

Title : Parallel Expansion Local Bus Interface Card - Type I, II & III



Background :

Generally computers use various forms of interface standards architecture like ISA, EISA, MCA, VL-Bus, PCI, PCI-X, AGP and other types of expansion bus to connect directly the main board to the peripheral add-on cards (like video display cards, sound cards, ethernet cards.) and 168pin SIMM, DIMM and RDRam memory ram modules which are at 90 degrees position to the main boards.

The main board have one or more central processing unit (CPU) as the brain centre and any additional CPU increases the performance of the computer, other than by increasing the RAM memory type and memory size (megabytes). The result is that the minimal size for the computers are based on the dimensions of the main board and the height of the peripheral add-on cards, generally 3.5 inches and the size of the internal peripheral devices.

Current main boards do not have the male local bus interface at one or more edges of the printed circuit board. They have instead the female local bus interface slots on the main board itself. Current computer main boards operate individually and independently in separate casings unless they are indirectly connected externally via a network using network cards. Current add-on cards have only one male edge connector at one edge of the printed circuit board.

ISA refers to Industry Standard Architecture.

EISA refers to Extended Industry Standard Architecture

MCA refers to Micro Channel Architecture.

PCI refers to Peripheral Component Interconnect

AGP refers to Accelerated Graphics Port

RAM refers to Random Access Memory

VL-Bus refers to Video Electronics Standards Association (VESA) Local Bus architecture



Discussion on prior art.

In 1980, the US 4196957 patent introduced an electrical connector using minimal printed circuit board (PCB) space and mounting space, mounted on the edge of the PCB. This formed the basis for the ISA interface with multiple rows. In 1982, IBM developed the ISA interface. Subsequently Intel developed the PCI interface.

The US 4333696 patent of 1982 used a complex packaging scheme using a cabinet apparatus with racks and guiding rails and PCBoard interconnection structure to mount PCBs in a parallel position to each other. The PCBs have one edge (in the front of the PCB) for ZIF connection and another (in the rear of the PCB) with socket pin connection for connection to external interface signals.

In 1986, US 4032475 patent relates to a hinged electrical connector comprising of two housings, each with a male and female electrical connection respectively. Each housing is mounted on a PCB and when the two housings of the two separate PCBs are hinged connected together, the two separate PCBs can be moved from a perpendicular plane at right angles to each other to a substantially co-planar/parallel position. This is a complex housing connection which is basically unstable because of the hinge and more costly and requires it to be incorporated onto the mainboards and appropriate add-on peripheral card. Standard mainstream mainboards and add-on peripheral cards cannot use this.

In 1988, EP 0278868 patent introduced a complex high density multirow connector on the edge of a circuit board.

In 1989, US 4836107 patent developed a complex system of connecting circuit boards arranged in succession, in which between two adjacent PCBs there are a series of optronic intersecting connections between coupling elements, using a transmitting diode and a receiving detector arranged opposite to each other and connected with a multiplexer or respectively a demultiplexer. All these complex apparatus are costly and require special design.

In 1998, WO 9804977 patent relates to a backplane PCB (mainboard) with a CPU and at least two sets of female connectors, ISA connectors (on the front) and PCI connectors (on the rear) for connection of the respective ISA and PCI cards inserted perpendicular to the mainboard (backplane PCB) and in parallel position to each other. This is very similar to current mainboards except that it has two sets (ISA and PCI) of rows of female connectors as compared to the single set of mixed ISA/PCI and AGP female connectors in current mainboards.

In 1998, DE 19709940 introduced the combined ISA/PCI terminal.

In 1999, EP 0278868 introduced the power bus system incorporated into modular blocks.

Generally the mainboards have one set of multiple rows of ISA, PCI and AGP interface female connectors arranged parallel to each other, for the appropriate add-on PCBs eg sound cards, VGA cards, modem cards, ethernet cards, etc and these are mounted perpendicular to the mainboard and in a parallel position to each other.

The series of related inventions is for a simple rigid ISA/PCI/PCI-X/AGP interface connector or flexible connector or any other interface connector to act as an intermediate connection to the respective interface connector so as to allow the appropriate add-on PCB or another mainboard PCB to be mounted in a parallel position to the mainboard PCB in the same plane or co-planar position. The second object of this series of inventions is to provide for a new type of peripheral add-on PCB with one or more male local bus on more than one edge of the PCB (or as many edges is present) according to the shape of the PCB (rectangular, square, hexagonal or any other shape) and or with

one or more female bus slots. A further objective of these series of inventions is to provide for a new type of mainboard with one or more male local bus edge and on as many edges as is allowed by the shape of the mainboard and or with one or more female connectors on one or more surfaces of the PCB .

Description :

The parallel expansion local bus (ISA, PCI, PCI-X, AGP or any faster interface standards and 168pin memory ram SIMM, DIMM RDRam or faster modules) interface card are of three types each, Type I (combined male/female), Type II (male/male), Type III (female/female) interface connectors and include any variation/s in physical size of the interface connectors. It comprise of a printed circuit board (PCB) and using the edge/s of the printed circuit board (PCB) as one or more than one male local bus edge connector and or having one or more female local bus slot/s conetor/s mounted 20-25 mm or further apart on the PCB parallel to each other and with or without CPU/s electric electronic electromagnetic memory storage devices components of the current mainboards. The proposal includes a new type of hybrid main board with one or more male edge connector/s on one or more edge/s of the printed circuit board and with one or more female local bus slots mounted 20 -25 mm or further apart parallel to each other on the printed circuit board (PCB) together with the other CPU/s electric electronic electromagnetic memory storage devices components of the current mainboards. This new hybrid main board is different from the current mainboards in that it has one or more male local bus connectors using one or more edge/s of the PCB wheras the current mainboards do not have any. The proposal also include a new type of hybrid add-on peripheral card with one or more male edge connector/s on more than one edge/s of the printed circuit board and with one or more female local bus slots mounted 20 -25 mm or further apart parallel to each other on the printed circuit board (PCB) together with the other CPU/s, electric electronic electromagnetic memory storage devices components of the current mainboards. This new hybrid add-on peripheral card is different from the current add-on peripheral card/s in that it has one or more female local bus slots mounted on the PCB wheras the current add-on peripheral card/s do not have any. The result is that the mainboard and the add-on peripheral card is very similar except for the difference in size and number and type of components mounted on the PCB, one being the main board and the others as add-on peripheral card/s.

In the minimal forms of the Type I, II and III interface card/connector, it comprise the minimal component of the male edge local bus and or the minimal component of the female local bus slot mounted on a PCB or joined together as a single unit. They are used as an intermediate second connector/s between the main board/s and or the add-on peripheral card/s so that all the mainboard/s and the add-on peripheral card/s, when linked by the appropriate Type I, II or III interface card/connector, are all in the same plane or co-planar position, namely parallel to each other.

In the maximum forms in size, the Type I, II or III interface card/connectors are used as intermediate second connector/s and or a new hybrid main board/s or new hybrid add-on peripheral card/s which when combined and linked together with the appropriate Type I, II or III minimal forms connector/s permit the formation of computers with the modular architecture as shown in the drawings shown as Figure 14.

NB: PCI, PCI-X, ISA and AGP refers to all the various possible types of expansion bus interface standards known and or being developed and or are not yet developed.

NB: The term "male" apply to the male edge connector/s and the term "female" apply to the female bus slot/s

The variations of the Type I , II and III interface card/connector in detail are as follows :

1. Type I (Combined Male/female) Variation 1 connector : A printed circuit board (PCB) of varying sizes and shape and with one 64 bit PCI male local bus (in any size) at one edge (in alignment to the PCI female local bus slot) and as part of the printed circuit board and with 1 or more PCI female local bus slots (of corresponding or any size) mounted parallel to the same edge on the printed circuit board (PCB) and with the PCI male local bus wired to the corresponding pins on the PCI female local bus slots/s using any of the appropriate various possible types of expansion bus interface standards known and or being developed and or are not yet developed and without any other electronic, electromagnetic, CPU or memory devices. - See Figure 1 and 2. It is different from the current mainboard (PCB with PCI female local bus mounted on the main board which does not have the male local bus) but it is a PCB with a PCI male local bus edge and with PCI female local bus slot mounted on the PCB. The edge of the PCB is used as the male local bus edge and not for mounting a male local bus. This Type I connector is for use as an intermediate second connector between the PCI female local bus slot of the mainboard and the male local bus connector of the add-on peripheral card, so that the add-on peripheral card is connected in a position parallel to the main board instead of being at 90 degrees to the main board. The male edge connector of the add-on peripheral card is slotted into the female bus slot of the intermediate second connector and the male edge connector of the intermediate second connector is slotted into the female bus slot mounted on the main board. In this manner, the peripheral add-on card is 90

degrees to the intermediate second connector which is a further 90 degrees to the main board, thereby resulting in the peripheral add-on card being parallel in position to the main board

2. **Type I (Combined Male/female) Variation 1 connector :** In the minimal form it is just a PCI female bus slot connector mounted on a narrow PCB the width of the female bus slot connector plus the width of the male edge connector, with one of the edges of the PCB as a PCI male edge connector.
3. Type I (Combined Male/female) Variation 2 connector: As in the above but with one or more PCI male local bus at more than one edge of the printed board. - See Figure 3. The edge of the PCB is used as the male local bus edge and not for mounting a male local bus. This Type I variation 2 connector is for use as an intermediate second connector between the PCI female local bus slot of the mainboard and the female local bus slot of another mainboard and or the male local bus connector of the add-on peripheral cards, all of which are in a parallel position to each other as well as to the first mainboard.
4. Type I (Combined Male/female) Variation 3 connector: As in all the above but with one or more PCI female local bus slots mounted (parallel to another PCI female local bus slot) to and wired appropriately on both sides of the circuit board using the mirror image of the PCI female local bus slot/s on the opposite side of the PCB. - See Figure 4 and 5. This Type I variation 3 connector is for use as an intermediate second connector between the PCI female local bus slot of the mainboard and the female local bus connector of another mainboard and or the male local bus connector of the add-on peripheral cards, all of which are in a parallel position to each other as well as to the first mainboard.
5. Type II (Male/male) Variation 1 connector : A printed circuit board (PCB) of varying sizes and any shape and with two 64 bit PCI male local bus (in any size) wired back to back (in alignment with each other) using any of the appropriate various possible types of expansion bus interface standards known and or being developed and or are not yet developed, and without any other electronic, electromagnetic, CPU or memory devices - See Figure 6 and 7. Essentially it is a PCB with two male local bus connector, each connector being located on an edge of the PCB, opposite and parallel to each other.
6. **Type II (Male/male) Variation 1 connector (minimal form) :** In the minimal form it is just a narrow PCB the width of two male local bus edge with the two opposite edges of the PCB used as a PCI male edge connector. This Type II variation 1 connector is for use as an intermediate second connector between the PCI female local bus of the mainboard and the female local bus connector of another mainboard, so that the second mainboard (which has the female local bus in a mirror image position) can be connected to the first main board in a parallel position to the first mainboard. The male edge connector of the intermediate second connector is slotted into the female bus slot of the mainboard and the other male edge connector of the intermediate second connector is slotted into the female bus slot mounted on the second main board. In this manner, the two main boards are at 90 degrees to the intermediate second connector thereby resulting in the two main boards being in a position parallel to each other.
7. Type II (Male/male) Variation 2 connector: As in Type II (Male/male) variation 1 above but with one or more PCI male local bus on one or more edge/s of the printed circuit board wired back to back. - See Figure 8. Both Type II variation 1 and 2 when combined with variations of Type I and or Type III local bus expansion card allows the modular architecture for a new type of computer
8. Type II (Male/male) Variation 3 connector: As in the above Type II (Male/male) variations 1 & 2 but with a flexible cable joining the two PCI male local buses back to back in alignment to each other.
9. Type III (Female/female) Variation 1 connector : A printed circuit board (PCB) of varying sizes with two or more 64 bit PCI female local bus slots (in any size), mounted (parallel to each other) on one side and wired together (for two or more PCI female local bus slots in any size) on corresponding pins without any other electronic, electromagnetic, CPU or memory devices using any of the appropriate various possible types of expansion bus interface standards known and or being developed and or are not yet developed - See Figure 9. This Type III variation 1 connector is for use as an intermediate connector between the PCI male local bus of the new type of mainboard with a female local bus of the Type II variation 1 connector and the male local bus connector of another similar new mainboard with the same Type III variation 1 connector so that all the new type of mainboards are in a parallel position to each other as well as to the first mainboard. ie making it possible for multiple new type main boards to be stacked in a compact format and maximise the multiple wide-open pathways for transfer of data from one CPU to memory to storage device or even to another CPU back and forth
10. Type III (Female/female) Variation 2 connector: As in Type III (Female/female) variation 1 above but with one or more PCI female local bus slots mounted on both sides of the printed circuit board using the mirror image of the PCI female local bus slot/s mounted on the opposite side and wired together on corresponding pins. -See Figures 10, 11 and 12
11. Type III (Female/female) Variation 3 connector: As in Type III (Female/female) variations 1 and 2 above but with flexible cables linking the two or more PCI female local bus slots as a single or in multiple combinations wired together on corresponding pins.
12. Type III (Female/female) Variation 4 connector: As in Type III (Female/female) variation 2 above but with a PCI female local bus slot joined directly back to back to a mirror image of the PCI female local bus slot as a single united pair (see Figure 12) or in multiple united pairs (see Figure 11). This combined with variations of

Type I and or Type II local bus expansion card allows the modular architecture to be applied to a new type of computer

13. Variation 11 : As in all the above but with ISA, and/or AGP and/or shared PCI/ISA, and /or shared PCI/AGP and/or shared ISA/AGP and or any shared combinations of male local bus connector and or female local bus slot and or any other faster interface standard/s instead of PCI male local bus and PCI female local bus slots.
14. Variation 12 : As in all the above but with any 8 bit, 16 bit, 24 bit, 32 bit, 64 bit, 128 bit, 256 bit, 512 bit or higher or any other male local bus in current standard size or smaller size or miniature size or any other size and or corresponding female local bus slot in current standard size or smaller size or miniature size or any other size instead of PCI male local bus and PCI female local bus slot.
15. Variation 13 : As in all the above but with combination/s of PCI and or ISA and or AGP and or any 8 bit, 16bit, 24 bit, 32 bit, 64 bit, 128 bit, 256 bit, 512 bit, or higher and or any other male local bus and combination/s of PCI and or ISA and or AGP and or shared PCI/ISA, and/or shared PCI/AGP, and/or shared ISA/AGP and or any 8 bit, 16 bit, 24 bit, 32 bit, 64 bit, 128 bit, 256 bit, 512 bit or higher and or any other single or shared female local bus slots instead of PCI male local bus and PCI female local bus slot.
16. Variation 14 : As in any of the above but with the memory ram slot for the 168 pin SIMM, DIMM, RDRam or faster memory ram modules mounted on the PCB .
17. Variation 15 : As in any or all the above for Type I (combined male/female) interface card but with electrical, electronic , electromagnetic, CPU devices patented or otherwise. This variation makes it more than a second intermediate parallel local bus card/connector. The current mainboards do not have any male local bus edge connector. The current add-on cards do not have female local bus slots. This is a new type of hybrid mainboard combined with an add-on peripheral card concept, and it has both the male local bus edge connector/s and the female local bus slot/s connector/s This is a new type of main board/s in any size and or of any shape (rectangular, square, hexagonal shape or any shape) with both the male local bus and the female local bus slot/s There can be one or more male edge connector / local bus at one or more edge/s of the PCB. This new type of main board combined with Type II and or Type III local bus expansion card/s allow/s the modular architecture to be applied to a new type of computer - See Figures 13 and 14. With this variation it is possible for two or more new type mainboards to be stacked in a compact format and maximise the wide-open multiple pathways for transfer of data from one CPU to memory to storage device or even to another CPU back and forth
18. Variation 16 : As in any or all the above for Type II (Male/male) interface card but with electrical, electronic , electromagnetic, CPU devices patented or otherwise. This variation makes it more than a parallel local bus card/connector. With these electrical, electronic, electro magnetic, CPU devices etc, it maximises the potential of these new hybrid add-on peripheral cards. The current add-on cards do not have female local bus slots. This is a new type of hybrid mainboard combined with an add-on peripheral card concept, and it has both the male local bus edge connector/s and the female local bus slot/s connector/s This is a new type of add-on peripheral card/s in any size and or of any shape (rectangular, square, hexagonal shape or any shape) with one or more male edge connector/s at one or more edge/s of the PCB and with or without female bus slots connectors mounted on the PCB. This new type of add-on peripheral card/s which combined with Type I (combined male/female interface) connector/s and or Type III (female/female interface) connector/s and or expansion card/s allow/s the modular architecture to be applied to a new type of computer - See Figures 13 and 14.
19. Variation 17: A mirror image product of any or all of the above items.

Materials: PCB with/without components, female interface bus slot with metal connectors and plastic casing

Description of Difference from known products :

1. Type I combined male and female connector : There are no known printed circuit boards with the male local bus on one or more edges of the printed circuit board and with one or more corresponding female local bus slot mounted on the board (without any other electronic components mounted) as an intermediate connection between the main board and the add-on peripheral card/s and or for the purpose of reducing the minimal height of the computers by connecting the peripheral add-on cards parallel to the main board.
2. Type I combined male and female connector : There are no known printed circuit boards with both the male local bus on one or more edges of the printed circuit board and with one or more corresponding female local bus slot mounted on the board
3. Type I combined male and female connector: These products combine the two (the male local bus and the female local bus slots) together on the same board and also on both sides of the printed circuit board to produce a new type of parallel local bus card / connector , a new range and type of printed circuit board/s (a new type of main board/s) and for a new use.
4. Type II male/male connector: There are no known PCBs which have two male local bus on opposite edges of the PCB or one or more edge connector on more than one edge of the printed circuit board and forming part of the PCB which allows connection to two female local bus slots.

5. Type II male/male connector: This product is a new type of expansion local bus card/ connector. This is also a new type of add-on peripheral card with one or more edge connector at more than one edge of the PCB.
6. Type III female/female connector: There are no known printed circuit boards with only the female local bus slot connector and yet bare of all electrical, electronic, electromagnetic, CPU items.
7. Type III female/female connector : There are no known PCBs with the female local bus slots mounted on both sides of the PCB
8. Type III female/female connector : There are no known female local bus slots joined back to back with a mirror image of another female local bus slot whether as a single pair or as multiple pairs.

Description of Purpose and commercial use :

The series of related inventions is for a simple rigid ISA/PCI/AGP interface connector or flexible connector or any other interface connector to act as an intermediate second connector to the respective interface connector so as to allow the appropriate add-on PCB or another mainboard PCB to be mounted in a parallel position to the mainboard PCB in the same plane or co-planar position instead of currently being mounted perpendicular at 90 degrees to each other. The male edge connector of the add-on peripheral card is slotted into the female bus slot of the intermediate second connector and the male edge connector of the intermediate second connector is slotted into the female bus slot mounted on the main board. In this manner, the peripheral add-on card is 90 degrees to the intermediate second connector which is a further 90 degrees to the main board, thereby resulting in the peripheral add-on card being parallel in position to the main board.

The second object of this series of inventions is to provide for a new type of hybrid peripheral add-on PCB with one or more male local bus on more than one edge of the PCB (or as many edges is present) according to the shape of the PCB (rectangular, square, hexagonal or any other shape) and with one or more female bus slots. This is a hybrid concept of the mainboard and the add-on peripheral card so that each of these new peripheral add-on cards can be linked or joined to one another in a modular architecture

A further objective of these series of inventions is to provide for a new type of hybrid mainboard with one or more male edges on as many edges as is allowed by the shape of the mainboard and with or without one or more female connectors on one or more surfaces of the PCB. This is a hybrid concept of the mainboard and the add-on peripheral card so that wide open multiple pathways of data transfer can be done between CPUs, memory, storage devices and other CPUs or between multiple new type mainboards stacked in a compact format.

1. The use of the special parallel local bus card (Parallel Type I - Combined Male & Female) allow the usual PCBs with the female local bus slots to be connected parallel to the second or third PCB with the male local bus instead of the usual 90 degrees perpendicular position of the second PCB to the first PCB (called the main board), changing the direction and relation of the main board to the other printed circuit boards
2. This allows a more compact united form of the main board with the other printed circuit boards, making possible thinner casings to house the main board and the other printed circuit boards
3. The variations of the Type II male/male local bus card allows two or more main boards to be directly connected in parallel to another main board . This allows a more compact stacked form of two or more main boards directly connected, with greater enhanced performance. Current main boards operate individually and independently in separate casings unless they are indirectly connected externally via a network using network cards
4. The variations of the Type III female/female local bus card (including single or multiple pairs) allows for direct parallel connection of two or more printed circuit boards (main boards) with the corresponding male local bus. It directly connects two or more main boards stacked parallel to each other, whereas current main boards operate individually and independently in separate casings unless they are indirectly connected externally via a network using network cards. This allows a more compact stacked form of the new type of two or more main boards (with the male local bus interface at one or more edges of the printed circuit board) which are directly connected, with greater enhanced performance and capability and to position the peripheral add-on cards parallel to the main board, thereby reducing the minimal height for the computer while using standard size components.
5. With the new type of main board/s and the add-on peripheral card/s, these can be connected in series or in parallel to each other to form modular computers.
6. A new type of modular computer using combinations of Type I and or Type II and or Type III. This allows modules to be exchanged or replaced without affecting the rest of the computer which can have two or more CPU modules in addition to a different module for each type of add-on card.

Drawings : See Figures 1 to 14

Summary :

The above variations of the various types of bus interface cards (Parallel Type I - Combined Male & Female) (using any of the appropriate various possible types of expansion bus interface standards known and or being developed and or are not yet develop) as an intermediate second connector/s allow the standard size peripheral add-on cards and or memory ram modules to be interfaced with the main board at a position parallel to the main board, reducing the minimal height of the computer and making it more compact. A particular variation is a new type of hybrid main board with the male bus component which can be directly connected in parallel and or in series (on the same plane) to each other and or to the peripheral add-on card/s with the use of the appropriate Parallel Type III (female/female) local bus card as an intermediate second connector/s.

The above variations of the various types of bus interface cards (Parallel Type II - Male/male) (using any of the appropriate various possible types of expansion bus interface standards known and or being developed and or are not yet developed) allow a more compact stacked form of two or more main boards directly connected by the intermediate second connector/s , with greater enhanced performance. A particular variation is a new type of hybrid main board with the male bus component and this new type of main board can be directly connected in parallel and or in series (on the same plane) to each other and or to the peripheral add-on card/s with the use of the appropriate Parallel Type III (female/female) local bus card. Another particular variation is a new type of hybrid add-on peripheral card with the edge connector on more than one edge of the printed circuit board.

The above variations of the various types of bus interface cards (Type III - Female/female) (using any of the appropriate various possible types of expansion bus interface standards known and or being developed and or are not yet developed) allow a more compact stacked form of the new type of two or more main boards allow a more compact stacked form of the new type of two or more main boards (with the male local bus interface at one or more edges of the printed circuit board) which are directly connected, with greater enhanced performance and capability and to position the peripheral add-on card/s in series or in a parallel position to the main board, thereby reducing the minimal height for the computer while using standard size components.

Combinations of the Type I, and or II and or III allows a modular architecture for the computer

The term "shape" applies to square, rectangular, hexagonal, or any other shape where applicable.

Where the physical size of the bus interface is varied whether it is larger, smaller or in miniature or in any other size, the various bus interface card (Parallel Type I, II & III) in its appropriate size will apply.

Claims :

Patent is to provide protection for the following :

1. Patent rights to the series of the invention/s Parallel Type I (combined male/female) connector/s with the appropriate local bus interface architecture including ISA, PCI, PCI-X, AGP, Slot 1, Slot A or any type of combined shared interface female slot eg ISA/PCI, ISA/AGP, PCI/AGP or any other type of interface standard, and any mirror image/s of the invention/s comprising of a printed circuit board (PCB) with one edge used as a male local bus connector and with one female bus slot mounted on the PCB, the width of the PCB being the sum of the width of the male local bus connector and the width of the female local bus slot, the length of the the PCB being equal to the length of the female local bus slot. In the minimal form of the Parallel Type I (combined male/female) connector, there is only one male local bus connector and one female local bus slot.
2. Patent rights to the minimal form of the Parallel Type I (combined female/male) connector and its use as an intermediate second connector/s between the mainboard and the add-on peripheral card/s to the respective interface connector so as to allow the appropriate add-on peripheral card or another mainboard to be mounted in a position parallel to the mainboard in the same plane or co-planar position instead of currently being mounted perpendicular at 90 degrees to each other.
3. Patent rights to the use of the series of inventions Parallel Type I (combined male/female) connector in the minimal form with the appropriate local bus interface architecture including ISA, PCI, PCI-X, AGP, Slot 1, Slot A or any type of combined shared interface female slot eg ISA/PCI, ISA/AGP, PCI/AGP or any other type of interface standard, and any mirror image/s of the invention/s and used as an intermediate second connector/s between the mainboard and the add-on peripheral card/s to the respective interface connector so as to allow the appropriate add-on peripheral card or another mainboard to be mounted in a position parallel to the mainboard in the same plane or co-planar position instead of currently being mounted perpendicular at 90 degrees to each other.
4. Patent rights to the series of invention/s Parallel Type I (combined male/female) connector with the appropriate local bus interface architecture including ISA, PCI, PCI-X, AGP, Slot 1, Slot A or any type of combined shared interface female slot eg ISA/PCI, ISA/AGP, PCI/AGP or any other type of interface standard, and any mirror image/s of the invention/s comprising of a PCB with one edge used for one or more than one male local bus connector/s and with more than one female bus slot/s mounted on the PCB, each female bus slot mounted parallel to each other on the PCB with a minimum of 20-25 mm apart.
5. Patent rights to the use of the series of invention/s Parallel Type I (combined male/female) connector with the appropriate local bus interface architecture including ISA, PCI, PCI-X, AGP, Slot 1, Slot A or any type of combined shared interface female slot eg ISA/PCI, ISA/AGP, PCI/AGP or any other type of interface standard, and any mirror image/s of the invention/s comprising of a PCB with one edge used for one or more than one male local bus connector/s and with more than one female bus slot/s mounted on the PCB, each female bus slot mounted parallel to each other on the PCB with a minimum of 20-25 mm apart and used as an intermediate second connector/s between the mainboard and the add-on peripheral card/s to the respective interface connector so as to allow the appropriate add-on peripheral card or another mainboard to be mounted in a position parallel to the mainboard in the same plane or co-planar position instead of currently being mounted perpendicular at 90 degrees to each other.
6. Patent rights to the series of inventions Parallel Type I (combined male/female) connector with the appropriate local bus interface architecture including ISA, PCI, PCI-X, AGP, Slot 1, Slot A or any type of combined shared interface female slot eg ISA/PCI, ISA/AGP, PCI/AGP or any other type of interface standard, and any mirror image/s of the invention/s comprising of a PCB with more than one edge used for one or more than one male local bus connector and with one or more than one female local bus slot mounted on the PCB with the female local bus slots parallel to each other with a minimum of 20-25 mm apart.
7. Patent rights to the use of the series of inventions Parallel Type I (combined male/female) connector with the appropriate local bus interface architecture including ISA, PCI, PCI-X, AGP, Slot 1, Slot A or any type of combined shared interface female slot eg ISA/PCI, ISA/AGP, PCI/AGP or any other type of interface standard, and any mirror image/s of the invention/s comprising of a PCB with more than one edge used for one or more than one male local bus connector and with one or more than one female local bus slot mounted on the PCB with the female local bus slots parallel to each other with a minimum of 20-25 mm apart and used as an intermediate second connector/s between the mainboard and the add-on peripheral card/s to the respective interface connector so as to allow the appropriate add-on peripheral card or another mainboard to be mounted in a position parallel to the mainboard in the same plane or co-planar position instead of currently being mounted perpendicular at 90 degrees to each other.
8. The Concept and patent rights to the series of the invention/s Parallel Type I (combined male/female) connectors and its use as an intermediate second connector/s between the mainboard and the add-on peripheral card/s to the respective interface connector so as to allow the appropriate add-on peripheral card

or another mainboard to be mounted in a position parallel to the mainboard in the same plane or co-planar position instead of currently being mounted perpendicular at 90 degrees to each other. It permit/s joining in parallel one printed circuit board (PCB) with female local bus slots to another printed circuit board with male local bus at one or more edge/s of the printed circuit board to reduce the height of the computer using any variation of the expansion local bus card (Parallel Type I - Combined Male & Female) of the appropriate local bus interface architecture using any of the appropriate various possible types of expansion bus interface standards known and or being developed and or are not yet developed. Patent rights to all the variations of the new combined expansion local bus card (Parallel Type I - Combined Male & Female) with both female local bus slots and male local bus / edge connector with one or more edge connector at one or more edge/s of the PCB using any of the appropriate various possible types of expansion bus interface standards known and or being developed and or are not yet developed. The various types include the PCI /PCI-X Type I adapter/connector known as PCI /PCI-X interface Type I female local bus slot mounted on a PCB with male edge connector, the AGP Type I adapter/connector known as AGP interface Type I female bus slot mounted on a PCB with male edge connector., the Slot 1 Type I adapter/connector known as Slot 1 interface Type I female bus slot mounted on a PCB with male edge connector, the Slot A Type I adapter/connector known as Slot A interface Type I female bus slot mounted on a PCB with male edge connector, the memory ram slot Type I connector known as the 168 pin SIMM, DIMM or RDRam or faster female memory slot mounted on a PCB with the male edge connector and any type of combined shared interface female slot eg ISA/PCI, ISA/AGP, PCI/AGP or any other type of interface standard, and any mirror image/s of any of the Parallel Type I adapters/connectors herein mentioned.

9. Patent rights to the series of invention/s Parallel Type II (male/male) connector comprising of a PCB with the appropriate local bus interface architecture including ISA, PCI, PCI-X, AGP, Slot 1, Slot A and with two opposite edges used as male local bus connectors. In the minimal form there are no other components.
10. Patent rights to the minimal form of the Parallel Type II (male/male) connectors and its use as an intermediate second connector/s between two or more mainboards with the appropriate female bus slots to be connected through their respective interface connectors so as to allow these mainboards to be mounted in a parallel position to the first mainboard in the same plane or co-planar position.
11. Patent rights to the use of the series of invention/s Parallel Type II (male/male) connector in the minimal form and with the appropriate local bus interface architecture including ISA, PCI, PCI-X, AGP, Slot 1, Slot A and used as an intermediate second connector/s between two or more mainboards with the appropriate female bus slots to be connected through their respective interface connectors so as to allow these mainboards to be mounted in a parallel position to the first mainboard in the same plane or co-planar position.
12. Patent rights to the series of invention/s Parallel Type II (male/male) connector with the appropriate local bus interface architecture including ISA, PCI, PCI-X, AGP, Slot 1, Slot A and with one or more male local bus on one or more edge/s of the printed circuit board wired back to back.
13. Patent rights to the use of of invention/s Parallel Type II (male/male) connector with the appropriate local bus interface architecture including ISA, PCI, PCI-X, AGP, Slot 1, Slot A and with one or more PCI male local bus on one or more edge/s of the PCB as an intermediate second connector/s between two or more mainboards with the appropriate female bus slots or between two add-on cards or or between the main board and another add-on peripheral card to be connected through their respective interface connectors so as to allow these mainboard/s and or add-on peripheral card/s to be mounted in a parallel position to the first mainboard or add-on peripheral card in the same plane or co-planar position
14. The Concept and patent rights to the series of the invention/s Parallel Type II (male/male) connectors with the appropriate local bus interface architecture including ISA, PCI, PCI-X, AGP, Slot 1, Slot A and its use as an intermediate second connector/s between two or more mainboards with the appropriate female bus slots to be connected through their respective interface connectors so as to allow these mainboards to be mounted in a parallel position to the first mainboard in the same plane or co-planar position. It permit/s joining in parallel two printed circuit boards with female local bus slot/s like main boards using any of the variations of the expansion local bus card (Parallel Type II - Male/male) of the appropriate local bus interface architecture using any of the appropriate various possible types of expansion bus interface standards known and or being developed and or are not yet developed. Patent rights to the new type of expansion local bus card (Parallel Type II - Male/male) and its variations in any size and using any of the appropriate various possible types of expansion bus interface standards known and or being developed and or are not yet developed. The various types include the PCI Type II adapter/connector known as PCI interface Type II male/male with male edge connectors on opposite edges of the PCB, the AGP Type II adapter/connector known as AGP interface Type II male/male with male edge connectors on opposite edges of the PCB, the Slot 1 Type II adapter/connector known as Slot 1 interface Type II male/male with male edge connectors on opposite edges of the PCB, the Slot A Type II adapter/connector known as Slot A interface Type II male/male with male edge connectors on opposite edges of the PCB, and any mirror image/s of any of the Parallel Type II adapters/connectors herein mentioned.

15. Patent rights to the series of invention/s Parallel Type III (female/female) connectors with the appropriate local bus interface architecture including ISA, PCI, PCI-X, AGP, Slot 1, Slot A or any type of combined shared interface female slot eg ISA/PCI, ISA/AGP, PCI/AGP or any other type of interface standard, and any mirror image/s of the invention/s comprising of two female local bus slots mounted parallel to each other on the PCB with a minimum of 20-25 mm apart. In the minimal form there are only two female local bus slots and no other components.
16. Patent rights to the series of invention/s Parallel Type III (female/female) connectors with the appropriate local bus interface architecture including ISA, PCI, PCI-X, AGP, Slot 1, Slot A or any type of combined shared interface female slot eg ISA/PCI, ISA/AGP, PCI/AGP or any other type of interface standard, and any mirror image/s of the invention/s comprising of two female local bus slot/s connectors mounted back to back to each other on the PCB or manufactured as a single unit/entity with one female bus slot opening on the right side and another female bus slot opening on the left side of the single unit/entity.
17. Patent rights to the to the use of the series of inventions Parallel Type III (female/female) connector/s in the minimal form/s with the appropriate local bus interface architecture including ISA, PCI, PCI-X, AGP, Slot 1, Slot A or any type of combined shared interface female slot eg ISA/PCI, ISA/AGP, PCI/AGP or any other type of interface standard, and any mirror image/s of the invention/s and used as an intermediate second connector/s between two mainboards or between the main board and the add-on peripheral card/s to the respective interface connector so as to allow the two mainboards or the mainboard and the add-on peripheral card to be mounted in a position/s parallel to the first mainboard in the co-planar position.
18. Patent rights to the series of inventions Parallel Type III (female/female) connector/s with the appropriate local bus interface architecture including ISA, PCI, PCI-X, AGP, Slot 1, Slot A or any type of combined shared interface female slot eg ISA/PCI, ISA/AGP, PCI/AGP or any other type of interface standard, and any mirror image/s of the invention/s comprising of more than two female local bus slots mounted parallel to each other on the PCB with a minimum of 20-25mm apart with or without electrical electronic memory slots storage devices or any electromagnetic devices.
19. Patent rights to the to the use of the series of inventions Parallel Type III (female/female) connector/s with the appropriate local bus interface architecture including ISA, PCI, PCI-X, AGP, Slot 1, Slot A or any type of combined shared interface female slot eg ISA/PCI, ISA/AGP, PCI/AGP or any other type of interface standard, and any mirror image/s of the invention/s with more than two female local bus slots on the PCB and used as an intermediate second connector/s between two mainboards or between the main board and the add-on peripheral card/s to the respective interface connector so as to allow the two mainboards or the mainboard and the add-on peripheral card to be mounted in a position/s parallel to the first mainboard in the co-planar position
20. The Concept and patent rights to the series of invention/s Parallel Type III (female/female) connectors with the appropriate local bus interface architecture including ISA, PCI, PCI-X, AGP, Slot 1, Slot A or any type of combined shared interface female slot eg ISA/PCI, ISA/AGP, PCI/AGP or any other type of interface standard, and any mirror image/s of the invention/s and its use as an intermediate second connector/s between two or more mainboards with the appropriate male local bus edge/s and or the add-on peripheral card/s to the respective interface connector so as to allow the appropriate add-on peripheral card or another mainboard/s to be mounted in a parallel position to the mainboard in the same plane or co-planar position instead of currently being mounted perpendicular at 90 degrees to each other. It permit/s joining in parallel two or more printed circuit main boards with male local bus and or to join the main board/s in the parallel position to any appropriate peripheral add-on cards using the expansion female local bus card (Parallel Type III - Female/female) of the appropriate local bus interface architecture using any of the appropriate various possible types of expansion bus interface standards known and or being developed and or are not yet developed, and any type of combined shared interface female slot eg ISA/PCI, ISA/AGP, PCI/AGP or any other type of interface standard. The various types include all the variations of the new expansion local bus card/device Parallel Type III Female/female connector joined back to back with each other or multiple female slots in one row whether of a homogenous interface type or a mixed row of interface types on one or more surface of a PCB, the PCI interface Type III female/female bus slots, the AGP Type III adapter/connector known as AGP interface Type III female/female connector, the Slot I Type III adapter/connector known as Slot I interface Type III female/female connector, the Slot A Type III adapter/connector known as Slot A interface Type III female/female connector, the ram memory slot Type III connector known as the 168 pin SIMM, DIMM, RDRam or faster memory ram modules joined back to back with each other, and any mirror image/s of any of the Parallel Type III adapters/connectors herein mentioned. Where there is a second set of female slots on the PCB, these are for add-on peripheral cards without the back edge external connectors, these add-on cards being dedicated PCBs for multiple CPUs or multiple ram memory chips/modules or any other type which does not have the back edge external connector/s.
21. Patent rights to a new type of hybrid main board comprising of a PCB of any size or shape (rectangular, square, hexagonal shape or any other shape) with one male local bus connector and with CPU/s electronic

electromagnetic memory storage device/s mounted on it with one or more than one female local bus slots connector mounted on the PCB with the appropriate local bus interface architecture including ISA, PCI, PCI-X, AGP, Slot 1, Slot A or any type of combined shared interface female slot eg ISA/PCI, ISA/AGP, PCI/AGP or any other type of interface standard, and any mirror image/s of the invention/s. It is a hybrid of the current mainboards and the current add-on peripheral cards. Current mainboards do not have male local bus connector using the edge of the PCB, while current add-on peripheral cards do not have female local bus slots mounted on the PCB. The hybrid main board has both the male local bus connectors using the edge of the PCB and the female local bus slots mounted on the PCB.

22. Patent rights to the use in a modular architecture of a computer of the new type of hybrid main board of any size or shape and with one male local bus connector and with CPU/s electronic electromagnetic memory storage device/s mounted on it with or without one or more than one female local bus slots connector mounted on the PCB with the appropriate local bus interface architecture including ISA, PCI, PCI-X, AGP, Slot 1, Slot A or any type of combined shared interface female slot eg ISA/PCI, ISA/AGP, PCI/AGP or any other type of interface standard, and any mirror image/s of the invention/s and to be connected to another main board or add-on peripheral card using the Parallel Type III (female/female) connector/s in the same plane or co-planar position
23. Patent rights to a new type of hybrid main board comprising of a PCB of any size or shape (rectangular, square, hexagonal shape or any other shape) with more than one male local bus connector on one or more than one edge of the PCB and with CPU/s electronic electromagnetic memory storage device/s mounted it with or without female local bus slots connector mounted on the PCB with the appropriate local bus interface architecture including ISA, PCI, PCI-X, AGP, Slot 1, Slot A or any type of combined shared interface female slot eg ISA/PCI, ISA/AGP, PCI/AGP or any other type of interface standard, and any mirror image/s of the invention/s.
24. Patent rights to the use in a modular architecture of a computer of the new type of hybrid main board of any size or shape and with more than one male local bus connector on one or more than one edge of the PCB and with CPU/s electronic electromagnetic memory storage device/s mounted on it with or without one or more than one female local bus slots connector mounted on the PCB with the appropriate local bus interface architecture including ISA, PCI, PCI-X, AGP, Slot 1, Slot A or any type of combined shared interface female slot eg ISA/PCI, ISA/AGP, PCI/AGP or any other type of interface standard, and any mirror image/s of the invention/s and to be connected to another main board or add-on peripheral card using the Parallel Type III (female/female) connector/s in the same plane or co-planar position.
25. Patent rights to a new type of hybrid main board comprising of a PCB of any size or shape (rectangular, square, hexagonal shape or any other shape) and with one male local bus connector on one or more than one edge of the PCB and with CPU/s electronic electromagnetic memory storage device/s mounted on the PCB and with or without one or more than one female local bus slots connector mounted on both sides of the PCB with the appropriate local bus interface architecture including ISA, PCI, PCI-X, AGP, Slot 1, Slot A or any type of combined shared interface female slot eg ISA/PCI, ISA/AGP, PCI/AGP or any other type of interface standard, and any mirror image/s of the invention/s.
26. Patent rights to the use in a modular architecture of a computer of the new type of hybrid main board of any size or shape and with one male local bus connector on one or more than one edge of the PCB and with CPU/s electronic electromagnetic memory storage device/s mounted on it with or without one or more than one female local bus slots connector mounted on both sides of the PCB with the appropriate local bus interface architecture including ISA, PCI, PCI-X, AGP, Slot 1, Slot A or any type of combined shared interface female slot eg ISA/PCI, ISA/AGP, PCI/AGP or any other type of interface standard, and any mirror image/s of the invention/s and to be connected to another main board or add-on peripheral card using the Parallel Type III (female/female) connector/s in the same plane or co-planar position.
27. Patent rights to a new type of hybrid main board comprising of a PCB of any size or shape (rectangular, square, hexagonal shape or any other shape) and with more than one male local bus connector on one or more than one edge of the PCB and with CPU/s electronic electromagnetic memory storage device/s mounted on the PCB and with or without one or more than one female local bus slots connector mounted on both sides of the PCB with the appropriate local bus interface architecture including ISA, PCI, PCI-X, AGP, Slot 1, Slot A or any type of combined shared interface female slot eg ISA/PCI, ISA/AGP, PCI/AGP or any other type of interface standard, and any mirror image/s of the invention/s.
28. Patent rights to the use in a modular architecture of a computer of the new type of hybrid main board of any size or shape and with one or more than one male local bus connector on one or more than one edge of the PCB and with CPU/s electronic electromagnetic memory storage device/s mounted on the PCB and with or without female local bus slot/s connector mounted on both sides of the PCB with the appropriate local bus interface architecture including ISA, PCI, PCI-X, AGP, Slot 1, Slot A or any type of combined shared interface female slot eg ISA/PCI, ISA/AGP, PCI/AGP or any other type of interface standard, and any mirror image/s of the invention/s and to be connected to another main board or add-on peripheral card using the Parallel Type III (female/female) connector/s in the same plane or co-planar position

29. The Concept and patent rights to the series of invention/s of a **new type of Hybrid mainboards with one or more male local bus edge** comprising of the new type of main board/s of any size or shape (rectangular, square, hexagonal shape or any other shape) and with the male local bus interface at one or more edges of the printed circuit board or as many edges as permitted by the shape of the new PCB mainboard , and or having one or more female interface slot/s on one or both surface/s of the PCB so as to permit the interboard connection from one surface of one PCB to another surface of another adjacent PCB in the coplanar/parallel position using the appropriate Parallel Type II Male/male interface connector, and or the joining of the two or more mainboard PCBs directly in parallel (on two or more parallel planes) and or in series (on the same plane) to each other and or to the peripheral add-on cards with the use of the appropriate Parallel Type III Female/female local bus card thereby reducing the height for the computer using any of the appropriate various possible types of expansion bus interface standards known and or being developed and or are not yet developed. Patent rights to the new main board/s of any size or shape (rectangular, square, hexagonal shape or any shape) with combined female local bus slots and male local bus / edge connector with one or more edge connector at one or more edge/s of the PCB using any of the appropriate various possible types of expansion bus interface standards known (including PCI, PCI-X, AGP, Slot I, Slot A and memory modules) and or being developed and or are not yet developed. Patent rights to all the variations of the new type of main board/s of any size or shape (rectangular, square, hexagonal shape or any shape) and any mirror image/s of the new mainboards herein mentioned, with one or more male local bus on one or more edges of the printed circuit board and as part of the printed circuit board (with or without any female bus slot on the main board/s) using any of the appropriate various possible types of expansion bus interface standards known (including PCI, PCI-X, AGP, Slot I, Slot A and memory modules) and or being developed and or are not yet developed. The new mainboards include those with one or more of the appropriate interface female bus slots on one or both sides/surfaces of the mainboard and with or without other electronic components on one or both sides of the PCB mainboard. Where there is a second set of female slots on the PCB, these are for add-on peripheral cards without the back edge external connectors, these add-on cards being dedicated PCBs for multiple CPUs or multiple ram memory chips/modules or any other type which does not have the back edge external connector/s.
30. Patent rights to a **new type of Hybrid mainboard** with the appropriate local bus interface architecture including ISA, PCI, PCI-X, AGP, Slot I, Slot A or any type of combined shared interface female slot eg ISA/PCI, ISA/AGP, PCI/AGP or any other type of interface standard, and any mirror image/s of the invention/s and with one or more female connectors on one or more surfaces of the PCB **AND** with or without one or more than one male edge connector on as many edges as is allowed by the shape of the mainboard and together with the appropriate Type II connector to directly link up more than one main board or linked up to an add-on peripheral card in a stacked or co-planar position so as to provide for wide open multiple pathways for data transfer. This is a hybrid concept of the mainboard and the add-on peripheral card so that wide open multiple pathways of data transfer can be done between CPUs, memory, storage devices and other CPUs or between multiple new type mainboards which can be directly linked and stacked in a compact format. Current mainboards do not have a male local bus edge connector and needs to be linked by external wires even though they may be stacked together.
31. Patent rights to the new type of **Hybrid add-on peripheral cards** of any size or shape (rectangular, square, hexagonal shape or any shape) and any mirror image/s of the new add-on peripheral cards herein mentioned, with one or more than one male local bus connector on more than one edge of the printed circuit board on one or more edges or as many edges as permitted by the shape of the new add-on peripheral card and as part of the printed circuit board (with or without any female bus slot on the PCB) using any of the appropriate various possible types of expansion bus interface standards known (including PCI, PCI-X, AGP, Slot I, Slot A and memory modules) and or being developed and or are not yet developed. The new peripheral add-on cards include those with electronic components on one or on both surfaces of the PCB with or without one or more interface female bus slot on one or both surfaces of the PCB. Current add-on peripheral cards has only one male local bus connector and no female local bus slots mounted on the PCB. The new hybrid add-on peripheral cards combine the features of the main board with the add-on peripheral card. The difference bewteen the new hybrid main board and the new hybrid add-on peripheral card is that of size and components with the main board as the main board and the add-on peripheral card as an add-on peripheral card.
32. Patent rights to the new type of **Hybrid add-on peripheral cards** of any size or shape (rectangular, square, hexagonal shape or any shape) with the appropriate local bus interface architecture including ISA, PCI, PCI-X, AGP, Slot I, Slot A or any type of combined shared interface female slot eg ISA/PCI, ISA/AGP, PCI/AGP or any other type of interface standard, and any mirror image/s of the invention/s and any mirror image/s of the new add-on peripheral cards herein mentioned, with one male local bus connector on one
33. edge of the printed circuit board with one or more female bus slot on the PCB using any of the appropriate various possible types of expansion bus interface standards known (including PCI, PCI-X, AGP, Slot I, Slot A and memory modules) and or being developed and or are not yet developed. The new peripheral add-on

cards include those with electronic components on one or on both surfaces of the PCB with or without one or more interface female bus slot on one or both surfaces of the PCB.

34. Patent rights to use in a modular architecture of a computer of the new type of **Hybrid** add-on peripheral cards of any size or shape (rectangular, square, hexagonal shape or any shape) with the appropriate local bus interface architecture including ISA, PCI, PCI-X, AGP, Slot 1, Slot A or any type of combined shared interface female slot eg ISA/PCI, ISA/AGP, PCI/AGP or any other type of interface standard, and any mirror image/s of the invention/s and any mirror image/s of the new add-on peripheral cards herein mentioned, with one male local bus connector on one edge of the printed circuit board with one or more female bus slot on the PCB using any of the appropriate various possible types of expansion bus interface standards known (including PCI, PCI-X, AGP, Slot 1, Slot A and memory modules) and or being developed and or are not yet developed. The new peripheral add-on cards include those with electronic components on one or on both surfaces of the PCB with or without one or more interface female bus slot on one or both surfaces of the PCB
35. Patent rights to a new type of Hybrid peripheral add-on PCB with the appropriate local bus interface architecture including ISA, PCI, PCI-X, AGP, Slot 1, Slot A or any type of combined shared interface female slot eg ISA/PCI, ISA/AGP, PCI/AGP or any other type of interface standard, and any mirror image/s of the invention/s and with one male local bus on one edge of the PCB **AND** with one or more female local bus slots **OR** with more than one male local bus on more than one edge of the PCB as permitted by as many edges of the PCB with or without one or more female local bus slot/s **AND** according to the shape of the PCB (rectangular, square, hexagonal or any other shape) and its use to directly link with another peripheral add-on PCB or main board. This is a hybrid concept of the mainboard and the add-on peripheral card so that each of these new peripheral add-on cards can be linked or joined to one another in a modular architecture. Current add-on peripheral cards cannot be linked to another except through the main board.
36. Patent rights to the new type of **Hybrid** add-on peripheral cards of any size or shape (rectangular, square, hexagonal shape or any shape) with the appropriate local bus interface architecture including ISA, PCI, PCI-X, AGP, Slot 1, Slot A or any type of combined shared interface female slot eg ISA/PCI, ISA/AGP, PCI/AGP or any other type of interface standard, and any mirror image/s of the invention/s and any mirror image/s of the new add-on peripheral cards herein mentioned, with more than one male local bus connector on one or more than edge of the printed circuit board with one or more female bus slot on the PCB using any of the appropriate various possible types of expansion bus interface standards known (including PCI, PCI-X, AGP, Slot 1, Slot A and memory modules) and or being developed and or are not yet developed. The new peripheral add-on cards include those with electronic components on one or on both surfaces of the PCB with or without one or more interface female bus slot on one or both surfaces of the PCB
37. Patent rights to use in a modular architecture of a computer of the new type of **Hybrid** add-on peripheral cards of any size or shape (rectangular, square, hexagonal shape or any shape) with the appropriate local bus interface architecture including ISA, PCI, PCI-X, AGP, Slot 1, Slot A or any type of combined shared interface female slot eg ISA/PCI, ISA/AGP, PCI/AGP or any other type of interface standard, and any mirror image/s of the invention/s and any mirror image/s of the new add-on peripheral cards herein mentioned, with more than one male local bus connector on one or more than one edge of the printed circuit board with one or more female bus slot on the PCB using any of the appropriate various possible types of expansion bus interface standards known (including PCI, PCI-X, AGP, Slot 1, Slot A and memory modules) and or being developed and or are not yet developed. The new peripheral add-on cards include those with electronic components on one or on both surfaces of the PCB with or without one or more interface female bus slot on one or both surfaces of the PCB
38. Patent rights to the concept and or production of modular computers using the various combinations of Type I, and or II and or III applied to the modular architecture for computers using several special boards each complete for the module and joined to each other on two to four edges with the add-on cards (sound card, ethernet card, display card and others) which require an external port to be placed on the outer margins of the completed modular computer (see Annex 4)
39. The apparatus of any of the above claims whereby the connection to the appropriate interface slots and or male edge connection is by the use of flexible cables and the multiple PCBs are secured and stabilised in the coplanar/parallel position with the use of support polymer/plastic pillars or screws and appropriate tubes for securing the screws and PCBs, these support pillars being of fixed height or variable/adjustable height.
40. Where the physical size of the bus interface/s and or the new type of main board/s and or the new add-on peripheral card/s is/are varied whether it is larger, smaller or in miniature or in any other size, the various bus interface card/s (Parallel Type I - Combined Male & Female, Type II - Male/male, and Type III - Female/female) and or the new type of main board/s and or the new add-on peripheral card/s in its appropriate size will apply. The term "shape" applies to all shapes (square, rectangular, hexagonal and or any other shape). The term local bus interface includes all and any variation/s of the ISA, PCI, PCI-X, AGP interface standards or shared ISA/PCI, ISA/AGP, PCI/AGP or any faster interface standards or any other interface standards known or being developed and or are not yet developed. The design, manufacture,

utilisation and sale of the any and or all the above items using all or any of the local bus standard architecture known and or being developed and or are not yet developed and the sale of other products using any of the above items in their product, except by the owner of the patent and/or his agent/s. All of these claims apply particularly to the personal computer, IBM and compatibles including workstations and servers, and also to other types of computers where applicable.