

# DIAG

## PC-Support Diagnostic and Repair Information Page

Information page about mainboard startup diagnostics, the so called "power on self test" (POST) for the AMI-BIOS, AWARD-BIOS and Phoenix-BIOS. Help for various PC startup problems. Links to support pages of manufacturers, and addresses of hardware repair and service centers in Germany.

Filename : e\_dta-pc-diag.htm

Location : <http://www.elektroniklager.de/pc-sup>

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**Revision History:**

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## 1. Mainboard Startup Diagnostics

Modern mainboards have a startup diagnostic, the so called "Power ON Self Test" (POST). This means they check themselves for the availability of the vital functions, the memory and some of the slot cards. In order to be able to run the diagnostics the following prerequisites have to be fulfilled:

1. The power supply has to generate the correct voltages and set the POWER OK signal. This is not true if e.g. the power supply detected a shortage on one of the voltages (which could be caused by the mainboard or one of the drives).
2. The CPU has to be able to come out of the reset condition and has to be able to execute processor instructions.
3. The BIOS chip has to be present on the mainboard and has to be readable for the CPU.
4. The BIOS chip has to contain a valid program. This will be checked via a checksum.
5. The CMOS has to be present and readable for the CPU.
6. The CMOS has to contain valid data. This is checked via a checksum. In case of doubt the CMOS can be cleared by setting a jumper on the mainboard. It will be brought into a defined condition by this.
7. The CPU has to be able to access the memory (RAM). This means that the memory controller, memory bus and memory modules have to be o.k.
8. The first 64KB (KiloByte) of memory have to be o.k. to be able to store the POST data. In case of doubt the memory should be replaced by another module (e.g. swap the memory modules among each other).
9. The I/O bus (I/O Controller) has to be o.k.
10. The CPU has to be able to access the graphic adapter via the I/O bus to read and write data.
11. The graphic adapter has to be present and has to be o.k. (video chip and video memory).
12. The loudspeaker / beeper has to be connected correctly and has to be o.k.

These functions have to be o.k. to execute the basic POST tests. E.g. if the memory or the graphic adapter is not present or not o.k. the system may output a beep code via the loudspeaker to notify of the defect. This is however not possible for all errors. Also the tests do not necessarily run in the above sequence. However, the good results of the tests are the prerequisites to run the higher tests as e.g. floppy disk and hard disk checks.

The cache memory controller usually will be only activated after a successful startup diagnostic. Therefore it is unlikely that cache problems will be detected by the startup diagnostics.

In the following section some beep codes are listed which are output by the mainboard checks in case of a detected error. This is, as it was already mentioned, if the system is not able to start up as far as to be able to output an error message via the graphic adapter. Also note that errors which generate a beep code can never be generated by operating systems or software.

**1.1. AMI BIOS**

1 beep	DRAM refresh failure
2 beeps	Parity Circuit Failure
3 beeps	Base 64K RAM failure
4 beeps	System Timer Failure
5 beeps	Processor Failure
6 beeps	Keyboard Controller / Gate A20 Failure
7 beeps	Virtual Mode Exception Error
8 beeps	Display Memory Read/Write Failure
9 beeps	ROM BIOS Checksum Failure
10 beeps	CMOS Shutdown Register Read/Write Error

At 1 beep, 2 beeps, or 3 beeps it is recommendable to remove the memory (RAM) and reseal it to take care of possible contact problems. If this does not help the memory should be replaced by a module which is definitely o.k.

At 4 beeps, 5 beeps, 7 beeps, or 10 beeps most likely the mainboard is defective.

At 6 beeps most likely the keyboard or the keyboard controller is defective. Try another keyboard and if this doesn't help the keyboard controller or mainboard has to be replaced.

At 8 beeps most likely the graphic adapter is defective and has to be replaced. But first try to reseal it.

At 9 beeps the BIOS chip is defective. In most cases it can be replaced. You can ask your mainboard manufacturer for a replacement.

Remark by Peter Götz: Often the problem is only a defective battery, or in older systems the rechargeable battery may be flat, if the PC was not used for some time.

**1.2. Award BIOS**

One long beep followed by 2 short beeps: shows that the graphic adapter is not seated correctly or is defective.

All other beeps: Most likely defective or mis-seated RAMs or defects on the mainboard.

1.3. Phoenix BIOS

1-1-3	CMOS write/read failure.
1-1-4	BIOS ROM checksum error.
1-2-1	System timer failure. (Programmable Interval Timer PIT)
1-2-2	DMA (direct Memory Access) failure.
1-2-3	DMA page register failure.
1-3-?	RAM failure.
1-4-1	64K RAM address line failure.
1-4-2	64K RAM parity error.
2-?-?	Any beep series starting with 2 beeps indicates a 64K RAM chip or data line error.
3-1-1	Master DMA register test.
3-1-2	Mslave DMA register failure.
3-1-3	Master interrupt mask register failure.
3-1-4	Slave interrupt mask register failure.
3-2-4	Keyboard controller failure.
3-3-4	Screen (video) memory failure.
3-4-1	Screen initialization failure.
3-4-2	Screen retrace failure.
4-2-1	Timer tick interrupt test failure.
4-2-2	Shutdown test failure.
4-2-4	Unexpected interrupt in protected mode.
4-3-1	RAM test failure above address 0FFFFh (64K +)
4-3-3	Interval timer channel 2 test failure.
4-3-4	Time of day clock failure.
4-4-1	Serial port test failure.
4-4-2	Parallel port test failure.
4-4-3	Math Co-processor failure.

The codes may differ strongly depending on the version of the BIOS. Therefore it is recommended to download the appropriate data sheets.

1.4. Still Problems?

**ATTENTION! Before you unplug or replug slot cards or other components, you must always power down the PC and then unplug the power cord. In modern PCs the power supply will always supply the mainboard with a voltage. If you do not observe this, this may damage the mainboard or components. It also may endanger your life to touch the PC or it's components while the power cord is plugged in.**

If you can not hear any beeps and the screen remains dark, check the following:

1. Is the loudspeaker connected correctly?
2. Is the screen connected correctly and switched on?
3. The power supply should be checked. Connect the power LED to the appropriate pins on the mainboard (watch the polarity). If the LED is illuminated and the motors of the hard disk, etc. are running the power is usually o.k.
4. Check the mainboard for loose or missing components. E.g. is the CPU seated correctly in the socket and the RAM modules placed correctly.
5. Remove all I/O slot cards except the graphic adapter and check again if the system is starting. If this is the case plug back the cards one after the other to their original position. Check for every card if the system is able to start up. A defective card can drag the whole system down. If the system still does not run, either the mainboard or the RAM is defective.

### 1.5. BIOS Information Pages

Phoenix BIOS codes - <http://www.phoenix.com/pcuser/PDF-Files/bios-postcode.pdf> as PDF files from Phoenix.

Phoenix BIOS codes - <http://www.firmware.com/support/oldbios/1011.htm> from Microfirmware.

FAQ pages for the Phoenix BIOS - <http://www.phoenix.com/pcuser/BIOS/biosfaq2.htm>

Manufacturer informations for the Award BIOS -

<http://www.phoenix.com/PlatSS/pcplatforms/desktop/awardbios.html> and Phoenix BIOS

Manufacturer informations for the AMI BIOS - <http://www.ami.com/amibios/>

General BIOS information page - <http://www.wimsbios.com> from Wim.

### 1.6. Problems with Components?

If your computer system starts up, but something is still not working, you should consult these support pages. This is an excellent general support page <http://www.repairfaq.org>. (in English)

For problems which can be doubtless assigned to components, you should consult the support pages of the various manufacturers. Here you find handbooks, support, jumper settings, etc.:

Acer - <http://www.acer.com/aac/support/index.htm>

Adaptec - <http://www.adaptec.com/support>

ALR - <http://www.alr.com/service/service.htm>

Apple - <http://support.info.apple.com/manuals/manuals.qry>

AST - <http://www.ast.com/support/support.asp>

AT&T/NCR - <http://www.ncr.com/support>

CalComp - <http://www.calcomp.com/support/support.htm>

Canon - <http://www.ccsi.canon.com/care/index.html>

C.ITOH/CIE - <http://www.citoh.com/dnload.htm>

Compaq - <http://www.compaq.com/support>

Comtrol - <http://www.comtrol.com/techsup.htm>

CTX - <http://www.ctxcomputers.com/techsupport.html>

Dataproducs - [http://www.dpc.com/support/technote/tn\\_dir.html#B](http://www.dpc.com/support/technote/tn_dir.html#B)

DEC - <http://ie.digital.com/channel/documentation/pcdoc>

Dell - <http://www.dell.com/support/index.htm>

DTK Taiwan - <http://www.dtk.com.tw/pc-sup/tech.html>

DTK USA - <http://www.dtkcomputer.com/pc-sup/tech.html>

Epson UK - <http://www.epson.co.uk/support>

Epson US - <http://www.epson.com/support>

Epson US FTP site - <ftp://ftp.epson.com>

Epson technical data - <http://support.dell.com/oti/index.asp?cc=5>

Everex - <http://www.everex.com/support.html>

Exabyte - <http://www.exabyte.com/home/suppserv.html>

Future Domain - <http://www.adaptec.com/support/eol/index.html#hardware>

Gateway 2000 - <http://www.gw2k.com/frameset.asp?s=home&p=support>

GCC Technologies - <http://www.gcctech.com/ts/index.html>

Hewlett Packard - <http://www.hp.com/cposupport/eschome.html>  
 IBM - <http://domino.www.ibm.com/Support/wwsup30e.nsf/d81ba789eae09118802564ca00636d9a?OpenView>  
 IBM FTP site - <ftp://ftp.pc.ibm.com/pub/pccbbs>  
 IBM PC Service manuals - <http://www.pc.ibm.com/us/cdt/hmm.html>  
 Intel - <http://support.intel.com/sites/support/welcome.htm>  
 Mannesman/Tally - <http://sales.tally.com/tech/techserv.html>  
 Micron - <http://support.micronpc.com>  
 Mitac - [http://mitac.mic.com.tw/service/service\\_a.htm](http://mitac.mic.com.tw/service/service_a.htm)  
 NEC - <http://support.neccsdeast.com>  
 NCD - <http://www.ncd.com/support/support.html>  
 NCR/AT&T - <http://www.ncr.com/support>  
 Okidata - <http://www.okidata.com/services/pub.html>  
 Olivetti - <http://www.ocwi.com/ihdesk/firstpag.htm>  
 Printronix - <http://www.primtronix.com/html/ampc-sup/tech.html>  
 Quantex - <http://www.quantex.com/community/qmembers/support/aboutsup.asp>  
 Samsung - <http://samsungelectronics.com/nonjava/support/downloads/index.html>  
 SATO USA - <http://www.satoamerica.com/tech/pc-sup/tech.htm>  
 Seikosha America - <http://www.seikosha.com/printers.html>  
 SGI - <http://www.sgi.com/support/info.html>  
 SONY - <http://www.ita.sel.sony.com/support>  
 Stallion Technologies - <http://www.stallion.com/html/userdoc.html>  
 Star Micronics - <http://www.starmicronics.com/tech/index.cfm>  
 Swan Technologies - <http://support.neccsdeast.com/swan-zdsdirect/zds>  
 Texas Instruments - <http://www.genicom.com/techsupp/TI/TI-techspt.htm>  
 Toshiba - <http://www.toshiba.com/tais/csd/support>  
 Trantor - <http://www.adaptec.com/support/eol.html#hardware>  
 Unisys - <ftp://ftp.gcs.unisys.com/pub>  
 Wangtek/WangDAT - <http://www.tecmar.com/support/download/techdocs.html>  
 Zenith Data Systems - <http://support.neccsdeast.com/swan-zdsdirect/zds>  
 ZEOS - [http://www.micronpc.com/support/file\\_lib/zeosbbs/zeosbbs.html](http://www.micronpc.com/support/file_lib/zeosbbs/zeosbbs.html)

Special Help for Display Problems can be found on these Pages (e.g. circuit diagrams):

Electronix - <http://www.electronix.com/schematics>

Anatek - <http://www.anatekcorp.com>

## 1.7. Problems with Software?

If you have problems with MicroSoft products, you can search

<http://support.microsoft.com/support/a.asp> for support for special problems with certain products. This is a side entry to the MicroSoft support pages.

For "shutdown" problems with Windows 9x and ME you may find help on this page

<http://www.freespeech.org/Khephra/a/shutdown.htm>.

## 2. Diagnostic Tools

- Data Depot - <http://www.datadepo.com/catalog.htm> PC HW and SW Tools. ISA/MCA bus diagnostics.
- FWB - <http://www.fwb.com> For Apple MAC
- Micro2000 - <http://www.micro2000.com> PC HW and SW Diagnostics, POSTprobe, Micro-Scope, etc.
- Unicore Software - <http://www.unicore.com> PC HW and SW Diagnostics. ISA, EISA bus, POST Diagnostics.
- Windsor Technologies - <http://www.windsortech.com> PC Diagnostics Software.

### 3. Further Help

- Support page for various PC Problems. (German): <http://www.fehlermeldungen.de>
- Microsoft Support: <http://support.microsoft.com/support/a.asp>
- Monitor u. Notebook Repair: <http://www.morservice.com/> <http://www.sug-service.de/>
- Circuit Diagrams: <http://www.schaltungsdienst.com/>

#### 4. Repair and Service Addresses (Germany)

Manufacturer	Address / Hotline
3COM	3Com Parts Bank Germany DHL World Wide Express GmbH Anton-Flettner-Straße 6 D-65479 Raunheim Tel. 0130-821502 Tel.: 0800-1821502 Fax: 06142-924228 Hotline: Tel: 06107/754258 Fax: 06107/744110 email:modemsupport@3com.com auch für US-Robotic Modem
aashima	aashima Trust Siemensstr. 1 47533 Kleve Tel.: 02821/58810 Fax: 02821/58850 email:trust3@euronet.nl Tel.: 02821/58835 (RMA)
Acer	Acer Computer GmbH Kornkamp 4 22926 Ahrensburg Tel. 04102/4880 Fax 04102/488100 email:info@ccmail.acer.de Vertretung / Reparatur: Elektronik Denk & Hoffmann Wolframstr. 8a 85395 Wolfersdorf Tel.: 08168-96280 Fax: 08168-1725 Hotline 0190-788 788 (Endkunden) Hotline: 04102-488 430 (Händler)
Adaptec	Adaptec Richard-Reitzner-Allee 8 85540 Haar Tel: 089-4564060 Fax: 089-45640615
Agfa	Hotline : 0190-871167
AMD	AMD Rosenheimer Str. 143 B 81671 München Tel.: 089-45053199 Fax: 089-406490 e-mail: euro.tech@amd.com
AOC	AOC International Ltd. CSS AOC-Service Pippelweg 62 38120 Braunschweig Tel.: 0531-8010800

Manufacturer	Address / Hotline
APC	APC Finkenweg 1 85774 Unterföhring Fax RMA Anträge 089/95823670 Tel: 0130/827988 oder 0130/818907 email:support@oln.comlink.apc.org Reparaturanschrift: ITG München APC Service Dieselstr. 16 85739 Garching 089-3261583 Hotline: 0130-818907
Apris	Tel.: 09131/7550-0 Fax: 09131/7550-50 email:info@apris.de
Asus Computer	Asus Computer GmbH Harkortstr. 25 40880 Ratingen Tel: 02102-95990 Fax: 02102-959911
ATI	ATI Swords Business Park Dublin Ireland Tel.: 00353-180778-26 Fax: 00353-180778-46 e-mail: eurotech@ati.com
Atrend	A-Trend Technology Corporation 46600 Fremont Boulevard, Fremont, California 94538 Tel: (510) 226-6290 Fax: (510) 226-6296 email:support@a-trend.com (bei Ware USA) fae@atrend.com.tw. (bei Ware aus Europa)
AVM	AVM Alt Moabit 95 10559 Berlin Tel: 030-39004390 Tel: 030-39976-113 Fax: 030-39976266 email:info@avm.de email:mailto:email:support@avm.de
Belinea	Maxdata Service Center Elbestraße 16 45768 Marl Tel: 02365-952-0 Fax: 02365-952-3505 Tel. Fachhandel: 02365-952-1011 Tel. Endkunden: 02365-952-1010
Brother	Brother Im Rosengarten 14 61118 Bad Vilbel Tel: 06101-805108 Fax: 06101-805328 Hotline 06101-805200 Drucker, 06101-805100 Faxgeräte email:service@brother.de odervetrieb@brother.de

Manufacturer	Address / Hotline
CANON	CANON Deutschland GmbH Marie-Bernays-Ring 23 41199 Mönchengladbach Tel.: 02151-349480 Fax: 02151-349481 Hotline : 02151-349555 Reparaturanschrift: Schüller + Haigis Höninger Weg 139 50969 Köln Tel: 0211/3600-50 Fax 0211/3600-556
Casio	Casio Computer GmbH Bornbach 10 22848 Norderstedt Tel.: 040-52865-0 Hotline : 040-52865-541
CeQuadrat	Fax: 0241-942-0211 email:supportd@cequadrat.com
Cherry	Tel. 09643/181111 Fax 09643/18545 Europäisches Kunden-Service-Center Tel: 0180-5212111 Fax: 0180-5212117
Compaq	Compaq Reparaturanschrift: IZE Karlsruher Str. 14 30880 Laatzen Hotline: 0180-5212111 (Monitore), 0511-8406718 (Notebook)
CSG	Hotline:06252-963502
Diamond	Diamond Multimedia Moosstr. 18b D-82319 Starnberg 08151-2662-09 08151-2662-13
D-Link	D-LINK GmbH Bachstr. 22 D-65830 Kriftel Tel: 06192-9711-0 Fax 06192-9711-11 D-Link Deutschland GmbH Breslauer Str. 25 63452 Hanau Tel.: 0800-72504000 Hotline : 0800-7250-8000 Infofax: 0800-7250-1000 e-mail: rma@dlink.de Tel: 0130-725040
Eizo	Eizo Deutschland Bischofstr. 98 47809 Krefeld Hotline: 02151-919551 Fax: 02151-919599 EIZO-Service-Center RMA Abteilung Lötscher Weg 66 41334 Nettetal RMA unter 02153/733162

Manufacturer	Address / Hotline
Elsa	Elsa GmbH (keine Monitore) Sonnenweg 11 52070 Aachen Tel.: 0241-606-0 oder 0241-6065112 Fax: 0241-606-1199 oder Tel. 0241/9177-0 Fax 0241/9177-600 Hotline : 0241-9177211 Reparaturanschrift: AVC (nur Monitore) Gasstr. 18 22761 Hamburg Tel.: 040-892006
Epson	Epson Deutschland GmbH Zülpicher Str. 6 40549 Düsseldorf Tel.: 0211-5082700 oder Serviceabteilung / RMA Tel.: 0211-5603-0 Fax: 0211-5603-354 Hotline : 0180-5234150 oder 0180-8234130 Hotline Stylus-Drucker: 0180-5234110 Technikhotline: 0180-5234120 Mailbox analog: 0211-5621411 Mailbox ISDN: 0211-5082777
Fast	FAST Multimedia AG Landsberger Str. 76 D-80339 München Tel. 089-50206-111 Fax 089-50206-273
Freecom	Freecom Schlesische Str. 27 10997 Berlin Hotline: 0190-891111
FUJI	FUJI Tape GmbH Am Fallhammer 2 40221 Düsseldorf Tel.: 0211-9303336Deutsche Fuji Tape GmbH Reparaturabteilung Fujistr. 1 47533 Kleve Tel. 02821/509-234 Fax 02821/509-628 email:fuji_serviceline@compuserve.com
Fujitsu	Fujitsu Deutschland GmbH Frankfurter Ring 211 80807 München Tel.: 089-32378-0 Fax: 089-32378-100Fujitsu ICL GmbH Serviceabteilung /RMA Erfurterstr. 44 D-99610 Sömmerda Tel: 089-32378-0 email:fast@fdg.fujitsu-europe.com
Genius	Tel. 02173-9743-0

Manufacturer	Address / Hotline
Gericom AG	Gericom AG Industriezeile 35 A - 4020 Linz Tel. Allgemein: 00 43-732-7664-100 Service-Tel.: 0190-880050 Fax: 0180-5968969 Pick-up Service Tel.: 0043-732-76649600
Goldstar	Tel: 02154/492-0 Monitore, CD-ROM Repair 2000 Hardware Service GmbH Werkstr. 5 22844 Norderstedt Tel. 040/5225031 Fax 040/5264811
Hewlett Packard	Hewlett Packard GmbH Reparaturzentrum Robert-Bosch-Str. 27-29 63225 Langen Tel: 0180-53207 Fax: 06172-161441 HP European Costumer Support DeskJet Modelle Tel: 0180-5258143 Helpline Kunden Tel. 02102/907070 Fax-Support (Treiber) Fax: 0130/810061
Toshiba	Toshiba Central Repair (nur für Garantiegeräte) Leibnitzstr. 2 D-93055 Regensburg Tel. 0941-7807-828 Fax. 0941-7807-947 IME Service GmbH In der Borsickerstr. 7-9 D-93092 Barbing Tel. 09401-9333-0 Fax 09401-9333-12 Toshiba Reparaturzentrum Lordring 55-57 D-63843 Niedernberg Mc Byte EDV Service GmbH Toshiba-Service Bernhardstraße 10 D-90431 Nürnberg
US Robotics	Tel: 0180-567-1548
IBM	Tel: 0711-921445 Tel: 0180-5253553 Hotline: Drucker, Tel: 0180-55223350 PC/Monitore, Tel. 0180-5253558 Thinkpad, Tel. 0180-5253558 Hard Disk Drive Tel: 07032-153050 e-mail: drive@de.ibm.com

Manufacturer	Address / Hotline
Intel	Intel Dornacher Str. 1 85622 Feldkirchen Tel: 089-99143-0 Fax: 089-9043948 CPUs Tel: 0044/1793431144 Fax: 0044/1793431155
IOMEGA	IOMEGA Europe GmbH Bötzingen Str. 48 79111 Freiburg Tel: 0130-829446 Fax: 0761-4504-414 Mailbox: 0761-4504444
Kodak	Digitale Kameras Tel: 0130/825402
KYE	KYE Systems Corp. Genius Service Hans Böckler Str. 62 40764 Langenfeld Tel: 02173-974318 Hotline: 02173-974321
Lexmark	Tel: 0231/9748-333 Fax: 0231/9748-480
LG - Monitore (Goldstar)	Hotline: 02154-492160 Tel: 02154-492149 Fax: 02154-492128
Logitech	Logitech GmbH Gabriele-Münter-Str. 3 82110 Germering
Madge	Madge Networks GmbH C/o Beauvais International GmbH Hürzenrott 3 D-52076 Aachen-Oberforstbach Tel: 0130-868828 Fax: 0044-1628858977
MAG	MAG Carl-Miele-Str.1 38112 Braunschweig Service-Hotline: 0180-5624100 Fax: 0180-5624200
MAXTOR	MAXTOR Customer Service Centre Boghall Road, Bray Co. Wicklow, Ireland Tel.: 00353-1-2866222 Fax: 00353-1-2864577
Microsoft	Microsoft GmbH Edisonstraße 1 D-85716 Unterschleißheim Tel: 089-31761150 Microsoft Direkt Daimlerstr. 1-7 33442 Herzebrock-Clarholz Tel.: 0180-5251199 Fax: 0180-5251190
Minolta	Minolta GmbH Minoltaring 11 30855 Langenhagen Hotline : 0180-3227404 Hotlines : 0800-6466582 (Produktinfos) 01803-6466582 (Service / techn.Anfragen) 01803-000388 (Ersatzteile)

Manufacturer	Address / Hotline
Miro	<p>Miro CPR                      Carl Mielestr. 4                      38112 Braunschweig                      0531-2113141 oder 0531-31060                      Fax 0531/2113-274                      Hotline: 0531/2113666                      Hotline: 0180-5228144                      Mailbox 0531/21113112</p> <p>Miro Displays GmbH                      TRIFORUM - Haus 1A                      Frankfurter Str. 233                      63263 Neu-Isenburg                      Tel.: 0180-5223526                      Fax: 06102-366777                      e-mail: kontakt@miro.de                      Service-Tel.: 0180-5647602                      Service-Fax: 0180-5647601</p>
Mitsumi	<p>Mitsumi                      Electronics Europe GmbH                      Hammerlandstraße 89                      41460 Neuss                      Tel: 02405/18026                      Fax: 02405/91145                      Tel.: 0180-521253-0                      Fax: 0180-521375-1                      email:support@mitsumi.de</p>
MSI	<p>MSI Technology GmbH                      Hanauer Landstrasse 306                      60314 Frankfurt</p>
Mustek	<p>Mustek                      Hellersbergstr.2a                      41460 Neuss                      Tel: 02131-2131                      Tel: 02131-162620                      Tel: 02131-162840                      Fax: 02131-103830                      email:support@mustek.mbis.de</p>
NEC	<p>NEC Deutschland GmbH                      Tel: 089/31601-251                      Mailbox 089/3164408                      Hotline : 089-31601233                      Hotlines:                      0180-5358189 (Endkunden)                      0180-5242523 (Händler f. Monitore)                      0180-5231353 (Händler f. Notebooks &amp; Desktops)                      email:HOTLINE@DE.NECEUR.COM                      Reparaturanschrift:                      AT-Service                      Auf der Halde 2a                      66239 Bildstock                      Tel: 06897-8081                      Tel: 06897-98010                      Fax: 06897-8082</p>
Neuhaus	<p>Neuhaus Telekommunikation GmbH                      Messestr. 20                      18069 Rostock                      Tel.: 0381-7700422</p>
Nokia	<p>Nokia Service Center                      Meraner Str. 43                      D-86165 Augsburg                      Tel: 0821-72048-0                      Fax: 0821-72048-15</p>

Manufacturer	Address / Hotline
OKI	OKI Systems Deutschland GmbH Hansaallee 187 40549 Düsseldorf Tel: 0211-5262-501 Tel: 0211/5266-286 Fax: 0211/5262-502 Mailbox 0211/5266-222 Hotline : 0211-5262555 oder 08152-9733 OKI Repair Center Schwannstraße 10 40476 Düsseldorf Tel: 0211-474-3440 Fax: 0211-474-3431
ONLINE	ONLINE Computer USV-Systeme GmbH In der Trandringer Str. 13 81677 München Hotline : 089-242399013 ONLINE Computer USV-Systeme Service-Center Hauptstr. 40 D-82229 Seefeld Tel: 08152-9733 Fax: 08152-9732 Hotline: 08105-3735-0 Hotline : 08105-3735-17
Panasonic	Tel: 040/85492776 Mailbox 040/85492829 Reparaturservice: Teleplan GmbH Bunsenstr. 5 64347 Griesheim Tel. 06155/83910-28 Fax 06155/83910-26

Manufacturer	Address / Hotline
Philips	Philips GmbH Tel: 0180/5336767 Support per Fax 0031/2060002589 Mailbox 040/28521841 Monitore: <a href="http://www.monitors.philips.com">www.monitors.philips.com</a> Tel: 0130-817143 oder 0800--26678846 (Fachhandel) 0800--1817143 (Endkunden) PC Add-ons: (Brenner, CD-ROM, Modems, Speaker) <a href="http://www.pc.be.philips.com">www.pc.be.philips.com</a> Tel: 0130-823983 Mo-Fr. von 10:00 - 24:00, Sa/So. von 10:00 - 18:00 Mobile Computing: <a href="http://www.velo.philips.com">www.velo.philips.com</a> Tel.: 0211-65791148 oder 0130-817148 Mo-Fr. von 8:00 - 20:00 Uhr Digitalkamera: <a href="http://www.digitalcamera.philips.com">www.digitalcamera.philips.com</a> Tel.: 0130-827480 Mo-Fr. von 8:00 - 20:00 Uhr LCD-Projektoren: <a href="http://www.cds.be.philips.com">www.cds.be.philips.com</a> Tel.: 0130-818490 Mo-Fr. 8:00 - 20:00 Uhr Teleplan Bunsenstr. 5 64374 Griesheim Tel. 06155/8391-0 Fax 06155/8391-16 CED Reparatur GmbH Rüdesheimerstr. 7 80686 München Tel 089/570927-0 Fax 089/570927-21 Monitore Repair 2000 Hardware Service GmbH Herr Grohmann Werkstr. 5 22844 Norderstedt Tel. 040/5225031 Fax 040/5264811 CD-ROM Philips Consumer GmbH Colonia Allee 11 51067 Köln Tel. 0221/96960-0
Pioneer	Artec Computer GmbH Bahnhofstr. 198a 61184 Karben Tel.: 06039-9154-0 Fax 06039-915454 email: <a href="mailto:sparts@pioneer.de">sparts@pioneer.de</a>
QDI	QDI System Handel GMBH Habicht Straße 41 20305 Hamburg Germany TEL : 040-6113-5316 FAX : 040-6113-5217 E-mail: <a href="mailto:mailto:qdigermanyfae@csi.com">mailto:qdigermanyfae@csi.com</a>
Quantum	Quantum Peripheral Products Ltd. European Customer Service Group Finnabair Industrial Park IRL-Dundalk Co. Louth Tel. 00353-4255261 Fax 00353-4255355
Roda	Roda GmbH Shinada Mobil Röntgenstr. 3 64291 Darmstadt

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Samsung	Samsung Customer Care Center Tel. 01805 - 121213 Fax 01805 - 121214 E-mail: hotline@samsung.de Samsung - Festplatten: Samsung Electronics GmbH Daimlerstraße 6 61449 Steinbach/TS Tel.: 06196-660
Scott	Hotline: 0180-50000451 02103-986828 (OEM)
Seagate	Tel: 089-14305000 Fax: 089-1409332
SKR	SKR Gewerbering 5 41372 Niederkräthen Tel: 02163-988910 (Reparatur) Tel: 02154-492149 (Tausch)
Smile Monitore	Smile GmbH Otto Brenner Str. 10 47877 Willich Hotline: 02154-412277
SONY	SONY Emil-Hoffmann-Str. 199 50996 Köln Hotline : 0130-914319 Tel: 0180/5252586 Fax: 0180/5252587 Reparaturanschrift: AVC GmbH (Monitore) Meranerstr.43 86165 Augsburg Tel. 0821/72048-10 Fax 0821/72048-15 AVC GmbH (Streamer/MO/CD-Writer) Widdersdorfer Straße 225b D-50825 Köln Tel. 0221-954483-0 Fax. 0221-954483-90 AVC (nur Monitore) Gasstr. 18 22761 Hamburg Tel.: 040-892006
Spea	SPEA Moostr. 18b 82319 Starnberg Tel: 08151/2662-09/-11 Fax: 08151/2662-13 email:techsupt@diamondmm.com
Summagraphics	Summagraphics Calcomp Technologies GmbH Herrmann-Klammt-Str. 1 D-41460 Neuss Tel. 02131-9550 Fax 02131-955-105
Symantec	Hotline: 0211-9917-0
Tandberg	Tandberg Data GmbH Feldstr. 81 44141 Dortmund Tel: 0231-5436-142 Fax: 0231-5436-143

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TEAC	TEAC Deutschland GmbH Bahnhofstr. 12 65205 Wiesbaden/Erbenheim Tel. 0611/7158-0 Tel: 0611-7158-54 Fax: 0611-7158-66 e-mail:Support@ja.teac.de
Teles	Teles AG Dovestraße 2-4 10587 Berlin Tel: 0190-871101 Fax: 030-3992801 Mailbox 0190/511822
TerraTec	TerraTec Electronic GmbH Steylerstr. 75 41334 Nettetal 02157-81790
TEXAS INSTRUMENTS	TEXAS INSTRUMENTS Elektronik Denk & Hoffmann Wolframstr. 8a 85395 Wolfersdorf Tel: 08168-96280
Tobit	Tobit Software GmbH Parallelstr. 41 D-48683 Ahaus Tel: 02561-913-0 Hotline: 02561-913-130 Fax: 02561-913-133 email:support@tobit.com
Toshiba	Toshiba Europe GmbH Hammfelddamm 8 41460 Neuss Tel: 02131-158-01 Fax: 02131-158-473 e-mail:dpinfo@toshiba-teg.com Reparaturanschrift: IME (Notebook) Borsigstr. 7-9 93092 Barbing Tel: 09401-93330 M+S EDV Service (Festplatten u. CD-Roms) Nordring 55-57 63843 Niedernberg Tel: 06028-944197
Umax	Umax Systems GmbH Halskestr. 46 47877 Willich Tel: 02154-918794 Hotline : 0190-872308
Western Digital	Hotline: 02773-83528 (Endkunden)
Yakumo	Reparaturanschrift: CSS Yakumo Service Pippelweg 62 38120 Braunschweig 0531-8010800 Hotline: 0180-500 08 03 S plus S Industriezeile 35A A-4021 Linz Hotline: 0190-880050

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Yamaha	Yamaha Europa GmbH Siemensstr. 22-34 D-25462 Rellingen Tel. 04101-303-334 Fax 04101-303-276>