

From an Accessory through Windows to Shutdown under DOS

Chavdar Korsemov, Stefan Koynov, Hristo Toshev

Institute of Information Technologies, Sofia 1113

1. Introduction

This paper is a partial result from the accumulated experience and a research in the field of improving the psychological environment for work on PCs.

It is a good practice for PCs to sort the files in a directory/folder by the date and the hour in cases when the directory/folder is long enough and the number of files is tremendous. Moreover the situation is additionally complicated by any mutually-contradictory requirements (small RAM and intensive processing for example). Still it is not possible to produce chronological references of the files if they are not sorted in advance (the reason for this lies in the cluster principle of the file updates). The usage of popular accessories like PC Tools and the File Managers either leads to intensive charging the disk heads (the Update option of the DOS File Manager for a directory of 381 files for PC XT is processed for 45 minutes) or the accessories themselves are of significant dimensions (PC Tools Deluxe R4.21 is 170 996 B long).

It is possible to produce such references bypassing the popular accessories. The approach for this can be realised in two ways: manual and program. The manual solution is based on the usage of some text editor and a sorting between. The program solution just automatizes the manual solution.

The Internet (the global village) epoch resides on the PC Windows working environment. This leads to the peculiar significance of the ShutDown option which allows not only closing sessions with the successive turning off but also rebooting the environment or changing the environment itself. The extension of this philosophy in a downgrade manner brings to life the ShutDown-under-DOS monitor for older models of PCs which can operate only under DOS or if there is a temporal abstinence from Windows. On the other hand such monitors seem to be the best illustration for application of the program chronological file sorting.

The present paper introduces a program realization of the chronological file sorting references by the xSList accessory ("x" may be equal to "D" or "F" which

comes from Directory/Folder Sorted LIST). xSList is compared with popular accessories like DOS File Manager and PCTools. Also it is viewed in different environments (DOS and Windows). Finally we motivate the usage of xSList in ShutDown-under-DOS monitors.

The conclusions also present the future trends which the authors see in improving the program environment for the compilers in use (this is an object of another paper).

2. xSList: Chronologically Sorted File Reference List Output

It is possible to sort the files by a special accessory and do the pre- and post-processings manually (by hand) using some text editor.

Still the manual solution is a casual decision. It is based on the proper knowledge of the text editor. The program solution is the easy decision aimed at end users (the cost of this decision can be evaluated as for any computer program – size, speed, etc.) The block diagram of the algorithm for both cases is shown in Fig. 1 a.

The xSList (from "x" Sorted LIST, where **x** may be "D" or "F" for Directory/Folder) program manifests the following most important features:

- Chronologically sorted file references (reference lists) based on redirected DIR commands thus avoiding sortings of the file entries on the disks;

- Optional date format (dd-mm-yy and mm-dd-yy);

- Autotuning to the working environment version;

- Optional output device (screen, system printer or ASCII disk text file);

- Independence on the working environment (MS DOS and Windows);

- Small size: 9024 B. It is compatible with the average command length for the older versions of MS DOS (for example the average command length for DOS 3.10 with 52 commands of the disk-resident section is 5 181,31 B) and is quite out of question for the average program length in Windows;

- Program languages. The first version of the program decision was created in Turbo Basic, but the executable program code turned out to be four times greater than the executable code for Turbo Pascal; moreover the realization in Basic always generated three lines of parasitic information after the lists;

- Processing conditions. The MS DOS commands MORE and SORT must be present on the disk;

- Friendliness. It is achieved by the intensive dialog with the user;

- Windows-like dialog screen. The dialog takes place on a white screen with black text information;

- Important subroutines. The **Shell** procedure, file *DosShell.Pas* models the IBM PC Basic SHELL command. The **SwapSubStrings** function swaps two substrings with equal lengths in an object string thus extending the set of string operations in Turbo Pascal. The **NewFile** procedure swaps date fields;

- File lengths. The sizes of *DosShell.Pas*, *xSList.Pas* and *xSList.Exe* are shown in Fig. 1b.

2.1. Basic information about xSList

Program setup

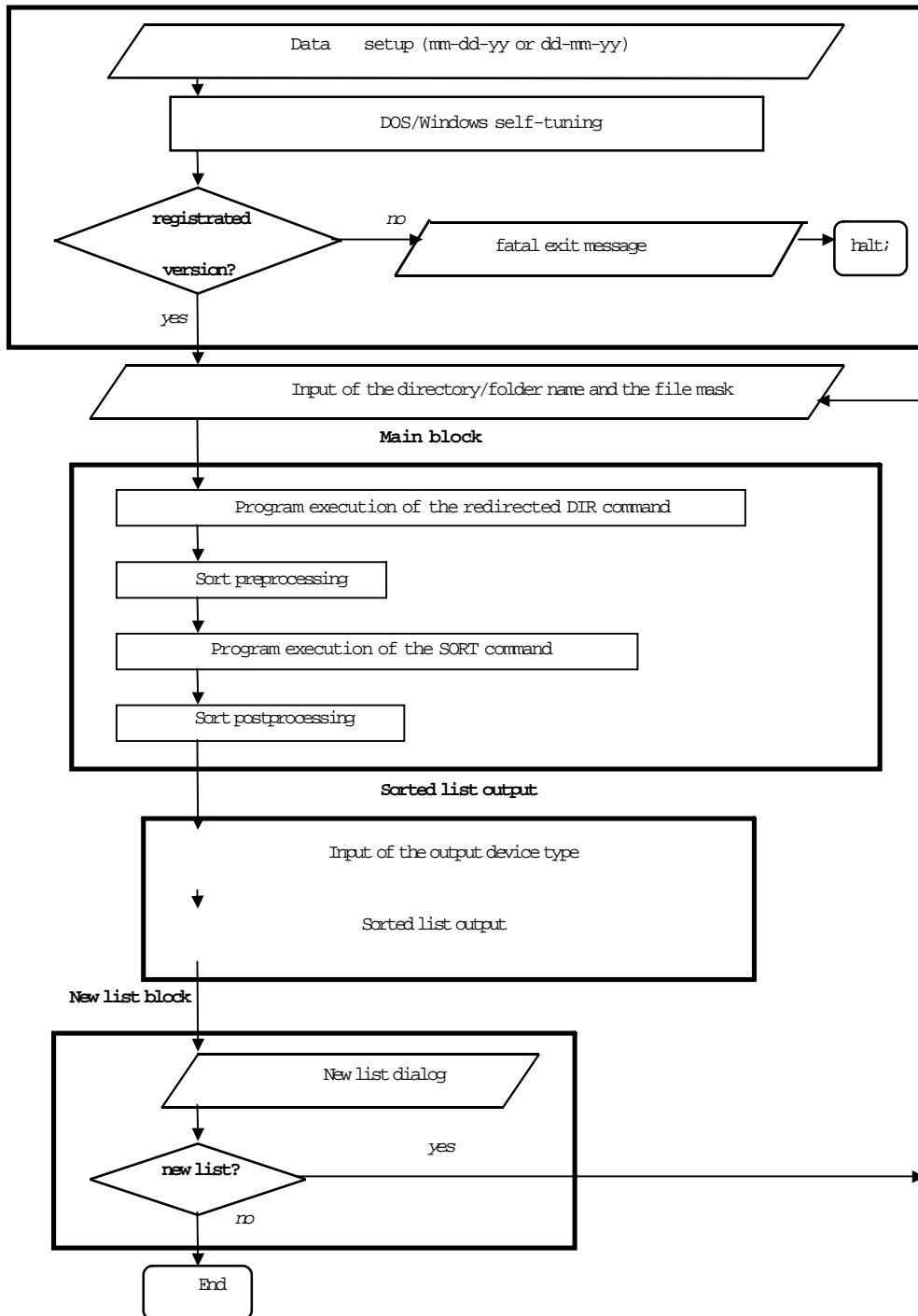


Fig. 1 a. The xSList block diagram

```

DosShell Pas    676  26.02.98 18:00
xSList  Pas    7056  5-06-98 11:52
xSList  Exe    9024  5-06-98 11:52

```

Fig. 1 b. xSList file parameters

THE MAIN ADVANTAGES of xSList:

- Chronologically sorted directory/folder file lists (the purpose);
- Prolonged time of exploitation for the hard disks in use;
- Outputs the necessary information in a way which makes it more convenient and more practical (compared to the File Managers).

xSList is STRONG in its:

- sorting the file lists of directories/folders instead of their entries (the main advantage);
- small size;
- intensive dialog with the user (instead of the DOS command line with keys) - factor "friendliness";
- self-tuning to the DOS/Windows version;
- optional output device (screen, system printer, ASCII disk text files);
- optional date format (mm-dd-yy and dd-mm-yy);
- Windows-like screen.

xSList is WEAK in its:

- only sorting mode (chronological - by date and time);
- dependence on the DOS/Windows version;
- keyed DOS command line unavailable by now.

Fig. 1 c. Advantages and disadvantages of xSList

Note: The following indexes refer to the block diagram in Fig. 2a.

¹⁾ Analogous to the Help-menus in Windows.

²⁾ In ShutDown-under-DOS the utilities are the analog to the Desktop-screen visualized application programs and program groups in Windows.

³⁾ Earlier disabling of Ctrl-Break lowers the flexibility of the program.

ShutDown-under-DOS may be compared with Windows and NC.EXE in the following items:

- analogous to the Desktop-screen in Windows;
- identical with the "Restart in MS-DOS mode" option of the "Shut Down Windows" menu in Windows;
- specialized version of NC.EXE only for executable (*.EXE) programs.

2.2. Basic information about ShutDown under DOS

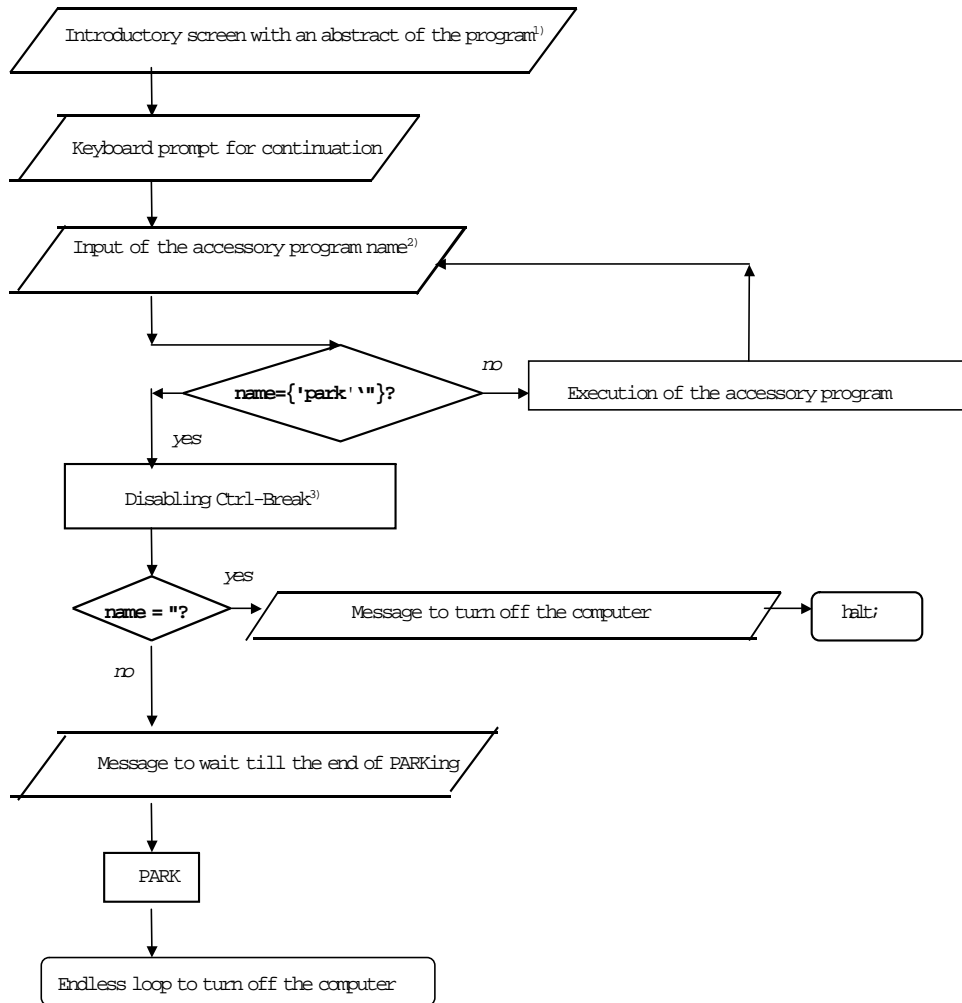


Fig. 2 a. The block diagram and basic features of ShutDown-under-DOS

xSList – chronologically sorted directory/folder file lists on optional output devices

PCTools – a multifunctional utility

F – DOS File Manager

Park – an utility for parking the hard disk heads

Fig. 2 b. The typical list of utilities to be run by ShutDown-under-DOS monitors

| | | | | |
|----------|-----|------|----------|-------|
| DosShell | Pas | 676 | 26.02.98 | 18:00 |
| ShutDown | Pas | 2758 | 17.04.98 | 17:10 |
| ShutDown | Exe | 7072 | 17.04.98 | 17:10 |

Fig. 2 c. ShutDown-under-DOS file parameters

3. xSList in Windows

According to [2] the PC accessories may be divided in three large groups: accessories, application programs and program kits.

The 24 best accessories for IBM PC in Windows may be classified according to the same source as it follows:

- antivirus (Dr Solomon's Home Guard; Windows 95 Norton Antivirus);
- archivists (SeaGate Backup Exec2; Stuffit Expander; WinZip 6.2);
- documentation (Acrobat Reader; Adobe Type Manager Deluxe; Common Ground Reader; Gamma Unitype);
- hardware (Adaptec EZ-SCSI 4; Displaymate; Laplink; Partition Magic 3.0; QEMM 8.0; Real Player Plus; Windows 95 Norton Utilities);
- Internet service (Headliner; net.jet; Shockwave);
- software (Codewright 5.0; Post-it Software Notes);
- specialized (First Aid 97; Norton Your Eyes Only; WISE Installer 5.0).

According to this classification the xSList accessory belongs to the class of the specialized accessories.

Accessories which operate equally well in DOS and in Windows seem to be rather exceptions than a rule. The xSList program is such an exception. It functions in Windows just in the same way as it does under DOS.

The mode of usage of xSList in Windows depends on the organization of the Desktop screen (a concrete decision admits an approach with the NCx program).

4. xSList under DOS: ShutDown under DOS

4.1. PC Working Environments

At present there are three PC working environments (the citation follows the decrease of the environmental complexity):

1. Internet;
2. Windows;
3. DOS.

Next we make a brief evaluation of every PC environment:

Internet: The typical case is with end users which do less or no programming but are mainly concerned with the Web sites. In Bulgaria this trend is additionally strengthened by the archaic technical basis for the communication lines (the prevailing number of the phone relays date since 1929 and the digitalization lags behind).

Windows: This is the modern PC environment with an active history for the last years. Moreover it is the basis for work with Internet. The corresponding hardware for Bulgaria requires IBM PC-AT with microprocessors at least Intel 486. Still this fact does not – and cannot! – eliminate the existing hardware up to the Intel 486 IBM PCs including even some number of IBM PC-XT models with microprocessors Intel 086 and 088.

IBM PC DOS: DOS and Windows have some common features which are realized in different ways in both environments. These features for these two environments seem to be more significant for the users than the common features for Internet and Windows. Table 1 illustrates the differences between DOS and Windows.

As a whole in Bulgaria it is possible to change the working environment not only between Windows and Internet, but also between DOS and Windows, even with the cost of a temporal abstinence from Windows (for IBM PC-XT models).

Table 1. Comparison between DOS and Windows

| Feature | D O S | Windows |
|---------------------------|------------------------------------|--|
| Mouse | Option | Basic periphery |
| Screen organization | DOS command lines | Desktop-screen, icons, menus, options, buttons |
| Origin of the environment | MS-DOS: the answer to AppleII+ DOS | MS-Windows: the answer to Mac- Windows |
| Task-subtask coupling | COMMAND/C and program analogs | X-philosophy (X-client, X-protocol, X-server) |
| Session termination | Disk heads PARKed | Different up to version 95 and after it |

4.2. Ending Computer Sessions and ShutDown-under-DOS: Basic Concepts

In minicomputers, working stations and multiuser PCs closing the computer session is a necessity to turn off the mains or to prepare the system reboot.

For example according to [1] ending a minicomputer session includes the successive execution of the following steps:

1. Warning all active terminals;
2. Aborting all unprivileged tasks;
3. Dismounting all programly mounted devices;
4. Stopping the system.

For multiuser PCs the session termination admits different things: turning off the mains, restarting Windows, exit to DOS (with the obligatory returning to Windows) and logging in as a new user (for Windows 95). There are two main differences depending on the Windows version with respect to the 95th version:

Windows versions up to 95: Windows is EXITed to DOS from the File menu (then it is possible to PARK the disk heads).

Windows versions after 95: DOS becomes rather transparent in a way similar to the Macintosh computers; AT THE VERY END there is no exit to DOS. These versions are designed for self-parkable disk heads.

There are possible variances according to the PC model and the producer (for example Powerbook option for Macintosh allows a partial turning off the supply, [4]).

For older PCs like IBM PC-XT which operate under DOS it is natural to think for analogical ShutDown-under-DOS monitors. In addition to parking for the older disk models other accessories run by such monitors may be xSLlist and/or PCTools (as mutually complemented), the DOS File Manager as a miniversion of PCTools, etc. For such PCs these monitors can be thought of as the "approach of the good master".

The accumulated experience makes the authors think that the good style of work with PCs under DOS requires the following steps to be executed before closing the computer sessions:

- 1) lists of chronologically sorted and/or chronologically sorting principally important directories;
- 2) inspection of the most important directories;
- 3) parking the heads of the older disk models.

The mentioned above programs (xSLlist, PCTools, DOS File Manager, Park) satisfy these requirements. There are some restrictions for the usage of PCTools for DOS 6.x versions. If the disk partition is system marked, then it is not possible to

visualize the partition directory contents (the message "No entries found" is displayed instead). In such cases the user may use the DIR command of DOS, xSList and the DOS File Manager. This means that the list above depends on the DOS version which is shown in Table 2. The table shows that the frequency of application of those four programs increases in the following succession: PCTools, Park, xSList and the DOS File Manager. Now we are convinced that xSList is necessary as much as the DOS File Manager and not only for DOS 6.x. The authors give the shortest definition of xSList as an accessory which is similar to the DOS File Manager which processes the redirected DIR list elements instead of sorting the directory entries on the disk. This is depicted in Fig. 2 b.

Table 2. ShutDown-under-DOS accessories and the DOS version

| No | DOS 3.x | DOS 6.x |
|----|-----------------------------|----------------------------|
| 1 | PCTools and/or xSList D O S | File Manager and/or xSList |
| 2 | DOS File Manager | DOS File Manager |
| 3 | Park | [Park] |

4.3. ShutDown-under-DOS Realizations in Turbo Pascal

The program which terminates the computer session under DOS must operate in a way which is inverse to the AutoExec.Bat file. This program consists of a ShutDown-under-DOS monitor which executes the accessory selected by the user. After the execution of the selected accessory the user has the option to proceed with the execution of another accessory or to turn off the mains. In the last case the computer must end the session in such way that the PC will be ready for new sessions. At this moment the well-known ending options (e.g. Macintosh [3, 4] and Windows 95) output on the screen the only message that now it is possible to turn off the computer.

Fig. 2 contains the block diagram of the algorithm for ShutDown-under-DOS for IBM PC, the list of the most often used accessories with it and some data about those files. The available accessory kits may be executed by the very end of the session or up to the execution of the PARKing program. Just like in Windows at the end of the session the screen outputs the only message that it is possible to turn off the mains (when PARKing the disk heads this message is preceded by another screen that the user must wait till the end of PARK).

The first version of the ShutDown-under-DOS monitor was written in the language of the .BAT-files. This version suffered from two main disadvantages: disabling Ctrl-Break was impossible; second, the .BAT-version admitted only predetermined lists of the available accessories. At present this monitor is written in Turbo Pascal. The text is displayed on a white background with black symbols (Windows-like screen output). At the end of Fig. 2 a there is a brief list of the comparison between ShutDown-under-DOS and ShutDown in Windows.

Important subroutines. The program execution of DOS commands is possible with the Shell procedure which models the SHELL operator in Basic.

The displayed text on the screen is CENTERed by an appropriate procedure. The extension of this procedure traces a direction to improve the programming environment in a way which uses macrohandlers; this is an object of other papers.

5. Conclusions and Trends for Future Research

The paper offers a way to improve the psychological comfort in sessions with PCs.

It is a common case when the disk is filled but the files are periodically updated. The paper shows that it is possible to sort the directory/folder files by the date and the time without sorting their entries on the disk. This can be done in two ways: manually and by programs. The manual decision requires the usage of some text editor and the DOS command SORT. The program decision the authors see in the xSList accessory which is self-tunable to the present DOS/Windows version and which accepts the two popular date formats: mm-dd-yy and dd-mm-yy. In addition this accessory possesses a list of other advantages which are viewed in a separate chapter.

Also the paper introduces the idea of ShutDown-under-DOS monitors which the authors see as a counterpart of the Windows ShutDown option. This idea is argued by descriptions of the three main PC environments (Internet, Windows and DOS) and the functions of options which end the computer sessions (for minicomputers, working stations and multiuser PCs). A realization of ShutDown-under-DOS monitors is presented which traces a direction to improve the psychological comfort with programming.

References

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От спомагателной программы через WINDOWS к ShutDown в DOS

Чавдар Корсемов, Стефан Койнов, Христо Тошев

Институт информационных технологий, 1113 София

(Р е з ю м е)

Работа представляет спомагателную программу xSList, ее использование под управлением Windows и DOS, также как и ее включение в ShutDown-процедуре как подчиненная программа. Представлены ее наиболее существенные характеристики. Показано, что она приобретает качества команды в DOS. При помощи связи между программой xSList и заключительной ShutDown-процедурой обсуждается вопрос создания DOS аналог известных ShutDown-решений при многопотребительских системах, включая миникомпьютеры, рабочие станции, многопотребительские персональные компьютеры и др. Показаны возможности дальнейшей исследовательской деятельности, которые рационализируют труд программиста, вводя подходящие макрогенераторы.