README.TXT
Realtek Semiconductor Corp. AC'97 Sound SystemSoftware   ver:A3.88
Installation and Setup

Driver & Application Installation/Removal Procedure For Realtek AC'97 Codec:
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<<< For Win2000/WinME/WinXP (WDMdriver)/Win98 Gold(First Edition)/Win98SE >>>

Setup Driver/Application at first time:

Step 1. Before installing the Realtek AC'97 Drivers & Applications, Press the
         [Cancel] button if Windows detect the PCI Multimedia Audio device.

Step 2. Insert the "Realtek AC'97 Drivers & Applications" CD into the CD-ROM
         drive and run the setup.exe programto finish the installation.

Step 3. Click on [Next/OK/Go] to continue the procedure. If the Windows popup
         "Digital Signature Not Found" message, press [Yes] to continue the
         installation.

Step 4. Finally, select to restart the systemand press [Finish] to complete
         the installation.

         The systemwill reload the drivers and do some adjustments in the INF
         file if so required.

Setup for Manual
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1.   Double-click the "System" icon to open the "SystemProperties" dialog fromControl Panel .
2.   Choose "Hardware" tab and click the "Device Manager" button .
3.   Please right-click mouse on "MultiMedia Audio Controller" and choose the "Properties" menu item
     to show the driver details.
4.   Click the "Driver" tab and then click the "Update Driver..." button for update.
5.   Please follow the instructions of the "Upgrade Device Driver Wizard".
6.   Choose "Search for a suitable driver for my device" and click the "Next" button.
7.   Please specify the driver location/source and then click the "Next" button in this case,
     "Specify a location" has been chosen.
8.   If "Specify driver location" is chosen, the Wizard will ask for the path where the driver is located.
9.   Click the "Next" button to install Audio Driver on "Driver Files Search Results".
10. If the "Digital Signature Not Found" dialog is opened, click the "Yes" button to continue
     the Installation.
11. After completing the above steps, the drier has been installed into the system
     Please click "Finish" button to complete the installation.

Update Driver/Application:

Step 1. Follow Step 2,3,4 described in [Setup at first time] above to complete
         the procedure.

Remove Driver/Application:

Step 1. Go to Start\Settings\Control Panel.

Step 2. Select [Add/Remove Programs] icon.

Step 3. Select "Realtek AC'97 Audio" and press [Change/Remove]
         button.

Step 4. Click on [Next/OK/Go] to finish the uninstallation.

Step 5. At the end of the procedure, select to restart the systemand press
         [Finish] to complete the uninstallation.

<<< For WinNT 4.0 (NT4 driver) >>>

Setup Driver/Application at first time:

     Ignore Step 1, and follow the same procedure in Win2000/WinME/WinXP.

Update Driver/Application:

     The same procedure in Win2000/WinME/WinXP.

Remove Driver/Application:

     The same procedure in Win2000/WinME/WinXP.

<< Other Informations >>

Silent Installation:

Run "Setup -s -f2<path\LogFile> -z[-rp<path\LogFile>]"
i.e. setup -s -f2c:\mylog.log -z[-rpC:\RHDSetup.log]

Note: 1. AVRack only works fine under WinNT 4.0 after installing
         Service Pick 3 or later.
      2. Please update Directx version to DirectX8.0 or above.

Version Informations:

WDM driver for Win98/WinMe/Win2000/WinXP   : 5.10.0.6080
WDM driver for Windows x64   : 5.10.0.6080
VXD driver for Win95   : 4.5.0.3019
VXD Software wavetable driver   : 3.1.0.0
NT4 driver for Windows NT4   : 4.3.0.3040
NT4 software wavetable driver   : 4.3.0.2002

RtlRack for Win98/Me/2000/XP   : 1.15.0.0
AvRack for Win95/NT4   : 2003.4.4.1

Realtek Soundman   : 5.1.0.52
Realtek Sound Effect Manager(CPL)   : 2.2.0.60
Realtek Sound Effect Manager(RtlCpl)   : 1.0.1.60
Realtek Sound Effect Manager for NT4   : 2.3.0.3

Driver/Application Setup Program   : 5.23

History:

A3.88 -
1. For special customize settings
2. Update Realtek 3D engine.
3. Fix delay issue in starting Windows.

A3.87 -
1. Update Realtek 3D engine.
2. For special customize settings.

A3.86 -
1. For special customize settings.

A3.85 -
1. Update Realtek 3D engine.
2. For special customize settings.
3. For Fujitsu power management issue.
4. Write installation progress and result to "C:\ALCSetup.log" within silent mode .
5. Assign log file name and path for silent mode program issue .
6. Upgrade setup program to IS11.5 .

A3. 84 -
1. For special customize settings.

A3. 83 -
1. Support Sensaura filter driver.
2. For AC3 SPDIF issue when modem is present in ATI chipsets.
3. For special customize settings.

A3. 82 -
1. Fix 8-channel line-out noise issue in NVIDIA chipsets.
2. Update Realtek 3D engine.
3. For special customize settings.

A3. 81 -
1. Fix 8-channel noise issue for NVIDIA chipsets.
2. Fix "World Of Warcraft" game noise issue in ATI chipsets.
3. Update Realtek 3D engine.
4. For special customize settings.

A3. 80 -
1. For special customize settings.
2. For modem remote wake up issue in ALI chipsets.

A3. 79 -
1. Manual setup driver setting "Add and remove program" .
2. For special customize settings.

A3. 78 -
1. For special customize settings.

A3. 77 -
1. For special customize settings.
2. Update audio 3D engine.
3. Roll Back driver problem.
4. Delete oeminf file for realtek in Windows x64 .

A3. 76 -
1. For special customize settings.
2. Fix pop noise for ATI chipsets.
3. Fix recording noise when below 48K samplerate.
4. Fix C3 state issue for ATI chipsets.
5. For ALI 1689 chipsets can't record continue after power resume.
6. Make driver package to be 8.3 format.
7. Setup Package-Delete older inf file (alcxwdm?.inf) for updating driver.
8. Setup Package-General inf file name change to "Alcxau.inf" .

A3. 75 -
1. For special customize settings.
2. Update Realtek 3D engine.
3. Support for the WMA Pro-over-S/PDIF Format.
4. Support DTS function for ALC850.
5. Fix ALI 1689 chipsets can't record continue after power resume.
6. Fixed driver package can't be removed on WinME.

A3. 74 -
1. For special customize settings.
2. Fix SPDIF stream hang up by playing DVD.

A3. 73a -
1. Driver general inf.
2. Setup package application size and progress backward problem.
3. Fixed driver package can't be removed on win98se .
4. HCT Scan on windows x64 os .

A3. 73 -
1. For special customize settings.
2. Support codec ALC653.
3. Fix record from SPDIF IN have noise in hyper-thread mode.

A3. 72 -
1. For special customize settings.
2. Modify initiate of DMA buffer allocate.
3. Fix abnormal THD-N performance on A-D test.

A3. 71 -

1. For special customize settings.
2. Fix HCT 12.1 DRM test fail issue.
3. Fix playback and record could not been played in the same time issue for ATI and nVidia chipsets.

A3.70 -
1. Add some customized settings.

A3.69 -
1. Add some customized settings.
2. Add SPDIF IN pass throuth SPDIF Out item for some of ATI and nVidia chipsets.
3. Fix AC3 SPDIF blue screen issue when SPDIF-out force to 44K
4. Change DMA Threshold from 06 to 10 to decrease noise for ATI SB400 chipset.
5. Update 3D engine to fix Half Life 2(Game) no sound issue and some noise issues.

A3.68 -
1. Add some customized settings.
2. Change DMA operation mode.
3. Fix SPDIF out issue for ALI1573 and ALI1689.
4. Fix SPDIF no output issue for digital and analog output mode in ALC658.
5. Fix SPDIF noise or no output issues in nVidia chipsets.
6. Fix audio can't be test in 3D Marks.
7. Fix UT2004 game noise issue.

A3.67 -
1. Add some customized settings.
2. SPDIF-out goes to AClink slot 6/9 for ATI SB400 when modem present.
3. Add New feature: Disable Analog CD.
4. Fix issue : mono-out volume synchronize with Master volume for ALC655 force 2 channel mode.

A3.66 -
1. Add some customized settings.
2. Enable Present ICH DMA hang up function in default.
3. Fix WarcraftIII game noise issue.
4. Add a new feature : Don't power taggle PR3 for ALC655 and ALC850.
5. Support swapping center Left function for nVidia CK804 chipset.
6. Support WHQL for nVidia CK804 chipset.

A3.65 -
1. Add some customized settings.
2. Fix SPDIF OUT no sound for ALC650 codec after power resume.

A3.64 -
1. Add some customized settings.
2. Update Realtek 3D engine.
3. Support AC3 SPDIF and 8 channels for nVidia CK804.
4. Fix EAPD issue after S1 or S3 resume.
5. Fix getposition not accearate for ATI chipsets.

A3.63 -
1. Add some customized settings.
2. Fix underrun noise issue by changing threshold value for ATi chipset.
3. Fix 'Winbench' application issue in 4 channel mode when Sensaura engine is disabled.

A3.62 -
1. Add some customized settings.
2. Fix SPDIF Copy protect issue in Mediaplayer.
3. Support AC3 SPDIF and 8 channels for Ali1689 chipsets.
4. Reduce POP noise with EAPD for power change.

A3.61 -
1. Add some customized settings.

A3.60 -
1. Add some customized settings.
2. Add workaround code when pause DMA engine for ICH6 / Hance Rapid.
3. Fix bug for "Force 44K SPDIF" feature when disable direct sound acceleration engine.
4. Set Surr-out pin as HP-out pin for ALC655 when disable multi-channels function.

A3.59 -
1. Add some customized settings.
2. Add channel status information of SPDIF output for ATi chipset(SB150/SB200/SB250).

A3.58 -
1. Add some customized settings.
2. Fix some UI issues for Realtek control panel.

3. Fix some issues for ATi chipset(SB150/SB200/SB250).
4. Solve pop noise for noise suppression feature.

A3. 57 -
1. Add some customized settings.
2. Fix some issues for the certain page of control panel.

A3. 56 -
1. Add some customized settings.
2. Update directsound acceleration engine.
3. Fix the issue which control panel shows the improper item in
   "Microphone" tab under some situation.

A3. 55 -
1. Improve the algorithm of Jack sensing.
2. Add some customized settings.
3. Support ICH6.
4. Improve the algorithm for ALC250 Hardware EQ feature.
5. Fix the issue which AUX volume register will be set the improper value.
6. Improve the algorithm of Noise suppression feature.
7. Fix SPDIF output issue for "WaveCyclic" architecture.

A3. 54 -
1. Add some customized settings.
2. Support Microphone Noise Suppression feature.
3. Toggle Vref before change Microphone jack type for AC97 2.3 codecs.
4. Modify Peak filter parameters for ALC655.

A3. 53 -
1. Add some customized settings.
2. Add "Remove recording DC offset" feature.
3. Fix Hardware EQ noise issue for ALC250.
4. Support 1 nVidia chipset (CK8).
5. Add workaround code for ATI chipset recording issue.
6. Support 8 channels playback feature for nVidia chipset with ALC850.
7. Fix the issue about SPDIF function type feature with ALC850.
8. Modify Peak Filter parameters for ALC655 and ALC850.
9. Fix side channel noise issue for VIA chipset with ALC850.
10. Add a new feature: SPDIF out can be sent to ACLink for ATI and nVidia Chipset.
11. Fix SPDIF slot assignment error for ALC850.
12. Support "Smart GPIO Volume Control" & "DC Voltage Volume Control" features for ALC250 and ALC203.
13. Turn on bit 14 of DC97_AUDIO_REG_INTERRUPT_ENABLE while audio playing for ATi chipset.
14. Add flexibility for "Preventing ICH hang up" feature.
15. Improve DirectMusic startup latency when HyperThreading was enabled.
16. Fix Pinball delay problem on Win2000.
17. This vesion does not include ALi 1535 chipset support.

A3. 52 -
1. Add some customized settings.
2. Fix SPDIF output frequency issue for nVidia chipset.
3. Disable Hardware EQ first before restore Hardware EQ for ALC250 when resuem
4. Disable Hardware EQ first before restore Hardware EQ for ALC250 polling function.
5. Turn on UAJ function for ALC850.
6. Set SPDIF control register to proper value when driver initialize.
7. Improve Read/Write codec register algorithm
8. Reduce resume time.
9. Add "Remove Recording DC offset" feature.
10. Check ALC850 JD5 to decide if support 8-channels feature.
11. Fix SPDIF output slot assignment error for ALC850.

A3. 51 -
1. Add ICH2, ICH3 and ATI Chipset IDs.

A3. 50 -
1. Support ALC850.
2. Add some customized settings.
3. Use "Wave PCI" architecture for ATI chipset.
4. Improve Jack Sensing algorithm to eliminate noise.
5. Show "Real-Time SPDIF-in Monitor" mode for nVidia chipset.
6. Remove ICH2/ICH3/ATI chipsets IDs.
7. Change JD bit definition of Front-out detection function for ALC658 (C version / D version).
8. Set "Direct DAC Mode" to Summation of DAC and analog inputs if H/w EQ is bypassed for ALC250.

A3. 49 -
1. Modify some customize settings.

2. Fine tune some registers for ALC655 to avoid noise.
3. Fine tune Surround DAC Volume and Center/LFE DAC volume for ALC655.
4. Set ALC655 Vrefout as 4V for 1 customer.
5. Fix Intel audio device DMA hang up issue for some customers.

A3.48 -
1. Add some customize settings.
2. Turn on "Ignore SPDIF in Invalid Bit" option as default if codec support.
3. Set Pin 47 as EAPD pin and turn off SPDIF in function as default for ALC250&ALC203.
4. Use "WaveCyclic" architecture under Windows 98 Gold version.
5. Modify Realtek control panel that don't detect UAJ automatically
   while Windows start for some customer's request.
6. Fix the failures on HCT 9.6 (WinME) "KS Position Accuracy" test.
7. Fix the problems with SPDIF output through DirectSound.
8. Prevent potential discontinuities in 8-bit streams.
9. Prevent potential audio systemhangs on badly behaved audio drivers.

A3.47 -
1. Add some customize settings.
2. Turn off SPDIF-In Schmitt Trigger Control for ALC655.
3. Fix the problemthat AC3 streamwill hang with the older revision of VIA8233 under Win98 SE.
4. Fix the problemthat AC3 streamwill be abnormal with Direct sound API.
5. Add hand-shaking protocol between audio driver and modemdriver for ATI chipset.
6. Disable "Mic2 Select" node in mixer for ALC655/ALC658.
7. Fix the bugcheck D1 in HCT verifier for nVidia chipset.

A3.46 -
1. Add some customize settings.
2. Add Hardware EQ function for ALC250.
3. Support independent SPDIF engine for nVidia CK8 chipset.
4. Modify driver for UAJ function.
5. Modify UAJ thresholds for ALC658.
6. Fix audio driver bug for ATI chipset.
7. Fix audio driver bug about nVidia independent SPDIF engine.
8. Change direct sound acceleration engine.(New engine require DirectX 8.1 under Windows 98 SE).

A3.45 -
1. Add some customize settings.
2. Reduce resume time for VIA chipset.
3. Modify mixer volume control algorithmfor multi-channels codec to prevent
   the value of mixer out of range.
4. Implement ATI dedicate SPDIF DMA engine.
5. Support ALC250 and ALC658.
6. Fix the problemthat Jack Sensing will hang in Windows 98SE.
7. Fix ICH5 pause DMA issue.

A3.44 -
1. Support independent SPDIF engine for nVidia MCP2 chipset under Windows 98 SE.
2. Improve the initialize procedure and the DMA access algorithmfor VIA chipsets.
3. Add some customize settings.
4. Apply the Channel Order and FIFO Flush procedure for ATI A41 chipset.

A3.43 -
1. Support ALC203 UAJ function.
2. Add some customize settings.
3. Support independent SPDIF engine for VIA 8233 (Only for never chipset version) under Windows 98 SE.
4. Fix hang up issue when systemsuspend for Ali 1563 chipset.
5. Fully support Jack sensing function with multiple language.
6. Fix Jack sensing problemwith DirectX 6.1.

A3.42 -
1. Support ALC655.
2. Modify driver for some customized settings.
3. Add SPDIF function for nVidia chipsets.
4. Zero recording data when recording gain is muted.
5. Support independent SPDIF engine for VIA 8233 (Only for never chipset version).

A3.41 -
1. Modify driver for some customized settings.
2. Support ATI SB200 south bridge.
3. Support Intel ICH5 south bridge.

A3.40 -
1. The setting of switching Center/LFE is saved before systemis shut down, restored after systemboot
up.

2. Fix click noise generated by playing short time wave.
3. Fix some problem about AC3 stream for VIA chipset.
4. Add some customize settings.

A3.38 -
1. Fix some problem for Ali 1563 chipset.
2. Set 1 timer to check SPDIF in status for ALC650 ver. F
3. Save playback volume value to registry key when the mixer is adjusted.
4. Combine Cyclic WDM driver and PCI WDM driver.

A3.37 -
1. Update DirectSound 3D Positional Audio Engine to fix some noisy problem for
   some DirectSound3D game (like Unreal Tournament 2003).
2. A3D compatible
3. Correct the gain settings of master volume for ALC650 ver.F

A3.36 -
1. Restore AC97REG_EXT_AUDIO_CTRL value first when resuming from suspend.
   Otherwise, Sample rate can't be restored because VRA was not enabled.
2. Support 6-bits capability for Master Volume control if hardware support it.
3. Also set GPIO for Jack Sharing with ALC650 ver.E execept some special models.
4. Add 1 customized settings "Disable3DDepthLine" to disable 3D Depth mixer Line.

A3.35 -
1. change company name from "Avance" to "Realtek".
2. add some new ID of motherboard
3. change some default settings for specific models

A3.32 -
1. compensate the gain for 3D sound when 2 speaker mode was selected.
2. support memory I/O for ICH4/ICH5 chipset
3. support SPDIF AC-3 playback using DirectSound API for ICH4/SiS chipset
4. correct DataRange declaration of S/PDIF pin to avoid blue screen on Win2000
   with DirectX 8.1 installed.

A3.30 -
1. turn on/off EAPD by GPIO for specific model
2. correct EAX initial setting.
3. support I3DL2 interface
4. fix wake on ring problem
5. support DirectSound 3D positional audio by using HRTF algorithm
6. Add "Loudness" control for ALC202/ALC202A.

A3.29 -
1. Add "S/PDIF IN/OUT Pass-Through" mode for specific model
2. fix S/PDIF-In Realtime monitor noise issue
3. fully support EAX compatible sound effect
4. fix S1 suspend/resume failure problem for some specific model using SiS audio controller
5. only disable "3D depth" line for specific model
6. duplicate analog input source according to output channel mode
7. support DirectSound hardware acceleration features by default
8. fix WinDVD problem when enabling video acceleration

A3.26 -
1. Improve compatibility with Agere software modem
2. Improve recording quality when IDE was in PIO mode.
3. Remove 3D Depth mixer line for some models

A3.23 -
1. Add "Loudness" mixer control for ALC650 front channel.
2. Add "SPDIF in pass through to SPDIF output" option for specific model.
3. Remove 3D depth mixer line.
4. Improve compatibility with WinDVD 4.0 playing AC3 bit stream through DirectSound API.
5. Improve recording quality for some specific models.

A3.22 -
1. Support S/PDIF-In function for ALC650 ver.E

A3.21 -
1. Fix Front Mic problem
2. Turn off "Analog input bypass to surround" when enter D1 mode.
3. Change back the default volume of Master to the middle position.
4. Add "EnableDCVoltageControl" customized option for ALC202/ALC202A.
5. Support customized DirectSound 2D/3D Acceleration (bypass kmixer).
   Add "EnableDS3DLibrary" customized option to enble it.

It is turned off by default.
6. Add "PreventRegisterReset" customized option for VIA8233.
7. Only ALC201 series and ALC650 series can use "Enable 3.3V support" customized option. For ALC202/A, it is work automatically.
8. Reset DMA when change state to Pause for ICH4 to fix HCT DirectSound failure in WinMe.

A3.13 -
1. To avoid mapping lost on Win98SE by raising IRQ level and adding TagCount before get mappings.
2. Disable "Phone Line" for some specific models.
3. Improve S/WSRC (if needed) quality to meet PC99 requirement.
4. Mute SPDIF while master volume was muted.
5. Improve EAX 1.0 compatible issue.

A2.94 -
1. Modify mixer control for multichannel output - master/front/surround/center/subwoofer line.
   a. The master volume/mute control will adjust all of front/surround/center/subwoofer volume/mute now to avoid confusion.
   b. The independent front/surround/center/subwoofer line offer volume control to balance the multichannel output.
2. Support "Front Mic" instead of Mic2.
3. Support Center and LFE output swap function.
4. Turn off analog input pass to surround function when suspend.
5. To avoid mapping lost on Win98SE (it can also fixed by QFE).
6. Improve S/WSRC (if needed) quality to meet PC99 requirement.
7. Mute SPDIF while master volume was muted.

A2.84 -
1. Support ALC650.

A2.82 -
1. Support ICH4
2. Implement workaround for Intel 440MX audio controller
3. Set analog CD Maximum volume to 12dB.

A2.81 -
A2.80 -
1. Remove "SPDIF SRC" Node if turn on "Enable 48K SPDIF" option.
2. Turn on "Saving LED power" feature for G version
3. Save/Restore AC97 extended registers when Suspend/Resume
4. Modify Servie() function for set SPDIF Invalid bit.
5. Modify data 0 insertion method for SPDIF.
6. Fix C3/C4 issue.

A2.73 -
1. Support ALC202A.

A2.71 -
A2.70 -
1. set CD Maximum volume to +12dB.

A2.62 -
A2.61 -
A2.60 -
1. Fix 48KHz if SPDIF SRC was enabled.
2. Fix NT4 driver for IRQ sharing on VIA8233A

A2.58 -
1. Support ALC101.

A2.56 -
A2.55 -
1. update VXD driver for VIA8233A.

A2.53 -
A2.52 -
1. Support VIA8233A audio controller.
2. Eliminate the PCM noise while playing AC-3 stream through SPDIF-out.
3. Power down EAPD when master volume mute.
4. Fix HCT full duplex unstable problem for VIA8233 audio controller.
5. The driver now support only VID/DID/SVID/SSID entry for WHQL requirement

A2.51 -
A2.50 -
1. Fix HCT ACPI stress device I/O test for VIA8233.
2. Improve compatibility with software modem for power management.

A2. 48 -
1. The driver now support the VID/DID entry

A2. 46 -
1. Add customized options.
2. Mute volume when volume slider was adjusted to the bottom

A2. 45 -
1. Support ALC201A.
2. The driver only support the VID/DID/SVID/SID entry to meet the INF requirement for PCI devices for WHQL logo.

A2. 43 -
1. Add SPDIF Mute control and SPDIF SRC On/Off control.
2. Modify 3D depth control behavior.
   When the slider was adjusted to the bottom,
   the 3D depth will be turned off.
3. Sound Effect Control Panel now installed by setup program
   It will not be installed with INF file.
4. AvRack support CD track auto-load function.

A2. 42 -
1. Add Mc2 select control
2. Improve MR card compatibility
3. Change volume default settings

A2. 40 -
1. Enable ALC201 3.3V function (INF optional)
2. Auto Power down DAC/ADC (INF optional)
3. Avoid scandisk problem on some machines
4. Fix HCT systemtest for VIA 686 (ACPI / Stress Device I/O)
5. Change version number to 5.10.00.xxxx for WinXP versioning requirement
6. Save/Restore recording mux setting
7. Improve compatibility with PCTel MR card
8. Fix hang problem while burn-in PowerDVD on some machines.
9. Fix IBM ViaVoice Mixer problem
10. Add MC 20dB Boost control on recording MC source line
11. Add Subsystem IDs