

# *SyMon*

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## *Examples of usage*

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## 1. Foreword

So, you mustered all your courage and decided to set out for a new world – a world of alternative operating systems, bootmanagers and mysterious file systems like **BeFS**, **ext2** or **reiserfs**. Great discoveries and miracles are waiting for you. In this world you can do almost anything: you can dig out and install the old good **DOS** with its games, you can use the **Norton Commander** once again or you can try to learn the basics of **FreeBSD**. Still, you can have **Linux**, **Windows XP** and **Windows Vista** installed on the same hard disk just as a matter of routine.

But in this world some underwater rocks are also waiting for you, so you run the danger to lose your data due to a minor mistake. Wouldn't it be great to have a guide book which could navigate you to a safe haven!

Well, this is the idea of this handbook: to serve you as a guide which would navigate you step by step to the ultimate aim.

If you want to reach your aim, you should be well equipped, of course. Please download the latest version of SyMon that would be R3.21 for the moment. That would give you a powerful piece of equipment, but you ought to prepare it for the action first.

### 1.1. How to prepare the SyMon installation diskette

In order to prepare the **SyMon** installation diskette you would need to prepare the **MS-DOS** startup floppy diskette first. Under **Windows** you can do this if you check the “*Create an MS-DOS startup disk*”-option while formatting a new diskette.

The second method of creating a startup floppy is a bit more tricky, but it has the following advantage: the startup floppy will also contain two important utilities **format.com** and **fdisk.exe**. In that case you will need the special **bootdisk**-utility which does the entire job for extracting of the startup-floppy image. This utility can be found under the URL address <http://www.bootdisk.com/bootdisk.htm> Here you should download the file which is commented «Windows 98 SE Custom, No Ramdrive», the file itself has the name «**BOOT98SC.EXE**». Now insert a new floppy into the floppy drive and double-click the file (I presume you are creating the startup floppy under OS Windows). You'll see a short prompt «Insert floppy to write»; click «OK» and the image will be extracted to the floppy.

Not all files lying now on the floppy will be really useful for you in the future. Please remove some of them in order to make free space for the **SyMon** installation package. Make sure that only the following files are present:

- COMMAND.COM
- FDISK.EXE
- FORMAT.COM
- IO.SYS
- MSDOS.SYS

If you don't see all the files on the floppy then please have a look into the Windows settings (Tools à Options) and temporarily uncheck "Hide protected operating system files", then check “Show all files”.

Now when you have got the startup floppy you just have to copy to it all files from the **SyMon** installation package. If your system will ask you if the existing file “autoexec.bat” should be overwritten by the file from the **SyMon** package, please say “Yes”. After copying the files your **SyMon** installation floppy will be ready for use.

### 1.2. What is MBR for?

When you got your equipment ready for action it could be a good idea to learn a bit about the territory you're going to explore. In case you have a good understanding of the bootstrap procedure please skip the next passage and move directly to the concrete examples. Otherwise we suggest to you the following metaphor:

Please imagine a hotel which has many apartments. Your task is to accommodate in this hotel several groups of people, such as engineers, doctors or businessmen. Every group should be able to find its apartments and it shouldn't conflict with another groups. You would think: "Well, it's a piece of cake! Just put all the groups on a list and leave the list down at the reception, so every group could look it up and see which apartments are assigned for it!" Well, it's not that easy. The hook is, the weird structure of the reception allows no more than four entries for all groups! Now when the hotel has grown up this situation is going to become a real problem.

So the hotel administration finds a solution: a special manager is engaged, who is supposed to look after the right order. That manager maintains a notebook; there he has the full information about all groups and their corresponding apartments. When the manager sees a group of, say, doctors approaching he goes to the reception and makes four entries for them. Doctors then see the entries and do find their rooms and stay unaware of another groups' presence. Afterwards engineers could come, who in their turn read the entries left by the reception-manager and find their rooms without a problem.

To say the least, a special accuracy is required while maintaining that important notebook. If the manager makes a mess the results would be catastrophic. In the very best case doctors who were sent to the businessmen's apartments would hesitate and refuse to step in. In the worst case the doctors would call for cleaners who would remove and destroy all the valuable belongings left by businessmen in their rooms.

On the other hand, a wise management policy would allow the different groups to co-exist without problems; it would even allow them an access to the storage rooms where a common-use equipment is located.

By now you would guess what the whole story means: in our case the hotel represents a hard disk drive, apartments are partitions, groups of people are operating systems, the four-entry reception is MBR, and the special manager is **SyMon**.

If you would look closer at this virtual hotel you would realize some important points:

- The **SyMon** bootmanager needs a place to live, and nobody should spoil his notebook.
- It is not a big deal to change the size or the location of apartments if nobody was previously accommodated in them before. In that case it would be enough to change the notes in the manager's notebook, later they will be automatically taken into the reception registry.
- It is also quite easy to change the apartments if their occupants moved away for ever. Such apartments may be filled with equipment or garbage, but in doesn't really matter. By changing of the notebook information you could easily divide such rooms into several ones or vice-versa you can merge several rooms into a single one. The new-assigned occupants would simply remove all the remainings and then they would put their own furniture as they find fit.
- It is a complicated issue to change the size of apartments if somebody lives there. After changing the size it is necessary to make sure that all the furniture is still within the apartment and that it is well-arranged. After that, the change of the size should be synchronized with the entries in the reception registry and in the manager's notebook. Only when it's done you can consider the change of the size as complete.
- So your whole strategy of arranging partitions will depend on the initial situation on your hard drive. Later on we will describe the most common situations. As a user, you'll have to decide for yourself which example fits best for your current situation.

We want to emphasize at that point that these "Examples of Usage" don't describe the whole functionality of **SyMon** and therefore cannot replace the online documentation. The same goes for the bootstrap structures and partition information which are described here just enough to realize the examples.

### 1.3. Registration of SyMon

Without registering **SyMon R3** is fully functional for a period of 40 days. When the evaluation period has expired you'll see for 15 seconds a warning message which will remind you to register the boot manager.

In order to register **SyMon R3** you'll have to visit the "Register" section on the SyMon website, its URL address is <http://symon.ru/usr/eng/reg.php>.

Typically, the registration takes no longer than 4 working days. When it is complete we will e-mail you back sending a message which contains a license file attached to it. To make your SyMon copy registered please continue with the following steps:

1. Copy the license file "LICENSE.TXT" file into the directory where the SyMon setup system lies.
2. Re-install SyMon on the track you used before ("Track 0" or "Track 1"). The previous SyMon configuration will be taken without changes.
3. The next time you'll start SyMon you can check if it has become registered by pressing **F1**.

## 2. EXAMPLES OF SyMon USAGE

### 2.1. An example of installing of three operating systems to a new hard drive

Here we assume that your hard drive is new so it doesn't contain any recordings. If you have a hard drive which contains partitions and data which you would like to remove then it would also suit the purpose. You would only have to "zero-out" the whole first sector of the hard drive (which means the **MBR**) using a Disk Editor or alternatively to remove all the partition information in any other way.

For the installation you would need the **SyMon** installation diskette prepared in the way described in the Section 1.1. „How to prepare the SyMon installation diskette". In this special case it would be better to take the very last version of **SyMon** i.e. R3.23.02.

#### 2.1.1. Preliminary Planning

Before you start creating partitions and installing operating systems you would have to know what is your final intention and how much of the hard drive capacity is available, of course. If you are going to make such a planning for the first time it would be a lot easier to make a sketch of partitions using a piece of paper and a pencil. The amount of space reserved for each operating system would depend on many factors: on the type of the OS, on the software you intend to install and on your own ideas and preferences, of course. So we suggest the following numbers just as recommendations which could vary heavily in each certain case.

- **Windows 98**                    1 Gb minimum,                    2-3 Gb recommended
- **Windows XP**                    5 Gb minimum,                    10-20 Gb recommended
- **Windows Vista**                10 Gb minimum,                20-30 Gb recommended
- **Linux Native**                    about 6 Gb
- **Linux Swap**                    about 1 Gb

Now let's assume you are going to install to your computer three operating systems, namely **Windows 98**, **Windows XP** and **Linux**. In order to make things perfect we're going to create not less than six partitions: one **NTFS** partition, one **Linux native** partition, one **Swap** partition, one **EXTENDEDx** partition and two **FAT32x** partitions. In this example we will take a hard drive with a capacity of 40 Gb.

Probably you would ask: why would we actually need so many partitions for only three operating systems? Well, let's explain it. A partition containing the file system **FAT32x** can be recognized by nearly all operating systems, thus this file system type suits very well as an exchange partition where you could store the data which are in common use between different systems. **NTFS** is an advanced journaled file system which was created for the **Windows NT/XP** family of operating systems. **EXTENDEDx** is a special type of partition which is actually a container of several subpartitions. This type is perfect for data storage. **Linux native** is a partition type which is assigned extra for the **Linux** family; it can contain such file systems as **Ext2/3** or **ReiserFS**. The **Swap** partition is mandatory when installing **Linux**; it doesn't contain any file system and is used only by **Linux**.

All right now, let's take a piece of paper and a pencil and make a sketch:

1. **Windows 98 SE** – is installed to a 2 Gb partition (**FAT32x**) + another 2 Gb partition (**FAT32x**) is available for data exchange
2. **Windows XP** – is installed to a 10 Gb partition (**NTFS**) + a 15 Gb extended partition is used for data storage + a 2 Gb partition (**FAT32x**) is available for data exchange
3. **Linux** - is installed to a 6 Gb partition (**Linux native**) + a 1 Gb partition is used for the **Swap** file + a 2 Gb partition (**FAT32x**) is available for data exchange

Now let's imagine how all those partition could be located on the hard drive:

- Cylinder number 0 remains free

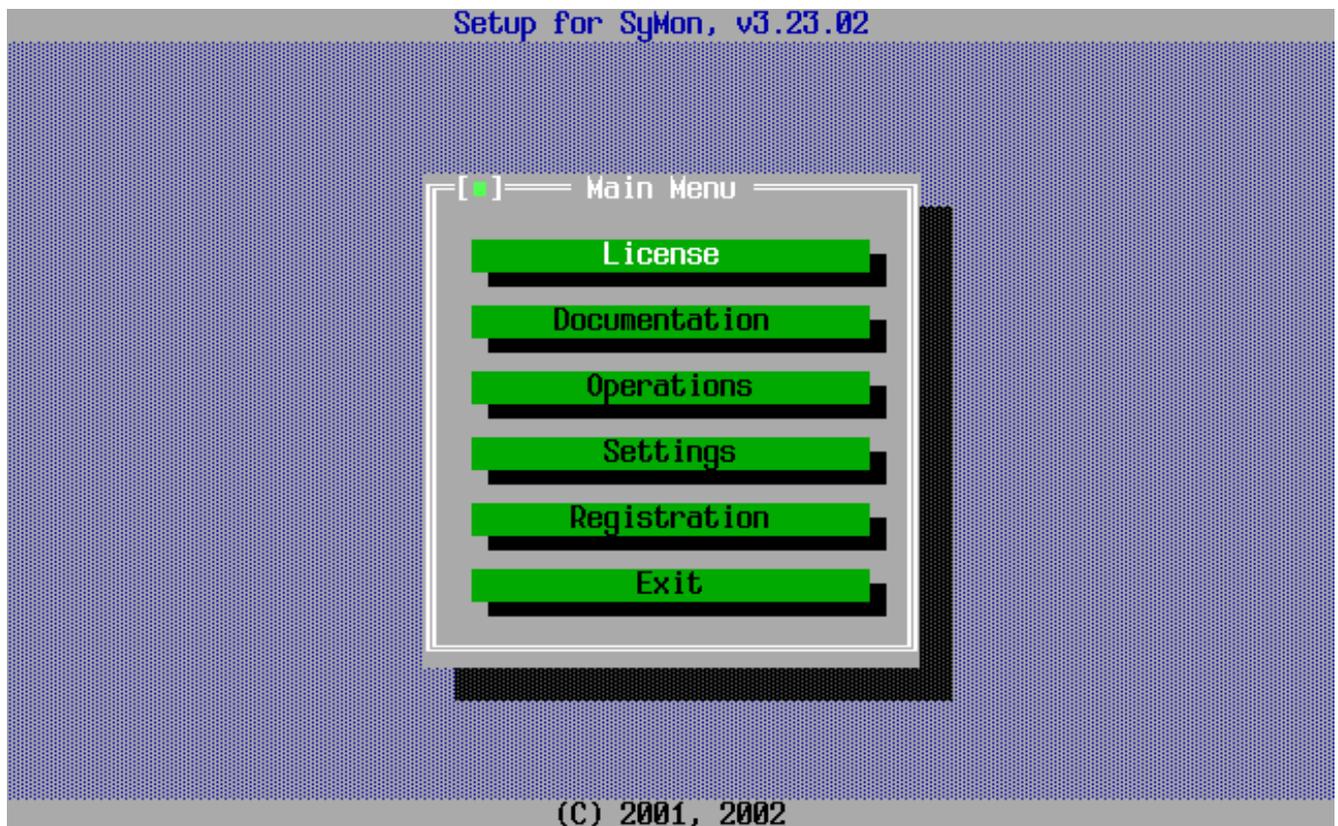
- Further on a 2 Gb partition (**FAT32x**) is located
- Further on a 10 Gb partition (**NTFS**) is located
- Further on a 6 Gb partition (**Linux native**) is located
- Further on a 1 Gb partition (**Linux Swap**) is located
- Further on a 15 Gb partition (**EXTENDEDx**) is located
- Further on a 2 Gb partition (**FAT32x**) is located

So we have 36 Gb in sum, the remaining 4 Gb will be spared for experiments.

If you look closer at the partition location order you will certainly notice that our three operating systems are placed in the partitions near the beginning of the hard drive. Correspondingly the partitions for data storage are located towards the end. They could be located another way, of course, but you should consider that the input/output rate is much higher at the beginning of the drive so it is a good idea to place the OSs right there. Another issue which should be considered at this stage is the following: some old operating systems such as **MS-DOS** or **Windows 3.1** can only be installed into the first 8 Gigabyte of the hard drive. If there is a chance that you are going to play with any of those systems some time later then you should spare out a few Gigabytes at the beginning of the hard drive along with the cylinder number 0, depending on the total disk space. That is, for creating there a partition later on. That advice can be ignored if you don't want to play with obsolete OSs for sure.

### 2.1.2. Installing of SyMon

When you boot your computer from the **SyMon** installation diskette then the **SyMon** Setup Utility will be started. First a window with the License Agreement will appear; you should read it and then press the button "Agree". After that you will see the Main Menu of the Setup Utility (picture 2.1.1).



Picture 2.1.1 Main Menu of the Setup Utility

When you see the main menu please choose the button “Settings”, here you can see the following options: “SyMon Font”, “SyMon Variants” and “Setup Settings”. First choose “SyMon Variants”, this menu allows to set the language of the **SyMon** as well as the **SyMon** modification (Professional or Lite) (picture 2.1.2).

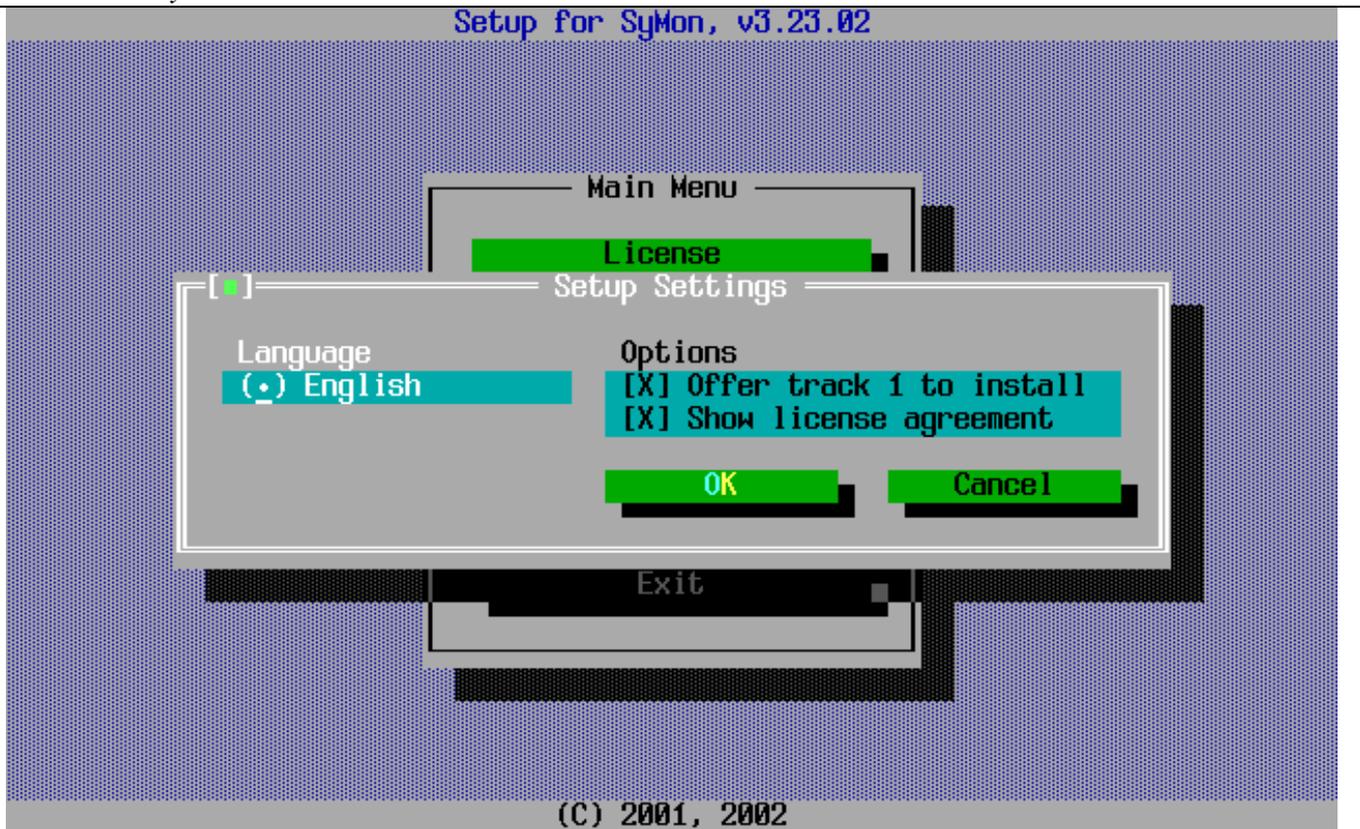


Picture 2.1.2 Choosing of **SyMon** Variant

The difference between the Professional and Lite modifications is in their size and thus in the number of tracks taken by the boot manager. In this special case we are going to leave the cylinder number 0 free, so we are not limited in number of tracks needed for **SyMon**. So we can choose the Professional modification which includes the Disk Editor taking 2 tracks out of 255 available. For moving around the menu you can use the cursor arrows and the **Tab** key, for choosing an item please press **Space**. For exiting the menu just move the cursor to the button “OK” and press **Enter**. After choosing the right settings in this first menu please choose in the main menu the “Settings” again, then choose “Setup Settings”. Here you should make sure that the option “Offer Track 1 to install” is activated. Otherwise check this option with a cross (picture 2.1.3).

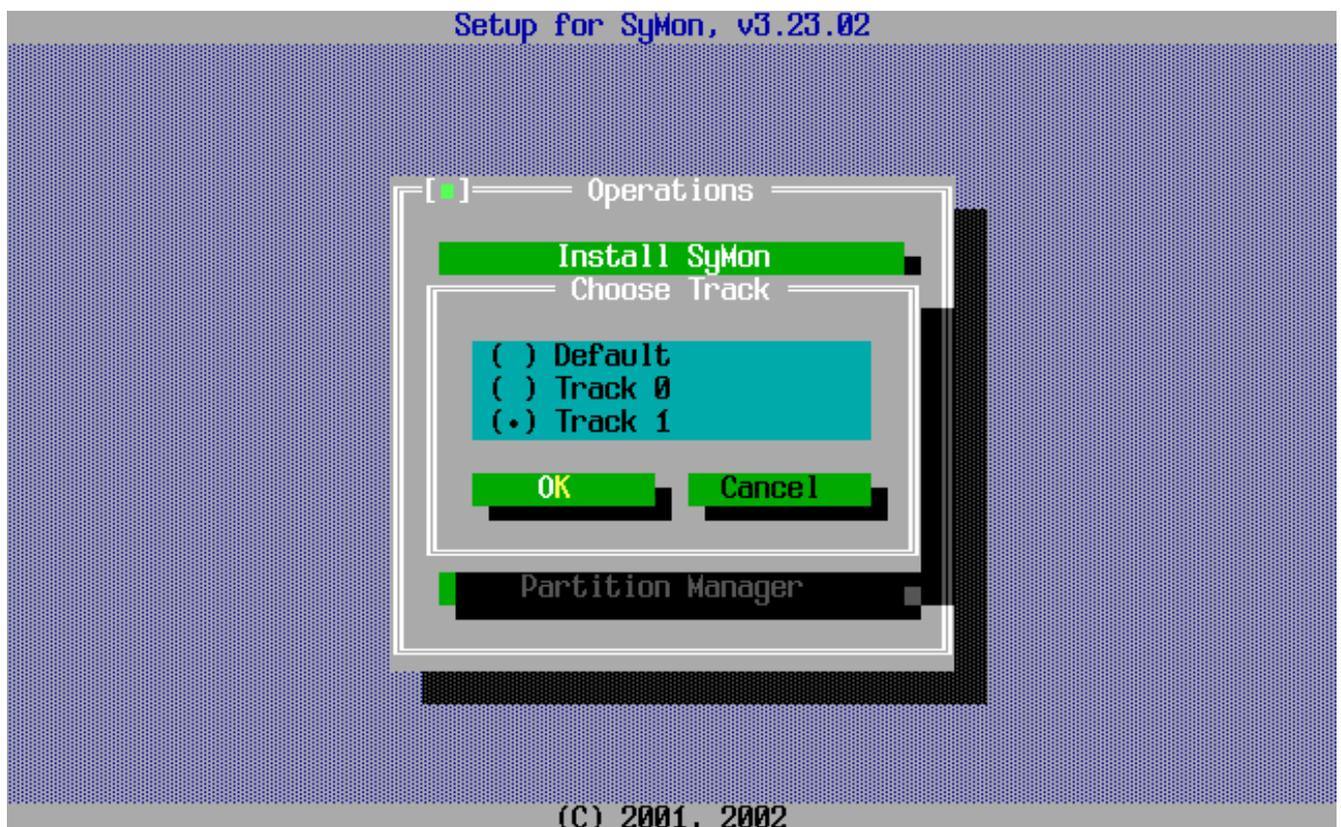
This will force the Setup Utility to ask you during the installation about the track where **SyMon** comes to.

Probably you will wonder why it is so important to choose between the Track 0 and Track 1 during the installation. Let’s look closer at this issue. If you don’t check the option in the menu that was mentioned above then **SyMon** will be installed into Track 0 by default and without questioning you. In this case a danger will always be present that **SyMon** could be damaged by some sort of software that makes hidden entries into the Track 0. Such entries can easily cause a malfunction of **SyMon**. Unfortunately it is not possible to avoid such annoying entries; they are mostly made by expensive software that tries to protect itself from unauthorized copying. On the other hand, removing of such entries (e.g. by restoring of **SyMon** from a backup copy) will cause problems with this protected software. So it’s a good idea to avoid this conflict from the very beginning by installing of **SyMon** into the Track 1.



Picture 2.1.3 Settings of the Setup Utility

Now when you've done all the necessary settings you can finally install **SyMon**. In the main menu you have to choose "Operations" and then "Install SyMon". After that you will be asked for track where **SyMon** should be installed (picture 2.1.4).



Picture 2.1.4 Choosing the track

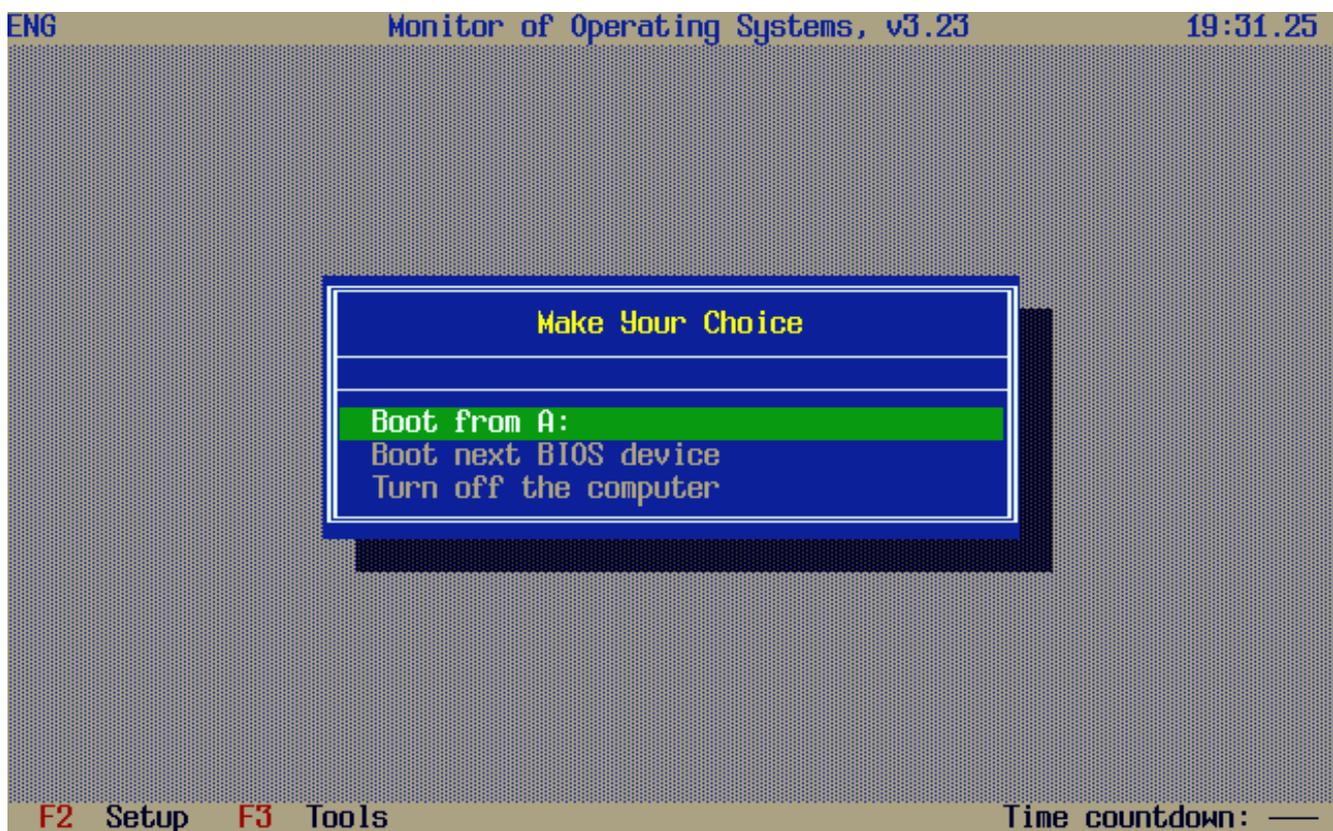
In case you have more than one hard disk drive you will also be asked for the number of the **HDD**. So please indicate the hard drive, e.g. "Drive 0". In the next step **SyMon** will be installed and you'll get a confirmation: "SyMon R3 successfully installed to track 1".

Now **SyMon** is on your hard drive and ready for use.

### 2.1.3. Taking a closer look at SyMon Bootmanager

At first glance at **SyMon** you may find it difficult to understand its tables and settings, but it all seems to be confusing only in the very beginning. Some minutes later you'll feel much more comfortable. Soon enough you'll find out that **SyMon** is clever and fills out many of the fields automatically. In case you make a gross mistake it just blocks your inputs!

In order to get into the main menu of the bootmanager you have to restart your computer. We want to emphasize here that in the first stage of restarting **no operating system will be loaded**. **SyMon** can do without an operating system, that's its main difference comparing with another bootmanagers. So in the first stage **SyMon** will start and you'll see its main menu (picture 2.1.5).



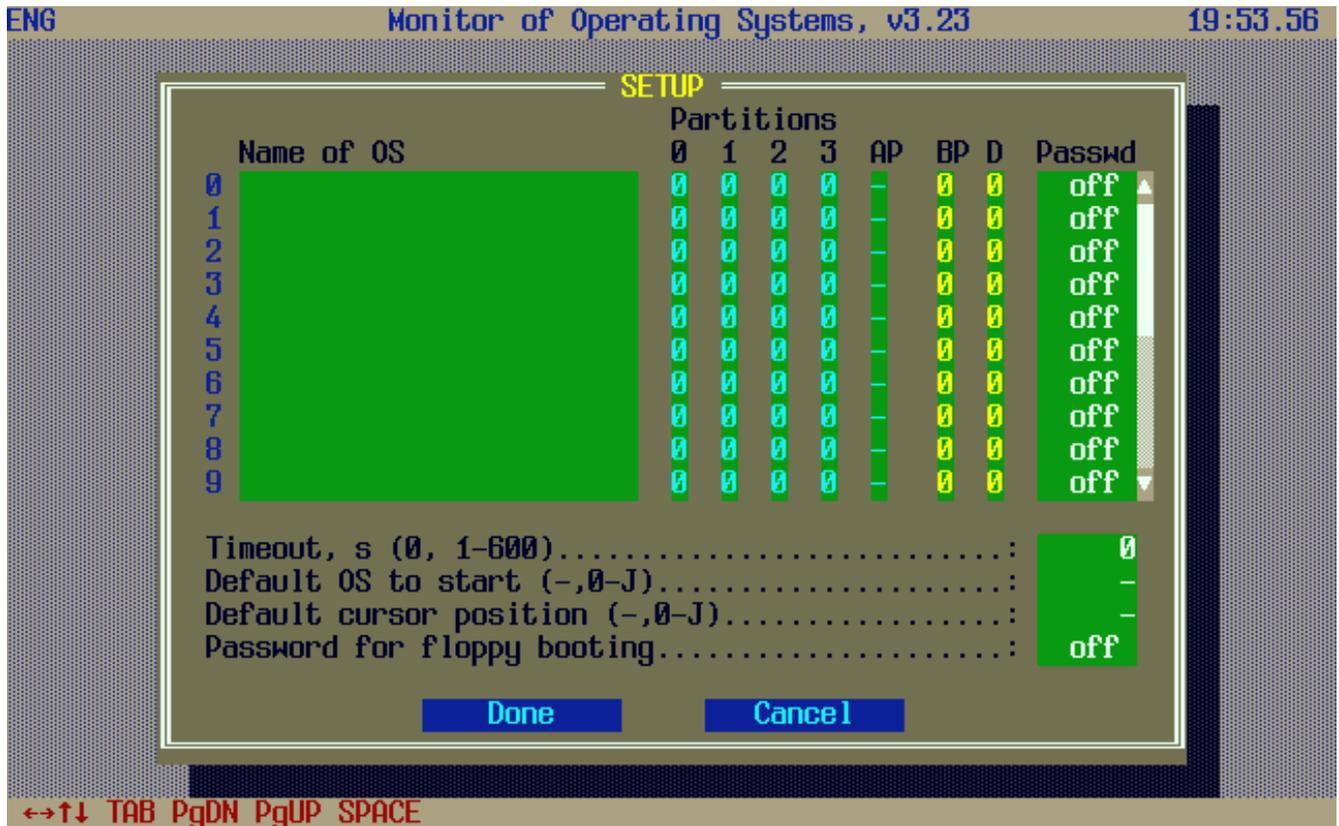
Picture 2.1.5 **SyMon** main menu

Right now you should have a look at the time countdown in the lower right corner of the window. If you don't press any key (except of **Enter**), **SyMon** will try to start an operating system after the countdown, so please press an arrow key to stop it.

Let's examine the main menu of **SyMon** and find out what it's all about. In the upper right corner there is a clock, in the lower left corner there are two hints for functional keys that can open the tools and settings. Right in the middle you see the list of available operating systems, well, it's empty now. Here you can also turn off the computer, if you wish to do so. This last point can be of a crucial importance if you suddenly encounter some hardware problems that make you unable to switch off the machine using the "normal" software. In that case it would be no good to use the brute force and pull the plug because the hard drive could be easily damaged. So this last point can solve the problem.

To make the names of the operating systems appear in the main menu, some settings have to be done. Now let's have a look behind the curtains and see how **SyMon** actually works.

By pressing **F2** you'll enter the Setup Dialog (picture 2.1.6).

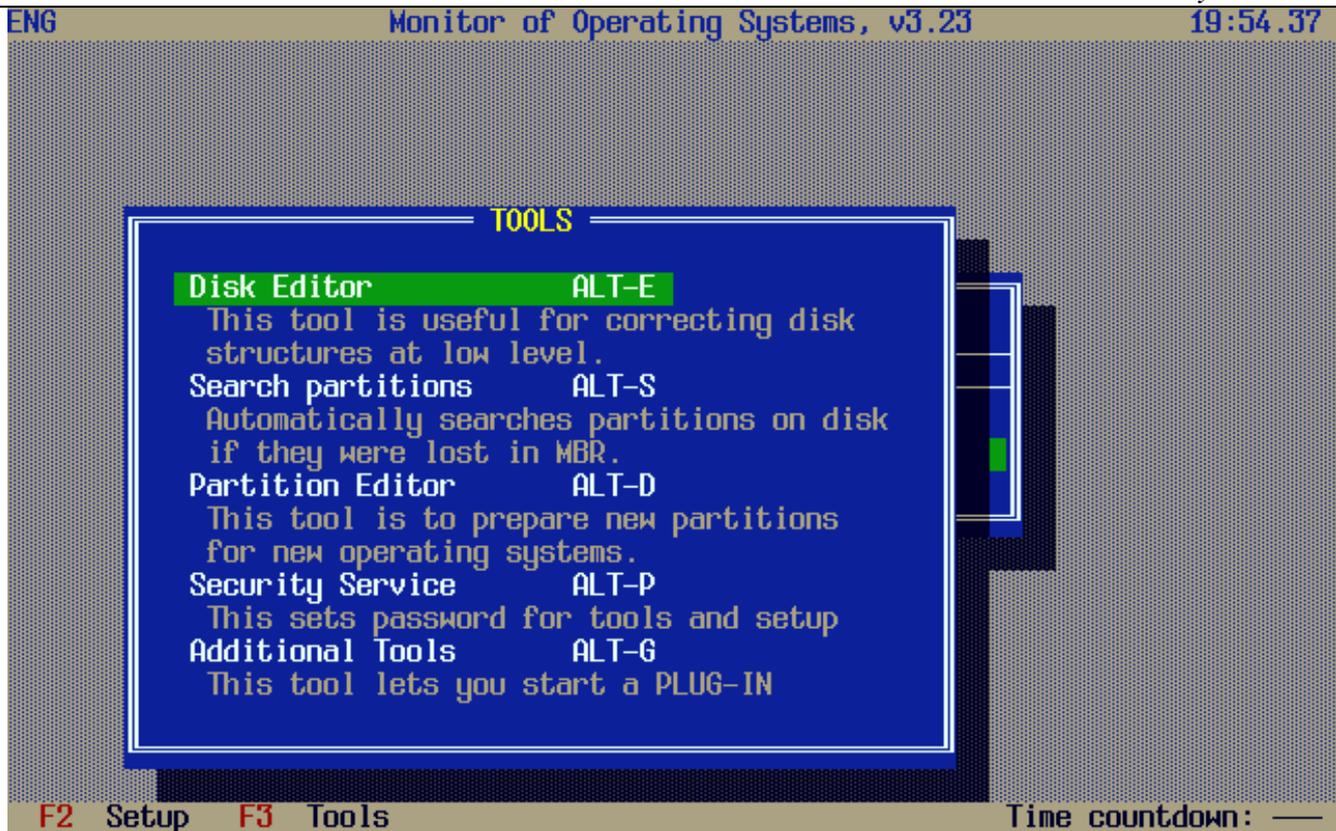


Picture 2.1.6 Setup Dialog

This is the table where all the descriptors for operating systems can be defined, including the OS names. From this table the information will be taken for creating the **MBR** entries on the hard drive. The entering of the correct values into these fields will be discussed some time later, now just make a mental note to yourself that the descriptors can be defined here in this dialog which can be opened by pressing **F2**. In this dialog you also can set the following: time countdown before an OS starts to boot; default OS to start; default cursor position; password for floppy booting. To get back into main menu without saving the changes simply press **Esc**.

By pressing **F3** in the main menu you will open the list of available tools (picture 2.1.7). The tool names are self-evident; let's indicate just the following points:

1. „Search partitions“ shouldn't be started just out of a curiosity. Working with this tool requires some experience because its results cannot always be predicted so a manual check may be necessary. It is in any case recommended to save the **SyMon** setting using the **SyMon Backup System** before this tool is started.
2. „Additional Tools“ can only be available if the corresponding plugins are installed and linked to the kernel of **SyMon**.
3. „Security Service“ makes it possible to secure the access to the **SyMon** tools by a password. If you also set the passwords for **BIOS**, floppy access and for each operating system you'll make your entire system “waterproof”.



Picture 2.1.6 SyMon tools

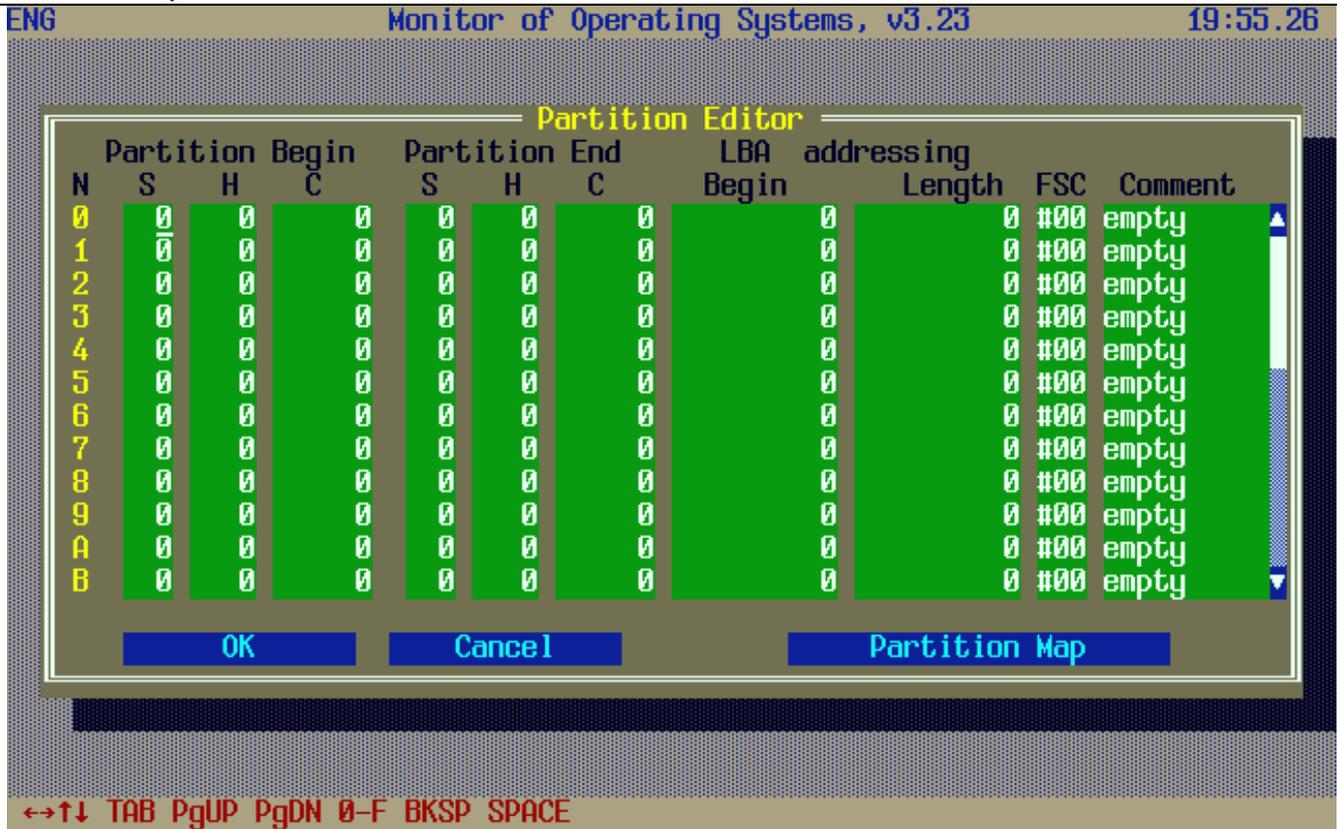
## 2.1.4. Partition creation

Now let's create the list of prospective partitions in the internal **SyMon** partition table. For that purpose you'll need the Partition Editor. To open it, press **Alt** + **D** in the main menu or alternatively press **F3** and then choose "Partition Editor" (picture 2.1.8).

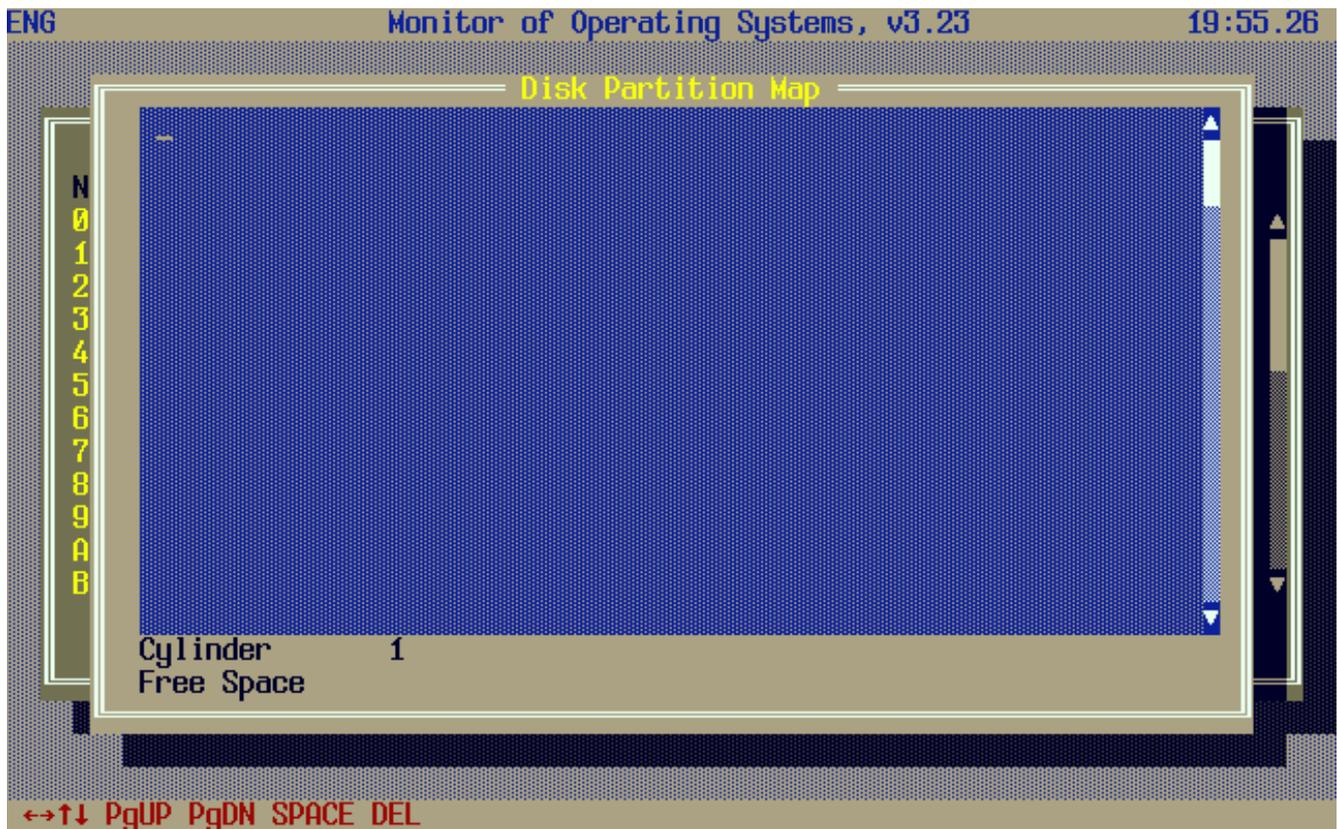
All the fields in the Partition Editor window are empty, as you can see on the picture. After creating of partitions using the Disk Partition Map the most of all necessary fields will be filled in automatically. To do so, place the cursor on the button "Partition Map" using the arrow keys and press **Enter**, or you may just press **Alt** + **M**. After that the Partition Map will appear (picture 2.1.9).

It is empty for now. In order to create a partition you should place the cursor in the upper left corner of the map and then move it one position right. That means, the cylinder number 0 will remain free for **SyMon** (remember, we've installed **SyMon** into track 1 of cylinder 0 which is supposed to make it invulnerable for license entries and viruses). One cursor position on the map means one cylinder or ca. 7.84 Mb in the **LBA** translation. Then press once **Space**, starting the prospective partition. Using the arrow keys, enlarge the partition until it reaches the planned size. Under the map you can see the size of the partition being created, here remember that 1 Gb = 1024 Mb. In order to indicate the end of the partition, stop the cursor and press **Space** once again.

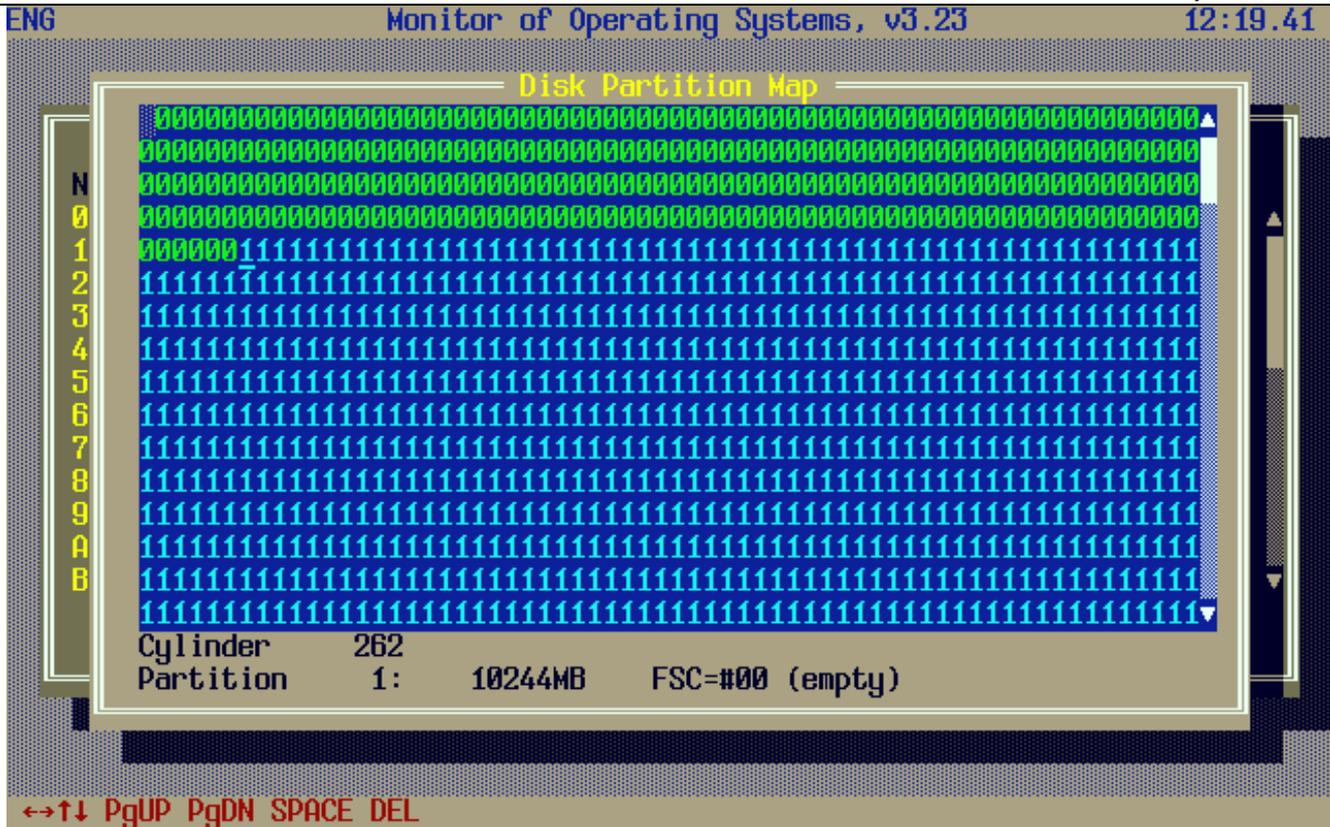
Using this technique, first create the system partition with the size of 2 Gb for **Windows 98**; after that the system partition with the size of 10 Gb for **Windows XP**; after that please create the partition with the size of 6 Gb for **Linux native**; after that the **Swap** partition for **Linux** with the size of 1 Gb; after that a partition with the size of 15 Gb for data storage, it will be an extended partition that can contain logical disks; at last create a partition with the size of 2 Gb for data exchange between all OSs. Partitions being created will be colored with four different colors to make the orientation easier. All in all this should look like the picture 2.1.10.



Picture 2.1.8 Partition Editor

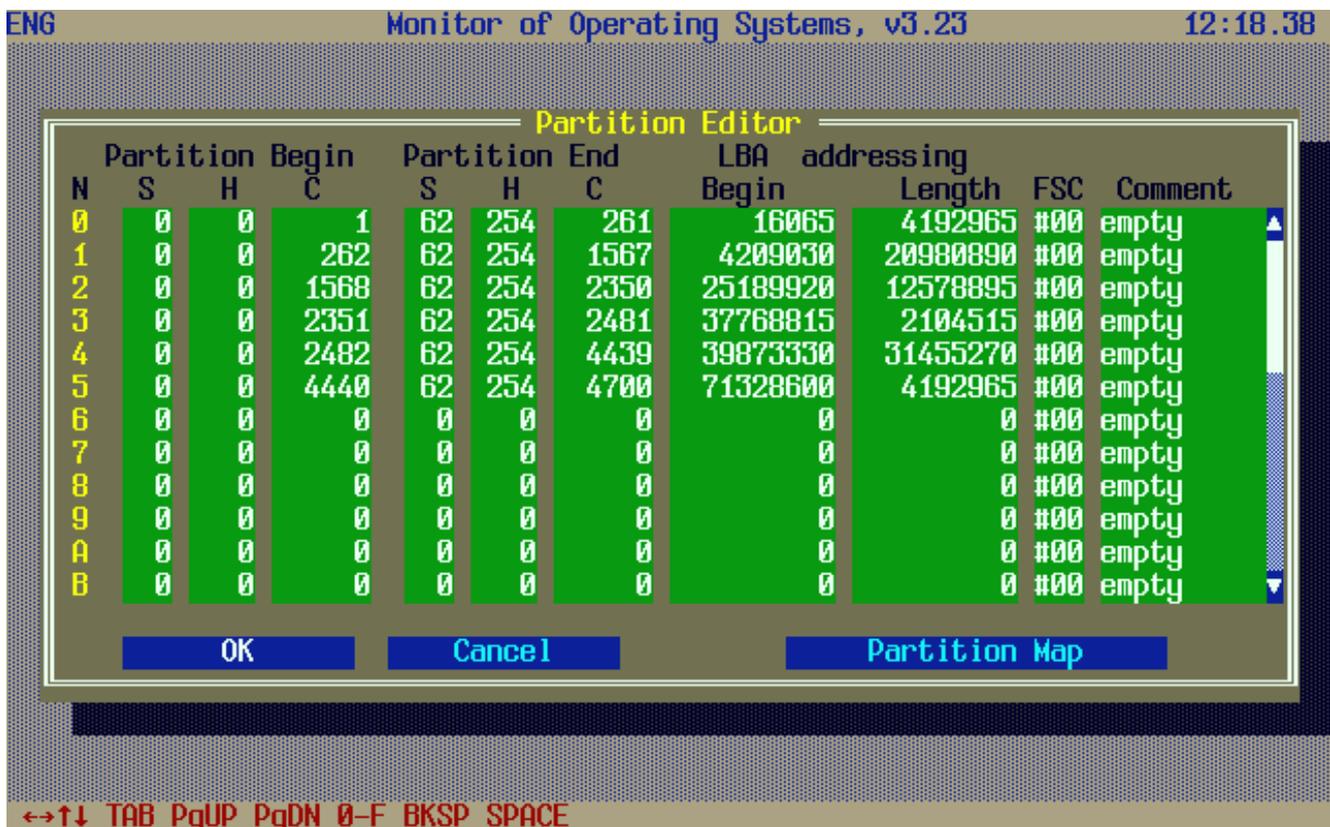


Picture 2.1.9 Disk Partition Map



Picture 2.1.10 Disk Partition Map

After you have finished creating of all partitions you should press **Enter**, that means “store the information and go back to Partition Editor”. Back in the Partition Editor, you’ll see the most fields already filled in (picture 2.1.11).



Picture 2.1.11 Partition Editor

As you can see here, every partition is labeled with a unique symbol. There can be 36 symbols: numbers **0...9** and Roman letters **A...Z**. In order to make the partition structure complete you'll have to assign a specific file system code (**FSC**) to each partition. This code will be written into the **MBR** along with the partition size; it will help the corresponding operating system to find out what file system it is supposed to use and thus if the partition suits well for its needs. Here you can see the file system codes which are used most often:

- #0E – FAT16x
- #0C – FAT32x
- #07 – NTFS / HPFS
- #83 – Linux native
- #82 – Linux Swap
- #0F – EXTENDEDx
- #A5 – FreeBSD
- #A6 – OpenBSD

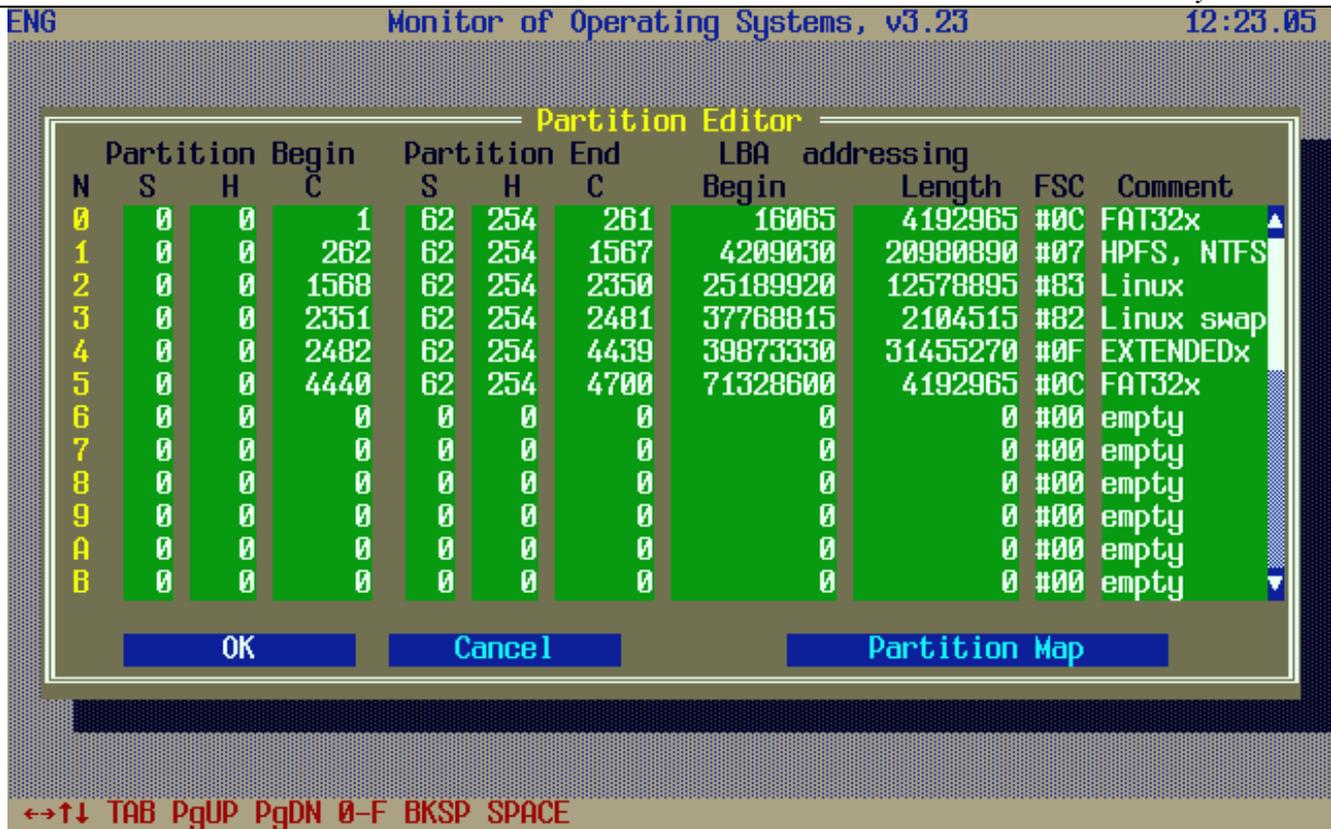
The complete list of codes you can find in the online documentation of **SyMon**.

Now you have to place the cursor into the **FSC** column and put in the appropriate code using the small list above. This is very easy done: when the cursor is placed in the **FSC** field, just press **Space** and you'll see the pull-down list of codes, so you'll have to select the right one and press **Enter**.

Alternatively you can directly enter the hexadecimal **FSC** if you know its value. This method is even faster because you don't have to search for the right code out of a one-hundred-entries list.

When you have entered the codes **SyMon** will automatically supplement the names for the file systemes so your work is virtually done (picture 2.1.12).

The Partition Editor can only show 12 partitions out of possible 36 at once. So if you have created more than 12 partitions you'll have to scroll the table using **Page Up**, **Page Down**. The arrow key can be used for moving up and down only within a 12-partitions list.

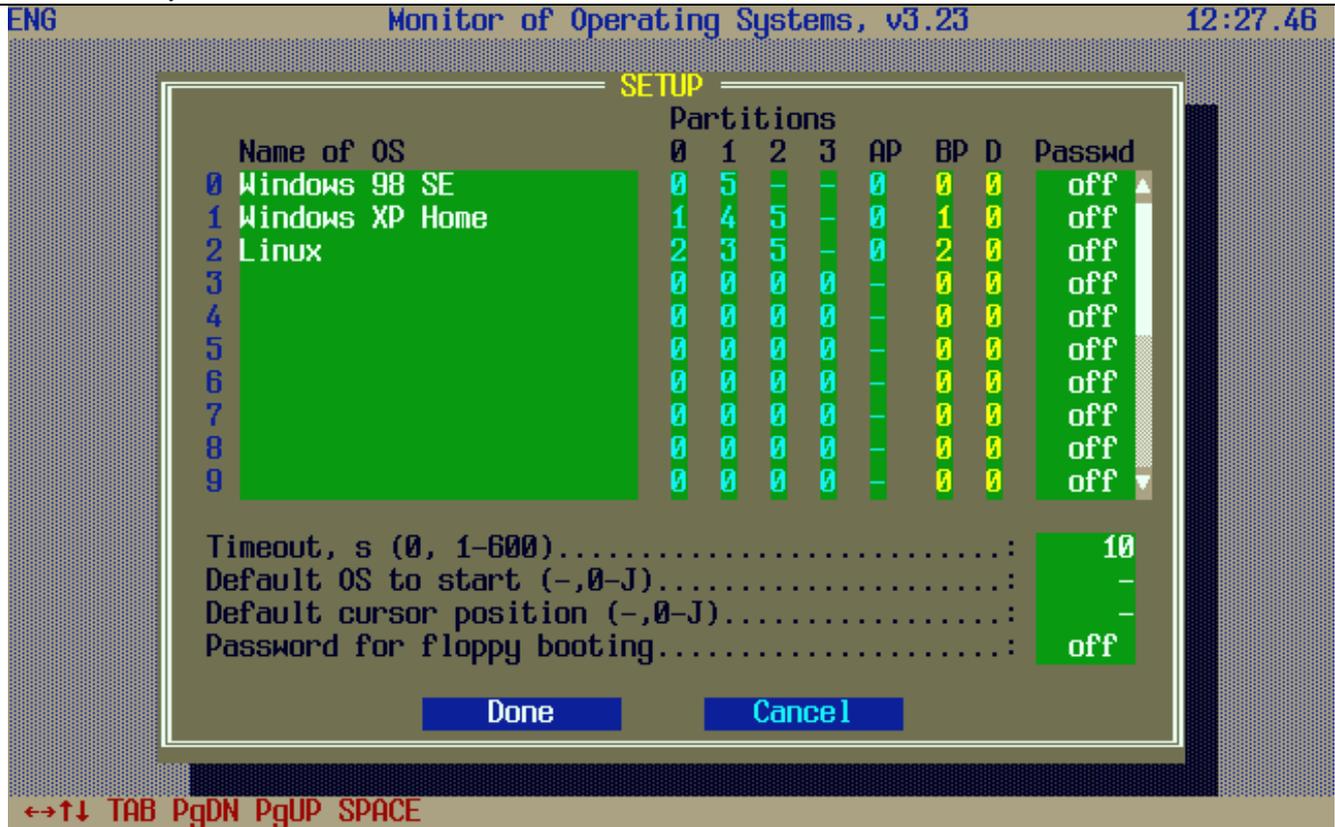


Picture 2.1.12 Partition Editor

Now you just have to move the cursor down to the «OK» button and press **Enter**.

### 2.1.5. Creation of OS descriptors

At that point you'll find yourself in the main menu where you would normally expect a list of operating systems for choosing but this list will still remain empty. In order to define the configuration entries including the names for operating systems you'll have to enter the Setup Dialog by pressing **F2** (picture 2.1.13).



Picture 2.1.13 Setup Dialog

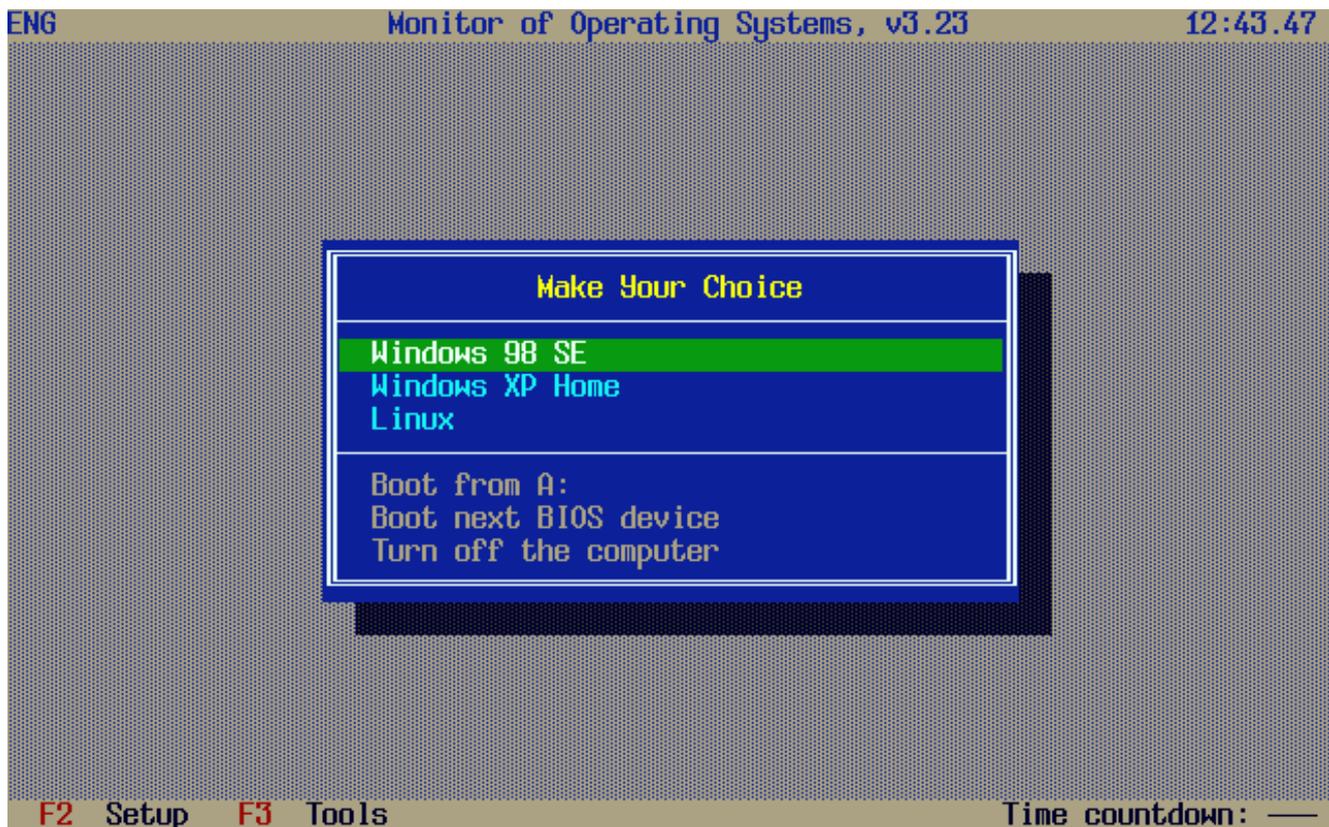
Now let's start by creating of a descriptor for **Windows 98**. In order to do so you have to enter the name of this OS in the beginning of the line labeled «0», then to press **Tab** and to start entering the descriptor configuration. This configuration starts with entering of prearranged partition numbers (compare the numbers in the Partition Editor) into the columns labeled «Partitions» «0» - «3». Here we only enter the partitions which we want to “show” to this particular OS. Obviously, in the first place the system partition of **Windows 98** should be present, so we put a «0» into the column labeled «0». After that, we want to add the **FAT32x** partition for data exchange. So we put a «5» into the column labeled «1». We don't want to “show” to this OS any further partitions, so we put a dash (minus) into the columns labeled «2» and «3». After that, we have to indicate in the column «AP» which partition placed into **MBR** should be active. If there are no special requirements for the partition order in the **MBR** then the active partition should be placed in the very beginning as we just did. So we put a «0» (that's the number of the first partition column) into the column labeled «AP». Then in the column «BP» will automatically appear a «0» confirming that the booting process will start from the partition labeled «0» in the Partition Editor. Now let's see what will happen if somebody will choose the point «Windows 98 SE» in the main menu of **SyMon**: a **MBR** will be compiled containing the following 4 entries:

- partition on cylinders 1 – 261, labeled as active, code #0C (FAT32x)
- partition on cylinders 4440 – 4700, code #0C (FAT32x)
- void
- void

After having read this entries the Setup Program of **Windows** will automatically assign the drive letter C: for the active partition which is always done by default. The next partition will be assigned the drive letter D: (next letter in the alphabet).

In a similar manner the descriptors for the other two OSs should be created using our sketch of partitions made before.

After having done this you should move the cursor down to the button «Done» and in the main menu of **SyMon** you'll see the list of operating system names which were entered into the field «Name of OS» (picture 2.1.14).



Picture 2.1.14 **SyMon** main menu

## 2.1.6. Short tips on installing of different OSs

Before starting the installation of our operating systems we should discuss some peculiarities which almost all OSs have in common. The point is, during the installation process not every partition containing operating systems becomes bootable as it is required by **SyMon**. The one very important requirement is that at the beginning of such a partition a second-stage loader is located which is able to take over control and continue with the booting. Especially in case of **Linux** this is seldom done because **Linux** by default tries to install its bootloader into **MBR**. The reason for this is that the **Linux** bootloader is designed to boot not only **Linux** itself but also another operating systems which may be present on the hard drive. In this case the only possible location for the bootloader is **MBR** which we actually want to prevent.

The **Windows** Setup Program can also cause some difficulties if it finds another **Windows** installation on the hard drive during installation process. In some cases the **Windows Setup** can even stop installation because the installation found on the hard drive is newer than the one we're going to install. In some other cases it creates the **ntloader** menu and worse, the one of the **Windows** installations becomes not bootable itself but bound to the second installation. That means that one of the **Windows** installations will share the **ntloader** files that are located on another partition. So it going to cause immense difficulties if you decide to remove the „master“ installation.

But remember, now we have **SyMon** that can easily workaroud the misbehaviour of different Setup Programs. In case of **Windows** installation we just have to create the OS descriptor that way that **Windows Setup** will not recognize another **Windows** installations i.e. all other partitions containing **Windows** installations should be hidden. If necessary, such partitions can be unhidden later when the installation will be finished.

The installation of **Linux** can be a little more tricky. As we know, **Linux** by default tries to install its bootloader into **MBR**. Now we should prevent this. This can be done using the configuration settings of **Linux** Setup Program. Different **Linux** distributions implement this in many different ways. Most often the user will be

asked during installation where the **Linux** bootloader should be installed. Please choose the **Linux** root partition, in our case it will be the **hda1**. Other distributions don't ask you, so you have to find this setting yourself. Sometimes it's pretty plain, sometimes you have to search the «Advanced Settings».

### 2.1.7. Installation of Windows 98

Let's install **Windows 98**. In order to install an operating system we should first create **MBR** which describes all partitions needed by that OS. As we know the **MBR** creation is done just before **SyMon** loads the corresponding OS. But how can we create **MBR** if an operating system is not installed yet and thus cannot be loaded? Well, it doesn't really matter: in **SyMon** main menu please move the cursor to «Windows 98 SE» using the arrow keys, then press **Enter**. After that your computer will show just black screen lacking an operating system but the creation of **MBR** was already done. Now you should reboot your computer using the „reset“ button after which you could start the installation of **Windows 98**. Before installation, don't forget to check in **BIOS Setup** the first booting device: it should be the CD-ROM, not hard drive.

Unfortunately, the **Windows 98** Setup Program shows just very scanty information about the found partitions. If you want to be absolutely sure and check the **MBR** you could use the startup floppy and the **fdisk.exe**-utility. After starting this utility and choosing the 4<sup>th</sup> point in its main menu (Partition Information) you will be able to check for yourself if the **MBR** creation was correct (picture 2.1.15).

```

                Display Partition Information

Current fixed disk drive: 1

Partition  Status  Type  Volume Label  Mbytes  System  Usage
C: 1        A      PRI  DOS           2047    UNKNOWN  4%
D: 2                PRI  DOS           2047    UNKNOWN  4%

Total disk space is 40960 Mbytes (1 Mbyte = 1048576 bytes)

Press Esc to continue
    
```

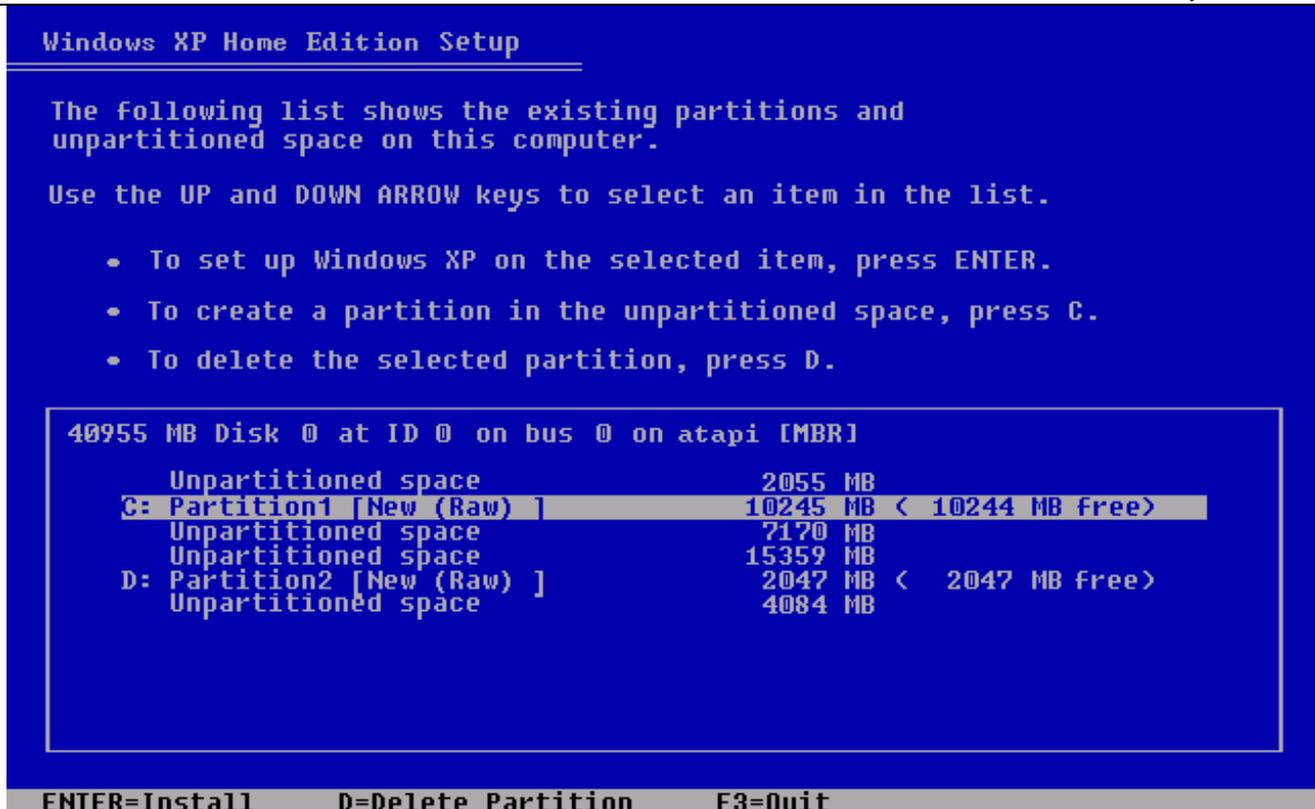
Picture 2.1.15 Partition information provided by **fdisk.exe**

If during the installation of **Windows 98** you will be asked if the automated configuration of the existing partitions should be done you should answer „no“. Otherwise the Setup Program will alter the **MBR** in a way it wants to. All that should be done here by the Setup Program is formatting of the disk C: and installing of the operating system into this disk.

After installing of **Windows 98** you will find out that the **SyMon** welcome screen doesn't appear when booting from the hard drive. The explanation for that is pretty plain: the **Windows 98** Setup Program has installed its own loader into **MBR** (but without altering the partition table). As the result **SyMon** was disabled but its settings remained untouched. So now you just have to install **SyMon** once again, in our case on the „Track 1“.

### 2.1.8. Installation of Windows XP

The next OS, **Windows XP**, can be installed just in the same way. First the **MBR** for that OS should be created as it was described above. After that the installation from the CD-ROM can be started. As you will see, the Setup Program of **Windows XP** shows much more detailed information about partitions found, so it won't be necessary to use the **fdisk.exe**-utility in order to check if the partition entries are correct (picture 2.1.16).



Picture 2.1.16 *Windows XP Setup Program*

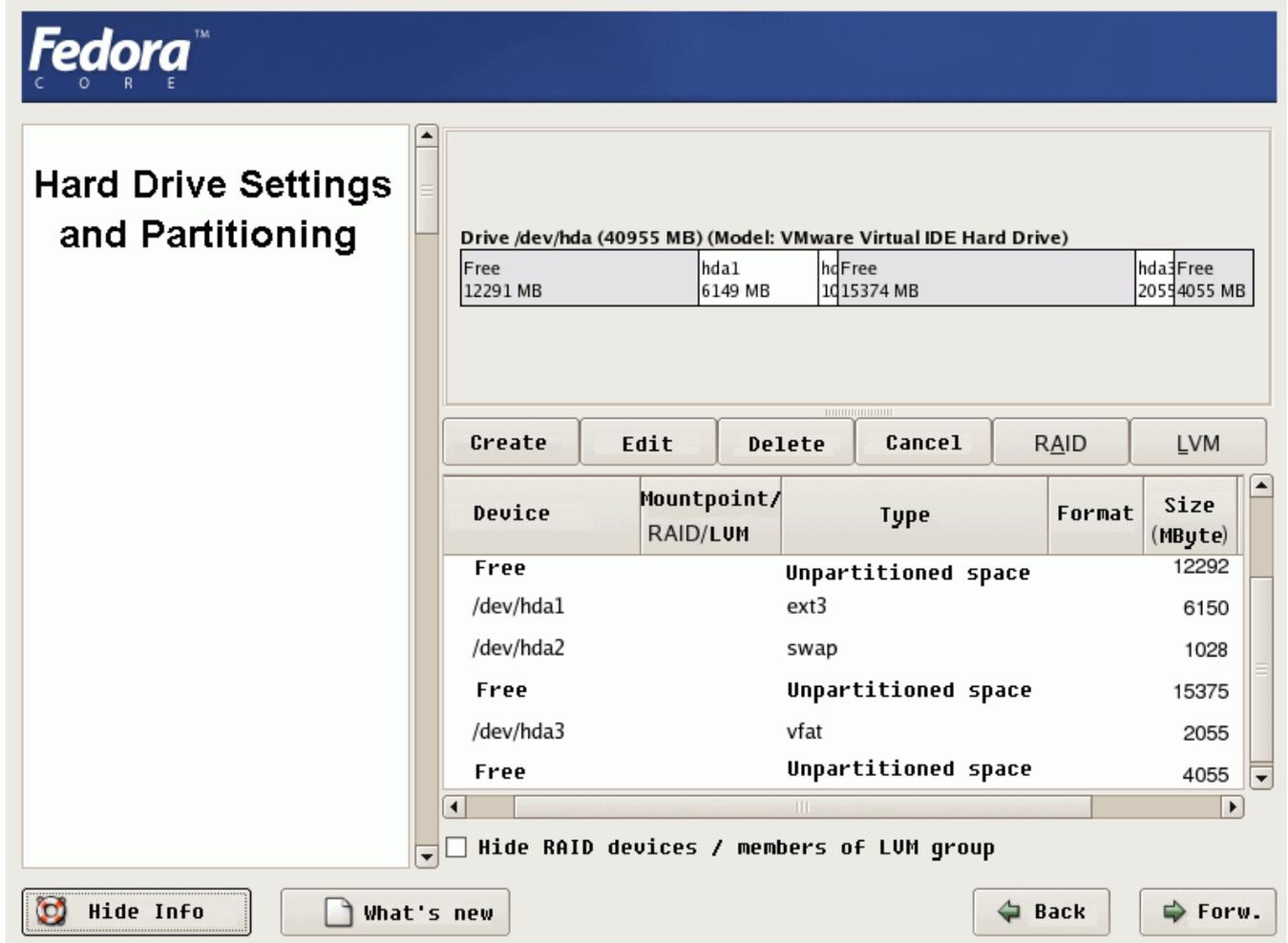
As we could expect the **Windows XP** Setup Program can recognize only the partitions we wanted to disclose, i.e. only the partitions represented in the **MBR** at the moment. Please pay a special attention to the partition sized 15359MB which represents the **EXTENDEDx**. Although this partition has its own entry in the **MBR**, the **Windows XP** Setup Program didn't assign it a driver letter. This is because the driver letters are assigned only to logical disks within the extended partition. Knowing this, we can create one or more logical disks in this "unpartitioned space" just right away using the Setup Program. Another "unpartitioned spaces" cannot be used for partition creating, of course, as we know they are designed for other purposes.

The partition sized 10245MB which was assigned the drive letter "C:" should be formatted first. The Setup Program will suggest this operation to you on its own. Probably in this moment you will be first ever facing the fact that you're going to format the drive "C:" once again! Remember, you have just formatted drive "C:" during installation of **Windows 98**. Never mind, in fact you are going to format quite another area of the hard drive which is labeled as "drive C:" right now. It is good to know that **Windows** assigns the label "drive C:" to the partition which is bootable and labeled as active in the **MBR**. So it only makes sense to talk about "drive C:" as long as the **Windows** operating system is loaded which has assigned the drive letter. Otherwise you can only talk about the physical location of the partition, e.g. in terms of cylinders and also about the file system the partition was purposed for.

### 2.1.9. Installation of Linux Fedora

Before installing **Linux** you should first create the **MBR** which corresponds to the OS descriptor „Linux“. After that you should boot your PC from the installation CD-ROM **Linux Fedora**. At this stage the **Linux** OS can be installed (picture 2.1.17). Please pay attention to the location for the **Linux** bootloader: it should be installed into the same partition as **Linux** and not into **MBR**. The reason for that was described above. As in case of **Windows** it is also a very good idea to check the contents of the „partition wizard“ and to confirm that all necessary partitions were found by the Setup System.

If you have managed to install the **Linux** OS the right way then it won't be necessary to re-install **SyMon**. This is because the **MBR** was not altered. **Linux** itself will be loaded by means of **SyMon** and in the next stage by the **Linux**-own loader **GRUB** or **LILO**.



Picture 2.1.17 Linux Fedora Setup Program

Well done, all operating systems are installed and ready to use. If necessary you can add some more partitions into the OS descriptors. In that case the additional partitions will be mounted automatically by **Windows**, of course, if they contain file systems which **Windows** can recognize. In case of **Linux** you should describe such additional partitions in the file **/etc/fstab** to make **Linux** mount them on boot.

## **2.2. An example of shortening of a Windows partition**

Sorry, this chapter is still being translated.

## **2.3. An example of shortening of a extended partition**

Sorry, this chapter is still being translated.

## **2.4. Transformation of an extended partition**

Sorry, this chapter is still being translated.

## **2.5. An example of isolating of two Windows OSs**

Sorry, this chapter is still being translated.

## **2.6. An example of restoring of a damaged MBR**

Sorry, this chapter is still being translated.

## **3. Afterword**

### **3.1. Backup Manager for SyMon Settings**

Sorry, this chapter is still being translated.