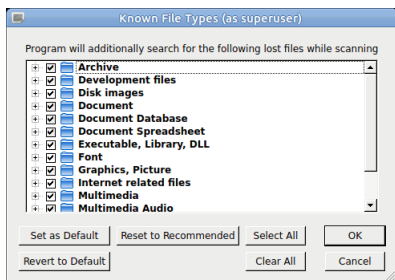
File Systems: Specifies the file systems which objects are to be searched for.

	Current version supports: Ext2/3/4FS.
Extra search for Known File Types	Enables search for Known File Types.
Save scan Info to File:	If this checkbox is selected, R-Linux will save scan information to a specified file. Later this file may be opened. Please note, that this option does not save actual disk data, only information on disk data structure gathered during disk scan.
Simple view	If this option is selected, R-Linux will show only scan progress.
Detailed view	If this option is selected, R-Linux will show graphic representation on objects found during scan.
Buttons	
Scan	Starts scanning
Advanced	Activates advanced scan options
Known File Types...	Selects file types that R-Linux will recognize during the disk scan.
Cancel	Closes the dialog box

**NEVER TRY TO SAVE SCAN INFORMATION ON THE OBJECT BEING SCANNED!!!
Or you may obtain unpredictable results and lose all your data.**

Known File Types: While scanning, **R-Linux** can recognize to which particular file type the data belong. Using such information, **R-Linux** can obtain more information about data/file structure on the object being scanned. By default, **R-Linux** tries to recognize all supported file types, greatly increasing time required for the scan. You may reduce it by selecting only those file types that you need. Click the **Known File Types...** button and select the required file types on the File Types dialog box.

File Types dialog box



Known File Types

Set as Default	Click this button to set the current list of selected file types as default values.
Revert to Default	Click this button to revert the default settings specified on the Known File Types tab of the Settings panel.
Reset to Recommended	Click this button to revert to factory-preset default settings.
Select All	Click this button to select all file types in the list.
Clear All	Click this button to clear all file types in the list except some predefined ones.

List of known file types

* By default, files of this type are not selected. If necessary, select them manually			
Document			
Adobe PDF document	Microsoft Word2 document	Microsoft WordPad document	OLE Storage

PostScript document	Rich Text document	TEX document	Word for Macintosh document
WordPerfect document			
Document: Spreadsheet			
Lotus worksheet	Lotus3 worksheet *	Microsoft Excel2 worksheet	Microsoft Excel3/4 worksheet
Quattro Pro worksheet			
Document: Database			
Data Interchange Format file	Microsoft Access database	dBase III database	Microsoft SQL database
Microsoft SQL Log			
Document: MS Office (OLE MS) (Word/Excel/PowerPoint)			
Microsoft Word document	Microsoft Excel document	Microsoft PowerPoint document	
Internet-related files			
Compiled HTML file	HTML document	Internet shortcut	Outlook Express Messages
Windows Address Book	XML document	XML document (Unicode)	The Bat! Address book
The Bat! Message Base	The Bat! Message Index		
Font			
Adobe PostScript Font	Adobe Printer Font	BDF Unix font	BGI font
CPI DOS font	TrueType font		
Graphics/Picture			
AVHRR Satellite image	Adobe Photoshop image	Agfa/Matrix Scodl image	Alias Wavefront Raster image
AutoCAD Binary image	AutoCAD image	Autodesk Animator Pro color map	Autodesk Animator Pro image
Autodesk Animator image	Autologic image	BMF image	ColorIX image
CompuServe GIF image	ComputerEyes Raw image	Continuous Edge Graphic image	Corel Texture image
CorelDraw CMX image	CorelDraw image	Cubicomp Picture Maker image	Dr. Halo palette
Enhanced MetaFile image	Epson Stylus image	Erdas LAN/GIS image	Fractal Image Format
GEM Raster image *	GEM VDI image	GOES Satellite image	Gridded Binary image

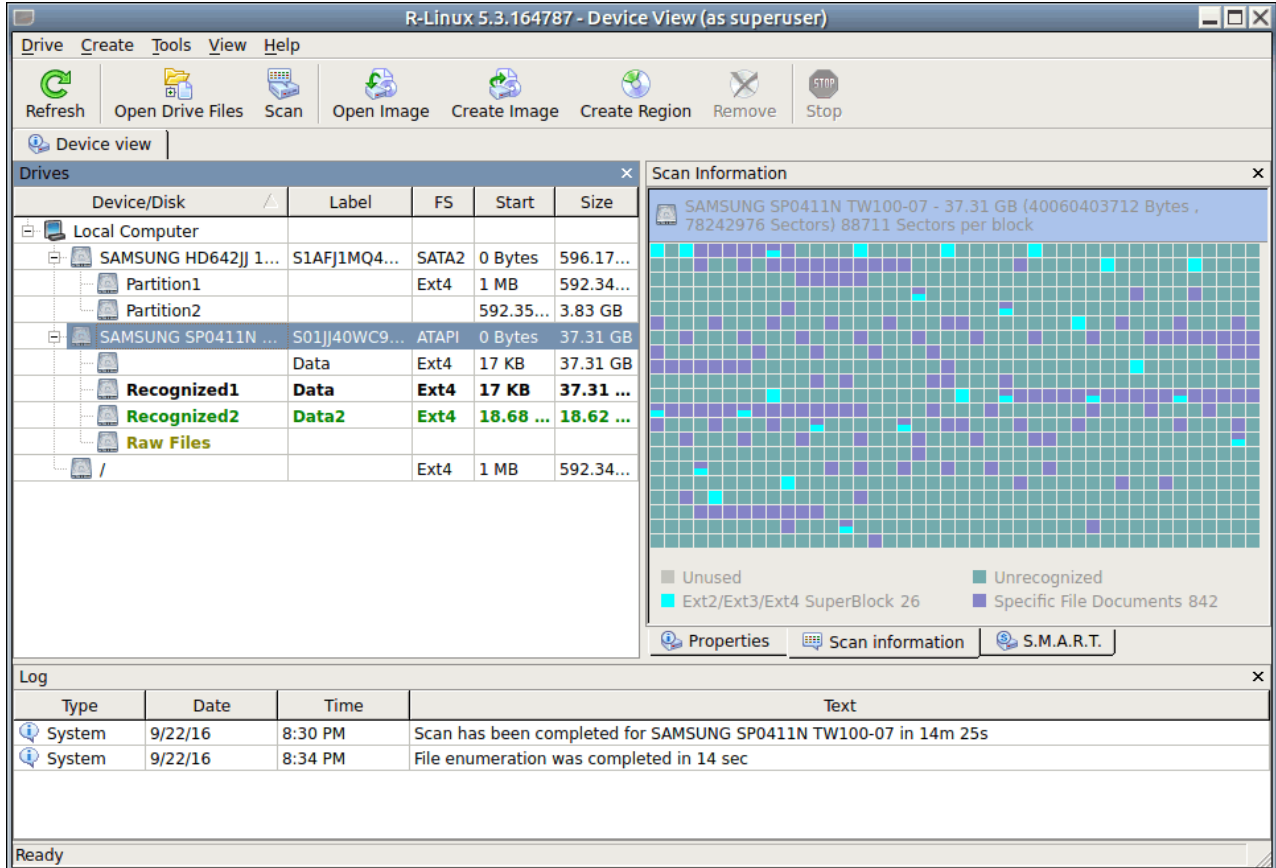
HP Command Language image	HP Raster image	Hitachi Raster image	IBM Picture Maker image
JPEG image	JPEG-LS image	HSI JPEG image	Jovian Logic image
LBM/IFF image	Lotus PIC image	Macintosh PICT image	Macintosh PICT image
Macintosh Paint image	Macintosh Paint image	Microsoft Paint image	PBM image
PGM image	PIX image	PM image	PNG image
PPM image	Pictor PC Paint image	Quick Link II fax image	RenderMan image
SGI image	STAD image	Sketch image	Sun Raster image
Tagged Image Format File	TrueVision image	Utah Raster Toolkit image	VITec image
Windows Animated cursor	Windows Bitmap image	Windows Fax Cover image	Windows MetaFile image
Windows cursor	Windows icon	WordPerfect Graphics image	X PixMap image
X Window Dump image	ZSoft PCX image		
Multimedia: Audio Files			
AIFF sound	AVR sound	Advanced Streaming Format file	AudioCD file
CMF music	Creative Voice file	DiamondWare sound	EA ASF/MUS audio file
Extended M3U playlist	MIDI Instrument definition	MIDI music	MIDI stream
MPEG Layer I audio file *	MPEG Layer II audio file *	MPEG Layer III audio file	MUS music
Next/Sun sound	Ogg Vorbis audio file	RIFF MIDI music	RK Audio sound
Sierra AUD sound	VQF sound	Westwood AUD sound	Windows Media Audio File
Windows WAVE sound	X-MIDI music	ZyXEL sound	
Multimedia: Video Files			
ANIM animation	Adobe Filmstrip animation	BINK video	DVM video
DeluxePaint animation	Director video	Intel DVI video	Interplay MVE video
LZA animation	MPEG video	NEOchrome animation	Nullsoft Video
QV-10 video	QuickTime video	RPL video	Shockwave video
Smacker video	VideoCD video	Windows AVI video	
Multimedia Files			

RIFF Multimedia File	Real Networks audio/video		
Archive Files			
7-Zip archive	ACE archive	AIN archive	ARJ archive
ARX archive	Aladdin Systems Stuffit archive	BAG archive	BIX archive
BOA archive	BZip2 archive	BlackHole archive	Blink archive
CPIO archive	CRUSH archive	ChArc archive	Compress archive
FOXSQZ archive	GZip archive	HA archive *	HAP archive
HPACK archive	Hyper archive	InstallShield Cabinet archive	InstallShield Data archive
InstallShield archive	JAM archive	JAR archive	JRC archive
LHA/LZARK archive	LIMIT archive	LZA archive	LZOParchive
LZSH archive	LZX archive	Microsoft Cabinet archive	Microsoft Compress 5 archive
Microsoft Compress 6 archive	PAKLEO archive	Pack archive *	QFC archive
Quantum archive *	Quark archive	RAR archive	RPM archive
ReSOF archive	SAR archive	SBC archive	SCO archive *
SQZ archive	SZip archive	Stuffit archive	TAR archive
UFA archive	UHArc archive	UltraCompressor 2 archive	UltraCrypt 2 archive
WIN-Freeze archive *	WRaptor archive	WinImp archive	YAC archive
YBS archive	ZIP archive	ZOO archive	ZZip archive
Executable/Library/DLL			
DOS Style Executable	ELF Executable (UNIX)	ELF Library (UNIX)	ELF Module (UNIX)
Java Bytecode	Novell NetWare executable	RDOFF executable	
Development files			
COM Type library Library	Microsoft ClassWizard file	Microsoft Linker database	Microsoft Precompiled header
Microsoft Program database	Microsoft Visual C++ project	Microsoft Visual Studio project	Microsoft Visual Studio workspace
OMF Object library	Windows Compiled resource (16bit) *	Windows Compiled resource (32bit)	
Other file types			

RegEdit file	RegEdit file (UNICODE)	WinHelp	WinHelp Contents
Windows Clipboard file *	Windows Color Profile	Windows National locale	Windows Password file
Windows Policy file	Windows Registry file	Windows Registry hive	Windows shortcut

> R-Linux starts scanning the object, and its panel will show information about new found objects:

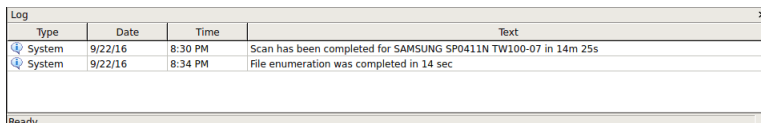
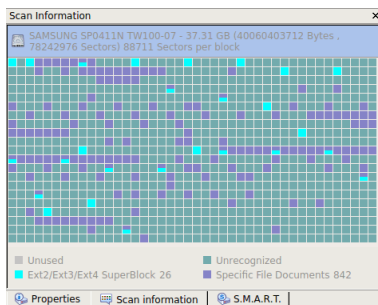
R-Linux Main panel



Drives panel after scanning:

You can select an object by clicking on it

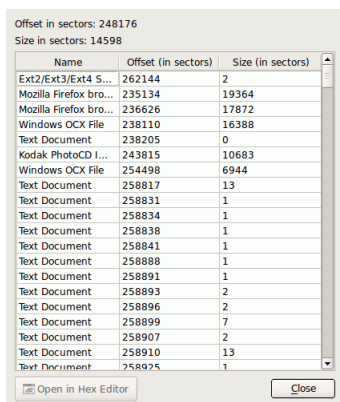
Device/Disk	Label	FS	Start	Size
Local Computer				
SAMSUNG HD642JJ 1AA01110	S1AFJ1MQ400283	SATA2	0 Bytes	596.17 GB
Partition1		Ext4	1 MB	592.34 GB
Partition2			592.35 GB	3.83 GB
SAMSUNG SP0411N TW100-07	S01JJ40WC94266	ATAPI	0 Bytes	37.31 GB
Data		Ext4	17 KB	37.31 GB
Recognized1	Data	Ext4	17 KB	37.31 GB
Recognized2	Data2	Ext4	18.68 GB	18.62 GB
Raw Files				
/		Ext4	1 MB	592.34 GB



The Log pane will show scan progress. Scan may be stopped by clicking the **Stop** button on the toolbar. Later the scan process may be resumed with different scan parameters.

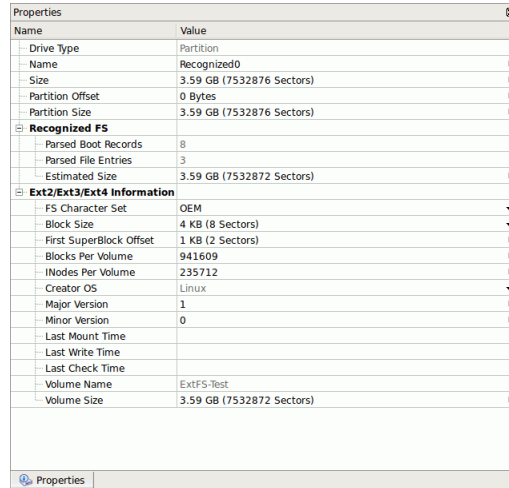
You may see which file object(s) is/are on a particular disk part. Click the corresponding rectangle on the Scan Information pane and view the information on the Scan Information dialog box.

Scan Information **dialog box**



Select the file object and click **Open in Hex Viewer** to view the file object in the [Text/Hexadecimal Viewer](#).

To see the information about a newly found object, simply click it on the Drives panel. Click this link to see the information about the object Recognized0 on the partition:.



When an object is scanned, a number of Recognized partitions will appear. **R-Linux** shows them in different colors depending on which elements of the partition have been found.

Partition	An existing partition
Recognized	An existing partition after disk scan
Recognized	Both boot records and file entries are found for this partition
Recognized	Only file entries are found for this partition
Recognized	Only boot records are found for this partition
DeletedPart	A deleted partition
Empty Space	Empty space on the object
Raw Files	Files that have been found using scan for known file types .

Although such recognized partitions are virtual objects, files can be searched for and recovered from recognized partitions as from real partitions using [Basic File Recovery](#).

All scanned information may be deleted on the context menu for a scanned object.

Scan information may be saved in a file. Previously saved scan information may be loaded. This can be done on the **Drive** or context menu for a selected object.

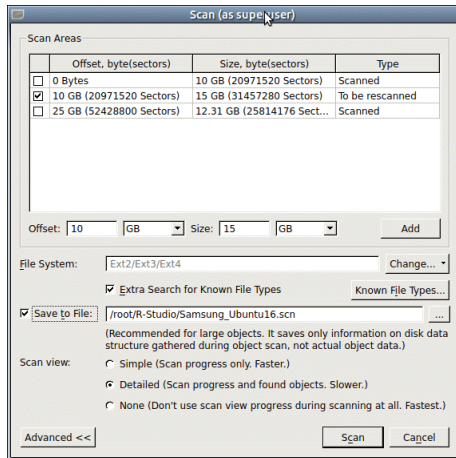
Multiple scans

If the selected object has been completely scanned, you may rescan it either completely or with new scan parameters. If the selected object has been scanned partially, you may scan the rest of the object, ignore the existing scan information and scan the entire object, or specify scan parameters manually.

R-Linux accumulates the information from successive scans and keeps track of changes in this information obtained from different scans.

You may make several scans of successive or overlapping areas. Click the **Advanced** button, specify an offset and size for a new area to scan on the Advanced Scan dialog box and click the **Add** button. You may specify and add several scan areas. You may select which areas should be scanned. Selected scan areas can be merged. Right-click a necessary area and select either **Merge Down**, **Merge Down All**, and **Merge Selected**.

Advanced Scan dialog box



Managing scan information

Scan information may be saved to a file. Previously saved scan information may be loaded.

To save scan information

- 1 Select an object on the **R-Linux Drives panel**
- 2 Select **Save Scan Information** on the **Drive** or context menu and save the scan information in a file
The default file extension is `*.dpl`.

To load scan information

- 1 Select an object on the **R-Linux Drives panel**
- 2 Select **Open Scan Information** on the **Drive** or context menu and select the required file with the scan information
The default file extension is `*.scn`.

> The scan information will appear in the **Drives panel**

To delete scan information

- 1 Select an object on the **R-Linux Drives panel**
 - 2 Select **Delete Scan Information** on the **Drive** or context menu
- > The scan information will disappear from the **Drives panel**

NEVER TRY TO SAVE SCAN INFORMATION ON THE OBJECT BEING SCANNED!!!
Or you may obtain unpredictable results and lose all your data.

2.2.2 Regions

Scanning large objects may take a long time. Sometimes, only a smaller area of a disk needs to be scanned or searched for files. Such area is called a *region*. A region can be created on any object in the **R-Linux's** Drives panel.

Created regions can be scanned, and files on them can be recovered in the same way as from hard drives or partitions.

Created regions can be deleted.

Note: **R-Linux** does not create anything real on the disk. Regions are virtual objects that do not affect actual data on the disk.

To create a region

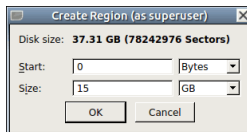
- 1 Select an object on the **R-Linux's** Drives panel and click the **Create Region** button

Other ways to create the region

- Right-click the selected object and select **Create Region** on the context menu
- or
- Select the object and select **Create Region** on the **Create** menu

- 2 Specify required parameters on the Create region dialog box and click the **Create** button

Create region dialog box



Region options

Disk size:	Shows size of the object where the region is to be created. The region cannot be larger than this size.
Start:	Start point of the region
Size:	Size of the region. Cannot be larger than Disk size.
Numbers in these fields can be in bytes or sectors. See the Data Formats and Multipliers topic for more details on data formats.	

- > A Region object will appear on the Drives panel.

Device/Disk	Label	FS	Start	Size
Local Computer				
SAMSUNG HD642j 1AA01110	S1AFJ1MQ400283	SATA2	0 Bytes	596.17 GB
Partition1		Ext4	1 MB	592.34 GB
Partition2			592.35 GB	3.83 GB
SAMSUNG SP0411N TW100-07	S01j40WC94266	ATAPI	0 Bytes	37.31 GB
Region 0 on SAMSUNG SP0411N T...			0 Bytes	15 GB
Partition1		Ext4	1 MB	33.48 GB
Partition1		Ext4	1 MB	33.48 GB
Partition2			33.48 GB	3.83 GB
/		Ext4	1 MB	592.34 GB

To change the size of a region

- * Right-click the **Region** on the **R-Studio** Drives panel, select **Edit** on the shortcut menu, and enter a new size on the **Edit Region** dialog box.

To convert a region into an exclusive one

- * Right-click the **Region** on the **R-Studio** Drives panel and select **Exclude area** on the shortcut menu

To delete a region

- * Select a **Region** on the **R-Linux** Drives panel and click the **Delete** button, or Right-click the selected region and select **Delete Region** on the context menu.

2.2.3 Exclusive Regions

Exclusive regions are areas on any object visible on the the **R-Linux's** Drives panel that are excluded from disk operations. **R-Linux** never tries to read/write data from/to such area. Exclusive regions are necessary when, for example, there are areas with bad sectors on a hard drive, and it is necessary to avoid any disk operations with such areas to not inflict further damage to such drive and to speed work with it.

Note: R-Linux does not create anything real on the disk. Exclusive regions are virtual objects that do not affect actual data on the disk.

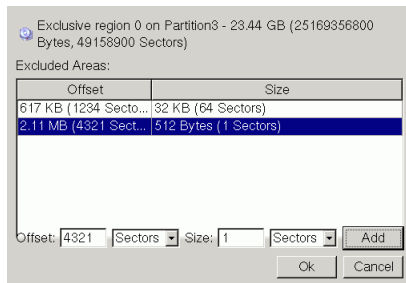
To create an *exclusive region*

- 1 **Right-click an object on the R-Linux's Drives panel and select Create Exclusive Region on the shortcut menu, or**

Select the object and select **Create Exclusive Region** on the **Create** menu

- 2 **Specify required parameters on the Create Exclusive Region dialog box and click the Add button**

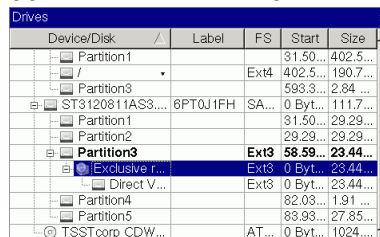
Create exclusive region dialog box



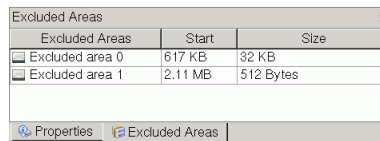
Exclusive Region options

Offset:	Start point of the exclusive region
Size:	Size of the exclusive region. Cannot be larger than Disk size.
Numbers in these fields can be in bytes or sectors. See Data Formats and Multipliers for more details.	

- > **An Exclusive Region object will appear on the Drives panel.**



Its properties can be seen on the Excluded Areas tab.



To delete an exclusive region

- * **Select an Exclusive Region on the R-Linux Drives panel and click the Delete button, or**
Right-click the selected region and select **Remove Region** on the context menu.

To change the size of an exclusive region

- * **Right-click an Exclusive Region on the R-Linux Drives panel, select Edit on the context menu, and add/delete excluded areas on the Edit Exclusive Region tab.**

You may delete an excluded area by right-clicking it and selecting **Remove** on the context menu.

2.2.4 Images

An *image* is an exact, byte by byte, copy of any object on the Drives panel. When created, images can be processed like their original objects.

Images are very useful if there is a risk of total data loss due to hardware malfunction. If bad blocks are constantly appearing on a hard drive, you must immediately create an image of this drive.

While creating images, **R-Linux** can simultaneously perform disk scan and save scan information to lessen time necessary to process the disk.

All data search, scan and restoring can be done from this image.

To create an *image*,

- 1 Select an object on the **R-Linux's** Drives panel and click the Create Image button

▣ Other ways to create the image

- Select the object and select **Create Image** on the Drive menu

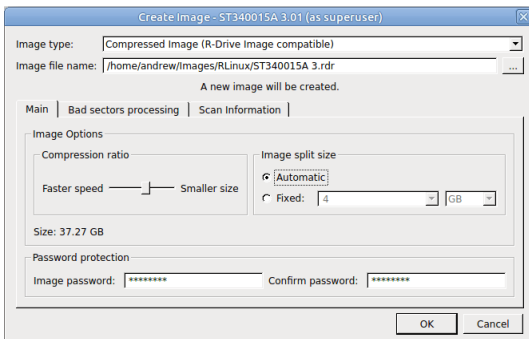
OR

- Right-click the selected object and select **Create Image File** on the context menu

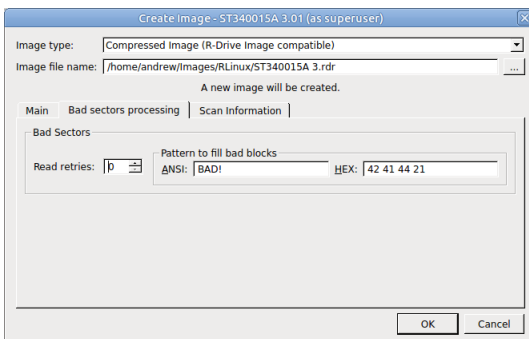
- 2 Specify image options, a file name, and destination for the *image* on the Create Image dialog box

Note: To store an image file, you need a free space equal to at least the object size.

Create Image dialog box



Create Image (Scan Information) dialog box



Create Image dialog box

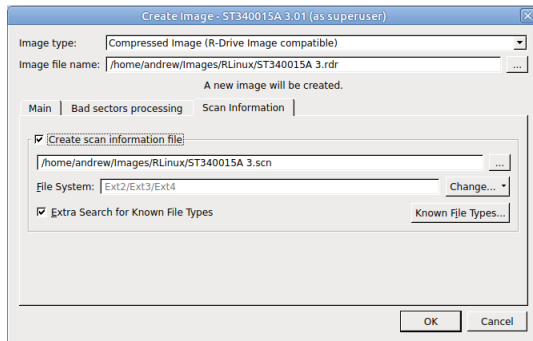


Image Options

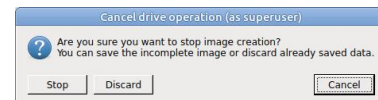
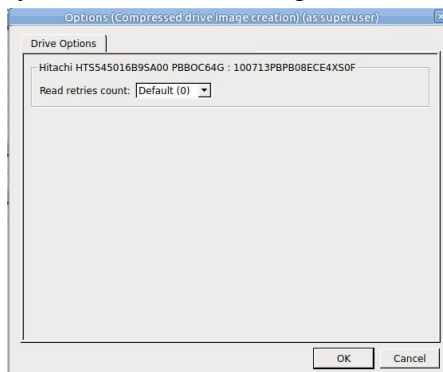
Image name	Specifies the name and path for the image file
Plain image	If this option is selected, R-Linux will create a simple exact copy of the object. This image format is compatible with the previous versions of R-Linux .
Compressed image (R-Drive Image compatible)	If this option is selected, R-Linux will create an image file which can be compressed, split into several parts, and password-protected. This image file is fully compatible with the images created by R-Drive Image , but incompatible with the previous versions of R-Linux .
Image compression ratio	You may compress the data in the image to save space. Active only if the Compressed image (R-Drive Image compatible) is selected.
Estimated size	Shows the estimated size of the image file. An actual image size depends on how much empty space is on the selected partition and what file types are there. Active only if the Compressed image (R-Drive Image compatible) is selected.
Image split size	You may set this option to Automatic and let the system decide how to split the image file. This mostly depends on the file system on the destination disk. You may also either explicitly specify the split size, or choose a preset for various devices with removable storage. Select Fixed size for that. Active only if the Compressed image (R-Drive Image compatible) is selected.
Password	You may protect your image file with a password. Note: This feature provides a relatively moderate protection against conventional unauthorized access. Active only if the Compressed image (R-Drive Image compatible) is selected.
Create scan information file	If this option is selected, R-Linux will perform disk scan simultaneously with image creation. See the Disk Scan help page to learn scan options
Read retries	Specifies a value for I/O Tries, or how many times R-Linux will try to read a bad sector. R-Linux treats bad sectors in the following way: It reads a certain part of disk (predefined by Windows) and <ul style="list-style-type: none"> • If Default read attempts is set to 0, the entire part with bad sectors will be filled with the specified pattern.

	<ul style="list-style-type: none"> If Default read attempts is set to a non-zero value, R-Linux reads again that part sector by sector, repeating the attempts the specified number of times. If R-Linux still cannot read a bad sector, it fills the sectors with the specified pattern. In this case only the bad sectors will be filled with the pattern, but that extremely slows the disk read process. <p>For example, if you set Default read attempts to 1, a bad sector will be read 2 times.</p>
Pattern to fill bad blocks	<p>Specifies a pattern R-Linux will use to fill bad sectors in this image. You may specify the pattern either in the ANSI or Hex data format.</p> <p>Note: R-Linux will never ever try to write anything on the disk from which data is to recover or an image is to create. This pattern fills bad sectors only in the image.</p>

> **R-Linux will start creating the image, the Progress message showing the progress.**

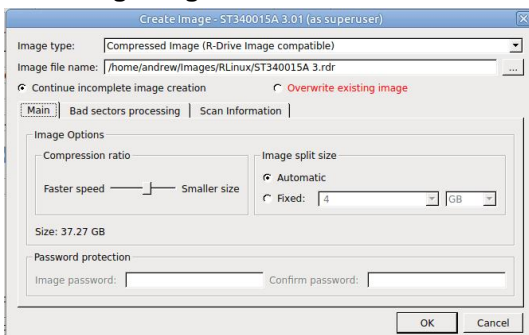
You may change some options during the imaging process. Click the **Options** button and change them as necessary.

You may stop the imaging process and then resume it later on. Click the **Stop** button and the Cancel drive operation dialog box will appear. Select **Stop** if you want to keep the partially created image or **Discard** if you don't need this image file.



To resume the creation of the image for the same object, select the same file name for the image. You'll be able to create a new image file or continue to create the image for the object.

Resuming image creation



R-Studio for Linux will create a new file for every new start of imaging for the `.rdi` file type.

To process an already created *Image*, the image file should be opened.

To open an image

1 Click the Open Image button, or
Select **Open Image File** on the **Drive** menu

2 Select the required image file

> **An *Image* object will appear on the Drives panel**

Depending whether this is a byte-by-byte, compressed (**R-Drive Image** compatible), or multi-volume, image, its appearance in the Drives panels is different.

You may perform all data search, scan, and recovery from this image as it were a regular drive/disk object.

Device/Disk	Label	FS	Start	Size
Local Computer				
KINGSTON SA400S371...	50026B7784...	SATA2	0 Bytes	111.79 ...
/		Ext4	1 MB	103.41 ...
Partition1			103.41 ...	8.38 GB
SAMSUNG HD642JJ 1A...	S1AFJ1MQ40...	SATA2	0 Bytes	596.17 ...
/home		Ext4	1 MB	596.17 ...
Image				
SAMSUNG SP0411...	S01J30X912...	ATAPI	0 Bytes	37.31 GB
Partition1	ext4fs	Ext4	1 MB	37.31 GB

A compressed (R-Drive Image compatible) image

Device/Disk	Label	FS	Start	Size
Local Computer				
KINGSTON SA400S371...	50026B7784...	SATA2	0 Bytes	111.79 ...
/		Ext4	1 MB	103.41 ...
Partition1			103.41 ...	8.38 GB
SAMSUNG HD642JJ 1A...	S1AFJ1MQ40...	SATA2	0 Bytes	596.17 ...
/home		Ext4	1 MB	596.17 ...
Image Files				
/home/andrew/Ima...				37.27 GB
Partition1	Data1	Ext4	1 MB	18.63 GB
Partition2	Data2	Ext4	18.63 GB	18.64 GB

A byte by byte image

Device/Disk	Label	FS	Start	Size
Local Computer				
KINGSTON SA400S37120G 03090005	50026B77843A5628	SATA2	0 Bytes	111.79 GB
/		Ext4	1 MB	103.41 GB
Partition1			103.41 GB	8.38 GB
SAMSUNG HD642JJ 1AA01110	S1AFJ1MQ400283	SATA2	0 Bytes	596.17 GB
/home		Ext4	1 MB	596.17 GB
Image				
08/24/2022 10:53:31 - Incomplete				
ST340015A 3.01	5LA5Y2H1	ATAPI	0 Bytes	37.27 GB
Partition1	Data1	Ext4	1 MB	18.63 GB
Partition2			18.63 GB	18.64 GB
08/24/2022 11:05:53				
ST340015A 3.01	5LA5Y2H1	ATAPI	0 Bytes	37.27 GB
Partition1	Data1	Ext4	1 MB	18.63 GB
Partition2	Data2	Ext4	18.63 GB	18.64 GB

A multi-volume image

To close an image

- * **Select the image and click the Close Image button,**
 - or right-click the image and select **Close Image** on the shortcut menu
 - or select the image and press the **F8** key.



To close all image

- * **Select Close All Images on the Tools menu**

A logical disk (or disks) containing in an image can be mounted in the operating system as a device which makes its content accessible to any program including any other data recovery software.

2.3 Mass File Recovery

Recovery of multiple files

If you need to recover multiple files you may do it through the following steps:

- 1 **Find and mark all the necessary files**
Go to the [Find and Mark Multiple Files](#) topic for more information
- 2 **Recover all marked files in a single file recovery step**
Go to the [Recover Multiple Files](#) for more information

Memory considerations

R-Linux stores information about found files in computer memory. If there are too many files, **R-Linux** may run out of it. To avoid this, you have two options:

Recover all files

If you want to recover data from an entire file system object (a partition, partition image, etc.), you may use the **Recover All Files** command from the **Drive** or context menu. Right click the object in the Drives panel to access the context menu. A [Recover](#) dialog box will appear. Select required restore settings, including file mask. This command restores unlimited number of files without memory restrictions.

View file information in steps

As soon as **R-Linux** nearly runs out of memory, a Too many files... message appears. You may temporarily stop file listing and browse through found files. Then you can resume file listing. You also may skip this file section and continue file listing.

In all cases, **R-Linux** keeps information about the entire file structure.

- [Find and Mark Multiple Files](#)
- [Recover Multiple Files](#)

2.3.1 Find and Mark Multiple Files

If you need to find and mark many files at once, you may do that in the following ways:

By sorting them by their extensions or creation/modification/accessed time

To sort files by their extensions or creation/modification/accessed time,

* On the Folders/Files panel select the tab

Extensions to sort the files by their extensions

Creation Time to sort the files by their creation time

Modification Time to sort the files by their modification time

Accessed Time to sort the files by their accessed time

Other ways to sort files by their extensions or creation/modification/accessed time

- Select the disk on Drives panel, select **Open Drive Files Sorted By** on the **Drive** menu, and select respective option,

or

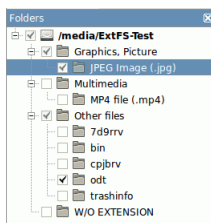
- On the Folders panel, right-click the disk letter and select **Show Files Sorted By** on the context menu and select respective option,

or

- On the Folders panel, select **Show Files Sorted By** on the **Drive** menu and select respective option.

> **R-Linux will show the sorted files in the Folders and Content panels, showing the path to each file:**

Folders panel for files sorted by their extensions



Content panel with files/folders sorted by their extensions

Name	Path	Size	Created	Modified	Accessed	Fileid	Parentid
<input checked="" type="checkbox"/> IMG_7609.jpg	Root/Photo/	2626946 Bytes	3/2/11 8:38 PM	4/29/09 11:43 PM	3/2/11 8:38 PM	236028 (157)	97843 (123)
<input type="checkbox"/> IMG_7622.jpg	Root/Photo/	0 Bytes	3/2/11 8:40 PM	3/2/11 8:40 PM	3/2/11 8:39 PM	97845 (121)	97843 (123)
<input checked="" type="checkbox"/> IMG_7623.jpg	Root/Photo/	3464297 Bytes	3/2/11 8:09 PM	4/29/09 11:46 PM	3/2/11 8:40 PM	97846 (124)	97843 (123)
<input type="checkbox"/> IMG_7624.jpg	Root/Photo/	3176084 Bytes	3/2/11 8:09 PM	4/29/09 11:47 PM	3/2/11 8:09 PM	97847 (125)	97843 (123)
<input type="checkbox"/> IMG_7626.jpg	Root/Photo/	4289730 Bytes	3/2/11 8:09 PM	4/29/09 11:49 PM	3/2/11 8:09 PM	97848 (126)	97843 (123)
<input checked="" type="checkbox"/> IMG_7683.jpg	Root/Photo/	1766948 Bytes	3/2/11 8:09 PM	4/29/09 11:49 PM	3/2/11 8:09 PM	97849 (127)	97843 (123)
<input type="checkbox"/> IMG_7685.jpg	Root/Photo/	2408158 Bytes	3/2/11 8:09 PM	4/29/09 11:50 PM	3/2/11 8:09 PM	97850 (128)	97843 (123)
<input checked="" type="checkbox"/> IMG_7689.jpg	Root/Trash-0/files/	0 Bytes	3/2/11 8:40 PM	3/2/11 8:40 PM	3/2/11 8:40 PM	97851 (129)	122229 (123)
<input type="checkbox"/> IMG_7689.jpg	Root/Photo/	0 Bytes	3/2/11 8:40 PM	3/2/11 8:40 PM	3/2/11 8:40 PM	236029 (158)	97843 (123)
<input checked="" type="checkbox"/> IMG_7690.jpg	Root/Photo/	2682000 Bytes	3/2/11 8:38 PM	4/29/09 11:52 PM	3/2/11 8:38 PM	236030 (159)	97843 (123)
<input type="checkbox"/> IMG_7697.jpg	Root/Photo/	1830252 Bytes	3/2/11 8:38 PM	4/29/09 11:53 PM	3/2/11 8:38 PM	236031 (160)	97843 (123)
<input type="checkbox"/> IMG_7698.jpg	Root/Photo/	1816964 Bytes	3/2/11 8:09 PM	4/29/09 11:53 PM	3/2/11 8:09 PM	97854 (130)	97843 (123)
<input type="checkbox"/> IMG0101.JPG	Root/Photo/	901269 Bytes	3/2/11 8:38 PM	4/29/09 11:54 PM	3/2/11 8:38 PM	236032 (161)	97843 (123)
<input type="checkbox"/> P1010365.JPG	Root/Photo/	0 Bytes	3/2/11 8:40 PM	3/2/11 8:40 PM	3/2/11 8:09 PM	97857 (132)	97843 (123)
<input type="checkbox"/> P1010371.JPG	Root/Photo/	862983 Bytes	3/2/11 8:09 PM	4/29/09 11:55 PM	3/2/11 8:09 PM	97858 (133)	97843 (123)
<input type="checkbox"/> P1010379.JPG	Root/Photo/	0 Bytes	3/2/11 8:40 PM	3/2/11 8:40 PM	3/2/11 8:09 PM	97859 (134)	97843 (123)
<input type="checkbox"/> P1010535.JPG	Root/Photo/	3533017 Bytes	3/2/11 8:09 PM	4/29/09 11:56 PM	3/2/11 8:09 PM	97860 (135)	97843 (123)
<input type="checkbox"/> P1010535_resize.j...	Root/Photo/	274713 Bytes	3/2/11 8:09 PM	4/30/09 12:12 AM	3/2/11 8:09 PM	97861 (136)	97843 (123)
<input type="checkbox"/> p1234.jpg	Root/Photo/	3286683 Bytes	3/2/11 8:09 PM	4/30/09 12:13 AM	3/2/11 8:09 PM	97856 (131)	97843 (123)

To return to the conventional view,

- * On the **Drives** panel, right-click the partition, select **Open Drive Files Sorted By** on the context menu, and select **Real File System Structure**,

or

On the **Folders** panel, select **Show Files Sorted By** on the **Drive** menu and select **Real File System Structure**

By finding and marking multiple files using the [Find/Mark](#) dialog box

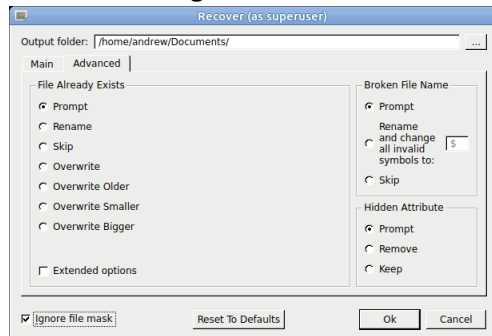
You may find and mark all the files on the entire disk by using **Mark** matched files in the **Find/Mark** mode option. You may specify all the necessary search options and mark all the found files. Please note that each find and mark/unmark operation is independent from previous ones. That is, if a file matches the search criteria, it will be marked/unmarked regardless of its previous marked/unmarked state.

For example, if you first mark all `doc` files, and then all `txt` files, all `doc` files remain marked, too. If you then decide to unmark all files smaller than 2 kB, all `doc` and `txt` files will stay marked except those that less than 2 kB.

2.3.2 Recover Multiple Files

If **R-Linux** while recovering files encounters either an already existing file or file with a broken name, normally it will stop working and ask you what to do with the file. If you recover multiple files, that may require you answer a lot of the same questions. You may use **Mass File Recovery Options** on the [Recover](#) dialog box to instruct **R-Linux** what to do in those cases for all files.

Recover dialog box



Mass File Recovery Options

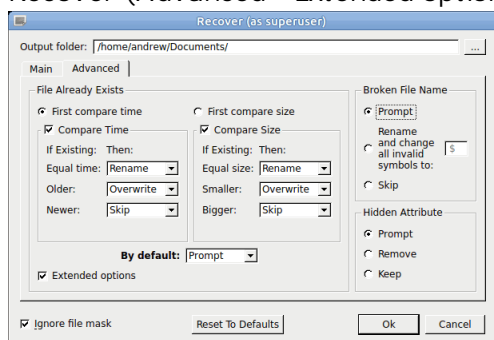
File Already Exists	These options instruct R-Linux what to do if there already exists a file with the same name.
Prompt	If this option is selected, R-Linux asks the user what to do for each such file. It stops file recovery until it receives the answer.
Add a File ID to filename	If this option is selected, R-Linux adds a File ID to the file name. If a file already exists with the same name and that file ID, a number will be added to the file name and file ID.
Overwrite	If this option is selected, R-Linux overwrites the old file with the new one.
Skip	If this option is selected, R-Linux skips all new files with the same name.
Broken File Name	These options instruct R-Linux what to do if a file to be recovered appears to have an invalid name.

Prompt	If this option is selected, R-Linux shows the standard Broken File Name dialog box for each file with a broken file name. It stops file recovery until it receives the answer.
Rename and change all invalid symbols to:	If this option is selected, R-Linux changes all invalid characters to the character specified.
Skip	If this option is selected, R-Linux skips all files with broken file names.

Extended options

These options give you more flexible ways to process multiple files with the same name. You may compare files by time (Modified) and size, and decide what **R-Linux** should do with those duplicates. If any of the files has an invalid time, the comparison by time is skipped. In this case, if comparison by size is not active, **R-Linux** goes to the default action..

Recover (Advanced - Extended options) dialog box



Extended advanced file recovery options

First compare time First compare size	These options instruct R-Linux which condition to use first, file time or size.
Compare time Compare size	These options instruct R-Linux to enable comparison by time and size..
Actions	These selectable actions instruct R-Linux what to do if the condition is met.
Empty field	If this option is selected, R-Linux skips the condition.
Prompt	If this option is selected, R-Linux asks the user what to do for each such file. It stops file recovery until it receives the answer.
Rename	If this option is selected, R-Linux adds a File ID to the file name. If a file already exists with the same name and that file ID, a number will be added to th file name and file ID.
Skip	If this option is selected, R-Linux skips all new files with the same name.
Overwrite	If this option is selected, R-Linux overwrites the existing file with the new one.
Time conditions	If the Modified time stamp is invalid, R-Linux will skip the comparison.

Equal time	Two time stamps are the same.
Older	The existing file is older than the new one.i
Newer	The existing file is newer than the new one.i
Size conditions	
Equal size	Two files have the same size.
Smaller	The existing file is smaller than the new one.i
Bigger	The existing file is bigger than the new one.i
By default	The action R-Linux takes when none of the comparison conditions have been met. That may happen when the comparison by size is not enabled.

2.4 Various Disk and Volume Managers

R-Linux can work with objects created by various Linux disk and volume managers. Currently, the following managers are supported:

- [Linux mdadm RAID5](#)
- [Logical Volume Manager \(LVM and LVM2\)](#)

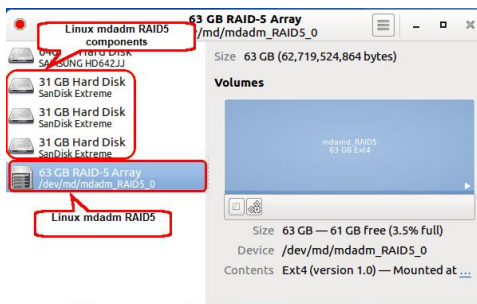
R-Linux can automatically recognize and add their physical components, component images, or the user can manually add the components when their data is damaged so severely that **R-Linux** cannot recognize them.

2.4.1 Linux mdadm RAID5

[mdadm](#) is a Linux utility used to manage and monitor software RAID devices.

R-Linux supports such devices and when drives from a mdadm RAID are connected to a Linux computer, it automatically detects them and assembles mdadm RAID5 accordingly.

Linux mdadm RAID5



R-Linux detects components from mdadm RAID5 and creates those RAID5 automatically. At the same time, **R-Linux** gives access to the components of those RAID5 (hard drives and images).

mdadm RAID5 in R-Linux

Device/Disk	Label	FS	Start	Size
SAMSUNG HD642J1 1AA01110	S1AFJ1MQ400283	SATA2	0 Bytes	596.17 GB
/		Ext4	1 MB	592.34 GB
Partition2			92.35 GB	3.83 GB
sys-mdadm-mdadm_RAID5	mdadm_RAID5			58.41 GB
/media/andrew/mdadm_RAID5	mdadm_RAID5	Ext4	0 Bytes	58.41 GB
SanDisk Extreme	AA0103041422155...	USB (10:0)	0 Bytes	29.22 GB
RAID: mdadm_RAID5			17 KB	29.22 GB
SanDisk Extreme	AA0103041404194...	USB (9:0)	0 Bytes	29.22 GB
RAID: mdadm_RAID5			17 KB	29.22 GB
SanDisk Extreme	AA0103041403134...	USB (8:0)	0 Bytes	29.22 GB
RAID: mdadm_RAID5			17 KB	29.22 GB
Virtual Volume sets and RAID5				
virt-mdadm-mdadm_RAID5	mdadm_RAID5	Ext4		58.41 GB

When an automatically created mdadm RAID is selected, **R-Linux** highlights its components. It also highlights the mdadm RAID that Linux may itself create from the same components.

R-Linux shows broken mdadm RAID5 in pink.

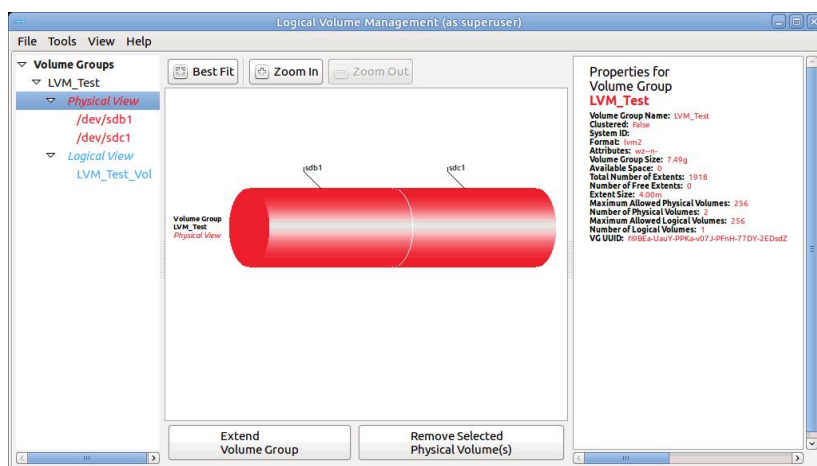
Broken mdadm RAID5 in R-Linux

Device/Disk	Label	FS	Start	Size
SAMSUNG HD642J1 1AA01110	S1AFJ1MQ400283	SATA2	0 Bytes	596.17 GB
/		Ext4	1 MB	592.34 GB
Partition2			92.35 GB	3.83 GB
sys-mdadm-mdadm_RAID5	mdadm_RAID5	Ext4		58.41 GB
/media/andrew/mdadm_RAID5	mdadm_RAID5	Ext4	0 Bytes	58.41 GB
SanDisk Extreme	AA0103041422155...	USB (10:0)	0 Bytes	29.22 GB
RAID: mdadm_RAID5			17 KB	29.22 GB
SanDisk Extreme	AA0103041403134...	USB (8:0)	0 Bytes	29.22 GB
RAID: mdadm_RAID5			17 KB	29.22 GB
Virtual Volume sets and RAID5				
virt-mdadm-mdadm_RAID5	mdadm_RAID5	Ext4		58.41 GB

2.4.2 Linux LVM/LVM2

Linux LVM is a logical volume manager for the Linux OS that manages disk drives and other data storage devices. Using it, it is possible to create single logical volumes on several physical disks, add and replace them in a running system, resize logical volumes, create various RAID configuration, and so on. You may read more about Linux LVM on this Wikipedia article: [Logical Volume Manager \(Linux\)](#).

LVM volume example



R-Linux automatically detects disks from LVMs and creates their virtual volumes automatically. At the same time, **R-Linux** gives access to the components of the virtual LVM volumes (hard drives and images).

LVM Volumes in R-Linux

The screenshot shows the 'Drives' window in R-Linux. A tree view on the left shows the hierarchy: Local Computer > LVM_Test-LVM_Test_Vol > SAMSUNG HD642JJ 1AA01110 > LVM Volume created by Linux > LVM Components > Partition2. The main table lists the following items:

Device/Disk	Label	FS	Start	Size
LVM_Test-LVM_Test_Vol		RAID		7.49 GB
SAMSUNG HD642JJ 1AA01110	S1AF1MQ400283	SATA2	0 Bytes	596.17 GB
/				592.34 GB
Partition2				592.35 GB
UFD 2.0Silicon-Power4G 1100	130308850260000...	USB (9:0)	0 Bytes	3.75 GB
Partition1				1 MB
UFD 2.0Silicon-Power4G 1100	130308850100000...	USB (8:0)	0 Bytes	3.75 GB
Partition1				1 MB
Virtual Volume sets and RAIDs				
LVM_Test-LVM_Test_Vol		Ext4		7.49 GB

When an automatically created LVM volume is selected, **R-Linux** highlights its components. It also highlights the LVM volume that Linux may itself create from the same components.

R-Linux shows broken virtual LVM volumes in pink. **Broken LVM volumes in R-Linux**

The screenshot shows the 'Drives' window in R-Linux. A tree view on the left shows the hierarchy: Local Computer > LVM_Test-LVM_Test_Vol > Direct Volume > SAMSUNG HD642JJ 1AA01110 > Broken LVM Volume. The main table lists the following items:

Device/Disk	Label	FS	Start	Size
LVM_Test-LVM_Test_Vol		RAID		7.49 GB
Direct Volume		Ext4	0 Bytes	7.49 GB
SAMSUNG HD642JJ 1AA01110	S1AF1MQ400283	SATA2	0 Bytes	596.17 GB
/				592.34 GB
Partition2				592.35 GB
UFD 2.0Silicon-Power4G 1100	130308850100000...	USB (9:0)	0 Bytes	3.75 GB
Partition1				1 MB
UFD 2.0Silicon-Power4G 1100	130308850260000...	USB (8:0)	0 Bytes	3.75 GB
Partition1				1 MB
Virtual Volume sets and RAIDs				
LVM_Test-LVM_Test_Vol		Ext4		7.49 GB

III Text/Hexadecimal Viewer

Any object visible by **R-Linux** can be viewed in the **Text/Hexadecimal Viewer**. It is also able to parse the data and represent data according to various data patterns.

- [Viewing Objects](#)
- [Navigating through an Object](#)
- [Data Copy](#)
- [Files and Sectors](#)

[R-Studio Features](#)

[Contact Information and Technical Support](#)

[Data Recovery Using R-Linux](#)

[Basic File Recovery](#)

[Advanced Data Recovery](#)

[Mass File Recovery](#)

[Technical Information and Troubleshooting](#)

3.1 Viewing Objects

To view an object,

1 Right-click the object and select View on the context menu

▢ Other ways to view the object

- Select the object and select **View** on the **File** menu
- or
- Select the object and press the **Ctrl+E** keys

> A Viewer panel will appear

▢ R-Linux Text/Hexadecimal viewer

The screenshot displays the R-Linux Text/Hexadecimal Viewer application. The main window title is "Text/hexadecimal Viewer - ST340015A 3.01 : 5LA5Y2H1 (as superuser)". The interface is divided into several sections:

- Menu Bar:** File, Edit, Navigate, View, Tools.
- Toolbar:** Back, Forward, Find, Find Previous, Find Next, Stop, Offset to go to, Bytes, ANSI Column, OEM Column, UNICODE Column, UNICODE+ Column, Auto flow.
- Templates Panel:** Master Boot Record, 0 HEX.
- Main Display:** Sector 0. Shows a grid of hexadecimal values (00-150) and their corresponding ASCII representations. Some characters are highlighted in orange, such as 'F', 'B', 'E', 'L', and 'R'.
- Data Interpreter Panel:** Shows various encoding options:

Name	Value
8 bit binary	11111010
ANSI character	ú
OEM character	ú
Little Endian	
UTF8 character	---
UTF16 character	---
8 bit hexadecimal ...	0xfa
8 bit octal number	0372
8 bit unsigned deci...	250
8 bit signed deci...	6
- Find Results Panel:** Shows search results for the string "FILE" from the position 0x50402c to 0x9516adfff. The results include file paths and metadata.
- Status Bar:** Ready, Size 40020664320, Offset 0x00000000 = 0, Sector 0, Read Only, Binary data, Unaltered.

Data Parsed According to the Selected Pattern

Name	Value
Master bootstrap loader code	FA B8 00 10 8E D0 BC 00 B0 B...
Windows disk signature	0x51b30e69
Partition	
80 = active partition	0x0
Start head	4
Start sector, cylinder (encoded)	0x401
Partition type indicator	0x53
End head	254
End sector, cylinder (encoded)	0xffc2
Sectors preceding partition	2048
Sectors in partition	39063552
Partition	
80 = active partition	0x0
Start head	0
Start sector, cylinder (encoded)	0x0
Partition type indicator	0x0
End head	0
End sector, cylinder (encoded)	0x0
Sectors preceding partition	0
Sectors in partition	0
Partition	
80 = active partition	0x0
Start head	0
Start sector, cylinder (encoded)	0x0
Partition type indicator	0x0
End head	0
End sector, cylinder (encoded)	0x0
Sectors preceding partition	0
Sectors in partition	0
Partition	
80 = active partition	0x0
Start head	0
Start sector, cylinder (encoded)	0x0
Partition type indicator	0x0
End head	0
End sector, cylinder (encoded)	0x0
Sectors preceding partition	0
Sectors in partition	0
Signature (55 AA)	55 AA[]

Object Sector Mapping

Sectors	Sector
0	
1	
2	
3	
4	
5	
6	
7	

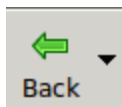
Object Properties

Property	Value
Name	SAMSUNG SP0411N TW100-07 : S01J40WC94266
Size	40060403712
Sector size	512
Offset	0x000000000
Sector	0
Position in sector	0
Parent	
Size	
Offset	
Sector	

Data Shown as Various Digits

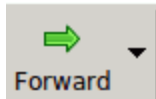
Name	Value
8 bit binary	11101011
ANSI character	é
OEM character	é
Little Endian	
UTF8 character	---
UTF16 character	---
8 bit hexadecimal nu...	0xeb
8 bit octal number	0353
8 bit unsigned decim...	235
8 bit signed decimal ...	-21
16 bit hexadecimal n...	0xeb3eb
16 bit octal number	061753
16 bit unsigned deci...	25579
16 bit signed decimal...	25579
32 bit hexadecimal n...	0x109063eb
32 bit octal number	02044061753
32 bit unsigned deci...	277898219
32 bit signed decimal...	277898219
64 bit hexadecimal n...	0xbcd08e10...
64 bit octal number	0274641070...
64 bit unsigned deci...	5314660420...
64 bit signed decimal...	5314660420...
Windows time	1769-06-01 ...
DOS time	1988-04-16 ...
Unix time	1978-10-22 ...
Big Endian	
UTF8 character	---
UTF16 character	---
8 bit hexadecimal nu...	0xeb
8 bit octal number	0353
8 bit unsigned decim...	235
8 bit signed decimal ...	-21
16 bit hexadecimal n...	0xeb63
16 bit octal number	0165543
16 bit unsigned deci...	60259
16 bit signed decimal...	-5277
32 bit hexadecimal n...	0xeb639010
32 bit octal number	0353307100...
32 bit unsigned deci...	3949170704
32 bit signed decimal...	-345796592
64 bit hexadecimal n...	0xeb639010...
64 bit octal number	0165543440...
64 bit unsigned decim...	1696155902...
64 bit signed decimal...	-148518505...
Windows time	55350-01-16 ...
DOS time	2097-11-03 ...
Unix time	2095-02-22 ...

Ready Size 40020664320 Offset 0x000000000 = 0 Sector 0 Read Only Binary data Unaltered



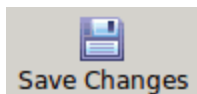
Previous Pattern

Click this button to go to the previous pattern.



Next Pattern

Click this button to go to the next pattern.



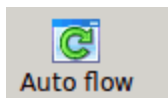
Save Changes

Click this button to save changes.



Code pages

Turns supported code pages on/off.



Autoflow

Click this button to turn autoflow on.

Panel view options

You may set which panels and bars to enable/disable.

To enable/disable:

ANSI data	Select/clear ANSI on the View menu
OEM data	Select/clear OEMr on the View menu
UNICODE data	Select/clear UNICODE on the View menu
UNICODE+ data	Select/clear UNICODE+ on the View menu
Toolbar	Select/clear Toolbar on the View menu
Properties View	Select/clear Properties View on the View menu
Sectors View	Select/clear Sectors View on the View menu
Data Interpreter View	Select/clear Data Interpreter View on the View menu
Template View	Select/clear Template View on the View menu
Bookmarks View	Select/clear Bookmarks View on the View menu
Find Results View	Select/clear Find Results View on the View menu

2 View the information

Viewing

You may view data in 4 various code pages: ANSI/OEM/UNICODE/UNICODE+ by switching on/off the respective code pages in the **Code pages** buttons or select the appropriate code pages on the **View** menu.

Patterns or Templates

You may select a pattern according to which the data will be parsed and shown in the parsed data pane. The Data Interpreter shows the data selected on the Template pane in various representations.

You may find the next or previous data that matches the pattern signature on the disk. Right-click the right pane of the viewer and select either **Find Template Signature Next** or **Find Template Signature Previous** on the context menu. You may also select these items on the **Edit** menu.

Navigating.

Text/hexadecimal viewer gives you various ways to navigate into an object. See the [Navigating through an Object](#) for more details.

Data Copy

Text/hexadecimal viewer gives you various ways to copy selected data navigate in an object. See the [Data Copy](#) for more details.

Selecting and saving an area in the Viewer

You may select an area in the Viewer panel and save it as a file.

To select and save an area in the Viewer panel,

1 Right-click the beginning of the selection and select **Select From** on the context menu

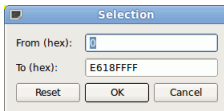
2 Right-click the end of the selection and select **Select To** on the context menu

Other ways to select an area

- Select **Select...** on the **Tools** menu and specify an area to select on the Select dialog box, or
- Click the start point of the area and drag the mouse cursor to its end.

If you need to select an entire object, select **Select All** on the **Tools** menu or click the **Ctrl+A** key

Select **dialog box**



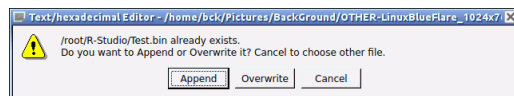
3 Select an appropriate item in the **Tools** menu to save the data in a required format and specify its file name

Select:

Save to Binary File...	to save the data in the binary format (default extension is <code>.bin</code>)
Save to Hexadecimal File	to save the data in the binary format (default extension is <code>.hex</code>)

on the **Tools** menu.

If you select an existing file, **R-Linux** will ask you if you want to append or overwrite the file.



> **Viewer will save the data to the file**

3.2 Navigating through an Object

Navigating

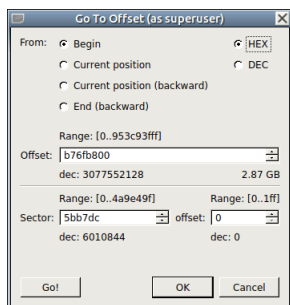
You may quickly move to a particular part of the object. To move to a particular part of the object being viewed/edited, enter the required offset in the **Go to Offset** field between the buttons.



Type an offset to which you want to go. You may select between bytes and sectors. See the [Data Formats and Multipliers](#) topic for more details on data formats.

You may also use the Go To Offset dialog box to go to a specified place in the object. Click the Offset field on the **Status** bar. You may also use this dialog box to copy the offset.

Go To Offset dialog box



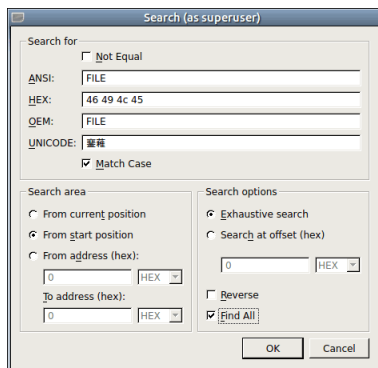
Go To Offset options

From:	Jump / offset direction. For example, if you need to find the offset from the object end for a selected byte, switch to the End (backward) option.
HEX / DEC	Switch between the hexadecimal and decimal data representation.
Range	Range of values that can be entered.
dec / hex:	Alternative data representation.
Offset:	Flat data offset (without separation between the sector and offset in the sector).
Sector / offset	Data offset represented as a sector and offset in the sector.
Go! /OK buttons	The Go! button moves the cursor to the specified positions, but the Go To Offset dialog box remains open. The OK button closes the dialog box after moving the cursor.

Searching

To search for a particular string, click the **Find**, **Find Next**, or **Find Previous** buttons or the same items on the **Edit** menu, and specify the string on the Search dialog box.

Search dialog box



Search options

Not Equal	Search for the place which content is not equal to the string. For example, the first byte not equal to 00 or FF.
Search for	

HEX	Field for the string to search for in the hexadecimal representation
ANSI	Field for the string to search for in the ANSI encoding
OEM	Field for the string to search for in the OEM encoding
UNICODE	Field for the string to search for in the UNICODE encoding
Match case	Select this check box to make the search case-sensitive
Search area	
From current position	Select this check box to start search from the current position
From start position	Select this check box to start search from the beginning of the object
From Address	Select this check box and specify the range in which the search is to be carried out
Search position	
Exhaustive search	Select this check box to search the entire object
Search at offset	Select this check box and specify the sector offset from which the search will start
Reverse	Select this check box to start the search in the reverse direction
Find all	Select this check box to search for all instances of the string to search. Search results will be shown in the Find Results pane.

Text/Hexadecimal Viewer will show the search progress.

Search results are shown on the Find Results pane. You may easily move to the required found item by clicking the item.

▣ Features of the Not Equal option

Suppose we have an object which first 3 consecutive sectors start with:

```
Sector1  FILEAAAAA.....
Sector2  FILEBBBBB.....
Sector3  NOTAFILE.....
```

And the search string is Not Equal FILE.

If the Exhaustive search option is selected, the **Text/Hexadecimal Viewer** will stop at the first A character in Sector1.

If the Search at offset=0 option is selected, the **Text/Hexadecimal Viewer** will stop at the N character in Sector3.

Bookmarking

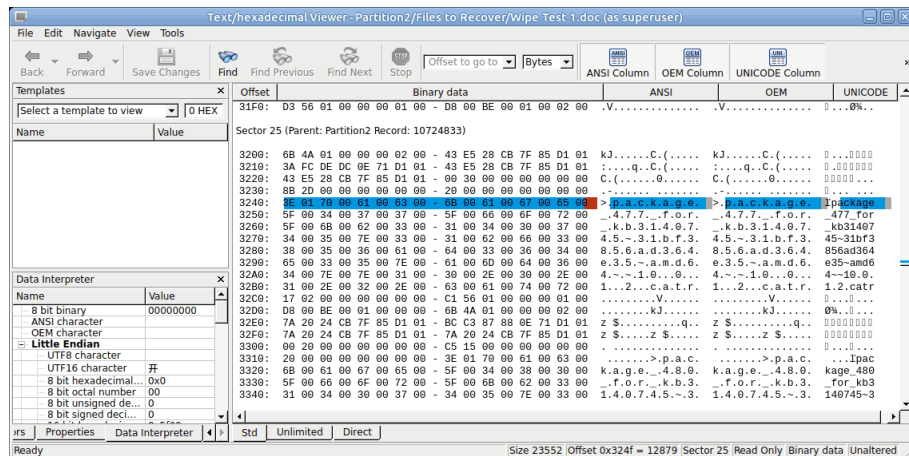
You may create bookmarks to easily move to those places. Right-click the cursor on the place you want to bookmark and select **Toggle Bookmark** on the shortcut menu. The list of bookmarks appears in the Bookmark pane. You may easily move to the required bookmark by clicking it in the list.

You may control bookmarks on the **Edit** menu.

3.3 Data Copy

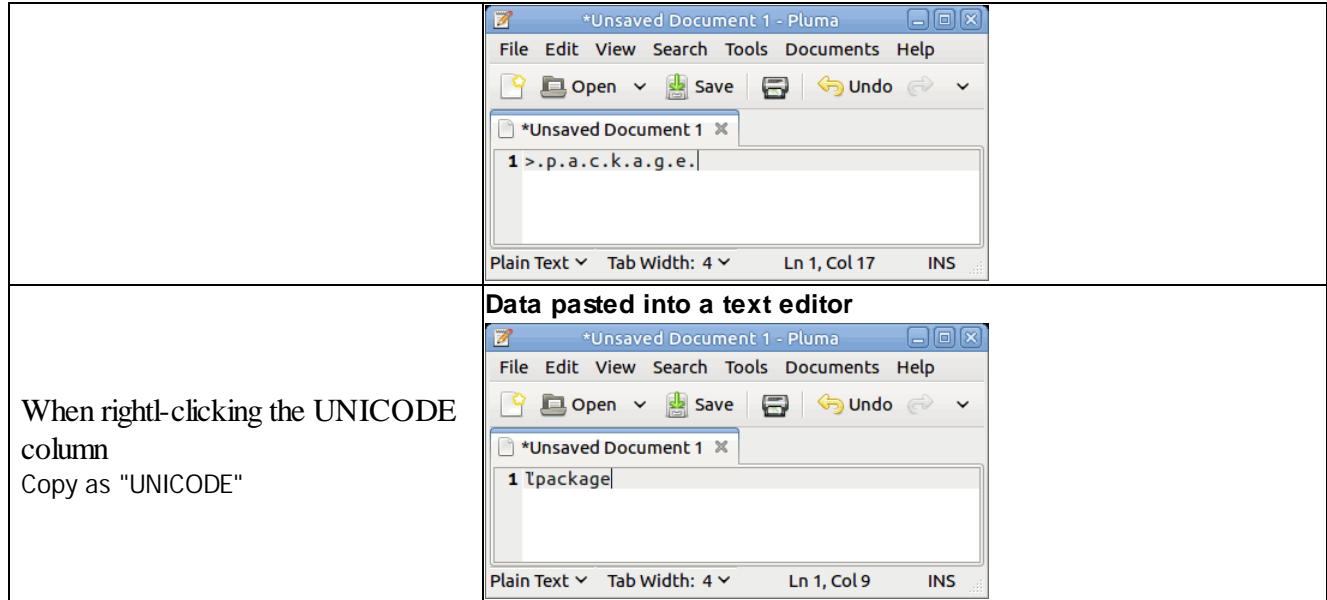
Text/hexadecimal Viewer gives you various ways to copy selected data in an object.

Data selected in Text/hexadecimal viewer



Depending on what column you have control-clicked, the following commands are available in the context menu:

<p>When right-clicking any column Copy Editor Display</p>	<p>Data pasted into a text editor</p> <p>The screenshot shows the Pluma text editor with the copied data pasted into the text area. The data is displayed as a single line of text.</p>
<p>When right-clicking any column Copy as File Signature</p>	<p>Data pasted into a text editor</p> <p>The screenshot shows the Pluma text editor with the copied data pasted into the text area. The data is displayed as a single line of text, representing the file signature.</p>
<p>When right-clicking the Binary data column Copy as "Binary data"</p>	<p>Data pasted into a text editor</p> <p>The screenshot shows the Pluma text editor with the copied data pasted into the text area. The data is displayed as a single line of text, representing the binary data.</p>
<p>When right-clicking the ANSI column Copy as "ANSI"</p>	<p>Data pasted into a text editor</p> <p>The screenshot shows the Pluma text editor with the copied data pasted into the text area. The data is displayed as a single line of text, representing the ANSI text.</p>



3.4 Files and Sectors

You may see which file is written on a particular sector. To do so:

- 1 Enumerate files on a logical disk on the Drives panel.
 - 2 Go to the tab of that logical disk and select Show Files in HexViewer on the Files menu.
 - 3 Return to the Drives panel and select View on the shortcut menu.
- > R-Linux will show a file that belongs to a particular section.

File in a sector

```
Sector 589786 (Parent: JMicron USB to ATA/ATAPI Bridge Record: 589849)
ID: 681 Root/Movies/San_Valley_Serenade/VIDEO_TS/VTS_01_LVOB
11FFB400: BB A6 C9 A6 FA E2 4E 45 - 8F 6E 24 File that belongs to this sector ".....4
11FFB410: 15 8A 0B BB A1 B2 CC C0 - 31 84 ..M...
11FFB420: 01 9C 2A 4F 43 45 9C 89 - 0C AD D0 40 4C 7F 7C 86 ..OCCE...[L.]
11FFB430: E2 34 69 31 80 00 9F BA - 6E DD 98 D0 E5 B5 32 87 .dh1.....2
11FFB440: 3C 7F 6B BC 42 B9 FC A6 - 3A 8A 15 99 C4 4E 45 0D <.k.B.....OE.
11FFB450: 45 87 EF CB 06 80 01 9C - 38 4E 27 51 43 A3 4A 4F E.....8N'QC,JQ
11FFB460: 1C 3D 07 89 0E F0 88 B4 - 3E E6 09 77 78 D0 19 EB .e.....>wx...
11FFB470: B9 17 C5 E1 AA 01 F7 33 - E9 21 63 C0 D1 1E EF 29 .....3.[c....)
11FFB480: 88 9C 7D C9 C7 74 2C 94 - 6A 48 9D 3C 92 CB A2 88 ..}.t.jH.<....
11FFB490: 47 F9 91 C3 8C C7 FA 40 - 4E 1C 61 A0 44 8D 1F C6 G.....@W.a.D...
11FFB4A0: 03 BC 03 F9 D0 23 3E 00 - 81 98 81 43 87 7A B6 60 .....#>.C.Z.'
11FFB4B0: 35 6B B3 C0 06 1D 0A 24 - 8B 02 02 21 C9 C0 03 BB 5k.....S.....
11FFB4C0: A1 C4 25 4E B1 E2 82 09 - 24 E7 29 53 B8 0E 19 E9 .\N.....$.S....
11FFB4D0: 72 2D 07 AF 98 09 98 40 - 69 05 8D 58 B5 5D E7 6E F.....@...X.]n
11FFB4E0: 07 D9 2C 10 A7 C7 8B 23 - CA 88 61 89 1A 57 94 3E .....#.a.W.>
11FFB4F0: F3 A1 9E 24 98 01 16 50 - A9 2C 38 79 9B 2D 83 8C ...S..P.,8y....
11FFB500: E7 C9 08 C7 6E EC A3 85 - 28 81 36 52 94 25 6E 47 .....n...(.6R.\nG
11FFB510: BB BC ED CD E1 E9 11 13 - EC C7 07 09 01 88 40 80 .....#.0B...
11FFB520: CB AA 9A 1F FA 7E 93 B9 - 07 F9 82 76 53 8B 3A 9A .....VS...
11FFB530: C4 49 F3 2F 85 E3 89 F4 - 38 8F 91 18 ED 69 3E 81 ..L/...B...>.
11FFB540: 18 01 18 6E CA 38 71 2D - 8E E2 C9 8C 11 D4 0B BF .....n;j<.....D
11FFB550: FD A8 A1 D8 44 27 8F 01 - F0 0C AF 31 A1 7C 06 76 ...D'.....1..v
11FFB560: 02 E8 CC 44 27 AA EE C9 - AC DF E9 C8 90 31 86 81 ...D'.....1...
11FFB570: 00 77 87 91 29 C6 B7 60 - 26 3C 95 8F 32 C7 A8 93 ..w..).<8<.2...
11FFB580: BB 00 F3 81 D0 78 B4 C6 - 92 EB 58 85 34 03 D0 A3 .....x...X.4...
11FFB590: BA EE F1 BF 01 61 A1 52 - 58 0A 01 94 65 FC 46 55 .....a.R]...e.FU
11FFB5A0: E2 59 41 67 75 C9 10 1C - F4 BF 99 14 1E 14 3F DE .Yagu.....?..
11FFB5B0: EA 03 C3 C9 E4 08 A2 88 - 6A 3F A9 63 FF FB 1A 8D .....?p<....
11FFB5C0: EC F3 CF 1E 28 89 67 6B - CF EF FA 05 99 C4 4C 71 .....gk.....lq
11FFB5D0: 8A 94 FB A4 87 B1 84 77 - EB 7D 37 30 00 67 AF 3D .....w.}70.g.=
11FFB5E0: 59 C4 08 01 90 81 56 69 - 82 08 AA 8D B8 D5 DE 7F Y.....V1.....
11FFB5F0: C7 AA C4 58 1A 3C 18 00 - 05 56 EB 0F 14 70 08 E9 ...[.<...V...p...
```

IV Technical Information and Troubleshooting

This chapter covers various technical issues and troubleshooting.

- [IntelligentScan technology](#)
- [Data Recovery Issues](#)
- [Data Formats and Multipliers](#)
- [Bad Sectors](#)
- [Memory Usage](#)
- [R-Linux Switches](#)
- [Properties Tab](#)

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[Basic File Recovery](#)

[Advanced Data Recovery](#)

[Mass File Recovery](#)

[Text/Hexadecimal Viewer](#)

4.1 IntelligentScan Technology

R-Studio uses a unique *IntelligentScan* technology when it tries to recover the data on the area being scanned.

While scanning the selected area, **R-Studio** reads data directly from the disk, analyzes them, and tries to determine a record to which the data belong. The following record types are possible:

- MBR/GPT records
- NTFS Boot Sector, Folder, and MFT records
- FAT/exFAT Boot Sector, folder, and file records
- ReFS Boot sector records and ReFS Meta blocks
- HFS/HFS+ Volume headers and BTree+ nodes
- APFS Super blocks, APFS Volume blocks, and APFS nodes
- Ext2/3/4FS SuperBlocks records
- UFS/FFS SuperBlock records
- Specific file signatures of Known File types for raw file carving

All these record types have different, but known, structure. Knowing valid values of record fields and relations between them for each record type, **R-Studio** determines a record type for the data. If such record type cannot be unambiguously determined, the data are assigned to the most probable record type. The same data can be assigned to several record types, with a certain probability for each assignment. A list of possible files is generated from these records.

R-Studio generates a record list for each record type. This list contains references to records assigned to a record type from the list with their assignment probability. The same data can be included into different record lists. Then **R-Studio** analyzes relations between elements in each list and between different lists, and generates

a list of found partitions with their parameters, such as partition start point and probable size, file system type, cluster size, and existence probability.

Using the file list and partition list, **R-Studio** reconstructs file systems and files on the found partitions. One file can be attributed to several different partitions.

When the entire disk or its part has been scanned, **R-Studio** shows all found partitions. Then the parameters of the found partitions may be manually corrected, if additional information on them is available.

Using the *IntelligentScan* technology, **R-Studio** can recover files not only on new and existing partitions. It also can find and recover data on partitions that have been deleted or reformatted. If, for example, there was an NTFS partition, which later was reformatted as a FAT partition, **R-Studio** will show two partitions on the same place on the disk, one having the FAT file system, the other the NTFS. Then, found files can be recovered.

The *IntelligentScan* technology makes **R-Studio** a very powerful data recovery tool, but it is not omnipotent. As it uses probabilistic approach to data reconstruction, it cannot guarantee 100% correct results. Moreover, even if **R-Studio** has reconstructed data structure correctly, it is impossible to guarantee that all found files will be completely and correctly recovered, as new data may be already written over the old files.

4.2 Data Recovery Issues

Files:

Hard links

[Hard links](#) are file system entries that give file names to files. This term is usually used when files may have several names. **R-Studio** shows hard links using the following icons:

A hard link:  MyPhoto1.jpg

The target file:  MyPhoto1.jpg

You may find a target or hard link for a file. Right-click the file and select **Links** on the context menu.

4.3 Data Formats and Multipliers

You may enter data in all numerical fields either in sectors or in bytes. If there is no letters are after the number, **R-Linux** assumes the numbers are in bytes.

Decimal numbers are entered as they are: 2372354

Hexadecimal numbers are entered as 0x23Fa67 or 23Fa67 hex.

The following case-insensitive notation is possible:

b	1 byte
kb	1 kb = 2 ¹⁰ =1024 bytes
mb	1 mb = 2 ²⁰ =104857 bytes
gb	1 gb = 2 ³⁰ =1073741824 bytes
tb	1 tb = 2 ⁴⁰ =1099511627776 bytes
eb	1 eb = 2 ⁵⁰ =1125899906842624 bytes
hex	A hexadecimal number
sec (sector)	A number is in sectors

You may also select the multipliers in the drop-down boxes.



Type an offset to which you want to go. You may select between bytes and sectors. See the [Data Formats and Multipliers](#) topic for more details on data formats.

When the multiplier has been changed, the data value will be changed according to the specific context commands for that field:

Suppose, the initial value is 1 GB, and the sector size of the object is 512 byte. The results will be the following:

Command: No recalculate

Change from GB to MB: 1

Change from GB to Sectors: 1

Command: Always recalculate

Change from GB to MB: 1024

Change from GB to Sectors: 2097152

Command: Units type recalculate

Change from GB to MB: 1

Change from GB to Sectors: 2097152

4.4 Bad Sectors

Quite often, drives from which the data are to be recovered have bad sectors, or those sectors that are very hard, even impossible, to read, mostly due to hardware problems. **R-Linux** tries to read such sectors several times. The number of tries is specified either on the [Settings/Bad Sectors](#) dialog box, or on the [Properties](#) tab, the Drive Control section, for each drive separately.

When **R-Linux** encounters such bad sectors while performing various tasks and they appear unreadable, it treats them as follows:

Object images:

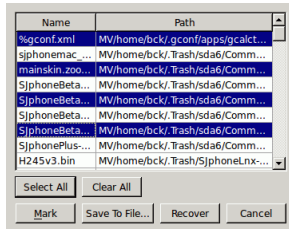
R-Linux fills the space in the image file where the bad sectors should be with the pattern specified in the Pattern to fill bad blocks field on the [Settings/Bad Sectors](#) dialog box. Please note that **R-Linux** writes the pattern on the image, not on the source drive.

Files

If Skip files with bad sectors on the [Recovery](#) dialog box is cleared, **R-Linux** fills bad sectors in the recovered file with the pattern specified on the the [Settings/Bad Sectors](#) dialog box. Information about such files will appear in the [Log](#).

If Skip files with bad sectors on the [Recovery](#) dialog box is selected, **R-Linux** skips files with bad sectors and displays their list on the Files with bad sectors dialog box when the recovery has been completed. You may select files to immediately recover them or to mark for later recovery. You may also save this list to a text file.

Files with bad sectors dialog box



Files with bad sectors Buttons

Select All	Click this button to select all files in the list.
Clear All	Click this button to unselect all selected files.
Mark	Click this button to mark all selected files in the list.
Save to File	Click this button to save the list of files with bad sectors to a text file.
Recover	Click this button to immediately recover selected files. The bad sectors in the recovered files will be filled with the pattern specified in the Pattern to fill bad blocks field on the Settings/Bad Sectors dialog box.

Objects edited in the Text/Hexadecimal Viewer

Bad sectors in the objects viewed in the [Text/Hexadecimal Viewer](#) are shown as filled with the pattern specified in the Pattern to fill bad blocks field on the [Settings/Bad Sectors](#) dialog box.

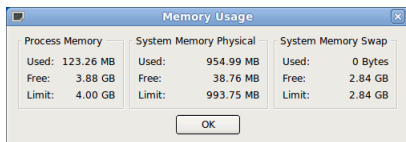
4.5 Memory Usage

You may see how much memory **R-Linux** uses while performing a data recovery task. This is especially useful when scanning large disks on a computer with limited resources.

To view memory usage,

- 1 **Select Memory usage on the Tools menu**
- > **R-Linux will show the total memory in your computer and how much memory it uses**

Memory usage dialog box



Memory usage

Process Memory	Shows how much memory R-Linux uses. Limit shows how much memory your system can virtually allocate to R-Linux . Actual memory allocation depends also on the RAM and swap file sizes.
System Memory Physical	Shows how much RAM is in your system
System Memory Swap	Shows how much virtual memory is in your system

4.6 R-Linux Switches

If there are problems in starting **R-Linux** and while working with it, you may use switches to avoid them.

The following switches are available:

-all_drives	Forces R-Linux to show all partitions in the system. Normally R-Linux shows only local disks in the system. Some storage devices may pretend that they are not local disks.
-debug	Includes additional debug information. When this switch is used, an additional command Create FS Snapshot on the context menu appears for an object with a file system. An FS Snapshot contains system data for the file system only (file descriptions without file contents). If a problem appears, this snapshot can be sent to R-Linux technical support to identify the problem. This switch greatly slows R-Linux . You may also turn this mode on by selecting Debug Mode on the Tools menu
-flush	Flushes the log file after each write to log operations. This switch is helpful when R-Linux locks and its log file remains in memory cache unwritten to a disk. This switch greatly slows R-Linux .
-log <filename>	Started with this switch, R-Linux writes its log into the specified file. If R-Linux locks and its log file remains in memory cache unwritten to a disk, use the <code>-flush</code> switch.
-mem <size in MB>	Sets memory usage limit in MB for R-Linux to reconstruct the file tree. When it exceeds the limit, a Too many files... message appears. You may temporarily stop file listing and browse through found files. Then you can resume file listing. You also may skip this file section and continue file listing. Example: <code>-mem 400</code> - sets the limit to 400 MB.
-no_ide_ext	Turns off the inquiry about extended information on HDDs in Wind9x/ME. This switch may be helpful if R-Linux returns information about HDDs incorrectly (detects HDD geometry incorrectly).
-no_int13	Turns off the disc access through Int13 in Wind9x/ME. This switch may be helpful if the system operates incorrectly (detects HDD geometry incorrectly or lock the system).
-no_ios	Turns off the Wind9x/ME protected-mode I/O system. This switch may be helpful if this system operates incorrectly (detects HDD geometry incorrectly or lock the system).
-reset	R-Linux resets an HDD controller each time it reads a bad sector. This switch may be helpful if the controller locks after it attempts to read a bad sector, or returns incorrect data.
-safe	Disables automatic partition search on a hard drive, file system recognition on partitions, and other potentially problematic operations. In this mode, it is necessary to use Find partition command from the hard drive context menu to manually find a partition.

If an unrecognized problem appears, start **R-Linux** with the `-debug` and `-log <filename>` switches, and send the log and screenshot of the **R-Linux** main panel to the **R-Linux** technical support:

[R-Linux Technical Support Team](#) is available 24 hours a day, seven days a week, and has an average response time less than 4 hours.

4.7 Properties Tab

Object size units

You may select the units in which the information on object sizes will be displayed.

To select the units

- 1 Select Properties on the View menu
- 2 Select the units in which you want to see object sizes.
 You may select
 - Show as Bytes
 - Show as Sectors
 - Show as Bytes and Sectors

1. Basic information

This section shows basic information for a disk object.

More information...

Drive Type	Device/disk type and subtype. Current R-Linux version supports the following types: Disk, WORM, CDROM, Optical, Changer, Floppy, RAM Disk, LDM Partition, LDM Component, LDM Volume and subtypes: Device, OS File, Physical Drive, Mount Point, Partition, Volume Set, Mirror, Stripe Set, RAID5
Name	Device/disk name
Size	Device/disk size
Bus Type	Device/disk bus type. Can be: IDE/ATA, IDE/ATAPI, SCSI, Floppy, USB, 1394, SSA, FibreChannel, RAID, SMART, BIOS

2. Information on hard drives and logical disks

This section shows available information on hard drives and logical disks. These properties depend on the drive/disk type and appear only when applicable. Under Windows NT/2000/XP/2003, an IDE drive/disk may be represented as a SCSI device, that is why the SCSI Address section appears under these OSes for those drives/disks.

More information...

OS object	Appears for image files under Windows 9x/ME and NT/2000/XP/2003, for drives/disks under Windows NT/2000/XP/2003 only. An object name used by OS to access the device/disk.
R-Studio driver	Driver names (both internal and OS) used to access this drive/disk.
Sector Size	Drive/disk sector size
Physical Drive Geometry	This section shows physical geometry for a hard drive. For a logical disk it shows the physical geometry for a hard drive where the logical disk resides

Cylinders	
Tracks Per Cylinder	
Sectors Per Track	
Sector Size	
Device Identification	This section shows vendor information for the drive/disk
Vendor	
Product	
Firmware	
Bus	
SCSI Address	This section shows SCSI information for the drive/disk
Port Number	
Path ID	
Target ID	
Lun	
Windows 9x/ME adds the following properties:	
Int13 Drive Number	128 for the first hard drive accessible through Int13, 129 for the second one, etc. 0...128 for drives and other devices accessible through a Windows 9x/ME protected mode driver, if their Int13 device option is disabled. R-Linux can use Int13 disk access, and for some drive types, like SCSI devices, Int13 access is preferable. You may consider enabling the Int13 device option in the Windows Device Manager for such devices.
Int13 Extension Version	Int13 Extension Version Support for hard drives. Extended Int13 support is necessary for large drives. If this property is zero, Extended Int13 is not supported, otherwise, it shows Extended Int13 standard version, the large, the better.

3.Properties controlling access to hard drives and logical disks

This section shows properties that control access (read and write) to hard drives and logical disks. They are set to their optimal values and should be altered only if access problems appear.

More information...

Drive Control	
Maximum transfer	Maximum data size that can be read or written during a single access to the drive. If there are problems with drive access, decrease the value of this property
I/O Unit	Data size read or written during a single access to the drive is a multiple value of this property. If there are problems with drive access, decrease the value of this property
Buffer Alignment	Drive data transfer buffer is positioned at an address multiple value of this property. If there are problems with drive access, increase the value of this property.

These three properties are set by OS drivers. If the drivers set incorrect values, problems may appear during data transfer operations. You can alter them until data transfer becomes stable.

I/O Tries	<p>Number of read/write tries during access to the drive. If there are bad sectors on the drive, increase the value of this property. This may help to successfully read those sectors. Sometimes, if the I/O Tries parameter is set too large and there are some unreadable sectors on the hard drive, the hard drive-controller pair may refuse to perform any successive read/write operations with the entire hard drive when it fails to read/write such sectors. In this case, set this parameter to zero.</p> <p>R-Linux treats bad sectors in the following way: It reads a certain part of disk (predefined by Windows) and</p> <ul style="list-style-type: none"> • If Default read attempts is set to 0, the entire part with bad sectors will be filled with the specified pattern. • If Default read attempts is set to a non-zero value, R-Linux reads again that part sector by sector, repeating the attempts the specified number of times. If R-Linux still cannot read a bad sector, it fills the sectors with the specified pattern. In this case only the bad sectors will be filled with the pattern, but that extremely slows the disk read process. <p>For example, if you set Default read attempts to 1, a bad sector will be read 2 times.</p>
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4.Partition properties

A *partition* is a continuous area on a hard drive, characterized by its offset and size. There are partitions on basic disks, dynamic disks, and recognized volumes and partitions. **R-Linux** treats regions like partitions.

▣ **More information...**

Partition Offset	Initial offset for the partition.
Partition Size	Size of the partition.
Partition Type	File system type for the partition. If the record in the drive partition table is incorrect, this property may differ from the actual file system type for this partition. Still, R-Linux will process this partition correctly, as it does not use this property.
Partition number	Appears under WinNT/2000/XP/2003 only. Shows the number of the partition on the physical drive.
For regions and recognized partitions, Partition Offset and Partition Type properties can be manually corrected.	

5.Compound volume properties

A *compound volume* is a union of several partitions or other disk objects. Each union type has its own rules, unique for each compound volume type. Among compound volumes are: *Volume Sets* (RAIDs Level 0), *Mirrors* (RAIDs Level 1), *RAIDs5* (RAIDs Level 5), both physical and created by the user (*Virtual Volume Sets*, *Virtual Stripe Sets*, *Virtual Mirrors*, *Virtual RAID5*).

▣ **More information...**

Main properties of compound volumes are <i>parents</i> (disk objects from which a compound volume is created) and their order. These properties may be viewed in the Parents tab. For user-created compound volumes these properties may be altered.	
Raid Block Size	Data block size for compound volumes of RAID (Level 0-5) types

6.LDM disks and volumes (Dynamic Disks)

LDM disks and volumes are volumes controlled by Logical Disk Manager (LDM). They are represented on a hard drive as a LDM database rather than partition tables. Under Windows 2000/XP/2003, LDM disks are also called *Dynamic Disks*.

More information...

Offset of Logical Disk	Initial offset of a logical disk on a hard drive. For disks, initially formatted by LDM, this value is often 31.5KB , for converted disks, it may be larger.
Supposed Parents Count	Supposed number of parent partitions for compound LDM volumes. If the LDM database is not damaged, the value of this property must be equal to the number of parent objects in the Parents tab for the disk object.
LDM Host GUID	Global Unique Identifier of a computer system where this LDM disk group has been created.
LDM DiskGroup GUID	Global Unique Identifier of the LDM disk group.
LDM Disk GUID	Global Unique Identifier of the hard drive.
LDM Volume GUID	Global Unique Identifier of the volume.
LDM Disk ID	Local hard drive Identifier, unique within this LDM disk group.
LDM Partition ID	Local partition Identifier, unique within this LDM disk group.
LDM Component ID	Local component Identifier, unique within this LDM disk group.
LDM Volume ID	Local volume Identifier, unique within this LDM disk group.
LDM Disk AltName	Additional Alternative Name given by LDM to the hard drive.
LDM Disk DriveHint	Last name of the volume, under which it has been mounted in the system. May be either a letter (C:, D:, etc.), or a mount point under Windows 2000/XP/2003.

7.File System Volume properties

A *File System (FS) volume* is a disk object where a certain, supported by **R-Linux**, file system is present. There are two FS volume types: FS volume on a regular disk object and a recognized volume, found by a scan process. FS volume properties depend on volume's file system and type.

7.1.NTFS Volume properties

These properties are present for all NTFS volumes and represent their main properties. For *recognized volumes*, these values can be altered.

More information...

NTFS Information	Regular volumes
Recognized NTFS	Recognized volumes
Cluster Size	Cluster size for the NTFS volume.
MFT record size	Size of one MFT record describing one file on the NTFS volume. This is an important property of any NTFS volume. Its common value is 1KB. If this property has incorrect value, many files may be incorrectly recovered.
Sector Size	Sector size for the physical drive. This property is read from the boot sector of the NTFS volume and does not affect R-Linux operation.

Index Block Size	Index block size for the NTFS volume. This property determines binary trees used to store NTFS folder structure. It does not affect R-Linux operation.
MFT position	MFT offset from the start of the NTFS volume.
MFT Mirror Position	Second MFT copy offset from the start of the NTFS volume.
Volume size	Size of the NTFS volume. This property does not affect R-Linux operation.

7.2.FAT Volume properties

These properties are present for all FAT volumes and represent their main properties. For *recognized volumes*, these values can be altered.

▣ More information...

FAT Information	Regular volumes
Recognized FAT	Recognized volumes
FAT Bits (12,16,32)	FAT type. 12 for the FAT12, 16 for the FAT16, 32 for the FAT32.
Cluster Size	Cluster size for the FAT volume.
First Cluster Offset	Offset of the first cluster from the start of the FAT volume.
Boot Directory Cluster	<i>(For FAT32 only.)</i> Cluster number where the root directory starts on the FAT volume where the logical disk resides.
Root Directory Offset	<i>(For FAT12 and 16 only.)</i> Root directory offset from the start of the FAT volume.
Root Directory Length	<i>(For FAT12 and 16 only.)</i> Root directory length for the FAT volume.
First FAT Offset	Offset for the first FAT table on the volume. Together with the Size of One Fat Table property, is a most important property for a FAT volume. If this property is incorrect, many files (especially fragmented ones) may be incorrectly recovered.
Size of One FAT Table	Size of one FAT table on the volume.
Sector Size	Sector size of the hard drive. This property is read from the boot sector of the FAT volume and does not affect R-Linux operation.
Number of FAT Copies	Number of FAT copies on the FAT volume.
Active FAT copy	Active FAT table number for the FAT volume. Can be set to Disabled, Auto, 1, or 2. If it is Disabled, R-Linux processes the volume as there is no FAT table present. This may be useful if the volume has been reformatted and thus a new FAT table is created and the old one is deleted. In this case, it is reasonable to recover files from the previous volume without processing the new and irrelevant FAT table. All files will be recovered as continuous byte chains beginning from their start cluster. Unfragmented files will be recovered successfully. If it is 1 or 2, R-Linux uses the first or second FAT table copy, respectively. If it is Auto, R-Linux uses both FAT table copies and decides, which FAT table copy should be used for a particular FAT table sector. This may be useful when both FAT tables are partially damaged.
Major version	FAT version.

Minor version	FAT minor version.
Volume size	Size of the volume.

7.3.Ext2/3/4FS Volume properties

These properties are present for all Ext2/3/4FS volumes and represent their main properties. For *recognized volumes*, these values can be altered.

More information...

Ext2/3/4FS Information	Regular volumes
Recognized Ext2/3/4FS	Recognized volumes
Block Size	Block size of Ext2/3/4FS file system. A block in the Ext2/3/4FS file system is similar to a cluster in the FAT file system.
First SuperBlock Offset	Offset of the first SuperBlock from the start of the Ext2/3/4FS volume.
Blocks Per Volume	Number of blocks in the Ext2/3/4FS volume.
INodes Per Volume	Number of inodes on the Ext2/3/4FS volume. An inode is a record describing file's size, attributes, position on an Ext2/3/4FS volume - all information about a file, except its name, which is stored separately. Therefore, the INodes Per Volume parameter is equal to the maximum number of files on an Ext2/3/4FS volume.
Creator OS	The OS that created this Ext2/3/4FS volume. May be Linux, Hurd, Masix, FreeBSD, Lites.
Major version	Ext2/3/4FS version. Usually 1.
Minor version	Ext2/3/4FS minor version. Usually 0.
Last Mount Time	Last mount time for this Ext2/3/4FS volume.
Last Write Time	Last write time for this Ext2/3/4FS volume.
Last Check Time	Last check time for this Ext2/3/4FS volume.
Volume size	Size of the volume.

7.4.Recognized Volume properties

These properties are present for all *recognized volumes*, regardless of their file system type. They estimate how reliable those volumes are recognized. This is useful for fast search for, and selection of, optimally recognized volume to recover.

More information...

Parsed File Entries	Number of files proving that this recognized volume existed. May have any non-negative values. The main property characterizing the reliability of volume recognition. The larger it, the higher probability that this recognized volume has file system properties that have been correctly found.
Parsed Boot Records	Number of boot records proving that this recognized volume existed. May be 0 or 1. This is the second important property characterizing the reliability of volume recognition.

Estimated Size	Estimated size of the recognized FS partition/volume. This property shows the most probable size of the recognized FS partition/volume. Alternatively, Size and Partition Size are set to the highest possible values in order to recover the maximum number of files.
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