

MODULAR PCMCIA CARD**BACKGROUND OF THE INVENTION****1. Field of the Invention**

The subject invention relates to PCMCIA cards. More particularly, it relates to a modular PCMCIA card comprising a base piece that conforms to the PCMCIA Type I or Type II physical dimensions and an interlocking second part that when added to the first piece conforms to the PCMCIA Type III dimensions.

2. Description of the Prior Art

The PCMCIA (Personal Computer Memory Card International Association) standard was developed for the purpose of providing user installed memory and I/O functions for small form factor digital computer systems. The standard specifies a card containing a printed circuit board. This product is usually referred to as a PC card. There are three PC card formats: Types I, II and III. All three have external dimensions of 54 millimeters by 85.6 millimeters. Thicknesses vary. Type I is 3.3 millimeters thick. Type II is 5 millimeters thick and Type III is 10.5

millimeters thick. The cards look similar to a conventional credit card. The standard specifies a 68 position connector on one end. The 68 position connector plugs into a mating connector mounted on a header which is in turn mounted to a mother board or daughter board which is located inside the host. The header is typically U shaped with the 68 pins at the base of the U. There is a wide variation of headers including headers for different thickness cards; however, the 68 pin connector is common to all PCMCIA cards.

The original PC cards were for memory addition and thus had no interaction with external devices. I/O cards were developed later to add functions such as modems, faxes, network interfaces, multi-media interface, sound cards, etc. In order to handle I/O functions, a second connector is located on the end of the card opposite the 68 pin connector. The I/O connector reaches the outside world through a cable.

Type I and Type II PCMCIA cards fit into the same PCMCIA slots. A Type III card would occupy two vertically stacked PCMCIA Type I/II slots. Most notebook size computers have one or two PCMCIA Type I/II slots. Most subnotebook and handheld computers have but one Type I/II slot. Very few computers of any size have Type III slots yet. However, there is a strong need for the functionality that only the larger volume of a Type III card can provide such as to accommodate a harddisk drive. There is expected to be a strong trend to computers with Type III slots in the coming years, but there is currently a large installed base of computers with Type I/II slots only, and this installed base will

grow substantially. Thus there is a need for a modular PCMCIA card that can perform certain functionality as a Type I or II card for those computers that only have a Type I/II slot and at the same time provide Type III card functionality for computers that have a Type III slot.

In addition, as pointed out in the co-pending patent application referenced in the first section of this application, there is a need for a stand alone computer that fits the PCMCIA format. This computer acts as a companion to a desktop or other larger computer. When in the larger computer, the PCMCIA card acts as additional memory. When out of the larger computer, the PCMCIA card is a stand alone computer. Because this is very difficult to accomplish with a Type I or Type II card, it is desirable to have a way to get added volume for the additional components without sacrificing PCMCIA card, Type I or II compatibility.

SUMMARY

The present invention provides a modular PCMCIA card which includes a base member conforming to the Type I or Type II physical dimensions and an add on section adapted to mechanically and electrically connect with the base member and having dimensions such that when the base member and the add on section are joined, they conform to the dimensions of a PCMCIA Type III card. The add on section may contain one or more functional units of a stand alone

computer system and may contain a modem, pager and/or an infrared transceiver.

BRIEF DESCRIPTION OF THE DRAWING

The preferred embodiments of the invention will now be described in conjunction with the Drawing, wherein:

Figure 1 is a perspective drawing of the modular PCMCIA card according to the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

According to one aspect of the present invention a modular Type III PCMCIA card consists of a base member that conforms to the PCMCIA Type I or Type II physical dimensions and an interlocking add on part that when attached to the base member conforms to the PCMCIA Type III dimensions.

Figure 1 is a perspective drawing of the modular PCMCIA card according to the present invention. Referring now to Figure 1, a base member 10 is a Type II PCMCIA card and consists of an edge area 12 that is 3.3 mm thick. Base member 10 has a rectangular top view with a short sides 14 and 16 and long sides 18 and 20. Over a center area 22 of base member 10, the thickness increases to 5.0 mm. An interlocking add on section 24 corresponds in length and width to center area 22. Add on section 24 is 5.5 mm thick. Add on section 24 connects mechanically to base member 10 by means of a connector consisting of



a plurality of pins 26 located in add on section 24 and a plurality of mating sockets 28 in center area 22 of base member 10.

Base member 10 has a PCMCIA 68 pin connector located in the edge of short side 14 (not shown) and an I/O connector 30 located in the edge of short side 16.

Electrical connection between add on section 24 and base member 10 may in the preferred embodiment be done with the same pins 26 and socket 28 as is used for mechanical connection. Or, alternatively, a small cable or clip (not shown) may be used to connect I/O connector 30 of base member 10 to a corresponding connector 32 in add on section 24.

In operation, the combination of PCMCIA base member 10 with add on section 24 attached will be plugged into a Type III slot if one is available. Otherwise, modular add on section 24 may be detached and PCMCIA base member 10 may be inserted into the more common Type I/II slot.

The modularity allows a Type I or Type II PCMCIA card to house additional capabilities such as a removable or additional battery, memory, a modem or a pater unit.

According to another aspect of the invention, add on section 24 when attached to base member 10 need not conform to the PCMCIA Type III specification since it will not be inserted into a Type III slot.



Rather it will provide the peripheral features of a stand alone computer as described in the copending application referenced in the first section of this application. These peripheral features include, a keyboard such as a qwerty keyboard, a display such as a touch screen display, an LCD display, flash or SRAM a microprocessor and/or extra battery power. Alternatively, voice recognition capability could be provided. This would include a microphone, a speaker and a digital signal processor and voice recognition software. Yet another capability that could be included is an infrared transceiver for communicating remotely to a printer, another computer or for controlling other devices.

In operation PCMCIA base member 10 performs in two separate modes. When the base member 10 is not plugged into a PCMCIA slot in a host computer, add on section 24 is connected to it and together they are a stand alone computer. This means that it has a CPU, memory, an input device, an output device, its own power and a software operating system. In stand alone mode, the computer may be used to access and update various data bases such as phone directories, appointment calendars, etc. In the second mode, add on section 24 is removed and base member 10 is inserted into a PCMCIA Type I/II slot in a host computer. In this mode, power is supplied by the host. In use, data bases such a phone directory, or an appointment calendar that are routinely kept on the host are down loaded into a flash memory in base member 10. Any changes to these data bases entered when base member 10 was used as a stand alone computer are up loaded by the host into the host's data base. Thus, when base member

THIS SHEET HAS BEEN
REPLACED

10 is plugged into the host, the data in both are mutually updated so that they are the same.

The foregoing preferred embodiments are subject to numerous adaptations and modifications without departing from the concept of the invention. Therefore, within the scope of the appended claims, the invention may be practiced other than as specifically described herein.





WO 96/26479

THIS SHEET HAS BEEN
REPLACED

-8-

PCT/US96/01294

CLAIMS

What is claimed is:

1. A modular PCMCIA card comprising:
a card section conforming to the Type I physical dimensions;
an add on section adapted to mechanically and physically connect with said card section and having dimensions such that when said card section and said add on section are joined, they conform to the dimensions of a Type III card.
2. The system of claim 1 wherein said add on section contains an LCD display.
3. The system of claim 1 wherein said add on section contains a qwerty keyboard.
4. The system of claim 1 wherein said add on section contains a touch screen.
5. The system of claim 1 wherein said add on section contains flash memory.

This Sheet Has Been Replaced





WO 96/26479

THIS SHEET HAS BEEN
REPLACED

PCT/US96/01294

- 9 -

6. The system of claim 1 wherein said add on section contains a battery.

7. The system of claim 6 wherein said battery is rechargeable.

8. The system of claim 1 wherein said add on section contains a modem.

9. The system of claim 1 wherein said add on section contains a pager unit.

10. The system of claim 1 wherein said add on section contains an infrared transceiver.

11. A modular PCMCIA card comprising:
a card section conforming to the Type II physical dimensions;

an add on section adapted to mechanically and physically connect with said card section and having dimensions such that when said card section and said add on section are joined, they conform to the dimensions of a Type III card.

12. The system of claim 8 wherein said add on section contains an LCD display.

This Sheet Has Been Replaced



THIS SHEET HAS BEEN
REPLACED



-10-

13. The system of claim 8 wherein said add on section contains a qwerty keyboard.

14. The system of claim 8 wherein said add on section contains a touch screen.

15. The system of claim 8 wherein said add on section contains flash memory.

16. The system of claim 8 wherein said add on section contains a battery.

17. The system of claim 13 wherein said battery is rechargeable.

18. A modular PCMCIA card comprising:
a card section conforming to the Type II physical dimensions; and

an add on section adapted to mechanically and physically connect with said card section wherein said add on section contains at least one functional unit of a stand alone computer system.

19. The system of claim 15 wherein said add on section contains an LCD display.





THIS SHEET HAS BEEN
REPLACED

WO 96/26479

PCT/US96/01294

-11-

20. The system of claim 15 wherein said add on section contains a qwerty keyboard.

21. The system of claim 15 wherein said add on section contains a touch screen.

22. The system of claim 15 wherein said add on section contains flash memory.

23. The system of claim 15 wherein said add on section contains a battery.

24. The system of claim 20 wherein said battery is rechargeable.

This Sheet Has Been Replaced

