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Patent Certificate for Invention

Patent Certificate for Utility Model

2000.11.11

2000.11.11

Certificate of Chinese patent for invention



PI0049N



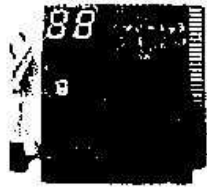
PI0049N-S



PI0049M-SD



PI0049B



PI0049B-S



PI0049B-SD



PI0050E



PI0050D



PI0050D-SD



LP49C



LP49C-L



LP50

1. Summarization

PC Analyzer card is also called POST (Power on Self Test) card, debug card or diagnostic card. Its work principle is making use of the POST process of BIOS to display the result of POST codes. You can find out various problem of computer soon According to meanings of displayed POST codes. Especially when the PC can't boot the operate system or it is a black screen, or PC Analyzer and motherboard couldn't utter beep. It is a powerful diagnostic tool. Now just use it, you'll get twice the result with half the effort.

When the power is turned on, the BIOS first would have a strict test with system circuit, memory, keyboard, video, hard disc, and floppy drive and so on. It analyzes the system configuration and initializes the basic I/O setup. At last when all is normal, it boots the operating system. The obvious feature of testing pivotal components is demarcate by curse's appearing .At first, the BIOS tests the pivotal components. If the test is abnormal, the computer stopped compulsively; the curse cannot appear on the screen; there is no response to the screen. If the test of pivotal components is normal, the BIOS tests common components afterwards .If the test of common components is abnormal, the computer continues running and displays the information of error on the screen. When there is some trouble with the computer and the test is abnormal, especially testing pivotal component, no displaying on the screen, the black screen, you can make use of the PC Analyzer. PC Analyzer will tell you exactly what is wrong with your computer in just seconds through explanation of the signals LEDs display and meanings of the POST codes that PC Analyzer displayed.

2. Must-reads of users

1. The meaning of POST codes is in the sequence of the codes' value from small to big. The sequence in which POST code displays is decided by BIOS of the motherboard.
2. There is a four-bit code displayed on PI0050E, M04A and L50. The four-bit code could be divided to two two-bit codes. The

one is made up of the thousands digit and the hundreds digit; The other is made up of the tens digit and units digit. The thousands digit and the hundreds digit show the POST codes. Definition of the code that is made up of the tens digit and units digit is different as operation is different. ①When the PI0050E, M04A and L50 are testing the Mainboard, The tens digit and the units digit show the POST code that is previous to the POST code of thousands digit and the hundreds digit; ②When You use the function switch to thumb through the POST codes, The tens digit and the units digit show count number of the POST code that is make up of the thousands digit and the hundreds digit. (PI0050E,M04A and L50 can memorize 48 POST codes whose operating time is oppositely long. The value of count number is from 00 to 47.)

3. You must identify that the code that PC Analyzer displayed is "initiative code" or "error code". "Initiative code" is meaningless.

①How do we distinguish "initiative code" or "error code" of conventional two-bit-code PC Analyzer?

When conventional two-bit-code PC Analyzer displayed a code, at first we must see whether there have been some other codes varying before the code is displayed. If there have been some other codes varying and it stops at a certain code in the end, the code is the "error code"; If the displayed code is first code after power of computer is on and you cannot see any other codes varying before it, the code is the meaningless "initiative code". But sometimes the speed of much codes varying is too fast so that by unaided eye we cannot make a judgment whether there have been some other codes varying before it stops at the certain code that I can see in the end. You need suppose this code as the "error code" here in this condition. If you have not solved the trouble, this code must be the "initiative code".

As long as code "0000" or "FFFF" is displayed by PI0050E, M04A and L50, the code "0000" or "FFFF" is "initiative code". It is no need for you to make a judgment by unaided eye whether

there have been some other codes varying before it stops at the code "0000" or "FFFF".

② Why is the "initiative code" meaningless?

When power of computer is on, the first code that is displayed by PC Analyzer is called after "initiative code" by us. Because the PC Analyzer is also electrical device itself. When the power is on, PC Analyzer will display one code automatically. It is the initiative code. But the code is not the "POST Code" (refer to the "Summarization" on page 1) of the computer. So the "initiative code" is meaningless.

4. For the different BIOS (such as AMI, Award and Phoenix), the meanings of POST codes is different. So you must make sure that which version and which kind of BIOS that is on the tested mainboard by viewing the users' guide of mainboard, Seeing symbol on the BIOS IC of the motherboard or looking at the screen directly while the computer booting.
5. There is only a part of POST codes displayed when you insert PC Analyzer into the PCI slot on a few brands of motherboards, but when you plug it into the ISA slot, all the codes can be displayed. At present, it has been also discovered that all codes is displayed when you insert PC Analyzer into the PCI slot of several brands of computers which not all codes is displayed when you plug PC Analyzer in the ISA slot. So we suggest that when examining the codes is unsuccessful you need plug PC Analyzer from one slot to another slot or use PI0050E whose compatibility is best. In addition, there are different states in the different slot on the certain motherboard. For example, all codes can be displayed in end with "00" or "FF" when you plug PC Analyzer in the PCI slot that is nearest the CPU on the motherboard DELL 810. While only a part of codes can be displayed in the other PCI slots. It ended with "38" when you plug PC Analyzer in the other slots on the motherboard DELL 810.
6. The time of PCI that the resetting signal needs is not always synchronized with the time of ISA. So sometimes the codes begin to be displayed when PC Analyzer in the ISA, but the

resetting light of PCI has not been off. PC Analyzer has stopped at the "initiative code" in PCI slot.

7. All two-bit-code PC Analyzer is not as supernatural as you think. It can show the codes that should not be seen (especially on the blank screen) essentially. The last POST code ("error code") that some BIOS output indicates that the referred test failed. While the last POST code (not "error code") that some other BIOS output indicates that the referred test passed and the next test failed. PI0050E, M04A and L50 can thumb through the POST codes. So you can know which POST codes passed in the POST procedures. Meanwhile you can know which part of computer is in good condition according to the passed codes. The function and the capability of two-bit-code PC Analyzer is not as good as PI0050E, M04A and L50. Because of the space, we can state them out one by one. Due to extensive source of collecting the meanings of POST codes, various types and versions of BIOS, somniferous context of the POST procedure running and BIOS manufacturer's getting rid of stales and bringing forth the fresh, it is impossible that the meanings of POST codes is absolutely accurate and complete in this manual. The meanings of POST codes in the manual are only a reference for you. But our company will do our best to collect all latest meanings of POST codes and upload them to the website <http://www.61131568.com> for you. You also can consult with the manufacturer of the BIOS that is on the tested mainboard.
8. According to experience, two-bit-code PC Analyzer is reliable if you plug it in the slot on the mainboard below and including P II 300. It may crash or does not indicate the POST code or indicate false POST codes on mainboard above P II 300. But it does not mean that two-bit-code PC Analyzer can not be applied to computer such as P III, P IV completely. We suggest you buy and use the PI0050E, M04 and L50.

3. System requirements

PI0049 series and PI0050E themselves only require an empty PCI or ISA expansion slot. M04A itself only requires an

empty MiniPCI. L50 itself requires empty parallel port (LPT) and alternative of empty USB and empty power supply plug of host computer. It is not necessary to install memory chips to perform analysis. "Post-codes" can be displayed through the hexadecimal displayed panel on the PC Analyzer itself.

4. PC Analyzer INDICATORS

Two "indicators" are any light emitting diodes (LED) or hexadecimal display panel that may be mounted on an PC Analyzer card. This section discusses the following indicators that appear on the PC Analyzer:

- POST code display. (Refer to "Meanings of POST codes")
- Signals LEDs (refer to "Explanation of signals LEDs display").

5. Hexadecimal character table

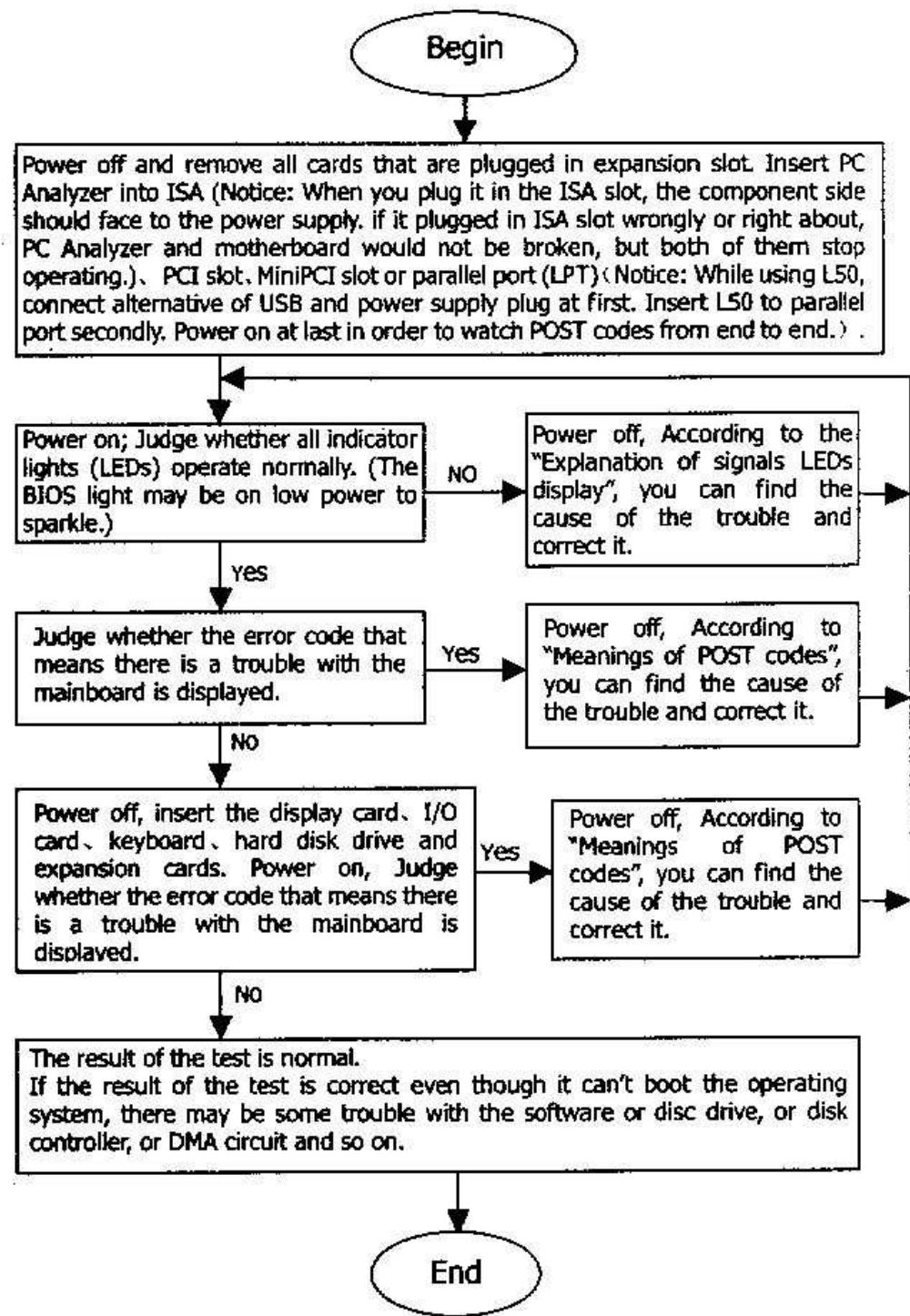
Decimalism	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Hexadecimal	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Display	0	1	2	3	4	5	6	7	8	9	A	b	C	d	E	F

Manner of inquiring about patent

This card is authentic patent product. You can inquire about the details in the web <http://www.sipo.gov.cn>. Method as follows: ① Enter home page <http://www.sipo.gov.cn>; ② Click "Enter" to English home page. ③ Click "patent search"; ④ Find the table named "Quick Search". Input "03126857" (Advert: Don't input "03126857.9") or "01224987" (Advert: Don't input "01224987.4") to the form named "term 1". Choose "Application Number" in form named "Field 1". Left the other unvarnished. Click the button "submit" to get the result of researching. You can click "Method for implementing computer testing instrument" or "computer Mainboard failure diagnosis card" to get the details. (Advert: If the requiring method has changed, you can visit the web <http://www.61131568.com> to learn latest requiring method.)

6. Flow chart of operating guide

(Take minimized system for example)



7. Explanation of signals LEDs display

LED	Signal Type	Description
RUN	Bus pulse	If the LED sparkles, the mainboard has been operating instructions; If the main board hasn't, the LED is off.
CLK	Bus clock signal	As long as the power of mainboard is on after you plug PC Analyzer in PCI slot, ISA slot of desktop or MiniPCI of laptop, the LED should be on even without CPU. Or else there is no bus clock signal.
BIOS	BIOS read signal	As long as the CPU is reading from BIOS when the power of Mainboard is on, the LED sparkles.
IRDY	Main equipments is ready	The LED sparkles when there is IRDY signal.
OSC	ISA Oscillation signal	It is oscillation signal of ISA slot. The LED should be on, as long as the Power is on after you plug PC Analyzer in the ISA slot on the mainboard. Or else the crystal oscillation circuit is broken, and there is no OSC signal.
FRAME	Frame periods	It is cycle frame signal of PCI slot or MiniPCI slot. The LED should sparkle as soon as the FRAME signal is coming. Or else there is no FRAME signal. Lights are off all the time.
RST	Reset signal	The LED ought to have been on for half second since you press the power switch or the reset switch. If it is on all the time, please check whether the resetting pins connect to the accelerating switch or make up a short circuit or there is some trouble with the resetting circuit.
12V	Power supply 12-volt positive	Should be on all the time, as long as the Power is on after you plug PC Analyzer in the slot. Or else there is no this voltage of power supply or there is

		short circuit.
-12V	Power supply 12-volt negative	Same as above.
5V	Power supply 5-volt positive	Same as above. (L50 use LED that can change color. When insert it in alternative of USB and power supply plug of host computer, that it is on indicate power of computer on. If the LED changes color, It indicates that the L50 is inserted in parallel port (LPT) with power. While using L50, recommend to connect alternative of USB and power supply plug at first. Insert L50 to parallel port secondly. Power on at last in order to watch POST codes from end to end.)
-5V	Power supply 5-volt negative	Should be on all the time, as long as the Power is on after you plug PC Analyzer in the ISA slot. Or else there is no voltage of -5V or there is short circuit. (There is own -5V of ISA slot.)
3V3	Power supply 3.3-volt positive	There is the proper voltage of 3.3V of the PCI slot and MiniPCI. The LED should be on all the time, as long as the power is on after you plug PC Analyzer in the PCI slot or MiniPCI slot. But sometimes the LED may be off by the reason that there is no voltage of 3.3V in PCI or MiniPCI slot of some mainboard or there is open circuit.

8. Explanation of prompt of PI0050E, M04A and L50 only

Prompt	Explanation
0 ---	The functions prompt of main menu: Start automatic diagnosis after it has displayed for about very short time in order not to delay displaying POST codes. The time is so short that You cannot see it by unaided eyes.

1---	The first function prompt of main menu: enter thumbing through POST codes function after it displayed for about half a second.
2---	The second functions prompt of main menu that displayed for about half a second. PI050E and M04A display the reference value of speed of bus. The larger the value is, the faster the bus operates; L50 displays the monitoring value of PC Analyzer's working speed itself. As long as the monitoring value is larger than 0500, PC Analyzer is all-right.
3---	The third function prompt of main menu: display the version number such as "5004", "L004" and so on after it displayed for about half a second.
4---	The fourth functions prompt of main menu: displayed for about half a second. Next, start to test display component of PC Analyzer. If displayed from "0000", "1111" to "FFFF", the self-test of PC Analyzer's display component passed.
5---	The fifth function prompt, start self-test of PC Analyzer after the prompt displayed for about half second. As long as each of four bits can display symbols, no matter what they display, the self-test process passed. Because of the self-test content has been enhanced a lot. Plenty of symbols are especial. You may pay no attention to it.
-P C I	It indicates that the slots you insert PC Analyzer in is PCI slot on desktop or MiniPCI on laptops, and wait for you to thumb through the POST codes backwards by pressing function switch.
-I S A	It indicates that the slots you insert PC Analyzer in is ISA slot, and wait for you to thumb through the POST codes backwards by pressing function switch.
LP--	It indicates that the ports you insert PC Analyzer in is parallel port (LPT), and wait for you to thumb through the POST codes backwards by pressing function switch.
— P	Waiting for you to thumb through the POST codes Backwards by pressing the function switch. After it displayed for half a second, the POST code will be displayed. The front two-bit code that is made up of the thousands digit and the hundreds digit displays the

	hexadecimal POST code, The back two-bit code that is made up of the tens digit and units digit displays count number of the POST code that is make up of thousands digit and the hundreds.
P---	Waiting for you to thumb through the POST codes forwards by pressing the function switch. After it displayed for half a second, the POST code will be displayed, The front two-bit code that is made up of the thousands digit and the hundreds digit displays the hexadecimal POST code, The back two-bit code that is made up of the tens digit and units digit displays count number of the POST code that is make up of thousands digit and the hundreds.
-E n d	It indicates that thumbing through the codes backwards is in the end and the last code(The value of count number limit: 00-47) had been displayed; press and hold the function switch for about 0.8 second, then enter the mode of thumbing through the codes forwards and display "P- - -", after half a second, the code is displayed. the thousands digit and hundreds digit indicate the 48th POST code, the two-bit code(47) that is made up of the tens digit and units digit indicate the count number of the POST code; if press and hold the function switch for about 0.8 second twice, it will exit thumbing through POST codes and enter the second function of main menu, at the same time displayed "2- - -", then display decimal reference value of the speed of PCI/ISA/MiniPCI bus or monitoring value of PC Analyzer L50's working speed itself in half a second.
E n d-	It indicates that thumbing through the codes forwards is in the end and the first code (The value of count number limit : 00-47) had been displayed; Press and hold the function switch for about 0.8 second, then enter the mode of thumbing through the codes backwards and display "- - -P", after half a second, the code is displayed. The thousands digit and hundreds digit indicate the first POST code; the two-bit code (00) that is made up of the tens digit and units digit indicates count number of the POST code. If press and hold the function switch for about 0.8 second twice, it

will exit thumbing through POST codes and enter the second function of main menu, at the same time displayed "2-+-", then display decimal reference value of the speed of PCI/ISA/MiniPCI bus or monitoring value of PC Analyzer L50's working speed itself in half a second.

9. Meanings of POST codes

(1) AMI BIOS

00	Control to Int-19 boot loader
01	Disable NMI
02	Power-on delay
03	Soft reset power-on
05	Disable cache
06	Uncompressed POST code
08	CMOS checksum
08	CMOS initialization
0A	CMOS initialization for date and time
0B	Initialization before keyboard batch
0C	Batch command to keyboard controller
0D	Verify batch command
0E	Initialize after KB controller batch
0F	Write KB command byte
10	Pin 23/24 block/unblock command
11	Check for <INS> key command
12	DMA/PIC disable
13	Chipset initialization
14	8254 timer test
19	Memory refresh test
20	Base 64K memory test
23	Set BIOS stack, setup before int. vector init
24	Interrupt vector initialization
25	Read input port of 9042 chip, clear password
26	Initialize global data for turbo switch
27	Initialize before setting video mode
28	Set video mode
2A	Initialize BUS
2B	Setup before operational video check
2C	Control to optional video ROM
2D	Proc. after optional video ROM routine

2E	Display memory Read/Write test if no EGA/VGA
2F	Display memory Read/Write test
30	Retrace check
31	Display alternate memory Read/Write check
32	Alternate display retrace check
34	Set display mode
37	Display power-on message
38	Initialize BUS types
39	Display BUS initialization error messages
3A	Display the hit message
3B	Virtual modem memory test
40	Prepare descriptor tables
42	Enter virtual mode for memory test
43	Enable Interrupts for diagnostic mode
44	Initialize data to check memory wrap at 0:0
45	Check memory wrap, find total memory amount
46	Memory write test
47	640K base memory write test
48	Determine memory below 1MB
49	Determine memory above 1MB
4B	Check for soft reset, clear memory below 1MB
4C	Clear memory above 1MB
4D	Save memory size
4E	Display first 64K memory size
4F	Sequential and random memory test
50	Displayed memory size
51	Above 1MB memory test
52	Save memory size information
53	Enter real mode
54	Disable gate A-20 line
57	Adjust memory size
58	Clear hit message
59	DMA/PIC test
60	DMA #1 base register test
62	DMA #2 base register test
65	Program DMA unit 1 and 2
66	Initialize 8259 Interrupt controller
67	Keyboard test
7F	Enable extended NMI sources
80	Stuck key and batch test

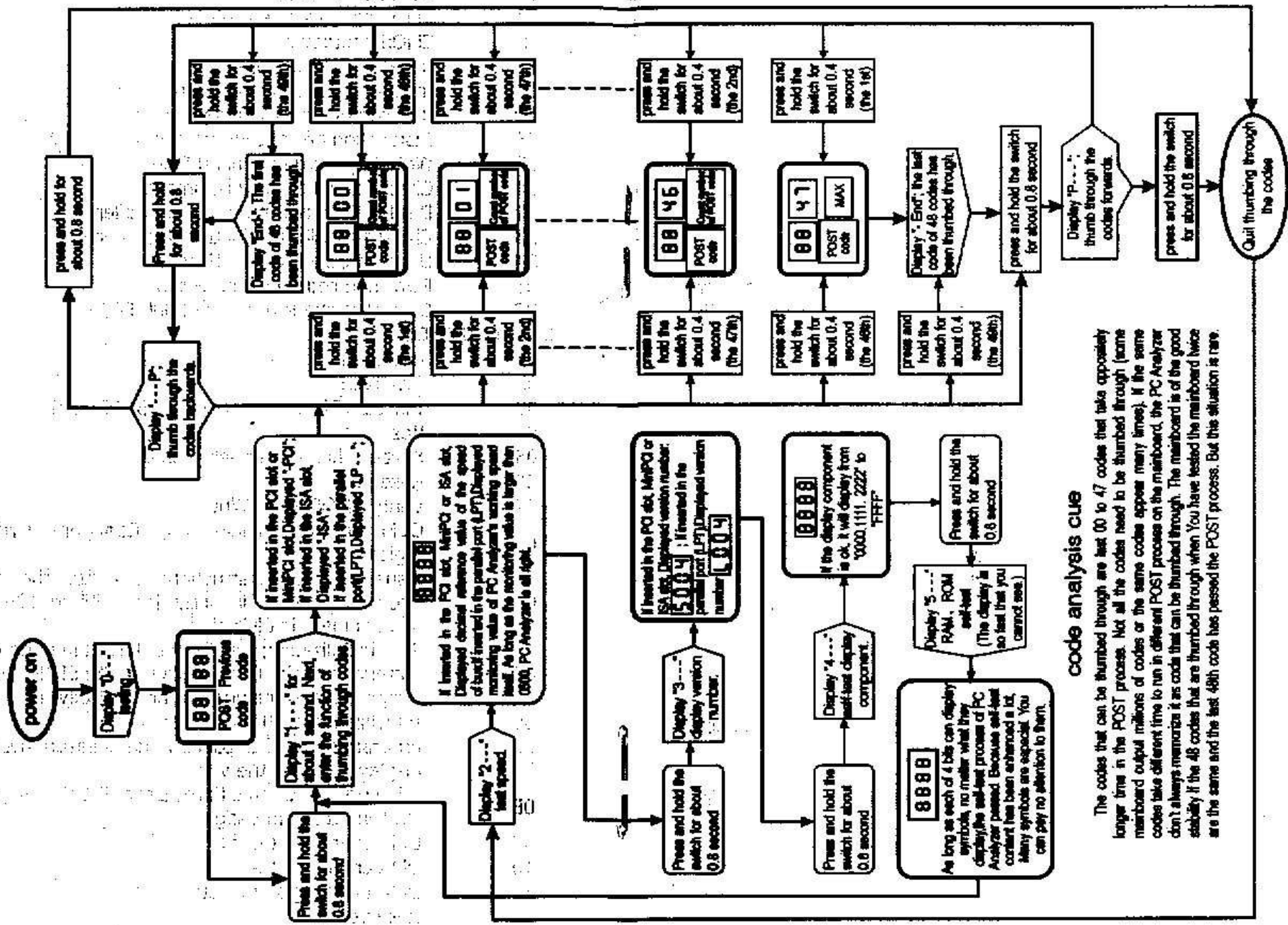
81 Keyboard controller test
 82 Write command byte, initialize circular buffer
 83 Lock key check
 84 Compare memory size with CMOS
 85 Password/soft error check
 86 Programming before check
 87 Execute CMOS setup
 88 Programming after setup
 89 Power-on display
 8B Shadow main and video BIOS
 8C Setup options after CMOS setup
 8D Initialize mouse
 8E Reset hard disk controller
 8F Floppy setup
 91 Hard disk setup
 94 Base/extended memory size
 95 Init. PCI/VLB BUS optional ROM's from C800
 96 Initialize before C800 optional ROM control
 97 Control to optional ROM
 98 Processing after optional ROM control
 99 Setup timer data area/printer base address
 9A Set RS-232 base address
 9B Initialize before NPU test
 9C NPU initialization
 9D Initialization after NPU test
 9E Check extended KB, KB ID and num-lock
 9F Issue keyboard ID command
 A0 Reset keyboard ID flag
 A1 Cache memory test
 A2 Display and soft errors
 A4 Program memory wait states
 A5 Clear screen, enable parity NMI
 A7 Init. needed before control to E000 ROM
 A8 Control to E000 ROM
 A9 Init. needed after control to E000 ROM
 AA Display system configuration
 B0 Uncompressed SETUP code for hot-key
 B1 Copy any code to specific area
 C2 Disable NMI, power-on delay
 C5 Enable ROM, disable cache

C6 ROM BIOS checksum
 C7 CMOS shutdown register test
 C8 CMOS shutdown
 CA Initialize CMOS date and time
 CB Initialization before keyboard batch
 CD BAT command to keyboard controller
 CE Installation after keyboard controller batch
 CF Write keyboard command byte
 D1 Check for <INS> key command
 D2 Disable DMA and Interrupt controllers
 D3 Chipset initialization/auto detect memory
 D4 Uncompressed RUNTIME code
 D5 RUNTIME code uncompressed
 DD Control to shadow RAM at F000:F000

(2) Award BIOS

01 Reserved
 02 Reserved
 03 Initialize EISA registers (EISA BIOS only)
 04 Reserved
 05 Keyboard controller self-tested
 06 Reserved
 07 Verify CMOS Read/Write
 09 OEM specific initialization; Configure Cyrix CPU register
 Issue CPU ID instruction; Initialize the first 32 interrupt vectors, initialize Int.'s 33 to 120, power management initialization
 0A PnP initialization; verify the RTC time, detect bad battery, read the CMOS data into the BIOS stack area, assign I/O and memory for any PCI devices
 0B Initialization of BIOS data area
 0C Program some of chipset's value; Measure the CPU for display, initialize the video
 0D Initialize APIC (multiprocessor BIOS only); Show startup screen message
 0E DMA channel 0 tested
 0F DMA channel 1 tested
 10 DMA page registers tested
 11 Reserved
 12 Reserved
 13 Reserved

10. Illustration of operating P10050A's, M04A's and L50's function switch



code analysis cue

The codes that can be thumbed through are test 00 to 47 codes that take oppositely longer time in the POST process. Not all the codes need to be thumbed through (some motherboard output millions of codes or the same codes appear many times). If the same codes take different time to run in different POST process on the motherboard, the PC Analyzer don't always memorize it as codes that can be thumbed through. The motherboard is of the good stability if the 48 codes that are thumbed through when you have tested the motherboard twice are the same and the last 48th code has passed the POST process. But this situation is rare.

14	Test 8254 0 counter 2
15	Test 8259 interrupt mask bit for channel 1
16	Test 8259 interrupt mask bit for channel 2
17	Reserved
19	Test 8259 functionality
1A	Reserved
1B	Reserved
1C	Reserved
1D	Reserved
1E	If an EISA NVM
1F-29	Reserved
30	Get size of base and extended memory
31	Test base and extended memory, Test base memory from 256K to 640K, test extended memory above 1MB
32	Test all on-board super I/O ports
33	Reserved
3A	Reserved
3B	Reserved
3C	Set flag to allow CMOS setup utility
3D	Install PS/2 mouse
3E	Try to turn on level 2
3F	Reserved
40	Reserved
41	Initialize floppy drive controller
42	Initialize hard drive controller
43	Initialize serial & parallel ports (PnP BIOS only)
45	Initialize math coprocessor
46-4D	Reserved
4E	Show all error messages on screen
4F	Ask for password, if needed
50	Write all CMOS values located in the BIOS stack back to CMOS
51	Reserved
52	Initialize all ISA ROM's; PCI initializations (PCI BIOS only); PnP initialization (PnP BIOS Only); setup shadow RAM, initialize power management
53	If not PnP BIOS, initialize ports; Initialize time in BIOS data area
54-5F	Reserved
60	Setup virus protection for the boot sector

61	Try to turn on level 2 cache
62	program numlock & typematic speed
63	Boot system via Int 19h
B0	Unexpected interrupt in protected mode
B1	Unclaimed NMI occurred
BE	Program defaults into chipset
BF	Program remaining chipset values
C0	Init. all standard devices with defaults
C1	Auto detect on-board DRAM & cache
C3	Test first 26K DRAM
C5	Copy ROM BIOS to E000-FFFF
FF	System booting

(3) Award BIOS

2	Verify real mode
3	Disable non-maskable interrupt (NMI)
4	Get CPU type
6	Initialize system hardware
7	Disable shadow and execute code from the ROM
8	Initialize chipset with initial POST values
9	Set IN POST flag
0A	Initialize CPU registers
0B	Enable CPU cache
0C	Initialize caches to initial POST values
0E	Initialize I/O component
0F	Initialize the local bus IDE
10	initialize power management
11	Load alternate registers with initial POST values
12	Restore CPU control word during warm boot
13	Initialize PCI bus mastering devices
14	Initialize keyboard controller
16	BIOS ROM checksum
17	Initialize cache before memory autosize
18	8254 programmable interrupt timer initialization
1A	8237 DMA controller initialization
1C	Reset programmable interrupt controller
20	Test DRAM refresh
22	Test 8742 keyboard controller
24	Set ES segment register to 4GB
26	Enable gate A20 line
28	Autosize DRAM

29 Initialize POST memory manager
 2A Clear 512KB base RAM
 2C RAM failure on address line xxxc
 2E RAM failure on data bits xxxc of low byte of memory bus
 2F Enable cache before system BIOS shadow
 30 RAM failure on data bits xxxc of high byte of memory bus
 32 Test CPU bus clock frequency
 33 Initialize Phoenix Dispatch Manager
 36 Warm start shut down
 38 Shadow system BIOS ROM
 3A Autosize cache
 3C Advanced configuration of chipset registers
 3D Load alternate registers with CMOS values
 41 Initialize extended memory for RomPilot
 42 Initialize interrupt vectors
 45 POST device initialization
 46 Check ROM copyright notice
 47 Initialize I20 support
 48 Check video configuration against CMOS
 49 Initialize PCI bus and devices
 4A Initialize all video adapters in system
 4B QuietBoot start (optional)
 4C Shadow video BIOS ROM
 4E Display BIOS copyright notice
 4F Initialize MultiBoot
 50 Display CPU type and speed
 51 Initialize EISA board
 52 Test keyboard
 54 Set key click if enabled
 55 Enable USB devices
 58 Test for unexpected interrupts
 59 Initialize POST display service
 5A Display prompt "Press F2 to enter SETUP"
 5B Disable CPU cache
 5C Test RAM between 512KB and 640KB
 60 Test extended memory
 62 Test extended memory address lines
 64 Jump to UserPatch1

66 Configure advanced cache registers
 67 Initialize Multi 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 messages
 72 Check for configuration errors
 76 Check for keyboard errors
 7C Set up hardware interrupt vectors
 7D Initialize Intelligent System Monitoring
 7E Initialize coprocessor if present
 80 Disable onboard super I/O ports and IRQ's
 81 Late POST device initialization
 82 Detect and install external RS232 ports
 83 Configure non-MCD IDE controllers
 84 Detect and install external parallel ports
 85 Initialize PC compatible PnP ISA devices
 86 Reinitialize onboard I/O ports
 87 Configure motherboard configurable devices (optional)
 88 Initialize BIOS data area
 89 Enable non-maskable interrupts (NMI's)
 8A Initialize extended BIOS data area
 8B Test and initialize PS/2 mouse
 8C Initialize floppy controller
 8F Determine number of ATA drives (optional)
 90 Initialize hard disk controllers
 91 Initialize local bus hard disk controllers
 92 Jump to UserPatch2
 93 Build MPTABLE for multi processor boards
 95 Install CD ROM for boot
 96 Clear huge ES segment register
 97 Fixup multi processor table
 98 Search for option ROM's
 99 Check for SMART drive (optional)
 9A Shadow option ROM's
 9C Set up power management

9D	Initialize security engine (optional)
9E	Enable hardware interrupts
9F	Determine number of ATA and SCSI drives
A0	Set time of day
A2	Check key lock
A4	Initialize typematic rate
A8	Erase F2 prompt
AA	Scan for F2 key stroke
AC	Enter setup
AE	Clear boot flag
B0	Check for errors
B1	Inform RomPilot about the end of POST
B2	POST done - prepare to boot operating system
B4	One short beep
B5	Terminate QuietBoot (optional)
B6	Check password
B7	Initialize ACPI BIOS
B9	Prepare boot
BA	Initialize DMI parameters
BB	Initialize PnP option ROM's
BC	Clear parity checkers
BD	Display multiboot menu
BE	Clear screen
BF	Check virus and backup reminders
C0	Try to boot with interrupt 19
C1	Initialize POST Error Manager (PEM)
C2	Initialize error logging
C3	Initialize error display function
C4	Initialize system error handler
C5	PnP dual CMOS (optional)
C6	Initialize notebook docking (optional)
C7	Initialize notebook docking late
C8	Force check (optional)
C9	Extended checksum (optional)
CA	Redirect Int 15h to enable remote keyboard
CB	Redirect Int 13 to Memory Technologies Devices such as ROM, RAM, 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

D2	Unknown interrupt
The following are for boot block in Flash ROM	
E0	Initialize the chipset
E1	Initialize the bridge
E2	Initialize the CPU
E3	Initialize the system timer
E4	Initialize system I/O
E5	Check force recovery boot
E6	Checksum BIOS ROM
E7	Go to BIOS
E8	Set Huge Segment
E9	Initialize Multi Processor
EA	Initialize OEM special code
EB	initialize PIC and DMA
EC	Initialize Memory type
ED	Initialize Memory size
EE	Shadow Boot Block
EF	System memory test
F0	Initialize interrupt vectors
F1	Initialize Run Time Clock
F2	Initialize video
F3	Initialize System Management Manager
F4	Output one beep
F5	Clear Huge Segment
F6	Boot to mini DOS
F7	Boot to Full DOS

11. Description of beep code

(1).AMI BIOS beep codes (fatal error)

1 beep	DRAM Refreshing Fails. Try to reseal the memory first. If the error still occurs, replace the memory with known good chips.
2 beeps	Parity Error in First 64K RAM. Try to reseal the memory first. If the error still occurs, replace the memory with known good chips.
3 beeps	Base 64K RAM Failure. Try to reseal the memory first. If the error still occurs, replace the memory with known good chips.
4 beeps	System timer fails.
5 beeps	Process fails.

6 beeps	Keyboard Controller 8042 - Gate A20 is Error. Try to reseat the keyboard controller chip. If the error still occurs, replace the keyboard chip. If the error persists, check parts of the system relating to the keyboard, e.g. try another keyboard, check to see if the system has a keyboard fuse.
7 beeps	Processor Virtual Mode Exception Interrupt Error.
8 beeps	Display Memory Read/Write Test Failure (Non-fatal). Replace the video card or the memory on the video card.
9 beeps	ROM BIOS Checksum (32KB at F800: 0) Failed. It is not likely that this error can be corrected by reseating the chips. Consult the motherboard supplier or an AMI product distributor for replacement part(s).
10 beeps	CMOS Shutdown Register Read/Write Error.
11 beeps	Cache memory error.
(2). AMI BIOS beep codes (Non-fatal error)	
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 retracing 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	
1 short	No error during POST
2 short	Any Non-fatal error, enter CMOS SETUP to reset
1 long 1 short	RAM or 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 (which on the motherboard) error. (BIOS error)
Long beep	Memory bank is not plugged well, or broken.

(4).Phoenix BIOS beep codes

Beep Code Description/What to Check

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	initializes 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 User Patch 0.
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 4 GB.
1-3-3-1	28 Autosize DRAM.
1-3-3-3	Clear 512K base RAM.
1-3-4-1	Test 512K base address line.
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	Autosize 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 devices.
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	56 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 512 and 640k.

2-3-1-1 Test expanded memory.
 2-3-1-3 Test extended memory address line.
 2-3-2-1 Jump to User Patch 1.
 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.
 2-4-2-3 Check for keyboard errors.
 2-4-4-1 Set up hardware interrupts 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 Re-initialize 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 User Patch 2.
 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.
 3-2-3-3 Shadow option ROMs.
 3-2-4-1 Set up Power Management.
 3-2-4-3 Enable hardware interrupts.
 3-3-1-1 Set time of day.
 3-3-1-3 Check key lock.
 3-3-3-1 Erase F2 prompt.
 3-3-3-3 Scan for F2 key stroke.
 3-3-4-1 Enter SETUP.
 3-3-4-3 Clear in-POST flag.
 3-4-1-1 Check for errors.
 3-4-1-3 POST done--prepare to boot operating system.
 3-4-2-1 One beep.
 3-4-2-3 Check password (optional).
 3-4-3-1 Clear global descriptor table.

3-4-4-1 Clear parity checkers.
 3-4-4-3 Clear screen (optional).
 3-4-4-4 Check virus and backup reminders.
 4-1-1-1 Try to boot with INT 19.
 4-2-1-1 Interrupt handler error.
 4-2-1-3 Unknown interrupt error.
 4-2-2-1 Pending interrupt error.
 4-2-2-3 Initialize option ROM error.
 4-2-3-1 Shutdown error.
 4-2-3-3 Extended Block Move.
 4-2-4-1 Shutdown 10 error.
 4-3-1-3 Initialize the chipset.
 4-3-1-4 Initialize refresh counter.
 4-3-2-1 Check for Forced Flash.
 4-3-2-2 Check HW status of ROM.
 4-3-2-3 BIOS ROM is OK.
 4-3-2-4 Do a complete RAM test.
 4-3-3-1 Do OEM initialization.
 4-3-3-2 Initialize interrupt controller.
 4-3-3-3 Read in bootstrap code.
 4-3-3-4 Initialize all vectors.
 4-3-4-1 Boot the Flash program.
 4-3-4-2 Initialize the boot device.
 4-3-4-3 Boot code was read OK.

(5).IBM BIOS beep codes

Beep Code	Description
No Beeps	No Power, Loose Card, or Short.
1 Short Beep	Normal POST, computer is ok.
2 Short Beep	POST error, review screen for error code.
Continuous Beep	No Power, Loose Card, or Short.
Repeating Short Beep	No Power, Loose Card, or Short.
One Long and one Short Beep	Motherboard issue.
One Long and Two short Beeps	Video (Mono/CGA Display Circuitry) issue.
One Long and Three Short Beeps	Video (EGA) Display Circuitry.
Three Long Beeps	Keyboard / Keyboard card error.
One Beep, Black or Incorrect Display	Video Display Circuitry.

12. If the POST code is not included in this manual, what can I do?

As the Mainboard manufacturer defines the codes, some codes haven't been defined. So our company can not provide the consultation of meanings of POST codes by telephone. You had better get in touch with the manufacturer of the tested Mainboard to make a consultation. You can also make a record when you understand the meanings of the POST codes in practice. In addition, our company will do our best effort to collect more meanings of POST codes and upload them to the website <http://www.61131568.com>.

13. Answers to frequently-asked questions

- NOTE: 1. Don't go against the rules of mainboard quality guaranty If the mainboard is under guaranty.
2. Resolve all errors only when the power is off.

Error	Description	Solutions
Memory bank	Memory bank is bad	Replace it and try again
	Pins of memory bank are dirty	Clean them with student eraser and try again.
	It is not matched with the other banks.	Replace it with the right memory bank.
	Plugged in the wrong direction	Insert it properly
Memory slot or extended slot	The slot is dirty or There is something in slot.	Clean it
	Metallic spring slice in the slot is out of shape or ruptured.	Refit its shape or replace it.
	Metallic spring slice in the slot is rusty or it has gone moldy.	Wash it with the pure alcohol, Inserts it and pull it out frequently to promote capability of tangency after it is dry.
CPU	CPU is broken	Replace it. (Touch it to check if it does generate heat or is overheated)

	The jumper setup or CMOS setup of CPU is error.	Check the jumper setup and CMOS setup such as voltage and frequency of CPU
	CPU pins are dirty.	Clean the CPU. Insert it and pull it out for several times in order to inoculate well.
	CPU is not plugged well.	Check the CPU pins and plug CPU carefully.
Error of PC Analyzer or it is plugged by error	The pins are dirty	Clean them with student eraser insert PC Analyzer and pull it out many times to promote capability of tangency.
	The PC Analyzer is plugged in wrong slot	Distinguish carefully between ISA slot and PCI slot
	It is plugged in the wrong direction.	Make sure the component side of PC Analyzer should face to the power supply when inert it in ISA slot.
	The PC Analyzer is bad	Get in touch with your dealer or Manufacturer. (p678@163.net, Tel: +86 020 61131568)
Power on, the code is not varying	The mainboard has not been running	Check the power, CPU jumper and so on.
	There is no code output to the bus slot in which the PC Analyzer insert	Try the other slot. (See "must-reads of users" on page 1)
POST codes stopped midway	computer error	It is purpose of PC Analyzer. According to its meanings of POST code You can troubleshoot.
	The mainboard stopped sending the POST codes to bus slot and send them to video display	Connect to the monitor, according to the message on the screen to check the error, and then try again.

Frequently-asked questions in course of using PI0050E, M04A and L50:

Situations	Causes	Resolvent
The indicator lights is lit, but the digital screen panel is not lit or 1bit, 2 bits or 3 bits of digital screen panel is lit.	The PC Analyzer may be loose so that they cannot inosculate well.	Power off, remove PC Analyzer and clean the pins and connector with eraser and try again.
	The slot or connector may be dirty	Clean the dirt in the slot, and try to insert and remove the PC Analyzer frequently so as to wipe out the dirt in the slot and inosculate well.
	the interval of restart is too short	Wait for no less than 8 seconds after you power off the computer and Restart it.
The function switch doesn't work	Press the switch too gently.	Press the switch with right force
	Your hands may touch the pins of function switch and result in faradism that makes the PC Analyzer program doesn't scan the switch.	Stick an insulating slide or paper to the switch pins at the back of PC Analyzer.
	While you press the switch PC Analyzer may be loose.	Press the switch as carefully as you can to keep PC Analyzer inosculated well in the slot.
The function switch works, but it doesn't operate well.	The time you hold the switch is incorrect (0.8 second is the longer one; 0.4 second is the shorter one.)	Hold the switch for proper time: press and hold the switch for proper time and then leave it off as soon as the PC Analyzer responds.
	The switch is bad.	Contact your dealer to change the switch

14. Introduction of the RUN LED

The RUN LED makes use of only a few components and circuit and needs a few signals of the mainboard's slot. The probability of the trouble with the run LED is very small. Even though you plug PC

Analyzer card in the bad slot, PC Analyzer card does not display POST codes, even to the extent that all lights is off except that the RUN light can be quite possible to run normally. You can solve the following problems by the result of "if the run LED had sparkled the mainboard had even run".

1. the code assembly of PC Analyzer is bad;
2. PC Analyzer is not compatible with the mainboard that is tested; we suggest you buy and use PI0050E, M04A, and L50.
3. PCI slot or ISA slot is bad;
4. PC Analyzer's interface cannot match the slot well by the cause of PC Analyzer's plugging incorrectly, the dirty of the interface, rusty slot of PCI, ISA, MiniPCI or rusty pin of parallel port (LPT) and so on.
5. the mainboard may crash;
6. the mainboard is running with programs which is out of relation to the POST codes;

Distinguish true and false

PI0050E, M04A and L50 are more compatible with mainboard of superior quality such as PIII, PIV and so on than the economical and really useful PI0049 series. So you can distinguish the PI0049 series that is regarded as PI0050E by their characteristics, and also you can dial this telephone number "+86 020 61131568" or visit website <http://www.61131568.com> or write to me by E-mail: p678@163.net to the get latest distinguishing messages of fake.

- Original**
- There is patent number such as "01224987.4" on the PCB;
 - There is certificate number such as "513427" on the PCB;
 - On the back of PC Analyzer, there is a telephone number "+86 020-61131568"
- The characteristics of fake pc analyzer have been known as follows:

- Fake**
- "中国专有号: 01223987.3" on the PCB;
 - "专有技术: 01224988.3" on the PCB;
 - "专利号: 02125087.5"(It's the patent of biology organic compound) on the PCB;
 - Be careful! The fake PC Analyzers always are made of bad or unsuitable materials. They have not been tested by the professional equipment and have no simulation technique.
 - At the same time, there may be a few PI0049 series regarded as PI0050E to sell

Quickly operating guide of PI0050E, M04A and L50

No.	Function	How to enter	Four-8H code description												
0	Diagnose trouble	Automatically enter when power on	<table border="0"> <tr> <td>8</td><td>8</td><td>8</td><td>8</td> </tr> <tr> <td colspan="2">└──┘</td> <td colspan="2">└──┘</td> </tr> <tr> <td colspan="2">POST code</td> <td colspan="2">Previous</td> </tr> </table>	8	8	8	8	└──┘		└──┘		POST code		Previous	
8	8	8	8												
└──┘		└──┘													
POST code		Previous													
1	Single step	Display "1—" when press the switch	<table border="0"> <tr> <td>8</td><td>8</td><td>8</td><td>8</td> </tr> <tr> <td colspan="2">└──┘</td> <td colspan="2">└──┘</td> </tr> <tr> <td colspan="2">POST code</td> <td colspan="2">Count number of POST codes</td> </tr> </table>	8	8	8	8	└──┘		└──┘		POST code		Count number of POST codes	
8	8	8	8												
└──┘		└──┘													
POST code		Count number of POST codes													
2	Test speed	Display "2—" when press the switch again	PI0050E and M04A display Referenced value of speed of bus. The larger the value is, the faster the bus operates; L50 displays the monitoring value of PC Analyzer's working speed itself. As long as the monitoring value is large than 0050, PC Analyzer is all right												
3	Display the version Number	Display "3—" when press the switch again	Display: 5004. If the PC Analyzer's version is 5004; Display L004 if it is L004												
4	Self-test of display function	Display "4—" when press the switch again	If the digital display panel display from 0000 to FFFF, the display function is ok.												
5	Self-test of PC Analyzer itself	Display "5—" when press the switch again	If display panel is not light, Self-Test if PC Analyzer failed.												

Part of Production



M04A



M04A-D



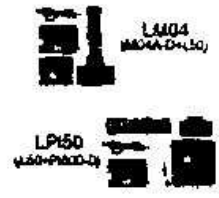
LM04B



L50



L20



combination series

PI0049 series



- ★ It is fit for desktop computer;
- ★ It does No harm to the device while inserting the card in ISA slot wrong or right about;
- ★ The globally unique main board run indicator Light is on it;
- ★ It can test important signals of the Main board even without CPU when it's on power;
- ★ It can display that the computer crashes because of repeating reset with black screen;
- ★ This series of PC analyzer can insert in either PCI slot or ISA slot;
- ★ It's the SMD device that does no harm to hands;
- ★ It's the function that audible beep reminds you where the computer is with trouble (Advert: this function for PI0049 series must be bought in addition.);
- ★ A external display function can make the user watch the POST codes out the casing of computer host (Advert: this function must be bought in addition.);
- ★ Including much explanation of POST codes for most types of BIOS into users' manual
- ★ It is provided. You can choose manual in Chinese or English.