

POST Code	Meaning
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IBM BIOS Beep and Alphanumeric Error Codes

After completing the POST, an audio code indicates either a normal condition or that one of several errors has occurred.

Table 18 IBM POST Audio Error Codes

Audio Code	Sound Graph	Description
1 short beep	•	Normal POST—system OK
2 short beeps	••	POST error—error code on display
No beep		Power supply, system board
Continuous beep	————	Power supply, system board
Repeating short beeps	•••••	Power supply, system board
1 long, 1 short beep	—•	System board
1 long, 2 short beeps	—••	Video adapter (MDA / CGA)
1 long, 3 short beeps	—•••	Video adapter (EGA / VGA)
3 long beeps	— — —	3270 keyboard card

IBM has developed a system in which the first part of the error code indicates the device the error involves, and the last part indicates the exact error meaning. One of the biggest problems with these error codes is that IBM does not publish a complete list of the errors in any single publication; instead, it details specific error codes in many different publications. I have researched these codes for many years; the following table represents all the codes I have found meanings for. These codes have been selected from a number of sources, including all IBM's technical-reference and hardware-maintenance service manuals.

Table 19 IBM POST and Diagnostics Error Codes

Code	Description
1xx	System Board Errors
101	System board interrupt failure (unexpected interrupt).
102	System board timer failure.
102	PS / 2; real-time clock (RTC) / 64 byte CMOS RAM test failure.
103	System board timer interrupt failure.
103	PS / 2; 2KB CMOS RAM extension test failure.
104	System board protected mode failure.
105	System board 8042 keyboard controller command failure.
106	System board converting logic test failure.
107	System board non-maskable interrupt (NMI) test failure; hot NMI.
108	System board timer bus test failure.
109	System board memory select error; low MB chip select test failed.
110	PS / 2 system board parity check error (PARITY CHECK 1).
111	PS / 2 I / O channel (bus) parity check error (PARITY CHECK 2).
112	PS / 2 Micro Channel Arbitration error; watchdog time-out (NMI error).
113	PS / 2 Micro Channel Arbitration error; DMA arbitration time-out (NMI error).
114	PS / 2 external ROM checksum error.
115	Cache parity error, ROM checksum error or DMA error.
116	System board port read / write failure.
118	System board parity or L2-cache error during previous power-on.
119	"E" Step level 82077 (floppy controller) and 2.88MB drive installed (not supported).
120	Microprocessor self-test error.
121	256KB ROM checksum error (second 128KB bank).
121	Unexpected hardware interrupts occurred.
131	PC system board cassette port wrap test failure.
131	Direct memory access (DMA) compatibility registers error.
132	Direct memory access (DMA) extended registers error.
133	Direct memory access (DMA) verify logic error.
134	Direct memory access (DMA) arbitration logic error.
151	Battery or CMOS RAM failure.
152	Real-time clock or CMOS RAM failure.
160	PS / 2 system board ID not recognized.
161	CMOS configuration empty (dead battery).

Code	Description
1xx	System Board Errors
162	CMOS checksum error or adapter ID mismatch.
163	CMOS error; date and time not set (clock not updating).
164	Memory size error; CMOS setting does not match memory.
165	PS/2 Micro Channel adapter ID and CMOS mismatch.
166	PS/2 Micro Channel adapter time-out error (card busy).
167	PS/2 CMOS clock not updating.
168	CMOS configuration error (math coprocessor).
169	System board and processor card configuration mismatch. Run Setup.
170	ASCII setup conflict error.
170	PC Convertible; LCD not in use when suspended.
171	Rolling-bit-test failure on CMOS shutdown address byte.
171	PC Convertible; base 128KB checksum failure.
172	Rolling-bit-test failure on NVRAM diagnostic byte.
172	PC Convertible; diskette active when suspended.
173	Bad CMOS/NVRAM checksum.
173	PC Convertible; real-time clock RAM verification error.
174	Bad configuration.
174	PC Convertible; LCD configuration changed.
175	Bad EEPROM CRC #1.
175	PC Convertible; LCD alternate mode failed.
176	Tamper evident.
177	Bad PAP (privileged-access password) CRC.
177	Bad EEPROM.
178	Bad EEPROM.
179	NVRAM error log full.
180x	Sub Address data error, where x = the slot number that caused the error.
181	Unsupported configurations.
182	Privileged-access switch (JMP2) is not in the write-enable position.
183	PAP is needed to boot from the system programs.
183	Privileged-access password required.
184	Bad power-on password checksum—erase it.
184	Bad power-on password.
185	Bad startup sequence.
186	Password-protection hardware error.
187	Serial number error.
188	Bad EEPROM checksum CRC #2.
189	Excessive incorrect password attempts.
191	82385 cache controller test failure.
194	System board memory error.
199	User indicated INSTALLED DEVICES list is not correct.

(continues)

Table 19 Continued

Code	Description
2xx	Memory (RAM) Errors
20x	Memory error.
201	Memory test failure; error location might be displayed.
202	Memory address error; lines 00–15.
203	Memory address error; lines 16–23 (ISA) or 16–31 (MCA).
204	Memory remapped due to error (run diagnostics again).
205	Base 128KB memory error; memory remapped.
207	ROM failure.
210	System board memory parity error.
211	PS/2 memory; base 64KB on system board failed.
212	Watchdog time-out error (reported by NMI interrupt handler).
213	DMA bus arbitration time-out (reported by NMI interrupt handler).
215	PS/2 memory; base 64KB on daughter/SIP 2 failed.
216	PS/2 memory; base 64KB on daughter/SIP 1 failed.
221	PS/2 memory; ROM to RAM copy failed (ROM shadowing).
225	PS/2 memory; wrong-speed memory on system board, unsupported SIMM.
230	Overlapping adapter and planar memory (Family 1).
231	Non-contiguous adapter memory installed (Family 1).
231	2/4-16MB Enhanced 386 memory adapter; memory module 1 failed.
235	Stuck data line on memory module, microprocessor or system board.
241	2/4-16MB Enhanced 386 memory adapter; memory module 2 failed.
251	2/4-16MB Enhanced 386 memory adapter; memory module 3 failed.
3xx	Keyboard Errors
301	Keyboard reset or stuck key failure (SS 301, SS = scan code in hex).
302	System unit keylock is locked.
303	Keyboard-to-system board interface error; keyboard controller failure.
304	Keyboard or system board error; keyboard clock high.
305	Keyboard +5v dc error; PS/2 keyboard fuse (on system board) error.
306	Unsupported keyboard attached.
341	Keyboard error.
342	Keyboard cable error.
343	Keyboard LED card or cable failure.
365	Keyboard LED card or cable failure.
366	Keyboard interface cable failure.
367	Keyboard LED card or cable failure.
4xx	Monochrome Display Adapter (MDA) Errors
4xx	PS/2 System Board Parallel Port Errors
401	Monochrome memory, horizontal sync frequency, or video test failure.
401	PS/2 system board parallel port failure.
408	User indicated display attributes failure.

Code	Description
4xx	PS/2 System Board Parallel Port Errors
416	User indicated character set failure.
424	User indicated 80525 mode failure.
432	Parallel port test failure; monochrome display adapter.
5xx	Color Graphics Adapter (CGA) Errors
*501	CRT error.
501	CGA memory, horizontal sync frequency, or video test failure.
503	CGA adapter controller failed.
508	User indicated display attribute failure.
516	User indicated character set failure.
524	User indicated 80×25 mode failure.
532	User indicated 40×25 mode failure.
540	User indicated 320×200 graphics mode failure.
548	User indicated 640×200 graphics mode failure.
556	User indicated light-pen test failed.
564	User indicated paging test failure.
6xx	Floppy Drive/Controller Errors
601	Floppy drive / controller POST failure; disk drive or controller error.
602	Diskette boot sector is not valid.
603	Diskette size error.
604	Non-media sense.
605	Diskette drive locked.
606	Diskette verify test failure.
607	Write-protect error.
608	Drive-command error.
610	Diskette initialization failure; track 0 bad.
611	Drive time-out error.
612	Controller chip (NEC) error.
613	Direct memory access (DMA) error.
614	Direct memory access (DMA) boundary overrun error.
615	Drive index timing error.
616	Drive speed error.
621	Drive seek error.
622	Drive cyclic redundancy check (CRC) error.
623	Sector not found error.
624	Address mark error.
625	Controller chip (NEC) seek error.
626	Diskette data compare error.
627	Diskette change error.
628	Diskette removed.
630	Index stuck high; drive A:.

(continues)

Table 19 Continued

Code	Description
6xx	Floppy Drive/Controller Errors
631	Index stuck low; drive A:.
632	Track 0 stuck off; drive A:.
633	Track 0 stuck on; drive A:.
640	Index stuck high; drive B:.
641	Index stuck low; drive B:.
642	Track 0 stuck off; drive B:.
643	Track 0 stuck on; drive B:.
645	No index pulse.
646	Drive track 0 detection failed.
647	No transitions on read data line.
648	Format test failed.
649	Incorrect media type in drive.
650	Drive speed error.
651	Format failure.
652	Verify failure.
653	Read failure.
654	Write failure.
655	Controller error.
656	Drive failure.
657	Write-protect stuck protected.
658	Changeline stuck changed.
659	Write-protect stuck unprotected.
660	Changeline stuck unchanged.
7xx	Math Coprocessor Errors
701	Math coprocessor presence / initialization error.
702	Exception errors test failure.
703	Rounding test failure.
704	Arithmetic test 1 failure.
705	Arithmetic test 2 failure.
706	Arithmetic test 3 (80387 only) failure.
707	Combination test failure.
708	Integer load / store test failure.
709	Equivalent expressions errors.
710	Exception (interrupt) errors.
711	Save state (FSAVE) errors.
712	Protected mode test failure.
713	Special test (voltage / temperature sensitivity) failure.
9xx	Parallel Printer Adapter Errors
901	Printer adapter data register latch error.
902	Printer adapter control register latch error.

Code	Description
9xx	Parallel Printer Adapter Errors
903	Printer adapter register address decode error.
904	Printer adapter address decode error.
910	Status line(s) wrap connector error.
911	Status line bit 8 wrap error.
912	Status line bit 7 wrap error.
913	Status line bit 6 wrap error.
914	Status line bit 5 wrap error.
915	Status line bit 4 wrap error.
916	Printer adapter interrupt wrap error.
917	Unexpected printer adapter interrupt.
92x	Feature register error.
10xx	Alternate Parallel Printer Adapter Errors
1001	Printer adapter data register latch error.
1002	Printer adapter control register latch error.
1003	Printer adapter register address decode error.
1004	Printer adapter address decode error.
1010	Status line(s) wrap connector error.
1011	Status line bit 8 wrap error.
1012	Status line bit 7 wrap error.
1013	Status line bit 6 wrap error.
1014	Status line bit 5 wrap error.
1015	Status line bit 4 wrap error.
1016	Printer adapter interrupt wrap error.
1017	Unexpected printer adapter interrupt.
102x	Feature register error.
11xx	Primary Async Communications (Serial COM1:) Errors
1101	16450 / 16550 chip error; serial port A error.
1102	Card selected feedback error.
1102	PC Convertible internal modem test failed.
1103	Port 102h register test failure.
1103	PC Convertible internal modem dial tone test 1 failed.
1104	PC Convertible internal modem dial tone test 2 failed.
1106	Serial option cannot be put to sleep.
1107	Cable error.
1108	Interrupt request (IRQ) 3 error.
1109	Interrupt request (IRQ) 4 error.
1110	16450 / 16550 chip register failure.
1111	Internal wrap test of 16450 / 16550 chip modem control line failure.
1112	External wrap test of 16450 / 16550 chip modem control line failure.
1113	16450 / 16550 chip transmit error.

(continues)

Table 19 Continued

Code	Description
11xx	Primary Async Communications (Serial COM1:) Errors
1114	16450/16550 chip receive error.
1115	16450/16550 chip receive error; data not equal to transmit data.
1116	16450/16550 chip interrupt function error.
1117	16450/16550 chip baud rate test failure.
1118	16450/16550 chip receive external data wrap test failure.
1119	16550 chip first-in/first-out (FIFO) buffer failure.
1120	Interrupt enable register error; all bits cannot be set.
1121	Interrupt enable register error; all bits cannot be reset.
1122	Interrupt pending; stuck on.
1123	Interrupt ID register; stuck on.
1124	Modem control register error; all bits cannot be set.
1125	Modem control register error; all bits cannot be reset.
1126	Modem status register error; all bits cannot be set.
1127	Modem status register error; all bits cannot be reset.
1128	Interrupt ID error.
1129	Cannot force overrun error.
1130	No modem status interrupt.
1131	Invalid interrupt pending.
1132	No data ready.
1133	No data available interrupt.
1134	No transmit holding interrupt.
1135	No interrupts.
1136	No received sine status interrupt.
1137	No receive data available.
1138	Transmit holding register not empty.
1139	No modem status interrupt.
1140	Transmit holding register not empty.
1141	No interrupts.
1142	No interrupt 4.
1143	No interrupt 3.
1144	No data transferred.
1145	Maximum baud rate error.
1146	Minimum baud rate error.
1148	Time-out error.
1149	Invalid data returned.
1150	Modem status register error.
1151	No data set ready and delta data set ready.
1152	No data set ready.
1153	No delta data set ready.
1154	Modem status register not clear.
1155	No clear to send and delta clear to send.

Code	Description
11xx	Primary Async Communications (Serial COM1:) Errors
1156	No clear to send.
1157	No delta clear to send.
12xx	Alternate Async Communications (Serial COM2:, COM3:, and COM4:) Errors
1201	16450 / 16550 chip error.
1202	Card selected feedback error.
1203	Port 102h register test failure.
1206	Serial option cannot be put to sleep.
1207	Cable error.
1208	Interrupt request (IRQ) 3 error.
1209	Interrupt request (IRQ) 4 error.
1210	16450 / 16550 chip register failure.
1211	Internal wrap test of 16450 / 16550 chip modem control line failure.
1212	External wrap test of 16450 / 16550 chip modem control line failure.
1213	16450 / 16550 chip transmit error.
1214	16450 / 16550 chip receive error.
1215	16450 / 16550 chip receive error; data not equal to transmit data.
1216	16450 / 16550 chip interrupt function error.
1217	16450 / 16550 chip baud rate test failure.
1218	16450 / 16550 chip receive external data wrap test failure.
1219	16550 chip first-in first-out (FIFO) buffer failure.
1220	Interrupt enable register error; all bits cannot be set.
1221	Interrupt enable register error; all bits cannot be reset.
1222	Interrupt pending; stuck on.
1223	Interrupt ID register; stuck on.
1224	Modem control register error; all bits cannot be set.
1225	Modem control register error; all bits cannot be reset.
1226	Modem status register error; all bits cannot be set.
1227	Modem status register error; all bits cannot be reset.
1228	Interrupt ID error.
1229	Cannot force overrun error.
1230	No modem status interrupt.
1231	Invalid interrupt pending.
1232	No data ready.
1233	No data available interrupt.
1234	No transmit holding interrupt.
1235	No interrupts.
1236	No received sine status interrupt.
1237	No receive data available.
1238	Transmit holding register not empty.
1239	No modem status interrupt.

(continues)

Table 19 Continued

Code	Description
12xx	Alternate Async Communications (Serial COM2:, COM3:, and COM4:) Errors
1240	Transmit holding register not empty.
1241	No interrupts.
1242	No interrupt 4.
1243	No interrupt 3.
1244	No data transferred.
1245	Maximum baud rate error.
1246	Minimum baud rate error.
1248	Time-out error.
1249	Invalid data returned.
1250	Modem status register error.
1251	No data set ready and delta data set ready.
1252	No data set ready.
1253	No delta data set ready.
1254	Modem status register not clear.
1255	No clear to send and delta clear to send.
1256	No clear to send.
1257	No delta clear to send.
13xx	Game Control Adapter Errors
1301	Game control adapter test failure.
1302	Joystick test failure.
14xx	Matrix Printer Errors
1401	Printer test failure.
1402	Printer not ready error.
1403	Printer no-paper error.
1404	System board time-out.
1405	Parallel adapter failure.
1406	Printer presence test failed.
15xx	Synchronous Data Link Control (SDLC) Communications Adapter Errors
1501	SDLC adapter test failure.
1510	8255 Port B failure.
1511	8255 Port A failure.
1512	8255 Port C failure.
1513	8253 Timer #1 did not reach terminal count.
1514	8253 Timer #1 stuck on.
1515	8253 Timer #0 did not reach terminal count.
1516	8253 Timer #0 stuck on.
1517	8253 Timer #2 did not reach terminal count.

Code	Description
Synchronous Data Link Control (SDLC) Communications Adapter Errors	
15xx	
1518	8253 Timer #2 stuck on.
1519	8273 Port B error.
1520	8273 Port A error.
1521	8273 command/read time-out.
1522	Interrupt Level 4 failure.
1523	Ring Indicate stuck on.
1524	Receive Clock stuck on.
1525	Transmit Clock stuck on.
1526	Test Indicate stuck on.
1527	Ring Indicate not on.
1528	Receive Clock not on.
1529	Transmit Clock not on.
1530	Test Indicate not on.
1531	Data Set Ready not on.
1532	Carrier Detect not on.
1533	Clear to Send not on.
1534	Data Set Ready stuck on.
1535	Carrier Detect stuck on.
1536	Clear to Send stuck on.
1537	Interrupt Level 3 failure.
1538	Receive interrupt results error.
1539	Wrap data compare error.
1540	Direct memory access Channel 1 error.
1541	Direct memory access Channel 1 error.
1542	8273 error-checking or status-reporting error.
1547	Stray interrupt Level 4.
1548	Stray interrupt Level 3.
1549	Interrupt presentation sequence time-out.
16xx	Display Station Emulation Adapter (DSEA) Errors (5520, 525x)
1604	DSEA or twinaxial network error.
1608	DSEA or twinaxial network error.
1624	DSEA error.
1634	DSEA error.
1644	DSEA error.
1652	DSEA error.
1654	DSEA error.
1658	DSEA error.
1662	DSEA interrupt level error.
1664	DSEA error.
1668	DSEA interrupt level error.

(continues)

Table 19 Continued

Code	Description
16xx	Display Station Emulation Adapter (DSEA) Errors (5520, 525x)
1669	DSEA diagnostics error; use 3.0 or higher.
1674	DSEA diagnostics error; use 3.0 or higher.
1674	DSEA station address error.
1684	DSEA device address error.
1688	DSEA device address error.
17xx	ST-506/412 Fixed Disk and Controller Errors
1701	Fixed disk general POST error.
1702	Drive / controller time-out error.
1703	Drive seek error.
1704	Controller failed.
1705	Drive sector not found error.
1706	Write fault error.
1707	Drive track 0 error.
1708	Head select error.
1709	Error correction code (ECC) error.
1710	Sector buffer overrun.
1711	Bad address mark.
1712	Internal controller diagnostics failure.
1713	Data compare error.
1714	Drive not ready.
1715	Track 0 indicator failure.
1716	Diagnostics cylinder errors.
1717	Surface read errors.
1718	Hard drive type error.
1720	Bad diagnostics cylinder.
1726	Data compare error.
1730	Controller error.
1731	Controller error.
1732	Controller error.
1733	BIOS undefined error return.
1735	Bad command error.
1736	Data corrected error.
1737	Bad track error.
1738	Bad sector error.
1739	Bad initialization error.
1740	Bad sense error.
1750	Drive verify failure.
1751	Drive read failure.
1752	Drive write failure.
1753	Drive random read test failure.
1754	Drive seek test failure.

Code	Description
17xx	ST-506/412 Fixed Disk and Controller Errors
1755	Controller failure.
1756	Controller error-correction code (ECC) test failure.
1757	Controller head-select failure.
1780	Seek failure; drive 0.
1781	Seek failure; drive 1.
1782	Controller test failure.
1790	Diagnostic cylinder read error; drive 0.
1791	Diagnostic cylinder read error; drive 1.
18xx	I/O Expansion Unit Errors
1801	I/O expansion unit POST failure.
1810	Enable/disable failure.
1811	Extender card wrap test failure; disabled.
1812	High-order address lines failure; disabled.
1813	Wait state failure; disabled.
1814	Enable/disable could not be set on.
1815	Wait state failure; disabled.
1816	Extender card wrap test failure; enabled.
1817	High-order address lines failure; enabled.
1818	Disable not functioning.
1819	Wait request switch not set correctly.
1820	Receiver card wrap test failure.
1821	Receiver high order address lines failure.
19xx	3270 PC Attachment Card Errors
20xx	Binary Synchronous Communications (BSC) Adapter Errors
2001	BSC adapter test failure.
2010	8255 Port A failure.
2011	8255 Port B failure.
2012	8255 Port C failure.
2013	8253 Timer #1 did not reach terminal count.
2014	8253 Timer #1 stuck on.
2015	8253 Timer #2 did not reach terminal count.
2016	8253 Timer #2 output stuck on.
2017	8251 data set ready failed to come on.
2018	8251 clear to send not sensed.
2019	8251 data set ready stuck on.
2020	8251 clear to send stuck on.
2021	8251 hardware reset failure.
2022	8251 software reset failure.
2023	8251 software "error reset" failure.
2024	8251 transmit ready did not come on.

(continues)

Table 19 Continued

Code	Description
20xx	Binary Synchronous Communications (BSC) Adapter Errors
2025	8251 receive ready did not come on.
2026	8251 could not force "overrun" error status.
2027	Interrupt failure; no timer interrupt.
2028	Interrupt failure; transmit; replace card or planar.
2029	Interrupt failure; transmit; replace card.
2030	Interrupt failure; receive; replace card or planar.
2031	Interrupt failure; receive; replace card.
2033	Ring indicate stuck on.
2034	Receive clock stuck on.
2035	Transmit clock stuck on.
2036	Test indicate stuck on.
2037	Ring indicate stuck on.
2038	Receive clock not on.
2039	Transmit clock not on.
2040	Test indicate not on.
2041	Data set ready not on.
2042	Carrier detect not on.
2043	Clear to send not on.
2044	Data set ready stuck on.
2045	Carrier detect stuck on.
2046	Clear to send stuck on.
2047	Unexpected transmit interrupt.
2048	Unexpected receive interrupt.
2049	Transmit data did not equal receive data.
2050	8251 detected overrun error.
2051	Lost data set ready during data wrap.
2052	Receive time-out during data wrap.
21xx	Alternate Binary Synchronous Communications (BSC) Adapter Errors
2101	BSC adapter test failure.
2110	8255 Port A failure.
2111	8255 Port B failure.
2112	8255 Port C failure.
2113	8253 Timer #1 did not reach terminal count.
2114	8253 Timer #1 stuck on.
2115	8253 Timer #2 did not reach terminal count.
2116	8253 Timer #2 output stuck on.
2117	8251 Data set ready failed to come on.
2118	8251 Clear to send not sensed.
2119	8251 Data set ready stuck on.
2120	8251 Clear to send stuck on.
2121	8251 Hardware reset failure.

Code	Description
21xx	Alternate Binary Synchronous Communications (BSC) Adapter Errors
2122	8251 Software reset failure.
2123	8251 Software "error reset" failure.
2124	8251 Transmit ready did not come on.
2125	8251 Receive ready did not come on.
2126	8251 Could not force "overrun" error status.
2127	Interrupt failure; no timer interrupt.
2128	Interrupt failure; transmit; replace card or planar.
2129	Interrupt failure; transmit; replace card.
2130	Interrupt failure; receive; replace card or planar.
2131	Interrupt failure; receive; replace card.
2133	Ring indicate stuck on.
2134	Receive clock stuck on.
2135	Transmit clock stuck on.
2136	Test indicate stuck on.
2137	Ring indicate stuck on.
2138	Receive clock not on.
2139	Transmit clock not on.
2140	Test indicate not on.
2141	Data set ready not on.
2142	Carrier detect not on.
2143	Clear to send not on.
2144	Data set ready stuck on.
2145	Carrier detect stuck on.
2146	Clear to send stuck on.
2147	Unexpected transmit interrupt.
2148	Unexpected receive interrupt.
2149	Transmit data did not equal receive data.
2150	8251 detected overrun error.
2151	Lost data set ready during data wrap.
2152	Receive time-out during data wrap.
22xx	Cluster Adapter Errors
23xx	Plasma Monitor Adapter Errors
24xx	Enhanced Graphics Adapter (EGA) or Video Graphics Array (VGA) Errors
2401	Video adapter test failure.
2402	Video display error.
2408	User indicated display attribute test failed.
2409	Video display error.
2410	Video adapter error; video port error.
2416	User indicated character set test failed.

(continues)

Table 19 Continued

Code	Description
24xx	Enhanced Graphics Adapter (EGA) or Video Graphics Array (VGA) Errors
2424	User indicated 80×25 mode failure.
2432	User indicated 40×25 mode failure.
2440	User indicated 320×200 graphics mode failure.
2448	User indicated 640×200 graphics mode failure.
2456	User indicated light-pen test failure.
2464	User indicated paging test failure.
25xx	Alternate Enhanced Graphics Adapter (EGA) Errors
2501	Video adapter test failure.
2502	Video display error.
2508	User indicated display attribute test failed.
2509	Video display error.
2510	Video adapter error.
2516	User indicated character set test failed.
2524	User indicated 80×25 mode failure.
2532	User indicated 40×25 mode failure.
2540	User indicated 320×200 graphics mode failure.
2548	User indicated 640×200 graphics mode failure.
2556	User indicated light-pen test failure.
2564	User indicated paging test failure.
26xx	XT or AT/370 370-M (Memory) and 370-P (Processor) Adapter Errors
2601	370-M adapter error.
2655	370-M adapter error.
2657	370-M adapter error.
2668	370-M adapter error.
2672	370-M adapter error.
2673	370-P adapter error.
2674	370-P adapter error.
2677	370-P adapter error.
2680	370-P adapter error.
2681	370-M adapter error.
2682	370-P adapter error.
2694	370-P adapter error.
2697	370-P adapter error.
2698	XT or AT/370 diagnostic diskette error.
27xx	XT or AT/370 3277-EM (Emulation) Adapter Errors
2701	3277-EM adapter error.
2702	3277-EM adapter error.
2703	3277-EM adapter error.

Code	Description
28xx	3278/79 Emulation Adapter or 3270 Connection Adapter Errors
29xx	Color/Graphics Printer Errors
30xx	Primary PC Network Adapter Errors
3001	Processor test failure.
3002	ROM checksum test failure.
3003	Unit ID PROM test failure.
3004	RAM test failure.
3005	Host interface controller test failure.
3006	±12v test failure.
3007	Digital loopback test failure.
3008	Host detected host interface controller failure.
3009	Sync failure and no Go bit.
3010	Host interface controller test okay and no Go bit.
3011	Go bit and no command 41.
3012	Card not present.
3013	Digital failure; fall through.
3015	Analog failure.
3041	Hot carrier; not this card.
3042	Hot carrier; this card!
31xx	Secondary PC Network Adapter Errors
3101	Processor test failure.
3102	ROM checksum test failure.
3103	Unit ID PROM test failure.
3104	RAM test failure.
3105	Host interface controller test failure.
3106	[p / m]12v test failure.
3107	Digital loopback test failure.
3108	Host detected host interface controller failure.
3109	Sync failure and no Go bit.
3110	Host interface controller test okay and no Go bit.
3111	Go bit and no command 41.
3112	Card not present.
3113	Digital failure; fall through.
3115	Analog failure.
3141	Hot carrier; not this card.
3142	Hot carrier; this card!
32xx	3270 PC or AT Display and Programmed Symbols Adapter Errors
33xx	Compact Printer Errors

(continues)

Table 19 Continued

Code	Description
35xx	Enhanced Display Station Emulation Adapter (EDSEA) Errors
3504	Adapter connected to Twinaxial cable during offline test.
3508	Workstation address error.
3509	Diagnostic program failure.
3540	Workstation address invalid.
3588	Adapter address switch error.
3599	Diagnostic program failure.
36xx	General-Purpose Interface Bus (GPIB) Adapter Errors
3601	Adapter test failure.
3602	Serial poll mode register write error.
3603	Adapter address error.
3610	Adapter listen error.
3611	Adapter talk error.
3612	Adapter control error.
3613	Adapter standby error.
3614	Adapter asynchronous control error.
3615	Adapter asynchronous control error.
3616	Adapter error; cannot pass control.
3617	Adapter error; cannot address to listen.
3618	Adapter error; cannot unaddress to listen.
3619	Adapter error; cannot address to talk.
3620	Adapter error; cannot unaddress to talk.
3621	Adapter error; cannot address to listen with extended addressing.
3622	Adapter error; cannot unaddress to listen with extended addressing.
3623	Adapter error; cannot address to talk with extended addressing.
3624	Adapter error; cannot unaddress to talk with extended addressing.
3625	Write to self error.
3626	Generate handshake error.
3627	Cannot detect Device Clear message error.
3628	Cannot detect Selected Device Clear message error.
3629	Cannot detect end with end of identify.
3630	Cannot detect end of transmission with end of identify.
3631	Cannot detect end with 0-bit end of string.
3632	Cannot detect end with 7-bit end of string.
3633	Cannot detect group execute trigger.
3634	Mode 3 addressing error.
3635	Cannot recognize undefined command.
3636	Cannot detect remote, remote changed, lockout, or lockout changed.
3637	Cannot clear remote or lockout.
3638	Cannot detect service request.
3639	Cannot conduct serial poll.
3640	Cannot conduct parallel poll.

Code	Description
36xx	General-Purpose Interface Bus (GPIB) Adapter Errors
3650	Adapter error; direct memory access (DMA) to 7210.
3651	Data error; error on direct memory access (DMA) to 7210.
3652	Adapter error; direct memory access (DMA) from 7210.
3653	Data error on direct memory access (DMA) from 7210.
3658	Uninvoked interrupt received.
3659	Cannot interrupt on address status changed.
3660	Cannot interrupt on address status changed.
3661	Cannot interrupt on command output.
3662	Cannot interrupt on data out.
3663	Cannot interrupt on data in.
3664	Cannot interrupt on error.
3665	Cannot interrupt on device clear.
3666	Cannot interrupt on end.
3667	Cannot interrupt on device execute trigger.
3668	Cannot interrupt on address pass through.
3669	Cannot interrupt on command pass through.
3670	Cannot interrupt on remote changed.
3671	Cannot interrupt on lockout changed.
3672	Cannot interrupt on service request in.
3673	Cannot interrupt on terminal count on direct memory access to 7210.
3674	Cannot interrupt on terminal count on direct memory access from 7210.
3675	Spurious direct memory access terminal-count interrupt.
3697	Illegal direct memory access configuration setting detected.
3698	Illegal interrupt level setting detected.
37xx	System Board SCSI Controller Error
38xx	Data Acquisition Adapter Errors
3801	Adapter test failure.
3810	Timer read test failure.
3811	Timer interrupt test failure.
3812	Delay; binary input 13 test failure.
3813	Rate; binary input 13 test failure.
3814	Binary output 14; interrupt status—interrupt request test failure.
3815	Binary output 0; count-in test failure.
3816	Binary input strobe; count-out test failure.
3817	Binary output 0; binary output clear to send test failure.
3818	Binary output 1; binary input 0 test failure.
3819	Binary output 2; binary input 1 test failure.
3820	Binary output 3; binary input 2 test failure.
3821	Binary output 4; binary input 3 test failure.
3822	Binary output 5; binary input 4 test failure.
3823	Binary output 6; binary input 5 test failure.

(continues)

Table 19 Continued

Code	Description
38xx	Data Acquisition Adapter Errors
3824	Binary output 7; binary input 6 test failure.
3825	Binary output 8; binary input 7 test failure.
3826	Binary output 9; binary input 8 test failure.
3827	Binary output 10; binary input 9 test failure.
3828	Binary output 11; binary input 10 test failure.
3829	Binary output 12; binary input 11 test failure.
3830	Binary output 13; binary input 12 test failure.
3831	Binary output 15; analog input CE test failure.
3832	Binary output strobe; binary output GATE test failure.
3833	Binary input clear to send; binary input HOLD test failure.
3834	Analog input command output; binary input 15 test failure.
3835	Counter interrupt test failure.
3836	Counter read test failure.
3837	Analog output 0 ranges test failure.
3838	Analog output 1 ranges test failure.
3839	Analog input 0 values test failure.
3840	Analog input 1 values test failure.
3841	Analog input 2 values test failure.
3842	Analog input 3 values test failure.
3843	Analog input interrupt test failure.
3844	Analog input 23 address or value test failure.
39xx	Professional Graphics Adapter (PGA) Errors
3901	PGA test failure.
3902	ROM1 self-test failure.
3903	ROM2 self-test failure.
3904	RAM self-test failure.
3905	Cold start cycle power error.
3906	Data error in communications RAM.
3907	Address error in communications RAM.
3908	Bad data reading / writing 6845-like register.
3909	Bad data in lower E0h bytes reading / writing 6845-like registers.
3910	Graphics controller display bank output latches error.
3911	Basic clock error.
3912	Command control error.
3913	Vertical sync scanner error.
3914	Horizontal sync scanner error.
3915	Intech error.
3916	Look-up table address error.
3917	Look-up table red RAM chip error.
3918	Look-up table green RAM chip error.
3919	Look-up table blue RAM chip error.

Code	Description
39xx	Professional Graphics Adapter (PGA) Errors
3920	Look-up table data latch error.
3921	Horizontal display error.
3922	Vertical display error.
3923	Light-pen error.
3924	Unexpected error.
3925	Emulator addressing error.
3926	Emulator data latch error.
3927	Base for error codes 3928–3930 (Emulator RAM).
3928	Emulator RAM error.
3929	Emulator RAM error.
3930	Emulator RAM error.
3931	Emulator horizontal/vertical display problem.
3932	Emulator cursor position error.
3933	Emulator attribute display problem.
3934	Emulator cursor display error.
3935	Fundamental emulation RAM problem.
3936	Emulation character set problem.
3937	Emulation graphics display error.
3938	Emulation character display problem.
3939	Emulation bank select error.
3940	Adapter RAM U2 error.
3941	Adapter RAM U4 error.
3942	Adapter RAM U6 error.
3943	Adapter RAM U8 error.
3944	Adapter RAM U10 error.
3945	Adapter RAM U1 error.
3946	Adapter RAM U3 error.
3947	Adapter RAM U5 error.
3948	Adapter RAM U7 error.
3949	Adapter RAM U9 error.
3950	Adapter RAM U12 error.
3951	Adapter RAM U14 error.
3952	Adapter RAM U16 error.
3953	Adapter RAM U18 error.
3954	Adapter RAM U20 error.
3955	Adapter RAM U11 error.
3956	Adapter RAM U13 error.
3957	Adapter RAM U15 error.
3958	Adapter RAM U17 error.
3959	Adapter RAM U19 error.
3960	Adapter RAM U22 error.
3961	Adapter RAM U24 error.

(continues)

Table 19 Continued

Code	Description
39xx	Professional Graphics Adapter (PGA) Errors
3962	Adapter RAM U26 error.
3963	Adapter RAM U28 error.
3964	Adapter RAM U30 error.
3965	Adapter RAM U21 error.
3966	Adapter RAM U23 error.
3967	Adapter RAM U25 error.
3968	Adapter RAM U27 error.
3969	Adapter RAM U29 error.
3970	Adapter RAM U32 error.
3971	Adapter RAM U34 error.
3972	Adapter RAM U36 error.
3973	Adapter RAM U38 error.
3974	Adapter RAM U40 error.
3975	Adapter RAM U31 error.
3976	Adapter RAM U33 error.
3977	Adapter RAM U35 error.
3978	Adapter RAM U37 error.
3979	Adapter RAM U39 error.
3980	Graphics controller RAM timing error.
3981	Graphics controller read/write latch error.
3982	Shift register bus output latches error.
3983	Addressing error (vertical column of memory; U2 at top).
3984	Addressing error (vertical column of memory; U4 at top).
3985	Addressing error (vertical column of memory; U6 at top).
3986	Addressing error (vertical column of memory; U8 at top).
3987	Addressing error (vertical column of memory; U10 at top).
3988	Base for error codes 3989–3991 (horizontal bank latch errors).
3989	Horizontal bank latch errors.
3990	Horizontal bank latch errors.
3991	Horizontal bank latch errors.
3992	RAG / CAG graphics controller error.
3993	Multiple write modes, nibble mask errors.
3994	Row nibble (display RAM) error.
3995	Graphics controller addressing error.
44xx	5278 Display Attachment Unit and 5279 Display Errors
45xx	IEEE Interface Adapter (IEEE-488) Errors
46xx	A Real-Time Interface Coprocessor (ARTIC) Multiport/2 Adapter Errors
4611	ARTIC adapter error.
4612	Memory module error.

Code	Description
46xx	A Real-Time Interface Coprocessor (ARTIC) Multiport/2 Adapter Errors
4613	Memory module error.
4630	ARTIC adapter error.
4640	Memory module error.
4641	Memory module error.
4650	ARTIC interface cable error.
48xx	Internal Modem Errors
49xx	Alternate Internal Modem Errors
50xx	PC Convertible LCD Errors
5001	LCD display buffer failure.
5002	LCD font buffer failure.
5003	LCD controller failure.
5004	User indicated PEL / drive test failed.
5008	User indicated display attribute test failed.
5016	User indicated character set test failed.
5020	User indicated alternate character set test failure.
5024	User indicated 80×25 mode test failure.
5032	User indicated 40×25 mode test failure.
5040	User indicated 320×200 graphics test failure.
5048	User indicated 640×200 graphics test failure.
5064	User indicated paging test failure.
51xx	PC Convertible Portable Printer Errors
5101	Portable printer interface failure.
5102	Portable printer busy error.
5103	Portable printer paper or ribbon error.
5104	Portable printer time-out.
5105	User indicated print-pattern test error.
56xx	Financial Communication System Errors
70xx	Phoenix BIOS/Chipset Unique Error Codes
7000	Chipset CMOS failure.
7001	Chipset shadow RAM failure.
7002	Chipset CMOS configuration error.
71xx	Voice Communications Adapter (VCA) Errors
7101	Adapter test failure.
7102	Instruction or external data memory error.
7103	PC to VCA interrupt error.
7104	Internal data memory error.
7105	Direct memory access (DMA) error.

(continues)

Table 19 Continued

Code	Description
71xx	Voice Communications Adapter (VCA) Errors
7106	Internal registers error.
7107	Interactive shared memory error.
7108	VCA to PC interrupt error.
7109	DC wrap error.
7111	External analog wrap and tone-output error.
7112	Microphone to speaker wrap error.
7114	Telephone attachment test failure.
73xx	3 1/2-Inch External Diskette Drive Errors
7301	Diskette drive / adapter test failure.
7306	Disk changeline failure.
7307	Diskette is write-protected.
7308	Drive command error.
7310	Diskette initialization failure; track 0 bad.
7311	Drive time-out error.
7312	Controller chip (NEC) error.
7313	Direct memory access (DMA) error.
7314	DMA boundary overrun.
7315	Drive index timing error.
7316	Drive speed error.
7321	Drive seek error.
7322	Drive cyclic redundancy check (CRC) error.
7323	Sector not found error.
7324	Address mark error.
7325	Controller chip (NEC) seek error.
74xx	IBM PS/2 Display Adapter (VGA Card) Errors
74xx	8514/A Display Adapter Errors
7426	8514 display error.
7440	8514/A memory module 31 error.
7441	8514/A memory module 30 error.
7442	8514/A memory module 29 error.
7443	8514/A memory module 28 error.
7444	8514/A memory module 22 error.
7445	8514/A memory module 21 error.
7446	8514/A memory module 18 error.
7447	8514/A memory module 17 error.
7448	8514/A memory module 32 error.
7449	8514/A memory module 14 error.
7450	8514/A memory module 13 error.
7451	8514/A memory module 12 error.
7452	8514/A memory module 06 error.

Code	Description
74xx	8514/A Display Adapter Errors
7453	8514/A memory module 05 error.
7454	8514/A memory module 02 error.
7455	8514/A memory module 01 error.
7460	8514/A memory module 16 error.
7461	8514/A memory module 27 error.
7462	8514/A memory module 26 error.
7463	8514/A memory module 25 error.
7464	8514/A memory module 24 error.
7465	8514/A memory module 23 error.
7466	8514/A memory module 20 error.
7467	8514/A memory module 19 error.
7468	8514/A memory module 15 error.
7469	8514/A memory module 11 error.
7470	8514/A memory module 10 error.
7471	8514/A memory module 09 error.
7472	8514/A memory module 08 error.
7473	8514/A memory module 07 error.
7474	8514/A memory module 04 error.
7475	8514/A memory module 03 error.
76xx	4216 PagePrinter Adapter Errors
7601	Adapter test failure.
7602	Adapter error.
7603	Printer error.
7604	Printer cable error.
84xx	PS/2 Speech Adapter Errors
85xx	2MB XMA Memory Adapter or XMA Adapter/A Errors
850x	Adapter error.
851x	Adapter error.
852x	Memory module error.
8599	Unusable memory segment found.
86xx	PS/2 Pointing Device (Mouse) Errors
8601	Pointing device error; mouse time-out.
8602	Pointing device error; mouse interface.
8603	Pointing device or system-bus failure; mouse interrupt.
8604	Pointing device or system board error.
8611	System bus error—I/F between 8042 and TrackPoint II.
8612	TrackPoint II error.
8613	System bus error or TrackPoint II error.
89xx	Musical Instrument Digital Interface (MIDI) Adapter Errors

(continues)

Table 19 Continued

Code	Description
91xx	IBM 3363 Write-Once Read Multiple (WORM) Optical Drive/Adapter Errors
96xx	SCSI Adapter with Cache (32-Bit) Errors
100xx	Multiprotocol Adapter/A Errors
10001	Presence test failure.
10002	Card selected feedback error.
10003	Port 102h register rest failure.
10004	Port 103h register rest failure.
10006	Serial option cannot be put to sleep.
10007	Cable error.
10008	Interrupt request (IRQ) 3 error.
10009	Interrupt request (IRQ) 4 error.
10010	16550 chip register failure.
10011	Internal wrap test of 16550 chip modem control line failure.
10012	External wrap test of 16550 chip modem control line failure.
10013	16550 chip transmit error.
10014	16550 chip receive error.
10015	16550 chip receive error; data not equal to transmit data.
10016	16550 chip interrupt function error.
10017	16550 chip baud rate test failure.
10018	16550 chip receive external data wrap test failure.
10019	16550 chip first-in / first-out (FIFO) buffer failure.
10026	8255 Port A error.
10027	8255 Port B error.
10028	8255 Port C error.
10029	8254 timer 0 error.
10030	8254 timer 1 error.
10031	8254 timer 2 error.
10032	Binary sync data set ready response to data terminal ready error.
10033	Binary sync clear to send response to ready to send error.
10034	8251 hardware reset test failed.
10035	8251 function error.
10036	8251 status error.
10037	Binary sync timer interrupt error.
10038	Binary sync transmit interrupt error.
10039	Binary sync receive interrupt error.
10040	Stray interrupt request (IRQ) 3 error.
10041	Stray interrupt request (IRQ) 4 error.
10042	Binary sync external wrap error.
10044	Binary sync data wrap error.
10045	Binary sync line status / condition error.
10046	Binary sync time-out error during data wrap test.

Code	Description
100xx	Multiprotocol Adapter/A Errors
10050	8273 command acceptance or results ready time-out error.
10051	8273 Port A error.
10052	8273 Port B error.
10053	SDLC modem status change logic error.
10054	SDLC timer interrupt request (IRQ) 4 error.
10055	SDLC modem status change interrupt request (IRQ) 4 error.
10056	SDLC external wrap error.
10057	SDLC interrupt results error.
10058	SDLC data wrap error.
10059	SDLC transmit interrupt error.
10060	SDLC receive interrupt error.
10061	Direct memory access (DMA) channel 1 transmit error.
10062	Direct memory access (DMA) channel 1 receive error.
10063	8273 status detect failure.
10064	8273 error detect failure.
101xx	300/1200bps Internal Modem/A Errors
10101	Presence test failure.
10102	Card selected feedback error.
10103	Port 102h register test failure.
10106	Serial option cannot be put to sleep.
10108	Interrupt request (IRQ) 3 error.
10109	Interrupt request (IRQ) 4 error.
10110	16450 chip register failure.
10111	Internal wrap test of 16450 modem control line failure.
10113	16450 transmit error.
10114	16450 receive error.
10115	16450 receive error data not equal transmit data.
10116	16450 interrupt function error.
10117	16450 baud rate test failure.
10118	16450 receive external data wrap test failure.
10125	Modem reset result code error.
10126	Modem general result code error.
10127	Modem S registers write/read error.
10128	Modem turn echo on/off error.
10129	Modem enable/disable result codes error.
10130	Modem enable number/word result codes error.
10133	Connect results for 300 baud not received.
10134	Connect results for 1200 baud not received.
10135	Modem fails local analog loopback test at 300 baud.
10136	Modem fails local analog loopback test at 1200 baud.
10137	Modem does not respond to escape/reset sequence.
10138	S-Register 13 does not show correct parity or number of data bits.

(continues)

Table 19 Continued

Code	Description
104xx	ESDI or MCA IDE Fixed Disk or Adapter Errors
10139	S-Register 15 does not reflect correct bit rate.
10450	Read / write test failed.
10451	Read verify test failed.
10452	Seek test failed.
10453	Wrong drive type indicated.
10454	Controller sector buffer test failure.
10455	Controller invalid failure.
10456	Controller diagnostic command failure.
10461	Drive format error.
10462	Controller head select error.
10463	Drive read / write sector error.
10464	Drive primary defect map unreadable.
10465	Controller; error-correction code (ECC) 8-bit error.
10466	Controller; error-correction code (ECC) 9-bit error.
10467	Drive soft seek error.
10468	Drive hard seek error.
10469	Drive soft error count exceeded.
10470	Controller attachment diagnostic error.
10471	Controller wrap mode interface error.
10472	Controller wrap mode drive select error.
10473	Read verify test errors.
10480	Seek failure; drive 0.
10481	Seek failure; drive 1.
10482	Controller transfer acknowledge error.
10483	Controller reset failure.
10484	Controller; head select 3 error.
10485	Controller; head select 2 error.
10486	Controller; head select 1 error.
10487	Controller; head select 0 error.
10488	Controller; read gate—command complete 2 error.
10489	Controller; write gate—command complete 1 error.
10490	Diagnostic area read error; drive 0.
10491	Diagnostic area read error; drive 1.
10492	Controller error, drive 1.
10493	Reset error, drive 1.
10499	Controller failure.
107xx	5 1/4-Inch External Diskette Drive or Adapter Errors
112xx	SCSI Adapter (16-bit without Cache) Errors
113xx	System Board SCSI Adapter (16-Bit) Errors

Code	Description
129xx	Processor Complex (CPU Board) Errors
129005	DMA error.
12901	Processor board; processor test failed.
12902	Processor board; cache test failed.
12904	Second level cache failure.
12905	Cache enable / disable errors.
12907	Cache fatal error.
12908	Cache POST program error.
12912x	Hardware failure.
12913x	Micro channel bus time-out.
12914x	Software failure.
12915x	Processor complex error.
12916x	Processor complex error.
12917x	Processor complex error.
12918x	Processor complex error.
12919x	Processor complex error.
12940x	Processor complex failure.
12950x	Processor complex failure.
129900	Processor complex serial-number mismatch.
149xx	P70/P75 Plasma Display and Adapter Errors
14901	Plasma display adapter failure.
14902	Plasma display adapter failure.
14922	Plasma display failure.
14932	External display failure.
152xx	XGA Display Adapter /A Errors
164xx	120MB Internal Tape Drive Errors
165xx	6157 Streaming Tape Drive or Tape Attachment Adapter Errors
16520	Streaming tape drive failure.
16540	Tape attachment adapter failure.
166xx	Primary Token-Ring Network Adapter Errors
167xx	Alternate Token-Ring Network Adapter Errors
180xx	PS/2 Wizard Adapter Errors
18001	Interrupt controller failure.
18002	Incorrect timer count.
18003	Timer interrupt failure.
18004	Sync check interrupt failure.
18005	Parity check interrupt failure.
18006	Access error interrupt failure.
18012	Bad checksum error.

(continues)

Table 19 Continued

Code	Description
180xx	PS/2 Wizard Adapter Errors
18013	Micro Channel interface error.
18021	Wizard memory compare or parity error.
18022	Wizard memory address line error.
18023	Dynamic RAM controller failure.
18029	Wizard memory byte enable error.
18031	Wizard memory-expansion module memory compare or parity error.
18032	Wizard memory-expansion module address line error.
18039	Wizard memory-expansion module byte enable error.
185xx	DBCS Japanese Display Adapter/A Errors
194xx	80286 Memory-Expansion Option Memory-Module Errors
200xx	Image Adapter/A Errors
208xx	Unknown SCSI Device Errors
209xx	SCSI Removable Disk Errors
210xx	SCSI Fixed Disk Errors
210PLSC	"PLSC" codes indicate errors P = SCSI ID number (Physical Unit Number or PUN) L = Logical unit number (LUN, usually 0) S = Host Adapter slot number C = SCSI Drive capacity: A = 60MB B = 80MB C = 120MB D = 160MB E = 320MB F = 400MB H = 1,024MB (1GB) I = 104MB J = 212MB U = Undetermined or Non IBM OEM Drive
211xx	SCSI Tape Drive Errors
212xx	SCSI Printer Errors
213xx	SCSI Processor Errors
214xx	SCSI Write-Once Read Multiple (WORM) Drive Errors
215xx	SCSI CD-ROM Drive Errors
216xx	SCSI Scanner Errors
217xx	SCSI Magneto Optical Drive Errors

Code	Description
218xx	SCSI Jukebox Changer Errors
219xx	SCSI Communications Errors
243xxxx	XGA-2 Adapter/A Errors
1998xxxx	Dynamic Configuration Select (DCS) Information Codes
1998001x	Bad integrity of DCS master boot record.
1988002x	Read failure of DCS master boot record.
1988003x	DCS master boot record is not compatible with the planar ID.
1988004x	DCS master boot record is not compatible with the model/submodel byte.
1988005x	Bad integrity of CMOS/NVRAM (or internal process error).
1988006x	Read failure of header/mask/configuration record.
1988007x	Bad integrity of header/mask/configuration record.
1988008x	Hard disk does not support the command to set the maximum RBA.
1988009x	DCS master boot record is older than system ROM.
19880402	Copyright notice in E000 segment does not match the one in DCS MBR.
19880403	DCS MBR is not compatible with the system board ID or model/submodel byte.
199900xx	Initial Microcode Load (IML) Error
1999001x	Invalid disk IML record.
1999002x	Disk IML record load error.
1999003x	Disk IML record incompatible with system board.
1999004x	Disk IML record incompatible with processor/processor card.
1999005x	Disk IML not attempted.
1999006x	Disk stage II System Image load error.
1999007x	Disk stage II image checksum error.
1999008x	IML not supported on primary disk drive.
1999009x	Disk IML record is older than ROM.
199900x1	Invalid diskette IML record.
199900x2	Diskette IML record load error.
199900x3	Diskette IML record incompatible with system board.
199900x4	Diskette IML record incompatible with processor card.
199900x5	Diskette IML recovery prevented (valid password and CE override not set).
199900x6	Diskette stage II image load error.
199900x7	Diskette stage II image checksum error.
199900x9	Diskette IML record older than ROM.
199903xx	No Bootable Device, Initial Program Load (IPL) Errors
19990302	Invalid disk boot record, unable to read IPL boot record from disk.
19990303	IML system partition boot failure.
19990304	No bootable device with ASCII console.
19990305	No bootable media found.
19990306	Invalid SCSI Device boot record.

(continues)

Table 19 Continued

Code	Description
199904xx	IML-to-System Mismatch
19990401	Unauthorized access (manufacturing boot request with valid password).
19990402	Missing ROM IBM copyright notice.
19990403	IML boot record incompatible with system board / processor card.
199906xx	IML (boot) Errors

Disk Software Interfaces and Error Codes

The operating system has to talk to the disk drives through the BIOS. Normally the OS calls on the BIOS via a standard software interface called INT13h. INT13h represents a series of functions that the BIOS can perform, regardless of the type of drive. This allows the same operating systems software to work on different types of drives such as IDE or SCSI, even though at a hardware and direct software command level their interfaces are different. The device drivers for the respective drives or controllers translates the INT13h commands into the low-level commands that actually operate the drive. Figure 3 shows a representation of the relationship between different disk software interfaces at work in a typical PC system. This figure shows the chain of command from the hardware, which is the actual drive controller, to the BIOS, OS, and, finally, the application programs.

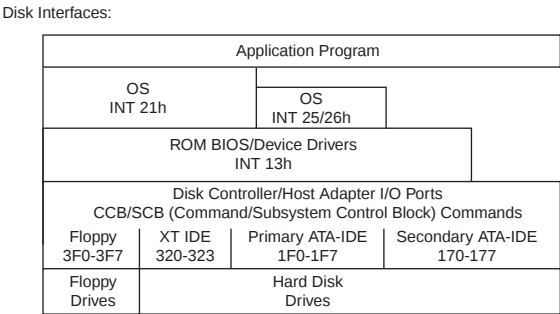


Figure 3 Disk software interface levels and relationships.

INT13h provides several standard functions which the operating system (or in some cases applications that require more direct disk access) can use. Table 20 shows the different functions available at the Interrupt 13h BIOS interface. Some functions are available to floppy drives or hard drives only, and others are available to both types of drives.

Table 20 Int13h BIOS Disk Functions

Function	Floppy Disk	Hard Disk	Description
00h	✓	✓	Reset disk system
01h	✓	✓	Get status of last operation
02h	✓	✓	Read sectors

Function	Floppy Disk	Hard Disk	Description
03h	✓	✓	Write sectors
04h	✓	✓	Verify sectors
05h	✓	✓	Format track
06h		✓	Format bad track
07h		✓	Format drive
08h	✓	✓	Read drive parameters
09h		✓	Initialize drive characteristics
0Ah		✓	Read long
0Bh		✓	Write long
0Ch		✓	Seek
0Dh		✓	Alternate hard disk reset
0Eh		✓	Read sector buffer
0Fh		✓	Write sector buffer
10h		✓	Test for drive ready
11h		✓	Recalibrate drive
12h		✓	Controller RAM diagnostic
13h		✓	Controller drive diagnostic
14h		✓	Controller internal diagnostic
15h	✓	✓	Get disk type
16h	✓		Get floppy disk change status
17h	✓		Set floppy disk type for format
18h	✓		Set media type for format
19h		✓	Park hard disk heads
1Ah		✓	ESDI—Low-level format
1Bh		✓	ESDI—Get manufacturing header
1Ch		✓	ESDI—Get configuration

Often, diagnostics programs use the INT13h interface to talk more directly to the drive, bypassing the operating system and working directly with the BIOS. An example of this type of program would be hard disk low-level format programs or the DiskEdit program that comes with the Norton Utilities, and which allows direct editing of disk sectors, file allocation tables, directories, etc. This type of access is accomplished by sending INT13h commands directly instead of working with the higher level INT21h operating system commands. INT21h commands are file-oriented, while INT13h commands are cylinder, head, and sector oriented.

Anytime a program uses INT13h commands, an error status is returned after each command. If an error occurs, the status will be reported as a number other than 00h, and most programs will then attempt to display this error to the user. Table 21 shows the error codes that might be returned by the BIOS INT13h routines. In some cases you may see these codes referred to when running a low-level format program, disk editor, or other program that can directly access a disk drive through the BIOS.

Table 21 INT13h BIOS Error Codes

Code	Description
00h	No error
01h	Bad command
02h	Address mark not found
03h	Write protect
04h	Request sector not found
05h	Reset failed
06h	Media change error
07h	Initialization failed
09h	Cross 64KB DMA boundary
0Ah	Bad sector flag detected
0Bh	Bad track flag detected
10h	Bad ECC on disk read
11h	ECC corrected data error
20h	Controller has failed
40h	Seek operation failed
80h	Drive failed to respond
AAh	Drive not ready
BBh	Undefined error
CCh	Write fault
0Eh	Register error
FFh	Sense operation failed

Most of these errors indicate a problem with the disk media, the drive hardware, cable, or controller.