

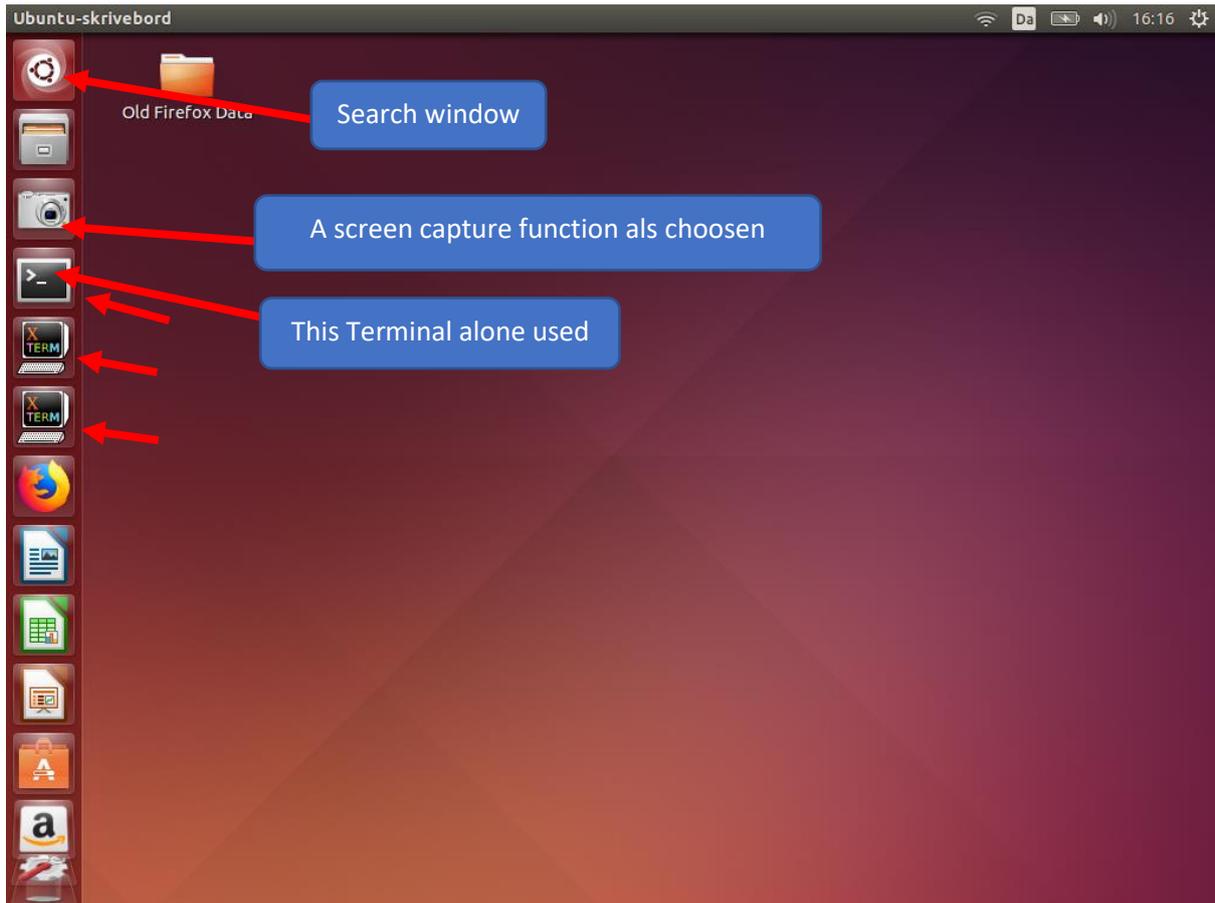
How to clone a R&S hard disk for the FSIQ and the similar FSE the right way

My FSIQ7 have a hard disk which might have developed problems and to clone this hard disk and try to repair the cloned hard disk did not succeed by using, Norton Ghost, PowerISO, ImageBurn and what ever I had to try out. In all cases the cloning on a disk similar to the original Hard Disk (6GB reduced to 2GB) failed as not being able to boot and the FSIQ7 bios did not detect the hard disk, although the original hard disk showed no detection in the bios either, but booted fine.

A hint: How to get access to the Bios... After selecting on the attached keyboard the reboot by CTL ALT DEL and then quickly press on the keyboard CTL ALT ESC several times.

The original Hard Disk is connected to an IDE to USB interface and on a Linux computer, in my case UBUNTU

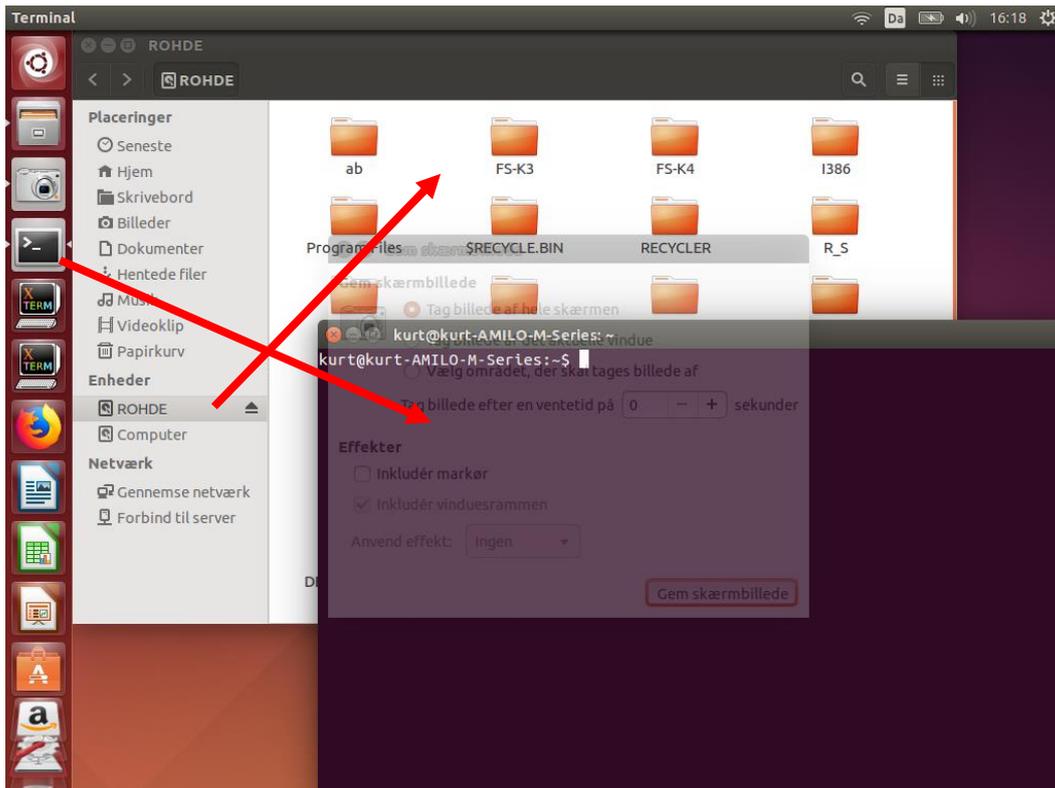
By selecting the search Icon and search after "Terminal" Three versions showed up and all of them moved to the left selection column.



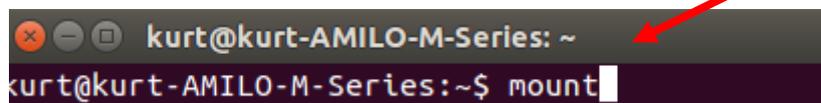
The Original hard disk mounted onto the IDE to USB interface as shown below



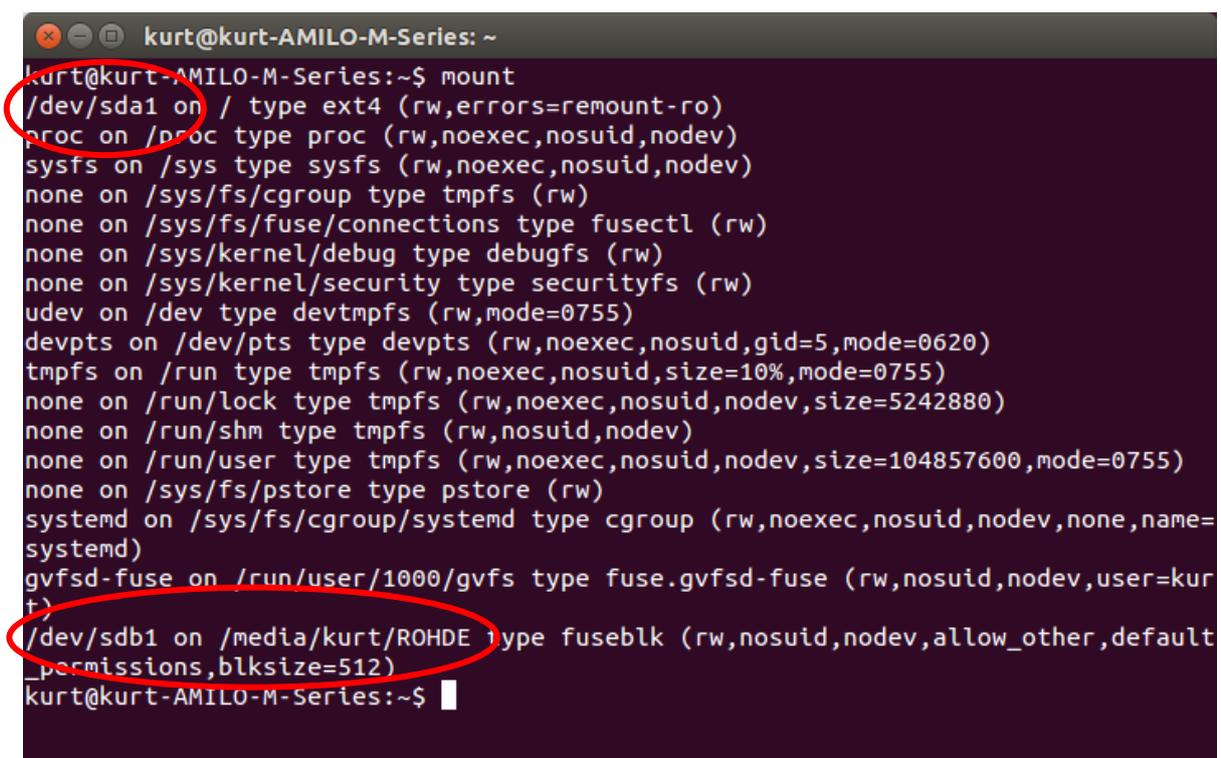
Plug the USB connector from the interface into an USB port. Both the content of the original HD which is named ROHDE is shown and by selection the Terminal Icon the screen look like this.



Close the window for the HD file content and type in the Terminal window the command “mount” and issue by a click on “Enter”



Now we see a list of all connected devices. The computer HD is mounted as /dev/sda1 and the original FSIQ7 HD is mounted as /dev/sdb1 with media name /media/kurt/ROHDE. These names may be written on a piece of paper as memo notice



As we shortly need to access the original HD for copying the content to an USB stick as an image, we must unmount it. As we use Ubuntu we must execute command as being in the Root, we therefore issue the command sudo in front so type into the terminal `sudo umount /dev/sdb1` Note the space between unmount and /

```
kurt@kurt-AMILO-M-Series:~$ sudo umount /dev/sdb1
```

However after the first sudo command the sudo password is requested, which is the Ubuntu logon password

```
/dev/sdb1 on /media/kurt/ROHDE type fuseblk (rw,nosuid,nodev,allow_other,default_permissions,blksize=512)
kurt@kurt-AMILO-M-Series:~$ sudo umount/dev/sdb1
[sudo] password for kurt:
```

To test that unmount has been successful and the `/dev/sdb1` on `/media/kurt/ROHDE` is accessible we issue a new mount command

```
kurt@kurt-AMILO-M-Series: ~
kurt@kurt-AMILO-M-Series:~$ mount
```

And the listing now shows that only the computer HD `/dev/sda1` is mounted

```
kurt@kurt-AMILO-M-Series:~$ mount
/dev/sda1 on / type ext4 (rw,errors=remount-ro)
proc on /proc type proc (rw,noexec,nosuid,nodev)
sysfs on /sys type sysfs (rw,noexec,nosuid,nodev)
none on /sys/fs/cgroup type tmpfs (rw)
none on /sys/fs/fuse/connections type fusectl (rw)
none on /sys/kernel/debug type debugfs (rw)
none on /sys/kernel/security type securityfs (rw)
udev on /dev type devtmpfs (rw,mode=0755)
devpts on /dev/pts type devpts (rw,noexec,nosuid,gid=5,mode=0620)
tmpfs on /run type tmpfs (rw,noexec,nosuid,size=10%,mode=0755)
none on /run/lock type tmpfs (rw,noexec,nosuid,nodev,size=5242880)
none on /run/shm type tmpfs (rw,nosuid,nodev)
none on /run/user type tmpfs (rw,noexec,nosuid,nodev,size=104857600,mode=0755)
none on /sys/fs/pstore type pstore (rw)
systemd on /sys/fs/cgroup/systemd type cgroup (rw,noexec,nosuid,nodev,none,name=systemd)
gvfsd-fuse on /run/user/1000/gvfs type fuse.gvfsd-fuse (rw,nosuid,nodev,user=kurt)
kurt@kurt-AMILO-M-Series:~$
```

Now is the time to connect the USB stick to a second USB port on the computer.

In advance the USB stick is formatted on a windows computer with NTFS system (or ext3 not tested)

As the Original R&S HD is a 6 GB HD with a 2GB partition, the size of the USB stick must have a size larger than the image we are going to create so minimum 8GB is recommended.

As alternative to an USB stick you may also save the image to an external USB HD (not tested by me)

After the USB stick of brand INTENSO is connected to an USB port we issue a `dmesg` command.

```
systemd on /sys/fs/cgroup/systemd type cgroup (rw,noexec,nosuid,nodev,none,name=systemd)
gvfsd-fuse on /run/user/1000/gvfs type fuse.gvfsd-fuse (rw,nosuid,nodev,user=kurt)
kurt@kurt-AMILO-M-Series:~$ dmesg
```

We see the INTENSO USB Stick is mounted as sdc1. So, we now have access to the original HD as **sdb1** and the USB stick as **sdc1**

```
kurt@kurt-AMILO-M-Series: ~
[ 6588.560030] sd 14:0:0:0: [sdb] No Caching mode page found
[ 6588.560030] sd 14:0:0:0: [sdb] Assuming drive cache: write through
[ 6588.649546] sdb: sdb1
[ 6588.654698] sd 14:0:0:0: [sdb] Attached SCSI disk
[ 7813.340103] usb 1-1: new high-speed USB device number 12 using ehci-pci
[ 7813.477767] usb 1-1: New USB device found, idVendor=090c, idProduct=1000
[ 7813.477794] usb 1-1: New USB device strings: Mfr=1, Product=2, SerialNumber=3
[ 7813.477816] usb 1-1: Product: Intenso Ultra Line
[ 7813.477835] usb 1-1: Manufacturer: SMI Technology
[ 7813.477854] usb 1-1: SerialNumber: 18102900020030
[ 7813.481923] usb-storage 1-1:1.0: USB Mass Storage device detected
[ 7813.482707] scsi host15: usb-storage 1-1:1.0
[ 7814.610293] scsi 15:0:0:0: Direct-Access Intenso Ultra Line 1100 P
Q: 0 ANSI: 6
[ 7814.614003] sd 15:0:0:0: Attached scsi generic sg3 type 0
[ 7814.614905] sd 15:0:0:0: [sdc] 122880000 512-byte logical blocks: (62.9 GB/58
.6 GiB)
[ 7814.616033] sd 15:0:0:0: [sdc] Write Protect is off
[ 7814.616033] sd 15:0:0:0: [sdc] Mode Sense: 43 00 00 00
[ 7814.616033] sd 15:0:0:0: [sdc] Write cache: enabled, read cache: enabled, doe
sn't support DPO or FUA
[ 7814.632022] sdc: sdc1
[ 7814.637659] sd 15:0:0:0: [sdc] Attached SCSI removable disk
kurt@kurt-AMILO-M-Series:~$
```

To figure out how the INTENSO USB stick as sdc1 is linked we issue a new mount command

```
[ 7814.632022] sdc: sdc1
[ 7814.637659] sd 15:0:0:0: [sdc] Attached SCSI removable disk
kurt@kurt-AMILO-M-Series:~$ mount
```

/dev/sdc1 on /media/kurt/INTENSO is the result

```
kurt@kurt-AMILO-M-Series: ~
[ 7814.632022] sdc: sdc1
[ 7814.637659] sd 15:0:0:0: [sdc] Attached SCSI removable disk
kurt@kurt-AMILO-M-Series:~$ mount
/dev/sda1 on / type ext4 (rw,errors=remount-ro)
proc on /proc type proc (rw,noexec,nosuid,nodev)
sysfs on /sys type sysfs (rw,noexec,nosuid,nodev)
none on /sys/fs/cgroup type tmpfs (rw)
none on /sys/fs/fuse/connections type fusectl (rw)
none on /sys/kernel/debug type debugfs (rw)
none on /sys/kernel/security type securityfs (rw)
udev on /dev type devtmpfs (rw,mode=0755)
devpts on /dev/pts type devpts (rw,noexec,nosuid,gid=5,mode=0620)
tmpfs on /run type tmpfs (rw,noexec,nosuid,size=10%,mode=0755)
none on /run/lock type tmpfs (rw,noexec,nosuid,nodev,size=5242880)
none on /run/shm type tmpfs (rw,nosuid,nodev)
none on /run/user type tmpfs (rw,noexec,nosuid,nodev,size=104857600,mode=0755)
none on /sys/fs/pstore type pstore (rw)
systemd on /sys/fs/cgroup/systemd type cgroup (rw,noexec,nosuid,nodev,none,name=
systemd)
gvfsd-fuse on /run/user/1000/gvfs type fuse.gvfsd-fuse (rw,nosuid,nodev,user=kur
t)
/dev/sdc1 on /media/kurt/INTENSO type fuseblk (rw,nosuid,nodev,allow_other,defau
lt_permissions,blksize=4096)
kurt@kurt-AMILO-M-Series:~$
```

Next step is to copy the content of the original HD to the INTENSO USB stick as an image file named rs.img by issuing following command

```
sudo dd if=/dev/sdb of=/media/kurt/INTENSO/rs.img bs=1M conv=sync,noerror
```

```
/dev/sdc1 on /media/kurt/INTENSO type fuseblk (rw,nosuid,nodev,allow_other,default_permissions,blksize=4096)
kurt@kurt-AMILO-M-Series:~$ sudo dd if=/dev/sdb of=/media/kurt/INTENSO/rs.img bs=1M conv=sync,noerror
```

Again the sudo password must be entered as before

```
/dev/sdc1 on /media/kurt/INTENSO type fuseblk (rw,nosuid,nodev,allow_other,default_permissions,blksize=4096)
kurt@kurt-AMILO-M-Series:~$ sudo dd if=/dev/sdb of=/media/kurt/INTENSO/rs.img bs=1M conv=sync,noerror
[sudo] password for kurt:
```

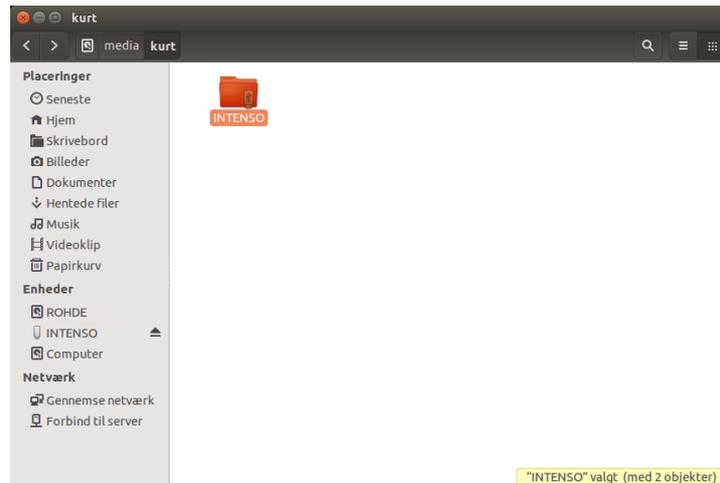
And now WAIT WAIT WAIT and WAIT a long time, here 10 minutes, until confirmation of a copy is displayed

```
kurt@kurt-AMILO-M-Series: ~
none on /sys/fs/cgroup type tmpfs (rw)
none on /sys/fs/fuse/connections type fusectl (rw)
none on /sys/kernel/debug type debugfs (rw)
none on /sys/kernel/security type securityfs (rw)
udev on /dev type devtmpfs (rw,mode=0755)
devpts on /dev/pts type devpts (rw,noexec,nosuid,gid=5,mode=0620)
tmpfs on /run type tmpfs (rw,noexec,nosuid,size=10%,mode=0755)
none on /run/lock type tmpfs (rw,noexec,nosuid,nodev,size=5242880)
none on /run/shm type tmpfs (rw,nosuid,nodev)
none on /run/user type tmpfs (rw,noexec,nosuid,nodev,size=104857600,mode=0755)
none on /sys/fs/pstore type pstore (rw)
systemd on /sys/fs/cgroup/systemd type cgroup (rw,noexec,nosuid,nodev,none,name=systemd)
gvfsd-fuse on /run/user/1000/gvfs type fuse.gvfsd-fuse (rw,nosuid,nodev,user=kurt)
/dev/sdc1 on /media/kurt/INTENSO type fuseblk (rw,nosuid,nodev,allow_other,default_permissions,blksize=4096)
kurt@kurt-AMILO-M-Series:~$ sudo dd if=/dev/sdb of=/media/kurt/INTENSO/rs.img bs=1M conv=sync,noerror
[sudo] password for kurt:
4645+1 blokke ind
4646+0 blokke ud
4871684096 byte (4,9 GB) kopieret, 597,739 s, 8,2 MB/s
kurt@kurt-AMILO-M-Series:~$
```

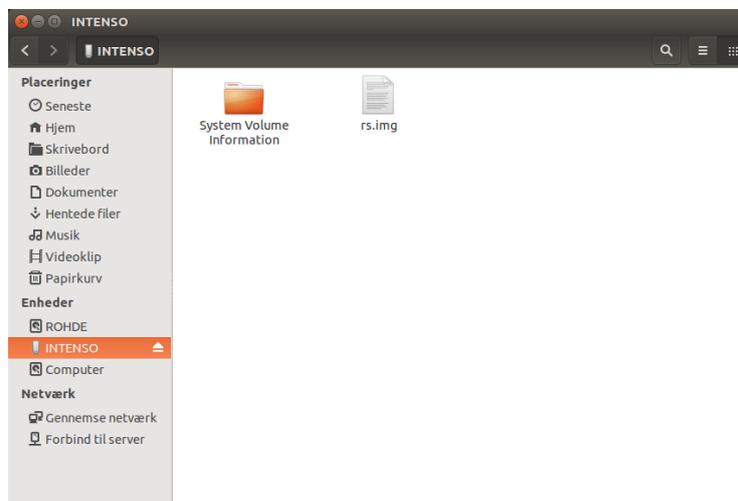
By a study of the content of the INTENSO USB stick we see beyond the rs.img file a folder not visible on a Windows computer is displayed. See next pages

The acknowledgment information shows 4.9GB copied and it lasted 597.739 sec = 10 minutes.

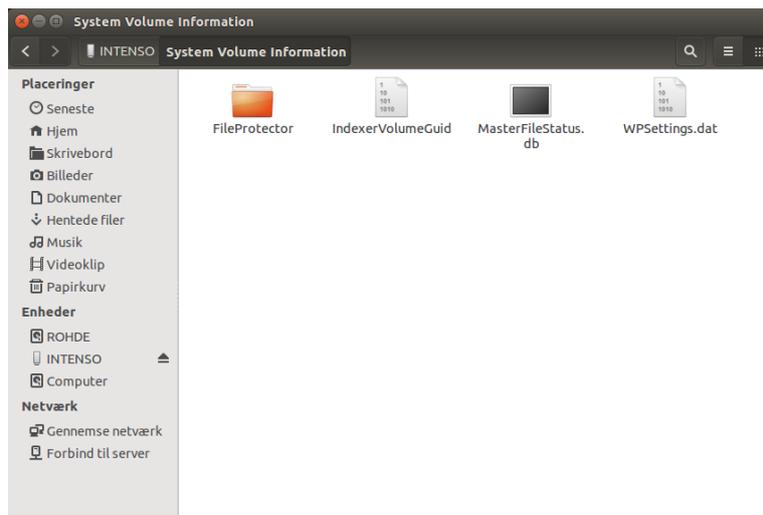
Opening the INTENSO folder



Reveal a folder called System Volume Information besides the rs.img



These data required for generation the clone HD in the process to be described now, after the IDE interface USB connection is removed from the computer



The hard disk used was actually not the Original hard disk but a 4.9GB hard disk same brand as the original but slightly smaller, and a clone of the original made by Norton Ghost and which could not boot in the FSIQ7. This test just to see how the procedure worked.

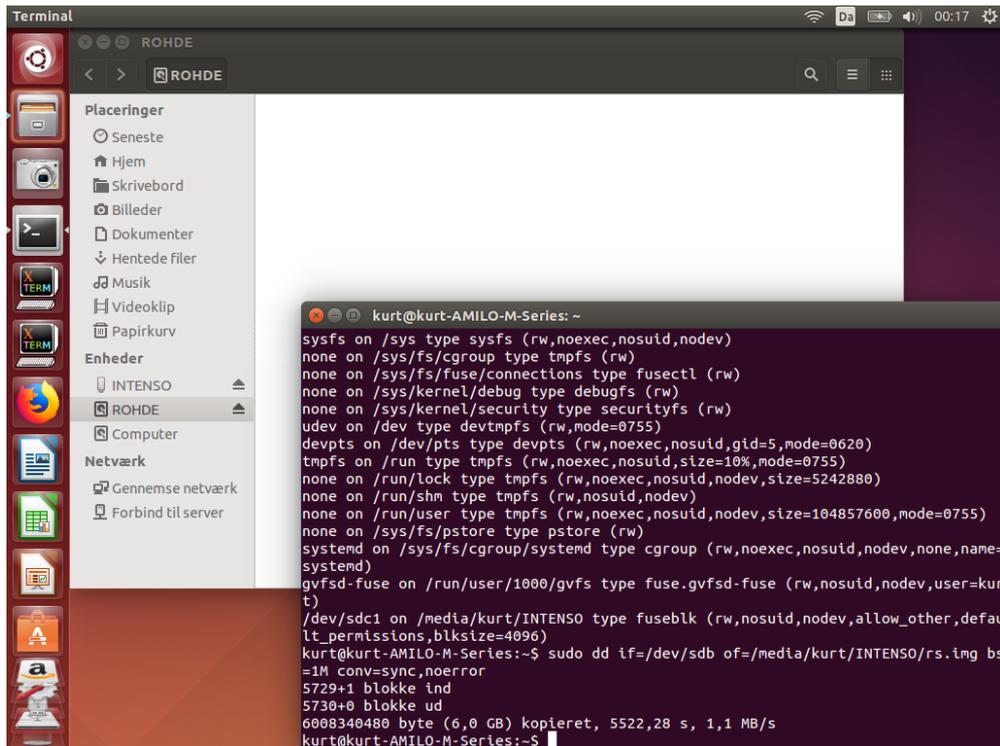
So, the process was repeated with the original hard disk, which in the meantime has developed error causing it to crash under NT booting. Still I created an image as the cloning hard disk created in the following worked fine again in the FSIQ7 !!!!

After the USB adaptor from the IDE to USB interface has been removed from the computer, it is time to mount the cloning HD to the IDE to USB interface and connect its USB adaptor to the computer.

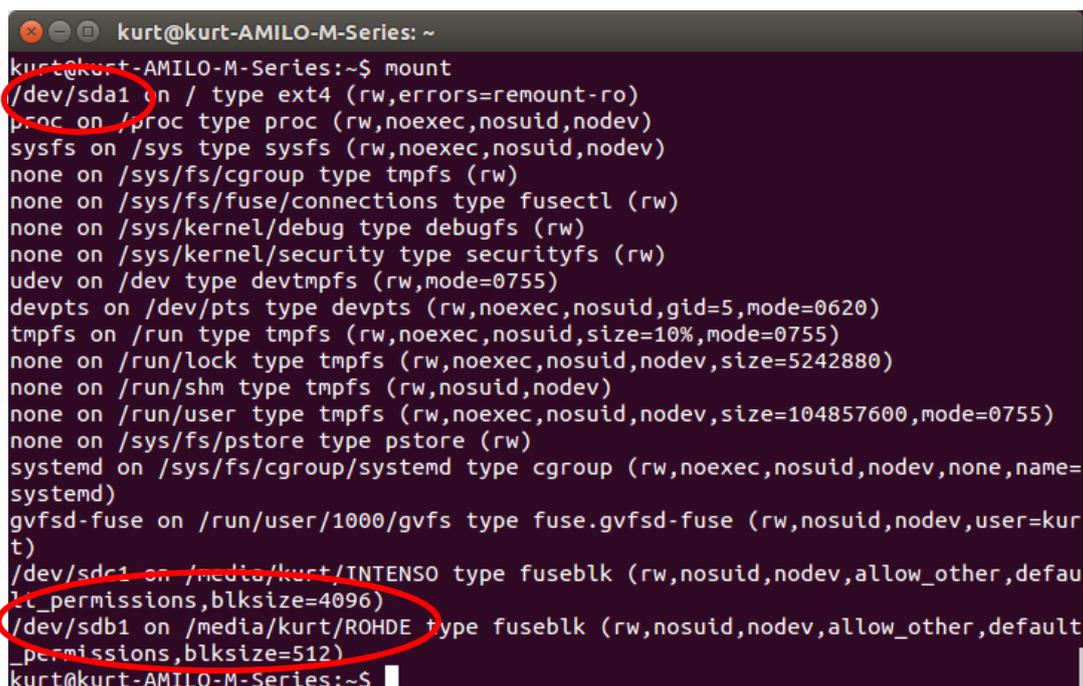
However the cloning HD must first be formatted by a windows computer with NTFS format and given the same name ROHDE

If larger than some 6 to 8GB use the windows program Windows administration / Disk Handling and reduce the size to 6GB. The bios and NT have some limitations for how large the disk/the partition can be. I have used a 20GB IDE disk and limited the partition to 6GB. The actual used data are less than 0.7GB

When the USB connector is plugged into the USB port and the Terminal program opened, we see the following. The ROHDE folder is empty and the terminal window still show the acknowledge if the writing the image file to the INTENSO USB stick, from the original hard disk containing errors. The time it took was 5522.28sec = 92 minutes against 10 minutes for an OK hard disk. So the original hard disk proven to have problems



Entering the command mount show the clone hard disk mounted as /dev/sdb1 on /media/kurt/ROHDE



We must now unmount the /dev/sdb1 as follows: sudo umount /dev/sdb1 to allow writing to the clone hard disk

```
kurt@kurt-AMILO-M-Series:~$ sudo umount /dev/sdb1
```

And when pressing Enter the request for sudo password appears

```
kurt@kurt-AMILO-M-Series:~$ sudo umount/dev/sdb1  
[sudo] password for kurt:
```

Issuing the command mount show that the “umount” was successful and only the computer HD and the USB stick is mounted

```
kurt@kurt-AMILO-M-Series:~$ mount  
/dev/sda1 on / type ext4 (rw,errors=remount-ro)  
proc on /proc type proc (rw,noexec,nosuid,nodev)  
sysfs on /sys type sysfs (rw,noexec,nosuid,nodev)  
none on /sys/fs/cgroup type tmpfs (rw)  
none on /sys/fs/fuse/connections type fusectl (rw)  
none on /sys/kernel/debug type debugfs (rw)  
none on /sys/kernel/security type securityfs (rw)  
udev on /dev type devtmpfs (rw,mode=0755)  
devpts on /dev/pts type devpts (rw,noexec,nosuid,gid=5,mode=0620)  
tmpfs on /run type tmpfs (rw,noexec,nosuid,size=10%,mode=0755)  
none on /run/lock type tmpfs (rw,noexec,nosuid,nodev,size=5242880)  
none on /run/shm type tmpfs (rw,nosuid,nodev)  
none on /run/user type tmpfs (rw,noexec,nosuid,nodev,size=104857600,mode=0755)  
none on /sys/fs/pstore type pstore (rw)  
systemd on /sys/fs/cgroup/systemd type cgroup (rw,noexec,nosuid,nodev,none,name=systemd)  
gvfsd-fuse on /run/user/1000/gvfs type fuse.gvfsd-fuse (rw,nosuid,nodev,user=kurt)  
/dev/sdc1 on /media/kurt/INTENSO type fuseblk (rw,nosuid,nodev,allow_other,default_permissions,blksize=4096)  
kurt@kurt-AMILO-M-Series:~$
```

Last step is to write the rs.img file from INTENSO USB stick to the Clone hard disk by issuing the command
sudo dd of=/dev/sdb if=/media/kurt/INTENSO/rs.img bs=1M

```
kurt@kurt-AMILO-M-Series:~$ sudo dd of=/dev/sdb if=/media/kurt/INTENSO/rs.img bs=1M
```

After pressing the Enter key we WAIT and WAIT and, in this case, only 282,386second or 4,7minutes

```
kurt@kurt-AMILO-M-Series:~$ sudo dd of=/dev/sdb if=/media/kurt/INTENSO/rs.img bs=1M  
5730+0 blokke ind  
5730+0 blokke ud  
6008340480 byte (6,0 GB) kopieret, 282,383 s, 21,3 MB/s  
kurt@kurt-AMILO-M-Series:~$
```

That is all gentlemen. Now the clone hard disk can be removed and installed in the FSIQ7, and it works as before the original hard disk crashed.

Then there is still a problem as the Lca download of the bin files FRAMCON, DETECTOR and IQDEM does not load, but that is another story.

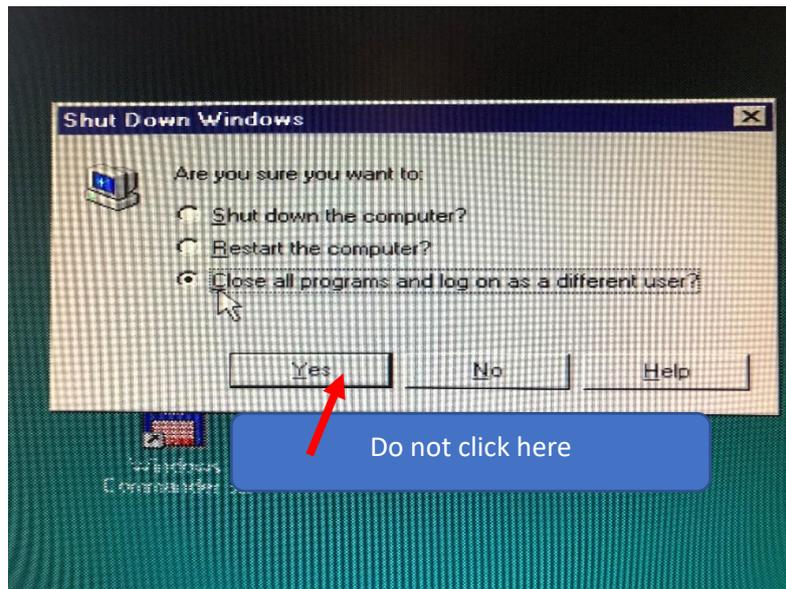
For those which have a complete dead hard disk there is a possibility to download an image for the FSIQ from the homepage of KO4BB at the link [Manuals - KO4BB](#) under Rohde Schwarz in the folder Rohde Schwarz FSIQ HDD Image EPROM-FSIQ_Disk with the direct link

http://www.ko4bb.com/getsimple/index.php?id=download&file=Rohde_Schwarz/Rohde_Schwarz_FSIQ_HDD_image_EPROM-FSIQ_DISK.zip

It is with windows NT 4.01 build 1381 and includes SP5. The image does work and a clone harddisk created just as described in above procedure by copy the image to the USB stick INTENSO. I have tested it and it have a problem detecting the monitor connected to the External PD VGA output, but when switching by pressing CTL and SYSRQ/PrintScreen then the NT control window is shown. My NT is with SP6 but same build number so maybe here is a difference

Some few additional hints:

Logging of for logging on as another user, does not work as expected, until you, when the function selected you are pressing on SHIFT and ENTER instead of clicking on YES



Logging on as administrator is by using **administrator** as username and 894129 as password

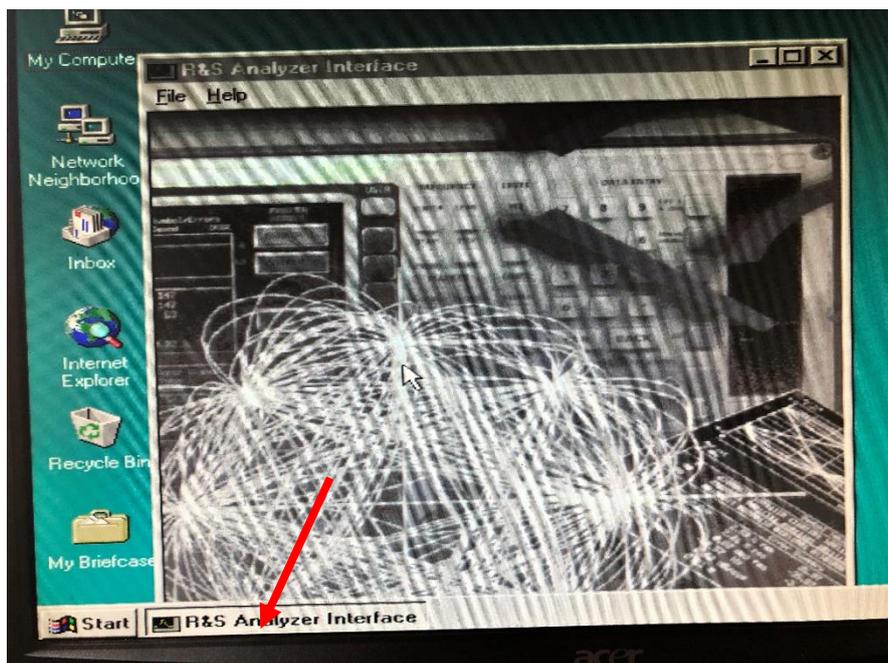
Automatic logon is possible by using **instrument** as both username and password

You may also create your own user account and remember to enable yourself as both user and administrator
I recommend to select that password should not be renewed/kept permanent over time

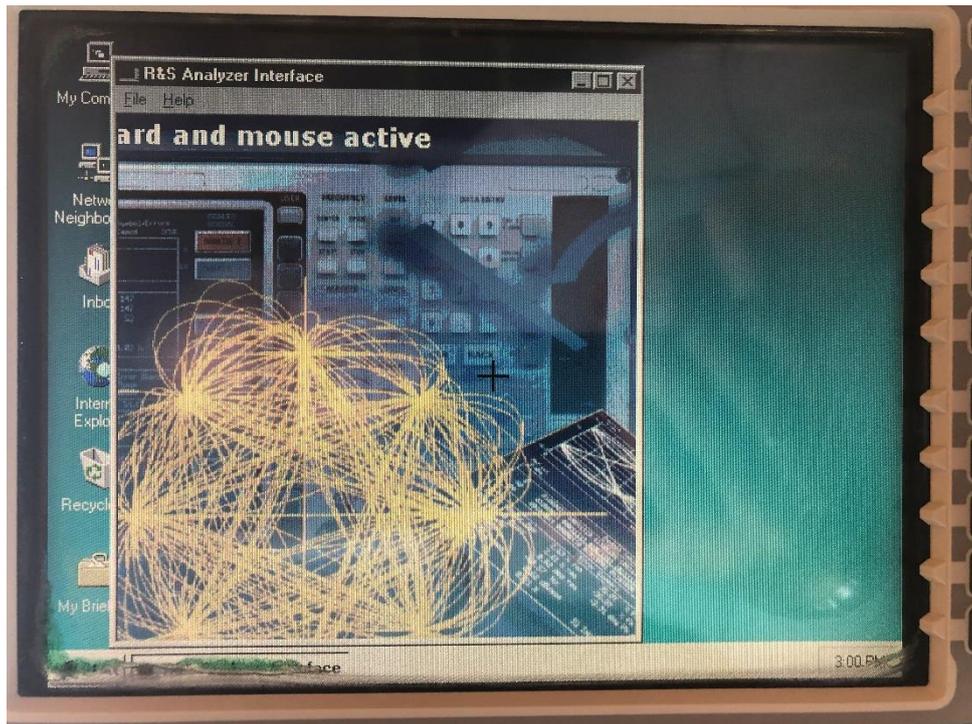
As mentioned in the beginning of the report access to the Bios is made by selecting on the attached keyboard the reboot by pressing CTL ALT DEL and then quickly press on the keyboard CTL ALT ESC several times.

Switching between the NT command Screen and the Measurement screen (R&S Analyzer Interface) is done by pressing on ALT and SYSRQ for an American keyboard and on European/Nordic keyboard ALT and PrintScreen

There is a trick how to switch mouse and keyboard from the NT4 command screen to the measurement screen. Activate on the NT4 command screen the R&S Analyzer Interface which at first is greyed out



With a mouse click in the center of the image it turns into color and a black cross cursor appear, and now the mouse and keyboard is controlling the measurement screen. This trick requires that a PC monitor is connected to the FSIQ7. In my case I have two monitors connected so I can monitor what is on the FSIQ7 LCD screen and on the other monitor the NT4 command screen as shown below



If your hard disk has totally gone dead and you get hold of an image somehow, then when booting the first time hold the Decimal Point on the FSIQ numeric keypad pressed for minimum 10 seconds. Then the EEPROM data from all the modules are read to the software and stored.

Acknowledgement:

Many thanks to Matthias DD1US, which has been the source for these Linux commands in a document where he describes substitution of the hard disk with a 8GB Compact Flash

His article is in German and named

Ersatz der festplatte in einem R&S Spectrumanalyzer FSIQ durch eine schnelle Compact-Flash-Karte

[Ersatz der HDD im FSIQ durch Compact-Flash-Karte 1v1.pdf \(dd1us.de\)](http://www.dd1us.de)

<http://www.dd1us.de>

Email DD1US@AMSAT.ORG

Another homepage about exchange of the hard disk for a FSE family of spectrum analyzer with solid state DOM disk is to find on <http://bymm.de>

Also, many thanks to the Linux and Ubuntu community for the great work given to all of us

07-10-2021 Kurt Poulsen OZ7OU

