

FBB Packet–radio BBS mini–HOWTO

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FBB Packet–radio BBS mini–HOWTO

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This mini–HOWTO covers the installation and use of the most popular amateur packet–radio BBS software FBB. That software works under Linux, DOS and Windows operating systems. It serves as a bulletin board system (BBS), a mailbox for personal messages, a database for various texts, documents and binary files, a server for small useful calculations etc. Packet radio is a way of connecting computers via amateur radio stations.

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1. [INTRODUCTION](#)

I have been using FBB amateur radio software since early nineties. It was the time of DOS operating system, so most of us, system administrators (or, so called system operators – sysop's), used various packet radio software for DOS. Versions of FBB packet radio BBS software for DOS, today are known as DosFBB.

I still administer one DosFBB database in the SRV (Amateur Radio Union of Vojvodina, a part of SRJ). It is DosFBB v7.00g23 that runs on a 486DX computer with 16 MB of RAM and Hercules b/w graphics. Since

last December, it runs without any re-boot (excepting some power failures). Before that, it was a bit tricky to set up all memory management properly, in order to avoid "frozen" system. Although this server runs under DOS, its "radio clients" don't depend on that. In fact, users of that DosFBB might run their client software under DOS, Windows, Linux or any other operating system that offer amateur packet radio abilities.

Two years ago, after I got my new box, Pentium 166 with 32 MB of RAM and VGA color graphics, I switched to a Windows version of FBB (so called WinFBB). Author of the software, an radio amateur from France, Jean-Paul F6FBB, has made many versions of WinFBB, including 16 bit variant for Windows 3.x and Windows 9x as well as 32 bit variant for Windows NT. I have run both variants until now (at the moment it is 16 bit WinFBB v7.00g25 that runs ok under Windows NT 4.0).

The main difference between DosFBB and WinFBB is that the second one offers you to do other jobs with your computer, while FBB is running as just any other application. Beside that, it is always nice to copy a text from another application (for example, from an Internet email) and to paste it into a packet radio message.

In the mean time, I upgraded my system to the Celeron 400 MHz with 96 MB of RAM and a big hard disk that has enough room to install Linux and try LinFBB ...

2. INSTALLATION

2.1 How to install X11 (Xwindows) version of LinFBB

- First of all, you should have running Linux with a GUI installed. I am fully satisfied with Gnome GUI but I suppose that KDE will be ok too (or any other GUI available).
- Download or copy LinFBB (the main ftp site is ftp.f6fbb.org but there are many mirror sites too). For example, if you get a file like
`x700e_full.tgz`

it means that it is X11 version 7.00e and it contains all you need in tgz archive to install the BBS. On the other hand, a name like

`xd700g_full.tgz`

means that it is not X11 but daemon version 7.00g and it is also complete to unpack. Further,

`x700f01.tgz`

and

`x700g.tgz`

are "upgrades" to any previous "full" package. For example, after I have upgraded to `x700g.tgz` I started to run X11 LinFBB 7.00g (04. August 1998). BTW, X11 versions are not maintained anymore, so I still run it here. It has some bugs but I like it.

- Copy the archive file in `/tmp` directory.

- You have to make a "base" directory where your FBB will be installed. For example you may type: **mkdir /usr/local/fbb** if you want FBB to be there. You have to be logged as 'root' or 'superuser' to install FBB.
- Then, you should locate yourself in that directory: **cd /usr/local/fbb**.
- Now, you should unpack the archive: **tar xvzf /tmp/x700b25.tgz** (<--- use the right name of the archive here).
- When you finished unpacking the archive, you may continue installing the software: **./install.sh** is the command for that. The setup will ask you for the 'base' directory where FBB will be installed. If you chose **/usr/local/fbb** again, you will be told that such directory already exists and all files will be overwritten. It is ok, so you should answer yes. If everything is ok, you should see on the screen that fbb system directories are created. At the beginning of that procedure, program will ask you for bbs's callsign, name of the city, QTH locator, your name etc. That details will become a part of **/usr/local/fbb/init.srv** file.
- After that, you **MUST** check this file **again** manually in order to fix some other details needed (because installation script does not fix all parts within that file).
- Well, so far – so good. After you have checked all configuration files, you may start the software: **./xfbb.sh** (<--- type this within an xterm or something similar). When you start your BBS for the first time, it will ask you to create some files it needs, so you should answer "yes" to the questions.

2.2 How to install LinFBB in addition to existing WinFBB

Notice: Folks, you see, at my place, I have a dual–boot system, consisting of Windows NT and Linux (each of them having their own partition(s) and file system). I wanted to have 'independent' operating systems that won't see each other. So I made two NT's partitions as NTFS partitions and rest of the space used Linux as ext2 partitions. Well, first I have installed WinFBB under NT and X11 LinFBB under Linux. Both of them worked, but there was a big "problem": I could not share their system files. You might say: So, what a big deal. But, my FBB's should serve as packet–radio forwarding stations (regardless of which one I boot at the moment), so it was really needed for new LinFBB to "know", for example, the position where WinFBB has stopped the mail exchange last time (and vice versa, of course).

- Well, in order to allow both WinFBB under Windows NT and LinFBB under Linux to use some common files, it is needed to put these files in a place where both operating systems can "see". So I do that by re–installing WinFBB onto a FAT (FAT16) partition that is recognized by NT and Linux too. The best way to do that is to install a "fresh" copy of WinFBB on a FAT partition and to copy complete "old" WinFBB from NTFS partition over the fresh installation (whenever you are asked to rewrite existing files, you should answer "yes").
- When that is finished, you should have a "clone" of the existing old WinFBB, but this time on the FAT partition that is visible from under Linux. Anyway, you should check if the "new" installation is able to run as the "old" one.
- I could also recommend you to check the file tree of WinFBB in order to become more familiar with it. The file tree of LinFBB is a bit different so it is advisable to note various details here and there.
- Some files can't be used as they are under *both* operating systems (without some necessary changes).

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That's why some file names should be renamed (or, at least, you should make appropriate copies of some files):

```
init.srv      ->  init_w.srv
forward.sys  ->  forw_w.sys
port.sys     ->  port_w.sys
protect.sys  ->  prot_w.sys
```

FBB is able to recognize and accept those renamed files.

- Make a backup of the actual WinFBB (I do this by copying the whole WinFBB file structure into the other Windows partition that *won't* be shared with Linux, like NTFS one). You'll never know when a catastrophe may happen, so as a result, you won't be able to start neither of WinFBB or new LinFBB. As a precaution, the backup might be the easiest way to recover at least the old WinFBB for a while (until you configure your new LinFBB, ok?).
- Now, you should restart your machine and boot into Linux. Log on as 'root' or make 'su' from a user's account.
- Mount a shared FAT directory (where FBB files are): **mount -t vfat /dev/hda2 /mnt/win** (for example).
- Copy LinFBB archive to **/tmp** directory.
- Position yourself to the 'base' directory: **cd /usr/local/fbb** (for example).
- Unpack the archive: **tar xvzf /tmp/filename**.
- Start the installation script **./install.sh** and, after asked for the 'base' installation directory, chose **/usr/local/fbb**. It doesn't matter if the program warns you that such directory already exists so existing files will be overwritten (by the way, if you choose a mounted directory shared with NT, many original WinFBB files, located there, would be over–written by LinFBB files, so after returning to Windows, WinFBB might not be functional like before).
- Copy **/usr/local/fbb** to **/mnt/win/fbb** but do **not** rewrite existing files with the new files having the same names.
- Copy **/mnt/win/fbb/init_w.srv** to **/mnt/win/fbb/init_l.srv** file.
- Edit **/mnt/win/fbb/init_l.srv** to what is needed for Linux. You may use the existing file **/mnt/win/fbb/init.srv** as an example.
- Copy newly edited **/mnt/win/fbb/init_l.srv** over the **/mnt/win/fbb/init.srv** (if you do not do that, maybe you wouldn't be able to start LinFBB using **./xfbb.sh**, like me at first).
- Copy **/mnt/win/fbb/system/port_w.sys** to **/mnt/win/fbb/system/port_l.sys** file.
- Edit **/mnt/win/fbb/system/port_l.sys** to what is needed for Linux and LinFBB. You may use the existing file **/mnt/win/fbb/system/port.sys** as an example.
- Edit **/mnt/win/fbb/xfbb.sh** in order to fix the right path.

- Ensure that you are in FBB's main directory: `cd /mnt/win/fbb` (for example).
- Start the script `./xfbb.sh` to run LinFBB. If everything is ok, your LinFBB under Linux should run with the same configuration as your "old" WinFBB under Windows. From this point, both FBB's should behave very similar (actually, I must admit that WinFBB has much better visual quality than X11 LinFBB, but probably the reasons for that you may find in Windows-vs.-Linux-GUI quality battles). FYI, my actual WinFBB is v7.00g25 (05. January 2000) and X11 LinFBB is v7.00g (04. August 1998).

2.3 How to install Protus password utility

Notice: Well, I have been using Protus connection filters for a long time now. At first, it was version 3.1/1.2 for DosFBB515c and, later, version 3.3 for Dos/WinFBB700. I have found Protus as very useful utility because of its implementation of BBS-to-BBS forwarding protection using MD2 algorithm. One of the reasons I am going to cover Protus in this document is a fact that its author haven't made a manual in english yet. I keep trying to translate the original manuals from spanish into english, but it is a hard process. Any good 'spanish-to-english' translator is welcomed to contact me: m.skoric@eunet.yu.

Protus offers several interesting features:

- It can send a presentation message to all users, informing about possibility to make users' access more safe,
- It can send messages to users who have normal access, informing about utility's existence,
- It can send messages to users who have no valid access (before disconnecting them),
- It can send messages to new users who have connected the BBS for the first time, informing them about the password utility.
- It can send messages to users who have entered wrong password (before disconnecting them),
- It can inform sysop about almost everything related to users' connections (new user on the system, unsuccessful connections etc),
- Messages mentioned above could be translated into various languages and used similarly as various language files that FBB uses,
- Messages mentioned above could be different for different BBS ports,
- Protus could be activated/deactivated at various intervals of time using CRON.SYS system file,
- Passwords could be managed remotely, using an external server, developed by Jose EB5IVB,
- ...

Well, let's see what should be done in order to implement secure access to the FBB packet radio BBS, using Protus type of `c_filter`:

- Users of Dos/WinFBB versions of Protus already know that it is needed to create a new directory

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\FBB\PROTUS where several *.PRT files should be placed. In addition, the main C_FILT*.DLL files should be copied into **\FBB\BIN** as well as a couple of "system", (i.e. config) *.PRT files that are going to be within **\FBB\SYSTEM** directory.

- After the sysop has copied all files into the proper locations, it is needed to make some configuration. The most important files are two "system" ones: CONFIG.PRT and USERS.PRT that should be carefully adopted to any particular situation. Other *.PRT files will work as they are in original, but they might be translated because they are originated in spanish (those files are just textual information that are sent to users who connect to the BBS). For your information, I usually don't care much about, because my BBS's are so called "open systems". It means they work quite normal for *all* users in the same way as they worked *before* implementing Protus. Only a couple of callsigns have password installed and, when connecting, they know what they are doing, so, they don't need any additional info. Your mileage may vary.
- So far – so good. When everything mentioned is done, you have to restart your FBB in order for Protus utility to be activated. In all connections to your BBS (including console), you should see a line like this: {**PROTUS-4.0**} just after a line [FBB-7.00-AB1FHMRX\$]. It only gives an information that Protus is active on the system. Users of your system who don't have their passwords, connect just normally as before. Users who's callsigns have password implemented, are prompted for password just after their connections.
- The author of Protus, Jesus EB5AGF, has made several working "modes" of its utility. It is possible for users to get various kinds of security: a fixed phrase as a password (similar when you connect to the Internet via telephone line, but this way the phrase can be masqueraded within the longer answer); a changeable answer to the 5 numbers (just like usual FBB sysop's password); a mode that uses automatic answer from user's client packet programs; implementation of MD2 and MD5 algorithms; FBB-to-FBB automatic forward protection etc. FYI, my WinFBB is equipped with 16-bit Protus 4.0 (13. August 1999). There is also a 32-bit module of the same date that would be called from within 32-bit WinFBB (I haven't tested those two).
- Well, the situation regarding working location of Protus files under LinFBB is somewhat different. I have become familiar to the directory structure that DosFBB and WinFBB versions of Protus have been using, so I considered that it was enough just to copy the same directory structure when I started the installation of Protus under LinFBB. It was wrong. After having pulled out the remaining hair, the things started to work, so, now I am going to tell you what to do.
- I have already told you that I have been running here both WinFBB under Windows NT and LinFBB under Linux (see also Linux+WinNT mini-HOWTO and Lilo mini-HOWTO). That means all Protus stuff has already been installed in a way WinFBB has required, except *Linux* executable of *c_filter* file. I put that file into **/fbb/bin** directory and, after the next restart of LinFBB, I got the info mentioned above: {**PROTUS-4.0**}. But the password protection was not likely to work. I was told to make a new directory **/var/ax25/fbb/protus** and put *.prt files there. I *didn't move* *.PRT files from **\FBB\PROTUS** but *copied* them into the new location, because I wanted Protus to run further under WinFBB as before. The utility still didn't want to run, unless I copied *also* *.PRT files from **\FBB\SYSTEM** to the new location (**/var/ax25/fbb/protus**). After I did that, Protus became fully functional.
- Well, I suppose, the above info would be useful for those of you who intend to run **both** Windows and Linux FBB's on the same machine. For the majority of LinFBB-only users, it is just important to make **/var/ax25/fbb/protus** where *all* *.prt files should be placed. *Only* *c_filter* executable should go to **/fbb/bin** and that's it.

- About FBB–to–FBB protection: **both** partners have to install Protus. Password for the forwarding partner's callsign must be the same at **both** sides of the link. The versions of Protus don't need to be the same (neither the versions of FBB, neither the operating systems, HI!). Anyway, MD5 algorithm will only work if both parties have Protus 4.x and above (I still don't use that, but it is not a problem, because my two boxes, DosFBB/Protus3.3 and WinFBB/LinFBB/Protus4.0, make all things ok with MD2).
- One of the interesting features of Protus is to log unsuccessful connections. Due to the *different* locations of *.prt files here, I have separate logs for WinFBB and LinFBB c_filtering. Those of you who are going to run only one version of FBB, will have *one* complete log of connection errors, your users make when they try connecting your BBS.
- As it was told earlier, if you implemented password protection for only *some* of your users (but not for all of them who connect normally) – your system is considered as an "open" one. It means that will be logged only unsuccessful tries to enter the system by "protected" callsigns. But, if you decided that your BBS can be accessed by *only* those callsigns who are protected with Protus, it means that your system is the "closed" one. Then, there is no way a user could enter your FBB unless its callsign has given a password within your Protus. Any unauthorized try to connect your BBS is logged.
- In addition, you may decide to have a "guest" access or a "read–only" as *default* for some ports and/or for users who enter the wrong password. Many combinations are possible. You could even password protect your own FBB console!
- To finish with this topic for now, just to inform you that my X11 LinFBB is equipped with Protus v4.1b7 (15. February 2000). It has some minor bugs, for example, it logs incoming connections with a SSID of –48 if a user doesn't have a SSID at all (of course, a SSID of –0 would be expectible in such case).

2.4 How to install daemon version of LinFBB

*Notice: You see, folks, that I keep trying to get as many as possible versions of this great software (Jean–Paul, F6FBB, must be very proud after reading these words now). What I think when mention "as many as possible versions" means that we have learned how to get both WinFBB and LinFBB for X11 on the same computer. But, that's not all. There is a variety of daemon versions of LinFBB. In this section we are going to discuss how to **add** a daemon LinFBB to the existing two: X11 LinFBB and WinFBB!*

- Well, many amateurs suggested me to install some packages that looked to me as not too much needed for LinFBB itself – to be run. Anyway, I have installed those packages *before* the installation of LinFBB daemon version itself:

```
libax25.rpm  
ax25apps.rpm  
ax25tool.rpm
```

- Now it is the right time to install fbbsrv.rpm package. The archive is composed to make its own directories, as "base" directories. The last new daemon version to start with, that I managed to find as a .rpm package, was 7.01f Release 4 (09. December 1999).
- A file **fbb.conf**, that serves as the replacement for **init.srv**, is located in the following location:
/etc/ax25/fbb.conf

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- *Unless* you are going to install *daemon-only* system, you should make a backup of the existing following files:

```
dirmes.sys
etat.sys
heard.bin
inf.sys
statis.dat
tpstat.sys
```

- Now you have to edit **/etc/ax25/fbb.conf** and change some paths in case you already have X11 LinFBB installed on a *different* path. Here you have some examples that cover my particular situation...
- Directory of data files, instead of `/var/ax25/fbb`, should be **/mnt/win/fbb/system**
- Directory of config files, instead of `/etc/ax25/fbb`, should be **/mnt/win/fbb/system**
- Directory of message files, instead of `/var/ax25/fbb/mail`, should be **/mnt/win/fbb/mail**
- Directory of compressed files, instead of `/var/ax25/fbb/binmail`, should be **/mnt/win/fbb/binmail**
- Directory of users, instead of `.../home/fbbdos/...`, should be **.../mnt/win/fbb/users...** (← case you don't mind that both your WinFBB and LinFBB users handle the same location for users' files)
- Directory of YAPP files, instead of `/home/fbbdos/yapp`, should be **/mnt/win/fbb/users/yapp** (← the same reason as above)
- Directory of documentation files, instead of `/var/ax25/fbb/docs`, should be **/mnt/win/fbb/docs**
- Directory of pg programs, instead of `/usr/local/pg`, should be **/mnt/win/fbb/pg**
- Path and filename for import file, instead of `C:\FBB\MAIL.IN` should be **/mnt/win/fbb/mail.in**
- Now you have to edit **/usr/sbin/xfbb.sh** and change some paths in case you already have running X11 version of LinFBB on a *different* path. Here you have an example that cover my particular situation...
- Base directory of XFBB software, instead of `/var/ax25/fbb`, should be **/mnt/win/fbb**
- So far – so good. Now it is the time to start LinFBB daemon. The command for that is in the location: **/usr/sbin/xfbb.sh** and it may be executed within an *xterm*. If everything is OK, you should get several system messages on your screen, ending with something like:

```
xfbbC/X server running ...
xfbbd ready and running ...
```

- Well, daemon itself can't be used to access the BBS so it is needed to activate a *client* that is **/usr/sbin/xfbbC**. It has a couple of parameters (a callsign/password pairs that are stored in **/fbb/passwd.sys**). Note that **xfbbC** can also be activated within another *xterm*.
- If you are like me, you would like to activate one more *xterm* with **xfbbC** in a way to monitor your

radio frequency. If you have enough room on your screen, you may place all three *xterm* windows side by side.

- When you finish your *xfbbC* console session, it is suitable to use the same *xterm* to eventually stop the daemon. First of all, with the command **ps ax** you should locate PIDs of *xfbb.sh* shell and daemon itself, that you may **kill** after that.

2.5 How to install an "upgrade" to daemon version of LinFBB

Notice: Well, the main trouble I have discovered with 7.01f daemon was the absence of Protus `c_filter` protection. As I told you before, Protus is a "third-party" product, so it might have some problems with the compatibility to LinFBB itself. Anyway, it is also possible that a daemon version of LinFBB has some special requirements over some "third-party" software.

- I also noticed that my version of Protus was *newer* than the version of daemon LinFBB I had at first. Beside that, some hams, as well as F6FBB himself, have suggested me to upgrade LinFBB. I have also found a "problem" that I am still new in compiling Linux software, so, I'd rather look for pre-compiled packages to install easily.
- Jose, HI8GN, has offered daemon LinFBB v7.02g as a `.rpm` package (18. September 2000). I got it from his site: <http://hi8gn.dynip.com/indice.html>. But, when I tried to install it *over* the previous version 7.01f, it complained about some existing LinFBB files.
- Then I had to de-install the old package, after what some config files remained as `.rpmsave` files. It was nice, so I could use them to update my new-installed config files.
- Btw, the installation of Jose's package was performed without problems, but the new daemon was not likely to run as I expected, although I tried to configure it as best as I could. So, I have decided to make copies of new `xfbbd` and `xfbbC` from 7.02g package and **de-install** the rest of its `.rpm`, in order to install the previous version of LinFBB once again – the version that I was satisfied with.
- So far – so good. The "old" 7.01f version was installed again and tested one more time to be sure it was ok. Then, I just copied the previously saved executables from the new package, over the "old" executables. In a couple of minutes, the new daemon LinFBB v7.02g has come in place and function. Comments...?
- Well, the new daemon is likely to check for some more directories than the older version (mostly regarding `7plus` operations). Next, its `xfbbC` console client looks better than the previous version. But, I still miss `xfbbX` client, that I have found not functional. I hope it will be fixed soon. Finally, Protus `c_filter` utility is active too.
- An interesting question might be: is that now a really upgraded LinFBB daemon or not? Actually, I haven't changed the "old" script `xfbbd.sh` with the new one, because during the first tests with the new one I was getting lots of error messages. Looks that the directory structure was a bit complicated for me to set properly within the new version of `xfbbd.sh`. In addition, there are still some mysterious messages telling that `m_filter` has not been found or something like that. The next tasks are to solve these issues.

3. [FURTHER INFORMATION](#)

3.1 Copyright

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You are strongly recommended to take a backup of your system before major installation and backups at regular intervals.

3.3 News

This is not the first release of this mini–HOWTO. I hope to improve it whenever possible. Beside that, there are other documents that may help you to use amateur radio stuff on your computer. You may look for AX.25 (mini–)HOWTO at the same location where you get FBB mini–HOWTO.

This mini–HOWTO would be improved from time to time. If you think that the HOWTO on your Linux installation CD is some out–of–date, you may check for newest release on the Internet. It could be found within the main [Linux Documentation Project](#) homepage.

3.4 Credits

This version of mini-HOWTO can thanks to:

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Jose Marte, HI8GN, the packager of 7.02g package.

Any comments or suggestions can be mailed to my email address: m.skoric@eunet.yu.

3.5 HOWTO

These are intended as the primary starting points to get the background information as well as show you how to solve a specific problem. Some relevant HOWTOs are `Bootdisk`, `Installation`, `SCSI` and `UMSDOS`. The main site for these is the [LDP archive](#) at Metalab (formerly known as Sunsite).

3.6 Mini-HOWTO

These are the smaller free text relatives to the HOWTOs. Some relevant mini-HOWTOs are `Backup-With-MSDOS`, `Diskless`, `LILO`, `Large Disk`, `Linux+DOS+Win95+OS2`, `Linux+OS2+DOS`, `Linux+Win95`, `Linux+WinNT`, `Linux+NT-Loader`, `NFS-Root`, `Win95+Win+Linux`, `ZIP Drive`, `FBB packet-radio BBS`. You can find these at the same place as the HOWTOs, usually in a sub directory called `mini`. Note that these are scheduled to be converted into SGML and become proper HOWTOs in the near future.

3.7 Local Resources

In most distributions of Linux there is a document directory installed, have a look in the [/usr/doc](#) directory, where most packages store their main documentation and README files etc. Also you will here find the HOWTO archive ([/usr/doc/HOWTO](#)) of ready formatted HOWTOs and also the mini-HOWTO archive ([/usr/doc/HOWTO/mini](#)) of plain text documents.

Many of the configuration files mentioned earlier can be found in the [/etc](#) directory. In particular you will want to work with the [/etc/fstab](#) file that sets up the mounting of partitions and possibly also [/etc/mdtab](#) file that is used for the `md` system to set up RAID.

The kernel source in [/usr/src/linux](#) is, of course, the ultimate documentation. In other words, *use the source, Luke*. It should also be pointed out that the kernel comes not only with source code which is even commented (well, partially at least) but also an informative [documentation directory](#). If you are about to ask any questions about the kernel you should read this first, it will save you and many others a lot of time and possibly embarrassment.

Also have a look in your system log file ([/var/log/messages](#)) to see what is going on and in particular how the booting went if too much scrolled off your screen. Using `tail -f /var/log/messages` in a separate window or screen will give you a continuous update of what is going on in your system.

You can also take advantage of the [/proc](#) file system that is a window into the inner workings of your system. Use `cat` rather than `more` to view the files as they are reported as being zero length. Reports are that

less works well here.

3.8 Web Pages

There is a huge number of informative web pages out there and by their very nature they change quickly so don't be too surprised if these links become quickly outdated.

A good starting point is of course the [Linux Documentation Project](#) home page, an information central for documentation, project pages and much, much more.

Please let me know if you have any other leads that can be of interest.

4. [GETTING HELP](#)

In the end you might find yourself unable to solve your problems and need help from someone else. The most efficient way is either to ask someone local or in your nearest Linux user group, search the web for the nearest one.

Another possibility is to ask on Usenet News in one of the many, many newsgroups available. The problem is that these have such a high volume and noise (called low signal-to-noise ratio) that your question can easily fall through unanswered.

No matter where you ask it is important to ask well or you will not be taken seriously. Saying just *my disk does not work* is not going to help you and instead the noise level is increased even further and if you are lucky someone will ask you to clarify.

Instead describe your problems in some detail that will enable people to help you. The problem could lie somewhere you did not expect. Therefore you are advised to list up the following information on your system:

Hardware

- ◆ Processor
- ◆ DMA
- ◆ IRQ
- ◆ Chip set (LX, BX etc)
- ◆ Bus (ISA, VESA, PCI etc)
- ◆ Expansion cards used (Disk controllers, video, IO etc)

Software

- ◆ BIOS (On motherboard and possibly SCSI host adapters)
- ◆ LILO, if used
- ◆ Linux kernel version as well as possible modifications and patches
- ◆ Kernel parameters, if any
- ◆ Software that shows the error (with version number or date)

Peripherals

FBB Packet-radio BBS mini-HOWTO

- ◆ Type of disk drives with manufacturer name, version and type
- ◆ Other relevant peripherals connected to the same busses

Remember that booting text is logged to `/var/log/messages` which can answer most of the questions above. Obviously if the drives fail you might not be able to get the log saved to disk but you can at least scroll back up the screen using the `SHIFT` and `PAGE UP` keys. It may also be useful to include part of this in your request for help but do not go overboard, keep it *brief* as a complete log file dumped to Usenet News is more than a little annoying.
