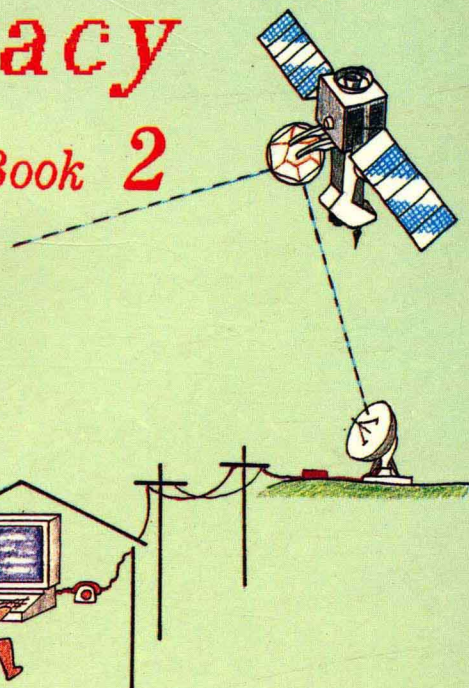


Computer Literacy

初中普通電腦科 第二册 Book 2

Miranda TSE • Wing-wah KI • Danny CHENG



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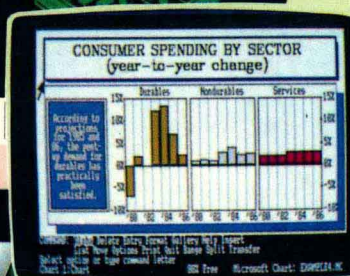
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初中普通電腦科 2

(Second Edition)

TSE LUK Siu Ping, Miranda

KI Wing Wah

CHENG Che Hung, Danny

Chief Editor:

TSE LUK Siu Ping, Miranda

Computer Education Publications Ltd.

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FOREWORD

Professor CHIN Yuk Lun, Francis

Head, Department of Computer Science

University of Hong Kong

President, Hong Kong Association for Computer Education

March 1989

In May 1986, I accepted the invitation from the Hong Kong Education Department to join the working party of formulating the Computer Literacy course. The working party mainly comprised of Computer Studies teachers from various schools, members of the Hong Kong Association for Computer Education and staff members of the Hong Kong Education Department. Throughout the summer, we were actively involved in the preparation of the draft Computer Literacy Syllabus. Meetings were held once or twice a week, many times after office hours and over weekends. I was very impressed by the enthusiasm and everlasting energy of the members of the working party. It was gratifying that, after a few months of hard work, the preliminary draft (both the English and Chinese versions) was approved by the Curriculum and Development Committee (CDC) for Computer Studies. Following the drafting of this syllabus, a questionnaire was issued to poll the teachers' opinion. Study groups were formed and a number of meetings were held to discuss the curriculum. Finally, the syllabus of the course was adopted. According to past practice, it has been a record that a new course for secondary schools was realized from scratch in such a short time.

The Computer Literacy course for Form 1 to 3 was launched in September 1987 as scheduled, and about 70 schools participated in this pilot scheme. During this period, good comments have been received from various sources. It has been planned to expand the course to more schools in the coming years. In view of the rapid advancement of technology, the Computer Education Centre at Hung Hom came in operation in December 1986 as a training and resource centre for the promotion of computer education in Hong Kong. In addition, the possibility of promoting computer literacy in all schools at the junior secondary level will be considered in the near future.

Besides the provision of suitable software for the hands-on experience of students, a good textbook is also crucial to the implementation of a well-balanced and successful syllabus. The Department of Computer Science, University of Hong Kong, together with the Hong Kong Education Department, have been developing software tailor-made for the education environment in Hong Kong. In order to provide the right software, a series of meetings and discussions on the requirements of the software were held with a group of experienced teachers and devoted staff of the Faculty of Education of the University of Hong Kong. Their valuable ideas and comments were considered in the implementation of the software packages. It was this group of people who, having the thorough understanding of the course material and software, prepared this textbook.

This text book is complete, well-organized and self-contained. Book 1 was written for the Form 1 syllabus, Book 2 for Form 2 and Book 3 for Form 3. In the books, English and Chinese languages are used appropriately to improve its readability for local students. The illustrations are colourful and attractive. Most importantly, it can incorporate the use of software and present the subject matter coherently with the philosophy of the course.

Again, many people have contributed to the success of this course, in particular, secondary school computer education teachers, staff members in the Education Department in Hong Kong Government, members of the Hong Kong Association for Computer Education, staff members in the Department of Professional Studies in Education, the Department of Education and the Department of Philosophy and of course, also my staff and students in the Department of Computer Science at the University of Hong Kong. I dare say that without the dedicated efforts and devotion of all these people, we would never be able to have this Computer Literacy course implemented and so well prepared for the Form I to Form III students in 1987. I urge the continual collaboration of these people to promote this Computer Literacy course in Hong Kong in the years to come.

前言

錢玉麟教授

香港大學
計算機科學系系主任
香港電腦教育學會會長
(一九八九年三月)

蒙香港教育署之邀，本人得於一九八六年五月參予策劃普通電腦科課程的工作小組；其成員主要為各校電腦科教師、香港電腦教育學會會員和香港教育署人員。在整個夏季，我們常安排在週末或工餘時間開會，每週約一至二次，積極投入籌備草擬普通電腦科課程綱要的工作中。其間，各成員熱誠的工作態度、無比的精神魄力，令我感動得很。經過數月的努力，電腦科課程委員會終於通過中英文版的課程綱要初稿，這實教人鼓舞不已。接着，有關方面發出問卷，徵詢教師的意見；更組織不少研究小組、召開連串會議，來討論課程的內容，最後，課程綱要終在這極短促的時間下，獲採納為中學新課程。這個課程大綱由籌草至完成，速度之快，亦可算是一項史無前例的紀錄。

在一九八七年九月，這項中一至中三普通電腦科課程得如期開辦。約有七十多間中學參加這個試驗計劃。試驗期間，課程獲各方好評。有關方面已計劃在未來數年，把課程推廣至更多中學；且有鑑於科技進步神速，位於紅磡的電腦教育中心亦於一九八六年十二月啓用，成為資源及培訓中心，在促進本港電腦教育。同時，有關方面將考慮在不久的將來，把普通電腦科推廣至全港各初中班級。

要推行一項內容充實與及全面成功的課程，除了應備有適當的軟件供實習外，一本優良的教科書更是重要。所以，香港大學計算機科學系一直與香港教育署聯袂研製一些切合香港教育環境的電腦軟件。我們更和香港大學教育學院一班熱心的教育工作者和一羣資深的教師召開一連串會議，討論軟件的規格，務求製作恰當的軟件來。設計軟件包的時候，各人不單對軟件包的製作提出寶貴的意見和批評，這班對課程內容和軟件用途均瞭如指掌的人士，更同時編寫了這套教科書。

這套教科書內容完備、條理分明、資料豐足，更依課程綱要分成三冊，分別適合中一、中二及中三年級使用。為配合本港學生的閱讀能力，全書均適當地以中文註釋，配上動人的彩色插圖，更重要的還是介紹了配合主題的軟件用法，貫徹整個課程宗旨。

總而言之，這項課程得以成功，實有賴不少人士的貢獻，特別是各校電腦科教師、教育署職員、香港電腦教育學會會員，及香港大學師範學系、教育學系、哲學系各同事，當然還有計算機科學系的同事與學生，大家的參與和支持，功不可沒。我敢肯定：若非大家的熱誠與幹勁，我們決不可在一九八七年在在中一至中三級推行這完備的普通電腦科。我謹懇請各位在未來的日子裏，繼續衷誠無間地合力推廣本港的普通電腦科課程！

PREFACE 序言

Computer Literacy grew out of an urgent need for a suitable textbook in a new subject area for our junior secondary schools.

Computer Literacy consists of Book 1, 2 and 3, each serving Form 1, 2 and 3 respectively in the Computer Literacy course.

Computer Literacy is written with the users in mind. The subject matter is structured in such a way that it covers the syllabus for Computer Literacy at junior secondary level as provided by the Curriculum Development Committee, Hong Kong. At the same time each module leads on to the next smoothly and logically. Moreover, each module is a self-contained unit. It contains theory, explanation, exercise and hands-on activities.

Computer Literacy presents the material coherently with the use of software which is provided to the schools running the course. No matter whether you are a BBC Computer user (Networking or Stand-alone computers), an Apple Computer user or a Commodore PC Machine user, your needs have been fully catered for.

Computer Literacy is intended for use in a classroom setting (with laboratory work), and the material is presented in a systematic and straightforward manner. Any student, teacher, or parent should find it easy to understand. The combination of carefully-written text, attractive and colourful illustrations, with appropriate Chinese explanations, should give people who are interested in computers a good basic knowledge of what computer literacy is about.

Computer Literacy is produced by the Computer Education Publications, formed by a team of educators dedicated to promoting computer education in Hong Kong. In the team, there are experienced computing teachers in secondary schools in Hong Kong and well-qualified lecturers in computer education at the University of Hong Kong and overseas. Among the authors, there is a wealth of expertise of teaching and developing course materials for computing subjects.

Completion of a book of this type requires the combined efforts of many people. The authors are indebted to the many individuals and groups who have provided us with their support and assistance: Prof. CHIN Yuk-Lun, Francis, Head of Department of Computer Science, University of Hong Kong for his expert advice and valuable suggestions; his colleagues and students, who

developed the software for use in the course; Professor Timothy MOORE, Dr. Laurence GOLDSTEIN and Mr. YU Kam-Por for their professional review of our book and giving us their consent for cross-referencing with their software packages in computer literacy; Mr. KAI Tak-Lung, Simon for his most valuable advice and comments; Mr. TONG Siu-Fai, Alex for his unfailing help and writing part of the informative text; Dr. Hubert O. BROWN, Mr. WONG Lop-Sun and Ms. CHOW Yuen Chu, Marie, our English and Chinese language editors, for their dedicated efforts that made the manuscript much more expressive in both English and Chinese; Mr. SHING Hung Ki and Mr. KWOK But who contributed their insight and valuable comments at various stages of our work. We also extend our warmest thanks to the many reviewers who provided invaluable feedback and guided the development of the book to its final form: Mr. MO Hin-Ling, Mr. LAI Suk-Ming, Mr. CHOI Wai-Keung, Mr. HO Wing-Kan, Dr. PUN Kwok-Hung and Mr. YU Yuen-Tak. May we also express our gratitude to the graphics designers, Mr. KWOK Siu-Kau, Ben, Mr. WONG Chun-Pong, Mark and Miss FOK On-Ki, for their vivid and artistic illustrations. We are also most thankful to the staff of the Hong Kong Computer Education Centre for their most valuable sources of information and reference.

Special thanks are conveyed to the Council and members of the Hong Kong Association for Computer Education; the Hong Kong Association for Science and Mathematics Education Ltd.; the Manager and staff of the Contemporary Development Company and Yih Mei Book Company for their unceasing and spontaneous assistance and co-operation which make the publication and distribution of this text book possible. And last but not least, our families for their understanding and patience when our work on the book took precedence over family activities.

This is the first complete series of our Book **Computer Literacy**. There may be plenty of room for improvement. Any suggestions or criticism will be most welcome.

CHENG Che Hung, Danny

KI Wing Wah

TSE LUK Siu Ping, Miranda

TO THE TEACHER 給老師的話

This series of book **Computer Literacy** has some carefully designed features to facilitate your teaching:

It contains many colourful diagrams and pictures -- to stimulate the interest of the students. Many of the pictures may be used as starting points for discussion and elaboration.

The text is made brief and straightforward, supplemented by a good deal of Chinese explanations to start with. Eventually, with the students' command of English as well as the grasp of computer concepts improve, the subject matter is gradually presented in a more comprehensive and sophisticated manner, in depth and in scope.

Students are encouraged to participate fully in the learning process by different activities: to read carefully, to discuss with the teacher or classmates, to collect information, to answer questions, to do exercises and to have hands-on experience with the computer.

LOGO programming is introduced in a systematic way, adopting an "interactive" approach. On the other hand, to consolidate their hands-on experience, they are guided to understand the rationale and important logical concepts behind programming.

"Turtle Playground" is specially designed for enlightening purposes. In the Playground, the programs are ready-made. The students only need to type in the programs exactly as shown and enjoy the fun when the programs are run. Although little intellectual demand is made on the students, they may develop an interest in learning more about programming. Challenges are incorporated to motivate the students to modify and develop the example programs.

In the text, teachers' notes are printed in italics. These notes are intended to supply more detailed information for reference purposes. A separate booklet for teachers (containing answers and reference material) is made available to teachers only.

Teaching diskettes contain programs or procedures used in the text books. Teachers can load the programs or procedures directly from the disks into the computers without re-typing them. It is hoped that the teaching diskettes will help to save teachers' time in the preparation of lessons. No matter whether you are a BBC Machine user, an Apple user, or a Commodore PC user, your needs have been fully catered for. These diskettes will only be made available to the schools using **Computer Literacy** for teaching purposes.

Some symbols are used to indicate the different activities :



POINTS FOR REFERENCE PURPOSES



SPECIAL POINT TO NOTE/REMEMBER



SPECIAL POINT TO WARRANT SPECIAL ATTENTION



SOMETHING FOR STUDENTS TO THINK ABOUT/DISCUSS



SOMETHING FOR DEBATE



ACTIVITIES/EXERCISE FOR STUDENTS



HANDS ON EXERCISE/ACTIVITIES



TURTLE PLAYGROUND

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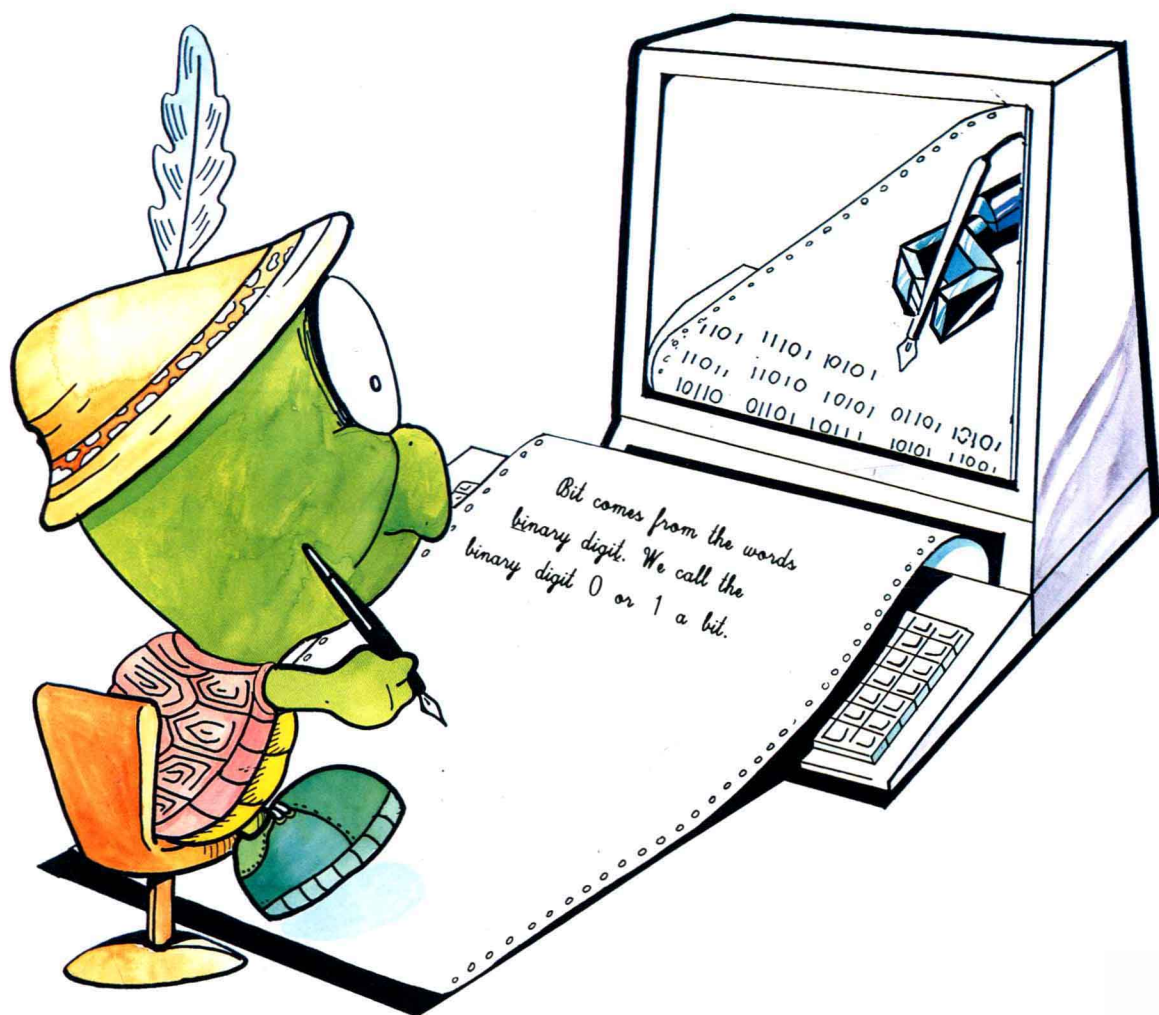
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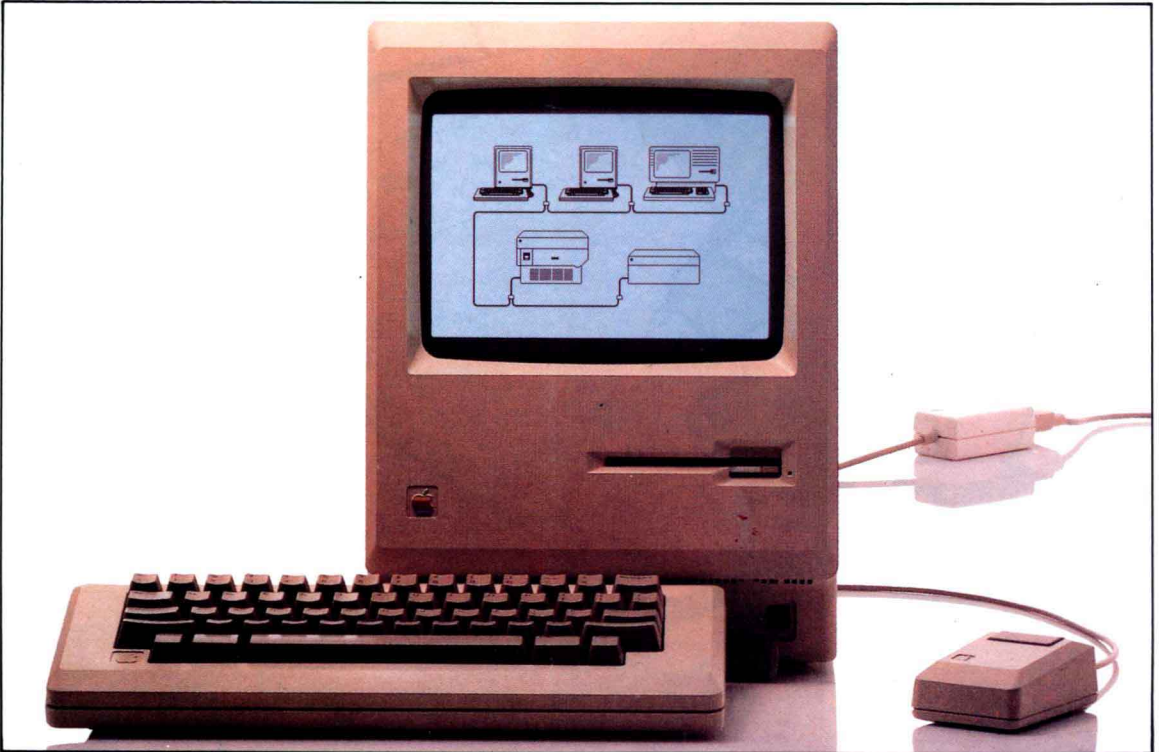
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PART I MORE ABOUT COMPUTERS

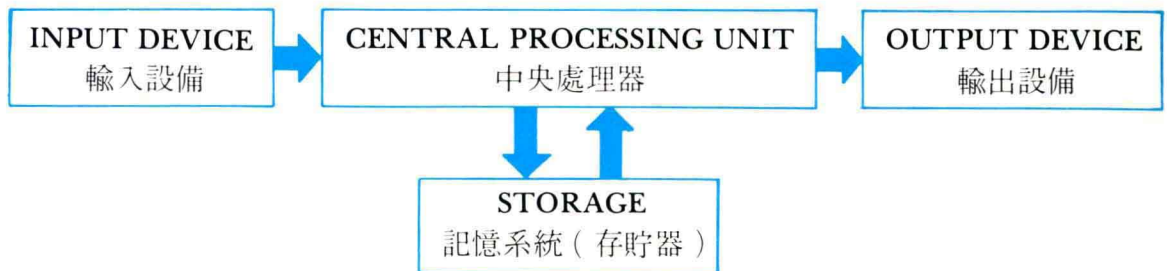
電腦再探





MORE ABOUT COMPUTERS 電腦再探

Do you remember the way information flows in a computer system?



Let us study these different parts in the computer system in further details.

1.1 Input Devices 輸入設備

Input devices help you feed information into the computer.

There are many different kinds of input devices for inputting different kinds of information.

(a) Keyboard 鍵盤

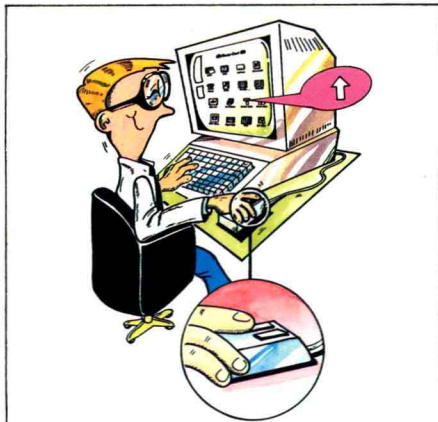
You can use a keyboard to type information into the computer.

The central part of a keyboard in a computer looks like a common typewriter. Besides the basic keys, there are many other keys which have special functions.



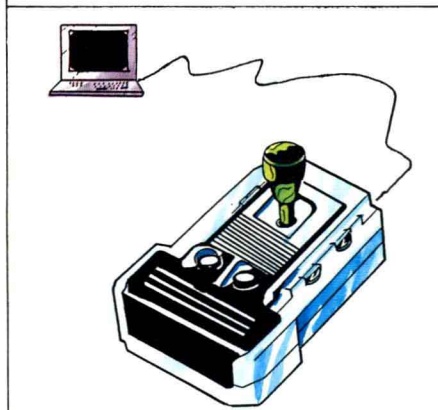
(b) Mouse, Joystick, graphic tablet, light pen

These devices are useful to input information about position and shape.



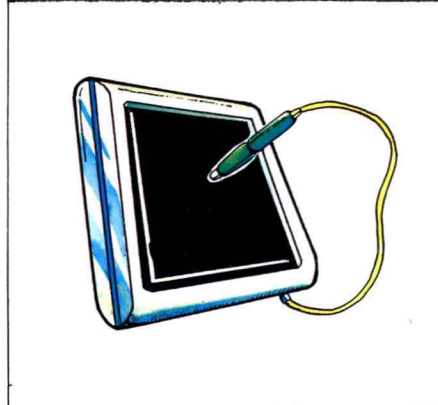
(i) Mouse 鼠形光標操縱器

A mouse is a hand-held box-like device used to move the cursor around the screen. As the mouse is moving, the cursor moves accordingly. Usually, there are two or three buttons on top of the mouse. The actions initiated by pressing these buttons depend very much on the software package being used.



(ii) Joystick 操縱桿

Similar to a mouse, a joystick is used to move the cursor around the screen. But instead of moving the device around, a user moves the stick on the device in different directions. This is particularly useful in playing video games. Usually, the actions initiated depend very much on the software package being used.



(iii) Graphic Tablet 繪圖機

Tablet is a flat surface device on which a user draws with a stylus. A tablet and stylus is similar to the use of paper and pencil. When the tip of the stylus touches the tablet, its position is detected. As it moves on the tablet, the information of its position is fed to the computer. Usually a trace of the stylus movement on the tablet is displayed on the screen.



(iv) Light Pen 光筆

Light pen is a device used to point to an item on the screen of a visual display unit. There is some optical detection mechanism at the tip of a light pen. When a light pen is put against a certain spot (a chosen item) on the screen, it picks up a significant amount of light energy when the electron beam inside the visual display unit is passing under the light pen. When this happens, a signal will be sent to the computer which will then deduce the position of the spot pointed to by the light pen.



The mouse, joystick and tablet are called positioning devices because their primary function is to put the cursor to a certain position on the screen. The light pen is a pointing device because it is used to point to an item on the screen.

(c) Light sensing devices 光敏設備

The light signals can be detected by the light sensors in the devices which will then send electrical information to the computer.

