

Description

= ISA SOUND CARD OVERVIEW = An incomplete overview of PC Soundcards for the ISA bus, as offered from around 1988 to 2000. By GB 23-11-2010, v1.08, reachable at <http://vogons.zetafleet.com> Data obtained from many datasheets, drivers, catalogues, internet articles and pictures, as well as some actual soundcards. In each category the items are normally listed from earliest releases at the top, on to the latest items at the bottom. Suggestions and Corrections are welcome. ESS ISA CHIPSETS (Audiocard Series:) ----- ES488 Controller+Codec 8-bit stereo, SB Mono compatible. ES688 (common) Controller+Codec 16-bit 44KHz, joystick support, software TSR MPU-401, Half-Duplex, No hardware volume. ES1488 Controller+Codec 16-bit 44KHz, ? ES1688 (common) Controller+Codec 16-bit 44KHz, Integr. OPL3 clone, MPU-401, joystick support, Half-Duplex, No hardware volume. ES1788 Controller+Codec 16-bit 44KHz, Integr. OPL3 clone, MPU-401, PnP, dual joystick, Half-Duplex. ES1888 / ES1887 Controller+Codec 16-bit 44KHz, Integr. OPL3 clone, MPU-401, PnP, dual joystick, Full-duplex. ES1868 (common) Controller+Codec 16-bit 44KHz, Integr. OPL3 clone, MPU-401, PnP, dual joystick, Full-duplex, IDE. ES1869 Controller+Codec 16-bit 48KHz, Integr. OPL3 clone, MPU-401, PnP, dual joystick, Full-duplex, IDE, Spatializer 3-D VBX. ES1878 Controller+Codec 16-bit 4?KHz, Integr. OPL3 clone, MPU-401, PnP, dual joystick, Full-duplex. ES1879 Controller+Codec 16-bit 4?KHz, Integr. OPL3 clone, MPU-401, PnP, dual joystick, Full-duplex, Spatializer 3-D VBX. ES938 Audio Effects Processor (mixer expansion) for Chips without integrated 3-D audio processing. ES968F Audio Effects Processor (mixer expansion) for Chips without integrated 3-D audio processing. ES689 Wavetable Music Synthesizer chip, 32 voices simultaneously at 44.1 kHz CD-quality ES98X for ES689, wavetable sample set ROM, from InVision Interactive, GM, 128 melodic instruments, 47 rhythm instruments. ES690 Wavetable Music Synthesizer chip, chorus+reverb, 52-pin PQFP package, APM, ES981 for ES690, 1MB Wavetable Sample Set ROM ES692 Wavetable with 1MB ROM, GM, 128 melodic instruments, 32 voices, 16-bit, 44.1 kHz. -All chipsets except the 488 are very SB/SBPro compatible. They also claim WSS compatibility. -All chipsets often used as on-board Mainboard/Laptop sound systems. Only the ES1868 is found on high-end soundcards. CRYSTAL ISA RELATED CHIPSETS (only the most common:) ----- CS4231(A) Codec 16-bit 48KHz, WSS Compatible, ADPCM, Full Duplex. CS4248 Codec 16-bit 48KHz, WSS Compatible, ADPCM, Full Duplex (as CS4231 without pulse code modulation compression/decompression). CS9233 See Dream SAM9233. CS8905 See Dream SAM8905. CS4232 Controller+Codec 16-Bit 48KHz, PnP, SB/SBPro/WSS/MPU-401 compatible, IDE. CS4236 Controller+Codec 16-Bit 48KHz, PnP, SB/SBPro/WSS/MPU-401 compatible, IDE, Integr. OPL3 clone. CS4236B Controller+Codec 16-Bit 48KHz, PnP, SB/SBPro/WSS/MPU-401 compatible, IDE, Integr. OPL3 clone, WT digital interface. CS4237B Controller+Codec 16-Bit 48KHz, PnP, SB/SBPro/WSS/MPU-401 compatible, IDE, Integr. OPL3 clone, WT digital interface, SRS 3D Sound. CS4235 Controller+Codec 16-Bit 48KHz, PnP, SB/SBPro/WSS/MPU-401 compatible, IDE, Integr. OPL3 clone, low cost. CS9236 Integrated Wavetable music synthesizer, GM, without DAC, also available as socket upgrade option, Reverb+Chorus, 1997. -Cirrus Logic acquired Crystal Semiconductor in 1991. -Crystal CS9233 and CS4232/4236 require DOS initialisation for the MPU-401 to work in windows. -CS4236B does not have the above issue. the rev B chips also have a 'Wavetable Digital

Interface'. -The interface chipsets are used as on-board Mainboard/Laptop sound systems. All chipsets can be found on both low-cost and high-end soundcards. DREAM/ATMEL ISA RELATED CHIPSETS (only the most common:) -----SAM9233 Integrated Wavetable music synthesizer, DSP, 18-bit, MPU-401, Reverb+chorus, GM/GS. SAM8905-1 Programmable Effects processor, optionally used next to the SAM9233. SAM9203 As SAM9233, but this one is an older revision in a larger package. SAM8905 As SAM8905-1, but this one is an older revision in a larger package. SAM9407 Single chip sound studio, usually used as a Wavetable music synthesizer using custom samples loaded in attached RAM. SAM9733 Integrated Wavetable music synthesizer with effects. CleanWave8 ROM 1MB sample set. CleanWave16 ROM 2MB sample set, 128 GM instruments + 159 variations, 9 drumsets. CleanWave32 ROM 4MB sample set, 128 GM instruments + 195 variations, 9 drumsets + 1 SFX-set. CleanWave64 ROM 8MB sample set. GMS931601+GMS931600 ROM 4MB sample set, GM/GS, based on 'illegally copied' and later 'licenced' Roland SoundCanvas samples. ANALOG DEVICES ISA CHIPSETS -----AD1845 JP SoundPort Codec 16-Bit 50 kHz Stereo, WSS Compatible, Pin Compatible with AD1848, AD1846, CS4248, CS4231. AD1848 JP/KP Soundport as above, the core of the actual Windows Sound System sound cards (next to an OPL3). AD1816 SoundPort Controller+Codec 16-Bit 55kHz Stereo, SBPro/WSS Compatible, MPU-401 MIDI Port, Integr. OPL3 clone, PnP. OPTi ISA CHIPSETS -----82C928 MAD16 Controller (big chip, replaced by 82C929). 82C929 MAD16 Pro Controller, SBPro/WSS/MPU-401 compatible, M-CD. 82C941 Midi Synthesizer 'QDSP', max 32 voices at 44.1KHz, Supports up to 16Mx8 sampling memory. 82C924 Controller, SBPro/WSS/MPU-401 compatible, PnP, IDE, M-CD. 82C925 Controller, SBPro/WSS/MPU-401 compatible, PnP, IDE, M-CD, Integr. OPL3 clone. 82C930 Controller+Codec 16-Bit, SBPro/WSS/MPU-401 compatible, IDE. 82C931 Controller+Codec 16-Bit, SBPro/WSS/MPU-401 compatible, PnP, IDE, Integr. OPL3 clone. 82C933 Controller+Codec 16-Bit, SBPro/WSS/MPU-401 compatible, PnP, IDE, Integr. OPL3 clone, 3D sound. -924/928/929/930 used in several variants of the OPTi MAD16 soundcard. -MAD16 is related to the OAK OTI-601 / OTI-605 'Mozart': The Mozart chip was developed by OAK and Media Chip, the latter now owned by OPTi. -Creative Labs bought OPTi's sound division around 1997 (not sure on the year). C-MEDIA ISA CHIPSETS -----ASC-9308 Controller, SB/SBPro compatible (Still named 'Compumedia', also gives nearly useless SB16 compat.). DSP-9309A Accompanies ASC-9308, maybe for MPU-401 support? CMI8328 Controller+Codec, MPU-401, ? CMI8330(/A) Controller+Codec, SB/SBPro/SB16+WSS+MPU-401 compatible, Integr. OPL3 clone, PnP, S/PDIF input/output. -CMI8330 also used on mainboards from PC-Chips and Asus, but labeled 'Soundpro'. AVANCE LOGIC ISA CHIPSETS -----ALS007 ALS100 ALS110 ALS120 OPL3 clone. ALS200 OPL3 clone.

Controller+Codec, SB/SBPro/SB16/MPU-401 compatible, PnP, IDE. Controller+Codec, SB/SBPro/SB16/MPU-401 compatible, PnP, IDE. ? Controller+Codec, SB/SBPro/SB16/MPU-401 compatible, PnP, IDE, Integr. Controller+Codec, SB/SBPro/SB16/MPU-401 compatible, PnP, IDE, Integr.

-Avance Logic has since been acquired by Realtek. -Some chips probably rebranded by Diamond Multimedia for their soundcards. YAMAHA ISA RELATED CHIPSETS -----OPL2/YM3812 FM

chip, 9 channels, mono. OPL2/YM3812-F FM chip, 9 channels, mono. (smaller package, sized like OPL3)
OPL3/YMF262 or YMF262-M FM chip, 18 channels, simple stereo (hard left, center or hard right).
OPL4/YMF278 FM+Midi chip with a max of 4MB addressing space. 100-pin SQFP. OPL4/YMF704C as
YMF278 with 1MB ROM, MPU-401 interface, GM, 24 Voices. "contains the same sample set as the stand
alone ROM which was certified by Fat Labs" (GM sound compatibility) OPL3SA /YMF701
Controller+Codec, SB/SBPro/SB16/MPU-401 compatible, PnP, IDE, Integr. OPL3. OPL3SA2/YMF711
Controller+Codec, SB/SBPro/SB16/MPU-401 compatible, PnP, IDE, Integr. OPL3, revised Log.Device
support and DMA/IRQ config. OPL3SA3/YMF715 Controller+Codec, SB/SBPro/SB16/MPU-401
compatible, PnP, IDE, Integr. OPL3, adds power management and 3D sound. -YMF719 Chips are told to
be rebranded YMF715's, probably the same story with YMF718 Chips. -OPL3SAx Cards made by Aopen
(AW-719), Labway (LWHA151-A00), Addonics, Genius... Chipset also used on Mainboard/Laptops. -
OPL3SAx Cards usually with a misplaced WBH (for OPL4-ML DB), sometimes with an OPL4 midi set
instead. -Sometimes an OPL3 like chip branded only 'LS262' or 'DSP24S' is found on soundcards...
YAMAHA ISA SOUND CARDS -----SW-20PC Sound Edge OPTi 82C928, AD1848, Wavetable GM,
2MB ROM, 128k RAM, OPL3, OPL4 YMF278B, Effects YSS205-F, M-CD. SW60XG 4MB GM/XG Wavetable,
no midi connectors?, has a line-in (music only card). YAMAHA MIDI DAUGHTERBOARDS -----
---DB50XG 4MB GM/XG Wavetable, TG300B mode for GS, MT-32 Mode. DB51XG 4MB GM/XG
Wavetable, TG300B mode for GS, MT-32 Mode. DB60XG 4MB GM/XG Wavetable, TG300B mode for GS,
MT-32 Mode, has a line in through the Waveblaster connector. OPL4-ML DB OPL4 + 1MB ROM
(YMF704C), GM. CREATIVE LABS ISA SOUND CARDS -----Game Blaster Simple music only
card: Creative Music System ("C/MS"), two Philips SAA 1099 circuits. Sound Blaster 1.0 8-bit 22kHz
mono, OPL2, SB-Midi port, C/MS. Sound Blaster 1.5 8-bit 22kHz mono, OPL2, SB-Midi port, empty C/MS
sockets. Sound Blaster 1.6 8-bit 22kHz mono, OPL2, SB-Midi port, filled C/MS sockets. Sound Blaster 2.0
8-bit 44kHz mono, OPL2, SB-Midi port. Sound Blaster Pro 8-bit 22kHz stereo (reversed!)/ 44kHz mono,
mixer, 2xOPL2, SB-Midi port. Sound Blaster Pro 2.0 8-bit 22kHz stereo / 44kHz mono, mixer, OPL3, SB-
Midi port. Sound Blaster 16 16-bit 44kHz stereo, MPU-401, OPL3, sometimes with WBH, sometimes with
M-CD or IDE. Sound Blaster Vibra 16 SB16 Single chip solutions, sometimes with WBH, sometimes with
IDE. Sound Blaster 32 SB16 + EMU8000 synth with 30-Pin RAM slots, 1MB ROM. Sound Blaster AWE32
SB16 + EMU8000 synth with 30-Pin RAM slots, 512kB RAM, 1MB ROM, WBH, has either IDE or M-CD.
Sound Blaster AWE64 (Gold)SB16 + EMU8000 synth with Creative RAM connector, 1MB ROM, 512kB or
1MB or 4MB(=GOLD) RAM onboard. Sound Blaster AWE Upgrade EMU8000 synth with 30-Pin RAM slots,
usually 512kB RAM, Optional S/PDIF or jackplug output. -Sound Blasters use C.L. designed chipsets
which have many revisions and resulting card models CT****. -Chipsets such as the Vibra 16 also sold to
OEM's such as mainboard manufacturers. -SB16 containing cards practically do not support SBPro mode,
as it results in mono sound only. -SB16 containing cards give hanging notes when using the MPU-401,
except for the first DSP-v4.05 (SB16) series and the last v4.16 (AWE64). -SB16 containing cards can have
either a real OPL3 or a CQM FM clone.

-EMU8000 is a semi software synth using 'SoundFont' patches+presets, not MPU-401 compatible unless
through emulation software. CREATIVE LABS WAVEBLASTER MIDI DAUGHTERBOARDS -----

-----Wave Blaster Oki IC404, Motorola, 4MB ROM GM/MT-32. Wave Blaster II EMU8000 IC405, Motorola, 2MB ROM GM/GS/MT-32. Wave Blaster 32 ? ADLIB ISA SOUNDCARDS -----
MSC (original 'AdLib') Gold Surround sound. ASB 16 Special Editon ASB 16 IDE ASB 16 4D ASB 16 4D IDE ASB 32 Wave IDE ASB 32 Wave 4D IDE surround. ASB 32 Wave Pro ROM, 4 Spkr surround. ASB 64 Wave Pro ROM, 4 Spkr surround. MSC 16 PnP MSC 32 Wave PnP MSC Wave Pro 16

OPL2, Volume wheel (Music only card) Gold CTRL, Yamaha 12-bit DAC, OPL3, Headers for: SCSI CD / Telephony / CS4232, CS4232, CS4232, CS4232, CS4232, CS4232,

AMC conn., WBH (8-bit ISA slot). AMC conn., WBH, IDE. AMC conn., WBH, 4 Spkr surround. AMC conn., WBH, 4 Spkr surround, IDE. AMC+IDE+cyberRAM Conn., CS/SAM9233 Wavetable 1MB ROM. AMC+IDE+cyberRAM Conn., CS/SAM9233 Wavetable 1MB ROM, 4 Spkr

CS4232, AMC+IDE+cyberRAM Conn., CS/SAM9233 + CS/SAM8905 Wavetable 1MB CS4232, AMC+IDE+cyberRAM Conn., CS/SAM9233 + CS/SAM8905 Wavetable 4MB CS4236, misplaced WBH, amplifier (same PCB as the MSC 32 Wave). CS4236, OPTi?? synth with AdMOS Qdsp 1MB ROM, amplifier. AD1848K SoundPort, Breve misc chips, 1MB wave table GM/GS MT32.

-Only the first MSC and Gold were developed by the canadian AdLib team, they are said to work at MediaTrix after that. -AMC stands for AdLib Media Connector for CyberComm or CyberISDN. MEDIATRIX ISA SOUNDCARDS -----AudioTriX Pro MT-00020PC, CS4231, OPL4 GM with 2MB ROM, SB/WSS compat., Expansion headers for: CD-ROM, +2MB RAM/ROM, Effects. AudioTriX 3D-XG Yamaha YMF715E, with mounted Yamaha DB60XG daughterboard. -the 3D-XG by default routes the PCM/FM output from the OPL3-SA3 chip through the DB60XG's two analog inputs via the WB header. TURTLE BEACH ISA SOUNDCARDS -----56K Motorola 56001 DSP, S/PDIF (first Digital recording card, plain). MultiSound Classic Motorola 56001 DSP, Two Altera EP1810, CS codecs, EMU proteus 1/XR midi engine 2MB or 4MB ROM on back half. MultiSound Tahiti Motorola 56001 DSP, Two Altera EP1810, CS codecs, WBH, no on-card synthesis. MultiSound Monterey As MultiSound Tahiti but sold with RIO Wavetable daughterboard mounted. MultiSound(2) Fiji Motorola 56002 DSP, Xilinx XV5210, WBH, S/PDIF daughtercard connector. MultiSound(2) Pinnacle Motorola 56002 DSP, Xilinx XV5210, WBH, Kurzweil MA-1, two white 72-Pin SIMM slots, IDE. Maui Motorola, ICS Wavefront GM, 2MB ROM, 256K RAM, 2 two black 30-pin SIMM: max 8 MB total, No Effects, Dead WBH! (music only card). TBS-930 OPTi 82C930a (TBS-810 4x/6600 6x/8800 8x CD-ROM kits). TBS-931 OPTi 82C931a (TBS-810 4x/6600 6x/8800 8x CD-ROM kits). MonteCarlo 928 OPTi 82C928a (big chip), CS4248 or CS4231, OPL3, M-CD, WBH? MonteCarlo 929 OPTi 82C929a, CS4248 or CS4231. Tropez (Classic) OPTi 82C929a, CS4231, OPL3, Motorola, ICS Wavefront GM, 2MB ROM, three black SIMM slots. Tropez32 CS4232, ICS Wavefront GM,

1MB ROM, IDE, OPL3 (TBS-6700/TBS-8900 CD-ROM kit). TBS-2000 CS4232, ICS Wavefront GM, 2MB ROM, IDE, OPL3 (TBS-6700/TBS-8900 CD-ROM kit). Tropez Plus CS4232, ICS Wavefront GM, 4MB ROM, IDE, OPL3, white 30-pin SIMM slots (TBS-2001). Malibu Surround 64 Crystal CS4237B, Kurzweil Wavetable, 4MB samples compressed to 2MB ROM size, S/PDIF output. -56K and MultiSounds are non-gaming soundcards with drivers for MS Windows (3.11/95), and only

few DOS utilities. TURTLE BEACH WAVEBLASTER MIDI DAUGHTERBOARDS -----
---RIO ICS 2115 Wavefront GM, 4MB ROM (Like Maui but uncompressed), 1 SIPP RAM slot; max 4MB (slow transfer), Effects. CancunFX Dream SAM9733, 4MB ROM, GM/GS, Chorus+Reverb. Kurzweil Homac 2MB ROM, Rockwell chipset. MEDIA VISION ISA SOUNDCARDS -----Pro Audio Spectrum 8-bit card that supports stereo digitized 8-bit sound and dual OPL2 support. (no SB compatibility). Thunder board 8-bit 22kHz Sound Blaster clone SB 1.0 compatibility. Adlib support. volume wheel. Pro Audio Spectrum Plus 16/8-bit 44kHz stereo sound support. OPL3 support, Thunder board chip, MVD-101-like chip. Pro Audio Spectrum 16 MVD101, Thunderboard + SB-1.0 compatible, OPL3. Pro Audio Studio 16 MVD101, Thunderboard + SB-1.0 compatible, OPL3, studio version has some additional shielding. Pro Sonic 16 MV JAZZ 16 chipset, OPL3, Adlib+Thunderboard+SB 1.0+SBPro compatible (no PAS compatibility). Premium 3-D MV JAZZ 16 chipset, built-in SRS surround sound, comes with KORG Wavetable daughter board on WBH. similar: Logitech SoundManWave MV JAZZ 16, OPL-4 2MB ROM, 16-bit 44kHz, SCSI-1, SB+(poor)SBPro compat, MPU-401 GM, PnP, effects daughterboard conn. -Also separately available a KORG 4MB midi daughterboard. ENSONIQ ISA SOUNDCARDS -----
Soundscape S-2000 AD1848KP, Motorola 68EC000, OTTO GM/GS Wavetable 2MB ROM, M-CD (also seen: variants without the M-CD headers). Soundscape Elite AD1848KP, Motorola 68EC000, OTTO GM/GS Wavetable 2MB ROM, M-CD, IDE, ESP daughtercard (based on S-2000. different 2MB patch set). Soundscape II: AD1848KP, Motorola 68EC000, OTTO GM/GS Wavetable 2MB ROM, M-CD, IDE, ESP connectors. (Elite minus the ESP, possibly different patch set). Soundscape OPUS AD1845JP, OPUS Wavetable 1MB ROM, PnP (Gateway 2000 OEM, uses unique I/O ports: may give compatibility issues). Soundscape VIVO90 AD1845JP, MARK5 Wavetable 1MB ROM, PnP (Requires an EMM386 dependant TSR driver in DOS). Similar: Reveal Sound FX Wave 32 Clone of Soundscape S-2000 (SC600) V7-media fx Clone of Soundscape S-2000 -Despite the AD codec the Soundscapes are normally not WSS compatible in DOS, but are so in Windows. See SSMODE DOS utility. -Also separately available: SoundscapeDB midi daughterboard, based upon the S-2000 chipset, available in both 2MB (old set) and 1MB (new set). -The Soundscapes emulate SB 2.0 mono and also OPL3 FM using the Wavetable, this does not require a (additional) TSR. ROLAND ISA SOUNDCARDS -----LAPC-I MT-32 LA synthesis on a card, predecessor of General Midi (one of a kind music only card). RAP-10 SoundCanvas Wavetable, chorus+Reverb, but GM only, includes a Roland 12-Bit Digital audio section. SCC-1 SoundCanvas Wavetable, chorus+Reverb, GM/GS (music only card). MPU-401-AT Simply a MPU401 interface with a WBH, gives no sound without something else attached. ROLAND WAVEBLASTER MIDI DAUGHTERBOARDS -----SCB-7 SoundCanvas Wavetable, chorus+Reverb, but GM only. SCB-55 SoundCanvas Wavetable, chorus+Reverb, GM/GS. ADVANCED GRAVIS ISA SOUNDCARDS ---

-----Ultrasound Classic GF1, no 16-bit audio recording and onboard analog mixer without CS4231

daughterboard. The final revision (v3.74) of the GUS Classic featured 256 kB + sockets for 768kB. Ultrasound Ace GF1, As Classic with 512kB RAM + sockets for 512kB, no game port or recording but a 'Wavetable synthesis' upgrade. Ultrasound CD3 GF1, An OEM version of Ultrasound Classic, 512–1024KB RAM, M-CD, (green PCB). Ultrasound MAX GF1, A version of GUS with CS4231, 512kB RAM + socket for 512kB, M-CD. Ultrasound Extreme GF1, 3rd party OEM solution that combined Ultrasound Classic with ESS1688, 1 MB RAM, no RAM slots. Ultrasound PnP AMD InterWave, different sound set, 1MB ROM, two 30-pin SIMM slots, ATAPI CD-ROM interface. Ultrasound PnP Pro AMD InterWave, added 512kB of on-board RAM required for compatibility with GUS Classic. Similar: Primax SoundStorm Wave GF1, Re-labeled "Altrasound", Sound M-16B without M-CD, M-16C with M-CD (as Ultrasound CD3). Synergy ViperMAX GF1, same card later repacked as Ultrasound Extreme, but with only 512kB RAM onboard. Expertcolor MED3201 AMD Interwave LC, cut-down variant of GFA1 chip - AM78C200 Interwave LC. First series was with standard Am78C201KC. Compaq Ultra-Sound 32 AMD Interwave, Newer "C" revision of Interwave - AM78C201AKC and TEA6330T fader. Produced by STB Systems. STB Systems Soundrage 32 AMD Interwave card missing SIMM slots and IDE interface. There was "Pro" variant with 512kB RAM. AM78C201KC chip. Dynasonic 3-D/Pro AMD Interwave, featured additional DSP chip that offered a graphic equalizer and additional sound FX presets. Philips PCA761AW ? AZTECH ISA SOUND CARDS (Sound Galaxy series:) -----SG BXII 8-bit, AZTSB0792-U07, AZTDSP36 (intel N80C51BHP), OPL2, volume wheel. SG NXII/Extra 8-bit... SG NX Pro/Extra 8-bit... SG Nova 16 AZT1605... SG Nova 16 Extra AZT1605... SG Orion 16 AZT1605... SG Pro16 II (1st) AZT1605, AD1845XP, OPL3, AZT805-J94, WBH, M-CD, expansion connector. SG Pro16 II (2nd) AZT2316R, CS4231A-KL, OPL3, WBH, IDE, expansion connector. SG WaveRider 32+ AZT2316A, AD1845JP, OPL3, AZT816, ICS2125V WaveFront, ICS2122M-001 WaveROM, IDE, M-CD, expansion connector. SG Nova 16 Extra II-3D AZT2316*... SG WaveRider Pro 32-3D AZT2316R, CS4231A-KL, OPL3, AZT3320 Wavetable, Samsung KS0174 (Wavetable ROM), IDE. SG Pro16 III-3D PnP AZT2320... SG WaveR. Pro 32-3D PnP AZT2320... SG WaveR. Platinum-3D PnP AZT2320... SG NX Pro 16 AZT2320... SG SCSI AZTSSPT0592-U01, AZT-NXPMIX0592, AZTDSP31H (intel S-81C51FANM), OPL3. -1st Generation, then 2nd: AZT1605 Chipset, 3rd: AZT2316/A/R Chipset, 4th: AZT2320 Chipset. -Aztech chipsets also rebranded and sold by Reveal. TERRATEC ISA SOUND CARDS -----Terratec SoundSystem 16-bit OPTi?+Crystal, OPL3, M-CD, WBH. Gold 16 (rev 3.2B) ES688, WBH, IDE, M-CD, OPL3 Clone DSP24S (green PCB, short). Gold 16 (1996 catalogue) ES688, WBH, IDE, M-CD, OPL3 Clone DSP24S, volume wheel (green PCB, long). Gold 16/96 ES1868, WBH, IDE (brown PCB, gold colored backplane). Gold 32 ES1868, WBH, IDE, 1MB Dream Wavetable daughterboard (host card as Gold 16/96). Maestro 16 (1st edition) ASC-9308 + DSP-9309A + AD1845, OPL3, M-CD, WBH, 1MB Dream Wavetable daughterboard. Maestro 16 (2nd edition) ASC-9308 + DSP-9309A + CS4248, OPL3, M-CD, WBH, 1MB Dream Wavetable daughterboard, Volume wheel. Maestro 32 (1st edition) ASC-9308 + DSP-9309A + AD1845, OPL3, M-CD, WBH, 4MB Dream Wavetable daughterboard. Maestro 32 (2nd edition) ASC-9308 + DSP-9309A + CS4248, OPL3, M-CD, WBH, 4MB Dream Wavetable daughterboard SAM9203/SAM8905, Volume wheel.