EVGA | Intelligent Innovation

GPU Motherboard
Install Guide

Before You Begin...

Parts NOT in the Kit

This kit contains all the hardware necessary to install and connect your new EVGA nForce motherboard. However, it does not contain the following items that must be purchased separately to make the motherboard functional.

❑ Intel microprocessor:
Intel Core 2 Extreme, Intel Core 2 Quad, Intel Core 2 Duo, Pentium EE, Pentium, and Celeron Socket 775 CPU's. (up to 1066Mhz FSB on 610i motherboards)

❑ Cooling fan and heat sink for the microprocessor

❑ System memory support:
Supports single channel DDR2 533/667/800, (800MHz not supported on 610i Motherboards)

❑ Power Supply
The power supply requirement is dependent upon the components used in the system. We recommend at least a 350 watt power supply for a basic configuration.

❑ *Graphics Card*
This motherboard comes with an onboard graphics adapter; it also has a PCI express x16 slot for graphics cards.

These instructions help you install each of the parts listed so you can have a functioning motherboard. As you go through the installation instructions, we are assuming you have purchased the necessary parts.

Motherboard Specifications

❑ **Size**
mATX form factor.

❑ **Microprocessor support**
Intel Core 2 Extreme, Intel Core 2 Quad, Intel Core 2 Duo, Pentium EE, Pentium, and Celeron. (610i supports up to 1066MHz FSB CPU's)

❑ **Operating systems**
Supports Windows XP and Windows Vista.

❑ **Contains NVIDIA nForce MCP and integrated GeForce graphics**

❑ **System Memory**

- Single-channel DDR2 800/667/533 (800MHz RAM not supported on 610i)

- Supports up to 4 GB DDR2 memory (2GB x 2)

❑ **USB 2.0 Ports**

- Supports hot plug
- Up to ten USB 2.0 ports
- Supports USB 2.0 protocol up to 480Mbps transmission rate

❑ **Onboard Serial ATA II**

- 3Gb/s data transfer rate
- Four Serial ATA II connectors
- Support for RAID 0, RAID 1, RAID 0+1, and RAID 5, (RAID 0+1 and RAID 5 not supported on 610i)
- Supports hot plug and NCQ (Native Command Queuing)

❑ **Onboard LAN**

- LAN interfaces built-in onboard
- Gigabit Ethernet (10/100 LAN on 610i motherboards)

❑ **Onboard 1394**

- 1394 port and header available on 630i Motherboards

Onboard Audio

- Supports 8-channel audio (6-channel on 112-CK-NF71-T1)
- Supports S/PDIF output (on 630i motherboards)
- Supports Jack-Sensing function

❑ **PCI Express x16 Support**

- Supports 4 GB/sec (8 GB/sec concurrent) bandwidth

❑ **Onboard Video**

- Integrated video
- All models support VGA out. On models with DVI, out a single link digital display is supported. Certain models come equipped with an HDMI connecter to connect an HDTV. Dual display is supported with VGA and DVI or VGA and HDMI.

❑ **Expansion Slots**

- Two PCI slots
- One PCI Express x1 slot
- One PCI Express x16 Graphics slot

Hardware Installation

This section will guide you through the installation of the motherboard. The topics covered in this section are:

- ❑ Preparing the motherboard
  - • Installing the CPU
  - • Installing the CPU fan
  - • Installing the memory
- ❑ Installing the motherboard
- ❑ Connecting cables and setting switches

Safety Instructions

To reduce the risk of fire, electric shock, and injury, always follows basic safety precautions.

Remember to remove power from your computer by disconnecting the AC main source before removing or installing any equipment from/to the computer chassis.

EVGA nForce Motherboard

The EVGA nForce motherboard with the 600 series MCP processor is a PCI Express motherboard with an onboard GeForce graphics card. Figure 1 shows the 7150/630i motherboard and Figures 2 shows the back panel connectors.

Model shown is 122-CK-NF77
7150 / 630i

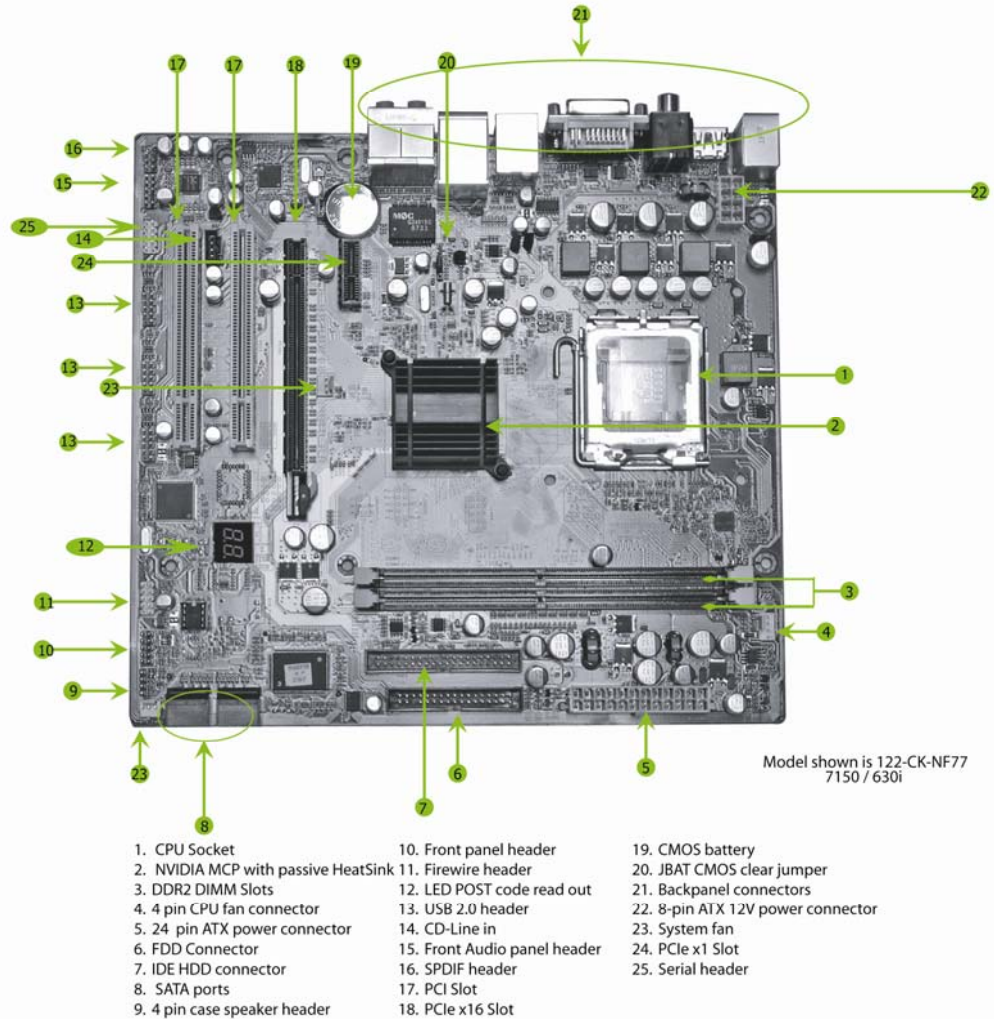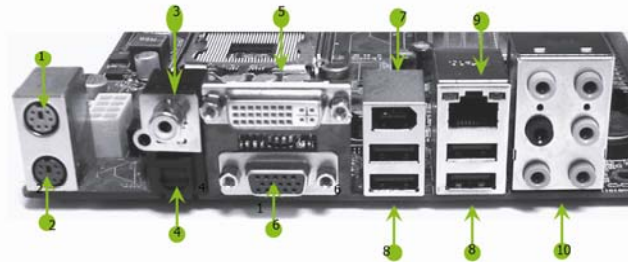|		
1. CPU Socket	10. Front panel header	19. CMOS battery
2. NVIDIA MCP with passive HeatSink	11. Firewire header	20. JBAT CMOS clear jumper
3. DDR2 DIMM Slots	12. LED POST code read out	21. Backpanel connectors
4. 4 pin CPU fan connector	13. USB 2.0 header	22. 8-pin ATX 12V power connector
5. 24 pin ATX power connector	14. CD-Line in	23. System fan
6. FDD Connector	15. Front Audio panel header	24. PCIe x1 Slot
7. IDE HDD connector	16. SPDIF header	25. Serial header
8. SATA ports	17. PCI Slot	
9. 4 pin case speaker header	18. PCIe x16 Slot	

Figure 1. Motherboard

Model shown 112-CK-NF75
630i / 7100

1. PS/2 Mouse Port
2. PS/2 Keyboard Port
3. Coaxial audio output
4. SPDIF optical output (on 630i based motherboards)
5. DVI output (on 630i based motherboards) *DVI to VGA adapter will not work on this DVI port*
6. VGA output
7. Firewire port (on 630i based motherboards)
8. USB 2.0 ports
9. Lan Port with LEDs to indicate status.
   •Yellow/Light Up/Blink = 10 Mbps/Link/Activity
   •Yellow and Green/Light Up/Blink = 100 Mbps/link/Activity
   •Green/Light Up/Blink = 1000 Mbps/Link/Activity
10.
Audio

Port	2-Channel	4-Channel	6-Channel/8-Channel
Blue	Line-In	Line-In	Line-In
Green	Line-Out	Front Speaker Out	Front Speaker Out
Pink	Mic In	Mic In	Mic In
Orange			Center/Subwoofer
Black		Rear Speaker Out	Rear Speaker Out
Grey			

Figure 2.   Chassis Backpanel Connectors

Preparing the Motherboard

The motherboard shipped in the box does *not* contain a CPU or memory. You need to purchase a CPU, a CPU heat sink/fan assembly, and memory module(s) to complete this installation.
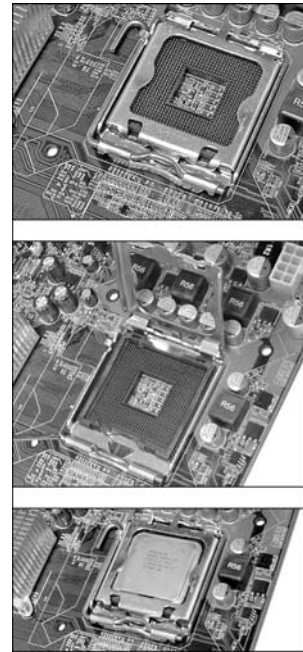
Installing the CPU

Be very careful when handling the CPU. Hold the processor only by the edges and do not touch the bottom of the processor.

Use the following procedure to install the CPU onto the motherboard.

1. Unhook the socket lever by pushing *down* and *away* from the socket.
2. Lift the load plate. There is a protective socket cover on the load plate to protect the socket when there is no CPU installed.
3. Remove the protective socket cover from the load plate.
4. Remove the processor from its protective cover, making sure you hold it only by the edges.
   It is a good idea to save the cover so that whenever you remove the CPU, you have a safe place to store it.
5. Align the notches in the processor with the notches on the socket.
6. Lower the processor straight down into the socket with out tilting or sliding it into the socket

> **Note:** Make sure the CPU is fully seated and level in the socket.

7. Close the load plate over the CPU and press down while you close and engage the socket lever.

Align notches with notches on the CPU

Installing the CPU heat sink/fan

There are many different heat sink types that can be used with this motherboard. Follow the instruction that came with your fan assembly. Be sure that the fan orientation is correct for your chassis type and your fan assembly.

Installing Memory DIMMs

Your new motherboard has two 1.8V 240-pin slots for DDR2 memory. These slots support 256 MB, 512 MB, 1 GB, and 2 GB DDR2 technologies. There must be at least one memory bank populated to ensure normal operation.

*Any of the two DIMM slots may be used as primary if only using one memory module.

1. Unlock a DIMM slot by pressing the module clips outward.
2. Align the memory module to the DIMM slot, and insert the module vertically into the DIMM slot. The plastic clips at both sides of the DIMM slot automatically lock the DIMM into the connector.

Installing the Motherboard

The sequence of installing the motherboard into the chassis depends on the chassis you are using and if you are replacing an existing motherboard or working with an empty chassis.

Determine if it would be easier to make all the connections prior to this step or to secure the motherboard and then make all the connections.

Use the following procedure to install the I/O shield and secure the motherboard into the chassis.

> **Note:** Be sure that the CPU fan assembly has enough clearance for the chassis covers to lock into place and for the expansion cards. Also make sure the CPU Fan assembly is aligned with the vents on the covers.

Installing the I/O Shield

The motherboard kit comes with an I/O shield that is used to block radio frequency transmissions, protects internal components from dust, foreign objects, and promotes correct airflow within the chassis.

Before installing the motherboard, install the I/O shield from the *inside* of the chassis. Press the I/O shield into place and make sure it fits securely. If the I/O shield does not fit into the chassis, you would need to obtain the proper size from the chassis supplier.

Securing the Motherboard into the Chassis

Most computer chassis have a base with mounting studs or spacers to allow the motherboard to be secured to the chassis and help to prevent short circuits. If there are studs that do not align with a mounting hole on the motherboard, it is recommended that you remove that stud to prevent the possibility of a short circuit.

1. Carefully place the motherboard onto the studs/spacers located inside the chassis.
2. Align the mounting holes with the studs/spacers.
3. Align the connectors to the I/O shield.
4. Ensure that the fan assembly is aligned with the chassis vents according to the fan assembly instruction.
5. Secure the motherboard with a minimum of six screws.

Power Connections

This motherboard requires an ATX power supply. Make sure your power supply can provide enough wattage to power all the components you will be installing.

24-pin ATX Power (PWR1)

PWR1 is the main power supply connector located along the edge of the board next to the DIMM slots. Make sure that the power supply cable and pins are properly aligned with the connector on the motherboard. Firmly plug the power supply cable into the connector and make sure it is secure.
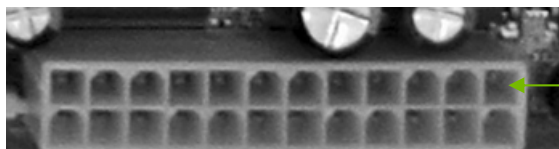
PWR1 connector
Plug power cable
from system power
supply to PWR1

8-pin ATX 12V Power (PWR2)

PWR2, the 8-pin ATX 12V power connection, is used to provide power to the CPU. Align the pins to the connector and press firmly until seated.
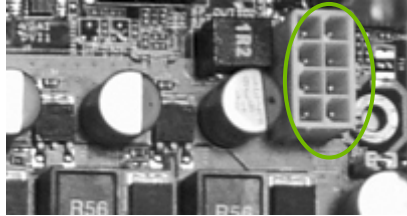
It is *strongly* recommended that you use an 8-pin ATX 12V power supply; however a four-pin power supply may be used. The 8 pin power connection is keyed for either a 4 pin or 8 pin connector to only go in one way.

Connecting IDE Hard Disk Drives

The IDE connector supports Ultra ATA 133/100/66 IDE hard disk drives.

Connect the cable end with a single connector to the motherboard.

If you install two hard disk drives, you must configure the second drive as a slave device by setting its jumper accordingly. Refer to the hard disk documentation for the jumper settings.

Connecting Serial ATA Cables

The Serial ATA II connector is used to connect the Serial ATA II device to the motherboard. These connectors support the thin Serial ATA II cables for primary storage devices. The current Serial ATA II interface allows up to 300MB/s data transfer rate.

There are four serial ATA connectors on the motherboard that support RAID 0, RAID 1, RAID 5, and RAID 0+1 configurations. (610i motherboards support RAID0 or RAID1 only)

| Primary Master	Secondary Slave
Secondary Master	Primary Slave
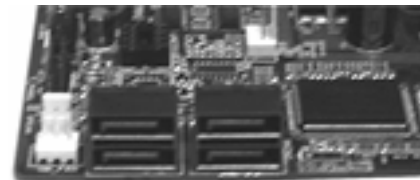
Connecting Internal Headers

Please refer to item 10 in figure 1 Motherboard.

Front Panel Header

The front panel header on this motherboard is one connector used to connect the following four cables:

❑ **PWRLED**
Attach the front panel power LED cable to the PWR LED connector. The Power LED indicates the system's status.
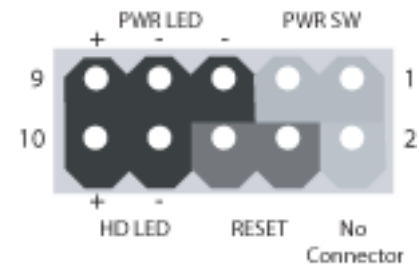
- ❏ **PWRSW**
  Attach the power button cable from the case to these two pins. Pressing the powerbutton on the front panel turns the system on off rather than using the power supply button.
- ❏ **HD_LED**
  Attach the hard disk drive indicator LED cable to these two pins. The HDD indicator LED indicates the activity status of the hard disks.
- ❏ **RESET**
  Attach the Reset switch cable from the front panel of the case to these two pins. The system restarts when the **RESET** switch is pressed.
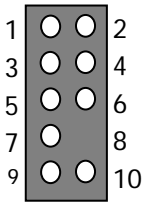
USB Headers

The motherboard contains 10-pin internal USB header connector(s). These can be used for your front panel USB connections or a USB bracket.
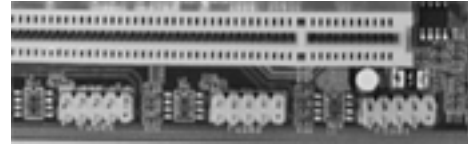
Audio

The audio connector supports the HD audio standard. Most cases come with a 10 pin standard block which will align and plug directly in to the header. In some cases there will be individual plugs which will need to be plugged in.

Table 1.   Front Audio Connector

Connector	Pin	Signal
Front Audio Connector	1	PORT1_L - Analog Port 1 - left channel (Microphone)
	2	AUD_GND - Ground
	3	PORT1_R – Analog Port 1 – right channel (Microphone)
	4	PRESENCE# - Active signal that indicates FP audio is present
	5	PORT2_R – Analog Port 2 - right channel (Headphone)
	6	SENSE1_RETURN – Jack detection return for front panel (Jack1)
	7	SENSE_SEND – Jack detection sense line
	8	Empty
	9	PORT2_L – Analog port 2 – left channel (Headphone)
	10	SENSE2_RETURN – Jack detection return for front panel (Jack2)

Fan Connections

There are two types fan connections, the system fan and the CPU fan. The fan speed can be detected and viewed in the PC Health Status section of the CMOS Setup. Both fans are automatically turned off after the system enters S3, S4 and S5 mode.

Note that the CPU fan cable can be either a 3-pin or a 4-pin connector. Connect a 3-pin connector to pins 1, 2, and 3 on the motherboard connector.
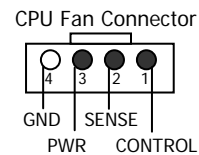
FDD Connector

The motherboard supports a standard 360K, 720K, 1.2M, 1.44m, and a 2.88M floppy disk drive (FDD).

Speaker

The speaker connector is used to connect the chassis speakers to the motherboard. Please refer to item 9 in figure 1 Motherboard.

Expansion Slots

The EVGA nForce motherboard contains four expansion slots, two PCI Express slots and two PCI slots. For a full list of PCI Express x16 graphics card supported by this motherboard, go to www.evga.com/products/.

PCI Slots

The two PCI slots support many expansion cards such as a LAN card, USB card, SCSI card and other cards that comply with PCI specifications. When installing a card into the PCI slot, be sure that it is fully seated. Secure the card's metal bracket to the chassis back panel with the screw used to hold the blank cover.

PCI Express x1 Slot

There is one PCI Express x1 slot that is designed to accommodate less bandwidth-intensive cards, such as a modem or LAN card. The x1 slot provides 250 MB/sec bandwidth.

PCI Express x16 Slot

The PCI Express x16 slot is reserved for a graphics card. The bandwidth of the x16 slot is up to 4GB/sec (8GB/sec concurrent). When installing a PCI Express x16 card, be sure the retention clip snaps and locks the card into place. If the card is not seated properly, it could cause a short across the pins. Secure the card's metal bracket to the chassis back panel with the screw used to hold the blank cover.

Install your Operating System

Boot up your machine, setup any hardware configurations in the BIOS setup if needed. Boot from your OS disk. Once your operating system is installed use the driver disk to install the appropriate drivers.

On-board LED Codes

On-board LED Codes

Code(hex)	Name	Description
01	Reserved	
02	Jumps to E000 segment	Execution of POST routines in E000
03	Early Superio	Init Early Initialized the super IO
04	Reserved	
05	Blank video	Reset Video controller
06	Reserved	
07	Init KBC	Keyboard controller init
08	KB test	Test the Keyboard
09	Reserved	
0A	Mouse	Init Initialized the mouse
0B	Reserved	
0C	Reserved	
0D	Reserved	
0E	CheckSum	Check Check the integrity of the ROM,BIOS and message
0F	Reserved	
10	Autodetect	EEPROM Check Flash type and copy flash Write/erase routines
11	Reserved	
12	Test CMOS	Test and Reset CMOS
13	Reserved	
14	Load Chipset	Load Chipset Defaults
15	Reserved	
16	Init Clock	Initialize onboard clock generator
17	Reserved	
18	InitCPU	CPU ID and initialize L1/L2 cache
19	Reserved	
1A	Reserved	
1B	Setup Interrupt	Initialize first 120 interrupt vectors Vector Table with SPURIOUS_INT_HDLR and initialize INT 00h-1Fh according to INT_TBL
1C	CMOS Battery Check	Test CMOS and check Battery Fail
1D	Early PM Early PM initialization	

Code(hex)	Name	Description
1E	Reserved	
1F	Re-initial KB	Load keyboard matrix
20	Reserved	
21	HPM init	Init Heuristic Power Management (HPM)
22	Reserved	
23	Program chipset	Early Programming of chipset registers
24	Init PNP	Init PNP
25	Shadow VBIOS	Shadow system/video BIOS
26	Clock	Gen Init onboard clock generator and sensor
27	Setup BDA	Setup BIOS DATA AREA (BDA)
28	Reserved	
29	CPU Speed detect	Chipset programming and CPU Speed detect
2A	Reserved	
2B	Init video	Initialize Video
2C	Reserved	
2D	Video memory test	Test Video Memory and display Logos
2E	Reserved	
2F	Reserved	
30	Reserved	
31	Reserved	
32	Reserved	
33	Early keyboard reset	Early Keyboard Reset
34	Reserved	
35	Test DMA Controller 0	Test DMA channel 0
36	Reserved	
37	Test DMA Controller 1	Test DMA channel 1
38	Reserved	
39	Test DMA Page Registers	Test DMA Page Registers
3A	Reserved	
3B	Reserved	
3C	Test Timer	Test 8254 Timer 0 Counter 2.
3D	Reserved	
3E	Test 8259-1 Mask	Verify 8259 Channel 1 masked interrupts by alternately turning off and on the interrupt lines.
3F	Reserved	
40	Test 8259-2 Mask	Verify 8259 Channel 2 masked interrupts by alternately turning off and on the interrupt lines.
41	Reserved	
42	Reserved	
43	Test Stuck Interrupt	Turn off interrupts then verify no 8259's Interrupt mask register is on. Test 8259 Force an interrupt and verify the interrupt occurred.
44	Reserved	

Code(hex)	Name	Description
45	Reinit serial port	Reinitialize Preboot agent serial port
46	Reserved	
47	EISA Test	If EISA non-volatile memory checksum is good, execute EISA initialization. If not, execute ISA tests and clear EISA mode flag.
48	Reserved	
49	Size Memory	Size base memory from 256K to 640K and extended memory above 1MB.
4A	Reserved	
4B	Reserved	
4C	Reserved	
4D	Reserved	
4E	Init APIC	Initialize APIC and set MTRR
4F	Reserved	
50	USB init Initialize	USB controller
51	Reserved	
52	Memory Test	Test all memory of memory above 1MB using Virtual 8086 mode, page mode and clear the memory
53	Reserved	
54	Reserved	
55	CPU display	Detect CPU speed and display CPU vendor specific version string and turn on all necessary CPU features
56	Reserved	
57	PnP Init	Display PnP logo and PnP early init
58	Reserved	
59	Setup Virus	Setup virus protect according to protect setup
5A	Reserved	
5B	Awdflash Load	If required, will auto load Awdflash. exe in POST
5C	Reserved	
5D	Onboard I/O Init	Initializing onboard superIO
5E	Reserved	
5F	Reserved	
60	Setup enable	Display setup message and enable setup functions
61	Reserved	
62	Reserved	
63	Initialize Mouse	Detect if mouse is present, initialize mouse, install interrupt vectors.
64	Reserved	
65	PS2 Mouse special	Special treatment to PS2 Mouse port
66	Reserved	
67	ACPI init	ACPI sub-system initializing
68	Reserved	
69	Init Cache	Initialize cache controller
6A	Reserved	
6B	Setup	Enter setup check and auto configuration check up
6C	Reserved	

Code(hex)	Name	Description
6D	Initialize Floppy	Initialize floppy disk drive
6E	Reserved	
6F	FDD install	Install FDD and setup BIOS data area parameters
70	Reserved	
71	Reserved	
72	Reserved	
73	Initialize Hard Drive	Initialize hard drive controller
74	Reserved	
75	Detect HDD	IDE device detection
76	Reserved	
77	Detect serial ports	Initialize serial ports
78	Reserved	
79	Reserved	
7A	Detect parallel ports	Initialize parallel ports
7B	Reserved	
7C	HDD Write Protect	HDD check for write protection
7D	Reserved	
7E	Reserved	
7F	POST error check	Check POST error and display them and ask for user intervention
80	Reserved	
81	Reserved	
82	Security Check	Ask password security.
83	Write CMOS	Write all CMOS values back to RAM and clear screen
84	Display PNP	Display PNP devices
85	USB Final Init	Final USB initialization
86	Reserved	
87	Reserved	
88	Reserved	
89	Setup ACPI tables	Setup ACPI tables
8A	Reserved	
8B	Option ROM Detect	Scan for Option ROMs
8C	Reserved	
8D	Enable Parity	Check Enable Parity Check
8E	Reserved	
8F	IRQ12 Enable	Enable IRQ12 if mouse present
90	Reserved	
91	Reserved	
92	Reserved	
93	Boot Medium Read	Detect and store boot partition head and cylinders values in RAM
94	Final Init	Final init for last micro details before boot
95	NumLock	Set NumLock status according to Setup
96	Boot Attempt	Set low stack Boot via INT 19h.
C0	Base CPU test	Read/Write CPU registers

Code(hex)	Name	Description
C1	Memory Presence	Base memory detect
C2	Early Memory	Board Initialization
C3	Extend Memory	Turn on extended memory, cache initialization
C4	Special Display	First display initialization
C5	Early Shadow	Early shadow enable for fast boot
C6	Cache presence	External caches
FF	Boot	

EVGA