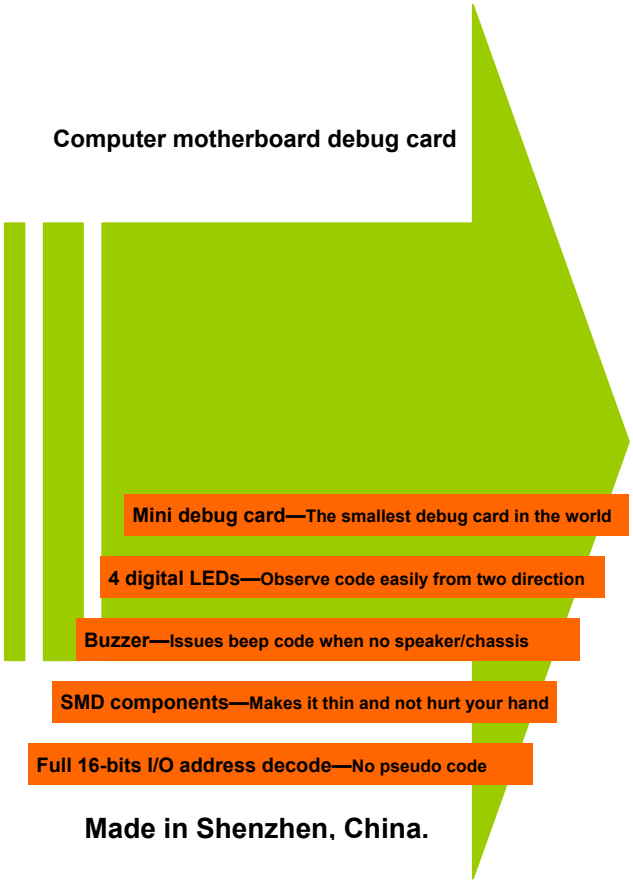

Computer motherboard debug card
Mini debug card—The smallest debug card in the world
4 digital LEDs—Observe code easily from two direction
Buzzer—Issues beep code when no speaker/chassis
SMD components—Makes it thin and not hurt your hand
Full 16-bits I/O address decode—No pseudo code
Made in Shenzhen, China.

DIRECTORY

1. General

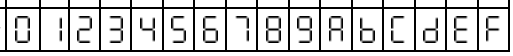
Debug card also named POST card. It catches the BIOS POST code, then display on digital LEDs. Find the corresponding code in this manual, you will quickly to know what's the matter with your motherboard. Especially in case of motherboard cannot boot, dark screen, no buzzing.

After reset, main board test CPU, chipsets, memory, keyboard, display card, hard disk, floppy disk one by one, then boot the operating system. When BIOS test, it put the POST code to debug port, thus you knows the matter.

2. Necessary knowledge

(1) The POST code table is in the order of the code value that from small to big. The sequence that the code displays is decided by BIOS and not the same order.
(2) Undefined code is not list in the table.
(3) Different BIOS (AMI, AWARD, PHOENIX)has the different meaning. So make sure that which kind of BIOS you are testing. See motherboard user's manual, or see it on the BIOS IC on the motherboard, or see BIOS info on the screen when computer starting.

3. Hexadecimal character table

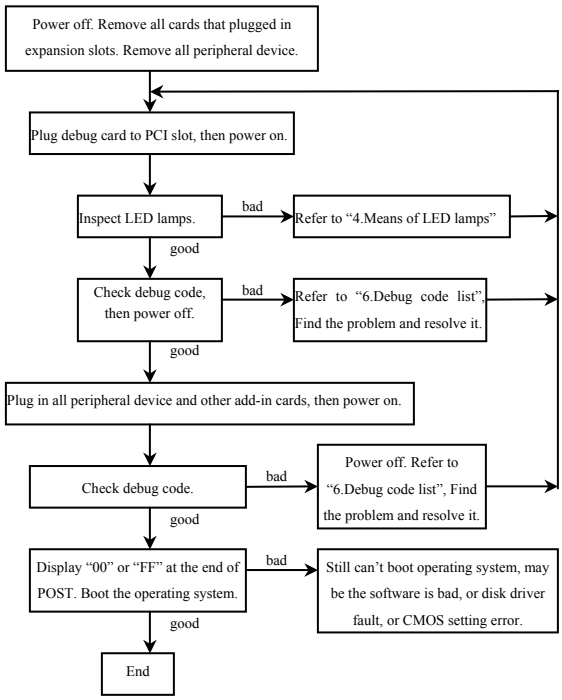
Hex	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Display																

4. Means of LED lamps

lamp	Indicator	Memo
+5V	+5V power	Display all the time when the motherboard powered on, otherwise the switching power supply is fault or short circuit occurs on the motherboard.
+3.3V	+3.3V power	The same as "+5V". It is unlit when some motherboard have no this power on PCI slots.
FRAME	PCI frame Signal	Flashing when PCI "FRAME" signal active.
IRDY	IRDY signal	Flashing when PCI "IRDY" signal active.
RESET	RESET signal	When in reset period, this lamp display. If it is lit all the time, check the following: make sure that the reset pin is plugged properly, or the reset circuit is broken.
+12V	+12V power	The same as "+5V".
-12V	-12V power	The same as "+5V".
-5V	-5V power	The same as "+5V". It is unlit when some motherboard have no this power on PCI slots.

Note: LED lamps in shadow maybe not exist.

5. Follow chart of usage



6. Debug code list

Code	Award	AMI	Phoenix4.0/Tandy3000
00		Code copying to specific areas is done. Passing control to INT 19h boot loader next.	
01	Processor testing 1, processor status (1flags) verification. Test the following processor status flags: carry, zero, sign, overflow The BIOS sets each flag, verifies they are set, then turns each flag off and verifies it is off		CPU is testing the register inside or failed, please change the CPU and check it
02	Test all CPU registers except SS, SP, and BP with data FF and 00		Verify real mode
03	Disable NMI, PIE, AIE, UEI, SQWV Disable video, parity checking, DMA Reset math coprocessor Clear all page registers, CMOS shutdown byte Initialize timer 0, 1, and 2, including set EISA timer to a known state Initialize DMA controllers 0 and 1 Initialize interrupt controllers 0 and 1 Initialize EISA extended registers	Disable NMI, PIE, AIE, UEI, SQWV. The NMI is disabled. Next, checking for a soft reset or a power on condition	Disable Nonmaskable interrupt
04	RAM must be periodically refreshed to keep the memory from decaying. This refresh function is working properly.		Get CPU type
05	Keyboard controller Initialization	The BIOS stack has been built. Next, disabling cache memory	DMA initialization in progress or failure

Code	Award	AMI	Phoenix4.0/Tandy3000
06	Reserved	Uncompressing the POST code next.	Initialize system hardware
07	Verifies CMOS is working correctly, detects bad battery	Next, initializing the CPU and the CPU data area	Disable shadow and execute code from the ROM
08	Early chipset initialization Memory presence test OEM chipset routines Clear low 64K memory Test first 64K memory	The CMOS checksum calculation is calculating.	Initialize chipset with initial POST values
09	Cyrix CPU initialization Cache initialization		Set IN POST flag
0A	Initialize first 120 interrupt vectors with SPURIOUS-INT-HDLR and initialize INT 00h-1Fh according to INT-TBL	The CMOS checksum calculation is done. Initializing the CMOS status register for date and time next	Initialize CPU registers
0B	Test CMOS RAM checksum, if bad, or INS key pressed, load defaults	The CMOS status register is initialized. Next, performing any required initialization before the keyboard BAT command is issued	Enable CPU cache
0C	Detect type of keyboard controller and set NUMLOCK status	The keyboard controller input buffer is free. Next, issuing the BAT command to the keyboard controller	Initialize caches to initial POST values
0D	Detect CPU clock Read CMOS location 14h to find out type of video in use Detect and initialize video adapter		
0E	Test video memory, display sign-on message Setup shadow RAM. Enable shadow according to setup	The keyboard controller BAT command result has been verified. Next, performing any necessary initialization after the keyboard controller BAT command test	Initialize I/O component
0F	Test DMA controller 0; BIOS checksum test Keyboard detect and initialization	Initialization after BAT command test is done. Keyboard command is written next	Initialize the local bus IDE

Code	Award	AMI	Phoenix4.0/Tandy3000
10	Test DMA controller 1	Test DMA. The keyboard controller command byte is written. Next, issuing the Pin 23 and 24 blocking and unblocking command	Initialize power management.
11	Test DMA page registers	Next, checking if <End> or <Ins> keys where pressed during power on. Initializing CMOS RAM if the initialize CMOS RAM in every boot AMIBIOS POST option was set in AMIBCP or the <End> key was pressed	Load alternate registers with initial POST values
12	Reserved	Next, disabling DMA controllers 1 and 2 and interrupt controllers 1 and 2	Restore CPU control word during warm boot
13	Reserved	The video display has been disabled. Port B has been initialized. Next, initializing the chipset	Initialize PCI bus mastering devices
14	Test 8254 Timer 0 Counter 2	The 8254 timer test will begin next	Initialize keyboard controller
15	Verify 8259 channel 1. Interrupts by turning off and on the interrupt lines		
16	Verify 8259 channel 2. Interrupts by turning off and on the interrupt lines		BIOS ROM checksum
17	Turn off interrupts then verify Nonmaskable Interrupt register is on		Initialize cache before memory auto size
18	Force an interrupt and verify the interrupt occurred		8254 timer initialization
19	Test stuck NMI bits. Verify NMI can be cleared		The 8254 timer test is over. Starting the memory refresh test next
1A	Display CPU clock	The memory refresh line is toggling. Checking the 15 seconds on/off time next	8237 DMA controller initialization
1B	Reserved		
1C	Reserved		Reset programmable interrupt controller

Code	Award	AMI	Phoenix4.0/Tandy3000
1D,1E	Reserved		
1F	If EISA non-volatile memory checksum is good, execute EISA initialization If not, execute ISA tests an clear EISA mode flag. Test EISA configuration memory integrity(checksum & communication interface)		
20	Initialize Slot 0(System board)		Test DRAM refresh
21	Initialize Slot 1		
22	Initialize Slot 2		Test 8742 keyboard controller
23	Initialize Slot 3	Reading the 8042 input port and disabling the MEGAKEY Green PC feature next. Making the BIOS code segment writable and performing any necessary configuration before initializing the interrupt vectors	
24	Initialize Slot 4	The configuration required before interrupt vector initialization has completed. Interrupt vector initialization is about to begin	Set ES segment register to 4GB
25	Initialize Slot 5	Interrupt vector initialization is done. Clearing the password if the POST DIAG switch is on	
26	1.Test the exceptional situation of protected mode, check the memory of CPU and motherboard. 2.Non-fatal errors occurred, error messages displaying, otherwise boot operating system, and this is the end code	1. Read/write input/output port of 8042 keyboard; ready for revolve mode, continue to get ready for initialization of all data, check the 8042 chips on motherboard. 2. Refer to the left	1. Enable A20 address line, Check the A20 pins of memory controlling chips, and check circuit, correlated to pins. In memory slot, may be A20 pin and memory pins are not in contact, or memory A20 pins bad. 2. Refer to the left

Code	Award	AMI	Phoenix4.0/Tandy3000
27	Initialize Slot 7	Any initialization before setting video mode will be done next	
28	Initialize Slot 8	Initialization before setting the video mode is complete. Setting the monochrome and color mode next	Auto size DRAM
29	Initialize Slot 9		Initialize POST memory manager
2A	Initialize Slot 10	Initializing the different bus system, static, and output devices, if present	Clear 512KB base RAM
2B	Initialize Slot 11	Passing control to the video ROM to perform any required configuration before the video ROM test	
2C	Initialize Slot 12	All necessary processing before passing control to the video ROM is done. Locking for the video ROM and passing control to it	RAM failure on address line XXXX*
2D	Initialize Slot 13	The video ROM has returned control to BIOS POST. Performing any required processing after the video ROM had control	
2E	Initialize Slot 14	Completed testing video ROM. If the EGA/VGA controller is not found, performing the display memory read/write test next	RAM failure on data bits XXXX* of low byte of memory bus
2F	Initialize Slot 15	The EGA/VGA controller was not found. The display memory read/write test is about to begin	Enable cache before system BIOS shadow
30	Size base memory from 256K to 640K and extended memory above 1MB	The display memory read/write test passed. Look for retrace checking next	
31	Test base memory from 256K to 640K and extended memory above 1MB	The display memory read/write test or retrace checking failed. Performing the alternate display memory read/write test next	

Code	Award	AMI	Phoenix4.0/Tandy3000
32	If EISA mode, test EISA memory found in slots initialization	The alternate display memory read/write test passed. Looking for alternate display retrace checking next	Test CPU bus clock frequency
33	Reserved		Initialize Phoenix dispatch manager
34	Reserved	Video display checking is over. Setting the display mode next	
35	Reserved		
36	Reserved		Warm start and shut down
37	Reserved	The display mode is set. Displaying the power on message next	
38	Reserved	Initializing the bus input, IPL, general devices next, if present	Shadow system BIOS ROM
39	Reserved	Displaying bus initialization error messages	
3A	Reserved	The new cursor position has been read and saved. Displaying the Hit <DEL> message next	Auto size cache
3B	Reserved	The Hit <DEL> message is displayed. The protected mode memory test is about to start	
3C	Setup enabled		Advanced configuration of chipset registers
3D	Detect if mouse is present, initialize mouse, install interrupt vectors		Load alternate registers with CMOS values
3E	Initialize cache controller		
3F	Reserved		
40	Display virus protect disable or enable	Preparing the descriptor tables next	
41	Initialize floppy disk driver controller and any drivers		Initialize extended memory for RomPilot
42	Initialize hard drive controller and any drivers	The descriptor tables are prepared. Entering protected mode for the memory test	Initialize interrupt vectors

Code	Award	AMI	Phoenix4.0/Tandy3000
43	Detect and initialize serial & parallel ports and game port	Entered protected mode. Enabling interrupts for diagnostics mode next.	
44	Reserved	Interrupt enabled if the diagnostics switch is on. Initializing data to check memory wraparound at 0:0 next	
45	Detect and initialize math coprocessor	Data initialized. Checking for memory wraparound at 0:0 and finding the total system memory size next	POST device initialization
46	Reserved	The memory wraparound test is done. Memory size calculation has been done. Writing patterns to test memory next	Check ROM copyright notice
47	Reserved	The memory pattern has been written to extended memory. Writing patterns to the base 640KB memory	Initialize 120 support
48	Reserved	Patterns written in base memory. Determining the size of memory below 1MB	Check video configuration against CMOS
49	Reserved	The size of memory below 1MB has been found and verified. Determining the size of memory above 1MB	Initialize PCI bus and devices
4A	Reserved		Initialize all video adapters
4B	Reserved	The amount of memory above 1 MB has been found and verified. Checking for a soft reset and clearing the memory below 1MB for the soft reset next. If this is a power on situation, going to checkpoint 4E next	Quiet boot start (optional)
4C	Reserved	The memory below 1MB has been cleared via a soft reset. Clearing the memory above 1MB next	Shadow video BIOS ROM

Code	Award	AMI	Phoenix4.0/Tandy3000
4D	Reserved	The memory above 1MB has been cleared via a soft reset. Saving the memory size next. Going to checkpoint 52h next	
4E	Reboot if manufacturing mode; If not, display messages and enter setup	The memory test started, but not as the result of a soft reset. Displaying the first 64KB memory size next	Display BIOS copyright notice
4F	Ask password security (optional)	The memory size display has started. The display is updated during the memory test. Performing the sequential and random memory test next	Initialize muti-boot
50	Write all CMOS values back to RAM and clear	The memory below 1MB has been tested and initialized. Adjusting the displayed memory size for relocation and shadowing	Display CPU type and speed
51	Enable parity checker, enable NMI, enable cache before boot	The memory size display was adjusted for relocation and shadowing. Testing the memory above 1MB next	Initialize EISA board
52	Initialize option ROMs from C8000h to EFFFFh or if FS can enabled to F7FFFh	The memory above 1MB has been tested and initialized. Saving the memory size information	Test keyboard
53	Initialize time value in 0000:0040h BIOS area	The memory size information and the CPU registers are saved. Entering real mode next	
54		Shutdown was successful. The CPU is in real mode. Disabling the gate A20 line, parity, and the NMI next	Set key click if enabled
55			Enable USB devices
57		The A20 address line, parity, and the NMI are disabled. Adjusting the memory size depending on relocation and shadowing	

Code	Award	AMI	Phoenix4.0/Tandy3000
58		The memory size was adjusted for relocation and shadowing. Clearing the Hit <DEL> message next	Test for unexpected interrupts
59		The Hit <DEL> message is cleared. The <WAIT…> message is displayed. Starting the DMA and interrupt controller test next	Initialize POST display service
5A			Display prompt: “Press F2 to enter SETUP”
5B			Disable CPU cache
5C			Test RAM between 512 and 640KB
60	Setup virus protection (boot sector protection) functionality according to setup setting	The DMA page register test passed. Performing the DMA controller 1 base register test next	Test extended memory
61	Try to turn on level 2 cache (if L2 cache already turned on in post 3D, this part will be skipped)		
	Set the boot up speed according to setup setting		
	Last chance for chipset initialization		
	Last chance for power management initialization (Green BIOS only)		
	Show the system configuration table		
62	Setup NUMLOCK status according to setup values	The DMA controller 1 base register test passed. Performing the DMA controller 2 base register test next	Test extended memory address lines
	Program the NUMLOCK, typematic rate & typematic speed according to setup setting		
63	If there is any changes in the hardware configuration, update ESCD information (PnP BIOS only)		

Code	Award	AMI	Phoenix4.0/Tandy3000
	Clear memory that have been used Boot system via INT 19h		
64			Jump to UserPatch1
65		The DMA controller 2 base register test passed. Programming DMA controllers 1 and 2 next	
66		Completed programming DMA controllers 1 and 2. Initializing the 8259 interrupt controller next	Configure advanced cache registers
67		Completed 8259 interrupt controller initialization	Initialize muti-processor APIC
68			Enable external and CPU caches
69			Setup system management mode (SMM) area
6A			Display external L2 cache size
6B			Load custom defaults (optional)
6C			Display shadow area message
6E			Display possible high address for UMB recovery
70			Display error message
72			Check for configuration errors
76			Check for keyboard errors
7C			Setup hardware interrupt vectors
7D			Initialize intelligent system monitoring
7E			Initialize coprocessor if present
7F		Extended NMI source enabling is in progress	

Code	Award	AMI	Phoenix4.0/Tandy3000
80		The keyboard test has started. Clearing the output buffer and checking for stuck keys. Issuing the keyboard reset command	Disable onboard super I/O ports and IRQs
81		A keyboard reset error or stuck key was found. Issuing the keyboard controller interface test command next	Late POST device initialization
82		The keyboard controller interface test completed. Writing the command byte and initializing the circular buffer next	Detect and install external RS232 ports
83		The command byte was written and global data initialization has completed. Checking for a locked key next	Configure non-MCD IDE controllers
84		Locked key checking is over. Checking for a memory size mismatch with CMOS RAM data next	Detect and install external parallel ports
85		The memory size check is done. Displaying a soft error and checking for a password or bypassing WINBIOS setup next	Initialize PC-compatible PnP ISA devices
86		The password was checked. Performing any required programming before WINBIOS setup next	Re-initialize onboard I/O ports
87		The programming before WINBIOS setup has completed. Uncompressing the WINBIOS setup code and executing the AMIBIOS setup or WINBIOS setup utility next	Configure motherboard configurable devices (optional)

Code	Award	AMI	Phoenix4.0/Tandy3000
88		Returned from WINBIOS setup and cleared the screen. Performing any necessary programming after WINBIOS setup next	Initialize BIOS data area
89		The programming after WINBIOS setup has completed. Displaying the power on screen message	Enable Nonmaskable Interrupts (NMIs)
8A			Initialize extended BIOS data area
8B		The first screen message has been displayed. The <WAIT…> message is displayed. Performing the PS/2 mouse check and extended BIOS data area allocation check next	Test and initialize PS/2 mouse
8C		Programming the WINBIOS setup options next	Initialize floppy controller
8D		The WINBIOS setup options are programmed. Resetting the hard disk controller next	
8E		The hard disk controller has been reset. Configuring the floppy drive controller next	
8F			Determine number of ATA drivers (optional)
90			Initialize hard disk controllers
91		The floppy drive controller has been configured. Configuring the hard disk drive controller next	Initialize local bus hard disk controllers
92			Jump to UserPatch2
93			Build MPTABLE for muti-processor boards
95		Initializing bus adaptor ROMs from C8000h through D8000h	Install CD-ROM for boot

Code	Award	AMI	Phoenix4.0/Tandy3000
96		Initialization before passing control to the adaptor ROM at C800h	Clear huge ES segment register
97		Initialization before the C800h adaptor ROM gains control has completed. The adaptor ROM check is next	Fix up multi-processor table
98		The adaptor ROM had control and has now returned control to BIOS POST. Performing any required processing after the option ROM returned control.	Search for option ROMs. One long, two short beeps on checksum failure
99		Any initialization required after the option ROM test has completed. Configuring the timer data area and printer base address next	Check for SMART drive (optional)
9A		Set the timer and printer base addresses. Setting the RS-232 base address next	Shadow option ROMs
9B		Returned after setting the RS-232 base address. Performing any required initialization before the coprocessor test next	
9C		Required initialization before the coprocessor test is over. Initializing the coprocessor test next	Setup power management
9D		Coprocessor initialized. Performing any required initialization after the coprocessor test next	Initialize security engine (optional)
9E		Initialization after the coprocessor test is complete. Checking the extended keyboard, keyboard ID, and NUMLOCK key next. Issuing the keyboard ID command next	Enable hardware interrupts

Code	Award	AMI	Phoenix4.0/Tandy3000
9F			Determine number of ATA and SCSI drives
A0			Set time of day
A1			Check key lock
A2		Displaying any soft error next	
A3		The soft error display has completed. Setting the keyboard typematic rate	
A4		The keyboard typematic rate is set. Programming the memory wait states next	Initialize typematic rate
A5		Memory wait state programming is over. Clearing the screen and enabling parity and the NMI next	
A7		NMI and parity enabled. Performing any initialization required before passing control to the adaptor ROM at E000 next	
A8		Initialization before passing control to the adaptor ROM at E000h completed. Passing control to the adaptor ROM at E000h next	Erase F2 prompt
A9		Returned from adaptor ROM at E000H control. Performing any initialization required after the E000 option ROM had control next	
AA		Initialization after E000 option ROM control has completed. Displaying the system configuration next	Scan for F2 key stroke
AB		Uncompressing the DMI data and executing DMI POST initialization next	
AC			Enter SETUP
AE			Clear boot flag

Code	Award	AMI	Phoenix4.0/Tandy3000
B0	If interrupts occurs in protected mode	The system configuration is displayed	Check for errors
B1	If NMI occurs, display: " Press F1 to disable NMI, F2 reboot"	Copying any code to specific areas	Inform RomPilot about the end of POST
B2			POST done-prepare to boot operating system
B4			One short beep before boot
B5			Terminate quiet boot (optional)
B6			Check password (optional)
B7			Initialize ACPI BIOS
B9			Prepare boot
BA			Initialize SMBIOS
BB			Initialize PnP option ROMs
BC			Clear parity checkers
BD			Display multi-boot menu
BE	Program chipset registers with power on BIOS defaults		Clear screen (optional)
BF	Program the rest of the chipset's value according to setup (later setup value program) If auto configuration is enabled, programmed the chipset with predefined values in the MODBIN.exe auto table		Check virus and backup reminders
C0	Turn off OEM specific cache shadow Initialize standard devices with default values: DMA controller (8237); Programmable interrupt controller (8259); Programmable interval timer (8254); RTC chip		Try to boot with INT 19
C1	OEM specific-Test to size on-board memory		Initialize POST Error Manager (PEM)
C2			Initialize error logging

Code	Award	AMI	Phoenix4.0/Tandy3000
C3	Test the first 256K DRAM. Expand the compressed codes into temporary DRAM area including the compressed system BIOS & Option ROMs		Initialize error display function
C4			Initialize system error handler
C5	OEM specific-Early shadow enable for fast boot		PnP dual CMOS (optional)
C6	External cache size detection		Initialize note dock (optional)
C7			Initialize note dock late
C8			Force check (optional)
C9			Extended checksum (optional)
CA			Redirect INT 15h to enable remote keyboard
CB			Redirect INT 13h to memory technologies devices such as ROM, AM, PCMCIA, and serial disk
CC			Redirect INT 10h to enable remote serial video
CD			Re-map I/O and memory for PCMCIA
CE			Initialize digitizer and display message
D0		The NMI is disabled. Power on delay is starting. Next, the initialization code checksum will be verified	
D1		Initializing the DMA controller, performing the keyboard controller BAT test, starting memory refresh, and entering 4GB flat mode next	
D2			Unknown interrupt
D3		Starting memory sizing next	

Code	Award	AMI	Phoenix4.0/Tandy3000
D4		Returning to real mode. Executing any OEM patches and setting the stack next	
D5		Passing control to the uncompressed code in shadow RAM at E000:0h. The initialization code is copied to segment 0 and control will be transferred to segment 0	
D6		Control is in segment 0. Next, checking if <Ctrl><Home> was pressed and verifying the system BIOS checksum. If either <Ctrl><Home>was pressed or the system BIOS checksum is bad, next will go to checkpoint code E0h，otherwise, going to checkpoint code D7h	
E0		The onboard floppy controller if available is initialized. Next, beginning the base 512KB memory test	Initialize the chipset
E1	E1 setup-Page E1	Initializing the interrupt vector table next	Initialize the bridge
E2	E2 setup-Page E2	Initializing the DMA and interrupt controllers next	Initialize the CPU
E3	E3 setup-Page E3		Initialize system timer
E4	E4 setup-Page E4		Initialize system I/O
E5	E5 setup-Page E5		Check force recovery boot
E6	E6 setup-Page E6	Enabling the floppy drive controller and Timer IRQs. Enabling internal cache memory	Checksum BIOS ROM
E7	E7 setup-Page E7		Go to BIOS
E8	E8 setup-Page E8		Set huge segment
E9	E9 setup-Page E9		Initialize multi-processor
EA	EA setup-Page EA		Initialize OEM special code
EB	EB setup-Page EB		Initialize PIC and DMA
EC	EC setup-Page EC		Initialize memory type

Code	Award	AMI	Phoenix4.0/Tandy3000
ED	ED setup-Page ED	Initializing the floppy drive	Initialize memory size
EE	EE setup-Page EE	Looking for a floppy diskette in drive A:. Reading the first sector of the diskette	Shadow boot block
EF	EF setup-Page EF	A read error occurred while reading the floppy drive in drive A: .	System memory test
F0		Next, searching for the AMIBOOT.ROM file in the root directory	Initialize interrupt vectors
F1		The AMIBOOT.ROM file is not in the root directory	Initialize Real Time Clock
F2		Next, reading and analyzing the floppy diskette FAT to find the clusters occupied by file AMIBOOT.ROM	Initialize video
F3		Next, reading the AMIBOOT.ROM file, cluster by cluster	Initialize System Management Manager
F4		The AMIBOOT.ROM file is not the correct size	Output one beep
F5		Next，disabling internal cache memory.	Clear huge segment
F6			Boot to Mini DOS
F7			Boot to Full DOS
FB		Next，detecting the type of flash ROM	
FC		Next，erasing the flash ROM	
FD		Next, programming the flash ROM	
FF	INT 19H boot attempt. The main board is ok.	Flash ROM programming was successful. Next restarting the system BIOS	

7. Speaker (buzzer) beep codes

(1) AMI BIOS beep codes (fatal error)

Beep code	Description
1 beep	Renovation of DRAM failed
2 beeps	Parity checking error in first 64K DRAM
3 beeps	Basic 64K RAM defect
4 beeps	System timer failure
5 beeps	Processor failure
6 beeps	Keyboard controller gate circuit A20 defect
7 beeps	Processor virtual mode exception occurs
8 beeps	Display memory read/write test failure
9 beeps	ROM BIOS checksum(32KB at F800:0) failed
10 beeps	CMOS shutdown register read/write error
11 beeps	Cache memory error

(2) AMI BIOS beep codes (Non-fatal error)

Beep code	Description
2 short	POST failure-One or more of the hardware tests has failed
1 long 2 short	An error was encountered in the video BIOS ROM, or a horizontal retrace failure has been encountered
1 long 3 short	Conventional/Extended memory failure
1 long 8 short	Display/Retrace test failed

(3) AWARD BIOS beep codes

Beep code	Description
1 short	System is normal
2 short	Any Non-fatal error, enter CMOS SETUP
1 long 1 short	RAM or the motherboard error
1 long 2 short	Video Error, cannot initialize screen to display any information
1 long 3 short	Keyboard controller error
1 long 9 short	Flash RAM/EPROM error (BIOS IC error)
Long beep	Memory bank is not plugged well or broken

(4) PHOENIX BIOS beep codes

Beep code	Description
1-1-1-3	Verify real mode
1-1-2-1	Get CPU type
1-1-2-3	Initialize system hardware
1-1-3-1	Initialize chipset registers with initial POST values

1-1-3-2	Set in POST flag
1-1-3-3	Initialize CPU registers
1-1-4-1	Initialize cache to initial POST values
1-1-4-3	Initialize I/O
1-2-1-1	Initialize power management
1-2-1-2	Load alternate registers with initial POST values
1-2-1-3	Jump to UserPatch0
1-2-2-1	Initialize keyboard controller
1-2-2-3	BIOS ROM checksum
1-2-3-1	8254 timer initialization
1-2-3-3	8237 DMA controller initialization
1-2-4-1	Reset programmable interrupt controller
1-3-1-1	Test DRAM refresh
1-3-1-3	Test 8742 keyboard controller
1-3-2-1	Set ES segment to register to 4GB
1-3-3-1	Auto check size of DRAM
1-3-3-3	Clear 512K base DRAM
1-3-4-1	Test 512K base address lines
1-3-4-3	Test 512K base memory
1-4-1-3	Test CPU bus-clock frequency
1-4-2-4	Reinitialize the chipset
1-4-3-1	Shadow system BIOS ROM
1-4-3-2	Reinitialize the cache
1-4-3-3	Auto check size of cache
1-4-4-1	Configure advanced chipset registers
1-4-4-2	Load alternate registers with CMOS values
2-1-1-1	Set initial CPU speed
2-1-1-3	Initialize interrupt vectors
2-1-2-1	Initialize BIOS interrupts
2-1-2-3	Check ROM copyright notice
2-1-2-4	Initialize manager for PCI Options ROMs
2-1-3-1	Check video configuration against CMOS
2-1-3-2	Initialize PCI bus and device
2-1-3-3	Initialize all video adapters in system
2-1-4-1	Shadow video BIOS ROM
2-1-4-3	Display copyright notice
2-2-1-1	Display CPU type and speed

2-2-1-3	Test keyboard
2-2-2-1	Set key click if enabled
2-2-2-3	Enable keyboard
2-2-3-1	Test for unexpected interrupts
2-2-3-3	Display prompt “Press F2 to enter SETUP”
2-2-4-1	Test RAM between 512K and 640K
2-3-1-1	Test expanded memory
2-3-1-3	Test extended memory address lines
2-3-2-1	Jump to UserPatch1
2-3-2-3	Configure advanced cache registers
2-3-3-1	Enable external and CPU caches
2-3-3-3	Display external cache size
2-3-4-1	Display shadow message
2-3-4-3	Display non-disposable segments
2-4-1-1	Display error messages
2-4-1-3	Check for configuration errors
2-4-2-1	Test real-time-clock(RTC)
2-4-2-3	Check for keyboard errors
2-4-4-1	Set up hardware interrupt vectors
2-4-4-3	Test coprocessor if present
3-1-1-1	Disable onboard I/O ports
3-1-1-3	Detect and install external RS232 ports
3-1-2-1	Detect and install external parallel ports
3-1-2-3	Reinitialize onboard I/O ports
3-1-3-1	Initialize BIOS data area
3-1-3-3	Initialize extended BIOS data area
3-1-4-1	Initialize floppy controller
3-2-1-1	Initialize hard-disk controller
3-2-1-2	Initialize local-bus hard-disk controller
3-2-1-3	Jump to UserPatch2
3-2-2-1	Disable A20 address line
3-2-2-3	Clear huge ES segment register
3-2-3-1	Search for option ROMs

(5) IBM BIOS beep codes

Beep code	Description
No beep	No power, loose card, or short
1 short	Normal POST, computer is ok

2 short	POST error, review screen for error code
Continuous beep	No power, loose card, or short
Repeat short beep	No power, loose card, or short
1 long and 1 short	Motherboard issue
1 long and 2 short	Video (Mono/CGA display circuitry) issue
1 long and 3 short	Video (EGA) display circuitry
3 long	Keyboard/keyboard card error
1 beep, blank or incorrect display	Video display circuitry

8、What can I do in this case?

(1) Code is not included in code list

Some codes defined by the motherboard manufacturer and not included in this manual. Please contact your dealer and find them. Also if you have the new code meaning, you can write them down in the following table:

CODE	BIOS type(√)			Description
	AWARD	AMI	Phoenix	

(2) Forget the password

If you forget your password, don't worry! The following will help you:

① Omnipotent password

For the BIOS form different manufacturer, their password is different too. Both omnipotent password and password users set are able to unlock the computer. Try the abbreviation of manufacturer or the characters string which formed by the first letter of each word May be it is the omnipotent password, for example:

i. AMI password

AMI	AMI~	Bios310	AMI!SW	KILLCMOS
A.M.I	589589	SMOSPWD	AMISETUP	Ami.kez
BIOS	ammii	AMI_SW	ami?	AMI.KEY
AMI_SW	amipswd	Amidecod	Amiami	
PASSWORD	LKWPETER	BIOSPASS	AMIPSWD	

ii. AWARD password

PASSWORD	HLT	biostar	?award	djonet
AWARD SW	ALFAROME	j09F	1EAAh	g6PJ
AWORD?SW	256256	j256	admin	HELGA-S
AWORE_PW	589721	LKWPETER	ally	

iii. Other BIOS

Phoenix BIOS: phoenix	Megastar: star
Biostar：Q54arwms	Micron: sldkj754xyzall
Compaq: Compaq	Mcironies: dn04rie
CTX International: CTX_123	Packard Bell: bell9
Dell: Dell	Shuttle: spacve
Digital Equipment: komprie	Siements Nixdorf: SKY_FOX
HP Vectra: hewlpack	Tiny: tiny
IBM: IBM BIOS sertafu	TMC: BIGO

② Discharge by software

CMOS RAM can be discharged by software. This helps you to solve the password problem. Follow these method, use the DOS command "DEBUG", all things to be easy.

i. Clear AWARD password

C:>DEBUG↙

-O 70 34↙ or -O 70 11↙

-O 71 34↙ -O 71 ff↙

-Q↙ -Q↙

ii. Clear AMI password

C:>DEBUG↙

-O 70 16↙ or -O 70 10↙

-O 71 16↙ -O 70 0↙

-Q↙ -Q↙

NOTICE: All setup data will be erased. If it is COMPAQ computer, you'd better get a floppy disk which store CMOS program first, then do the discharge, or else it is easy to discharge but hard to recover.

③ Hardware jumper discharge to CMOS BIOS

All the computers could discharge to CMOS BIOS by switch or jumper, and clear any password (the system leading password, CMOS set password, keyboard lock password). To discharge particularity CMOS of some Original packaging computer, take an example:

Discharge of COMPAQ and AST is finished by close/open the switch, but it doesn't discharge when the computer shutdown, it must pass many steps below:

a. Pull the switch SW1-2 to the position of "ON" while power off.

b. Turn on the power, start the computer.

c. After started the computer about 1 to 5 minutes, turn off the computer.

d. Pull SW1 and SW1-2 to the position of “OFF”.

e. Start the computer and enter CMOS setting.

Many motherboards discharge to CMOS by jumper. And for different board the pin is different. Before discharge, read the user’s manual of motherboard first, if the state of CMOS discharge jumper pin is not included in it, to check that whether there are signs on the motherboard, such as “Exit batter”, “Clean CMOS”, “CMOS ROM Reset”. If you find these signs, close the jumper, or remove the battery.

④ Ask for help from the factory

If the problem is still not solved, please get in touch with your dealer.

(3) BIOS damage

Repair the BIOS chip which broken by CIH VIRUS.

a. Changing: ask the factory for one same BIOS chip to change the broken chip

b. Writing: write BIOS chip with a Flash ROM writer, then install it

c. Plugging and writing online: disconnect the hard disk, take down the BIOS chip of motherboard, find one same chip, plug it to the socket of BIOS ROM, then start the program with the disk which has no virus (don’t load any drive program), take the good BIOS chip, use the broken chip instead of it, taking the writing work that like have a upgrade with motherboard-----the kind of method must be used only by professional

(4) Cannot enter CMOS SETUP

BIOS type	Key	Prompt
AMI	<Del> or <Esc>	Display
Award	<Del> or <Ctrl><Alt><Esc>	Display
MR	<Del>or<Ctrl><Alt><Esc>	None
Quadtel	<F2>	Display
COMPAQ	Press <F10> when the cursor displayed on top right screen	None
AST	<Del><Alt><Esc>	None
Phoenix	<Del><Alt><S>	None
Hewlett Rackard(HP)	<F2>	None

(5) Frequently asked questions(FAQ)

Note 1: Don't against the rules in motherboard quality guaranty during repair the board.

Note 2: Troubleshooting only when the power is off..

Error	Description	Solutions
Memory bank	Memory bank is bad	Replace it and try again
	Pin of memory bank is dirty	Clean it with student eraser and try again
	It is not match the other bank	Insert the right memory bank
	Plugged in the wrong direction	Insert it properly
Memory slot or extended slot	The slot is dirty or something in it	Clean it
	Metallic spring slice in the slot is out of shape or ruptured	Refit it's shape or replace it
	Metallic spring slice in the slot is rusty or mouldy	Wash with the pure alcohol, inserts it and pull it out frequently after it is dry
CPU	CPU is bad	Replace it. (Touch it to check if it does not generate heat or overheated)
	The jumper setup or CMOS setup of CPU is error	Check the setup of working voltage and frequency of CPU
	CPU pin is dirty	Clear the dirty thing, insert and pull out it frequently.
	CPU is not plugged well	Check the CPU pin
Error of POST card or it plugged by error	The pin is dirty	Clean it with student eraser, insert the card and pull it out many times.
	The POST card is plugged in wrong slot	Plug again.
	It is plugged in the wrong direction	Check card direction
	The POST card is bad	Contact your dealer
Power on, the code is stopped	The motherboard is not running	Check the power and CPU jumper
	There is no code export to the bus slot in which the POST card insert	Try the other slot.
POST fails midway	Motherboard error	According to error codes
	The motherboard send the error code to video display	Connect the video display, according to the message on the screen to check the error, then try again.