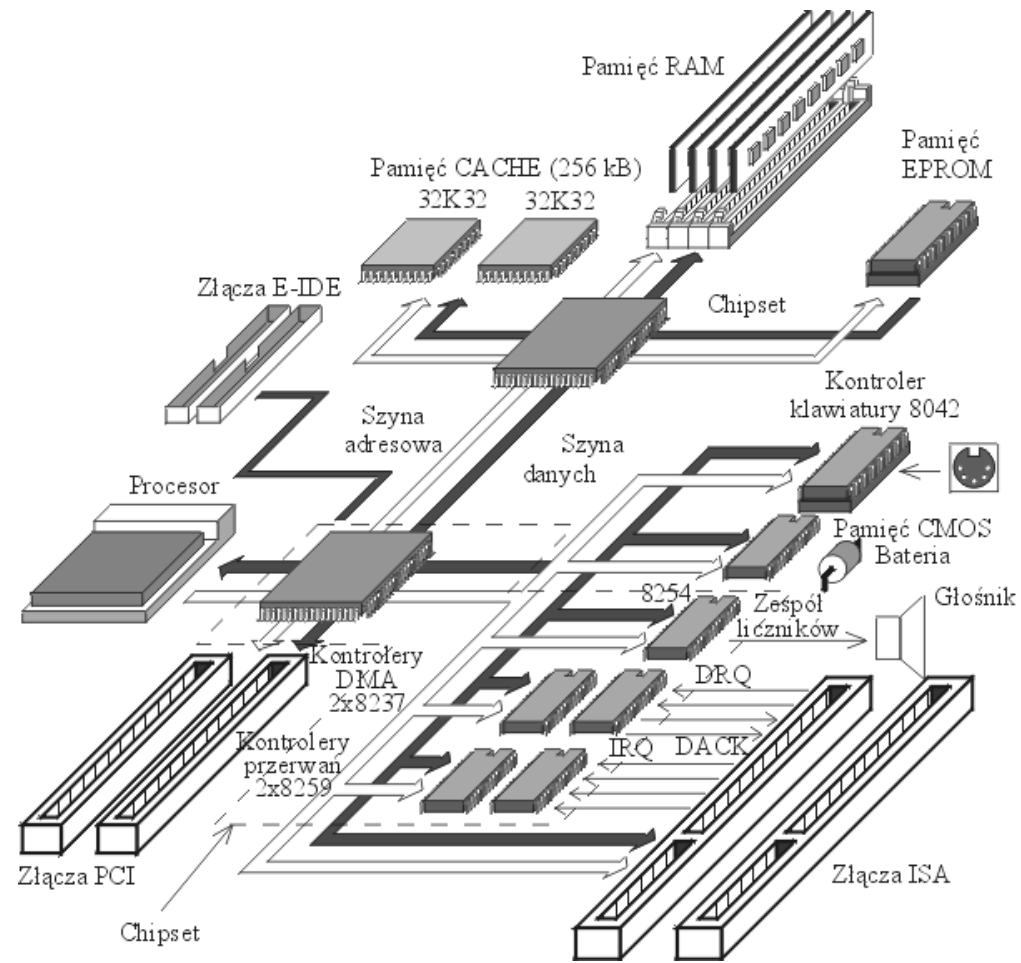
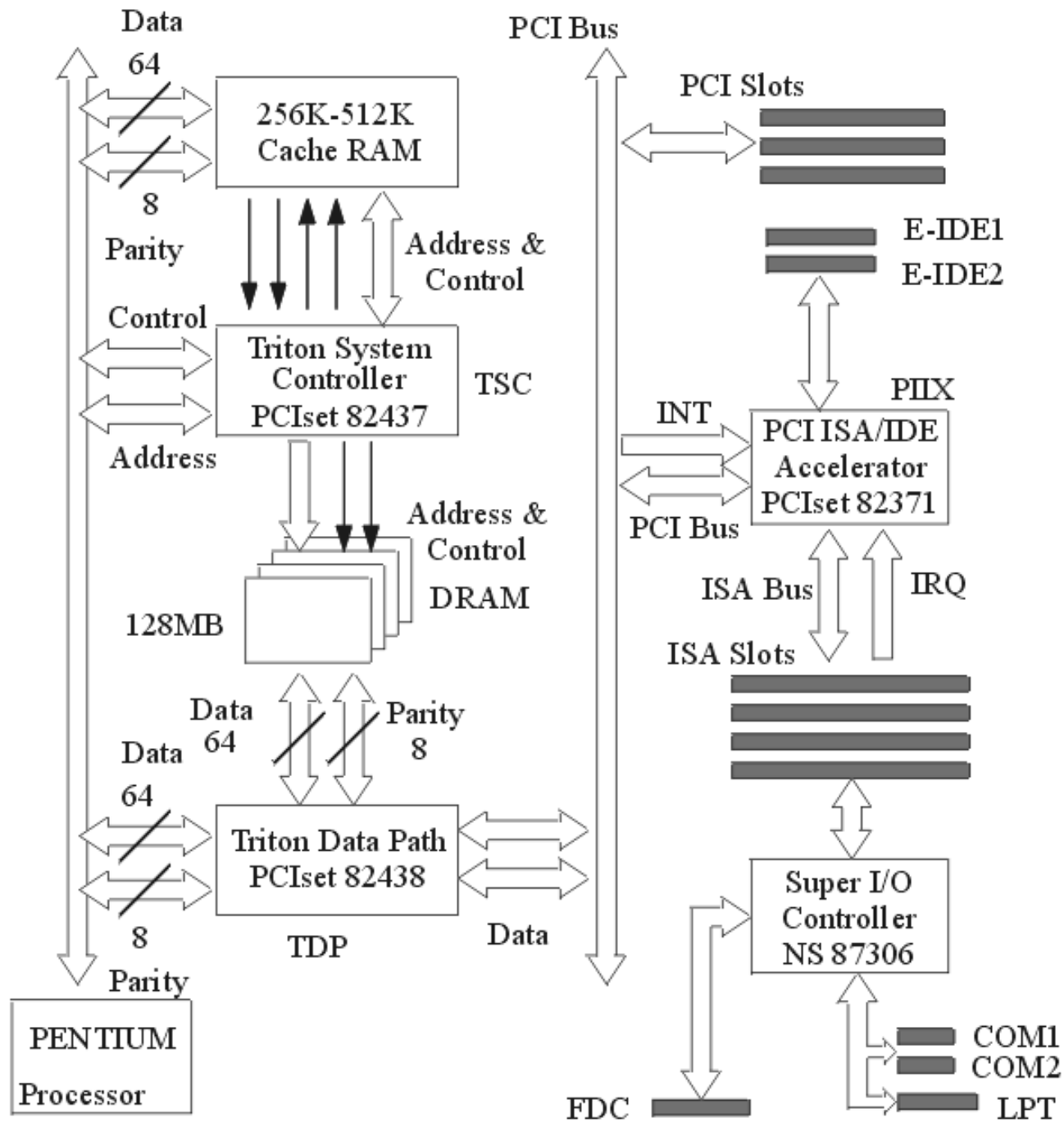
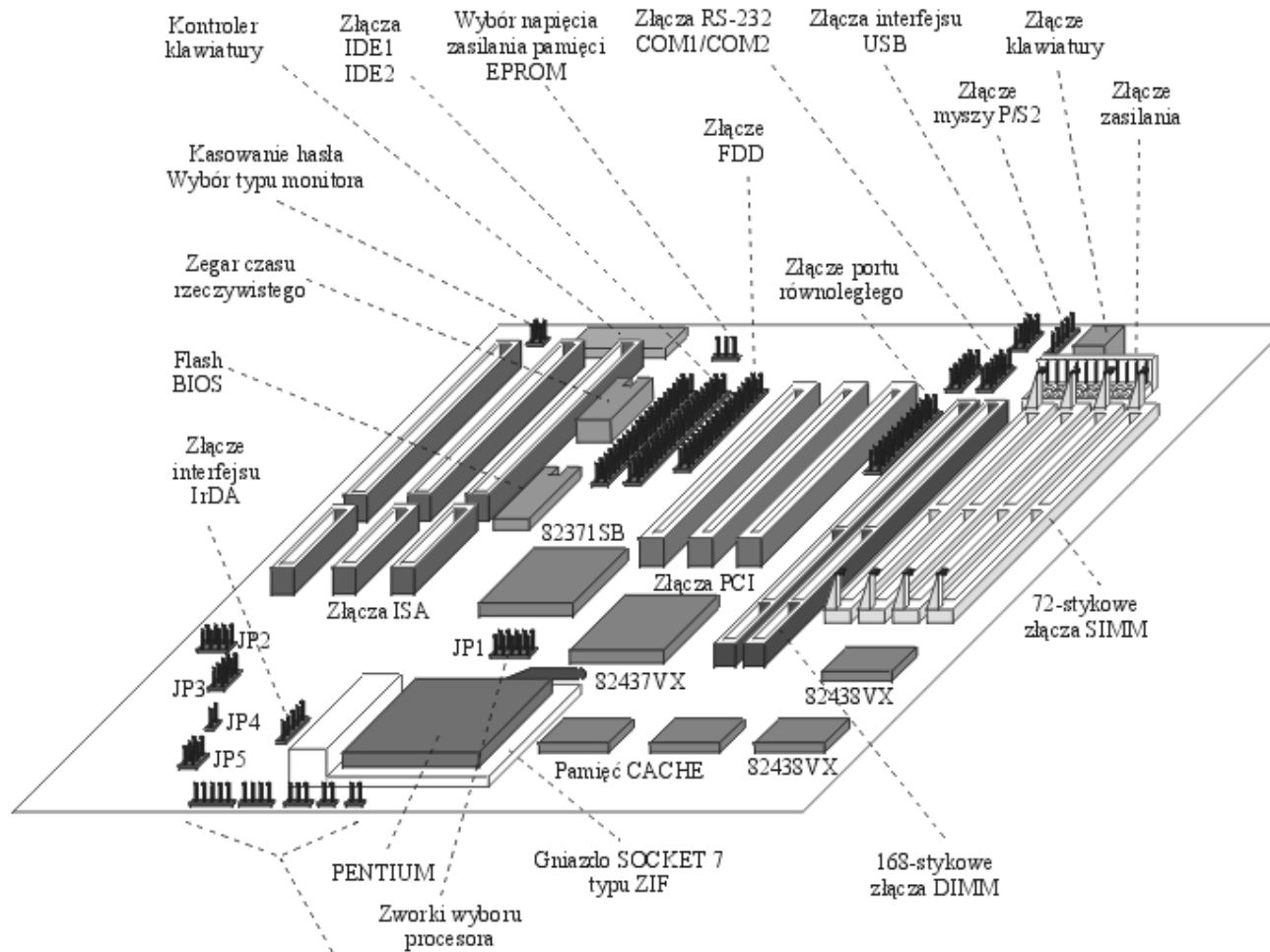


PŁYTY GŁÓWNE

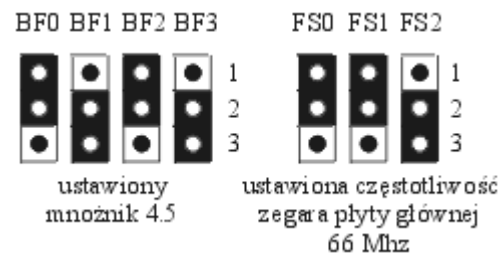




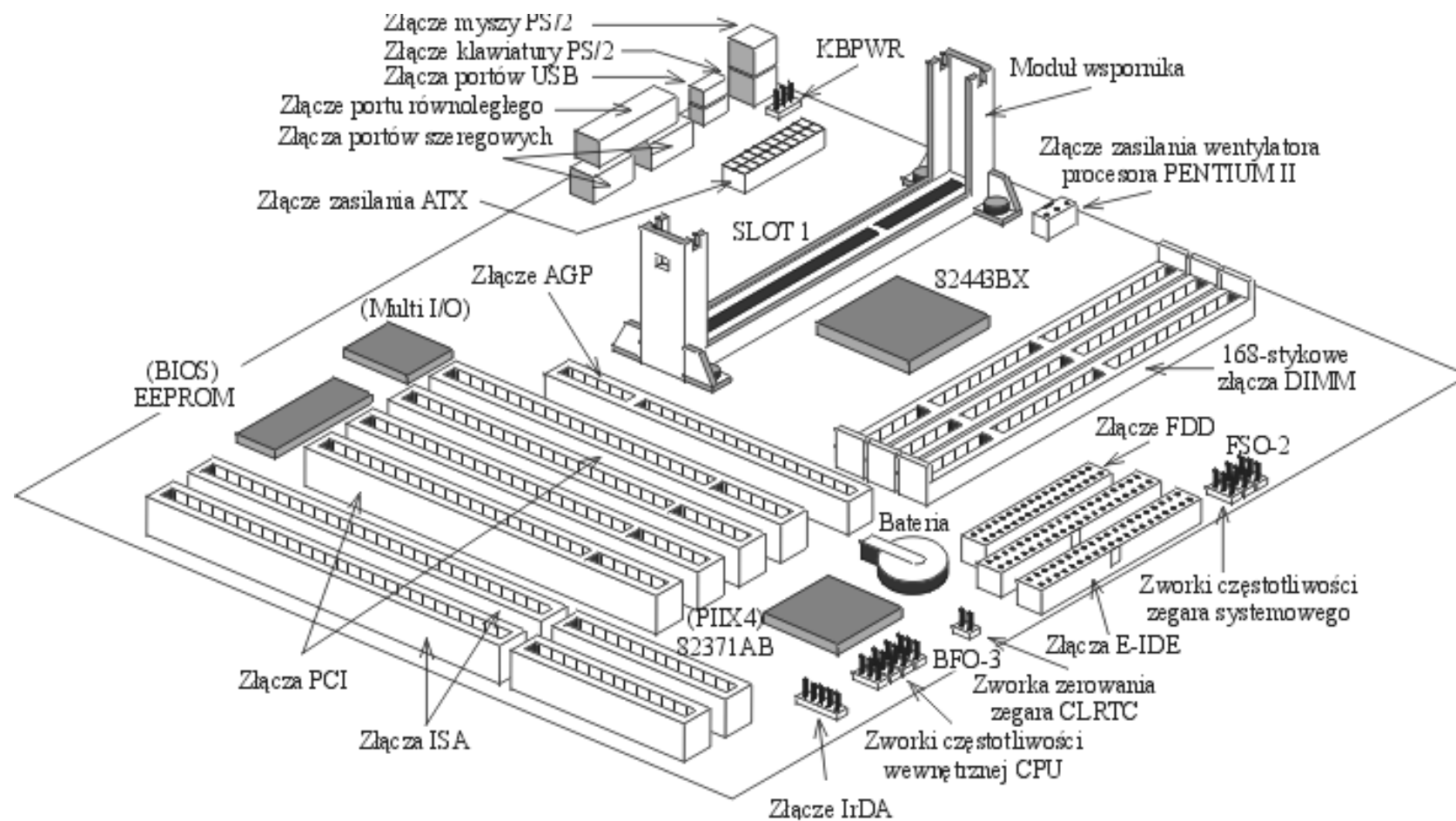


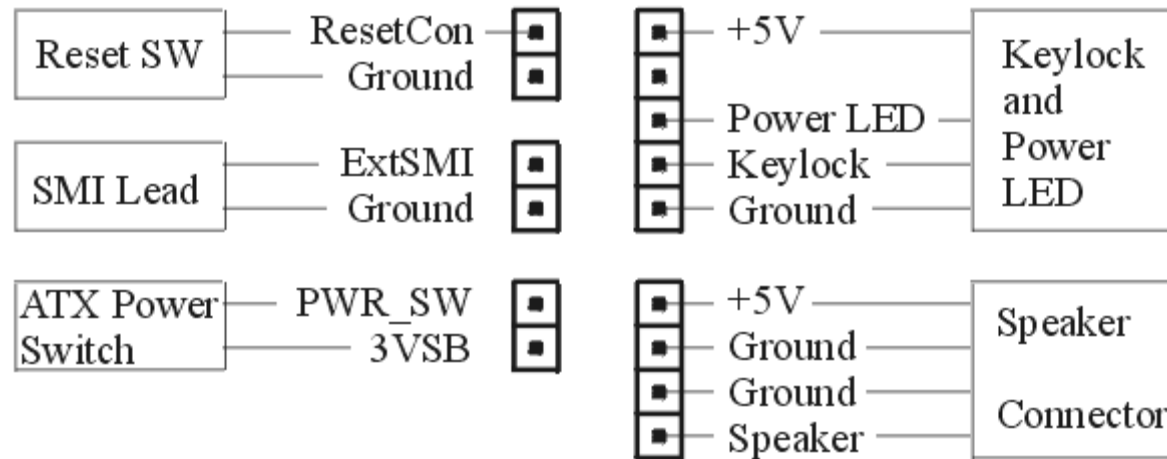
Złącze LED zasilania    Złącze głośnika    Złącze przycisku turbo    Złącze diody turbo    Złącze przycisku RESET






Keylock and Power LED    Speaker connector

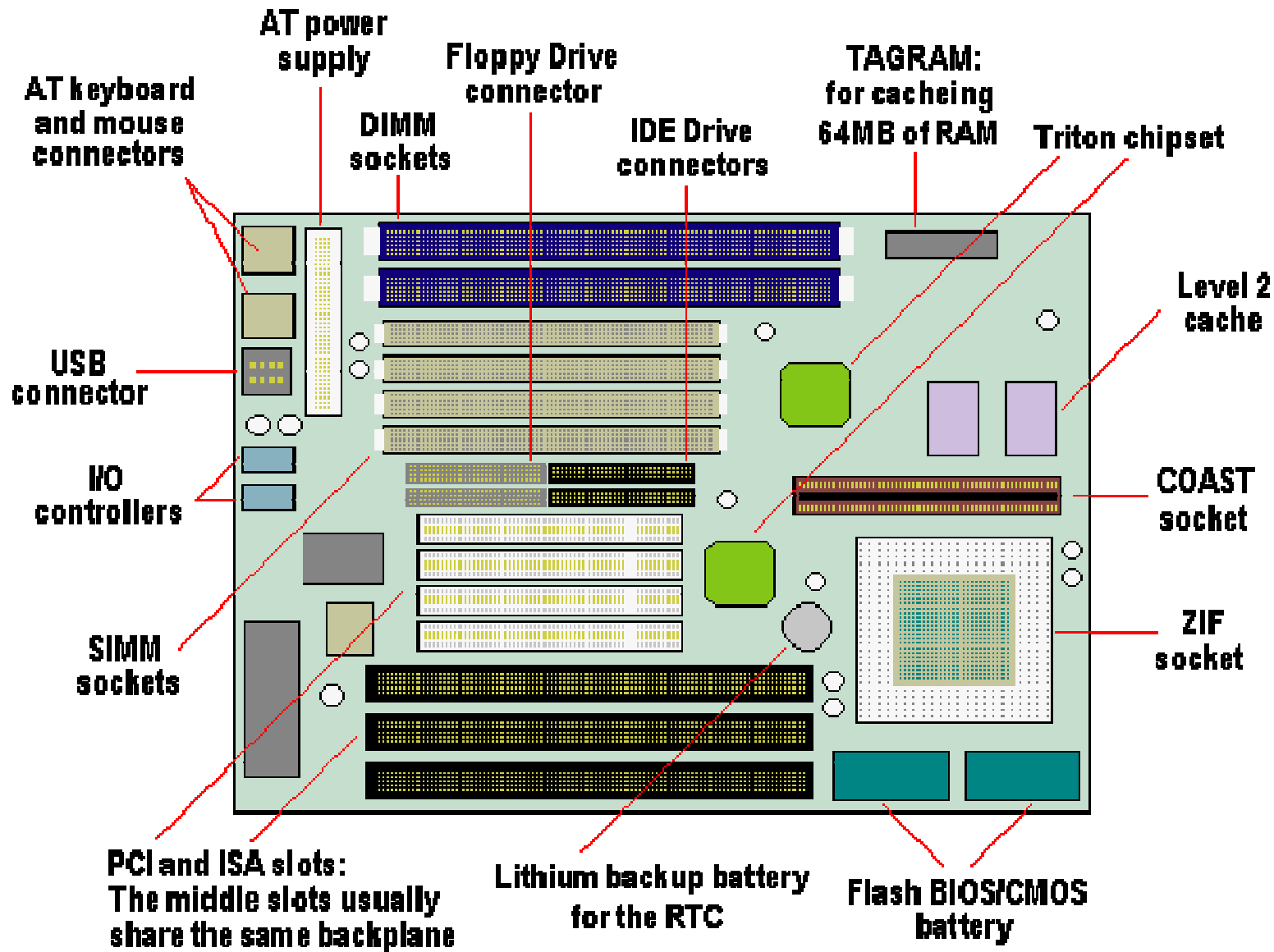


Pentium II	Mnożnik	Częstot. płyty	BF0	BF1	BF2	BF3	FS0	FS1	FS2
400 MHz	4.0	100 MHz	2-3	2-3	1-2	2-3	1-2	1-2	1-2
350 MHz	3.5	100 MHz	1-2	1-2	2-3	2-3	1-2	1-2	1-2
300 MHz	3.0	100 MHz	2-3	1-2	2-3	2-3	1-2	1-2	1-2
333 MHz	5.0	66 MHz	2-3	1-2	1-2	2-3	1-2	1-2	2-3
<b>300 MHz</b>	<b>4.5</b>	<b>66 MHz</b>	<b>1-2</b>	<b>2-3</b>	<b>1-2</b>	<b>2-3</b>	<b>1-2</b>	<b>1-2</b>	<b>2-3</b>
266 MHz	4.0	66 MHz	2-3	2-3	1-2	2-3	1-2	1-2	2-3
233 MHz	3.5	66 MHz	1-2	1-2	2-3	2-3	1-2	1-2	2-3

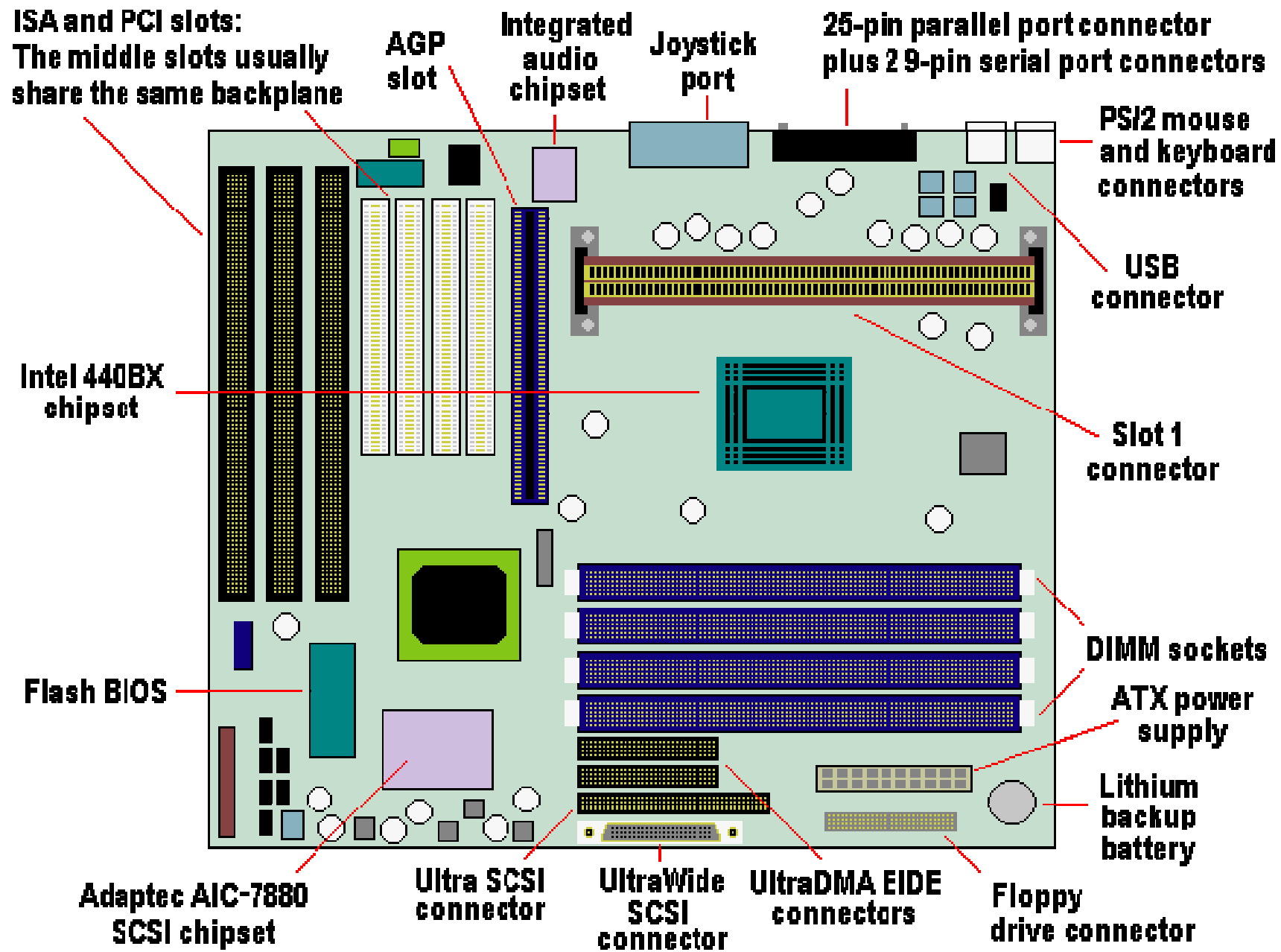


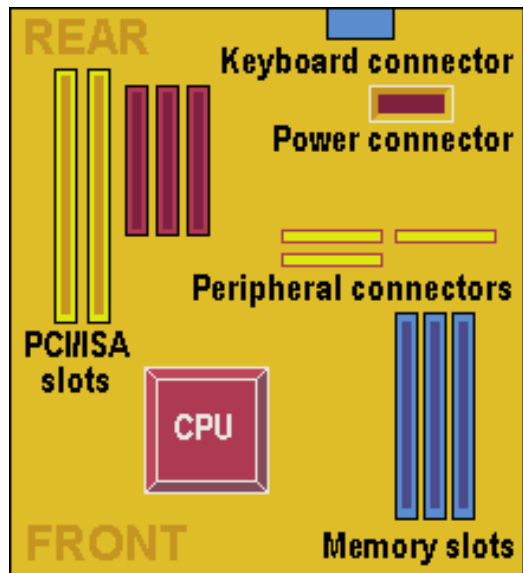


- |   |   |   |
|---|---|---|
| 1 |    | +5V - zasilanie                             |
| 2 |   | N/C - pin (bolec) nie uzywany               |
| 3 |  | IRRX (IRIA)<br>- dane odbierane (wejściowe) |
| 4 |  | GND - masa                                  |
| 5 |  | IRTX (IROA)<br>- dane nadawane (wyjściowe)  |



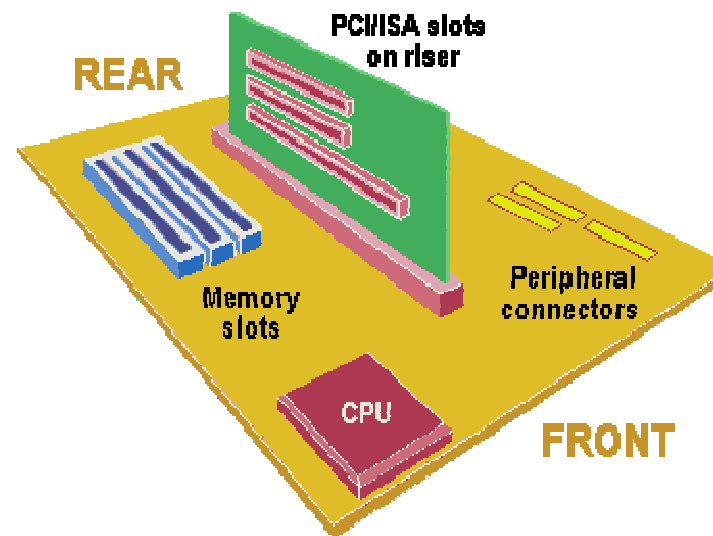






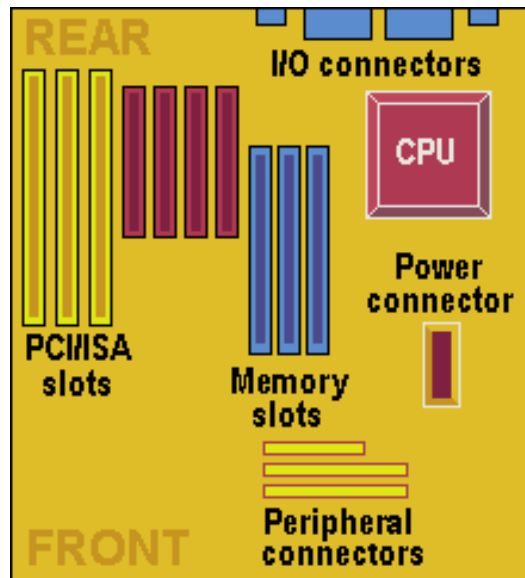
### BAT

Baby AT  
format 9in szer. 10in dł.



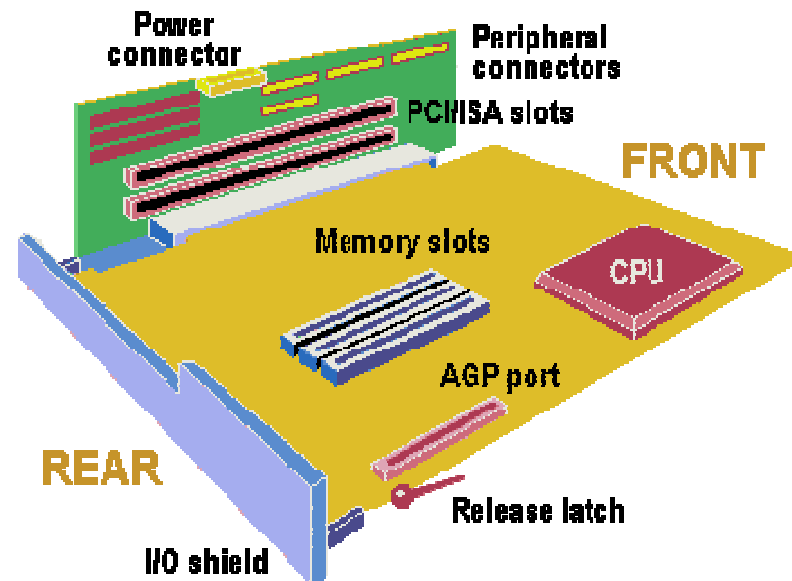
### LPX

wariant Baby-AT dla  
low profile desktop systems



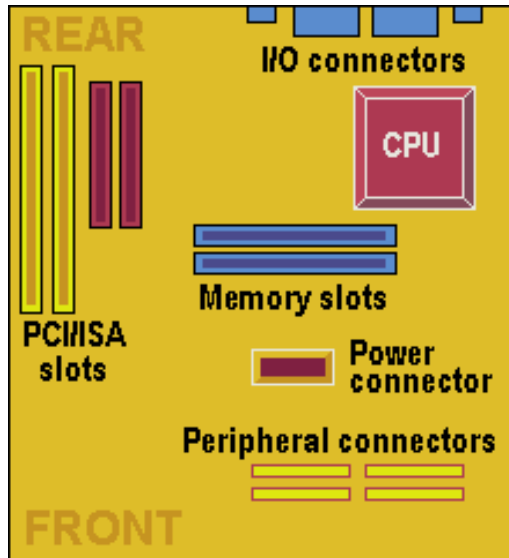
### ATX

Intel Advanced/ML motherboard,  
1996,  
format 12in szer. 9.6in dł.  
mini ATX 11.2in \* 8.2in

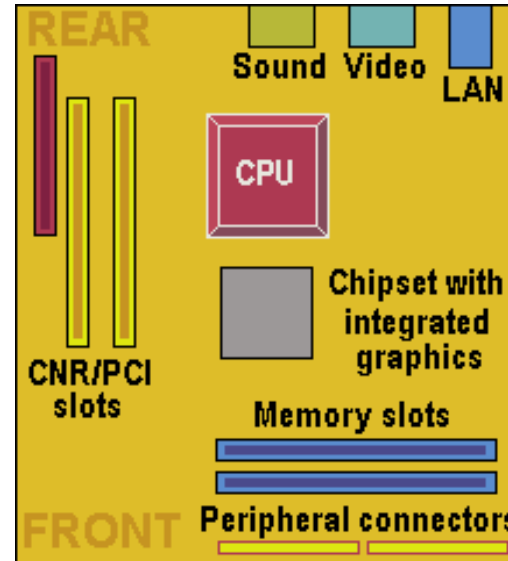


### NLX

Intel's NLX design, 1997  
format 8.8in szer. by 13in dł.



**MicroATX** format max. 9.6in



**FlexATX** format 9in x 7.5in

**ITX** format 174mm x 73mm x 55mm

Form Factor	Max. Width (mm)	Max. Depth (mm)
microATX	244	244
FlexATX	229	191
ITX	215	191

Name	Interface	Description
Socket 1	169-pin	Found on 486 motherboards, operated at 5 volts and supported 486 chips, plus the DX2, DX4 OverDrive.
Socket 2	238-pin	A minor upgrade from Socket 1 that supported all the same chips. Additionally supported a Pentium OverDrive.
Socket 3	237-pin	Operated at 5 volts, but had the added capability of operating at 3.3 volts, switchable with a jumper setting on the motherboard. Supported all of the Socket 2 chips with the addition of the 5x86. Considered the last of the 486 sockets.
Socket 4	273-pin	The first socket designed for use with Pentium class processors. Operated at 5 volts and consequently supported only the low-end Pentium-60/66 and the OverDrive chip. Beginning with the Pentium-75, Intel moved to the 3.3 volt operation.
Socket 5	320-pin	Operated at 3.3 volts and supported Pentium class chips from 75MHz to 133MHz. Not compatible with later chips because of their requirement for an additional pin.
Socket 6	235-pin	Designed for use with 486 CPU's, this was an enhanced version of Socket 3 supporting operation at 3.3 volts. Barely used since it appeared at a time when the 486 was about to be superseded by the Pentium.
Socket 7	32-pin	Introduced for the Pentium MMX, the socket had provision for supplying the split core/IO voltage required by this and later chips. The interface used for all Pentium clones with a 66MHz bus.
Socket 8	387-pin	Used exclusively by the Intel Pentium Pro, the socket proved extremely expensive to manufacture and was quickly dropped in favour of a cartridge-based design.

Name	Interface	Description
Slot 1	242-way connector	The circuit board inside the package had up to 512KB of L1 cache on it - consisting of two 256KB chips - which ran at half the CPU speed. Used by Intel Pentium II, Pentium III and Celeron CPUs.
Slot 2	330-way connector	Similar to Slot 1, but with the capacity to hold up to 2MB of L2 cache running at the full CPU speed. Used on Pentium II/III Xeon CPUs.
Slot A	242-way connector	AMD interface mechanically compatible with Slot 1 but which using a completely different electrical interface. Introduced with the original Athlon CPU.
Socket 370	370-pin	Began to replace Slot 1 on the Celeron range from early 1999. Also used by Pentium III Coppermine and Tualatin CPUs in variants known as FC-PGA and FC-PGA2 respectively.
Socket A	462-pin	AMD interface introduced with the first Athlon processors (Thunderbird) with on-die L2 cache. Subsequently adopted throughout AMD's CPU range.
Socket 423	423-pin	Introduced to accommodate the additional pins required for the Pentium 4's completely new FSB. Includes an Integral Heat Spreader, which both protects the die and provides a surface to which large heat sinks can be attached.
Socket 603	603-pin	The connector for Pentium 4 Xeon CPUs. The additional pins are for providing more power to future CPUs with large on-die (or even off-die) L3 caches, and possibly for accommodating inter-processor-communication signals for systems with multiple CPUs.
Socket 478	478-pin	Introduced in anticipation of the introduction of the 0.13-micron Pentium 4 Northwood CPU at the beginning of 2002. It's micro Pin Grid Array ( $\mu$ PGA) interface allows both the size of the CPU itself and the space occupied by the socket on the motherboard to be significantly reduced.

Type/Generation	Year	Data/Address bus width	Level 1 Cache (KB)	Memory Bus speed (MHz)	Internal Clock speed (MHz)
8088/First	1979	8/20 bit	None	4.77-8	4.77-8
8086/First	1978	16/20 bit	None	4.77-8	4.77-8
80286/Second	1982	16/24 bit	None	6-20	6-20
80386DX/Third	1985	32/32 bit	None	16-33	16-33
80386SX/Third	1988	16/32 bit	8	16-33	16-33
80486DX/Fourth	1989	32/32 bit	8	25-50	25-50
80486SX/Fourth	1989	32/32 bit	8	25-50	25-50
80486DX2/Fourth	1992	32/32 bit	8	25-40	50-80
80486DX4/Fourth	1994	32/32 bit	8+8	25-40	75-120
Pentium/Fifth	1993	64/32 bit	8+8	60-66	60-200
MMX/Fifth	1997	64/32 bit	16+16	66	166-233
Pentium Pro/Sixth	1995	64/32 bit	8+8	66	150-200
Pentium II/Sixth	1997	64/32 bit	16+16	66	233-300
Pentium II/Sixth	1998	64/32 bit	16+16	66/100	300-450
Pentium III/Sixth	1999	64/32 bit	16+16	100	450-1.2GHz
AMD Athlon/Seventh	1999	64/32 bit	64+64	266	500-2.2GHz
Pentium 4/Seventh	2000	64/32 bit	12+8	400	1.4GHz-3.6GHz
AMD Athlon 64/Eighth	2003	64/64 bit	64+64	400	2GHz-2.4GHz

## ISA

szerokość magistrali 8/16 bit

taktowanie ~8MHz

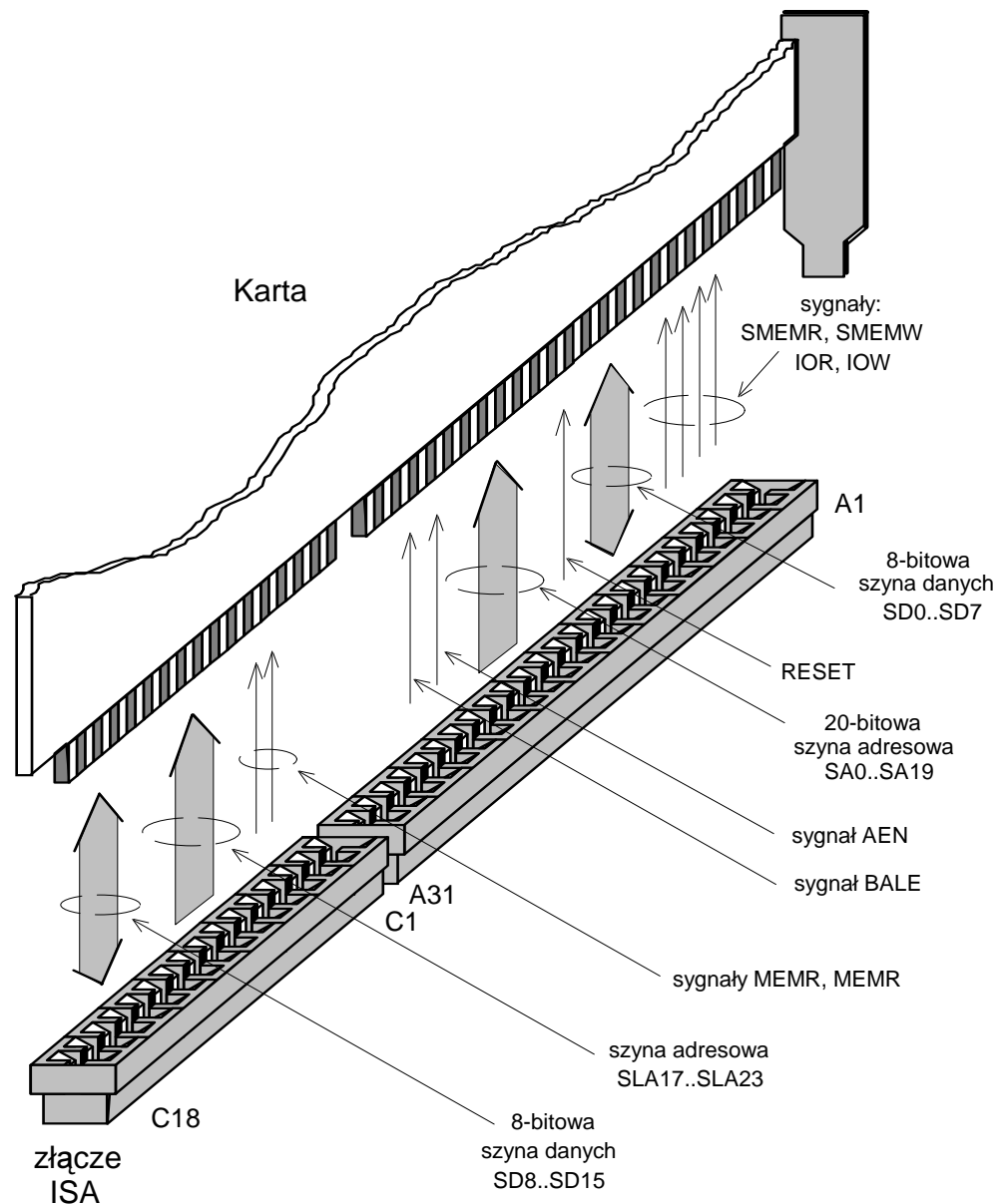
przepustowość 8MB/s

## EISA (Enhanced ISA)

szerokość magistrali 32 bit

taktowanie ~8MHz

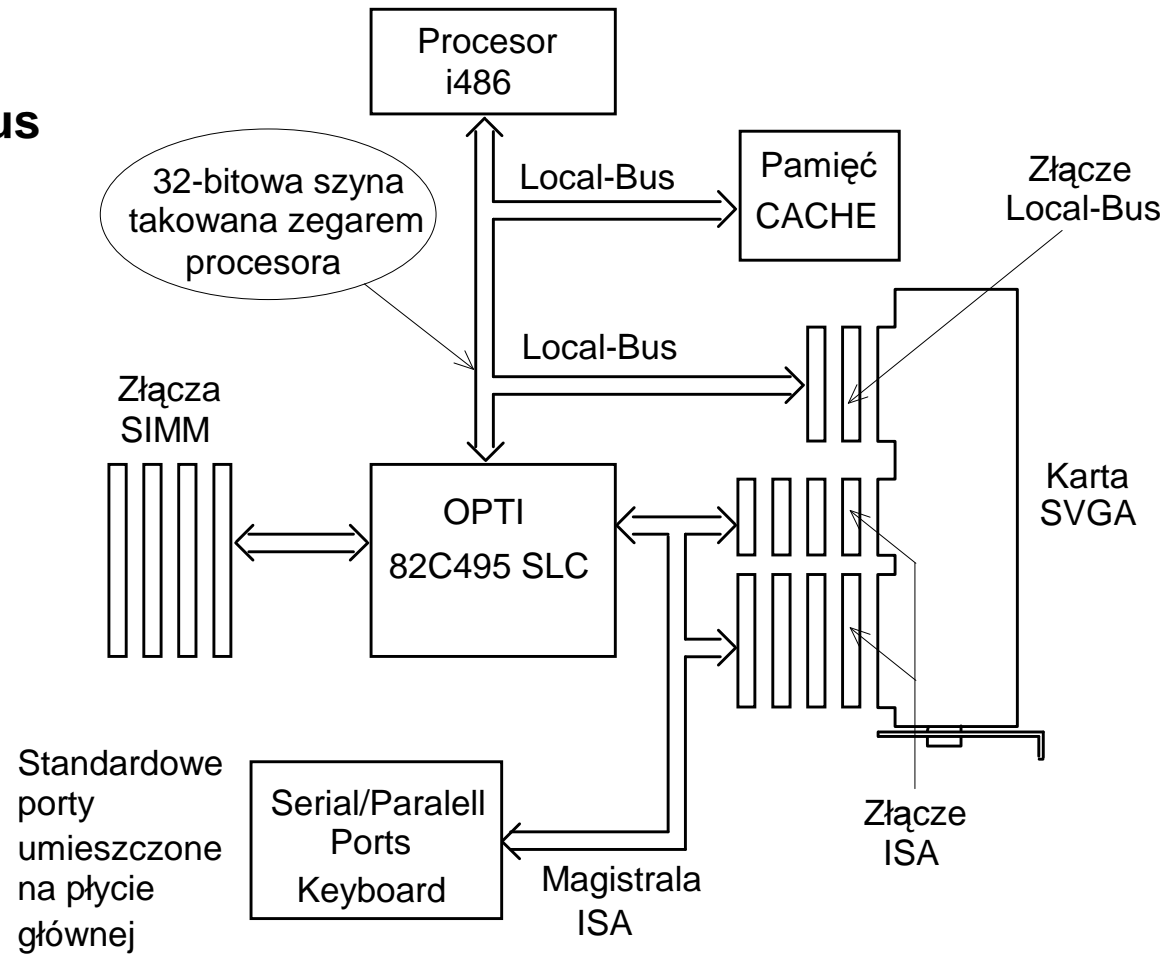
przepustowość 32MB/s



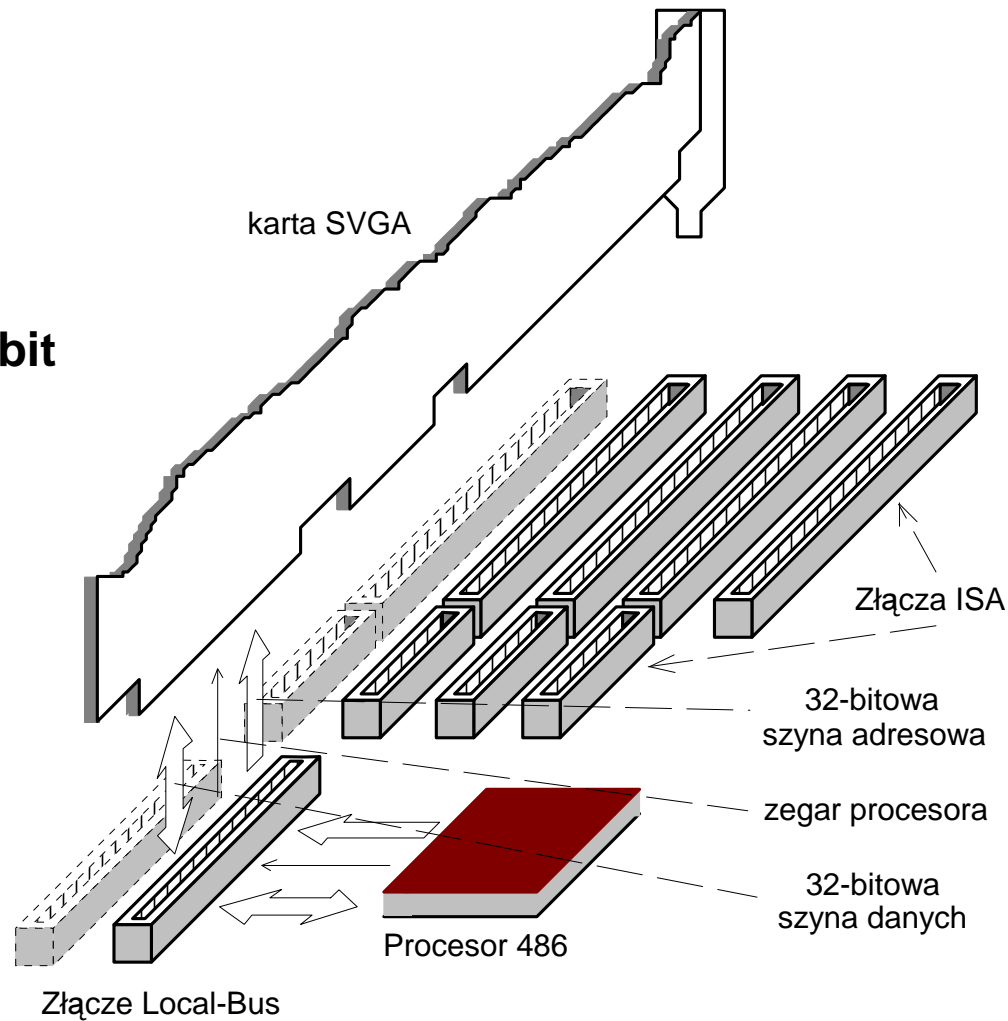
*Złącze PC Slot wg standardu ISA składa się z dwóch sekcji:  
62-stykowej (A1-A31, B1-B31) i 36-stykowej (C1-C18, D1-D18)*



# Magistrala VESA Local Bus



**szerokość magistrali 32 bit**  
**taktowanie do 40MHz**  
przepustowość 120MB/s



*Schemat blokowy płyty głównej komputera z procesorem i486, wyposażonej w dwa złącza Local-Bus. Układ 82C495SLC zapewnia współpracę procesora z otoczeniem. Do jednego ze złączy VESA Local-Bus dołączono kartę graficzną SVGA*

## Magistrala PCI (Peripheral Component Interconnect)

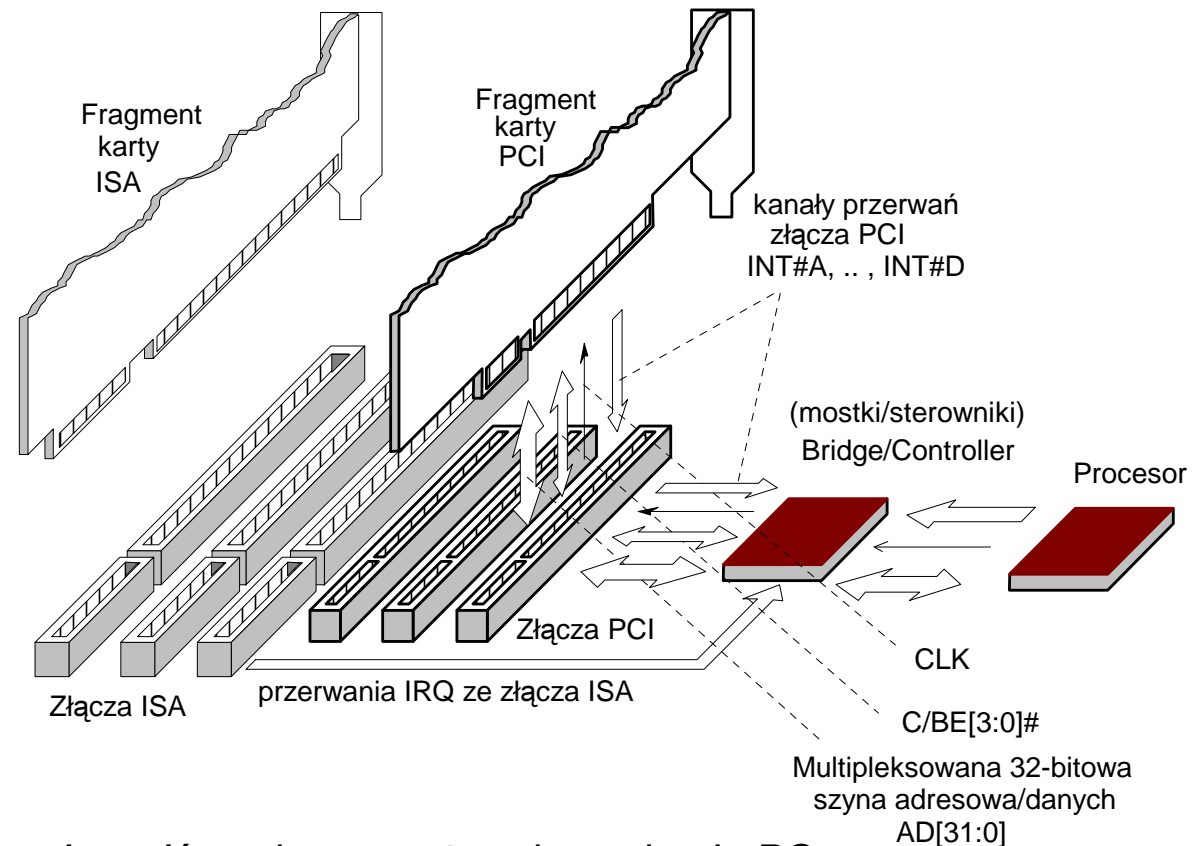
Specyfikacja 2.1 standardu PCI: współpraca do 256 magistral PCI, przy czym każda z nich może obsługiwać do 32 urządzeń PCI, a każde urządzenie może pełnić do 8 funkcji.

**Taktowanie od 0 do 33 MHz (wersja 2.1 66 MHz);**

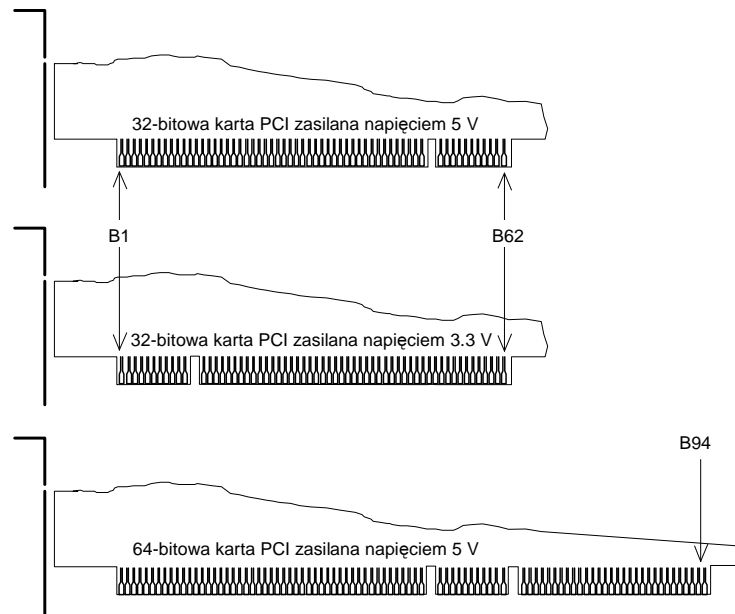
**Szerokość magistrali 32 lub 64 bit**

**przepustowość 133, 264, 528MB/s**

**4 kanały przerw: INT#A, INT#B, INT#C, INT#D**

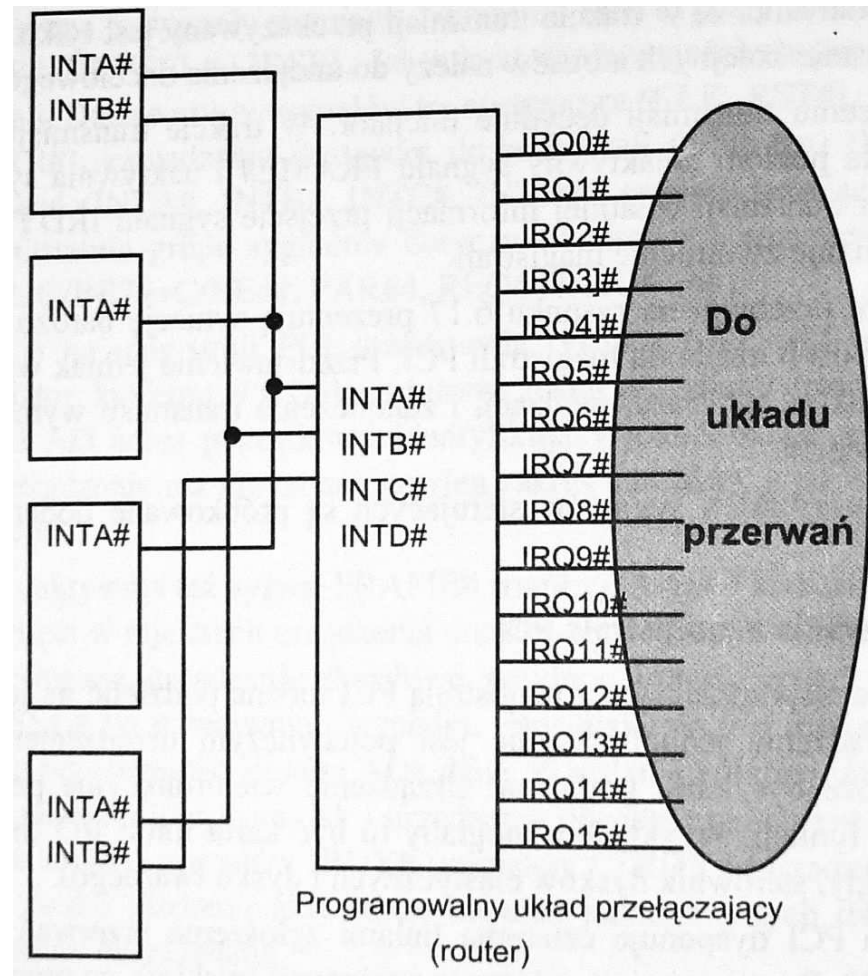


*Fragment płyty głównej wyposażonej w gniazda PC*



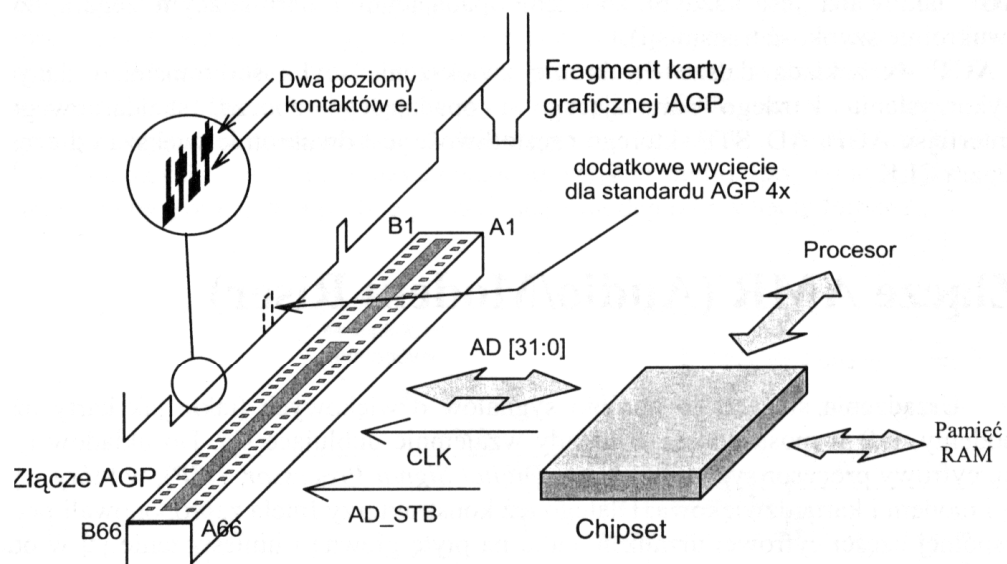
*Złącza kart PCI: karty 32-bitowej zasilanej napięciem 5V, karty 32-bitowej zasilanej napięciem 3.3V, karty 64-bitowej zasilanej napięciem 5V.*

# Połączenia sygnałów przerwań magistrali PCI do systemu



# Magistrala AGP

Szybki port graficzny AGP (ang. Accelerated Graphics Port)

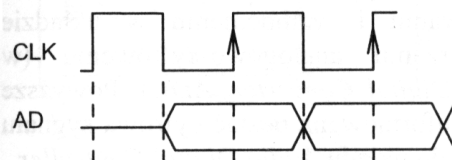


## AGP 1 x

CLK - 66 MHz

Przesyłanie danych taktowane narastającym zboczem CLK

Szybkość transmisji - 66 MHz x 4B (bajty) = 264 MB/s

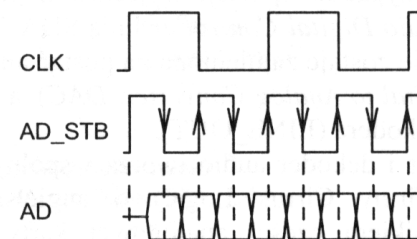


## AGP 4 x

CLK - 66 MHz

Przesyłanie danych taktowane narastającym i opadającym zboczem AD\_STB

Szybkość transmisji - 4 x 66 MHz x 4B = 1056 MB/s

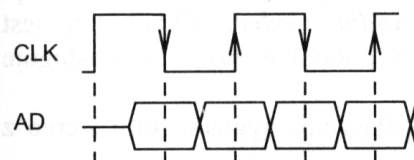


## AGP 2 x

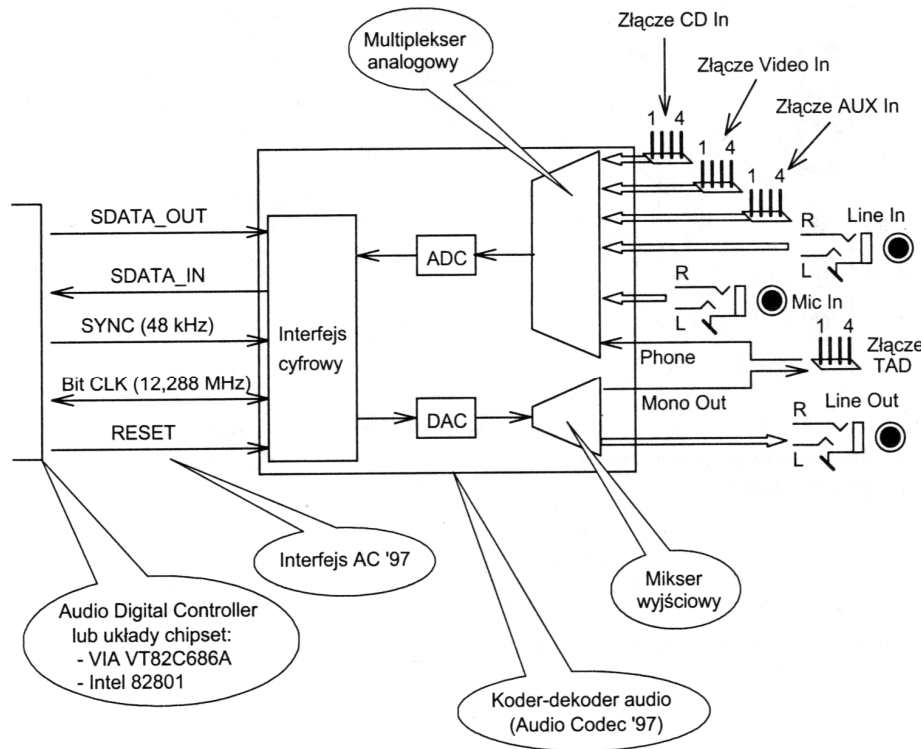
CLK - 66 MHz

Przesyłanie danych taktowane narastającym i opadającym zboczem CLK

Szybkość transmisji - 2 x 66 MHz x 4B = 528 MB/s



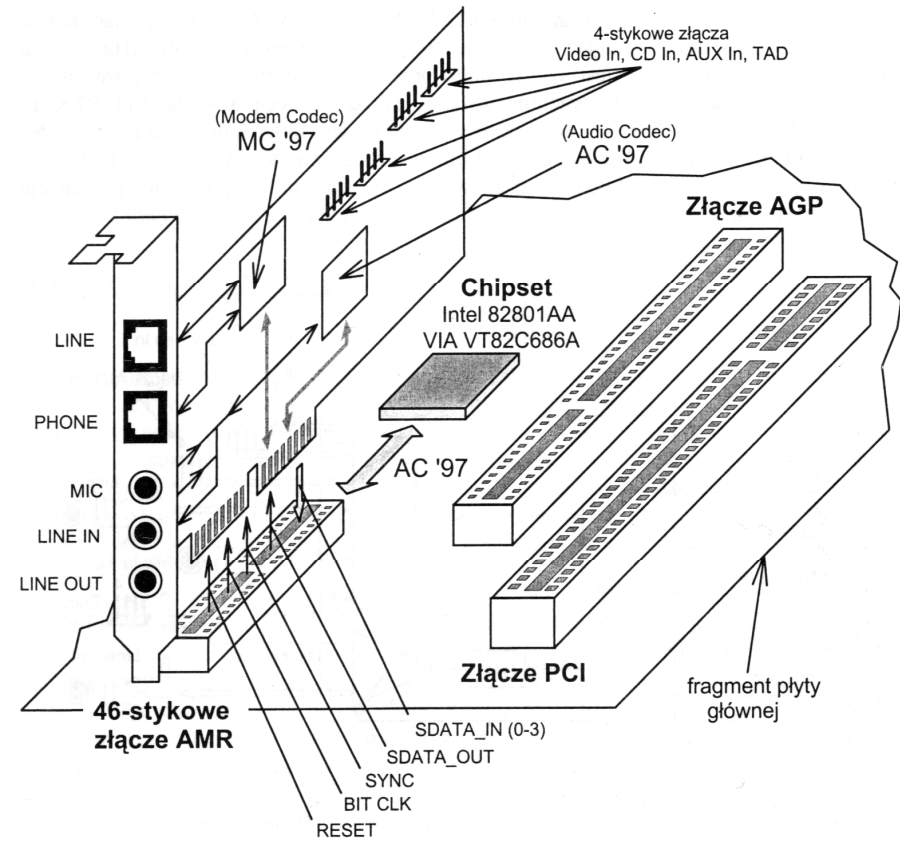
# Złącze AMR (Audio/Modem Riser)



Audio Digital Controller lub układy chipset:  
 - VIA VT82C686A  
 - Intel 82801

Interfejs AC '97

Koder-dekoder audio (Audio Codec '97)

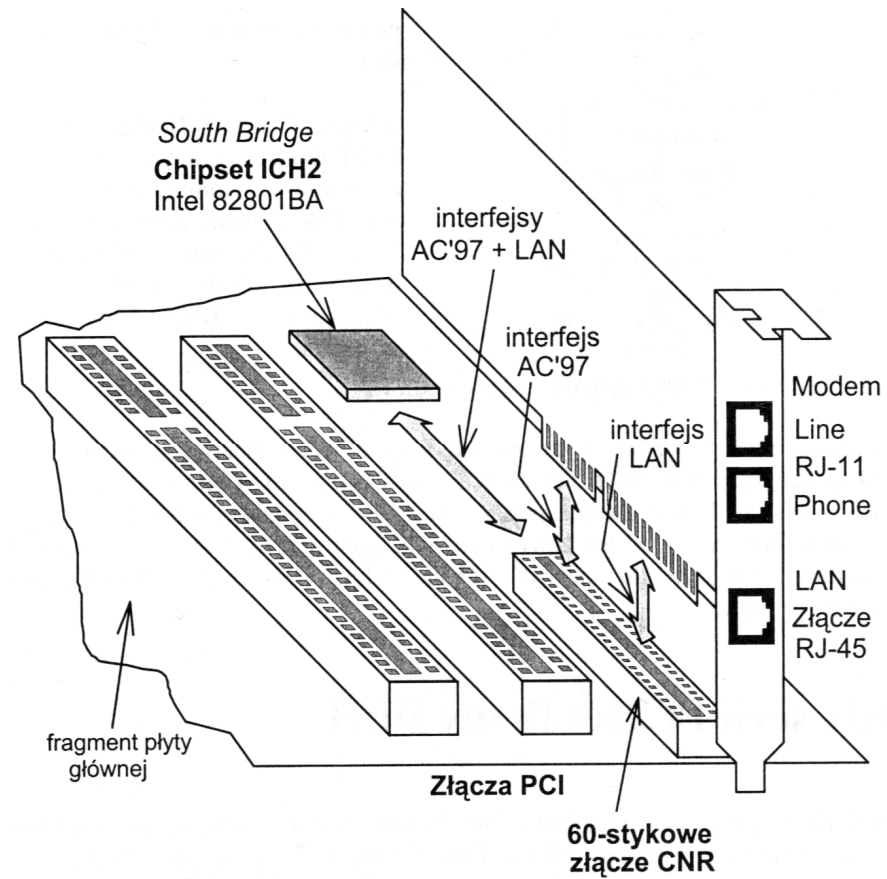


46-stykowe złącze AMR

SDATA\_IN (0-3)  
 SDATA\_OUT  
 SYNC  
 BIT CLK  
 RESET

fragment płyty głównej

# Złącze CNR (Communications and Networking Riser)





# PCI-X

<b>wersja</b>	<b>PCI-X 1.0</b>	<b>PCI-X 2.0</b>	<b>PCI-X 3.0</b>
rok wprowadzenia	1999	2002	2003
maksymalna szerokość szyny danych	64 bity	64 bity	64 bity
maksymalna częstotliwość taktowania	133 MHz	533 MHz	1066 MHz
maksymalna przepustowość	1066 MB/s	4264 MB/s	7,95 GB/s
napięcie	3.3 V	3.3 V/1.5 V	3.3 V/1.5 V

# PCI Express

wariant PCIe	przepustowość (w każdą stronę)
x1	250 MB/s
x2	500 MB/s
x4	1000 MB/s
x8	2000 MB/s
x16	4000 MB/s
x32	8000 MB/s

## PCI Express Example Connectors

**x1**

**BANDWIDTH**

Single direction: 2.5 Gbps/200 MBps  
Dual Directions: 5 Gbps/400 MBps



**x4**

**BANDWIDTH**

Single direction: 10 Gbps/800 MBps  
Dual Directions: 20 Gbps/1.6 GBps



**x8**

**BANDWIDTH**

Single direction: 20 Gbps/1.6 GBps  
Dual Directions: 40 Gbps/3.2 GBps



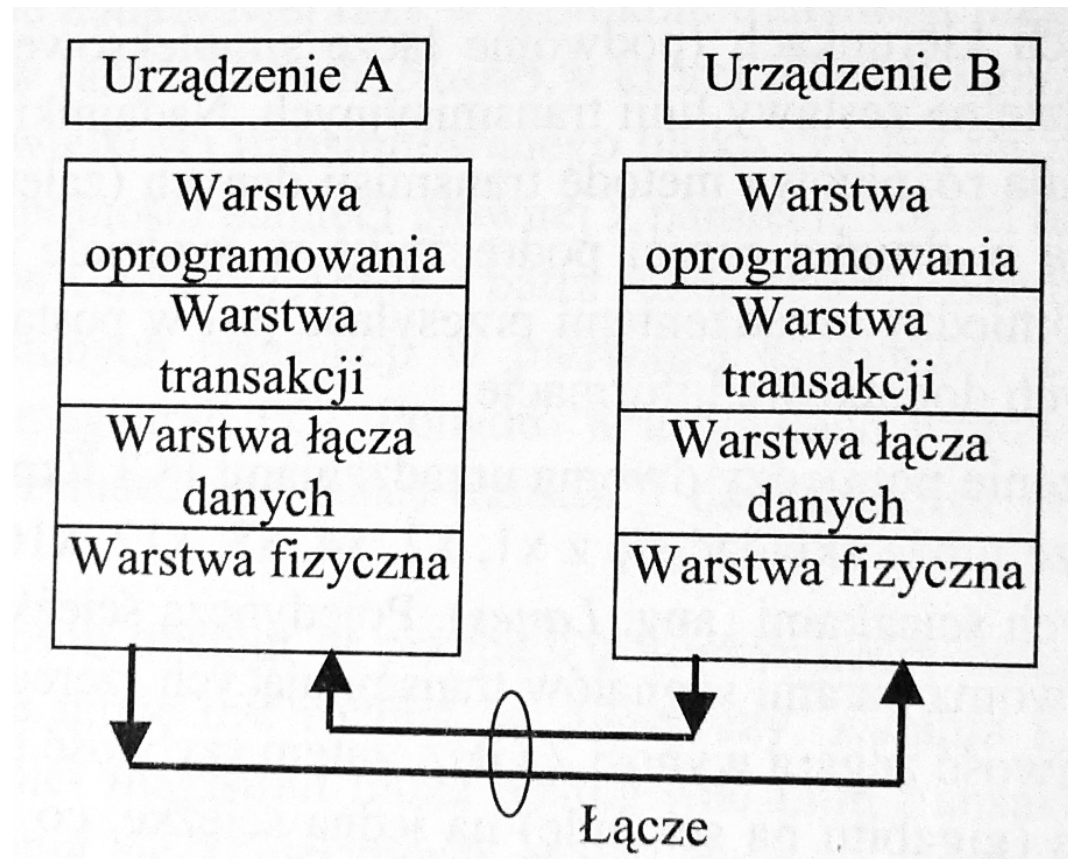
**x16**

**BANDWIDTH**

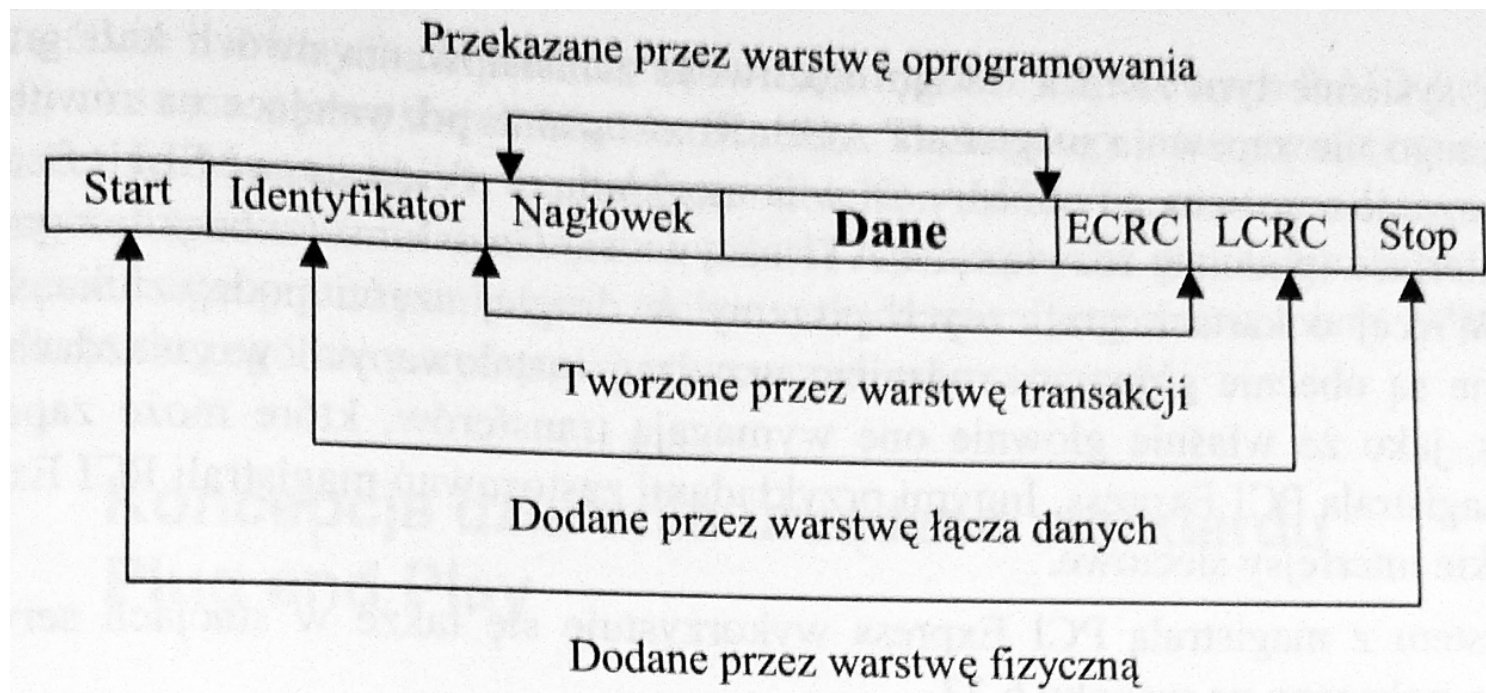
Single direction: 40 Gbps/3.2 GBps  
Dual Directions: 80 Gbps/6.4 GBps



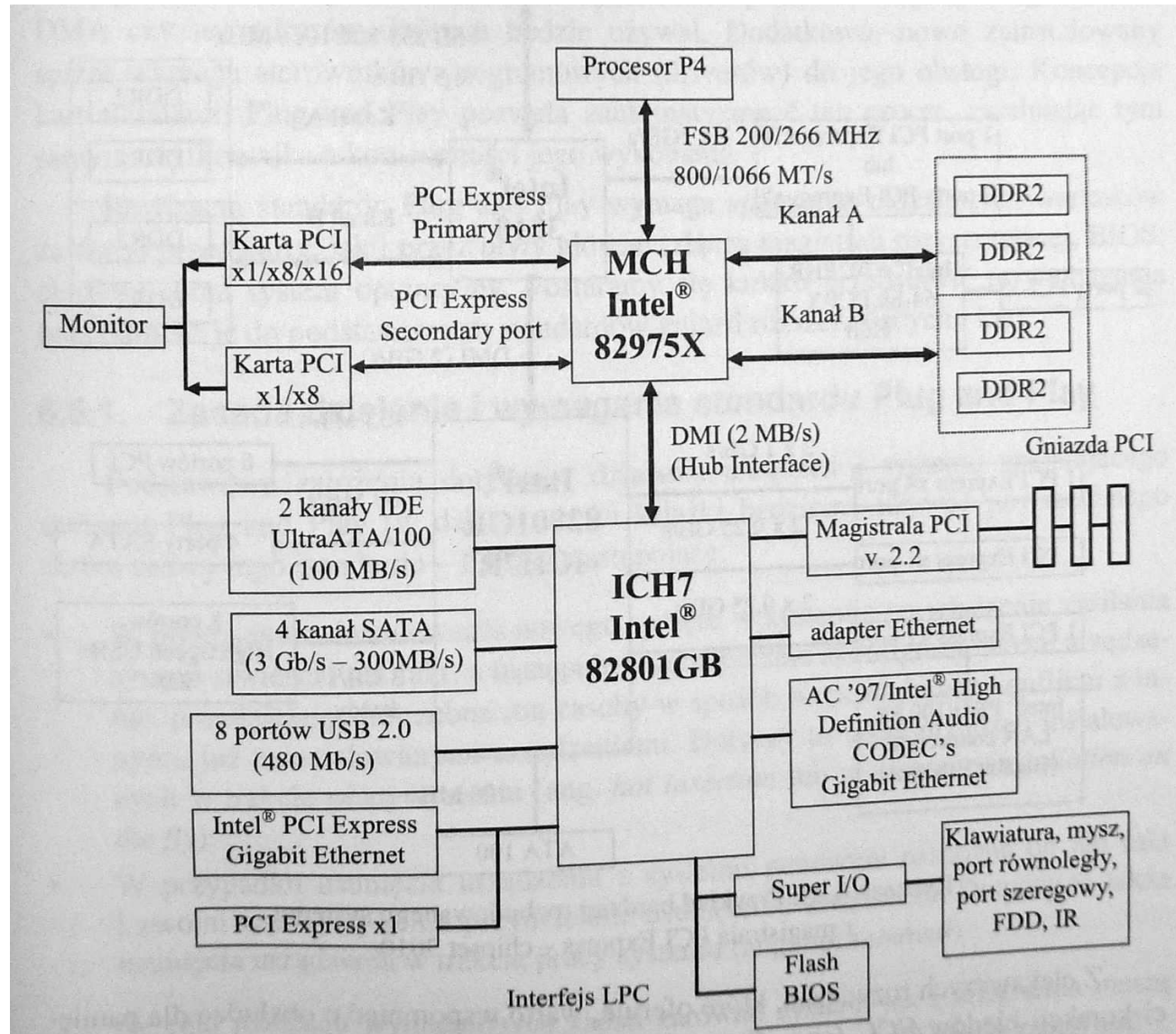
# Model warstwowy magistrali PCI Express



# Struktura pakietu magistrali PCI Express



# Przykład prostego systemu z magistralą PCI Express



# Przykład rozbudowanego systemu z magistralą PCI Express

