Mesa Processor MP Codes

UNDER CONSTRUCTION

We apologize for the inconvenience.

MP Codes (or Maintenance Panel Codes) are the numbers that appear in big red LEDs next to the power switch on Dandelions, green LEDs on the front of 8090 servers, or as teeny tiny numbers in the cursor of other D-machines. These codes are important clues as to what your computer is doing.

8090 MP codes are from the *Xerox 8090 Diagnostics Handbook* dated September 1989. The rest were extracted from Appendix B of the November 1984 edition of the *XDE User's Guide*, with additions from my memory. This is by no means a complete list.

Some of these code may not apply to all machines. Conversely, some codes may have different meanings from machine to machine. Once again, this is not a complete list. Even if your machine is not listed in the **System** column for a specific MP code, it is entirely possible that one of the entries applies to it anyways. I'll be adding more info about this as it becomes available.

All MP codes are presented here as 4 digit values. On some machines, leading zeroes may be dropped - for example, `0915` could also be displayed as `915`.

MP codes with a Help! in their description have diagnostic/repair procedures available (click to follow the link to the procedures applicable to that code).

Code	System	Description
`0000` through `0013`		**Boot options.**
`0000`		**IOPB PWB might be hung.** Before a Dark Boot takes place, this code indicates that the IOPB is hung up. Booting will not proceed until this is cleared.
Preboot Diagnostics		
`0060`	8090	**Cartridge tape controller reset failed.** The cartridge tape controller is located on the IOPB PWB. Help!
`0062`	8090	**Cartridge tape controller seek test failed.** The cartridge tape controller is located on the IOPB PWB. Help!
`0063`	8090	**Cartridge tape head load test never completed.** Help!
`0065`	8090	**Cartridge tape change status fails high.** Help!
`0066`	8090	**Cartridge tape change access end count fails high.** Cartridge tape drive subsystem. Help!
`0067`	8090	**Cartridge tape drive not selected.** Help!
`0068`	8090	**Ready fails high with cartridge tape drive not selected.** Help!

0069	8090	**Write protect fails high with cartridge tape drive not selected.** Help!
0070	8090	**Cartridge tape drive head loaded fails high after a reset.** Help!
0072	8090	**Cartridge tape drive CRC error after a reset.** Help!
0073	8090	**Track 00 fails high with cartridge tape drive not selected.** Help!
0075	8090	**Cartridge tape drive busy fails high after a reset.** Help!
0076	8090	See Alternate boot option 0010.
0077	8090	See Alternate boot option 0010.
0081	8090	**Index pulse failure.** Index pulse signal from the cartridge tape drive was not received. This also occurs normally during tape retensioning (see Alternate boot option 0010). Help!
0082	8090	**Index pulse failure.** Index pulse signal from the cartridge tape drive was not received. This also occurs normally during tape retensioning (see Alternate boot option 0010). Help!
0087	8090	**Cartridge tape drive track number is too big.**
0089	8090	**Cartridge tape drive controller track register is incorrect.**
0090	8090	**Cartridge tape drive is not ready.**
0091	8090	**Cartridge tape drive restore failed.**
0099	8090	**Preboot diagnostics are complete.** Normally this should only be up for a little bit - if it persists more than a few seconds it might indicate a problem. Help!
Diagnostic/Operating System Software Load Sequence		
0100	8090	**Start Phase 0.** The source of this code is Boot EPROM on the IOPB PWB. Help!
0111	8090	**Rigid disk booting specified, but no disk found.** The source of this code is Boot EPROM. Help!
0112	8090	**Multi disks found.** Rigid disk booting specified bu multi disks bits in Mem 0. The source of this code is boot code. Help!
0113	8090	**Not implemented alternate boot device.** The source of this code is boot code. Help!
0114	8090	**Invalid boot type.** The source of this code is boot code. Help!
0115	8090	**Not implemented boot source.** The source of this code is boot code. Help!
0117	8090	**Unknown special boot file block.** The source of this code is boot code. Help!
0118	8090	**Something is wrong with the IOPB block byte count.** The source of this code is boot code. Help!
0120	8090	**Track number too big (cartridge tape).** The source of this code is boot code. Help!
0121	8090	**Track number negative (cartridge tape).** The source of this code is boot code. Help!
0122	8090	**Hardware track register incorrect (cartridge tape).** The source of this code is boot code. Help!
0123	8090	**Seek hard error (cartridge tape).** Probably the drive is not ready. The source of this code is boot code. Help!
0124	8090	**Restore failure (cartridge tape).** Cannot verify track - or track 0 bit is not true. The source of this code is boot code. Help!

0125	8090	**Seek failure (cartridge tape).** The source of this code is boot code. Help!
0135	8090	**Finish Phase 0 (IOPB PWB).** The source of this code is boot microcode (Domino). Help!
0136	8090	**Transfer of Control Store Image completed.** The source of this code is boot microcode (Domino). Help!
0137	8090	**Transfer of TPC Image completed.** The source of this code is boot microcode (Domino). Help!
0138	8090	**Start CP kernel (IOPB PWB).** The source of this code is boot microcode (Domino). Help!
0139	8090	**Start CP Phase 0 (IOPB PWB).** The source of this code is boot microcode (Domino). Help!
0140	8090	**Boot devices detected in main memory by IOPB PWB.** The source of this code is boot microcode (Domino). Help!
0141	8090	**Inform CP.** CP U-registers set up. Boot device and host address transmitted to CP PWB. The source of this code is boot microcode (Domino). The SCSI boot PROM is installed on the ESCSI PWB. Help!
0142	8090	**Cartridge tape initialized for cartridge booting (IOPB PWB).** The source of this code is boot microcode (Domino). Help!
0149	**Dandelion**	This code is normally displayed for only a few seconds. On Dandelions equipped with the SA4000 disk drive, **149** will be displayed for about 90 seconds after turning on the power. "Persistent **149**'s should be reported to your hardware support group."
0149	8090	Waiting for Phase 1 boot file to be read in from boot device. THis is an early code during the booting sequence and should display for only a few seconds. During disk booting, this code will be displayed up to 90 seconds after initial power on. The source of this code is the boot EPROM. Help!
0149		This can occur when booting a Dandelion after turning power on. Try rebooting. If that fails, it's a hardware problem.
0150	8090	**Commence interpreting Phase 1 boot file.** The source of this code is the boot EPROM. Help!
0151	8090	**CP error in reading from boot device.** This frequently occurs when booting after switching on power. Rebooting usually clears this code. The source of this code is the boot code. Help!
0154	8090	**Illegal IOPB port command.** The source of this code is the boot code. Help!
0155	8090	**CP Trap through Control Store 0** (CS parity, or double-bit memory error). The source of this code is the boot code. Help!
0167	8090	**Unknown special boot file block.** The source of this code is the boot code. Help!
0168	8090	**Something wrong with IOPB block byte count.** The source of this code is the boot code. Help!
0169	8090	**LoadU specified not in Phase 0.** The source of this code is the boot code. Help!
0170	8090	**Track Too Big Phase 1** (IOPB PWB). The source of this code is the boot code. Help!

0171	8090	**Track Number Negative Phase 1** (IOPB PWB). The source of this code is the boot code. Help!
0172	8090	**Command Track Error Phase 1** (IOPB PWB). Hardware track register incorrect. The source of this code is the boot code. Help!
0173	8090	**Type 1 Hard Error Phase 1** (IOPB PWB). Seek hard error, probably disk not ready. Esure that the cartridge tape is in the drive and in a "ready" state. Help!
0174	8090	**Restore Failure Phase 1** (IOPB PWB). The source of this code is the boot code. Help!
0175	8090	**Seek Failure Phase 1** (IOPB PWB). The source of this code is the boot code. Help!
0176	8090	**Read Sector Failure Phase 1** (IOPB PWB). The source of this code is the boot code. Help!
0177	8090	**Read Hard Error Phase 1** (IOPB PWB). The source of this code is the boot code. Help!
0178	8090	**No DMA End Count 1 Phase 1** (IOPB PWB). No internal DMA completion. The source of this code is the boot code. Help!
0179	8090	**No DMS End Count 2 Phase 1** (IOPB PWB). No external DMA completion. The source of this code is the boot code. Help!
0190	8090	**Commence completion of Phase 1.** The source of this code is the EPROM. Help!
0191	8090	**CP Stopped Phase 1.** The source of this code is the boot EPROM. Help!
0192	8090	**Transfer of Control Store image completed.** The source of this code is the boot EPROM. Help!
0193	8090	**Transfer of TPC image completed.** The source of this code is the boot EPROM. Help!
0194	8090	**CP execution of Initial started.** The source of this code is the boot EPROM. Help!
0199	8090	**Waiting for Phase 2 boot file to be read in from the boot device.** The source of this code is the boot code. Help!
0200	8090	**Interpret Boot File Phase 2** (IOPB PWB). The source of this code is the boot code. Help!
0201	8090	**CP error in reading from the boot device.** The source of this code is the boot code. Help!
0202	8090	**Null Germ slot in Physical Volume Root Page** (PVRP). The source of this code is the boot code. Help!
0203	8090	**CP Broken Chain Phase 2.** Error in rigid disk block chain. The source of this code is the boot code. Help!
0204	8090	**Illegal IOPB por command.** The source of this code is the boot code. Help!
0205	8090	**CP Trap through Control Store 0** (CS parity, or double-bit memory error). The source of this code is the boot code. Help!
0206		**The diagnostic microcode cannot be loaded.** Refetch (using Othello's "Diagnostic Microcode Fetch" command) and be sure to answer "Yes" to the question about using it for the physical volume. Help!

0206	8090	A boot sequence was initiated which includes running diagnostics, but no diagnostic microcode file is installed on the rigid disk. PVRP pointer is zero. Help!
0207	8090	**No Pilot microcode** file is installed on the rigid disk. PVRP pointer is zero. Help!
0208		**The germ cannot be loaded.** Refetch (using Othello's "Germ Fetch" command) and be sure to answer "Yes" to the question about using it for the physical volume. Help!
0208	8090	**No boot loader** file is installed on the rigid disk. PVRP pointer is zero. Help!
0209	8090	**Failed to read self describing page.** Help!
0210	8090	**Head count of 0 in self describing page.** Help!
0211	8090	**Bad seal in self describing page.** Help!
0212	8090	**Bad version # in self describing page.** Help!
0217	8090	**Unknown special boot file block.** The source of this code is the boot code. Help!
0218	8090	**Something is wrong with the IOPB block byte count.** The source of this code is the boot code. Help!
0219	8090	**LoadU specified not in Phase 0.** The source of this code is the boot code. Help!
0220	8090	**Track too big phase 2.** The source of this code is the boot code. Help!
0221	8090	**Track negative phase 2.** The source of this code is the boot code. Help!
0222	8090	**Command track error phase 2.** Hardware track register incorrect. The source of this code is the boot code. Help!
0223	8090	**Type 1 hard error phase 2.** Seek hard error, disk probably not ready. The source of this code is the boot code. Help!
0224	8090	**Restore failure phase 2.** The source of this code is the boot code. Help!
0225	8090	**Seek failure phase 2.** The source of this code is the boot code. Help!
0226	8090	**Read sector failure phase 2.** The source of this code is the boot code. Help!
0227	8090	**Read hard error phase 2.** The source of this code is the boot code. Help!
0228	8090	**No DMA end count 1 phase 2.** No internal DMA completion. The source of this code is the boot code. Help!
0229	8090	**No DMA end count 2 phase 2.** No external DMA completion. The source of this code is the boot code. Help!
0240	8090	**Commence completion of phase 2.** The source of this code is the boot code. Help!
0241	8090	**CP stopped phase 2.** The source of this code is the boot code. Help!
0242	8090	**Transfer control storage image phase 2.** The source of this code is the boot code. Help!
0243	8090	**Transfer TPC image phase 2.** The source of this code is the boot code. Help!
0244	8090	**Start CP phase 2.** CP execution of Mesa emulator started. The source of this code is the boot code. Help!
0249	8090	**Wait for floppy initial to complete in CP.** The source of this code is the boot code. Help!

0250	8090	**Commence reading PVRP from floppy.** The source of this code is the boot microcode (Domino). Help!
0251	8090	**The germ disk address is 0.** Help!
0252	8090	**The soft microcode disk address is 0.** The Pilot (soft) microcode disk address is 0. Help!
0253	8090	**The hard microcode (diag file) disk address is 0.** Help!
0260	8090	**Start interpretation of Germ/Boot from cartridge tape.** The source of this code is the boot code. Help!
0270	8090	**Memory initialization: Track number too big.** While the memory was being initialized with the germ/Othello file from the cartridge tape, the cartridge tape track number was found to be too big. The source of this code is the boot code. Help!
0271	8090	**Memory initialization: Track number negative.** While the memory was being initialized with the germ/Othello file from the cartridge tape, the cartridge tape track number was found to be negative. The source of this code is the boot code. Help!
0272	8090	**Memory initialization: Hardware track register incorrect.** While the memory was being initialized with the germ/Othello file from the cartridge tape, the cartridge tape track register was found to be incorrect. The source of this code is the boot code. Help!
0273	8090	**Memory initialization: Seek hard error.** While the memory was being initialized with the germ/Othello file from the cartridge tape, the cartridge tape got a hard error while trying to seek. Disk probably not ready. The source of this code is the boot code. Help!
0274	8090	**Memory initialization: Restore failure.** While the memory was being initialized with the germ/Othello file from the cartridge tape, the cartridge tape was unable to do a restore. The source of this code is the boot code. Help!
0275	8090	**Memory initialization: Seek failure.** While the memory was being initialized with the germ/Othello file from the cartridge tape, the cartridge tape was unable to do a seek. The source of this code is the boot code. Help!
0276	8090	**Memory initialization: Read sector failure.** While the memory was being initialized with the germ/Othello file from the cartridge tape, the cartridge tape was unable to read a sector. The source of this code is the boot code. Help!
0277	8090	**Memory initialization: Hard read failure.** While the memory was being initialized with the germ/Othello file from the cartridge tape, the cartridge tape had a hard read error. The source of this code is the boot code. Help!
0278	8090	**Memory initialization: No internal DMA completion.** While the memory was being initialized with the germ/Othello file from the cartridge tape, the internal DMA did not complete. The source of this code is the boot code. Help!
0279	8090	**Memory initialization: No external DMA completion.** While the memory was being initialized with the germ/Othello file from the cartridge tape, the external DMA did not complete. The source of this code is the boot code. Help!
0285	8090	**Commence completion of phase 2 cartridge tape.** The source of this code is the boot code. Help!
0286	8090	**Pilot (Soft) microcode cartridge tape address set.** The source of this code is the boot code. Help!
0287	8090	**Diagnostic (Hard) microcode cartridge tape address set.** The source of this code is the boot code. Help!

Boot Diagnostics		
0301	8090	**Terminal diagnostic test.** Help!
0302	8090	**Control Store Constant data (ones) test.** Help!
0303	8090	**Control Store Constant data (zero) test.** Help!
0304	8090	**TPC constant/random data test.** Help!
0305	8090	**Control store address data test.** Help!
0306	8090	**Control store random data test.** Help!
0307	8090	**Register and branch test.** Help!
0308	8090	**Branch on cyc2 test.** Help!
0309	8090	**Port in test.** Help!
0310	8090	**Port out test.**
0311	8090	**DMA port in test.** Help!
0312	8090	**DMA port out test.** Help!
0313	8090	**CP branches test.** Help!
0314	8090	**CP bus data rotation test.** Help!
0315	8090	**CP registers test.** Help!
0316	8090	**CP instruction buffer test.** Help!
0317	8090	**CP trap and error handling test.** Help!
0318	8090	**CPMEM test.** Help!
0319	8090	**CURSOR test.** Help!
0320	8090	**Cycle test.** Help!
0321	8090	**Task TC test.** Help!
0322	8090	**Ethernet test.** Help!
0323		**Internal clock not set**. Diagnostic microcode will wait displaying 323 if the internal clock has not been set (for example, just after turning power on). On Dandelions, depress the ALT B button and hold it until the MP code advances to 324. Help!
0323	8090	**Clock problem.** The diagnostics will display 0323 on MP if the clock is not incrementing properly. Help!
0324	8090	**Host Prom test.** Help!
0325	8090	**CS mostly 0 access test.** Help!
0326	8090	**CS mostly 1 access test.** Help!
0327	8090	**Extended CS:** bank reg test.
0328	8090	**Extended CS:** constant data (ones) test.
0329	8090	**Extended CS:** constant data (zero) test.
0330	8090	**Extended CS:** address data test.
0331	8090	**Extended CS:** random data test.
0332	8090	**Extended CS:** mostly 0 access test.

0333	8090	**Extended CS:** mostly 1 access test.
0334	8090	**Extended bank isolation test.**
0335	8090	**Any mouse switch stuck on test.**
0339	8090	**SCSI non-DMA test.** Help!
0340	8090	**SCSI DMA test.** Help!
0380	8090	**Keyboard loopback test.**
0381	8090	**Keyboard test:** no data set ready.
0382	8090	**Keyboard test:** no TxReady.
0383	8090	**Keyboard test:** no RxReady.
0399	8090	**Boot Diagnostic:** Monitor input mode. The Boot diagnostic is waiting for some input from the keyboard. "B" runs the regular Boot diagnostic (rather than Memory or Disk diagnostics). See section 4 of the *Xerox 8090 Diagnostics Handbook* for details. Help!
EI Utility Diagnostics		
0400	8090	**EI-Utility:** Read RTC test. Help!
0401 0402 0403 0404 0405 0406 0407	8090	**EI-Utility:** Set RTC test. Help!
0408 0409 0410 0411 0412	8090	**EI-Utility:** LSEP test. Help!
0413	8090	**EI-Utility:** 19.2K baud RS232C internal loopback test. Help!
0414	8090	**EI-Utility:** 9.6K baud RS232C port loopback test. Help!
0415	8090	**EI-Utility:** 956K baud RS232C cable loopback test. Help!
0416	8090	**EI-Utility:** 300 baud RS232C cable or async modem loopback test. Help!
0417	8090	**EI-Utility:** 1200 baud RS232C cable or async modem loopback test. Help!
0418	8090	**EI-Utility:** All RS232C synchronous modem loopback test. Help!
0419	8090	**EI-Utility:** Secondary channels RS232C cable loopback test. Help!
0420 0421 0422 0423 0424	8090	**EI-Utility:** RS366 test. Help!
00425 0426 0427 0428 0429	8090	**EI-Utility:** Character printer port loopback test.
0430	8090	**EI-Utility:** Host prom checksum boot. Help!

0431	8090	*Not applicable.*
0432 *0433* *0434* *0435*	8090	*Not applicable.*
0436	8090	**EI-Utility:** Initialize and restore cartridge tape.
0437	8090	**EI-Utility:** Read all cylinders on side 0.
0438	8090	**EI-Utility:** Read all cylinders on side 1.
0439	8090	**EI-Utility:** Initialize and restore cartridge tape.
0499	8090	**Boot diagnostic:** EI-Utility input mode. The boot diagnostic is waiting for some input from the keyboard. Help!
IOPB Operation Software Execution		
0500	8090	**The operation IOPB code (Domino) has started.** The source of this code is the operational IOPB code. Help!
0501	8090	**Domino starting to read the time-of-day clock.** Help!
0502	8090	**Domino completed reading the time-of-day clock.** The next MP codes will come from Mesa software. Help!
0505	8090	**CS parity error detected.** The source of this code is the operational IOPB code. Help!
0506	8090	**Burdock attempted to use EtherKludge.** The source of this code is the operational IOPB code. It flashes when displayed on the MP, indicating the presence of an error. Help!
0507	8090	**CP attempted to use EtherKludge.** The source of this code is the operational IOPB code. It flashes when displayed on the MP, indicating the presence of an error. Help!
0509	8090	**An illegal IOPB interrupt was attempted.** Help!
0510	8090	**The map entry was incorrect for the IOPB page access.** The source of this code is the operational IOPB code. It flashes when displayed on the MP, indicating the presence of an error.
0511	8090	**CP DMA operation failed to complete.** The source of this code is the operational IOPB code. It flashes when displayed on the MP, indicating the presence of an error.
0512	8090	**CP DMA channel not specified.**
0513	8090	**Read CPPort timed out;** the CP was not responding.
0514	8090	**Write CPPort timed out;** the CP was not responding.
0520	8090	**A task's stack has overflowed.**
0565	8090	**Invalid keyboard tone generator command.**
0570	8090	**Command value in Processor CSB was invalid.** The source of this code is the operational IOPB code. It flashes when displayed on the MP, indicating the presence of an error.
0571	8090	**Not implemented command in Processor CSB.**

0572	8090	**The time-of-day could not be set correctly in the hardware TOD clock.** The time was still indicated as invalid. The source of this code is the operational IOPB code. It flashes when displayed on the MP, indicating the presence of an error.
0576	8090	**LSEP control CSB overrun.** The source of this code is the operational IOPB code. It flashes when displayed on the MP, indicating the presence of an error.
0580	8090	**Invalid IOCB command.** The source of this code is the operational IOPB code. It flashes when displayed on the MP, indicating the presence of an error.
0581	8090	**IOCB command not implemented.** Unimplemented cartridge tape command. The source of this code is the operational IOPB code. It flashes when displayed on the MP, indicating the presence of an error.
0582	8090	**Invalid Escape command.** Unimplemented cartridge tape command. The source of this code is the operational IOPB code. It flashes when displayed on the MP, indicating the presence of an error.
0583	8090	**Track register is not correct.** The source of this code is the operational IOPB code. It flashes when displayed on the MP, indicating the presence of an error.
0584	8090	**Track number too large.** The source of this code is the operational IOPB code. It flashes when displayed on the MP, indicating the presence of an error.
0585	8090	**Could not program cartridge tape DMA controller channel.** The source of this code is the operational IOPB code. It flashes when displayed on the MP, indicating the presence of an error.
0586	8090	**External DMA end count not set.** The source of this code is the operational IOPB code. It flashes when displayed on the MP, indicating the presence of an error.
0587	8090	**Internal DMA end count not set.** The source of this code is the operational IOPB code. It flashes when displayed on the MP, indicating the presence of an error.
EI Memory Diagnostics		
0600	8090	**EI memory:** 1 pass of all zeros store and check. Help!
0601	8090	**EI memory:** 1 pass of all FFFF store and check. Help!
0602	8090	**EI memory:** 1 pass of all AAAA store and check. Help!
0603	8090	**EI memory:** 1 pass of all 5555 store and check. Help!
0604	8090	**EI memory 128 passes of block patterns store and check.**
0605	8090	**EI memory:** 8 passes of store and check all 64k bank selection logic. Help!
0606	8090	**EI memory:** 2 passes address test no display. Help!
0607	8090	**EI memory:** 4 passes address test with a display. Help!
0608	8090	**EI memory:** 128 passes random data 2 store and check. Help!
0609	8090	**EI memory:** 128 passes random data 3 store and check. Help!
0610	8090	**EI memory:** 255 passes checking trap logic using address 0. Help!
0611	8090	**EI memory:** 128 passes ecc test using block patterns. Help!
0612	8090	**EI memory:** 128 passes ecc test using random data 2 store and check. Help!
0613	8090	**EI memory:** 128 passes ecc test using random data 3 store and check. Help!
0614	8090	**EI memory:** 2 passes refresh counter test store delay check. Help!

0699	8090	**Boot Diagnostic:** EI memory input mode. The boot diagnostic is waiting for some input from the keyboard. See section 4 of the *Xerox 8090 Diagnostics Handbook* for details. Help!
0799	8090	**Boot Diagnostic:** EI disk input mode. The boot diagnostic is waiting for some input from the keyboard. See section 4 of the *Xerox 8090 Diagnostics Handbook* for details.

Operating System Software Execution

NOTE: These MP codes are displayed when the Operating System Software is being executed or detects and error. If a code remains on the MP panel for more than two minutes, assume it is a fault code.

0900	**Boot loader entered.** Starting to load boot file. cGerm. Help!
0901	**Boot loader out of frames.** (Pilot bug) The Pilot boot loader has received a frame fault. This could be caused by hardware, by client code overwriting the boot loader, by the boot mesa file (given to MakeBoot when the boot loader was created) specifying an inadequate distribution of frames, or by a boot loader software bug. cGermAllocFault. Help!
0902	**Unexpected trap of kernel function call.** (Pilot bug or hardware fault) The Pilot boot loader got a trap or kernel function call for which it does not provide a handler. This could be caused by hardware, client code overwriting the boot loader, or by a boot loader software bug. In the development environment only, this code can be caused by the following: From the time that you press the boot button until Pilot moves the Germ into the display bank, you can only teledebug. You cannot use a local debugger because it is installed with the germ in the display bank, and if called when the germ is not in the display bank, the inload of Copilot wil smash the germ resulting in 902. cGermControlTrap. Help!
0903	**Attempt to start an already started module.** (Pilot bug) The Pilot boot loader got a start trap on a module which has already been started. TThis could be caused by hardware, client code overwriting the boot loader, or by a boot loader software bug. cGermStartFault. Help!
0904	**Page or write protect fault.** (Pilot bug) The pilot boot loader got a page or write-protect fault. This could be caused by hardware, client code overwriting the boot loader, or by a boot loader software bug. cGermMemoryFault. Help!
0905	**Boot loader not compatible with initial microcode.** Reload initial microcode or boot file; check physical volume boot pointers. The boot loader has detected that it is not compatible with the initial microcode which it is running on. This could also be caused by hardware, or client code overwriting the boot loader. cWrongGerm. Help!
0906	**Boot loader and boot file have different version numbers.** The Pilot boot floader has discovered it is not compatible with the Pilot that just called it. This could be caused by hardware, client code overwriting the boot loader, or by a boot loader software bug. cGermWrongPilot. Help!
0907	**Boot loader disk reschedule trap.** The Pilot boot floader has got a page fault, write fault, or frame fault. This could be caused by hardware, client code overwriting the boot loader, or by a boot loader software bug. cGermRescheduleTrap. Help!

0905	**Boot loader SIGNAL or ERROR.** (Pilot bug) The Pilot boot loader got a Mesa SIGNAL or ERROR. This could be caused by hardware, client code overwriting the boot loader, or by a boot loader software bug. cGermError.
0910	**Boot loader running action** (such as inload or outload). Help!
0911	**Boot loader not compatible with physical volume.** Reload boot file; check physical volume boot pointers; ensure you've got the right files for your hardware. Help!
0912	**Boot loader not compatible with MakeBoot used to produce boot file.** Reload boot file; check physical volume boot pointers; ensure you've got the right files for your hardware. The version of MakeBoot which was used to produce the boot file being loaded is incompatible with the boot loader being used (that is, different versions of StartList.mesa. Help!
0913	**No physical boot file installed.** The boot loader has been instructed to boot the sysem physical volume boot file but there is none installed. Reload boot file; check physical volume boot pointers; ensure you've got the right files for your hardware. Help!
0914	**Boot file contains invalid data.** The boot loader has detected bad data in the boot file it is loading. Reload boot file; check physical volume boot pointers; ensure you've got the right files for your hardware.
0915	**System crash. Ethernet debuggee server in control.** The system has crashed and is waiting for a network debug session. Sword either cannot handle it for some reason, or you have asked it to go to the net in this situation.If your machine is connected to the network and you have another D-machine on that net, you can use sword on the second D-machine to debug the crashed machine. The system is waiting to talk to a remote Ethernet debugger. A local debugger is not being used because either • the "5" boot switch has been used, or • CoPilot was not correctly installed in a volume of the next higher type; or • it is too early in initialization to find the local debugger. If 0915 occurs during the installation of software, the problem could be a bad page on the rigid disk, or the system cannot read the cartridge tape, or hardware failure. Help! Almost every long-term XDE user/programmer has had the experience of waking up Saturday morning, groggily seeing **915** on the digital clock, and panicking.
0916	**Boot file won't fit into real memory** The boot file that the loader is loading is too large to fit into real memory. Either you've got a corrupt boot file, or your RAM is missing or bad. Help!
0917	**Remote debug in progress.** This machine crashed to 915, and another machine is being used to debug it over the Ethernet. This indicates status only.
0918 0919	**Boot loader has transferred control back to Pilot, who has hung.** The boot loader has finished the actions that its client requested, and it has transferred control back to its client. The client has not managed to change the MP code, and is presumed to have hung. Help!

0920		**Boot loader running driver** (such as disk, Ethernet, cartridge tape). Help!
0921		**Hard error on device being booted.** Physical or logical volume never initialized; or hardware error. If booting, refetch the boot file and retry the operation; if going to/from CoPilot, reinstall CoPilot. Help!
0922		**Operation on boot device not completed in expected time.** Typically, this is reported by an Ethernet operations when teh source of the data being read has stopped supplying data. See your network administrator or try again. Help!
0923		**Broken link in chained boot file.** If booting, try reinstalling the boot file; if interrupting to CoPilot from Othello, use the "Set Debugger Pointers command to correct the pointers from Othello to CoPilot; if going to/from CoPilot, reinstall CoPilot. Help!
0923	8090	*Not applicable* Help!
0924		**Ethernet boot server not responding.** Help!
0925		**Unexpected packet sequence number or size.** The boot loader received a packet from the Ethernet which contains an unexpected packet sequence number or size. cGermFunnyPacket. Help!
0926	**Dandelion**	**Ethernet debuggee server trying to find a Pup/EthernetOne 8 bit address.** Help!
0926	8090	**The cartridge tape from which you are trying to boot needs its tension reset.** Germ posts this. Help!
0927		**Boot file ends before it should.** The germ has found no more boot file to load when it expected more, likely due to a broken link. Reinstall the boot file and try again. Help!
0928		**Waiting for any boot server to respond.** Pilot displays this code while it is waiting for a response from any boot server. Help!
0929		**Boot file descriptor does not look like one** (boo file installed non-labelless, boot file pointers not set, boot file not really there, or descriptor page trashed). Resintall the boot file, reset physical volume boot pointers and try again. Help!
0930		**Pilot Control and MesaRuntime components being initialized.** Help!
0931		**Pilot not compatible with `MakeBoot` used to produce boot file.** A Pilot boot file has received control, but discovered that the software it contains is incompatible with the version of `MakeBoot` which produced that boot file (that is, different versions of StartList.mesa). Reload boot file; check physical volume boot pointers; ensure you've got the right files for your hardware. Help!
0932		**Trap before trap handler initialized.** Pilot has gotten a trap very early in its initialization before the handler for the trap has been initialized. Verify that you have consistent versions of microcode, germ and bootfiles. Help!
0933		**Pilot not compatible with boot file.** The Pilot inside the boot file which has just started running has discovered that it is incompatible with the boot loader that loaded it (that is, different versions of Boot.mesa. Reload boot file and/or Pilot; check physical volume boot pointers; ensure you've got the right files for your hardware. Help!
0934		**Boot file's StartList contains bad data.** The Pilot inside the boot file which has just started running has found bad data in the StartList in that boot file. Possibly this is a corrupted boot file - try reloading it. Help!

0935	**Need Ethernet debuggee server but boot loader used does not have that capability.** The boot loader being used has been requested to act as an Ethernet debuggee server, but it does not have that capability (if it did, you'd get `0915` instead of this one). Install a smarter boot loader and try again. Help!
0936	**Waiting for microcode debugger.** Pilot is now spinning in a loop, waiting to be debugged by an attached microcode debugger (`Burdock` or `Midas`). This behavior is invoked when trying to go to the debugger when you booted Pilot using the `&` or the `\376\` boot switches. Help!
0937	**Trying to get the time from either the hardware clock or Ethernet.** Pilot is attempting to get the time of day from an Ethernet Time Server. If none responds, it attempts to get the time from the hardware clock. The system will wait displaying this MP code until the time is avilable from one of these sources. If code persists for more than a few seconds, see your Time Server administrator.
0938	**Running clean up procedures.** For example, before booting or going to the debugger. Pilot has begun shutting down the I/O devices in preparation for booting another system or going to the debugger. If this code persists for more than a moment, some software or hardare has hung up. Help!
0939	**`System.PowerOff` was called but no power control relay.** Help!
0940	**Pilot Store component being initialized.** Help!
0941	**Bad load state version.** Help!
0947	**Waiting disk drive to become ready.** Pilot displays this code when the disk drive containing the system being boot is not ready. Seen mostly on Dandelions, especially those with 29MB drives. Shouldn't last more than 30 seconds. Help!
0948	**System physical volume needs scavenging.** Use Othello's `Physical Volume Scavenge` command. Help!
0949	**Pilot is unable to complete scavenging** due to a hardware error while trying to access the disk. Help!
0950	**Pilot logical volume scavenge in process.** If a logical volume being booted or opened is in an inconsistent state, Pilot will display this MP code while it scavenge (that is, verifies the contents of the volume). This is akin to a Unix `fsck`. The filesystem is being checked for consistency and correctness, and may be reconstruncted. **Do not reboot out of this MP code.** Reboot during scavenge has a high risk of permanent filesystem damage. Scavenge may take a while (on the order of hours for large volumes with lots of files or lots of problems) - please be patient. The amount of time required depends on the size, occupancy and fragmentation of the logical volume. Reboot during scavenge has a high risk of permanent filesystem damage. Not applicable to 8090 systems. Still may occur on labelled systems.
0951	**Alternate code for progress of logical volume scavenging.** This is an alternate to `950`, available for additional feedback on the progress of the logical volume scavenger. Indicates status only. **Do not reboot out of this MP code.** Reboot during scavenge has a high risk of permanent filesystem damage. Not applicable to 8090 systems. Still may occur on labelled systems.

0952		**Alternate code for progress of logical volume scavenging.** This is an alternate to 950 and 951, to indicate additional passes during logical volume scavenging. Indicates status only. **Do not reboot out of this MP code.** Reboot during scavenge has a high risk of permanent filesystem damage. Not applicable to 8090 systems. Still may occur on labelled systems.
0953		**Debugger pointers are invalid.** Reset or clear debugger pointers, or (re)install the debugger and repeat the operation.
0960		**Deleting temporary files from the previous run.** The Verifier is also being run. This can take a bit. **Rebooting out of this code may munge the filesystem**, resulting in the need to scavenge.
0965		**Insufficient file space for Pilot data space** (VM) **backing storage.** This MP code is caused by the booting agent (usually the operator, talking to Othello, Prometheus, etc) specifying a boot switch ("[", "!", or "]", or some combination of them, or none of them) which specifies a size for the Pilot data space backing storage cache but there is not enough free space on the system volume to provide the requested file space. This error can only happen when the size specified is larger than that specified during the previous boot session. Specify a smaller size with the boot switches and retry the boot. Help!
0966		**Insufficient file space for the file lock nodes file.** Try specifying a smaller backing file to allow room for this file. Help!
0970		**Client and other non-boot-loaded code being mapped.** Space is being created for this code. Help!
0975		**Transaction crash recovery.** Help!
0980		**Pilot Communications component being initialized.** Help!
0981		**Trying to find a Pup/EthernetOne 8 bit address.** You are trying to initiate PUP communications, but there is no PUP name server on your network or your workstation is not registered with it, since PUP is an obsolete Xerox internal protocol.
0982		**Cannot determine ARPA 32 bit host address.**
0990		**XDE/Tajo boot has completed**, Pilot.Run or PilotClient.Run has been called, and everything is hunky dory (at least from the OS point of view).
1515		**Task did not wakeup or took too long to complete.**
2000 through 2190	8090	**Server terminal online diagnostics.** See sections 8 of the *Xerox 8090 Diagnostics Handbook.*
2800	8090	**Running multiport diagnostics, no errors encountered.**
2801	8090	**RS232C hardware problem.** Suspect: MPCO, Mesa processor, backplane. Internal loopback subtests.
2802	8090	**RS232C hardware problem.** Suspect: MPCO, harness/connector, loopback tool. Turnaround tool loopback subtests.
2803	8090	**RS232C hardware problem.** Suspect: MPCO, harness/connector, cable, modem. Modem loopback subtests.

2804	8090	**RS232C hardware problem.** Suspect: MPCO, harness/connector, cable, Mesa processor, backplane. All (command timeout occurred). ***Note:*** *This is a possible microcode hangup and the cartridge tape diagnostic may have to be rebooted.*
2806	8090	**RS232C hardware problem.** Suspect: IOP, MPCO, backplane, harness and/or connector, loopback tool. RS366 loopback subtests.
2808	8090	**Software problem.** Call the Xerox Systems Analyst.
2809	8090	**Realtime clock problem.** Suspect: IOPB.
2820	8090	**Cartridge tape diagnostics loaded.**
2821	8090	**Cartridge tape hardware error.**
2822	8090	**Cartridge tape hardware error.**
2823	8090	**Cartridge tape media or hardware error** - too many soft read errors.
2824	8090	**Cartridge tape media or hardware error** - too many hard read errors.
2825	8090	**Cartridge tape: IO command has timed out.**
2826	8090	**Cartridge tape: Retension failure.**
2827	8090	**Cartridge tape: Reading the bad page table failed.**
2829	8090	**Reboot.** If the MP code remains on 2829 for more than two minutes, a real time clock failure is indicated.
3900	8090	**EI-Disk diagnostic: Unknown ST506 disk program running.** A server whose self describing disk page (SDD page) is initially damaged will display MP code 3900. After the SDD page has been fixed (via the Change Disk Description, New Disk Checkout, or Format commands) the MP code will continue to display 3900 until a Format has been run, or the diagnostics are rebooted.
3910	8090	**Unknown ST506 Disk Fault Anaysis interface test: Test running.**
3911	8090	**Unknown ST506 Disk Fault Anaysis interface test: No interface signals.**
3912	8090	**Unknown ST506 Disk Fault Anaysis interface test: Not ready, no index, no sector.**
3913	8090	**Unknown ST506 Disk Fault Anaysis interface test: Not ready, no index.**
3914	8090	**Unknown ST506 Disk Fault Anaysis interface test: Not ready, no sector.**
3915	8090	**Unknown ST506 Disk Fault Anaysis interface test: Not ready.**
3916	8090	**Unknown ST506 Disk Fault Anaysis interface test: No index, no sector.**
3917	8090	**Unknown ST506 Disk Fault Anaysis interface test: No index.**
3918	8090	**Unknown ST506 Disk Fault Anaysis interface test: No sector.**
3930	8090	**Unknown ST506 Disk Fault Anaysis seek complete test: Test running.**
3931	8090	**Unknown ST506 Disk Fault Anaysis seek complete test: seek incomplete.**
3940	8090	**Unknown ST506 Disk Fault Anaysis recal seek test: Test running.**

3941	8090	**Unknown ST506 Disk Fault Anaysis recal seek test: incorrect track 000 status / seek error.**
3942	8090	**Unknown ST506 Disk Fault Anaysis recal seek test: Seek error.**
3970	8090	**Unknown ST506 Disk Fault Anaysis read test: Test running.**
3971	8090	**Unknown ST506 Disk Fault Anaysis read test: Bad electronics.**
3972	8090	**Unknown ST506 Disk Fault Anaysis read test: Bad head.**
3980	8090	**Unknown ST506 Disk Fault Anaysis Verify test: Test running.**
3981	8090	**Unknown ST506 Disk Fault Anaysis Verify test: Verify error.**
3990	8090	**Unknown ST506 Disk Fault Anaysis Head Select test: Test running.**
3991	8090	**Unknown ST506 Disk Fault Anaysis Head Select test: Wrong head selected.**
4000	8090	**Unknown ST506 Disk Fault Anaysis sector test: Test running.**
4002	8090	**Unknown ST506 Disk Fault Anaysis sector test: wrong sector selected.**
4010	8090	**Unknown ST506 Disk Fault Anaysis extended seek test: Test running.**
4013	8090	**Unknown ST506 Disk Fault Anaysis extended seek test: Seek error.**
4020	8090	**Unknown ST506 Disk Fault Anaysis extended read test: Test running.**
4021	8090	**Unknown ST506 Disk Fault Anaysis extended read test: Bad media.**
4040	8090	**Unknown ST506 Disk Fault Anaysis write test: Test running.**
4041	8090	**Unknown ST506 Disk Fault Anaysis write test: Bad electronics.**
4042	8090	**Unknown ST506 Disk Fault Anaysis write test: Bad head.**
4043	8090	**Unknown ST506 Disk Fault Anaysis write test: Not run due to excessive risk.**
4050	8090	**Unknown ST506 Disk Fault Anaysis write seek test: Test running.**
4051	8090	**Unknown ST506 Disk Fault Anaysis write seek test: Write error.**
4091	8090	**Unknown ST506 Disk Fault Anaysis fatal error: Write fault.**
4092	8090	**Unknown ST506 Disk Fault Anaysis fatal error: Microcode wakeup problem.**
4093	8090	**Unknown ST506 Disk Fault Anaysis fatal error: Memory fault.**
4099	8090	**Unknown ST506 Disk Fault Anaysis ran successfully to completion.**
4110	8090	**Unknown ST506 Disk Format Anaysis interface test: Test running.**
4111	8090	**Unknown ST506 Disk Format Anaysis interface test: No interface signals.**
4112	8090	**Unknown ST506 Disk Format Anaysis interface test: Not ready, no index, no sector.**
4114	8090	**Unknown ST506 Disk Format Anaysis interface test: Not ready, no sector.**
4115	8090	**Unknown ST506 Disk Format Anaysis interface test: Not ready.**
4116	8090	**Unknown ST506 Disk Format Anaysis interface test: No index, no sector.**

4117	8090	**Unknown ST506 Disk Format Anaysis interface test: No index.**
4118	8090	**Unknown ST506 Disk Format Anaysis interface test: No sector.**
4130	8090	**Unknown ST506 Disk Format Anaysis seek complete test: Test running.**
4131	8090	**Unknown ST506 Disk Format Anaysis seek complete test: Seek incomplete.**
4140	8090	**Unknown ST506 Disk Format Anaysis recal seek test: Test running.**
4141	8090	**Unknown ST506 Disk Format Anaysis recal seek test: incorrect track00 status / seek error.**
4142	8090	**Unknown ST506 Disk Format Anaysis recal seek test: seek error.**
4160	8090	**Unknown ST506 Disk Format Anaysis write read test: Test running.**
4161	8090	**Unknown ST506 Disk Format Anaysis write read test: Bad electronics.**
4162	8090	**Unknown ST506 Disk Format Anaysis write read test: bad head.**
4165	8090	**Unknown ST506 Disk Format Anaysis verify test: Test running.**
4166	8090	**Unknown ST506 Disk Format Anaysis verify test: verify error.**
4170	8090	**Unknown ST506 Disk Format Anaysis head select test: Test running.**
4171	8090	**Unknown ST506 Disk Format Anaysis head select test: Wrong head selected.**
4180	8090	**Unknown ST506 Disk Format Anaysis extended seek test: Test running.**
4181	8090	**Unknown ST506 Disk Format Anaysis extended seek test: Seek error.**
4190	8090	**Unknown ST506 Disk Format Anaysis sector test: Test running.**
4192	8090	**Unknown ST506 Disk Format Anaysis sector test: Wrong sector selected.**
4195	8090	**Unknown ST506 Disk Format Anaysis extended format test: Test running.**
4197	8090	**Unknown ST506 Disk Format Anaysis extended format test: Bad cylinder 0000.**
4199	8090	**Unknown ST506 Disk Format Anaysis test ran successfully.**
4200	8090	**Echo test started.**
4201	8090	**Echo test initiated.**
4202	8090	**Echo test sent out packet.**
4203	8090	**Echo test checking.**
4500	8090	**Online RS232C Diagnostic.** Indicates the beginning of the test.
4501	8090	**Online RS232C Diagnostic.** Inability to create a communications channel with the RS232C port. Code indicates RS232C port appears non-existant or busy on the machine.
4510	8090	**Online RS232C Diagnostic.** Indicates the successful start of the on-line RS232C echo test.

4520	8090	**No Data Set Ready raised.** On-line RS232C echo test waits for the signal DSR to be raised to make the connection. If the signal is not raised in 30 seconds, the test will time out and abort.
4527	8090	**Begin dialing portion of the RS232C test.** Indicates the dialer test has been chosen and is beginning.
4528	8090	**Begin dialing portion of the RS232C test.** Indicates the dialer test has been chosen and is beginning.
4529	8090	**User has cancelled the dialer test.** User has pressed Control-C to end test while on-line RS232C dial test was dialing.
4540	8090	**RS232C online test is finishing.** The test is cleaning up the space it used.
4545	8090	**First frame has been received.** In the RS232C test, the first frame sent is more carefully monitored than successive frames. When this frame has beeen completely sent, this code will appear. No more frames will be sent until the continue question has been answered "Yes" in the display.
4598	8090	**Ending receive process.** In the RS232C online test, this code shows that the receive process has ended and is joining the other processes.
4599	8090	**Ending send process.** In the RS232C online test, this code shows that the send process has ended and is joining the other processes.
4600	8090	**EI-Disk Diagnostic:** 25MB fault analysis program running.
4610	8090	**25MB Fault Analysis interface test:** Test running.
4611	8090	**25MB Fault Analysis interface test:** No interface signals.
4612	8090	**25MB Fault Analysis interface test:** Not ready, no index, no sector.
4613	8090	**25MB Fault Analysis interface test:** Not ready, no index.
4614	8090	**25MB Fault Analysis interface test:** Not ready, no sector.
4615	8090	**25MB Fault Analysis interface test:** Not ready.
4616	8090	**25MB Fault Analysis interface test:** No index, no sector.
4617	8090	**25MB Fault Analysis interface test:** No index.
4618	8090	**25MB Fault Analysis interface test:** No sector.
4630	8090	**25MB Fault Analysis seek complete test:** Test running.
4631	8090	**25MB Fault Analysis seek complete test:** Seek incomplete.
4640	8090	**25MB Fault Analysis recal seek test:** Test running.
4641	8090	**25MB Fault Analysis recal seek test:** Incorrect track00 status/seek error.
4642	8090	**25MB Fault Analysis recal seek test:** Seek error.
4670	8090	**25MB Fault Analysis read test:** Test running.
4671	8090	**25MB Fault Analysis read test:** Bad electronics.
4672	8090	**25MB Fault Analysis read test:** Bad head.
4680	8090	**25MB Fault Analysis verify test:** Test running.
4681	8090	**25MB Fault Analysis verify test:** verify error.
4690	8090	**25MB Fault Analysis head select test:** Test running.
4691	8090	**25MB Fault Analysis head select test:** Wrong head selected.

4700	8090	**25MB Fault Analysis sector test:** Test running.
4702	8090	**25MB Fault Analysis sector test:** Wrong sector selected.
4710	8090	**25MB Fault Analysis extended seek test:** Test running.
4713	8090	**25MB Fault Analysis extended seek test:** Seek error.
4720	8090	**25MB Fault Analysis extended read test:** Test running.
4721	8090	**25MB Fault Analysis extended read test:** Bad media.
4740	8090	**25MB Fault Analysis write test:** Test running.
4741	8090	**25MB Fault Analysis write test:** Bad electronics.
4742	8090	**25MB Fault Analysis write test:** Bad Head.
4743	8090	**25MB Fault Analysis write test:** Not run due to excessive risk.
4750	8090	**25MB Fault Analysis write seek test:** Test running.
4751	8090	**25MB Fault Analysis write seek test:** Write error.
4791	8090	**25MB Fault Analysis Disk Fatal Error:** Write fault.
4792	8090	**25MB Fault Analysis Disk Fatal Error:** Microcode wakeup problem.
4793	8090	**25MB Fault Analysis Disk Fatal Error:** Memory fault.
4799	8090	**25MB Fault Analysis Ran Successfully.**
4810	8090	**25MB Format Analysis interface test:** Test running.
4811	8090	**25MB Format Analysis interface test:** No interface signals.
4812	8090	**25MB Format Analysis interface test:** Not ready, no index, no sector.
4814	8090	**25MB Format Analysis interface test:** Not ready, no sector.
4815	8090	**25MB Format Analysis interface test:** Not ready.
4816	8090	**25MB Format Analysis interface test:** No index, no sector.
4817	8090	**25MB Format Analysis interface test:** No index.
4818	8090	**25MB Format Analysis interface test:** No sector.
4830	8090	**25MB Format Analysis seek complete test:** Test running.
4831	8090	**25MB Format Analysis seek complete test:** Seek incomplete.
4840	8090	**25MB Format Analysis recal seek test:** Test running.
4841	8090	**25MB Format Analysis recal seek test:** Incorrect track00 status/seek error.
4842	8090	**25MB Format Analysis recal seek test:** Seek error.
4860	8090	**25MB Format Analysis write read test:** Test running.
4861	8090	**25MB Format Analysis write read test:** Bad electronics.
4862	8090	**25MB Format Analysis write read test:** Bad head.
4865	8090	**25MB Format Analysis verify test:** Test running.
4866	8090	**25MB Format Analysis verify test:** verify error.
4870	8090	**25MB Format Analysis head select test:** Test running.
4871	8090	**25MB Format Analysis head select test:** Wrong head selected.
4880	8090	**25MB Format Analysis extended seek test:** Test running.

4881	8090	**25MB Format Analysis extended seek test:** seek error.
4890	8090	**25MB Format Analysis sector test:** Test running.
4892	8090	**25MB Format Analysis sector test:** Wrong sector selected.
4895	8090	**25MB Format Analysis extended format test:** Test running.
4897	8090	**25MB Format Analysis extended format test:** Bad cylinder 000.
4899	8090	**25MB Format Analysis ran successfully.**
5600	8090	**EI-Disk Diagnostic:** 85MB fault analysis program running.
5610	8090	**85MB Fault Analysis interface test:** Test running.
5611	8090	**85MB Fault Analysis interface test:** No interface signals.
5612	8090	**85MB Fault Analysis interface test:** Not ready, no index, no sector.
5613	8090	**85MB Fault Analysis interface test:** Not ready, no index.
5614	8090	**85MB Fault Analysis interface test:** Not ready, no sector.
5615	8090	**85MB Fault Analysis interface test:** Not ready.
5616	8090	**85MB Fault Analysis interface test:** No index, no sector.
5617	8090	**85MB Fault Analysis interface test:** No index.
5618	8090	**85MB Fault Analysis interface test:** No sector.
5630	8090	**85MB Fault Analysis seek complete test:** Test running.
5631	8090	**85MB Fault Analysis seek complete test:** Seek incomplete.
5640	8090	**85MB Fault Analysis recal seek test:** Test running.
5641	8090	**85MB Fault Analysis recal seek test:** Incorrect track00 status/seek error.
5642	8090	**85MB Fault Analysis recal seek test:** Seek error.
5670	8090	**85MB Fault Analysis read test:** Test running.
5671	8090	**85MB Fault Analysis read test:** Bad electronics.
5672	8090	**85MB Fault Analysis read test:** Bad head.
5680	8090	**85MB Fault Analysis verify test:** Test running.
5681	8090	**85MB Fault Analysis verify test:** verify error.
5690	8090	**85MB Fault Analysis head select test:** Test running.
5691	8090	**85MB Fault Analysis head select test:** Wrong head selected.
5700	8090	**85MB Fault Analysis sector test:** Test running.
5702	8090	**85MB Fault Analysis sector test:** Wrong sector selected.
5710	8090	**85MB Fault Analysis extended seek test:** Test running.
5713	8090	**85MB Fault Analysis extended seek test:** Seek error.
5720	8090	**85MB Fault Analysis extended read test:** Test running.
5721	8090	**85MB Fault Analysis extended read test:** Bad media.
5740	8090	**85MB Fault Analysis write test:** Test running.
5741	8090	**85MB Fault Analysis write test:** Bad electronics.
5742	8090	**85MB Fault Analysis write test:** Bad Head.

5743	8090	**85MB Fault Analysis write test:** Not run due to excessive risk.
5750	8090	**85MB Fault Analysis write seek test:** Test running.
5751	8090	**85MB Fault Analysis write seek test:** Write error.
5791	8090	**85MB Fault Analysis Disk Fatal Error:** Write fault.
5792	8090	**85MB Fault Analysis Disk Fatal Error:** Microcode wakeup problem.
5793	8090	**85MB Fault Analysis Disk Fatal Error:** Memory fault.
5799	8090	**85MB Fault Analysis Ran Successfully.**
5810	8090	**85MB Format Analysis interface test:** Test running.
5811	8090	**85MB Format Analysis interface test:** No interface signals.
5812	8090	**85MB Format Analysis interface test:** Not ready, no index, no sector.
5814	8090	**85MB Format Analysis interface test:** Not ready, no sector.
5815	8090	**85MB Format Analysis interface test:** Not ready.
5816	8090	**85MB Format Analysis interface test:** No index, no sector.
5817	8090	**85MB Format Analysis interface test:** No index.
5818	8090	**85MB Format Analysis interface test:** No sector.
5830	8090	**85MB Format Analysis seek complete test:** Test running.
5831	8090	**85MB Format Analysis seek complete test:** Seek incomplete.
5840	8090	**85MB Format Analysis recal seek test:** Test running.
5841	8090	**85MB Format Analysis recal seek test:** Incorrect track00 status/seek error.
5842	8090	**85MB Format Analysis recal seek test:** Seek error.
5860	8090	**85MB Format Analysis write read test:** Test running.
5861	8090	**85MB Format Analysis write read test:** Bad electronics.
5862	8090	**85MB Format Analysis write read test:** Bad head.
5865	8090	**85MB Format Analysis verify test:** Test running.
5866	8090	**85MB Format Analysis verify test:** verify error.
5870	8090	**85MB Format Analysis head select test:** Test running.
5871	8090	**85MB Format Analysis head select test:** Wrong head selected.
5880	8090	**85MB Format Analysis extended seek test:** Test running.
5881	8090	**85MB Format Analysis extended seek test:** seek error.
5890	8090	**85MB Format Analysis sector test:** Test running.
5892	8090	**85MB Format Analysis sector test:** Wrong sector selected.
5895	8090	**85MB Format Analysis extended format test:** Test running.
5897	8090	**85MB Format Analysis extended format test:** Bad cylinder 000.
5899	8090	**85MB Format Analysis ran successfully.**
6000	8090	**High Capacity Tape drive Off-Line Diagnostics are running with no errors encountered.**

6001	8090	**High Capacity Tape drive:** the device is not ready for operation. Ensure that the power to the peripheral cabinet is connected and that the power switch is ON. Ensure that the cartridge tape is correctly inserted into the drive and that the tape drive door is fully closed. *(NOTE: The door closes only if the tape is correctly inserted.)*
6002	8090	**High Capacity Tape drive:** hardware error.
6003	8090	**High Capacity Tape drive:** unknown error.
6005	8090	**High Capacity Tape drive:** file mark found.
6006	8090	**High Capacity Tape drive:** wrong request bytes.
6007	8090	**High Capacity Tape drive:** end of tape.
6008	8090	**High Capacity Tape drive:** end of data.
6009	8090	**High Capacity Tape drive:** beginning of tape.
6010	8090	**High Capacity Tape drive:** recovered error.
6011	8090	**High Capacity Tape drive:** cartridge not ready.
6012	8090	**High Capacity Tape drive:** wrong cartridge.
6013	8090	**High Capacity Tape drive:** drive power is off.
6014	8090	**High Capacity Tape drive:** cartridge is not loaded.
6015	8090	**High Capacity Tape drive:** load failure occurreed.
6016	8090	**High Capacity Tape drive:** unrecoverable media error occurred.
6017	8090	**High Capacity Tape drive:** media error occured during tape erasure.
6018	8090	**High Capacity Tape drive:** controller hardware error.
6019	8090	**High Capacity Tape drive:** drive interface error.
6020	8090	**High Capacity Tape drive:** drive hardware error.
6021	8090	**High Capacity Tape drive:** DB parity error detected in SCSI.
6022	8090	**High Capacity Tape drive:** error occurred in the controller buffer.
6023	8090	**High Capacity Tape drive:** invalid contents in the CDN or parameter data.
6024	8090	**High Capacity Tape drive:** unit attention.
6025	8090	**High Capacity Tape drive:** writing was attempted on a write protected tape.
6026	8090	**High Capacity Tape drive:** unformatted tape was read and no block could be detected.
6027	8090	**High Capacity Tape drive:** the controller aborted a command.
6028	8090	**High Capacity Tape drive:** volume overflow.
6029	8090	**High Capacity Tape drive:** bus has been reset.
6030	8090	**High Capacity Tape drive:** cartridge has been changed.
6031	8090	**High Capacity Tape drive:** data error.
6032	8090	**High Capacity Tape drive:** too many soft read errors.
6033	8090	**High Capacity Tape drive:** too many hard read errors.

	8090	*NOTE: The MP codes for the first high capacity tape drive were covered in the previous sections (codes 6001-6033). The MP code descriptions are the same for second through the fourth tape drives. For example MP code 6001 for the first high capacity tape drive would be equivalent to 6051 for the second tape drive, 6101 for the third tape drive, and 6151 for the fourth tape drive.*
6051 through **6083**	8090	**The second high capacity tape drive.**
6101 through **6133**	8090	**The third high capacity tape drive.**
6151 through **6183**	8090	**The fourth high capacity tape drive.**
6200	8090	**High Capacity Disk off-line diagnostics are running with no errors encountered.**
6211	8090	**High Capacity disk drive:** hardware problem. Ensure the power to the SCSI box is connected and that the power switch is ON
6212	8090	**High Capacity disk drive:** media problem. Run Disk Surface Verification test.
6213	8090	**High Capacity disk drive:** media or hardware problem (too many soft read errors). Run Disk Surface Verification test.
6214	8090	**High Capacity disk drive:** media or hardware problem (too many hard read errors).
6215	8090	**High Capacity disk drive:** IO command timed out. Reboot the system.
6216	8090	**High Capacity disk drive:** bad spot on cylinder 0.
6217	8090	**High Capacity disk drive:** reading the manufacturing bad page table failure.
6218	8090	**High Capacity disk drive:** drive spindle motor start up too slow, the drive will soon fail. Back up the data. Run the Confidence test.
6219	8090	**High Capacity disk drive:** Physical volume problem. Run the Confidence test, then run Physical Volume Scavenge.
	8090	*NOTE: The MP codes for the first high capacity drive were covered in the previous section (MP codes 6211-6219). For the second through seventh drives, the MP codes will be represented in the form 62NX, where N = the drive number and X = codes 1 through 9.* *For example, the MP code 6216 for the first high capacity disk drive would be equivalent to 6226 for the second disk drive, 6236 for the third disk drive, etc.*
6221 through **6229**	8090	**Second high capacity disk drive.**
6231 through **6239**	8090	**Third high capacity disk drive.**
6241 through **6249**	8090	**Fourth high capacity disk drive.**

6251 through **6259**	8090	**Fifth high capacity disk drive.**
6261 through **6269**	8090	**Sixth high capacity disk drive.**
6271 through **6279**	8090	**Seventh high capacity disk drive.**
6300	8090	**High Capacity Configuration Utility is running with no error encountered.**
6301	8090	**High Capacity Configuration Utility:** checksum error detected after a read operation.
6302	8090	**High Capacity Configuration Utility:** checksum error detected after a write operation.
6303	8090	**High Capacity Configuration Utility:** EEPROM space exceeded.
6305	8090	**High Capacity Configuration Utility:** Person running the diagnosticss claims that the Configuration EEPROM contents are not valid.
6308	8090	**Reboot.** If the MP code remains on 6308 for more than two minutes, a Real Time Clock failure is indicated.
7001	8090	**Backstop needs to be initialized.**
7002	8090	**Backstop unable to initialize itself.**
7003	8090	**Uncaught signal from Backstop.**
7004	8090	**Backstop looping.** The file server is raising an error during its recovery, causing the infinite loop from file server error to Backstop to file server restart to file server error.
7500	8090	**The scavenger program is running.** No action is required. **Do not reboot out of this MP code.** Reboot during scavenge has a high risk of permanent filesystem damage. Scavenge may take a while (on the order of many hours for large volumes with lots of files & folders, severe fragmentation, or lots of problems) - please be patient.
7505	8090	**Need to run the configuration Utility cartridge tape.** Contact the Xerox System Analyst to run the Configuration Utility.
7512 *rotating*	8090	**Fault (software error).** A software error has been found that prevents the 8090 from proceeding. Four codes will cycle as 7512, *gggg*, 00*gg*, 0*mmm*, where *gggg* is the global frame address and *mmm* is the octal code for the first letter of the CallDebugger message giving further information about the problem. Record the code and retry the operation. If the retry succeeds, treat the code as an intermittent failure.

7513 *rotating*	8090	**Hardware Error** Four codes will cycle as `7513`, *gggg*, `00`*gg*, `0`*mmm*, where *gggg* is the golbal frame address and *mmm* is the octal code for the first letter of the CallDebugger message giving further information about the problem. Record the code and retry the operation. If the retry succeeds, treat the code as an intermittent failure.
7513 **0130** **0004** **0107** *rotating*	8090	**Hardware Error** GMT clock not set: GetUniversalID. Record the code and retry the operation. If the retry succeeds, treat the code as an intermittent failure.
7516 *rotating*	8090	**Unrecoverable disk error** Four codes will cycle with the following meaning: `7516, 00`*XX*, `0`*XXX*, `0125` means unrecoverable disk error on page *XXXXX*. Record all four codes, but **DO NOT** reboot the system. If the problem occurs repeatedly, call for assistance.
7516 **0000** **0000** **0107** *rotating*	8090	**Unrecoverable disk error:** error. Record all four codes, but **DO NOT** reboot the system. If the problem occurs repeatedly, call for assistance.
7520 *rotating*	8090	**Break point.** A breakpoint has been encountered. MP codes will cycle as `7520`, `0`*ggg*, `0`*ggg*, and *pppp*; where *gggggg* is the global frame of the module and *pppp* is the program counter of the instruction where the breakpoint is set.
7521 *rotating*	8090	**Bug.** An internal error has occurred in the operating system. MP codes will cycle as `7521`, `0`*ggg*, `0`*ggg*, *pppp* and *bbbb*; where *gggggg* is the global frame of the module, *pppp* is the program counter of the instruction at which the error was ecnountered, and *bbbb* is the bug parameter number.
7522 *rotating*	8090	**Call Debugger.** A program has asked to go to the debugger. MP codes will cycle as `7522`, `0`*ggg*, `0`*ggg*, *pppp*, *mmmm* and *nnnn*; where *gggggg* is the global frame of the module, *pppp* is the program counter of the instruction at which the debugger was called, and *mmmm* and *nnnn* are the octal codes of the first two characters of the message parameter.
7524 *rotating*	8090	**Interrupt.** Some program has called `Runtime.Interrupt`. MP codes will cycle as `7524`, `0`*ggg*, `0`*ggg*, *pppp*; where *gggggg* is the global frame of the module and *pppp* is the program counter of the current instruction.
7525 *rotating*	8090	**Visit debugger.** Some program has called `SpecialRuntime.VisitDebugger`. MP codes will cycle as `7525`, `0`*ggg*, `0`*ggg*, *pppp*; where *gggggg* is the global frame of the module and *pppp* is the program counter of the current instruction.
7526 *rotating*	8090	**Return.** *This MP code is only used by the debugger and should never occur with the debugger substitute.* It indicates the return from an interpret-call. MP codes will cycle as `7526`, `0`*ggg*, `0`*ggg*, and *pppp*; where *gggggg* is the global frame of the module and *pppp* is the program counter of the current instruction.
7527 *rotating*	8090	**Return aborted.** *This MP code is only used by the debugger and should never occur with the debugger substitute.* It indicates the return from an unsuccessful interpret-call. MP codes will cycle as `7527`, `0`*ggg*, `0`*ggg*, and *pppp*; where *gggggg* is the global frame of the module and *pppp* is the program counter of the current instruction.

7528 *rotating*	8090	**Address fault.** A program has tried to access an address that is not mapped. MP codes will cycle as 7528, 0*ggg*, 0*ggg*, *pppp*, and *xaaa*; where *gggggg* is the global frame of the module and *pppp* is the program counter of the current instruction. *x* is the high order octal digit of the address, and *aaa* is the number of octal digits in the address.
7529 *rotating*	8090	**Write protect fault.** A program has tried to write into an address that is read-only. MP codes will cycle as 7529, 0*ggg*, 0*ggg*, *pppp*, and *xaaa*; where *gggggg* is the global frame of the module and *pppp* is the program counter of the current instruction. *x* is the high order octal digit of the address, and *aaa* is the number of octal digits in the address.
7530 *rotating*	8090	**Uncaught signal.** A program has raised an error or signal that was not caught. MP codes will cycle as 7530, 0*ggg*, 0*ggg*, *pppp*, 0*hhh*, 0*hhh*, 0*iii*, and 0*sss*; where *gggggg* is the global frame of the module and *pppp* is the program counter of the current instruction. *hhhhhh* is global frame of the signal and *iii* is the index of the signal in that frame. *sss* is the first word of the signal argument.
7531 *rotating*	8090	**Unrecoverable disk error.** There is a disk page which contains invalid data. MP codes will cycle as 7530, 0*ggg*, 0*ggg*, *pppp*, 0*aaa*, 0*aaa*, and 0*aaa*; where *gggggg* is the global frame of the module and *pppp* is the program counter of the current instruction. *aaaaaaaaa* is the decimal address of the bad disk page.
7539 *rotating*	8090	**Other - Debugger Subsitute.** The debugger substitute has been called with one of the swap reasons used only by CoPilot. This should never happen. MP codes will cycle as 7539, 0*ggg*, 0*ggg*, and *pppp*; where *gggggg* is the global frame of the module and *pppp* is the program counter of the current instruction.
8000		**8000-series applications software is running ok.** Star/ViewPoint/GlobalView/Services/whatever boot has completed and everything is hunky dory (at least from the OS point of view).
8888		**Lamp test for all the segments on the MP.**
9700		**25MB ST506 drive:** sequence, ready test.
9701		**25MB ST506 drive:** index timing test.
9702		**25MB ST506 drive:** seek/read/verify cylinder zero.
9703		**25MB ST506 drive:** seek/read/verify diagnostic cylinder.
9704		**25MB ST506 drive:** dip switch test.
9705		**25MB ST506 drive:** controller sequence, all ones test.
9706		**25MB ST506 drive:** controller sequence, all zeros test.
9707		**25MB ST506 drive:** controller sequence, all ones test.
9708		**25MB ST506 drive:** controller sequence, all zeros test.
9718		**85MB ST506 drive:** sequence, ready test.
9719		**85MB ST506 drive:** index timing test.
9720		**85MB ST506 drive:** seek/read/verify cylinder zero.
9721		**85MB ST506 drive:** seek/read/verify diagnostic cylinder.
9722		**85MB ST506 drive:** dip switch test.
9723		**85MB ST506 drive:** controller sequence, all ones test.
9724		**85MB ST506 drive:** controller sequence, all zeros test.
9725		**85MB ST506 drive:** controller sequence, all ones test.

9726	**85MB ST506 drive:** controller sequence, all zeros test.
9950	**XDE/Tajo filesystem scavenge in process.** This is akin to a Unix `fsck`. The filesystem is being checked for consistency and correctness, and may be reconstructed. This code is for informational purposes only. **Do not reboot out of this MP code.** Reboot during scavenge has a high risk of permanent filesystem damage. Scavenge may take a while (on the order of hours for large volumes with lots of files & folders, severe fragmentation, or lots of problems) - please be patient.
9999	**The Debugger Substitute has been called.** This is a result of an abnormal error condition and may require System Analyst/Technical Support Center assistance. Run Boot Diagnostics (boot 5 from the cartridge tape) and repair as indicated. After performing the repair action, reboot. If the problem persists, call for assistance.

I'll add more when I get around to digging out further old docs. Contributions, corrections, suggestions, and additions are welcome. Many, many thanks to those who have helped out with this already.

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