MDGx MAX SPEED

MDGx Comprehensive Windows Registry Guide



MDGx
http://www.mdgx.com/

MDGx MAX SPEED

Comprehensive Windows Registry Guide
+
200+ Ways To Hack Your Windows 9x/NTx Registry

I will post here **ALL New Registry Hacks** [in chronological order] every time I'll also add them to **WIN10.TXT**, **WINDOWS8.TXT**, **WINDOWS7.TXT**, **REGISTRY.TXT, TIPSXP.TXT, TIPSME.TXT, TIPS2000.TXT, TIPS98.TXT, TIPSNT4.TXT, OSR2TIPS.TXT +/- other text files**, all part of my **Updated** **Windows 9x/NTx + DOS 7.xx/8.00 ©Tricks + Secrets Files [W95-11D.EXE]**, FREEware:

- **Windows 9x/NTx + DOS 7.xx/8.00: W95-11D.EXE/W95-11D.ZIP**
- **Windows/WfWG 3.1x + DOS 6.xx: W31-11D.ZIP**

FYI:

- **Windows NTx (based on Windows NT) = Windows NT4/2000/XP/2003/Vista/2008/7/8/8.1/2012/10/2016/2019/11/2022/newer.**
- **Windows 9x (based on Windows 95) = Windows 95/95 OSR1/95 OSR2.x/98/98 SP1/98 SE(U)/ME.**

A MUST [99.99% Free(ware)] [separate pages]:

- **Windows 9x/NTx System + Registry Tweakers**
- **Windows 9x/NTx System + Registry Fixers**

Comprehensive Windows Registry Guide: HTML ● TXT ● PDF ● Cover [JPEG]
PDF Cover → cropped from MDGx ©Photos [own work]

Contents:

- **Comprehensive Windows Registry Guide:**
  - **The Registry**
  - **Registry Structure**
  - **REG Files**
  - **Registry Inconsistencies, Curiosities + Oddities**
  - **Registry Editing Rules**
  - **BACKUP/EXPORT + RESTORE/IMPORT REGISTRY/REGISTRY KEY(S) [Windows NTx] [separate page]**
  - **REGISTRY BACKUP + RESTORE [Windows 9x] [separate page]**
  - **RESTORE DAMAGED REGISTRY [Win95/98] [separate page]**
  - **Registry Credits + Links**
- **200+ Registry Hacks List**

1. Comprehensive Windows Registry Guide

The Registry

PolEdit | CfgBack | ERU + ERD | ScanReg + ScanRegW | gpedit.msc | REG

DEFINITION:
The Windows 9x/NTx Registry (also called Registration Database) is a complex, unified, system wide, continually referenced during operation database, repository and backup, used for centrally (locally and/or remotely) storing, locating (identifying), modifying (changing, editing) and administering (controlling and managing) system, hardware (low level), software (applications, programs, services,

tasks) and user (high level) configuration, information, settings, preferences (options), organized in a hierarchical structure.
One of its roles is to replace the text/ASCII based MS-DOS configuration (.BAT, .SYS) and Windows configuration and initialization (.CFG, .INI) files, used by the old MS-DOS 3/4/5/6.xx, Windows 3.xx and Windows for WorkGroups 3.1x (REG.DAT) releases.
Most data from the MS-DOS startup configuration files: AUTOEXEC.BAT and CONFIG.SYS, and from the Windows system initialization files: CONTROL.INI, SYSTEM.INI, WIN.INI, PROTOCOL.INI, NETWORK.INI etc, is now contained into the Registry, together with most of the other system settings. Most Win32 [32-bit (x86)] and Win64 [64-bit (x64)] specific applications store their initialization and configuration data into the Registry instead of into .INI, .CFG etc files. The MS-DOS and .INI files are kept only for backward compatibility with older MS-DOS and Win16 (16-bit) based programs.
The Registry is stored in binary data format (**.DAT**), and the information it contains can be accessed (read from/written to) at any time during operation by any Registry aware Windows programs, as needed.

More info:

- MS Docs: Windows Registry.
- MS Docs: Structure of the Registry.
- MS Docs: Registry Hives.
- MS Docs: Registry Value Types.
- MS Docs: Description of Windows Registry.
- MS Docs: View System Registry with Windows 64-bit (x64).
- MS Docs: Windows Server 2003 Resource Kit Registry Reference.
- MS Docs: Glossary of Registry Terms.
- MS DOCs: Windows Registry Information for Advanced Users.
- MSDN: Structure of the Registry.
- MS TechNet: Windows Server 2003 Registry.
- MS TechNet: About Windows Server 2003 Registry.
- MS TechNet: Inside Windows NT4 + 2000 Registry.
- MS TechNet: Administering Windows NT Registry.
- MSKB: Description of Registry Files in Windows ME.
- MSKB: Description of Registry Files in Windows 95/98.
- MS TechNet: Windows 98 Registry Revealed.
- MS TechNet: Windows 98 Registry.
- MS TechNet: Windows 98 Registry (TechRepublic).
- MS TechNet: Windows 95 Registry Overview.
- MS TechNet: Working with the Registry.
- UConn Knowledge Base (KB): Understanding the Registry on Windows.
- Windows XP Registry.
- j79zlr's Registry Tutorial.
- Windows Registry Tutorial.
- Learn How to Use the Windows Registry Editor (Regedit).
- The Internal Structure of Windows Registry (2009) [PDF format].
  The Internal Structure of Windows Registry project (2009).
- The Windows NT Registry File Format (2009) [PDF format].
- Windows Registry Forensics (2011) [PDF format].
- Windows Registry File Format Specification (2018).
- RegRipper.
- Windows Registry Forensics [RegForensicTool].
- Wikipedia: Windows Registry.

• **The Windows 95/98/ME Registration Database** is contained in these 5 files, with the Hidden, Read-only attributes for write-protection purposes, usually located in the %WinDir% folder (default is C:\Windows) in stand-alone single-user environments:

- **SYSTEM.DAT** = stores persistent hardware and software settings related to the system it resides on, contained in the **HKEY_CLASSES_ROOT** (Windows 95 and 98 only) and **HKEY_LOCAL_MACHINE** Hive keys.
- **USER.DAT** = stores user specific and software settings contained in the **HKEY_CURRENT_USER** Hive key. If more than one user, then multiple user profiles enable each user to have their own separate USER.DAT file, located in %WinDir%\Profiles\%UserName%. When a user logs on, Windows OS (down)loads both USER.DAT files: the one from the local machine %WinDir% (global user settings), and the most recent one from the local machine %WinDir%\Profiles\%UserName%, or from the central (host) server if user profiles reside on a network (local user settings).
- **CLASSES.DAT** = stores persistent data contained in the **HKEY_CLASSES_ROOT** Hive key, found only on Windows ME.
- **SYSTEM.DA0 + USER.DA0** = automatically created backups of SYSTEM.DAT + USER.DAT from the last successful Windows GUI startup, and found only on Windows 95 retail, 95a OSR1, 95B OSR 2.0, 95B OSR 2.1 and 95C OSR 2.5.

PolEdit:

This other file is specific only to Windows 95/98/ME and resides usually on the central (host) server in multi-user environments/networks or in %WinDir% on stand-alone multi-user machines:

- **POLICY.POL** = optional, provides additional info specific to the network, and can override certain settings in the Registry, allowing network administrators to control/restrict users access level to network/local computers. Policy files (**.POL**) can be created/edited using the Policy Editor tool (**PolEdit.exe**), found in %WinDir% only on Windows 95, 95a OSR1, 95B/95C OSR 2.x and 98/98 SP1/98 SE(U) systems, if installed as an optional component from the Windows Setup CD-ROM: open Windows Explorer → right-click on \Tools\Reskit\Netadmin\Poledit**PolEdit.inf** → select Install.
  PolEdit requires Administrative privileges.
  Microsoft removed the Policy Editor from Windows ME. **:-(**
  Get PolEdit.
  MS TechNet: System Policy Editor Tutorial.
  MS TechNet: Protecting Users from Themselves.
  Alan: Using Policy Editor to Secure Windows 95/98/ME.
  Network Computing: Profiles, System Policies and the Registry.
  O'Reilly: Windows System Policy Editor Top 10 Tips.

CfgBack:

In Windows 95 retail, 95a OSR1, 95B OSR 2.0, 95B OSR 2.1 and 95C OSR 2.5
the **HKEY_LOCAL_MACHINE** + **HKEY_USERS** Registry Hive keys can be backed up manually by using the Configuration Backup tool (**CfgBack.exe**) found on the Windows Setup CD-ROM in the \Other\Misc\Cfgback subfolder, and also part of Microsoft Windows 95 CD-ROM Extras:
Get CFGBACK.EXE [46 KB, free, unsupported].
Both CFGBACK.EXE + CFGBACK.HLP should reside into the same directory/folder of your choice.
On computers with more than one user only **HKEY_LOCAL_MACHINE** (SYSTEM.DAT) is backed up.
CfgBack can create up to 9 different compressed Registry SYSTEM.DAT + USER.DAT backup copies with the .RBK extension. Registry BacKup files (**.RBK**) can be stored on any available hard, floppy, optical, USB or removable backup drive, and are used exclusively by CfgBack to restore an older set of working Registry Hive keys back into SYSTEM.DAT (+ USER.DAT = if only 1 user).
CfgBack can be scheduled through System Agent/Task Scheduler (MS Plus! 95 or Win98/98 SE/ME only) to perform periodical backups of the Registry.

WARNING:

CfgBack does NOT work correctly according to Microsoft!
Confirmed CfgBack **BUGs** @ MSKB:

- Configuration Backup Tool Does Not Restore All Settings.
- Configuration Backup Gives Confusing Warning on Restore.

See "**REGISTRY BACKUP + RESTORE**" to learn how to backup/restore your entire Registry safely.

ERU + ERD:

In Windows 95 retail, 95a OSR1, 95B OSR 2.0, 95B OSR 2.1 and 95C OSR 2.5 the SYSTEM.DAT + USER.DAT Registry files can be backed up manually by using the Emergency Recovery Utility (**ERU.exe**) found on the Windows Setup CD-ROM in the \Other\Misc\ERU subfolder, and also part of Microsoft Windows 95 CD-ROM Extras:
Get ERU.EXE + ERD.EXE [65 KB, free, unsupported].
All these files MUST reside into the same directory/folder of your choice for ERU to work properly: ERU.EXE, ERD.E_E (ERD.EXE renamed) + ERU.INF.
By default ERU creates backups of these boot, system, configuration + registry files (if present at default locations): AUTOEXEC.BAT, COMMAND.COM, SYSTEM.DAT, USER.DAT, EXPLORER.EXE, PROTOCOL.INI, SYSTEM.INI, WIN.INI, CONFIG.SYS, IO.SYS + MSDOS.SYS, and can be stored on any available hard, floppy, optical, USB or removable backup drive.
ERU backs up only %WinDir%\USER.DAT (if only one user), but does NOT backup %WinDir%\Profiles\User_Name\USER.DAT (if more than 1 user).
Copy & paste the text between cut & paste lines below into Notepad, and save it as ERD95.BAT (example) in C:\ERUBKP (example), which should also contain all other necessary files: ERU.EXE, ERD.E_E + ERU.INF:

```
-----Begin cut & paste here-----
@ECHO OFF
IF "%OS%"=="Windows_NT" GOTO END
MEM /C | FIND /I "vmm32">NUL
IF NOT ERRORLEVEL 1 GOTO END
C:
CD\ERUBKP
IF NOT EXIST ERD.* GOTO END
IF EXIST ERD.EXE GOTO RUN
IF EXIST ERD.E_E REN ERD.E_E ERD.EXE
:RUN
ERD.EXE
:END
EXIT
------End cut & paste here------
```

To restore files backed up by ERU you need to reboot to native/real/true/pure MS-DOS mode: hold F8 at the bootup BIOS POST (Power On Self Test) screen to bring up the Startup Menu ➜ select the "Command prompt only" option ➜ press Enter.
At the C:_ prompt ➜ switch to the drive/partition letter and directory/folder where ERD95.BAT is located (example using C:\ERUBKP) ➜ run ERD95.BAT.
Available backups can be selected/deselected by pressing the Space key.
Confirmed ERU **BUG** @ MSKB:
Emergency Recovery Utility Does Not Back Up Files.

ScanReg + ScanRegW:

In Windows 98, 98 SE(U) and ME working Registry files (.DAT) are backed up automatically upon loading Windows by the Scan Registry tool (%WinDir%**ScanRegw.exe**) into compressed Cabinet files (**.CAB** = Microsoft proprietary compression technology based on LZX compression algorithm) found in the %WinDir%\Sysbckup subfolder (default), and holding 5 (default), up to a maximum of 99 different backup copies, a new one being created upon the first successful GUI boot of each new day (the oldest is replaced with the newest). They are named from: **RB000.CAB, RB001.CAB, ... up to RB099.CAB**. Check their date/time stamp to determine the newest backup set.
Windows 98/ME automatic Registry backup is enabled by this command:

C:\Windows\ScanRegw.exe /autorun

found as a String Value called "**ScanRegistry**" under this Registry key:

HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Run

See "**SCANREGW, SCANREG + SCANREG.INI**" for more details.

- In addition, **SYSTEM.1ST** (Windows 95, 98 and ME) + **CLASSES.1ST** (Windows ME only) are found in the %HostWinBootDrv% folder (boot drive/partition root directory, usually C:\ on uncompressed

drives/partitions), as a backup of the first Win95/98/ME SYSTEM.DAT and WinME CLASSES.DAT respectively, created at the end of a successful Setup. These are also Hidden, Read-only files.

• **The Windows NTx Registration Database** is contained (with some OS specific variations) in these 6 files located in the **%SystemRoot%\System32\Config** folder (default is C:\Winnt\System32\Config for Windows NT or C:\Windows\System32\Config for Windows 2000/XP/2003/Vista/2008/7/8/8.1/2012/10/2016/2019/11/2022):

- **DEFAULT** = stores the **HKEY_USERS\.Default** key.
- **SAM** = stores the **HKEY_LOCAL_MACHINE\Sam** key.
- **SECURITY** = stores the **HKEY_LOCAL_MACHINE\Security** key.
- **SOFTWARE** = stores the **HKEY_LOCAL_MACHINE\Software** key.
- **SYSTEM** = stores the **HKEY_LOCAL_MACHINE\System** key and the **HKEY_CURRENT_CONFIG** Hive key.
- **USERDIFF** = stores the **HKEY_CURRENT_USER** Hive key with a correspondent subkey for every registered user,

these 2 files located in the **%SystemRoot%\Profiles\%UserName%** and/or **%SystemRoot%\Documents** and **Settings\%UserName%** folder(s):

- **NTUSER.DAT** (Windows NT/2000/XP/2003/newer) + **USRCLASS.DAT** (Windows XP/2003/newer only) = store the **HKEY_CURRENT_USER** Hive key,

and their automatically created backups from the last known good booting process (successful startup):

- **SYSTEM.ALT** = backup of SYSTEM file above.
- **DEFAULT.SAV, SOFTWARE.SAV + SYSTEM.SAV** = backups of first Hive keys created at the end of a successful (text mode) Setup.

gpedit.msc:

This other file is specific only to Windows NTx and resides usually on the central (host) server in multi-user environments/networks, in **%SystemRoot%\Inf** on stand-alone multi-user (client) machines/terminals or in **%SystemRoot%\System32** on stand-alone end-user (personal) computers:

FYI:
Microsoft removed Group Policy Editor (GPE) [respectively GPEdit.DLL + gpedit.msc] from all Home and Starter Editions of Windows XP/Vista/7/8/8.1/10/11! :-(
Restore GPE on all Windows NTx [2000/XP/2003/Vista/2008/7/8/8.1/2012/10/2016/2019/11/2022] Editions.

- **SYSTEM.ADM** = optional, provides additional info specific to the system, and can override certain settings in the Registry, allowing network administrators to control/restrict users access level to network/local computers. Administration Template files [**.ADM**, **.adml** + **.admx**] are in plain text/ASCII or Unicode/ASCII format, and can be created/edited using the plain text/ASCII Group Policy Editor (**GPEDIT.MSC**) computer management module [**GPEDIT.DLL** Microsoft Management Console (MMC) snap-in], found in **%SystemRoot%\System32** only on NTx OSes: Windows NT 4.0, 2000, XP Professional, 2003, Vista, 2008, 7, 8, 8.1, 2012, 10, 2016, 2019, 11, 2022 + newer.
  Microsoft disabled Group Policy Editor in all Home and Starter Editions of Windows XP/Vista/7/8/8.1/10/11! **:-(** GPEDIT requires Administrative privileges.
  Other Administrative Template policy files [**.ADM**, **.adml** and/or **.admx**] can be found in **%SystemRoot%\System32\GroupPolicy\Adm** , **%SystemRoot%\PolicyDefinitions** and **%SystemRoot%\Inf** (some are installed by other applications like Microsoft Office, Microsoft Server/Active Directory/IIS software):
  - **AER_?.ADM** (Application Error Reporting Settings; **?** = 4 digit numeric ISO language code)
  - **COMMON.ADM** (Windows 9x/NTx Common Settings)
  - **CONF.ADM** (NetMeeting Conference Settings)
  - **DW20.ADM** (Error Reporting Settings) ➜ obsolete, replaced by **AER_?.ADM** (see above)

- **INETCORP.ADM** (Internet Configuration Settings, RAS, PPP, Dial-up)
- **INETRES.ADM** (Internet Explorer Restrictions) ➜ see "**SYSTEM RESTRICTIONS**"
- **INETSET.ADM** (Internet Explorer Settings)
- **SYSTEM.ADM** (Operating System Settings)
- **WINDOWS.ADM** (Windows 9x networked with Windows NTx Settings)
- **WMPLAYER.ADM** (Windows Media Player Settings)
- **WUAU.ADM** (Windows Update/Automatic Updates Settings)
- Over 100 ***.adml** + ***.admx** files in %WinDir%\PolicyDefinitions (Windows Vista, 7, 2008, 8, 8.1, 2012, 10, 2016, 2019, 11, 2022 + newer settings).

MS TechNet: Group Policy Extension Snap-ins.
Understanding Administrative Templates in GPO.
Write custom .ADM + .ADMX administrative template files in IE7/newer.
Most ADM templates can be downloaded from Microsoft (English, free, **right-click to save!**):

- IE 9.0 Administrative Template ADM script: **INETRES.ADM** [2.7 MB].
- Windows 2000/XP/2003 + MS IE 5/6/7/8 Group Policy ADM scripts: **CONF.ADM**, **INETRES.ADM**, **SYSTEM.ADM**, **WMPLAYER.ADM** + **WUAU.ADM**.
- MSN Search Toolbar ADM script (obsolete) [35 KB].

More info:

- MS TechNet: Group Policy.
- MS TechNet: Windows Server Group Policy.
- Microsoft Windows 2000/XP/2003/Vista/2008/7/8/8.1/2012/10/2016/2019/11/2022 Group Policy Settings [English, Excel XLS format, **right-click to save!**].
- MS TechNet: Managing Windows XP SP2 Features Using Group Policy.
- MSKB: Recommendations for managing Group Policy Administrative Template (.ADM) files.
- MSKB: Writing Custom ADM Files for System Policy Editor.
- Microsoft: Windows 2000/XP/2003 Group Policy tools: **GPMC** + **GPO** (free).
- Windows XP Group Policy registry entries.
- Terry Burke: Group Policy Reference.
- Elder Geek: Group Policy Editor.
- Vic Laurie: Group Policy Editor (gpedit.msc) in Windows XP Professional.
- Group Policy Administrative Templates Catalog.
- Chromium/Chrome Group Policy Templates (**ADML** + **ADM**):
  Latest Templates.
  Chromium/Chrome Group Policy Administrative Templates Catalog.
  Install + Tweak Chromium/Chrome Group Policies.

  • **Import + tweak ADM(L) policies:**
  Start ➜Run... ➜GPEdit.msc ➜Local Computer Policy ➜Computer Configuration ➜Administrative Templates ➜right-click ➜Add/Remove Templates ➜browse to chrome.adm(x) (example): %WinDir%\PolicyDefinitions\chrome.adm(x)
  ➜Close button ➜Administrative Templates folder ➜Google folder ➜Chrome folder ➜double-click ➜tweak desired policies.

- Wikipedia: Administrative Template.
- Wikipedia: Group Policy.

REG:

In Windows XP, 2003, Vista, 2008, 7, 8, 8.1, 2012, 10, 2016, 2019, 11, 2022 + newer the Registry Hive keys can be backed up or restored manually by using the command line Registry Console tool (**REG.EXE**) located in the %WinDir%\SYSTEM32 directory/folder [%WinDir% = usually C:\WINDOWS].
See "**BACKUP/EXPORT + RESTORE/IMPORT REGISTRY/REGISTRY KEY(S)**" chapter, also in **WINDOWS7.TXT** [part of W95-11D.EXE].
REG.EXE is also part of Microsoft Windows NT4/2000/XP/2003 Resource Kits (RK).
Windows XP SP3 version of **REG.EXE** [5.1.2600.5512] 32-bit works also [as far as I'm aware] with all newer

Windows NTx OSes 32-bit (x86) + 64-bit (x64).
Scroll down to the "**Download reg.exe Files**" section at the bottom ➜ click the right hand side "**Windows XP**" link ➜ click the "**Download**" button which drops down below. Depending on your web browser you may need to confirm you wish to keep **reg.exe** [EXEcutable file]. Example using Chromium/Chrome web browser: click the "**Keep**" button ➜ click the "**Keep anyway**" button.
This is the •last• REG.EXE version able to use the **/nt4** parameter used to export/save + import/load the registry or registry sections/keys in the older **REGEDIT4** (RegEdit v4.0) ANSI format as plain text/ASCII files [.reg].
In this example REG.EXE is located in the **C:\Tools** directory/folder:
ECHO Y|C:\Tools\REG.EXE EXPORT "HKLM\SYSTEM\CurrentControlSet\services" "C:\Tools\Current_Services.reg" /nt4
CAUTION:
This older version of REG.EXE may or may •NOT• support certain current/newer/updated functions, for example: latest UNICODE implementation, more complex/longer registry keys/values/data.
Windows NT 4.0 users can install REG.EXE from Windows NT 4.0 Server Resource Kit (RK).
Windows 2000 users can install REG.EXE by running **\SUPPORT\TOOLS\SETUP.EXE** from the Windows 2000 Setup CD-ROM.
Microsoft Windows 2000 Professional Resource Kit (RK) CD-ROM:
Windows 2000 RK ISO [286 MB, **right-click to save!**].
More info.
REG Command in Windows XP.
REG.EXE.
Reading NT's Registry with REG.EXE.
Reading NT's Registry with REG QUERY.

Elder Geek: Backing Up and Restoring Windows XP Registry.
Windows Registry Backup, Restore + Tweaking tools [free(ware)]: see "**Free Windows 9x/NTx System + Registry Fixers**", also in SOFTWARE.TXT [part of W95-11D.EXE].

MSKB, MS Help + MS DOCs ➜ How to Backup, Edit + Restore the Registry in:

- Windows 7/newer.
- Windows 2003.
- Windows XP.

MDGx ➜ see "**BACKUP/EXPORT + RESTORE/IMPORT REGISTRY/REGISTRY KEY(S)**" chapter, also in WINDOWS7.TXT [part of W95-11D.EXE] ➜ applies to all Windows NTx OSes [2000/newer].

Back 2 Contents

Registry Structure

The Registry consists of 2 basic components (elements):

1. **(Sub)Key**: storage container (folder, directory, tree, heading, node). They organize the Registry data in a consistent and hierarchical format. Keys can contain subkeys and/or values. Each (sub)key name is predefined by the system or created by users or Win32/Win64 [32-bit (x86)/64-bit (x64)] programs, and consists of most printable ANSI (ASCII: alphanumeric) characters: 32 - 127, except: asterisk (*****), backslash (****), space ( ), question mark (**?**), non-localized (other than Latin alphabet) characters. Key names starting with a period (**.**) are reserved solely for operating system use, and cannot be created/renamed/deleted by applications/users.
   Wikipedia: ASCII printable characters.
   A (sub)key is defined by its complete pathway starting at the root level (main key = Hive Key = HKEY).
   NOTE:
   These examples of Registry (Sub)Keys and Values follow the .REG file rules (more on this subject further below).

   - **HKEY_KEY_NAME** = Root Handle/Hive/Main/Parent Key. The Windows 95/98/ME Registry consists of 6 Root Keys under the "**My Computer**" heading (see further below). Hive Keys can contain one or more Child (Sub)Key(s) (see below).

Example:
[HKEY_LOCAL_MACHINE]

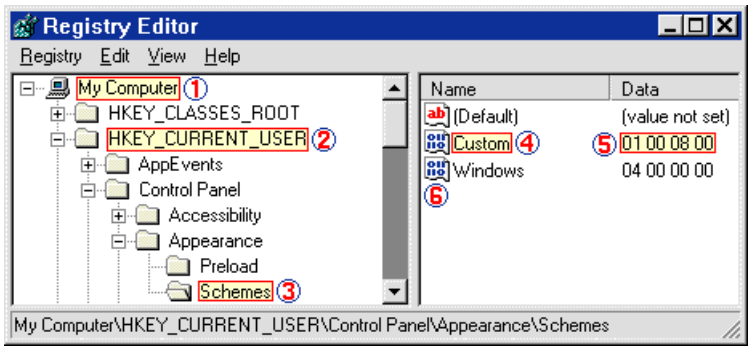
- **HKEY_KEY_NAME\SubKeyName** = Child (Sub)Key. They are nested underneath each other (like branches) following a single or multiple level tree structure (like folders).
  Example:
  [HKEY_LOCAL_MACHINE\Software]

2. **Value**: stores actual Registry data created/modified/used by the system, users and Registry aware Win32/Win64 [32-bit (x86)/64-bit (x64)] applications to control hardware, software and user settings. Values (like files) are stored inside (sub)keys (like folders):

   "ValueName"=ValueType(API Code #):ValueData

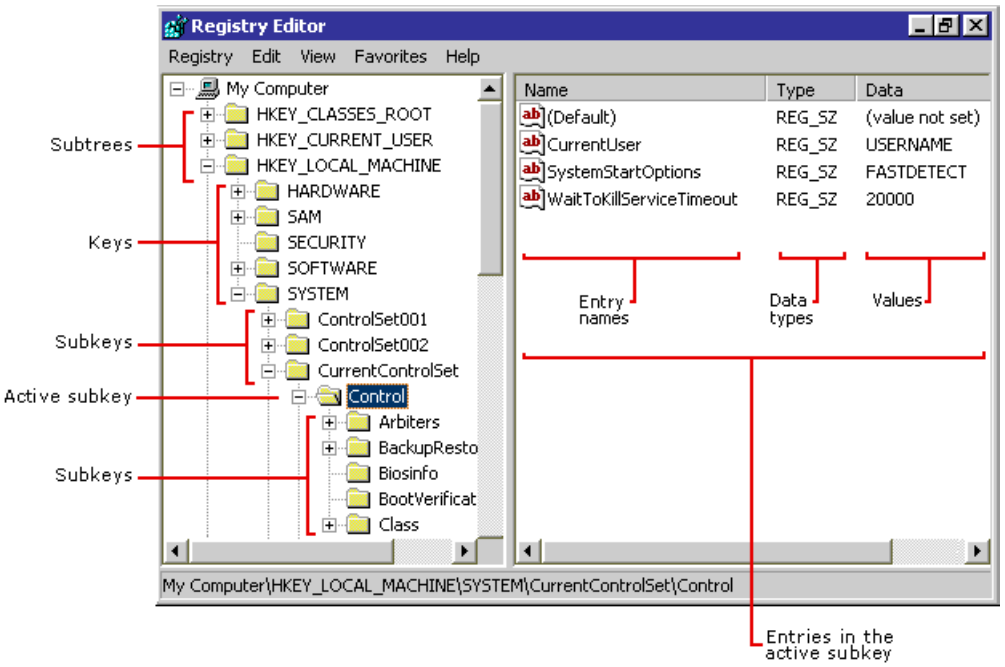
   Value Type defines Value Data, displayed in multiple alphanumeric formats.

   This is how they appear in the Registry Editor:



LEGEND:			
Left hand panel:	(1) Main Heading [Tree]	Right hand panel:	(4) Value Name
	(2) Hive [Root] Key		(5) Value Data
	(3) Sub [Child] Key		(6) Value Type

More details:



- There are 4 basic (simple) Registry Value types, 3 of them (except **REG_QWORD**) valid for all Windows 95, 98, ME, NT, 2000, XP, 2003, Vista, 2008, 7, 8, 8.1, 2012, 10, 2016, 2019, 11, 2022 + newer releases, and available in both **RegEdit** and **RegEdt32**:

  - **REG_DWORD** [**DWORD Value**: API code **4**] = Double WORD numerical data of 4 bytes (32 bits) in length, in 3 numeric formats: decimal (base of 10), hexadecimal (base of 16) or binary

(base of 2). Integer limits: 0-232.
This applies to all 32-bit Windows OSes.
Example:
[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Explorer]
"IconUnderline"=dword:2
There are 2 REG_DWORD Registry Value subtypes:

- **REG_DWORD_LITTLE_ENDIAN** [**DWORD Value**: API code **4**] = Windows/DOS OSes are designed to operate on Little Endian computer architecture ("normal order"): a multi-byte value is stored from the rightmost lowest byte ("little end", "low order") to the leftmost highest byte ("big end", "high order"). Example: the value 0x12345678 is stored as 0x78 0x56 0x34 0x12.
- **REG_DWORD_BIG_ENDIAN** [**DWORD Value**: API code **5**] = UNIX/Linux/BSD (*nix) OSes are designed to operate on Big Endian computer architecture ("reversed order"): a multi-byte value is stored from the leftmost highest byte ("big end", "high order") to the rightmost lowest byte ("little end", "low order"). Example: the value 0x12345678 is stored as 0x12 0x34 0x56 0x78.

- **REG_QWORD** [**QWORD Value**: API code **11**] = Quadruple WORD numerical data of 4 bytes (64 bits) in length, in 3 numeric formats: decimal (base of 10), hexadecimal (base of 16) or binary (base of 2).
  This applies only to 32-bit Windows NTx (NT based) OSes (x86) and to all 64-bit Windows NTx OSes (x64).
  There is only 1 REG_QWORD Registry Value subtype:
  REG_QWORD_LITTLE_ENDIAN [**QWORD Value**: API code **11**].

- **REG_BINARY** [**Binary Value**: API code **3**] = 8-bit or 16-bit data of any length, in 2 numeric formats: binary (base of 2) or hexadecimal (base of 16).
  Example:
  [HKEY_LOCAL_MACHINE\System\CurrentControlSet\control\FileSystem]
  "Win31FileSystem"=hex:00

- **REG_SZ** [**String Value**: API code **1**] = Data of any length, in 3 ANSI or Unicode formats: simple text/ASCII (fixed string), expanded (%string% variable string) or extended (multi-string) null terminated string ➜ see below for 2nd and 3rd String Value types.
  Example:
  [HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion]
  "Version"="Windows ME"

- There are several complex (multiple) Registry Value types (contain multiple or a list of data types of any length separated and terminated by null characters), valid only for Windows NT4, 2000, XP, 2003, Vista, 2008, 7, 8, 8.1, 2012, 10, 2016, 2019, 11, 2022 + newer, and available only in RegEdt32:

  - **REG_EXPAND_SZ** [**Expanded String Value**: API code **2**] = in system variable (%string%) format, stores environment variables within strings, accessed by substituting variables with actual system path names.

  - **REG_LINK** [**Link String Value**: API code **6**] = symbolic link in Unicode format between system or software data.

  - **REG_MULTI_SZ** [**Multiple String Value**: API code **7**] = in extended multi-string format, stores an array of empty-string terminated multiple strings into a single Registry entry terminated by an empty-string and a null character.

  - **REG_RESOURCE_LIST** [**Resource List Value**: API code **8**] = device driver and hardware component list of hardware resources stored under the **HKEY_LOCAL_MACHINE\HARDWARE\ResourceMap** tree.

- **REG_FULL_RESOURCE_DESCRIPTOR** [**Resource Descriptor Value**: API code **9**] = device driver and hardware component description of nested arrays of hardware resources stored under the **HKEY_LOCAL_MACHINE\HARDWARE\Description** tree.
- **REG_RESOURCE_REQUIREMENTS_LIST** [**Resource Requirements List Value**: API code **10**] = device driver and hardware component list of hardware resource requirements stored under the **HKEY_LOCAL_MACHINE\HARDWARE\ResourceMap** tree.

This is the complete list of supported 32-bit (x86) + 64-bit (x64) Windows OS Registry Value types:

Value Type	API Code #	Value Description
REG_ERROR	**-1**	Error request value
REG_NONE	**0**	Undefined binary value type
REG_SZ	**1**	Null terminated Unicode fixed string value
REG_EXPAND_SZ	**2**	Null terminated unexpanded Unicode/ANSI environment string value
REG_BINARY	**3**	Binary value of any form/length
REG_DWORD	**4**	32-bit numerical value
REG_DWORD_LITTLE_ENDIAN	**4**	32-bit numerical value
REG_DWORD_BIG_ENDIAN	**5**	32-bit reversed numerical value
REG_LINK	**6**	Symbolic Unicode link string value
REG_MULTI_SZ	**7**	Null terminated array of multiple Unicode strings separated by empty strings
REG_RESOURCE_LIST	**8**	Device driver list of hardware resources in Resource Map tree
REG_FULL_RESOURCE_DESCRIPTOR	**9**	List of hardware resources in Description tree
REG_RESOURCE_REQUIREMENTS_LIST	**10**	Device driver list of hardware resource requirements in Resource Map tree
REG_QWORD	**11**	64-bit numerical value

See also this image:

Type ID	Type Name	Description
0	REG_NONE	No defined value type.
1	REG_SZ	A string value stored as UTF-16LE (if the Unicode Win32 API functions are used. If ANSI functions are used, it will be an ANSI string).
2	REG_EXPAND_SZ	An expandable string value, also stored as UTF-16LE or ANSI, dependent on the API functions that created it. This type can contain unexpanded references to environment variables, such as %PATH%.
3	REG_BINARY	Binary data stored in any form.
4	REG_DWORD/REG_DWORD_LITTLE_ENDIAN	A DWORD value, meaning a number between 0 and 4,294,967,295, stored in little-endian format. Little-endian stores the least significant, or last, byte in the smallest memory address.
5	REG_DWORD_BIG_ENDIAN	You guessed it! This is a number between 0 and 4,294,967,295 — just like Type 4, but stored in big-endian format. This places the most significant, or first, byte in the smallest memory address.
6	REG_LINK	A unicode symbolic link to another registry key. This link will contain the root key and path to the linked key.
7	REG_MULTI_SZ	A sequence of null-terminated strings, terminated by an empty string. Empty strings are shown as \0.
8	REG_RESOURCE_LIST	*Only used by the Plug-n-Play (PnP) component of Windows.*
9	REG_FULL_RESOURCE_DESCRIPTOR	*Only used by the Plug-n-Play (PnP) component of Windows.*
10	REG_RESOURCE_REQUIREMENTS_LIST	*Only used by the Plug-n-Play (PnP) component of Windows.*
11	REG_QWORD/REG_QWORD_LITTLE_ENDIAN	Though they share the same ID, they are different types. Both are a 64-bit number from -9,223,372,036,854,775,808 to 9,223,372,036,854,775,807. Stored in big-endian and little-endian format, respectively.

Unfortunately most Registry elements have fixed limits:

Registry Element	MAX Allowed Length/Size
(Sub)Key Name	255 characters
Value Name [Win2000/XP/2003]	255 ANSI or 16,383 Unicode characters
Value Name [Win95/98/ME]	255 characters
Value Data [Win2000/XP/2003]	Limited by available RAM

Value Data [Win95/98/ME]	16,383 Bytes [16 KB]
All Values within same (Sub)Key [Win2000/XP/2003]	Limited by available RAM
All Values within same (Sub)Key [Win95/98/ME]	65,535 Bytes [64 KB]

Values larger than 2,048 Bytes [2 KB] should be stored as separate files, and their file names stated in the Registry, for optimal efficiency.
More info @ MSDN.
Even more info.
Do NOT confuse this with the "**RegistrySizeLimit**" (RSL) Registry DWORD [REG_DWORD] Value used to configure paged database memory pools in Windows NT4/2000, and subsequently removed from Windows XP/2003/newer.
More info @ MS TechNet.

When you run the **Registry Editor** (see further below), you'll see the following expandable Registry subtrees, each marked with a plus [**+**] sign, under the "**My Computer**" heading (main tree).
To further expand each subtree and view all underlying branches (subkeys), click on the plus [**+**] signs of the 6 main Hive Keys (HKEY) below.
(Sub)key/(sub)tree/(sub)heading are used here as synonyms.
This layout is a typical example of Windows 95/98/ME Registry:

```
[+] My Computer
 |
 |--[+] HKEY_CLASSES_ROOT (HKCR): Software settings, DDE, OLE,
 |      drag-and-drop, Win31 backward compatibility, shortcut settings and
 |      subkeys for every defined file association, also found ("cloned")
 |      at HKEY_LOCAL_MACHINE\Software\Classes ("alias" key) .
 |
 |--[+] HKEY_CURRENT_USER (HKCU): Currently logged on user
 |   |  configuration settings, also found at HKEY_USERS\Username .
 |   |  Subkeys:
 |   |
 |   |--[+] AppEvents: Assigned system and applications sound events
 |   |      settings.
 |   |
 |   |--[+] Control Panel: Control Panel settings, similar to those
 |   |      defined in SYSTEM.INI, WIN.INI and CONTROL.INI in
 |   |      Windows/WfWG 3.xx.
 |   |
 |   |--[+] Identities: Created and used by MS Outlook Express 4/5/6
 |   |      and its Address Book. [Thank you Ojatex!]
 |   |
 |   |--[+] InstallLocationsMRU (Most Recently Used): Installation and
 |   |      Startup folders paths.
 |   |
 |   |--[+] Keyboard: Current keyboard layout.
 |   |
 |   |--[+] Network: Network connection settings.
 |   |
 |   |--[+] RemoteAccess: Current logon location settings if using
 |   |      Dial-Up Networking (DUN).
 |   |
 |   *--[+] Software: Software configuration settings for the currently
 |          logged on user, sorted by developer/manufacturer/vendor.
 |
 |--[+] HKEY_LOCAL_MACHINE (HKLM): User independent hardware and
 |   |  software machine specific information: bus type, device drivers,
 |   |  keyboard layout etc. Subkeys:
 |   |
 |   |--[+] Config: System and software configuration.
 |   |
 |   |--[+] Drivers: Used by the Device Manager to keep track of active
```

```
|   |     loaded drivers for hardware peripherals: PnP devices, PC
|   |     cards, PCMCIA etc. [Thank you Ojatex!]
|   |
|   |--[+] Enum: Hardware devices information and settings.
|   |
|   |--[+] Hardware: Serial communication port(s) information and
|   |     settings.
|   |
|   |--[+] Network: Information and settings about network(s) the user
|   |     is currently logged on to.
|   |
|   |--[+] Security: Network security information and settings.
|   |
|   |--[+] Software: Software specific information and settings sorted
|   |     by developer/manufacturer/vendor, each stored under its own,
|   |     separate Subkey.
|   |
|   *--[+] System: System startup, device drivers and operating system
|         information and settings.
|
|--[+] HKEY_USERS (HKU): Information about Desktop and user specific
|     settings for each user who logs on to the same Windows 95/98/ME
|     system. Each user has a separate subkey here. If there is only
|     one user, the only subkey is .Default .
|
|--[+] HKEY_CURRENT_CONFIG (HKCC): Information about current hardware
|     profile used by the local computer at startup, pointing to
|     HKEY_LOCAL_MACHINE\System\CurrentControlSet\Hardware Profiles\Current .
|
*--[+] HKEY_DYN_DATA (HKDD): Virtual key (exists only in memory)
      |  created every time Windows 95/98/ME initializes: dynamic
      |  configuration data about installed PnP devices. Changes constantly
      |  when hardware devices are added, swapped or removed on-the-fly.
      |
      |--[+] Config Manager: Hardware problem codes and status.
      |
      *--[+] PerfStats: System and network performance statistics.
```

These 6 Hive Keys (HK) are interrelated: the information contained in **HKEY_LOCAL_MACHINE** (**HKLM**) and **HKEY_USERS** (**HKU**) (the only 2 "real" keys) appears also in 3 other Hive Keys (also called "alias" or "clone" keys):

Real Hive Key	Alias (Clone) Hive Key
HKLM\Software\Classes + HKCU\Software\Classes	HKEY_CLASSES_ROOT (HKCR)
HKU\Username [HKU\.Default if only 1 user]	HKEY_CURRENT_USER (HKCU)
HKLM\Config\Profile	HKEY_CURRENT_CONFIG (HKCC)

The 3 "alias" keys are the Registry equivalent of Windows shortcuts ("pointers"), and their contents derives from the 4 "real" Hive Keys. Any data written to the "real" keys is also automatically registered ("cloned") into the correspondent "alias" keys, but not the other way around. Exception makes HKCU, which can "clone" HKU\Username [HKU\.Default if only 1 user] subkeys + values and vice versa.
Any data contained in **HKEY_CURRENT_USER** (**HKCU**) overrides any data contained in **HKEY_LOCAL_MACHINE** (**HKLM**), therefore any change in **HKEY_CLASSES_ROOT** (**HKCR**) is always "cloned" into **HKEY_CURRENT_USER** (**HKCU**).
Exception makes **HKEY_DYN_DATA** (**HKDD**) ("virtual" key) [Windows 95/98/ME only], which is automatically created during every Windows initialization phase, exists only in the computer's memory, and is automatically erased upon system shutdown.

On Windows NTx 64-bit (x64) OSes [2000 (2000 Advanced Server + 2000 Datacenter Server IA-64 editions), XP Professional, 2003 Server, Vista, 2008 Server, 2008 R2 Server, 7, 8, 2012 Server, 8.1, 2012 R2 Server, 10, 2016 Server, 2019 Server, 11, 2022 Server and newer] portions of the registry are stored separately for 32-bit and 64-bit

applications, and mapped ("mirrored", "cloned") into separate logical registry keys (hives), using the registry redirector and registry reflection (certain shared registry keys are not redirected or reflected), because 64-bit applications may use different registry keys and/or values than the 32-bit ones.
More info:

- MS DOCs: 32-bit and 64-bit Application Data in the Registry.
- MS DOCs: Registry Keys Affected by WoW64 on Windows 64-bit (x64) editions.
- Advanced INSTALLER: Wow6432Node Registry Key.

WoW64 = Windows on Windows 64-bit.

Each 64-bit registry node has its own ISN (Image Specific Node) parent under the **HKEY_LOCAL_MACHINE\Software\Wow6432Node** registry subkey, which is the 32-bit equivalent of the **HKEY_LOCAL_MACHINE\Software** subkey.
The registry redirector directs the 64-bit application/executable/DLL registry access to the appropriate ISN subnode, transparent to the user. Registry tree redirection subnodes (subkeys) are created automatically by the WOW64 component under the Wow6432Node hive (main) key as needed.
HKEY_CURRENT_USER (**HKCU**) is a symbolic link to **HKEY_USERS*** (**HKU**) where * indicates a match for all user Security IDs (SIDs).
HKEY_USERS*\SOFTWARE\Classes is a symbolic link to **HKEY_USERS*_Classes**.
HKEY_CLASSES_ROOT (**HKCR**) is a merged view of **HKEY_LOCAL_MACHINE\SOFTWARE\Classes** and **HKEY_CURRENT_USER\SOFTWARE\Classes**.
Redirected keys in these registry paths are also effectively redirected for **HKEY_CLASSES_ROOT** (**HKCR**).
This is also true for reflected registry keys on OSes that support them.
WOW64 defines following symbolic registry links strictly for compatibility with existing applications/programs/software that may use built-in/hardcoded registry key paths containing Wow6432Node (example): the **HKEY_LOCAL_MACHINE\SOFTWARE** subkey is linked to the **HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node** subkey.
These 64-bit OSes use the **%SystemRoot%\System32** directory/folder for their 64-bit system files (for backward compatibility reasons), which is achieved by redirecting 32-bit applications/executables (.exe)/programs/APIs/DLLs to the **%SystemRoot%\SysWOW64** directory/folder transparently. 32-bit applications/executables (.exe)/programs/APIs/DLLs can access **%SystemRoot%\System32** through the **%SystemRoot%\Sysnative** pseudo-directory (virtual directory).
Similarly, there are 2 separate directories/folders for installed applications/programs, both visible to all 32-bit and 64-bit applications/executables (.exe)/programs/APIs/DLLs:

- **%ProgramFiles%** [usually C:\Program Files] = for 64-bit applications/drivers/updates and
- **%ProgramFiles(x86)%** [usually C:\Program Files (x86)] = for 32-bit applications/drivers/updates.

Back 2 Contents

REG Files

Windows 9x/NTx use dedicated files in different (mostly plain text/ASCII, but also Unicode) formats: **.HTA** (HyperText Application), **.INF** (INFormation), **.REG** (REGistration), **.VBS** (Visual Basic Script) etc, to **import** (insert, merge) and **export** (save) information into and from the Registry.

Exceptions:

- Windows 95/98/ME/NT4 can import + export ONLY plain text (ASCII) .REG files.
- Windows 2000 can import ONLY binary (Unicode) .REG files.

Their purpose is to add, modify or delete Registry (Sub)Keys and/or Values.
See "**DELETE REGISTRY KEY/VALUE**" to learn how to delete Registry (Sub)Keys and Values in Windows 95B/95C OSR 2.x, 98, 98 SP1, 98 SE(U), ME, 2000, XP, 2003, Vista, 2008, 7, 8, 8.1, 2012, 10, 2016, 2019, 11, 2022 + newer. More info @ MSKB.
This can be achieved by running them directly from the Start ➔ Run... box, Windows Explorer (%windir%**Explorer.exe**), File Manager (FM = %windir%**WINFILE.EXE**) or native/real/true/pure MS-DOS prompt in Windows 95/98/ME (using %winbootdir%**REGEDIT.EXE** command line switches = see further below).

This is possible because in all Windows 32-bit/64-bit (Win32/Win64) OSes REG files are associated by default with the Registry Editor (**RegEdit.exe**/**RegEdt32.exe**) executable, which resides in the main Windows directory/folder (%windir%) and System32 (%systemroot% = NTx OSes only) respectively, listed on the system path (%PATH% environment).
NTx Windows OSes (NT4, 2000, XP, 2003, Vista, 2008, 7, 8, 8.1, 2012, 10, 2016, 2019, 11, 2022 + newer) also install **REG.EXE**, a command line tool located in %SystemRoot%\System32, which can be used to read and modify the registry: create, copy, delete, move, rename, merge, change keys and values from any DOS box/console or by using it in custom DOS batch (.BAT or .CMD) files. More info.

We will discuss here the most well known and easy to create/modify/use, the "all mighty" **.REG file**, which can be in:

- plain **text (ASCII)** format in Windows 9x + NTx or
- **binary (Unicode/ANSI)** format in Windows 2000/XP/2003/Vista/2008/7/8/8.1/2012/10/2016/2019/11/2022.

Text .REG files can be easily viewed/created/edited by hand using any text/ASCII editor, like Notepad [%windir%**Notepad.exe**, included with all Windows releases, but primitive, and limited in Windows 95/98/ME/NT4/2000 to a maximum file size of only 64 KB **:-(**], or any other 3rd party text editor [see "FREE Windows 9x/NTx Text Editors" for better Notepad replacement tools], eventually by cutting & pasting Registry specific text strings from other sources, like a fragment of, or entire Registry, saved as plain text .REG file by using a Registry Editor.
See "**REGISTRY BACKUP + RESTORE**" to learn how to backup/restore your entire Windows 95/98/ME Registry safely by exporting/importing .REG files.
Note that Regedit always saves REG files in plain text/ASCII format in Windows 9x, but in Windows 2000/XP/2003/Vista/2008/7/8/8.1/2012/10/2016/2019/11/2022 they are always exported (default) in binary (Unicode) format, unless the user selects a different (text/ASCII) file format from the Export Registry File menu, like the "**Win9x/NT4 Registration Files (*.reg)**" format, available to both Regedit and Regedt32 in Windows 2000, XP, 2003, Vista, 2008, 7, 8, 8.1, 2012, 10, 2016, 2019, 11, 2022 + newer.

Registration (.REG) file structure:

1. **Header line**: this FIRST line is mandatory. MUST contain only these exact words (case sensitive = character capitalization required!):
   - **REGEDIT4** = (RegEdit v4.0) Windows 95/98/ME + NT 4.0 or
   - **Windows Registry Editor Version 5.00** = (RegEdit v5.0) Windows 2000/XP/2003/Vista/2008/7/8/8.1/2012/10/2016/2019/11/2022.

   This is the only way 32-bit/64-bit Windows OSes can recognize/validate, run/merge and import/export .REG files.
   Windows 2000/XP/2003/Vista/2008/7/8/8.1/2012/10/2016/2019/11/2022 also support the REGEDIT4 header line, but only for plain text/ASCII encoded Registry values, not for some complex binary/Unicode encoded Registry values.
   Limitation:
   RegEdit v4.0 ("**REGEDIT4**" header) .REG files (Windows 95, 98, ME + NT 4.0) support only comma separated, null terminated single byte character hex values: REG_EXPAND_SZ [hex(2)] + REG_MULTI_SZ [hex(7)], therefore they do not support non-ASCII (non-Latin, non-ISO-8859) code pages/characters/languages.
   RegEdit v5.0 ("**Windows Registry Editor Version 5.00**" header) .REG files (Windows 2000, XP, 2003, Vista, 2008, 7, 8, 8.1, 2012, 10, 2016, 2019, 11, 2022 + newer) support comma separated, null terminated double byte character hex values (see above), therefore they do support all non-ASCII (non-Latin, non-ISO-8859) code pages/characters/languages.
   Example:
   RegEdit v4.0 .REG file representation of a REG_MULTI_SZ Value:

```
-----Begin cut & paste here-----
REGEDIT4
; This key + value do NOT exist. Used here only as example!
[HKEY_LOCAL_MACHINE\Software\Multi_String]
"Multi String Value"=hex(7):48,65,6c,6c,6f,21,00,00
```

------End cut & paste here------

RegEdit v5.0 .REG file representation of same REG_MULTI_SZ Value above in Unicode format:

```
-----Begin cut & paste here-----
Windows Registry Editor Version 5.00
; This key + value do NOT exist. Used here only as example!
[HKEY_LOCAL_MACHINE\Software\Multi_String]
"Multi String Value"=hex(7):48,00,65,00,6c,00,6c,00,6f,00,21,00,00,00,00,00

------End cut & paste here------
```

In v5.0 each character of the word "Hello!" is expressed as a double byte (H = **48h,00h** | E = **65h,00h** | etc), but in v4.0 it is expressed as a single byte (H = **48h** | E = **65h** | etc).

2. **Empty (blank) line**: this second line is optional. Similar to inserting a carriage return (**CR**).
3. **Remarked (comment) line(s)**: optional. MUST begin with a semicolon (**;**) which may be followed by a space (optional). Can contain Registry (Sub)Keys and Values (which can be disabled this way) or plain text comments/reminders. Windows does NOT process (ignores) remarked lines, treating them as comments. May be inserted anywhere in the .REG file, but NOT before the Header, which MUST be present as FIRST line (see **#1** above).
4. **(Sub)Key line**: MUST be preceded and terminated by square parentheses (**[]**). (Sub)Key name MUST start with the Hive Key name (left end) and MUST contain entire Subkey pathway leading to the current Subkey name (right end). Consecutive (Sub)Key names MUST be separated by SINGLE backslash marks (****):

   [HKEY_KEY_NAME\SubKeyName0\SubKeyName1\SubKeyName2\etc...]

   Example:

   [HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion]

   (Sub)Key names not present in the Registry will be automatically created when the REG file is merged into the Registry. **Exception:** new Hive (Root) Keys can be created ONLY in Windows NTx, but NOT in Windows 95/98/ME. Users must have administrative rights to create, rename or move registry keys.

5. **Value line**: MUST contain these elements in this EXACT order:
   - **Value name**: MUST be preceded and terminated by quotation marks (**""**).
   - **Equal mark (=)**: MUST separate Value name from Value type.
   - **Value type**: MUST be specified: **dword:** [DWORD = REG_DWORD], **hex(#):** [Binary = REG_BINARY] ONLY IF Value type other than String [REG_SZ].
   - **(API Code #)**: MUST be specified as alphanumeric hex value: from **2** [**hex(2)**] up to **11** [**hex(b)**] and MUST be preceded and terminated by round parentheses [**()**] ONLY IF Value type other than String [REG_SZ] (API Code 1) or DWORD [REG_DWORD] (API Code 4 or 5).
     Refer to the complete list of supported Registry Value types further above for details.
   - **Colon mark (:)**: MUST separate Value type from Value data ONLY IF Value type other than String [REG_SZ].
   - **Value data**: MUST be in the same format as defined by Value type: text/ASCII, Unicode/ANSI, (alpha)numeric (decimal, hexadecimal or binary) etc. MUST be preceded and terminated by quotation marks (**""**) ONLY IF Value type is String [REG_SZ].
     Syntax:

     - String Value: **hex(1)** [REG_SZ] (API Code 1):

       "ValueName"="ValueData"

       Value Data is expressed here in Unicode or ANSI formats: simple text/ASCII, expanded or extended.

     - DWORD Value: **hex(4)** [REG_DWORD] (API Code 4):

"ValueName"=ValueType:ValueData

Value Data is expressed here in Double WORD (4 bytes = 32 bits) formats: decimal, hexadecimal or binary.

- Simple (8-bit) or complex (16-bit) Binary (hex) Value of any length:
  - **hex(0)** [REG_NONE (null = empty)] (API Code 0),
  - **hex(1)** [REG_SZ (hex notation)] (API Code 1),
  - **hex(2)** [REG_EXPAND_SZ] (API Code 2),
  - **hex(3)** [REG_BINARY (hex notation)] (API Code 3),
  - **hex(4)** [REG_DWORD (hex notation)] (API Code 4),
  - **hex(5)** [REG_DWORD_BIG_ENDIAN (hex notation)] (API Code 5),
  - **hex(6)** [REG_LINK] (API Code 6),
  - **hex(7)** [REG_MULTI_SZ] (API Code 7),
  - **hex(8)** [REG_RESOURCE_LIST] (API Code 8),
  - **hex(9)** [REG_FULL_RESOURCE_DESCRIPTOR] (API Code 9),
  - **hex(a)** [REG_RESOURCE_REQUIREMENTS_LIST] (API Code 10) or
  - **hex(b)** [REG_QWORD (64-bit Value)] (API Code 11):

  "ValueName"=ValueType(API Code #):ValueData

  Large Value Data Strings can span onto more than one line, in which case each line (except the last one) is terminated by a comma (**,**) followed by a SINGLE backslash mark (****) and consecutive lines are separated by carriage returns (**CR**):

  "ValueName"=ValueType(API Code #):ValueData,ValueData,
  ValueData,ValueData

  Value Data is expressed here in numeric: binary or hexadecimal, or multi-string (complex) formats: binary, hexadecimal, Unicode or ANSI.
  Consecutive bit pairs (double digits) of data MUST be separated by a comma (**,**).

The **** separator/delimiter used in REG files for local/UNC path name lines to separate drive letters, directory (folder) names, UNC path names and file names, or used on command line parameters lines etc... MUST be typed as DOUBLE backslash marks (****).
Here the first backslash (treated by the Registry as Escape character) is used to tag ("mark") the next character, the second backslash in this case. Regedit interprets in fact these two backslashes as a single one, and only the second backslash is processed as such. The first one is ignored.
Exception: Registry (Sub)Key path names used in REG files MUST be separated by SINGLE backslash marks (****).
When the REG file is merged into the Registry (Sub)Keys and Value names not present in the Registry will be automatically created. (Sub)Keys and Value names already present under the same Registry (sub)key(s) but containing different Value type(s) and/or data will be automatically updated to match the one(s) in the REG file.

6. **Empty (blank) line**: this LAST line is mandatory for proper operation only in Windows 95/98/ME, to process the plain text (ASCII) .REG files as DOS text format, not as Unix text format. Similar to inserting a carriage return (**CR**) or a line feed (**LF**) or an end of file (**EOF**) character to mark the end of file.

This is how a generic text/ASCII .REG file looks like:

```
-----Begin cut & paste here-----
REGEDIT4

; This is a comment line.
[HKEY_KEY_NAME\SubKeyName0\SubKeyName1\SubKeyName2\etc...]
; String Value:
"ValueName"="ValueData"
; DWORD or Binary Value:
"ValueName"=ValueType:ValueData
```

------End cut & paste here------

... And this is an example of actual text .REG file containing real Keys and Values:

```
-----Begin cut & paste here-----
REGEDIT4

; First Value below identifies MS Windows OS name:
[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion]
; String Value:
"Version"="Windows ME"
; DWORD Value:
"CacheWriteDelay"=dword:00000320
; Binary Value:
"OldWinVer"=hex:00,02

------End cut & paste here------
```

FYI: Cut & paste lines are not part of the .REG files, of course. ☐

Back 2 Contents

Registry Inconsistencies, Curiosities + Oddities

Thank you Sergio!
Except for the "ACP"="1251" String Value [REG_SZ] below, all these are fictional examples. Merging these REG files into your Registry will achieve nothing. ☐
"Various REG_* Value types can be expressed in REG scripts this way:

```
-----Begin cut & paste here-----
Windows Registry Editor Version 5.00
[HKEY_CURRENT_USER\ 5]
; Name only: useful for flag values such as "AlwaysShowExt" [: required].
"0 REG_NONE"=hex(0):
; These strings are Unicode (probably UTF-16).
"1 REG_SZ"=hex(1):48,00,65,00,6c,00,6c,00,6f,00,2c,00,20,00,\
 57,00,6f,00,72,00,6c,00,64,00,21,00,00
"2 REG_EXPAND_SZ"=hex(2):25,00,50,00,72,00,6f,00,67,00,72,00,61,00,6d,00,\
 46,00,69,00,6c,00,65,00,73,00,25,00,00,00
"3 REG_BINARY"=hex(3):46,72,65,65,20,66,6f,72,6d,20,62,69,6e,61,72,79
"4 REG_DWORD_LITTLE_ENDIAN"=hex(4):12,34,56,78
"5 REG_DWORD_BIG_ENDIAN"=hex(5):12,34,56,78
"7 REG_MULTI_SZ"=hex(7):4c,00,69,00,6e,00,65,00,20,00,31,00,00,00,\
 4c,00,69,00,6e,00,65,00,20,00,32,00,00,00,\
 4c,00,69,00,6e,00,65,00,20,00,33,00,00,00,\
 4c,00,69,00,6e,00,65,00,20,00,34,00,00,00,\
 00,00
; Windows XP RegEdit silently imports this registry value type, but does not
; recognize nor display it properly. Probably Windows XP 64-bit edition does.
"b REG_QWORD_LITTLE_ENDIAN"=hex(11):12,34,56,78,9a,bc,de,f0
; So it does with this weird line.
"f REG_REDMOND_ONE_MICROSOFT_WAY"=hex(15):aa,bb,cc,dd,ee,ff

------End cut & paste here------
```

Some inconsistencies exist between string representation in different versions of REG scripts (5.0 and 4), as following example shows:

```
-----Begin cut & paste here-----
REGEDIT4
[HKEY_CURRENT_USER\ 4]
; Only this string is Unicode for REGEDIT4 script, the rest are ANSI.
```

```
; Probably RegEdit handles REG_SZ differently, even in this form.
"1 REG_SZ"=hex(1):48,00,65,00,6c,00,6c,00,6f,00,2c,00,20,00,\
 57,00,6f,00,72,00,6c,00,64,00,21,00,00,00
"2 REG_EXPAND_SZ"=hex(2):25,50,72,6f,67,72,61,6d,\
 46,69,6c,65,73,25,00
"7 REG_MULTI_SZ"=hex(7):4c,69,6e,65,20,31,00,\
 4c,69,6e,65,20,32,00,\
 4c,69,6e,65,20,33,00,\
 4c,69,6e,65,20,34,00,\
 00

------End cut & paste here------
```

Windows 95/98/ME RegEdit will expect:

```
"1 REG_SZ"=hex(1):48,65,6c,6c,6f,2c,20,57,6f,72,6c,64,21,00
```

Windows XP RegEdit exports REGEDIT4 scripts as text files encoded in current ANSI codepage (example):

```
-----Begin cut & paste here-----
REGEDIT4
[HKEY_LOCAL_MACHINE\System\CurrentControlSet\Control\Nls\CodePage]
"ACP"="1251"

------End cut & paste here------
```

so localized value names and data should comply with it. But nothing will stop you from creating REGEDIT4 scripts as Unicode (as far as I know, only low-endian UTF-16 encoded text files with byte order mark FF FE are recognized) or Windows Registry Editor Version 5.00 scripts as ANSI encoded text files.

Windows 98 SE RegEdit (the DOS part of dual REGEDIT.EXE) imports REG_SZ value data verbatim, no translation done, so to be compatible, REGEDIT4 scripts should be properly encoded.

It appears that RegEdit simply parses scripts ignoring white space for value name (quoted string before equal sign), value type and value data [in generic form hex(#):b1,b2,b3... with #==3 if omitted together with both parentheses, or specific "string" for hex(1), dword:12345678 for hex(4)], then submit them along with data size to RegSetValueEx() Win32 API function, which in turn simply posts it to the Registry. You can make a value of type REG_NONE with arbitrary data, confuse RegEdit with non-four-byte REG_DWORD, explore and exploit buffer overflows with null-unterminated REG*_SZ values etc. □"
This comes directly from the "horse's mouth" (formerly independent software developer Sysinternals was "acquired" by Microsoft), and demonstrates what can be done with the Registry using Windows NTx (NT 4.0/newer) Native API... RegHide [Reghide.exe] any1?

Back 2 Contents

Registry Editing Rules

To modify the Registry, you need to use a **Registry Editor**:

- **Regedit.exe** (Windows 9x/NTx) = located in %WinBootDir% (%SystemRoot%),
  Get Win98 **REGEDIT.EXE 4.10.1998** [53 KB] modified to work properly with ALL Windows 95/OSR1/OSR2/98/98 SP1/98 SE(U) releases (NOT WinME!).
  Get WinME **REGEDIT.EXE 4.90.3000** [173 KB] modified to work properly with ALL Windows 95/OSR1/OSR2/98/98 SP1/98 SE(U) releases.
- **Regedt32.exe** (Windows NTx) = located in %SystemRoot%\System32 [32-bit Windows NTx OSes (Win32)],
- or a freeware 3rd party Registry editing tool like:
  - **RegCool**
  - **Registrar Registry Manager Lite**
  - **Registry Commander**

- **Registry Explorer Standard**
- **RegAlyzer**.

Microsoft Windows 9x/NTx Registry Editor is a tool used to display, search, modify, create, delete, save, import and export Windows Registry (Sub)Keys and Values.

Windows NT4/2000 RegEdit.exe versus RegEdt32.exe side by side comparison:

REGEDIT.EXE (RegEdit)	REGEDT32.EXE (RegEdt32)
16-bit Windows + DOS executable	32-bit Windows only executable
Single window display	Separate Hive Key window display
Key and Value level Search	Key level Search only
Handles only simple Value types [see above]	Handles also complex Value types [see above]
Only Read and Write mode	Optional Read Only mode
No Security mode	Optional Permissions Security mode
No Security control	Full Security control [Win2000/XP/2003 only]
Text REG files export and import	Text REG files export only
No binary REG files export or import	Binary REG files export and import
Creates/renames/deletes only Subkeys	Creates/renames/deletes also Hive Keys
Opens at last accessed (Sub)Key level [WinME/XP/2003 only]	Opens at Root level only

Windows 95/98/ME do not include nor support RegEdt32.exe.
In Windows XP/2003/Vista/2008/7/8/8.1/2012/10/2016/2019/11/2022 RegEdt32.exe is just a "stub" that actually starts RegEdit.exe.
More info @ MSKB.
REGEDIT.

You can use either RegEdit's (Windows 9x/NTx) or RegEdt32's (Windows NT/2000) interface (see above) in protected mode Windows environment from within Windows GUI, or REGEDIT's DOS based (Windows 95/98/ME) command line parameters in native/real/true/pure mode MS-DOS from outside Windows.
To learn how to use the **REGEDIT.EXE** available DOS mode switches, run (Windows 95, 98 or ME only):

```
C:\>REGEDIT

Imports and exports registry files to and from the registry.

REGEDIT [/L:system] [/R:user] filename1
REGEDIT [/L:system] [/R:user] /C filename2
REGEDIT [/L:system] [/R:user] /E filename3 [regpath1]
REGEDIT [/L:system] [/R:user] /D regpath2

/L:system     Specifies the location of the SYSTEM.DAT file. Win95/98/ME
                        ONLY!
/R:user       Specifies the location of the USER.DAT file. Win95/98/ME
                        ONLY!
filename1     Specifies the file(s) to import into the registry.
/C filename2  Specifies the file to create the registry from or compress
                        existing registry. Win95/98/ME ONLY!
/E filename3  Specifies the file to export the registry to.
regpath1      Specifies the starting registry key to export from.
                        (Defaults to exporting the entire registry).
/D regpath2   Specifies the registry key to delete. Win98/ME ONLY!
/S            UNDOCUMENTED [USE WITH CAUTION!]: executes all
                        REGEDIT command line operations quietly, without
                        ANY confirmation. Available ONLY in Windows GUI
                        mode!
                        See "UNATTENDED REGISTRATION" for details.
```

from native MS-DOS.
More info @ MSKB.

In Windows NTx OSes (2000, XP, 2003, Vista, 2008, 7, 8, 8.1, 2012, 10, 2016, 2019, 11, 2022 + newer) RegEdit.exe adds more command line switches, and others work differently or have been removed:

```
C:\>regedit

/A filename.reg  Exports the entire registry (if no starting registry
regpath1         path specified) or registry path to text/ASCII
                 (non-Unicode) registry file (REGEDIT4 header line). If
                 both /A and /E parameters specified, /A (text/ASCII)
                 overwrites /E (Unicode/ANSI).
/E filename.reg  Exports the entire registry (if no starting registry
regpath1         path specified) or registry path to Unicode/ANSI
                 registry file ("Windows Registry Editor Version 5.00"
                 header line).
/I filename.reg  Imports the entire registry (if no registry file
                 specified) or registry path(s) from registry file.
                 Windows 2000 can import ONLY Unicode/ANSI registry
                 files!
/C               Removed from Windows NTx OSes.
/D               Removed from Windows NTx OSes.
                 See "DELETE REGISTRY KEY/VALUE" to learn
                 how to delete registry (sub)keys and values.
/L               Removed from Windows NTx OSes.
/R               Removed from Windows NTx OSes.
```

RegEdit is NOT installed as a Start Menu shortcut!
To create a RegEdit shortcut: right-click on an empty raised **Taskbar** spot ➜ select **Properties** ➜ click **Start Menu Programs** tab ➜ click the **Add** button ➜ browse to your main **Windows** folder (%windir% = usually **C:\WINDOWS** in Win9x/NTx or **C:\WINNT** in WinNT4/2000) ➜ (double)-click on **Regedit.exe** ➜ click the **Next** button ➜ (double)-click: **Start Menu ➜ Programs ➜ Accessories ➜ System Tools** ➜ click the **Next** button ➜ in the **Select name for the shortcut** box type **Registry Editor** ➜ click the **Finish** button.

You can also add a Registry Editor icon to your **Control Panel** in Windows 2000/XP/2003/Vista/2008/7/8/8.1/2012/10/2016/2019/11/2022. Copy & paste the text below between the cut & paste lines in Notepad (or better plain text/ASCII editor), and save it as **REGEDTCP.REG** (example):

-----Begin cut & paste here-----

```
Windows Registry Editor Version 5.00

[HKEY_LOCAL_MACHINE\SOFTWARE\Classes\CLSID\{77708248-f839-436b-8919-527c410f48b9}]
@="Registry Editor"
"InfoTip"="Starts the Registry Editor"
"System.ControlPanel.Category"="5"

[HKEY_LOCAL_MACHINE\SOFTWARE\Classes\CLSID\{77708248-f839-436b-8919-527c410f48b9}\DefaultIcon]
@="REGEDIT.EXE"

[HKEY_LOCAL_MACHINE\SOFTWARE\Classes\CLSID\{77708248-f839-436b-8919-527c410f48b9}\shell\open\command]
@="REGEDIT.EXE"

[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Explorer\ControlPanel\NameSpace\{77708248-f839-436b-8919-
527c410f48b9}]
@="Add Registry Editor to Control Panel"
```

------End cut & paste here------

Then run **REGEDTCP.REG** from Windows Explorer or File Manager (FM = %windir%\WINFILE.EXE) to merge (import) this information into your Registry.
From now on: open **Control Panel** ➜ click **Registry Editor**.

In all Windows OS editions (32-bit + 64-bit) a Registry Editor item can be added to the list of items displayed when you right-click on an empty spot on your **Desktop**. Copy & paste the text below between the cut & paste lines in Notepad (or better plain text/ASCII editor), and save it as **REGEDTDT.REG** (example):

```
-----Begin cut & paste here-----
REGEDIT4

[HKEY_LOCAL_MACHINE\SOFTWARE\Classes\Directory\Background\shell\regedit]
@="Registry Editor"
"SuppressionPolicy"=dword:0
"Icon"="REGEDIT.EXE,0"

[HKEY_LOCAL_MACHINE\SOFTWARE\Classes\Directory\Background\shell\regedit\command]
@="REGEDIT.EXE"

------End cut & paste here------
```

Then run **REGEDTDT.REG** from Windows Explorer or File Manager (FM = %windir%\WINFILE.EXE) to merge (import) this information into your Registry.
From now on: right-click any empty **Desktop** spot ➜ select **Registry Editor**.

In all Windows OS editions (32-bit + 64-bit) a Registry Editor item can be added to the list of items displayed when you right-click the main "**My Computer**" icon (all users!) on your Dekstop. Copy & paste the text below between the cut & paste lines in Notepad (or better plain text/ASCII editor), and save it as **REGEDTMC.REG** (example):

```
-----Begin cut & paste here-----
REGEDIT4

[HKEY_LOCAL_MACHINE\SOFTWARE\Classes\CLSID\{20D04FE0-3AEA-1069-A2D8-08002B30309D}\shell\regedit]
@="Registry Editor"
"SuppressionPolicy"=dword:0
"Icon"="REGEDIT.EXE,0"

[HKEY_LOCAL_MACHINE\SOFTWARE\Classes\CLSID\{20D04FE0-3AEA-1069-A2D8-08002B30309D}\shell\regedit\command]
@="REGEDIT.EXE"

------End cut & paste here------
```

Then run **REGEDTMC.REG** from Windows Explorer or File Manager (FM = %windir%\WINFILE.EXE) to merge (import) this information into your Registry.
From now on: right-click main "**My Computer**" icon (all users!) ➜ select **Registry Editor**.

If you are NOT familiar/comfortable "messing" with your Registry, do NOT attempt to make ANY changes!
But let's presume you ARE familiar enough with your Registry's "innards", and would like to tweak it for MAXimum performance, stability, security etc. After all this is •THE• purpose of this "dissertation". ☐ So keep reading...
If you don't like to modify your Registry directly, there is an "easier" [☐] alternative: use one of these "**Free Windows 9x/NTx System + Registry Tweakers**". My favorite is **X-Setup Pro** (freeware for personal use), the BEST Windows 9x/NTx Registry "hacker", capable of tweaking 1600+ Registry, System, Software, User, Network etc settings.
Or better, "hack" the Registry yourself... like I do. ☐
In the following **Registry Hacks**, the **subkeys/pathways** in the Registry Editor left hand pane point to a specific **Subkey** or **Value** located in the Registry right hand pane, with complete explanations of what they do, and how/why you may want to modify/rename/delete them and/or add new ones to customize/speed-up/fix your Windows computer.

WARNING:
FIRST BACKUP ALL YOUR HARD DRIVES TO A SAFE LOCATION BEFORE ATTEMPTING TO MAKE ANY SYSTEM CHANGES !
•READ• "REGISTRY BACKUP + RESTORE" for DETAILS!
Take EXTREME CAUTION when modifying your System/Startup settings! Faulty changes may result in crashes/lockups/permanent data loss, or might lead to having you REINSTALL your Operating System(s)!

YOU are the ONLY one responsible for ANY changes YOU make!
ALWAYS HAVE YOUR MOST RECENT SYSTEM BACKUP READY !

NOTE:
These "hacks" have been tested on many computers, but with NO guarantee they will also work for YOU!

BEWARE:
Whenever using Windows Registry Editor [RegEdit (REGEDIT.EXE) or RegEdt32 (REGEDT32.EXE)] to CHANGE/MODIFY your Registry in ANY way ALL CHANGES TAKE PLACE INSTANTLY WITHOUT ANY CONFIRMATION/NOTIFICATION/PROMPT!

To learn about Registry editing, run Regedit.exe (or Regedt32.exe) and click on **Help**.
To learn even more about the Registry, (double)-click on the Windows 95/98 Resource Kit (RK) Help file, found on your Windows 9x Setup CD-ROM:

- Win95/OSR1/OSR2: **WIN95RK.HLP** in the **\Admin\Reskit\Helpfile** folder,
- Win98/98 SE(U): **WIN98RK.HLP** in the **\Tools\Reskit\Help** folder,

and read the Registry related topics.

I also recommend to check frequently the **MicroSoft Knowledge Base (MSKB)**, for detailed info, updates, patches + bug fixes related to your Windows OS + MS applications/games.
See "**MICROSOFT KNOWLEDGE BASE MADE EASY**" for MSKB access details.

MicroSoft Developer Network (MSDN) and Microsoft TechNet post periodically detailed info about the Registry for the more technically inclined [read "geeks" ☐].

Back 2 Contents

Registry Credits + Links

As far as I'm aware, this is 1 of the most comprehensive Windows 9x/NTx + IE/OE/AOL/Netscape/etc Registry Hacks, Tweaks, Secrets, Speed-Ups, Workarounds + Fixes databases on the Internet. Some of the following tips I stumbled upon while browsing the Internet, some have been kindly sent by concerned readers (all authors/contributors are acknowledged and reliable sources given proper credit), and some I discovered on my own (clearly marked) while "messing" with the Registry.
Enjoy the ride!

NOTE:
Contributed tips (clearly marked) and other web sites mentioned here do not necessarily reflect the opinion of the owner of this web site.

Please send me your comments, corrections, tips.

The Registry on the Internet:

- John's RegTips, Etc.
- Windows XP Registry Tips, Tricks and Tweaks
- Windows NTx FAQs
- Bob's Registry Tips
- Windows 95/98/ME/NT/2000/XP/2003 Registry DataBase
- Windows Registry Guide
- 2003 Windows Registry Guide in HTML Help (CHM) format [1.4 MB, freeware]
- The Elder Geek Windows XP Registry Edits
- j79zlr's Registry Tweaks
- Registry Explorer Tweak of the week
- ActiveWindows - Registry Tips
- SpeedGuide Windows 9x/ME Registry Tweaks
- Gamefox Windows 2000 Tweaks
- WUGNET Tip of The Day
- Mystery Behind Windows Registry in Help (HLP) format [200 KB, freeware]

- PC911 Tips + Tweaks
- Kelly's REG, INF + VBS Files
- James' Windows Registry Patches
- Doug's Windows Tweaks + Fixes
- Ron's Reg Files
- Bill's Windows VBScript Tools

Back 2 Contents

... Enuff said. Let's have some fun now... ☐

2. 200+ Registry Hacks List

[new hacks added at the TOP]

- **2-25-25 Comprehensive Windows Registry Guide: also ➜ RegGuide.txt + RegGuide.pdf [updated frequently]**
- **7-7-20 Updated Win10/11 Tweaks + Fixes: also ➜ WIN10.TXT + WIN10.pdf [updated frequently]**
- **3-6-19 Updated Win8/8.1 Tweaks + Fixes: also ➜ WINDOWS8.TXT + WINDOWS8.pdf [updated frequently]**
- **2-12-18 Updated Win7/7 SP1 Tweaks + Fixes: also ➜ WINDOWS7.TXT + WINDOWS7.pdf [updated frequently]**
- **11-25-15 Updated Win7/8/8.1/10 Trick + Fix: also ➜ MDGx Win10 Block Tools (10_BLOCK)**
- **4-12-07 Updated Win9x/ME/IE5/IE6 Registry ©Trick: ADVANCED OPTIONS GALORE**
- **12-30-06 Updated Win98 SE Original Registry ©Trick: 98SE2ME: KILLER REPLACEMENTS: ME ➜ 98 SE [UPDATED 12-30-2006]**
- **7-3-06 Win9x/NT/2000/ME/XP/2003 Registry ©Trick: REGISTRY INCONSISTENCIES, CURIOSITIES + ODDITIES [part of this page]**
- **12-31-03 Win9x/ME Registry ©Trick: DELUXE CD PLAYER**
- **10-16-02 Win9x/NT4/2000/ME/XP/IE Registry ©Trick: SHOW FULL URL**
- **8-29-02 Win9x/ME Registry ©Trick: OPTIMAL VIDEO REFRESH RATE**
- **6-3-02 Win9x/NT4/2000/ME/XP/2003 Registry ©Trick: FIX COPY TO/MOVE TO/SEND TO**
- **6-3-02 WinNT4/2000/XP Registry ©Trick: NO POPUPS ON BOOT**
- **5-23-02 WinNT4/2000/XP/2003 Registry ©Trick: GET BACK YOUR CD/DVD**
- **5-8-02 Win9x/NT4 Original Registry ©Trick: PATCHED SHELL32.DLL BUG + FIX**
- **5-8-02 WinXP Registry ©Trick: TEACH XP NEW TRACKS**
- **1-29-02 WinNT4/2000/XP/2003/Vista/2008/7/8/8.1/2012 Registry ©Trick: TURN OFF NUMLOCK**
- **1-4-02 Win9x/NT4/2000/ME/XP/IE Registry ©Trick: KILL IE ABOUT: URLS**
- **1-4-02 Win2000/XP/2003 Registry ©Trick: 50 WAYS TO LEAVE YOUR MESSENGER :)**
- **12-12-01 Win9x/NT4/2000/ME/XP/2003/IE Registry ©Trick: FIX TASKBAR BUTTONS**
- **12-4-01 WinME Registry ©Trick: WINME WBEM (WINMGMT) BUG + FIX**
- **11-14-01 Win9x/ME Original Registry ©Trick: DETONATOR 22.XX BUG + FIX**
- **11-7-01 WinXP Registry ©Trick: AVOID XP REGISTRATION**
- **10-17-01 WinXP Registry ©Trick: WELCOME ADMINISTRATOR!**
- **8-21-01 WinNT4/2000/XP Registry ©Trick: AUTOREBOOT**
- **8-21-01 WinXP Registry ©Trick: COMMENTS? LINK**
- **8-9-01 Win2000/XP Registry ©Trick: REMOVE MOUSE SHADOW**
- **7-12-01 WinXP Registry ©Trick: WMP8 MP3 ENCODING**
- **7-12-01 Win9x/NT4/2000/ME Registry ©Trick: NETMEETING ADDRESS LIST**
- **6-28-01 Win9x/ME Registry ©Trick: FIX BUTTON SIZE**
- **6-28-01 Win9x/ME/IE/OE Registry ©Trick: REENABLE PRINTING**
- **6-13-01 Win9x/NT4/2000/ME/XP/2003/IE Registry ©Trick: BROWSING SPEEDUP**
- **6-13-01 Win2000/XP/2003 Registry ©Trick: INCREASE DNS CACHE**
- **5-17-01 Win2000 Registry ©Trick: PRIORITIZE PROGRAMS**
- **5-17-01 Win2000 Registry ©Trick: FASTER TELNET**

- 5-17-01 Win2000/XP Registry ©Trick: CHANGE SYSTEM FONT
- 5-2-01 Win9x Registry ©Trick: TIMED SHUT DOWN
- 4-26-01 Win9x/NT/2000/ME/XP Original Registry ©Trick: REG FILES [part of this page]
- 4-12-01 WinME Registry ©Trick: DISABLE SCANDISK ON BOOT
- 4-12-01 Win9x/ME Registry ©Trick: CACHE WRITE DELAY
- 3-28-01 Win9x/ME Registry ©Trick: MAXIMIZE NOTEPAD
- 3-28-01 Win98/2000/ME Registry ©Trick: REMOVE FIND ITEMS
- 3-15-01 WinME Registry ©Trick: CHANGE SYSTEM RESTORE DISK USAGE
- 2-28-01 Win2000/XP/2003 Updated Registry ©Trick: DISABLE FILE PROTECTION
- 2-28-01 WinNT4/2000/XP Registry ©Trick: ERROR MODE
- 2-28-01 Win9x/2000/ME/AIM Registry ©Trick: MORE AIM BUDDIES
- 1-31-01 Updated Win9x/NT4/2000/ME/XP/2003 Registry ©Trick: CPU PRIORITY [UPDATED 1-31-2001]
- 1-31-01 Win9x/NT4/2000/ME/IE Registry ©Trick: NEW IE SEARCH BUTTONS
- 1-4-01 WinNT4/2000/XP/2003 Registry ©Trick: DISABLE LAST NTFS ACCESS
- 12-13-00 Win9x/ME/OE Registry ©Trick: DELETE OUTLOOK PASSWORD
- 12-13-00 Win9x/ME/YM Registry ©Trick: CUSTOMIZE YAHOO MESSENGER
- 11-30-00 Win9x/NT4/2000/ME/XP/2003 Registry ©Trick: TWEAK WEB VIEW
- 11-30-00 WinNT4/2000/XP/2003 Registry ©Trick: SPLIT WINDOWS EXPLORER
- 11-7-00 Win9x/ME Original Registry ©Trick: INCREASE NETBIOS SECURITY
- 10-25-00 Win9x/ME Registry ©Trick: CLEAR MEDIA PLAYER HISTORY
- 10-18-00 Win98 SE Original Registry ©Trick: FIX WIN98 SE USB + SHUTDOWN ERRORS
- 10-18-00 Win2000/XP Registry ©Trick: OPEN WITH NOTEPAD FIX
- 9-25-00 Win9x/ME Registry ©Trick: UNKNOWN FILE EXTENSION
- 9-20-00 Updated Win9x/NT4/2000/ME/XP/2003 Registry ©Trick: BUGGY TWEAKUI 98 [UPDATED 9-20-2000]
- 9-5-00 Win9x/NT4/2000/ME/XP Original Registry ©Trick: REMOVE NETSCAPE AIM
- 8-24-00 WinME Registry ©Trick: UNINSTALL PCHEALTH + SYSTEM RESTORE
- 8-17-00 Win2000 Registry ©Trick: WEB BASED FTP
- 8-17-00 Win9x/IE Registry ©Trick: REMOVE SYSTEM FOLDERS
- 8-11-00 Win9x/2000/ME Registry ©Trick: 96-BIT VIDEO RESOLUTION
- 7-26-00 Updated Win9x/ME Registry ©Trick: CD-ROM/DVD + HARD DISK MAX CACHE
- 7-19-00 Win2000/XP/2003 Registry ©Trick: UDMA/66 ALL THE WAY
- 7-13-00 Win2000/XP/2003 Registry ©Trick: XDSL/CABLE MODEM SPEEDUP
- 7-13-00 Win2000/ME/XP Registry ©Trick: GRAB THE FOCUS!
- 6-21-00 Win9x Registry ©Trick: TELNET TWEAKS
- 6-14-00 Win9x Registry ©Trick: FASTER INTERNET
- 6-8-00 Win9x/NT4/2000/ME/XP/2003 Registry ©Trick: BRING BACK ATTRIBUTES COLUMN
- 6-8-00 Win9x/ME Registry ©Trick: ENABLE EDITFLAGS
- 6-1-00 Win98/98 SE Registry ©Trick: WIN98 GLOBAL RWIN TCP/IP BUG
- 5-18-00 Win9x/ME Original Registry ©Trick: ENABLE UDMA/RAID HARD DISK DMA
- 5-11-00 WinNT4/2000/XP Registry ©Trick: KEYBOARD + MOUSE BUFFER
- 5-4-00 WinNT4/2000/XP Registry ©Trick: BYPASS AUTOLOGON
- 4-28-00 WinNT4/2000/XP/2003 Registry ©Trick: DOS NAME COMPLETION
- 4-14-00 Win9x/ME Original ©Trick: SCANDSKW HIDDEN SWITCHES
- 4-6-00 Win9x/ME Original Registry ©Trick: DIRECTX TWEAKS
- 4-1-00 Win9x Registry ©Trick: FREE PROXY
- 3-23-00 Win9x/ME Original Registry ©Trick: WIN.INI DIRECTX + VIDEO SETTINGS
- 3-16-00 Win9x/2000 Registry ©Trick: DHCP VULNERABILITY FIX
- 3-8-00 Win9x/NT4/2000/ME/XP/2003/IE Registry ©Trick: IE CONTENT ADVISOR PASSWORD FIX
- 2-23-00 Win9x/ME Registry ©Trick: TASKBAR TRAY TEXT
- 2-23-00 Win9x/ME Registry ©Trick: TROJAN INFECTED *.EXE FIX

- 2-16-00 Win9x/ME Original Registry ©Trick: DIRECTX FIX WITH 2 3D VIDEO CARDS
- 2-16-00 Win9x/ME Registry ©Trick: DISABLE DEFRAG FILE ORDER
- 2-16-00 Win9x/ME Original Registry ©Trick: DISABLE NEW SHORTCUT
- 2-9-00 Win9x/IE Registry ©Trick: SAFE MODE ACTIVE DESKTOP
- 2-2-00 Win98/AOL Registry ©Trick: BACKUP WITH SCANREG
- 2-2-00 Win9x/IE4 Registry ©Trick: RESTORE IE4 NEW WINDOW
- 1-27-00 Win98 ©Trick: FIX DEFRAG
- 1-20-00 Win9x ©Trick: INF UNINSTALL
- 1-12-00 Win98/ME Registry ©Trick: WIN2000 COLOR SCHEME
- 12-29-99 Win9x/ME Registry ©Trick: LEGAL NOTICE
- 12-22-99 OSR2/98/2000/ME/XP/2003/Vista/2008/7/8/8.1/2012 Registry ©Trick: DELETE REGISTRY KEY/VALUE
- 12-15-99 Win9x/ME Original Registry ©Trick: MAX CACHE SPEED
- 12-15-99 Win9x/ME Original Registry ©Trick: UNATTENDED REGISTRATION
- 12-2-99 Win9x/NT4/2000/ME Registry ©Trick: FREE DVD PLAYER
- 12-2-99 Win9x Registry ©Trick: METAL BRIEFCASE
- 11-24-99 Win9x Registry ©Trick: UNCHECK OPEN WITH
- 11-18-99 Win9x/ME/IE Registry ©Trick: TOGGLE MENUS
- 11-12-99 Win9x/ME Original Registry ©Trick: FORCE ICON VIEW
- 11-2-99 Win9x/ME Original Registry ©Trick: MANAGE YOUR POWER!
- 10-21-99 Win9x/ME Original Registry ©Trick: DISPLAY CPL + DLL HIDDEN ICONS
- 10-14-99 Win9x/2000/ME/XP Registry ©Trick: TOOLTIP OFF
- 10-14-99 Win9x/NT4/ME/2000/XP/2003 Registry ©Trick: ALWAYS UNLOAD DLLS
- 10-7-99 Win9x/ME Registry ©Trick: FASTER 56K MODEM
- 9-30-99 Win98 SE/IE5 Registry ©Trick: 98 SE + NEW IE5
- 9-22-99 Win3.1x/9x/IE Registry ©Trick: IE BLANK PAGE OFF
- 9-15-99 Win3.1x/9x/NT/2000/ME/XP/2003 Original ©Trick: 3.1X/9X/2000/NT/ME/XP/2003 MULTIBOOT SWAP FILE
- 9-8-99 Win9x/OE5 Registry ©Trick: CHANGE OE5 IDENTITY
- 9-1-99 Win98 Registry ©Trick: WIN98 LOW DISK SPACE WARNING
- 8-24-99 Win9x/IE Registry ©Trick: TAME IE 4/5 CACHE FOLDERS
- 8-19-99 Win9x/OE5 Registry ©Trick: OUTLOOK EXPRESS 5 FOLDERS
- 8-11-99 Win9x Original Registry ©Trick: SOUND BLASTER LIVE! REGISTRY BUG
- 8-11-99 Win9x/NT4/2000/ME/XP/2003/IE Registry ©Trick: HTTP SERVER REQUESTS
- 8-5-99 Win9x/IE Registry ©Trick: CLEAR IE CACHE
- 7-27-99 Win9x/NT4/2000/ME/XP/2003 Original Registry ©Trick: HIDE YOUR DRIVES!
- 7-27-99 Win9x/OE Registry ©Trick: DISABLE OUTLOOK EXPRESS SPLASH
- 6-29-99 Win98 Registry ©Trick: MAPPED DISK CACHE
- 6-17-99 Win9x/ME/IE Registry ©Trick: START MENU COLUMNS
- 6-1-99 Win9x/ME/IE Registry ©Trick: CUSTOM IE TOOLBAR
- 6-1-99 Win98/ME/IE Registry ©Trick: STARTUP ORDER
- 5-19-99 Win9x/ME Registry ©Trick: WRITE BEHIND CACHE
- 5-19-99 Win9x/ME Registry ©Trick: SCREEN SAVER PASSWORD
- 5-4-99 Win9x/NT4/2000/ME/XP/IE Original Registry ©Trick: BROWSER CACHE IN MEMORY
- 5-4-99 Win9x/NT/2000/ME/XP Original Registry ©Trick: THE REGISTRY [part of this page]
- 5-4-99 Win9x/NT/2000/ME/XP Original Registry ©Trick: REGISTRY STRUCTURE [part of this page]
- 5-4-99 Win9x/NT/2000/ME/XP Original Registry ©Trick: REGISTRY EDITING RULES [part of this page]
- 5-4-99 Win9x/ME Original Registry ©Trick: REGISTRY BACKUP + RESTORE
- 5-4-99 Win9x/NT/2000/ME/XP Original Registry ©Trick: REGISTRY LINKS [part of this page]
- 4-20-99 Win98/ME Original Registry ©Trick: MAP THE CACHE

- 4-8-99 Win9x Registry ©Trick: QUICKVIEW ALL FILES
- 4-8-99 Win9x Registry ©Trick: FILE SYSTEM SYNCHRONIZATION
- 3-30-99 Win9x/ME/NT4/2000/XP/IE Registry ©Trick: BRANDED MS IE
- 3-30-99 Updated Win9x Original ©Trick: FLOPPY (OR ANY OTHER DRIVE) ACCESS ANNOYANCE! [UPDATED 3-30-1999]
- 3-24-99 Win9x/NT/2000/ME/XP Registry ©Trick: FORCED EXIT
- 3-24-99 Win9x/NT/2000/ME/XP Registry ©Trick: END TASK TIMEOUT
- 3-24-99 Win9x/ME Registry ©Trick: COOL SWITCH
- 3-2-99 Win9x Original MTU Registry ©Trick: FASTEST INTERNET 98 - PART 2
- 2-23-99 Updated Win98/ME Registry ©Trick: FASTER APP LOAD [UPDATED 2-23-1999]
- 2-18-99 Win98/ME Registry ©Trick: CLEAN DEFRAG
- 2-9-99 Win9x Registry ©Trick: IBM SCANNER "FIX"
- 2-9-99 Win9x Registry ©Trick: SPEAKER BEEP
- 2-2-99 Win9x Original Registry ©Trick: MODEM LOG OFF
- 1-27-99 Win9x AOL Registry ©Trick: AOL 4.0/5.0 MTU FIX
- 1-27-99 Updated Win9x Original AOL Registry ©Trick: AOL MAXMTU REVISITED [UPDATED 1-27-1999]
- 1-19-99 Win98/OSR2 Registry ©Trick: TURN OFF DMA!
- 1-5-99 Win9x Registry ©Trick: TAME THE BIN
- 12-29-98 Win9x/ME Registry ©Trick: RESTRICT LOGON ACCESS
- 12-25-98 Win9x/NT4/2000/ME/XP Original Registry ©Trick: ACTIVE WINDOW TRACKING
- 12-16-98 Win9x/IE4 Registry ©Trick: SAVE SETTINGS - PART 2
- 12-16-98 Win9x/OE Registry ©Trick: RENAME OUTLOOK EXPRESS TITLE
- 12-16-98 Win9x/ME Registry ©Trick: CHANGE TIME ZONE
- 12-7-98 Win98/2000/ME/XP/2003 Registry ©Trick: REGISTERED USER?
- 12-1-98 Win98 Registry ©Trick: WIN98: NO INSTALL CODE!
- 11-25-98 Win9x/ME/IE Registry ©Trick: IE FULL SCREEN BAR
- 11-4-98 Win9x/NT4/2000/ME/XP/2003/IE Registry ©Trick: RENAME MS IE TITLE
- 10-27-98 Win9x/NT4/2000/ME/XP/2003/Vista/2008/7/8/8.1/2012/10/IE Registry ©Trick: SYSTEM RESTRICTIONS
- 10-27-98 Win9x Registry ©Trick: OPEN WITH
- 10-20-98 Win9x/OSR2/IE4 Registry ©Trick: VANISHING EXPLORER COLUMNS
- 10-14-98 Win9x/ME/IE/AOL Original Registry ©Trick: URL PREFIX FIX
- 10-6-98 Updated Win95/MTU Registry ©Trick: HOW FAST CAN YOU GO? - PART 1 [UPDATED 10-6-1998]
- 10-6-98 Updated Win9x Original Registry ©Trick: HOW FAST CAN YOU GO? - PART 2 [UPDATED 10-6-1998]
- 10-6-98 Win98 Original Registry ©Trick: STRETCH WALLPAPER
- 9-28-98 Win9x Registry ©Trick: RIGHT-CLICK CAB EXTRACT
- 9-1-98 Updated Win9x Original MTU Registry ©Trick: FASTEST INTERNET 98 - PART 1 [UPDATED 9-1-1998]
- 8-19-98 Win9x/IE4 Original Registry ©Trick: MORE VISIBLE IE4 FONTS
- 8-11-98 Win9x Registry ©Trick: MOVE PROGRAM FILES
- 8-5-98 Win9x/ME Registry ©Trick: REMOVE "SHORTCUT TO"
- 7-21-98 Win9x Registry ©Trick: DEFAULT BROWSER - PART 2
- 7-21-98 OSR2 Registry ©Trick: BUS MASTER DMA - Part 4
- 7-15-98 Win9x/ME Original Registry ©Trick: CD-ROM/DVD MAX SPEED
- 7-9-98 Win98 Original Registry ©Trick: 98 ESSENTIALS
- 7-1-98 Win9x/ME/IE Registry ©Trick: UNCLUTTER START MENU
- 6-24-98 Win9x/NT4/2000/ME/XP/IE Registry ©Trick: IE AUTOSCAN
- 6-24-98 Win9x/NT4/2000/ME/XP/2003 Registry ©Trick: HIGH COLOR ICONS WITHOUT PLUS!
- 6-17-98 Win98 ©Trick: GIMME BACK MY REGISTRY!

- 6-7-98 Win98 Registry ©Trick: WIN98 CPU INFO
- 5-18-98 Win9x/ME Original Registry ©Trick: DITCH THAT SOUND ICON
- 5-18-98 Win9x Registry ©Trick: APPLICATION PATH
- 4-28-98 Win9x Registry ©Trick: DISABLE DNS FOR WINS RESOLUTION
- 4-28-98 Win95/OSR2 Registry ©Trick: INSTALL MS PLUS! 95 OVER MS IE 3/4/5
- 4-29-98 Easter Egg: HEARTS EASTER EGG
- 4-7-98 Win9x Registry ©Trick: CD-ROM KEYS
- 4-1-98 OSR2 Registry ©Trick: BUS MASTER DMA - Part 3: MORE BUGS + FIXES!
- 3-30-98 Win9x/ME Original Registry ©Trick: CONTIGUOUS FILE ALLOCATION SIZE
- 3-30-98 Win9x Registry ©Trick: EDIT THE BAT
- 3-30-98 Win9x/ME Original Registry ©Trick: SOURCE PATH CHANGE
- 3-16-98 Win9x/ME Registry ©Trick: NO MORE "CLICK HERE TO BEGIN"
- 3-11-98 Updated Win9x/ME Original ©Trick: SHRINK THE REGISTRY! [UPDATED 3-11-1998]
- 3-2-98 Win9x Registry ©Trick: MOVE WITHOUT REINSTALL
- 2-18-98 Win9x Registry ©Trick: DELETE DESKTOP ICONS
- 2-9-98 Updated Win3.1x/9x/NT4/2000/ME/XP/2003/Vista/2008/7/8/8.1/2012 Original Registry ©Trick: HARD DRIVE THRASHING
- 2-1-98 Win9x/ME Original Registry ©Trick: MODEM INITIALIZATION STRINGS
- 1-21-98 Win3.1x/9x/ME Original ©Trick: LOAD/RUN
- 12-30-97 Win9x Registry ©Trick: NEW TCP/IP SETTINGS
- 12-25-97 Win95/OSR2 Registry ©Trick: ACTIVE CORNERS
- 12-25-97 Win95 ©Trick: FRESH REGISTRY
- 11-3-97 Win9x Registry ©Trick: WALLPAPER POSITION
- 11-1-97 Win95/OSR1 Registry ©Trick: SAVE SETTINGS - PART 1
- 10-22-97 Win9x Registry ©Trick: DEFAULT BROWSER - PART 1
- 10-17-97 Win9x Registry ©Trick: REMOVE PROGRAMS
- 10-17-97 Win9x Registry ©Trick: RUN COMMAND HISTORY
- 10-5-97 Win9x Registry ©Trick: BEWARE, TROJANS!
- 10-5-97 Win9x/NTx Original Registry ©Trick: MENUSHOWDELAY
- 10-3-97 Win9x Registry ©Trick: MOVE STARTUP FOLDER
- 10-1-97 Win9x Registry ©Trick: DUN DIALING
- 9-16-97 Win3.1x/9x/NT4/2000/ME/XP/2003 Original Registry ©Trick: BLINK... NOT!
- 9-3-97 Win9x Registry ©Trick: KEEP IT SHORT/LONG
- 8-16-97 Win9x/ME Registry ©Trick: CLEAR DOCS & MORE...
- 7-29-97 Win9x Registry ©Trick: PERMANENT SETTINGS
- 5-5-97 Win9x/ME Registry ©Trick: PASSWORD CACHE... NOT!
- 3-3-97 Win9x/ME/IE Registry ©Trick: IE FONT FANCY
- 10-5-96 Win9x Registry ©Trick: NEW MENU
- 9-11-96 Win9x/ME Registry ©Trick: ICON BITMAP
- 8-8-96 Win9x/NTx Registry ©Trick: ANIMATED WINDOWS
- 7-30-96 Win9x Registry ©Trick: TRASH THE BIN
- 7-30-96 Win9x Registry ©Trick: KILL DA BIN!
- 7-30-96 Win9x Registry ©Trick: RENAME RECYCLE BIN
- 7-7-96 Win9x Original Registry ©Trick: RESTORE DAMAGED REGISTRY
- 5-3-96 Win9x Registry ©Trick: MIDDLE BUTTON
- 5-3-96 Win9x Registry ©Trick: OPEN NEW WINDOW
- 5-3-96 Win9x/ME Registry ©Trick: NAMENUMERICTAIL [+ WARNING!]
- 4-20-96 Win9x Registry ©Trick: MODEM TIMEOUT
- 3-25-96 Win9x Registry ©Trick: NOTEPAD FONT
- 3-11-96 Win9x Registry ©Trick: DOS MODE OPTIONS
- 2-2-96 Win9x/ME Registry ©Trick: INSTANT REFRESH
- 1-20-96 Win9x/ME Registry ©Trick: PERSONALITY CHANGE

- 11-11-95 Win9x/NTx Registry ©Trick: DITCH THOSE ARROWS!
- 11-11-95 Win9x/NTx Registry ©Trick: CHANGE ARROWS
- 10-10-95 Win9x/ME Registry ©Trick: NUMLOCK ON/OFF
- 9-15-95 Win3.1x/9x/ME Original ©Trick: DATE/TIME FUN
- 9-8-95 Win9x Registry ©Trick: NETWORK SERVER
- 9-2-95 Win9x Registry ©Trick: ADD NEW SOUNDS
- Win9x/ME Version: WHICH 9X/ME VERSION/BUILD ARE YOU USING?
- Win9x/ME Specs: 95 → 98 → ME COMPLETE SPECS + FEATURES

Back 2 Hacks List

Back 2 Contents

©1996-2026 MDGx (a.k.a. AXCEL216): Everything here at MDGx.com, except for my ©photos, is FREEware.
Always free of ad(vertisement)s, cookies, tracking, malware + spyware.
I have created [August 1996], maintain and update these web pages entirely by hand using Programmer's File Editor [replaced Notepad].
I am not affiliated with, don't advertise/promote, speak on the behalf/name of, nor work for any for profit business/entity.
All ©copyrights and ®registered ™trademarks retain owners' property.

