PHILIPS

TERMINAL SYSTEM PTS 6000
SYSTEM DESCRIPTION

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Module M01

Data
Systems

Philips PTS 6000 Introduction

The Philips PTS 6000 Bank Terminal System is designed to help banks to deal with the expansion of business. It does this by making banking operations quicker, smoother and more accurate.

At the counter it is a flexible, versatile tool for the teller. It makes a record of all his transactions, and it guides him through them. It updates a passbook every time deposits or withdrawals are made, makes the journal entry, issues a voucher for the customer. It answers, by display or hardcopy, the enquiries the teller puts to the bank's data files. In the back-office, it is an efficient tool for all types of clearing transactions, and for producing management information.

The Philips PTS 6000 system is flexible and adaptable and can therefore meet the needs of any bank. It can be applied to any type of transaction, and any combination of transactions – savings, foreign exchange, clearing (e.g. giro), trusts and bonds, loans, investments and management services. Most important, the Philips PTS 6000 is a computer-based system which will work with any existing bank main computer.

To achieve its main objective – to help banks deal with the expansion of their business – a bank terminal system must increase efficiency by increasing the capacity of bank staff, and it must increase security – fewer errors. The Philips PTS 6000 system provides increases in both efficiency and security, and thus serves the bank by giving better service to its customers. Any operating system must be reliable and easy to service, so that it is always available for work. The Philips PTS 6000 system is both of these. Further, a bank terminal system should in every way fit easily into normal bank offices and should not require special training to operate. Philips PTS 6000 devices are compact, need no special environment and resemble conventional office machines. A true bank terminal system must be flexible, so that it can easily be adapted to the needs of individual banks.

The Philips PTS 6000 Bank Terminal System achieves all these objectives by:

- its modular design which allows ample choice of devices to suit customers' individual needs.

  This choice is extended by comprehensive and adaptable software, so that programs can be tailored to any specific banking application.

- its compactness, which allows it to be installed in the existing space, even when this is restricted. Furthermore, the system works on normal mains power supplies and has no special demands for air conditioning.

  The system fits the space already available, bank offices do not have to be rebuilt to fit the system.

- its ergonomic layouts, which make it easy to operate.

  Devices can be positioned for the optimum convenience of individual operators.

The Philips PTS 6000 Bank Terminal System represents a systems approach to the needs of automated banking. It will provide any bank with real benefits – for the business, for the staff and for the bank's customers.

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Philips PTS 6000 Applications

The Philips PTS 6000 Bank Terminal System is designed specifically for banking applications. It is therefore most usually found in banks, but also finds applications elsewhere.

Banks can be broadly classified by the type of transactions which provide the major volume of their business: merchant banks, commercial banks, savings banks, post office savings banks, rural and cooperative societies, and so on. A bank in a large city is different from a bank in a market town. Also, national customs vary.

Each bank therefore needs a special terminal system, one which will meet its own special, individual requirements.

The Philips PTS 6000 Bank Terminal System can meet the needs of any bank because of its modular software and hardware, and because Philips have teams of specialists with banking knowledge who can prepare, from the wide range of devices and programs available, the application package most suitable to any particular bank's needs.

Let us consider foreign exchange

This is the most important application – the major part of business – in tourist areas, at airports, seaports and at many large railway stations. In such locations, a Philips PTS 6000 terminal system provides fast, faultless execution of the whole exchange transaction – by simple push-button action at a keyboard, US dollars can be exchanged for Swedish kroner or German marks. It is not necessary for the operator (teller) to look up the rates of exchange in a table and to calculate the answer. With the Philips PTS 6000 system, the rate of exchange used is the most up-to-date available, and is automatically supplied by the bank's central computer. Equally important, the calculation involved, the preparation of the customer receipt and of the bank's journal entry are also automatic. Throughout the operation, the transaction details are displayed to the teller, step-by-step, for his guidance, and erroneous entries are blocked.

Savings transactions are another extremely widespread and important type of bank operation. Although the software and some of the hardware required are different from those used with foreign exchange, the actual transaction operations are equally simple.

Savings account transactions involve more clerical work – each customer has a pass-book which must be frequently updated – across-the-counter transactions being the most common. These involve the deposit or withdrawal of cash. With such a transaction, all that the teller has to do is to drop the passbook into the terminal printer and perform a few simple key-in actions. The nature of the transaction and the amount involved are printed in the correct position in the passbook, together with the new balance (which is automatically calculated) and all transaction information is automatically updated in the customer file at the same time. Not only deposits and withdrawals are automatically entered. Calculations of interest and standing charges can be built into the software and automatically performed by the terminal printer. Once again, the teller is guided step-by-step through the transaction and erroneous entries are blocked.

The key to successful investment is accurate information and service at the time of buying or selling. This is particularly true of investment in stocks and shares where a day's, or even an hour's delay in actual prices can sometimes make the difference between profit and loss.

The Philips PTS 6000 system enables a bank to offer an efficient business investment service with investment information immediately available at any branch and not just at a central office. The system's visual display unit can provide up-to-the-minute information on stock market fluctuations. Customers can see the real situation at their own branch office and base their investment decisions on the very latest share values and, where necessary, benefit from expert advice made available by a management centre linked on-line to the branch office. And not only information, but action too! Via the keyboard, stocks and shares, unit trusts, or any other kind of investment, can be actioned on the spot. Furthermore, the printer can be used to produce a hard-copy record of the investment details, leaving customer and bank with the satisfaction of a truly complete transaction.

The majority of transactions will be carried out in the back office – giros, cheques and credit transfers are handled here by specially assigned staff. Here the Philips PTS 6000 system can provide alternative arrangements which enable bank employees to handle more detailed and comprehensive data than is needed at a teller terminal.

A general terminal printer can provide a print-out with a fully-edited and tabulated format. And, in addition to its functions as a batch data-entry terminal, the general terminal can be used to prepare a customer's account statement, or to deal with complex inquiries directed to the central files.

All the principal types of banking operation have already been automated with a Philips PTS 6000 Bank Terminal System. The proofs are described in detail in the case histories which follow. These show how the modular design of the Philips PTS 6000 system hardware and software, applied to specific operations by a Philips specialist,

PHILIPS PTS 6000 TERMINAL SYSTEM

Philips PTS 6000 Applications

have produced economical, optimum solutions for widely-varying applications.

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November 1978

Philips PTS 6000 Applications

Remove this sheet and replace it by appropriate application data sheets.

Philips PTS 6000 System philosophy

The Philips PTS 6000 Bank Terminal System is the product of cooperation between bankers and Philips designers. Together they have set the requirements for a universal banking system. As a result of cooperation, the following main points could be set for a bank terminal system.

Briefly, such a system must enable any bank to increase the services it gives to its customers, either quantitatively or qualitatively. It should therefore:

Increase efficiency, now and in the future

Automation leads to higher output from staff, less routine and less paper. It so helps the bank to cope with their increase in the volume of business.

Increase security

Immediate up-dating of records, immediate availability of records – better service to customers, less chance of unauthorised or unintentional overdrafts. Compared with a "manual" system, a computer-based system is much less likely to make arithmetical or transactional errors and can calculate faster and make more checks. It also guides staff through the correct routines.

Serve the bank's customers

The bank can extend and improve its service to its customers. Teller transactions are immediately and automatically carried out, so that more service can be given – across-the-counter or elsewhere. Totalling is continuous through the day, so that business hours can be extended. Information-only operations can be performed by the customer himself, thus freeing the teller for more active operations.

Be reliable

The terminal modules have a very high availability, more than 99%. No transaction data are lost should the mains supply or the transmission line fail. Operators are guided through the transaction routines – accidental error is impossible.

Be easy to service

The modular structure of the system allows quick-replacement and Philips have a world-wide, highly-trained service network.

Fit easily into normal bank offices

The terminal devices are compact. They do not require special power supplies or air conditioning.

Require no special skills to operate

The terminal devices are ergonomic. Most of them are very similar in appearance and operation to conventional office machines, such as calculators and typewriters. A terminal system, including its computer, is simpler to operate than a car.

Adapt easily to the needs of individual banks

Banks differ from country to country, from bank to bank, even from branch to branch. The Philips PTS 6000 Bank Terminal System has great flexibility of function and capacity due to its modular nature, so that it is adaptable to the individual needs of any bank.

All the terminal devices are bank devices, designed to fit together to provide a banking-oriented system.

Considering these points in more detail, the Philips PTS 6000 Bank Terminal System:

INCREASES EFFICIENCY

The efficiency of the bank's operations is increased because dull, routine, time-consuming work such as form filling, adding, subtracting and totalling are carried out automatically by the system. This enormously speeds up the teller's work, for example, and at the same time the system provides him with faster, easier access to the transaction data he requires – like balances, exchange rates, etc.

The application program in the terminal system automatically takes care of book-keeping and layout functions, but still allows the teller control over the transaction to be performed. In addition, the on-line connection to the bank's central computer gives him quick access to relevant customer data – this comes to him directly at a touch of a button. Contrast this speed, ease and accuracy with the operation of a traditional system. Ledger card files and computer lists must be searched – if they are available in the branch. Often, if the customer's account is held at another branch, a telephone call has to be made to that branch, where another staff member then has to examine the records – two staff members engaged for at least several minutes on one simple transaction.

This increase in efficiency is of vital importance to banks when the number of transactions and of services rendered to their customers is rapidly increasing. The alternative solution – to take on more staff – is just not possible. More staff will require more working space, and staff, even when obtainable, are getting more and more expensive.

Further savings of time and effort could be made by installing a Customer Operated Teller in the bank lobby.

Philips PTS 6000 System philosophy

Such a device would handle the major part of the daily routine transactions like cash withdrawals, credit transfers and enquiries as to balances.

INCREASES SECURITY

A bank is responsible for other people's money – its customers' money. Security is therefore very important to bankers. The Philips PTS 6000 Bank Terminal System increases security because it is:

- a terminal to the main computer:
  transaction details can thus be fed immediately into the central data files and records are immediately up-dated. Instant access to these same records gives the teller the most up-to-date information on the status of a customer's account so that he knows the customer's solvency and can prevent unauthorised overdrafts.
- programmable,
  the application program guides the teller through each transaction – reduces the chances of error or fraud. Passbooks, vouchers, tallyrolls, journals, etc., are printed under program control as well, thus ensuring that the data printed agree with the data entered, and the chances of error are again reduced.
- safeguarded from unauthorised access.
  a terminal can be set to work only by an operator with a special key. Without this key it is impossible to perform any transaction or to change any data, under the main-key system a second key, held only by the bank (branch) manager, gives access to confidential or crucial data which may not be dealt with by the general bank staff.

SERVES THE BANK'S CUSTOMERS BY SERVING THE BANK

The increase in efficiency resulting from the use of the Philips PTS 6000 Bank Terminal System saves staff time. This time provides the staff with further opportunities to sell more bank services to its customers – they can advise customers on loans, savings accounts, insurance and other services offered by the bank.

A Customer Operated Teller, handling daily routine transactions such as cash withdrawals, balance enquiries and transfers to other accounts, gives the bank's staff even more time for more interesting tasks and the selling of the bank's services. A Customer Operated Teller can also extend the banks services beyond normal business hours. It allows many routine transactions, particularly cash withdrawals, to be carried out on Saturdays, for example, when customers are often shopping.

IS RELIABLE

The reliability of the Philips PTS 6000 Bank Terminal System is very high. Even a teller terminal printer, commonly the weakest part of a terminal system (because it's the busiest), has a proved availability of more than 99%.

The telephone line link to the main computer is much more likely to fail than any of the terminal devices in the event of such a failure, the terminal computer will automatically switch the terminal system from on-line to off-line working, and in less than 1 second. Operators will be informed by lamp signals, but they can continue to operate the system without any delay and without any loss of transaction data. Only enquiries to the main computer are disabled by off-line working, but urgent information can still be obtained via the normal voice telephone.

Mains power failures are also guarded against. The terminal memory is non-volatile, so no data are lost. As soon as power is restored, the system resumes operation at the point where it was interrupted – even if this is in the middle of a step in a transaction.

The system is protected against static discharge, a very common problem in a modern office environment with, e.g. nylon carpets, synthetic materials for furnishings and clothing and plastic fittings.

Preventive maintenance is the best way of safeguarding reliability, but it must not be required so frequently as seriously to interrupt normal operation of the system. A Philips PTS 6000 Bank Terminal System requires only 1 hour of preventive maintenance every 4 months.

IS EASY TO SERVICE

All hardware will fail sometime. The Philips PTS 6000 terminal devices do not often fail, but when they do repairs can be carried out very quickly.

Philips has a service network made up of sales offices and dealers all over the world. In all main cities there are service engineers, well-trained in the Philips PTS 6000 System. Thus, a service engineer can reach any location in the shortest possible time.

The modular design of the Philips PTS 6000 system speeds repair. A defective module is replaced as a complete unit and the system resumes operation with the minimum of delay. All the time-consuming and, for a bank, untidy

Philips PTS 6000 System philosophy

work of stripping down, repair and reassembly is done in a well-equipped workshop.

Quick trouble shooting requires efficient tools and well thought out routines. The Philips PTS 6000 service engineer is equipped with specially-developed test devices and test programmes which enable him to trace the defective module without waste of time. Since the modules are 'plug-in', replacement is very quick, and the system resumes working as perfectly as before the failure.

FITS EASILY INTO NORMAL BANK OFFICES

Bank terminals should fit into bank offices – the offices should not have to be adapted to receive the terminals. All the Philips PTS 6000 terminal devices are very compact. A complete teller terminal occupies no more space than a normal electric typewriter, it produces no more heat than a fluorescent lamp and it makes less noise than a typewriter.

The environmental conditions are those of a normal office – where people can work, the Philips PTS 6000 system can work, with the minimum of disturbance to that environment by size, heat or noise. It has no special requirements for air conditioning or mains power supplies.

REQUIRES NO SPECIAL SKILLS TO OPERATE

The Philips PTS 6000 Bank Terminal System is a tool for the bank to use.

Its application program, assisted by the display devices, guides the operator smoothly, step-by-step, through the transactions, so that hardly any training is required. In addition, all the devices are designed so that they more-or-less explain themselves. The keyboards, for example, look like normal calculator and typewriter keyboards, so that the operators take to them naturally.

The display devices and the keyboards are freely adjustable for optimum ergonomy. Every operator can give himself free access to all functions and can clearly see messages on display or print out, irrespective of whether he works sitting or standing.

ADAPTS EASILY TO THE NEEDS OF INDIVIDUAL BANKS

The type and number of transactions, the format and layout of documents, the functions – and even the positions – of the bank staff with regard to customers, all differ from country to country and from bank to bank.

The modular design of the Philips PTS 6000 Terminal Bank System together with the great flexibility of the devices as to position and their far-reaching adaptability as to functions and capacities, allow it to be tailor-made for the requirements of each bank. Each terminal device is available in several types, and where necessary, the bank may specify details such as texts, incriptions and colours of keytops.

All the terminal devices of the Philips PTS 6000 are bank devices, designed to fit together to provide a banking-oriented system which will answer the needs of any bank.

Very important too – the Philips PTS 6000 software can be easily adapted to fit any application and any transaction.

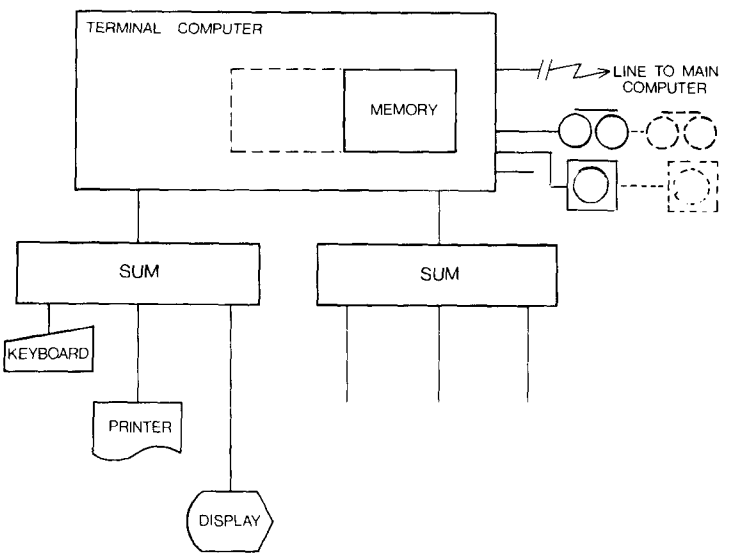
Philips PTS 6000 Systems build-up

The system philosophy of the Philips PTS 6000 Bank Terminal System is based on the following requirements:

- increase efficiency
- increase security
- serve the bank by giving better service to customers
- be reliable
- be easy to service
- fit easily into the normal bank office
- require no special skills for its operation
- adapt easily to the needs of individual banks.

These requirements have to a great degree dictated the design and structure of the system. As a result:

- the system is very modular in its build up; even within the modules there is great freedom for the customer to fulfil his special requirements.
- the system is freely and comprehensively programmable, so that any individual banking application can be implemented.
- the modules are compact and can thus easily be installed in the existing bank offices, without rebuilding, even if the space available is restricted.
- the devices, and thus the whole system, operates in a normal office environment; heat dissipation is at about the level of an ordinary fluorescent lamp, the noise is much less than that of an ordinary typewriter.



The linking of different modular devices

Philips PTS 6000 Systems build-up

– the devices are ergonomically designed; positioning is easily arranged to suit the ease of individual operators, paper handling is reduced, and what is left is easy; the keyboards and printers are very like the office machines that bank staffs are used to, such as calculators and typewriters.

The Philips PTS 6000 Bank Terminal System is made up of a wide range of modular devices, interconnected by plug-in cables to form configurations which will suit any banking application. The diagram shows how different modular devices can be linked together.

There is a choice of terminal computer, and a choice of memory size within the computer. This allows computer capacity to be matched to the particular application, to the volume of business, to the number of different types of transactions to be carried out, and to the number of terminal devices to be served by the terminal computer. Back-up storage allows the system to work off-line as well as on-line. This is a very important option with on-line working since it ensures that no data are lost in the event of a transmission line failure. The design of the working stations, which will comprise keyboards, display devices and/or printers, can be freely chosen best to suit the requirements of individual customers. A wide range of these devices is available – numeric and function keyboards; alphanumeric, function and signal keyboards; teller terminal printers; general terminal printers; 8-lamp signal displays, 288-character graphic displays, etc.

The design flexibility is assisted by the selector units. These are the communication links between the terminal devices, keyboard, printers, etc., and the terminal computer. They also provide the power supplies for the terminal devices and thus reduce the space demands of the latter.

A terminal computer can be shared by two branch offices. This allows a small branch, with possibly too-low a volume of business to make an individual terminal computer economic, to have the same benefits as other, larger branches. The terminal configuration possibilities are in no way restricted, but in this case the selector unit is connected via a telephone line to the terminal computer.

Very often a great deal of data must be printed together in summary form on a regular basis, a daily record of transactions, for example. This requirement can easily be accommodated by means of a line printer connected via a selector unit to the terminal computer.

With a busy bank, carrying out a large number of transactions every day, it may be more convenient to transfer data on-line to the main computer in a format acceptable by the latter. In such a case, the data on cassette in the terminal computer can be transferred by one of the magnetic tape units to standard tape which can physically be transferred to the data processing centre. This is an extremely valuable facility when telephone lines are unreliable or where their number must be kept to the minimum because of their high cost.

With some banks, it is a matter of policy to decentralise customer files. In other cases, the telephone line may be too unreliable, or too expensive, for on-line working to the main computer. In such cases, a disk unit can be connected to the terminal computer at the branch.

The foregoing is a brief review of the systems which can be built up using the Philips PTS 6000 system modules. The possibilities are described in greater detail in the chapter on Working Positions.

The flexibility and adaptability of the Philips PTS 6000 Bank Terminal System ensure that it will meet your bank's present needs.

But what of the future? Banks grow both in their total volume of business and in the variety of transactions they handle. The Philips PTS 6000 system allows for this. Any terminal system can easily be expanded, without any basic restructuring, to meet any possible future needs.

PTS 6000 System Structure

The system philosophy of the PTS 6000 terminal system is aimed at supporting automation to the level that is required for any specific branch office system of

- workstations
- information handling
- processing
- communication

This means that the structure of the system is very open ended and flexible from configurating and performance point of view.

The major components of the PTS 6000 system are

- shared processing and storage capacity
- shared printing
- workstation build-up (workstation modules, dedicated processing and storage capacity)
- internal network (locally and remotely)
- connection to external networks (leased lines/public datanets)

The PTS 6000 system supports two types of internal networks, star and multipoint.

STAR NETWORK: A traditional way of connecting terminals point to point to a computer. This network is characterized as strictly hierarchical, built on shared processing, storage and connection to external networks. The star network can handle locally as well as remotely sited workstations.

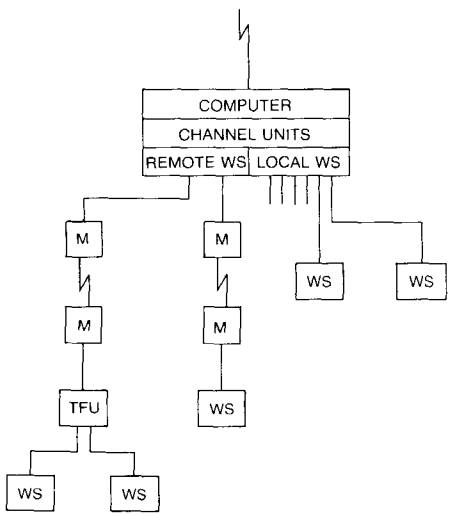
MULTIPOINT NETWORK: Each workstation and computer is connected to one communication line (a bus). It can be characterized as a hierarchical or horizontal multipoint network, which supports distribution of processing and storage capacity as well as shared or dedicated connection to external networks. The multipoint network can handle locally as well as remotely sited workstations.

STAR CONNECTION OF WORKSTATIONS

This connection of workstations is done via selector units (as shown in the figure).

These are the communication links between the workstation modules, keyboards, printers etc and the computer. They also provide the power supplies for some workstation modules and thus reduce the space demands of the latter.

A computer can also be shared by two branches and in this case the selector unit is connected via a communication line to the computer.



PTS 6000 System Structure

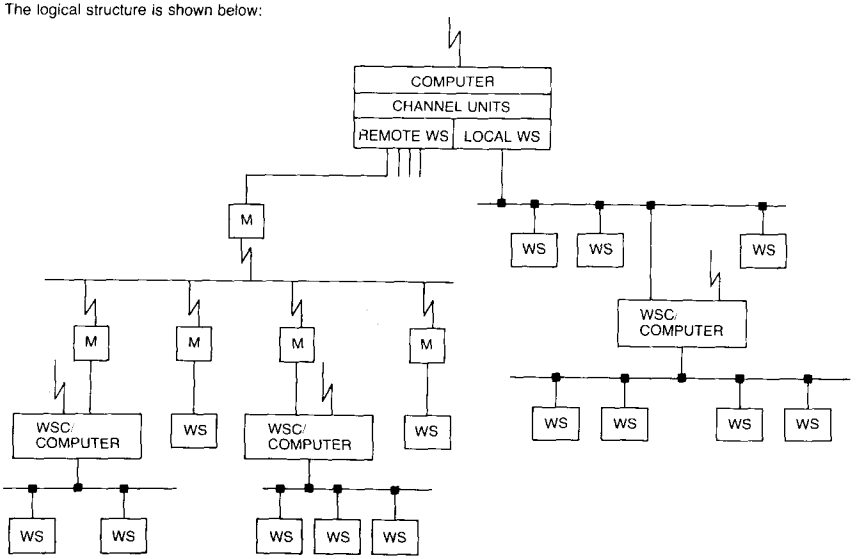
MULTIPOINT CONNECTION OF WORKSTATIONS

The connection principles are parts of an overall workstation architecture.

The features in this architecture can be summarized:

- Distribution of processing capacity
- Connection of a large number of local workstations (LWSI)
- Connection of remotely sited workstations via leased lines or via switched public datanet (RWSI)
- Building up of workstations

The logical structure is shown below:



PTS 6000 System Structure

Interface structure

The communication interface comprises 5 levels:

LEVEL 1: Electrical Interface

- X27 for local workstations (LWSI)
- V24 for remotely sited workstations (RWSI)

LEVEL 2: HDLC Protocol (ISO-DIS 6159-HDLC unbalanced).

The HDLC Protocol handles the data exchange between controller computer and the Main Modules. Data is exchanged on the line in form of frames.

Flag signals are used to separate frames from each other.

Level 2 Protocol (HDLC-protocol) supervises the following functions:

- Initialization or start-up control, begins the process and is used to start transmission in an idle system
- Framing, locates transmission-block beginnings and endings via message-deliminating bit groups.
- Error control, handles the error detection and acknowledges correctly received messages.
- Sequence control, numbers messages to eliminate duplication, identifies lost messages and requests retransmission.
- Flow control, regulates the passage of message across the link.
- Transparency, allows the link to treat all transmitted and received information as a pure data stream.

LEVEL 3: Philips Link Sharing Protocol (PLSP)

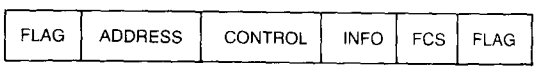
As mentioned earlier the HDLC-protocol, level 2, handles the data exchange to and from the Main Modules. However, the Computer must be able to both send data to and to receive data from devices. This multiplexing function is handled by the Philips Link Sharing Protocol, PLSP, which is a subset of X25.

The Link Sharing Protocol also enables individual flow control of the data streams to and from the devices.

These functions are created by exchange of data packets, each containing a logical channel number equal to the device address (3 bytes) and also the control information for the flow control.

The flow control is implemented to prevent a device, connected to a Main Module, to use too big portion of the available capacity so other devices connected to the same Main Module will temporarily be blocked.

Frame build-up.



FLAG, 1 byte. The flag byte (7E Hexadecimal) is generated by the channel unit and the Hexadecimal code 7E = 0111 1110 is built up with six "ones" in a row.

In each data byte sent into the line the channel unit inserts automatically a "zero" bit after each set of 5 "ones".

In this way the Main Module is able to detect whether a flag or a data byte is sent.

ADDRESS field, 1 byte. Address to Main Module

CONTROL field. 1 byte. Identifies the type of the frame. Three types are used.

- Information frames (I)
- Supervisory frames (S)
- Unnumbered frames (U)

INFORMATION field. a variable size field (1-256 bytes). Only used for information frames The first 3 bytes contain the address of the device (=workstation module) concerned and control information.

FRAME CHECK SEQUENCE (FCS field), 2 bytes. Contains a check sum, (CRC), cyclic redundancy check.

PTS 6000 System Structure

LEVEL 4: Device Drivers

There is one device driver for each type of device connected via the multipoint network *.

Each device has its own unique control table, called Device Work Table.

The data exchange between the Device Drivers and the Link Sharing Protocol, levels 4 and 3 respectively, is handled by the Network Distributor.

LEVEL 5: Application Program

Program Control is entirely application – dependent and varies with each application.

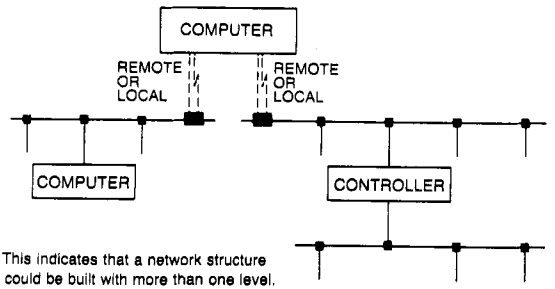
Primary/secondary

At each moment there must be one master of the communication bus—the **PRIMARY**, which is responsible for the control and polling of the line.

A **PRIMARY** is a computer/controller. A computer/controller can also act as a **SECONDARY.**

A workstation (programmable or non-programmable) is always a **SECONDARY**

A computer/controller that is connected to the bus (as a secondary) can also act as a primary towards a new bus in which case however another channel unit is required.



This indicates that a network structure could be built with more than one level.

This also indicates the possibilities of interconnection between computers.

Poll schedule

The communication between the primary and the secondary is made by means of a polling sequence where the primary cyclically polls (asks) the secondaries, whether they have any data to send to the primary. If so, the transmission of data will take place.

The channel unit maintains optimal line usage by dynamically adjusting the polling-rate to match the actual traffic.

- high frequency of traffic
- low frequency of traffic
- no traffic

Each secondary is moved between the lists dynamically depending on its traffic.

When a secondary receives a poll, the primary is given that secondary control over the Data In Line and no other secondary can be polled until the Data In Line is released again. The Data Out Line, however, is used with the other secondaries (full duplex).

If the polled secondary does not respond, it is moved to the "no traffic" polling list.

* However, different line drivers may exist in a system. The line driver for multipoint is labelled DRPL01.

PTS 6000 System Structure

Performance

The total performance of an application system depends on:

- types of workstations
- requirements on response time
- transaction load on the line
- CPU-capacity (i.e the computer used)
- application programs
- disc-handling etc
- line speed if connection via leased lines (RWSI)

The performance of LWSI in terms of configurating possibilities (number of workstation and CPU-load) has to be calculated.

To estimate the performance of an application system the average transaction type **must be known.**

The average is calculated by taking the average for **all** transaction types and thereby taking care of the frequency of each type.

The parameters needed per **workstation** are
A = number of characters per second (input & echoed)
B = number of lines per second (output)
C = average length of a line (output)

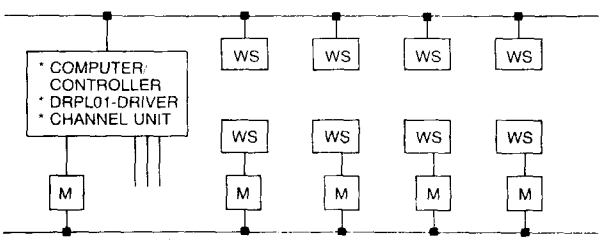
The structure of a system is based on the following components:

The driver (DRPL01) can handle maximum 4 channel units for LWSI and 4 for RWSI.

The limitations of the performance is set by

- The maximum rate of the channel unit
- The CPU-load of the computer/controller
- The echo-response time
- The line speed (for RWSI)

The factors depend on chosen computer/controller and respective channel unit.



Philips PTS 6000 System operation

The Philips PTS 6000 Bank Terminal System brings the power of the computer to the teller's desk: the power of the bank terminal computer to control and guide him through transaction routines, plus the power of the bank's main computer to supply him with information stored in its files. The power to free him from routine tasks, subtraction, addition, totalling and to free him from paper and pen. These powers are brought to him immediately he needs them – by a touch on a button.

Ergonomy is one of the major design features of the Philips PTS 6000 System. This means that it is easy, simple and comfortable to operate. It has been made so by very careful attention to detail, such as:

- operating is mainly by keys which require only light, firm pressure (50 - 100g) to depress them – light enough to avoid fatigue but firm enough to avoid accidental depression. Usually the working pressure required varies insignificantly from key to key within one keyboard, so that operation is smooth and fast, but some function keys need a heavier pressure, to warn and guide the operator. Sometimes an operator will work faster than the keyboard, and will press a new key before the previous one has been released. In such cases, the keyboard will "hold" the information from the second key until the first key operation is complete. This is known as the "roll-over function" and helps to keep up speed while reducing cancellations and errors.
- paper handling is simple. The terminal printers are factory-adjusted to suit the bank's individual document formats and layouts. Thus all the operator needs to do is to drop the document – passbook, voucher, cheque, etc. – into the terminal printer. It will automatically be adjusted to the correct position for printing. Other papers, journals, tallyrolls and receipts, are just as automatically produced. As a result, the operator is freed from much time-wasting routine.
- programmed operator guidance is provided. Although the system is very easy to operate, it is essential to reduce the chances of error to a minimum. The system software leads the operator step-by-step through every transaction by means of signals on the display device – and erroneous operations are blocked. This gives the operator ease and confidence.
- displays and printouts are clear, easy to read at normal working distances, with a generous viewing angle. The operator does not have to shift his position or to peer at the display in order to get the message.
- the layouts of keyboards and printers are familiar; they look very much like usual office machines such as calculators and typewriters. The operator can apply the skills which he has already, and this makes for faster, more accurate work.
- the devices are freely adjustable for height and often for angle as well, so that the most convenient position can be chosen for any operator, regardless of whether he works standing or sitting.
- the terminal devices are compact, take up very little space. They help the operator without forcing him into a corner or getting in his way. They are also quiet and cool. This makes them unobtrusive, the operator is aware of them only when he wants to use them.

The terminal computer itself is easier to operate than a television set. It needs only to be switched on and then it operates itself automatically. From time to time a full magnetic tape cassette must be replaced with a fresh one. The terminal computer gives ample warning that the tape is reaching its end and changing the cassette is as easy and as

Philips PTS 6000 System operation

familiar as the same operation on a domestic recorder.

The teller's counter is probably the busiest working position in any bank. More and more varied types of transaction will be done here than in any other single position in the bank. The teller will have one of the series of Philips PTS 6000 keyboards, positioned to allow him maximum convenience when operating it, and one of the series of easy-to-read displays. Light pressures on the keyboard, in a simple sequence, command the transaction he wants and enter the details. The program will guide him step-by-step, signalling his next move, stopping him should he try to make a mistake.

Very often, the teller must handle documents from customers, savings passbooks for example. He will then have one of the teller terminal printers, specially set to handle the bank's own passbooks. He has only to drop the passbook into the printer at the right time – and the terminal computer will remind him of this. He does not have to position the passbook, the printer does this for him, automatically. Again, the transaction sequence is under program guidance – the chance of error becomes negligible. As a result, the teller can work more accurately, more efficiently, and he has more time for a more important task – selling the bank's services to its customers.

The Philips PTS 6000 Bank Terminal System is for all aspects of banking, and the bank manager is an operator too. The same push-button ease the system gives to the teller is given to the policy maker, the manager. Push-buttons operated in simple sequences bring computer power to his desk as well, to give him the information he needs to make decisions on loans and to advise customers on their investments. All he needs is a simple and unobtrusive keyboard and a display device which is as clear and as easy to read by his customer as it is by himself.

The Philips PTS 6000 system brings specialised central office services to his customers in his own office.

A Customer Operated Teller can be used in only one way – the right one. Whatever the customer wants to do – withdraw cash, transfer credit or just enquire about the state of his balance – the display tells him how to begin and what to do next until he is satisfied.

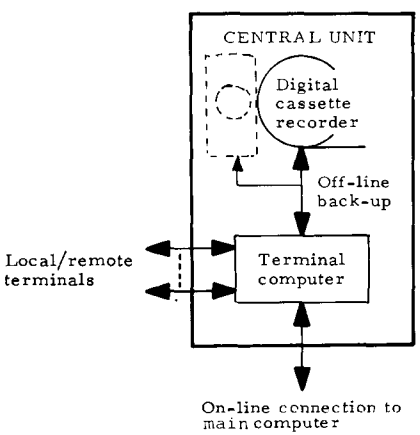
All the terminal devices are ergonomic – quick and easy to operate. Put together, in the optimum configuration for the individual bank, they form the ergonomic, fast, Philips PTS 6000 Bank Terminal System, a system which is easier to operate than a car.

Philips Terminal Computers

The terminal computer is the nerve centre of a bank terminal system. It links together and controls the terminals. It guides the bank's staff through transaction routines and performs the transaction calculations. It also provides the communication link with the bank's main computer.

The terminal computer controls the whole terminal system by means of its program. It guides the bank staff by giving them the right commands at each stage of every transaction and by blocking, or recovering, procedural errors. Even the layout of printed information on passbooks, vouchers, tallyrolls, etc., is included in the software instructions. Code transformation and interrupt handling are, naturally, automatic.

Having been designed specifically for bank terminals, the terminal computers are application oriented: their arithmetic and store capabilities – although very important, are a minor feature compared with their suppleness and their ability to deal with a wide variety of terminals and banking procedures.



The terminal computer also forms the centre of the transmission and reception of data on-line and from the bank's main computer. It incorporates all the circuits and programming required for formatting coding and line procedure. The terminal computer can be connected in point-to-point, multidrop or loop to any main computer. BSC, Uniscope 100, ECMA-16 and many other procedures are applicable and are actually in use.

When local records of transaction data are necessary they can be accommodated on compact magnetic tape cassettes within the terminal computer. This will always be the case with off-line working, and when, for example, decentralised accounting is the rule, or when separate records are required by auditors or comptrollers. The data-recording facility also forms a standby store when working on-line. This is automatically switched in should the transmission line fail, thus ensuring that no transaction data are lost.

The terminal computers are, of course, programmable units, and an extremely important feature of the Philips PTS 6000 system is the wide range of software available. It is this which gives the Philips system much of its power and flexibility.

The software can be divided into two types – that necessary for the general running of the system and that required to generate a particular application. Under the first category is the standard bank terminal software for controlling the terminal devices and peripherals. This attends to the details of printed data layout, data channel routings, priorities, interrupts, etc. Housekeeping programs are also standard. These, for example, cater for the transfer of data from cassette to tape or disk, etc.

The second type comprises the programming tools which allow the simple, rapid build up of the specific application programs required by individual banks. These range from the relatively simple programs for transaction routines via macro assemblers up to high-level language programs which allow the most sophisticated types of banking operations to be automated.

Naturally, all the foregoing are complemented by debugging and test routines which check the terminal system operation before any real transactions are entered.

There is no banking operation which cannot be covered by existing Philips PTS 6000 system programs. For details please see the separate chapters describing the software.

Because it is the control centre of the bank terminal system, the terminal computer must be exceptionally

Philips Terminal Computers

reliable. This means not only reliable in itself – it must also safeguard information from failures of associated equipment and services. The most common types of non-system failures are transmission line breakdown and mains power loss. The Philips terminal computers cater for both. A mains power failure, or a drop below the generous minimum allowed, starts a rapid and automatic power failure sequence. The current program is interrupted and all the relevant data are stored in the core memory. As soon as power is restored, the hardware is reset, the stored data retrieved and the program resumes at the point where it was interrupted. Transmission line failure has already been mentioned – no data are ever lost. An additional problem in modern offices is static electricity – Philips terminal computers are protected against this.

The Philips PTS 6000 Bank Terminal System has many configuration possibilities and so, too, have the terminal computers themselves. Up to 16 terminals and several peripherals may be connected. Computer-sharing is a standard feature – up to 8 of the terminals may be remote, in another branch. Any number of programs can be accommodated. Memory capacity can be varied from 16k to 64k bytes. Standard plug-in units handle all the processing necessary for telephone line transmission and reception of data.

The terminal computers handle day-to-day bank transactions with ease – savings, credit transfers, giro clearance, loans are the most common. But the Philips PTS 6000 system is intended for every type of bank operation and, to maximise its flexibility and scope the terminal computers also allow the use of powerful peripherals to master all banking operations. Local administration of customers' files are accommodated with the disk unit; bulk printing, e.g. giro output, can be performed with the line printer; the cost of telephone line transmission is reduced by transferring data from cassette via the magnetic tape unit or by the concentrator which can channel up to 10 input lines into one output. These, and similar application developments are easily executed. The Philips PTS 6000 system provides standard hardware and software for any application required by a customer.

The terminal computers fit easily into normal bank offices. They are compact (about the size of a normal dish washer), work from normal – even fairly erratic – mains supplies and require no air conditioning. Interconnections with the terminals are by simple cables which require no special ducting or shielding.

They are easy to operate. All that is needed is to switch them on, and from time to time, insert a fresh data storage cassette or to change a program cassette – less complicated than operating a domestic cassette recorder. The memories are non-volatile, so that the terminal computer and the whole bank terminal system is ready to operate as soon as it is switched on or as soon as power is restored after a mains failure.

The capacity, flexibility and adaptability of the terminal computer hardware and software in the Philips PTS 6000 system permit the maximum freedom for the build-up of the bank terminal system most suited for any particular bank application.

PHILIPS PTS 6000 TERMINAL SYSTEM

Philips Terminal Computers

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Having been designed specifically for bank terminals, the terminal computers are application oriented : their arithmetic and store capabilities – although very important, are a minor feature compared with their flexibility and their ability to deal with a wide variety of terminals and banking procedures.

The terminal computer also forms the centre of the transmission and reception of data on-line and from the bank's main computer. It incorporates all the circuits and programming required for formatting coding and line procedure. The terminal computer can be connected in point-to-point, multidrop or loop to any main computer. BSC, HDLC, SDLC, Uniscope 100, VIP700 and many other procedures are applicable and are actually in use.

When local records of transaction data are necessary they can be accommodated on flexible disk or compact magnetic tape cassettes within the terminal computer. This will always be the case with off-line working, and when, for example, decentralised accounting is the rule, or when separate records are required by auditors or controllers. The data-recording facility also forms a standby store when working on-line. This is automatically switched in should the transmission line fail, thus ensuring that no transaction data are lost.

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Transmission line failure has already been mentioned – no data are ever lost. An additional problem in modern offices is static electricity – Philips terminal computers are protected against this.

The Philips PTS 6000 Bank Terminal System has many configuration possibilities and so, too, have the terminal computers themselves. A number of terminals can be connected locally as well as remotely, in another branch.

Any number of programs can be accommodated. Memory capacity can be varied from 64k to 256k bytes. Standard plug-in units handle all the processing necessary for telephone line transmission and reception of data.

Terminal computers handle day-to-day bank transactions with ease – savings, credit transfers, giro clearance, loans are the most common. But the Philips PTS 6000 system is intended for every type of bank operation and, to maximise its flexibility and scope the terminal computers also allow the use of powerful peripherals to master all banking operations. Local administration of customers' files is accommodated with the disk unit; bulk printing, e.g. giro output, can be performed with the line printers; the cost of telephone line transmission is reduced by transferring data from flexible disk or cassette via the mag-

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They are easy to operate. All that is needed is to switch them on, and from time to time, insert a fresh data storage medium or to change a program loading medium – less complicated than operating a domestic cassette recorder.

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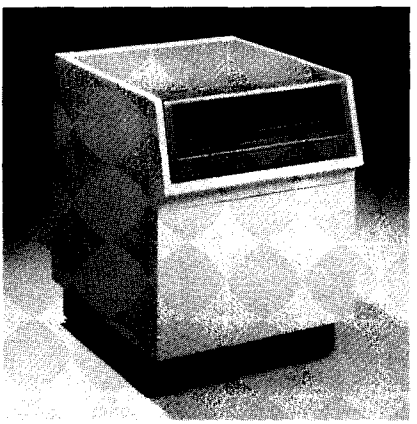
Philips PTS 6805 Terminal Computer



INTRODUCTION AND APPLICATION

The Philips PTS 6805 Terminal Computer is used for control and preprocessing of data in financial systems. It controls all the functional modules of any PTS 6000 terminal. A terminal may be a teller station, a back-office station or a customer operated terminal. This compact computer is designed to work in an office environment. It is very easy to install, and, furthermore, it is highly insensible to static electricity and protected against disruptions to the supply.

The Philips PTS 6805 TC uses flexible disc for program load and as back-up medium. The flexible disc also has the potential for program overlay and limited file handling.

PTS 6805 TC can be used in both off-line and on-line systems. In an off-line system the flexible disc drive, which is housed in the terminal computer cabinet, is used to store all the transaction data. The flexible disc can later on be sent to the EDP centre for processing.

In an on-line system the flexible disc is used as a back-up facility, in case the on-line transmission is interrupted. A terminal computer which is normally used off-line can be converted for on-line operation by the simple addition of a plug-in channel unit for line control and with the addition of the appropriate software.

Each Philips PTS 6805 Terminal Computer can perform up to six terminal stations. Of these, up to four may be remote terminals situated in another branch office(s) and connected to the terminal computer via modems and telephone lines.

PRODUCT DESCRIPTION

The terminal computer Philips PTS 6805 consists basically of:

- a processor, called CPU
- a memory
- channel units

All these units are built into a cabinet, which also provides the power supply and the operator's panel. Apart from the terminal computer itself this cabinet houses 1 or 2 flexible disc drives.

The PTS 6805 Terminal Computer operates with 16-bit parallel words and the processing is controlled by means of 100 basic instructions. The Central Processing Unit, CPU, and a Bootstrap ROM are located on one printed circuit board. The memory is a semiconductor RAM with a capacity of 32K, 16-bit words.

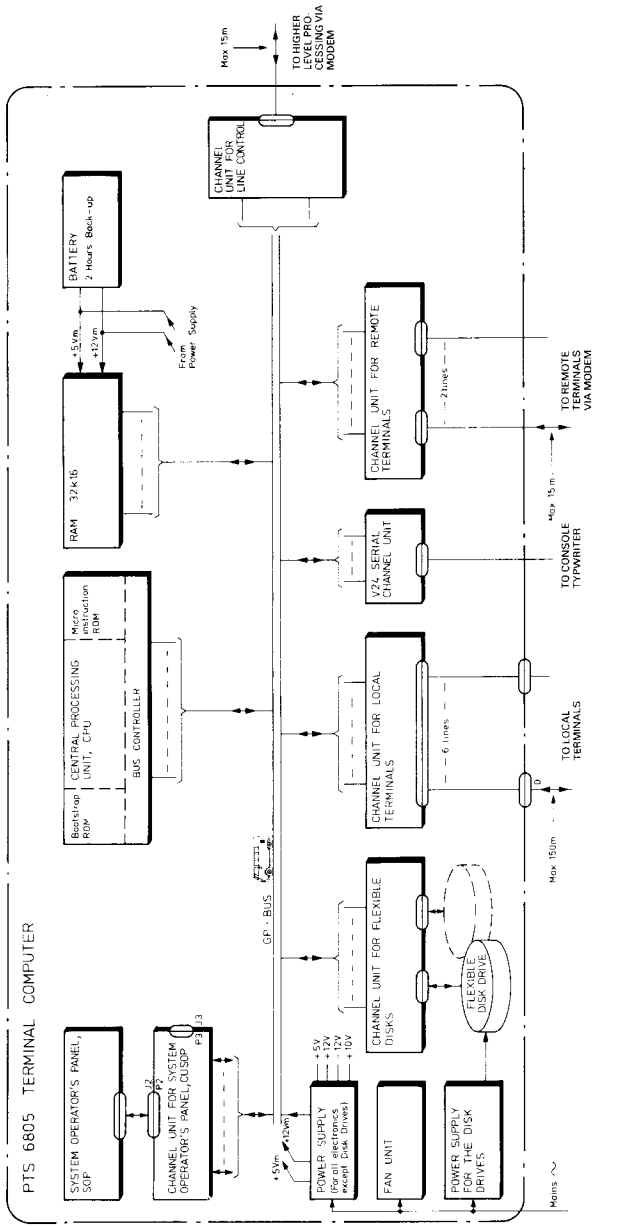
In case of power failure the battery back-up automatically takes over the power distribution to the memory.

A bus system interconnects CPU and memory with the channel units for:

- **System Operator's Panel**, SOP: used for manual control and supervision of flexible disc operations.
- **Flexible Disc**: used for program loading and program overlays as well as back-up, data files or data interchange medium.
- **Terminals** (work stations): up to six local terminals can be connected via a Channel Unit for Local Terminals (CULT) and a maxium of two remote channels can be connected via a Channel Unit for Remote Terminals (CURT). Each of the remote channels can handle two terminals provided that the remote site is equipped with a Transfer Unit.
- **Line control**: the channel unit is available in two versions for different communication procedures, one for HDLC-procedures (CULC/HDLC) and one for BSC-procedures (CULC/BSC).
- **Console Typewriter**

Philips PTS 6805 Terminal Computer

System architecture



Philips PTS 6805 Terminal Computer

Central processing unit (CPU)

The central processing unit of the Philips PTS 6805 computer is a minicomputer, mounted on one single board.

The main features of the architecture of the computer are strongly related to the generalized bidirectional asynchronous I/O-bus, General Purpose bus, GP bus.

Some vital characteristics are:

- CPU timing is independent of memory timing.
- Bus cabling.
- The CPU timing is independent of the channel unit timing.

The architecture of the Central Processing Unit is based on a microprogram store which contains the information to control a series of CPU sequences during the execution of an instruction. The internal and external data path of the computer is 16 bits.

General data

- 16 bits, parallel
- 15 general purpose registers + P register
- General purpose bus 'S'
- 64 I/O-addresses
- 100 basic instructions
- 16 hardware interrupt levels
- Addressing modes: direct, indirect, indexed, indexed indirect
- Up to 256 external registers
- Power failure/Automatic Restart
- Real Time clock
- Automatic IPL-loader (ROM Bootstrap)
- 32 K 16 direct addressable
- Diagnostic Program

Interrupt and stacking system

The interrupt system is used for all peripheral operations and for handling internally generated interrupts. The system will handle up to 64 interrupt levels, 16 accessible from the channel units. Interrupts are handled according to their priority, which is established by pre-wiring on the back panel; the priority interrupt request is accepted and compared with the priority level of the running program. If the priority level of the interrupt is higher than that of the running program, the program is interrupted, if an enable instruction has been given, and the P-register contents (the address of the next program instruction) and the program status word (containing the priority level and information) are stored in a memory stack. A new program is then started by the interrupt and this program runs until stopped by a higher priority interrupt or until it is completed.

A hardware routine is started by the program interrupt signal after the current program instruction is completed. During this routine the P-register contents and the program status word are stacked and the stack pointer (scratch pad register 15) is decremented to point to the next free location in the stack. The 6-bit number from the priority encoder, which is the priority level of the new program register, is loaded into the priority register. This number is also used to select a location in memory which contains the starting address of the new program. The illustration shows, in a simplified form, the operation of the interrupt and stacking system.

The new program started by the interrupt will normally contain routines to save the contents of registers for the old program and may also include an instruction to enable the interrupt system to accept new interrupts requests.

Return to the interrupted program is initiated by a return instruction (RTN) to take the program status word and program address from the stack. The priority level of the program, contained in the status word, is loaded into the priority register and the program address is loaded into the P-register. The program then resumes and continues until completed or until interrupted by a new interrupt signal.

The bus concept

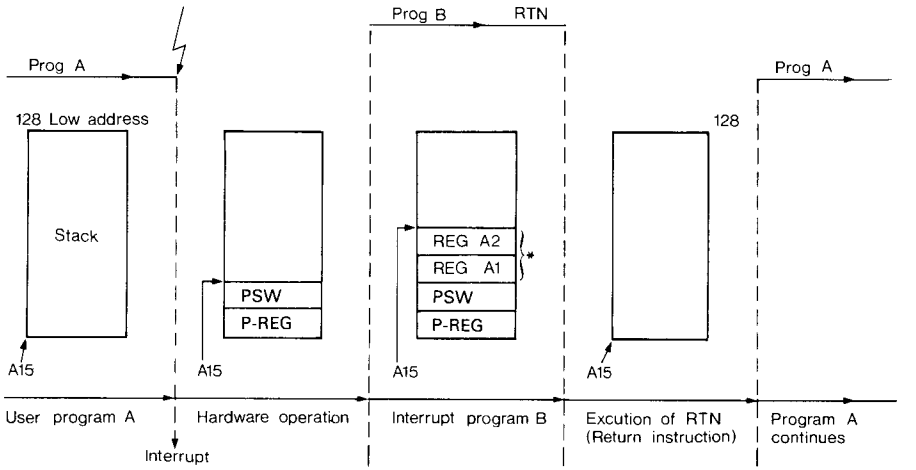
The Philips PTS 6805 Terminal Computer is built up according to the bus concept. Devices which are connected to the bus are divided into master and slaves. The master is:

- CPU

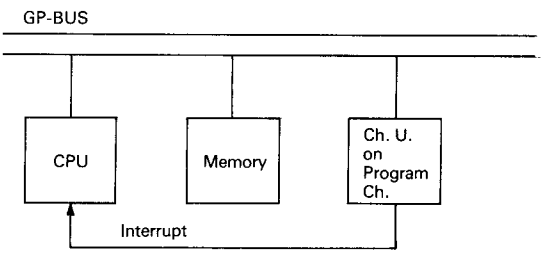
The slaves are:

- Memory Modules
- Program Channel Units

Philips PTS 6805 Terminal Computer



Operation of the interrupt and stacking system



The bus concept

Philips PTS 6805 Terminal Computer

General purpose registers

Register 0:	A 15-bit register (called P-register) used as an instruction counter to contain the address of the next program instruction to be executed.
Registers 1 to 14:	Fourteen 16-bit general purpose registers which can be used as accumulators (to contain the intermediate results of computation), an address or index registers or as I/O registers.
Register 15:	A 16-bit register used as a stack pointer for the interrupt system.

Power failure/automatic restart

This feature provides the means of detecting a power failure and automatically restarting a program, without loss of information.

If the AC power fails or drops below the minimum level of error-free operation, an interrupt is generated after 5 milliseconds. Power for another 2 ms is stored in the power supply. During this time all information relevant to the current program is stored by software in the memory.

The program is automatically restarted when the power is returned, i.e. all the hardware is reset, the stored information is retrieved and the interrupted program is resumed.

Real Time Clock (RTC)

The real time clock gives an interrupt each time a timing signal is received. This signal comes from the interval timer which is tied to the power supply; one RTC-pulse for each 20 ms at 50 Hz and for each 16.67 ms at 60 Hz.

Microdiagnostics

A microprogrammed diagnostic routine, which permits very easy and rapid testing of the main system components, is provided.

Bootstrap

By operating the IPL switch on the SOP (System Operator's Panel), the bootstrap, which is contained in a ROM package is automatically loaded into the memory and then executed. By the bootstrap, loading of the IPL-program from flexible disc is possible. The ROM package is located on the CPU card.

Memory

The memory of the Philips PTS 6805 TC is a semiconductor RAM memory. The memory size is 32 K $_{16}$. The time for a complete read/write cycle is 0.75 μs. The memory board is inserted in a reserved slot in the computer rack.

The semiconductor memory will in case of power failure be supported with power from a battery keeping the memory contents for about two hours. Together with the power failure/automatic restart facility of the CPU, it ensures an immediate restart after a power break without loss of data.

Channel units

The channel units are the interfaces between the processing unit of the terminal computer and the connected devices. The channel units are mounted in dedicated slots in the computer rack.

In the Philips PTS 6805 Terminal Computer system channel units are available for connection

- of a system operator's panel
- of flexible discs
- of local or remote working stations
- to a network
- of a console typewriter

Channel Unit for the System Operator's Panel (CUSOP)

The Channel Unit for the System Operator's Panel is the communication link between the CPU and the System Operator's panel (SOP) which is always included in the Philips PTS 6805 terminal computer.

On this channel unit are located:

- logic for interfacing the SOP to the CPU via the GP-bus
- a relay control for ON and OFF switching of the flexible disc power supply
- three lamps for testing the system (indicates the result of the microdiagnostic test)
- a switch for selecting Normal or Test function

Channel Unit for Flexible Disc (CUFD)

The Channel Unit for Flexible Disc (CUFD) is the communication link between the CPU and one or two flexible disc drives.

Philips PTS 6805 Terminal Computer

Channel Unit for Local Terminals (CULT)

The Channel Unit for Local Terminals (CULT) is the communication link between the CPU and the local terminals. The CULT can handle up to six locally connected terminals, where each terminal is a fully equipped working place with a selector unit. Each selector unit is connected to the CULT through its own line, up to 150 m long (star network). The line is a three pair shielded cable. The procedure is fully controlled by the CULT. Transmission of data is in full duplex and the bit rate is 73 kHz.

The character rate is (approximately):

Number of connected terminals	Character rate
4	285 ch/s
6	190 ch/s

The number of connected lines is selected by means of a strap on the CULT.

Channel Unit for Remote Terminals (CURT)

The Channel Unit for Remote Terminals (CURT) is the communication link between the CPU and the remote terminals.

Up to two remote lines can be connected to this channel unit and one or two fully equipped terminals can be connected to each line. When two terminals share one line they have to be placed on the same office and are connected to the same modem equipment through a Transfer Unit, TFU.

The line procedure is a full duplex procedure, 4-wire connection completely controlled by the channel unit. The channel outputs are connected to modems at a transfer rate of 1200 or 2400 baud. Character rates are given in Tables 1 and 2.

At the terminal end the modem can be connected directly to a selector unit, SUMR, (Selector unit for Remote Terminals) or to a TFU (Transfer Unit) to which one or two SUMRs can be connected. If the modem is not equipped with a line-test switch a TFU must be used also in the case of one SUMR.

Table 1.
Characters rates, single character procedure

1200 bauds	2400 bauds
41 ch/s	70 ch/s

In order to achieve high efficiency on transferring a large amount of information to a device, e.g. a CRT display unit, a block transmission feature is included in addition to the single character transmission normally used. In block transmission the characterwise acknowledgement is suppressed which permits a significantly higher characterrate.

In the block transmission mode an LRC check is always performed. An LRC generator in the Selector Unit is checked by the program after each terminated transmission and gives information about any VRC/LRC errors that may occur.

The LRC check feature can be utilized in single character transmission too.

Table 2.
Character rates, block transmission

Block length	1200 bauds	2400 bauds
8 characters	55 ch/s	90 ch/s
32 characters	65 ch/s	120 ch/s

Channel Unit for Line Control (CULC)

The Channel Unit for Line Control is the communication link between the CPU and the line.

Two different channel units are available, one for HDLC and one for BSC procedures.

The CULC/HDLC supports the hardware features of the High Level Data Link Control protocol. The transmission system is designed under CCITT recommendations (V24, V28).

The CULC/BSC is either an asynchronous or a synchronous line control unit working in half or full duplex mode. The choice between asynchronous and synchronous mode is made by means of a strap on the channel unit.

The CULC/BSC is provided with a V24 interface permitting connection of different kinds of modems.

Both the channel units for line control can be used on general switched network for point to point connection or with leased (or private) lines in point to point or multipoint network.

Channel Unit for Console Typewriter (CUCTW)

The Channel Unit for Console Typewriter is the communication link between the CPU and a console typewriter. It is a V24 serial control unit and allows connection of a Philips PTS 6862 Console Typewriter or a teletype.

Philips PTS 6805 Terminal Computer

Modules of the terminal computer

All the modules of the terminal computer are housed in a computer cabinet. This is a free standing unit containing:

- a computer rack with
  - 13 slots for the electronic boards (CPU, memory and channel units)
  - a power supply for all the electronics in the computer rack
  - a battery as power back-up for the semiconductor memory in case of power failure
- a system operator's panel
- one or two flexible disc drives and power supply for these

The physical location of the modules inside the cabinet is shown in the illustration (front view). The operator's panel and the front covers are in this illustration removed to expose the computer rack.

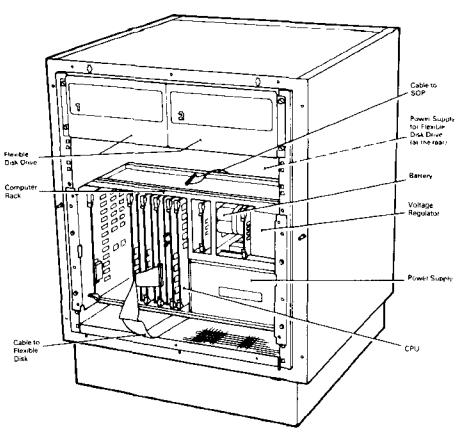
The flexible discs, the operator's panel, the electronic boards, the battery and the power supply for the electronics are accessible from the front. Cables and connectors and the power supply for the flexible disc drives are accessible from the rear. The front and the rear are covered with easy removable plates.

The connector panel (at the rear) allows connections of

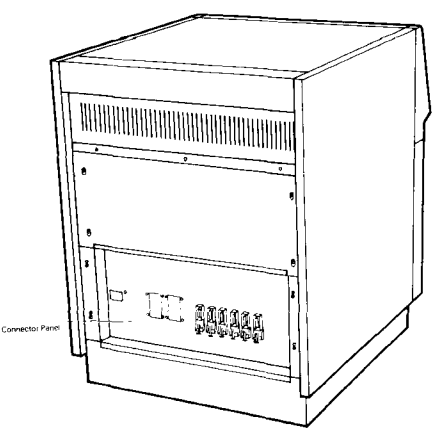
- six local lines
- two remote lines
- one line to public or private network
- one line to a console typewriter

Computer rack

The computer rack has 13 slots which permits the insertion of 13 printed circuit boards (electronic boards). The electronic boards (CPU, memory and channel units) are built on double-size "Eurocards" of the plug-in type. Each unit (electronic board) has been given a dedicated slot in the computer rack because of the hardwired interrupt (break) system.

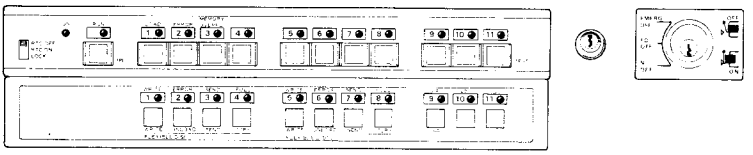


PTS 6805 front view



PTS 6805 rear view

Philips PTS 6805 Terminal Computer



Layout of System Operator's Panel

System Operator's Panel (SOP)

A System Operator's Panel (SOP) is always connected to the computer.

The panel is mounted at the front, and is easily accessed by the operator when the front shelf (the SOP cover flap) is opened.

Via the SOP, the system operator can obtain access to the computer program and gets a visual output from the CPU. The SOP is controlled by the channel unit for system operators panel. The SOP is also used to load the IPL-program.

The SOP has thirteen red indicators of LED-type. The first one indicates power on and the second indicate RUN-status. The remaining eleven indicators are under software control and mainly used for displaying different program status to the operator.

Ten push button switches are available for program and system control. The functions can be defined by the application as the switches are fully software controlled. One switch is for indicator test only.

The slide switch and one push button switch are used for loading of the bootstrap program. Another switch initiates loading of the IPL-program and further programs. The slide switch has three positions:
LOCK, RTC ON, RTC OFF (RTC = Real Time Clock).

The "bootstrap" switch is disabled when the slide switch is in the LOCK position. The real time clock is used for time out and supervisory functions.

The RTC selector governs the operation of the SOP and the functions of the three positions are shown in the following table.

	LOCK	RTC ON	RTC OFF
The system is able to run	Yes	Yes	Yes
The Real Time Clock is	enabled	enabled	inhibited
IPL switch operation	inhibited	enabled	enabled
SOP interrupt switches operation	enabled	enabled	enabled

The text on the System Operator's Panel covers the program loading phase. For guidance in the operational phase a separate sign is provided placed inside the SOP cover flap. This sign is exchangeable and the text can be adapted to special requirements.

Power Supply

There are two power supply units in PTS 6805 TC; one provides power to the flexible disc drives and the other one provides power for all the electronics in the computer rack.

Both the power supply units and the fan unit are connected to mains via a transformer, which is switchable for the following mains voltages: 100V, 110V, 115V, 127V, 200V, 220V, 230V and 240V, 50 or 60 Hz.

The output from the transformer is 220V, which is direct distributed to the power supply for the computer rack but via a relay to the power supply for the flexible disc drives. This relay is controlled by software, allowing the program to put ON/OFF the power for the flexible discs.

The relay function is selected by means of the key-operated mains switch, position FDD OFF, on the System Operator's Panel.

The location of the mains switch is shown in the illustration.

The terminal computer is put ON and OFF by means of the key, which controls the central section of the key knob. The key can be removed in both on- and off position. The outer section of this key knob, which is not key-controlled, has three settings:

- ON
- FDD OFF
- SERVICE/EMERGENCY

The normal position at day-time is position "ON". The position SERVICE/EMERGENCY is only used when service is performed, to ensure that the memory is power supplied from the battery.

Philips PTS 6805 Terminal Computer

The power supply unit for the computer rack is designed with switching technique. This unit also provides the CPU with power failure and restart signals, which are used by the CPU to start up power failure and restart sequences. A Real Time Clock with a period according to the main cycle time is also provided.

Flexible Disc

The Philips PTS 6805 Terminal Computer houses one or two flexible disc drives, one as standard and the second unit as option.

The flexible disc is used for program loading and as back-up medium. It also has the potential for program overlay and limited file handling.

The flexible disc can be used as a medium for data interchange between different systems. On the physical level the flexible disc is compatible to IBM 3740. On the logical level two different labelling systems are available, IBM- and TOSS-labelled discs.

The IBM-label should be chosen when the flexible disc is used as a medium for data interchange especially to and from systems others than PTS, and the TOSS-label when the disc is to be used only within PTS 6000 systems.

Program loading is only available from a TOSS-formated disc.

Performance:	
Capacity, unformatted:	3.2 Mbit
Capacity, formatted:	250 Kbytes
Rotating speed:	360 rev/min
Packing density, outer track:	1836 BPI
Packing density, inner track:	3268 BPI
Track density:	48 tracks/inch
No. of tracks:	77
Sector per track:	26
Sector length:	128 bytes
Head positioning time:	10 x n + 10 ms (n = No. of tracks)
Latency time:	83.3 ms
Average positioning time:	260 ms
Cartridge:	ISO/TC97/SC11 (e.g. IBM diskette)
Transfer rate:	250 K bit/sec

STANDARD/OPTIONS/ADAPTATIONS

The standard version of the Philips PTS 6805 Terminal Computer includes

- CPU
- $32K_{16}$ memory
- System Operator's Panel incl channel unit
- 1 Flexible Disc Drive incl channel unit
- Channel Unit for Local Terminals (for connection of six local lines)

Options

- 2nd Flexible Disc Drive
- Channel Unit for Line Control for HDLC or BSC procedures (two separate units)
- Channel Unit for Remote Terminals
- Channel Unit for Console Typewriter

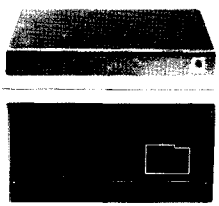
Adaptation of

- mains connection

TECHNICAL SUMMARY

Memory size	32k 16	
Cycle time	0.75 µsec.	
Number of instructions	100	
Interrupt levels	16 (64)	
Number of terminals	6 of which up to 4 may be remote	
Number of I/O addresses	64	
Registers	15 General purpose + 1 P register up to 256 external registers	
Dimensions and weight		
Depth	660 mm	
Height	700 mm	
Width	560 mm	
Weight	85 kg	
Power	100-240V, 50 or 60 Hz	
Environment	in operation	during storage
Temperature	+15 to +35°C	-40 to +70°C
Humidity	20-80%	20-90%

Philips PTS 6812 Terminal Computer



INTRODUCTION AND APPLICATION

The Philips PTS 6812 Terminal Computer is used to perform calculations on transaction information and to control all the functional modules of a Philips PTS 6000 Terminal System. Furthermore, it has the capabilities to perform dedicated applications and network operations. This compact computer is designed to work in an office environment. It is very easy to install, and, furthermore, it is unaffected by static electricity and fully protected against disruptions to the mains supply.

The Philips PTS 6812 TC uses flexible disc or magnetic tape cassette for program load and as back-up medium. The flexible disc also has the potential for program overlay and limitid file handling.

The Philips PTS 6812 TC can be used in both off-line and on-line systems. In an off-line system the flexible disc drive or the magnetic tape cassette recorder, which is housed in the terminal computer cabinet, is used to store all the transaction data. The flexible disc/cassette can later on be sent to the EDP centre for processing.

In an on-line system the disc/cassette is used as a back-up facility, in case the on-line transmission is interrupted. A terminal computer which is normally used off-line can be converted for on-line operation by the simple addition of a plug-in channel unit for line control and with the addition of the appropriate software.

The Philips PTS 6812 computer is planned for connection of up to 16 terminal stations. Of these up to 12 may be remote connected situated in another branch office(s) and connected to the terminal computer via modems and telephone lines. Normally a performance calculation has to be made to determine the maximum number of work stations that PTS 6812 TC can control in an application.

The processing unit of the computer handles the arithmetic and logic operations on submitted data, and also directs the transfer of information between different parts of the coincidenc-type ferrite core memory and the functional modules of the system. Data are processed in parallel form with a 16-bit basic word length.

All operations are controlled by the terminal computer program which can be tailored to the user's requirements. Each transaction routine is software controlled; if the terminal operator makes an error during the transaction procedure, or inadvertently tries to use the wrong procedure, an immediate warning is given to the operator and the routine is stopped until the correct procedure is carried out.

The functions of all the terminal modules are fully controlled by the terminal computer; even the layout of printed information can be incorporated within the program. And to decrease the chance of errors being made at the keyboard, those keys not required for a particular operation can be disabled.

Weighting techniques are used to supplement data stored in the registers and allow check digit verification further to reduce the risk of errors. Before information is forwarded to the central computer, it is automatically edited and arranged into a suitable format for subsequent processing.

The adaptability of the computer software, combined with a choice of memory capacity plus the range of peripherals, and the ease of converting it from off-line to on-line working, make the computer suitable for use in different types of decentralized and centralized enterprises. Its functional possibilities include local management of files, print-out of table data and network control.

PRODUCT DESCRIPTION

The terminal computer Philips PTS 6812 consists basically of:

- a processor, called CPU
- a memory
- channel units
- an input/output (multiplex) processor.

All these units are built into a cabinet, which also provides the power supply and the operator's panel. Apart from the terminal computer itself this cabinet houses 1 or 2 flexible disc drives or/and 1 or 2 digital cassette recorders.

Philips PTS 6812 Terminal Computer

Central Processing Unit (CPU)

The central processing unit of the Philips PTS 6812 computer is a minicomputer mounted on one single board.

The main features of the architecture of the computer are strongly related to the generalized bidirectional asynchronous I/O-bus, General Purpose bus, GP-bus.

Some vital characteristics are:

- CPU timing is independent of memory timing
- Possibility of using an input/output (multiplex) processor which gives high throughput rate
- Bus cabling
- The CPU timing is independent of the channel unit timing.

The architecture of the Central Processing Unit is based on a microprogram store which contains the information to control a series of CPU sequences during the execution of an instruction. The internal and external data path of the computer is 16 bits.

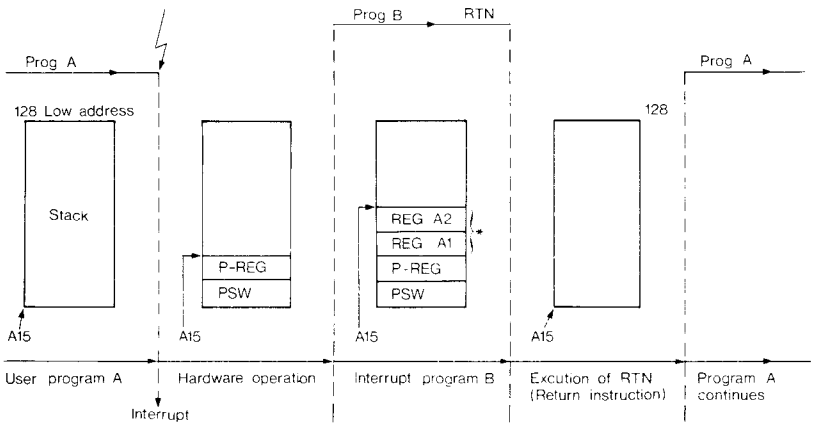
General data

16 bits, parallel transfer
15 general purpose registers + P register
64 I/O addresses
Microprogrammed
74 instructions
47 (63) interrupt levels
Addressing: direct; indirect; indexed; indexed indirect
Up to 256 external registers
Power Failure/Automatic Restart and Real Time Clock
Automatic IPL-loader
32K/16 memory direct addressable

Interrupt and stacking system

The interrupt system is used for all peripheral operations and for handling internally generated interrupts. The system will handle up to 64 interrupt levels. Interrupts are handled according to their priority, which is established by pre-wiring on the channel units; the priority interrupt request is accepted and compared with the

Philips PTS 6810 Terminal Computer



Operation of the interrupt and stacking system

Philips PTS 6812 Terminal Computer

priority level of the running program. If the priority level of the interrupt is higher than that of the running program, the program is interrupted, if an enable instruction has been given, and the P-register contents (the address of the next program instruction) and the program status word (containing the priority level and information) are stored in a memory stack. A new program is then started by the interrupt and this program runs until stopped by a higher priority interrupt or until it is completed.

A hardware routine is started by the program interrupt signal after the current program instruction is completed. During this routine the P-register contents and the program status word are stacked and the stack pointer (scratch pad register 15) is decremented to point to the next free location in the stack. The 6-bit number from the priority encoder, which is the priority level of the new program register, is loaded into the priority register. This number is also used to select a location in memory which contains the starting address of the new program. The illustration shows, in a simplified form, the operation of the interrupt and stacking system.

The new pogram started by the interrupt will normally contain routines to save the contents of registers for the old program and may also include an instruction to enable the interrupt system to accept new interrupt requests.

Return to the interrupted program is initiated by a return instruction (RTN) to take the program status word and program address from the stack. The priority level of the program, contained in the status word, is loaded into the priority register and the program address is loaded into the P-register. The program then resumes and continues until completed or until interrupted by a new interrupt signal.

The bus concept

The Philips PTS 6812 terminal computer is built up according to the bus concept. Devices which are connected to the bus are divided into masters and slaves. The types of master are:

- CPU
- Input/Output (Multiplex) Processor

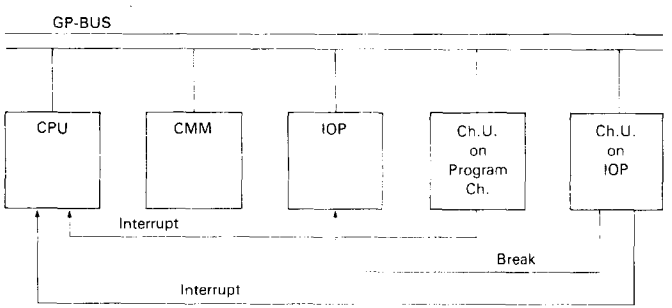
The slaves are:

- Memory Module
- Input/Output Channel Units
- Program Channel Units

The Input/Output Processor may itself be slave when it is receiving or transferring control information from the CPU.

The bus masters may acquire control of the bus by putting a request to the bus control. The bus control is a piece of logic situated in the CPU. Whenever a master requires control of the bus it sends a bus request and the bus control logic grants the bus to the master. The priority of the masters with respect to this control is a kind of daisy chain in which the actual position of the master in the chain determines its bus priority.

Once the master has control of the bus it sends a timing signal together with an address of a slave on the bus. The slave recognizes its address and sends a control signal back to the master. The master or the slave then sends the information and the master removes the control signal. After that, the control signal from the slave is removed and this is the end of the bus cycle.



The bus concept

Philips PTS 6812 Terminal Computer

General purpose registers

P-register: A 15-bit register (register 0) used as an instruction counter to contain the address of the next program instruction to be executed.

Register 1 to 14: Fourteen 16-bit general purpose registers which can be used as accumulators (to contain the intermediate results of computation), as addresses or index registers or as I/O-registers.

Register 15: A 16-bit register used as a stack pointer for the interrupt system.

Power Failure/Automatic Restart

This feature provides the means of detecting a power failure and automatically restarting a program, without loss of information.

If the AC power fails or drops below the minimum level of error-free operation, an interrupt is generated after 5 milliseconds. Power for another 2 ms is stored in the power supply. During this time all information relevant to the current program is stored by software in the core memory.

The program is automatically restarted when the power is returned, i.e. all the hardware is reset, the stored information is retrieved and the interrupted program is resumed.

Real Time Clock (RTC)

The real time clock gives an interrupt each time a timing signal is received. This signal comes from the interval timer which is tied to the power supply: one RTC pulse for each 20 ms at 50 Hz and for each 16.67 ms at 60 Hz.

Bootstrap

By operating the key switch on the SOP (System Operator's Panel), the bootstrap, which is contained in a ROM package is automatically loaded into the main core memory and then executed. By the bootstrap, loading of the IPL-program from flexible disc or magnetic tape cassette is possible. The ROM package is located on the CPU card.

Console Typewriter interface

The console typewriter interface is a standard feature which is mounted on the CPU-card. It allows connection of a Philips PTS 6862 Console Typewriter or a teletype.

Memory

The memory of the Philips PTS 6812 TC is of the core type. Together with the power failure/automatic restart facility of the CPU, it ensures an immediate restart after a power break without loss of data.

The memory consists of one 32K 16 bits module, which is inserted in a reserved slot in the CPU cabinet. The time for a complete read/write cycle is 1.2 μsec.

Channel Units

A channel unit is the interface between the processing unit of the terminal computer and the devices. Channel units can logically be mounted in any slot intended for channel units. If, however, they are used on multiplex channels or have device connectors on the bus side (e.g. CHCR) the position has to be fixed in each configuration.

Channel units are available for local or remote connection of working stations, for data communication interfaces for on-line network, and for all the supported peripherals like magnetic tape cassette recorder, flexible disc, magnetic tape, cartridge disc, line printer and card reader.

Input/Output (Multiplex) Processor (IOP)

The IOP is used for two main purposes:

- to achieve a high transfer rate between channel units and the memory
- to unload the program from I/O-transfers.

The IOP provides for the control and automatic execution of direct transfers of variable length blocks of data between channel units of peripherals and the memory. Up to eight channel units can be handled by the IOP, each having its own hardwired priority. The IOP is inserted in a reserved slot in the computer rack.

The parameters of each block to be transferred – maximum length of transfer, type of transfer (output or input), transfer mode (character or word) and starting address – are loaded by the program into registers in the IOP, corresponding to the channel unit concerned, before each transfer commences. The IOP contains 16 program addressable working registers for this purpose.

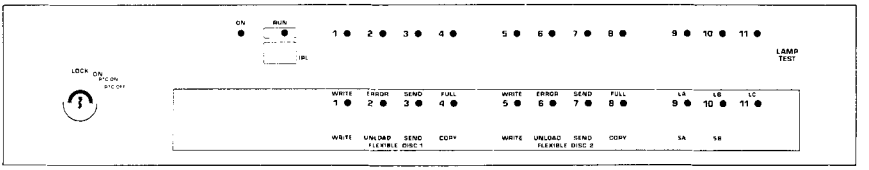
For each data transfer, the IOP occupies the bus just once and uses one single memory cycle (cycle-stealing). The transfer takes place on break request from the channel units.

The maximum transfer rate is around 600 K word/sec. In that case no time is left for normal CPU activities.

MODULES OF THE TERMINAL COMPUTER

All the modules of the terminal computer are housed in a computer cabinet. This is a free standing unit containing:

- mounting shelves for up to two flexible disc drives and two digital cassette recorders
- system operator's panel
- a power supply
- a 10 slot rack, in which the CPU, the memory unit and channel units are mounted. Each of these units is built on a printed circuit board.



Layout of System Operator's Panel with a text sign

Philips PTS 6812 Terminal Computer

The cassette recorders, the discs and the system operator's panel are accessible from the front and power supply unit and computer rack are accessible from the rear.

The front is covered by a door equipped with a unique lock. The rear is covered by an easy removable plate. All empty spaces are covered with inlet covers.

The fan unit is located at the bottom of the cabinet. It is provided with an easily exchangeable dust filter.

The cabinet is made of steel and has a colour conforming to the PTS 6000 series. The external dimensions of the cabinet are:

- Height: 995 mm
- Depth: 635 mm
- Width: 520 mm

Flexible Disc

The Philips PTS 6812 Terminal Computer houses one or two Flexible Disc Drives. They are placed in the upper part of the cabinet and connected to the CPU via the Channel Unit for Flexible Disc, Philips PTS 6848 CHFD, located in the rack compartment of the terminal computer. PTS 6848 can handle up to four daisy chained disc drives. Thus two drives inside the terminal computer cabinet and two drives in a free-standing unit, PTS 6879 FDU.

The flexible disc is used for program loading and as back-up medium. It also has the potential for program overlay and limited file handling.

The flexible disc can be used as a medium for data interchange between different systems. On the physical level the flexible disc is compatible to IBM 3740. On the logical level two different labelling systems are available, IBM- and TOSS-labelled discs.

The IBM-label should be chosen when the flexible disc is used as a medium for data interchange especially to and from systems others than PTS, and the TOSS-label when the disc is to be used only within PTS 6000 systems. Program loading is only available from a TOSS-formatted disc.

Digital Cassette Recorder

As an alternative to flexible disc the digital cassette recorder can be used for program loading and as back-up medium. The terminal computer can house one or two recorders (the Philips professional recorder) in the upper part of the cabinet, and connected to the CPU through the Channel Unit for Cassette Recorder and SOP (CHCR) located in the rack compartment of the terminal computer.

The recorder uses ECMA-34 cassettes. The tape length is 86 m and the tape width is 3.81 mm.

System Operator's Panel (SOP)

The panel is mounted at the front, and is easily accessed by the operator when the front door is opened.

Via the SOP the system operator can obtain access to the computer program and gets a visual output from the CPU. This part of the SOP is controlled by the CHCR (Channel Unit for SOP and Cassette Recorder), which must be inserted in the computer rack. The SOP is also used to load the IPL-program.

The SOP has thirteen red indicators of LED-type. The first one indicates power on and the second indicates RUN-status. The remaining eleven indicators are under software control and mainly used for displaying different program status to the operator.

Ten push button switches are available for program and system control. The functions can be defined by the application as the switches are fully software controlled. One switch is for indicator test only (LAMP TEST).

The key switch and one push-button switch are used for loading of the bootstrap program. Another switch initiates loading of the IPL-program and further programs. The key switch has three positions: LOCK, RTC ON, RTC OFF (RTC = Real Time Clock).

The RTC selector governs the operation of the SOP and the functions of the three positions are shown in the following table.

	LOCK	RTC ON	RTC OFF
The system is able to run	Yes	Yes	Yes
The Real Time Clock is	enabled	enabled	inhibited
IPL switch operation	inhibited	enabled	enabled
SOP interrupt switches operation	enabled	enabled	enabled

Below the push-button switches on the SOP there is a space to place a text sign for guidance in the operation of the SOP. The picture showing the layout of the SOP also shows an example of a text sign (a self-adhesive tape) placed in this space.

Power Supply Unit (PSU)

The power supply unit is positioned alongside the computer rack. It converts the main AC voltage into different levels of DC voltage. Overvoltage and overload protection are both provided and a thermo-switch disconnects the mains in case of overheating.

The power supply is designed with switching technique and the input voltage can be in the range of 100-127 V ± 10% or 200-240 V ± 10%, 50 or 60 Hz.

The PSU provides the CPU with a Power Failure Signal which is used by the CPU to start up power failure and restart sequences. A reset signal resets the CPU after a power failure. A Real Time Clock with a period according to the main cycle time is also provided.

Identical power supply units are used in the basic cabinet and the extension unit. The PSU provides approximately 43 A on + 5 V, which covers the powers requirements of almost any configuration.

Philips PTS 6812 Terminal Computer

Computer rack

The computer rack has 10 slots which permit the insertion of 10 printed circuit boards. Some of the slots are reserved for mandatory boards and for boards which require pre-wiring of the rack or must have special connectors in the rack, for instance

- Central Processing Unit (CPU) mandatory
- Core Memory Module (CMM) mandatory
- Channel Unit for SOP mandatory
- Input/Output Processor (IOP)

The remaining slots are shared between different channel units. For larger configurations an Extension Unit, Philips PTS 6864 EXU, is used.

STANDARD/OPTIONS/ADAPTATIONS

The standard version of the Philips PTS 6812 Terminal Computer includes

- CPU
- 32K 16 memory module
- System Operator's Panel including channel unit (CHCR)
- 1 Flexible Disc Drive including channel unit (CHFD) or 1 Digital Cassette Recorder
- 1 Channel Unit for Local Terminals

Options are

- 2nd Flexible Disc Drive or 2nd Digital Cassette Recorder
- Input/Output Processor
- 2nd Channel Unit for Local Terminals
- Channel Units for Remote Terminals
- Channel Units for Line Control
- Channel Units for peripherals

Adaptation of

- mains connection

TECHNICAL SUMMARY

Memory size	32K 16
Memory module	32K 16
Cycle time	1.2 μsec
Number of instructions	74
Interrupt levels	47 (63)
Max. number of terminals	16 local and remote
Number of I/O addresses	64
Registers	15 General purpose + 1 P-register up to 256 external registers
I/O transfer rate	up to 600 000 word/sec
Dimensions and weight	
Depth	635 mm
Height	995 mm
Width	520 mm
Weight	100 kg appr.
Power	100-127 V, 200-240 V ± 10% 50 or 60 Hz ± 2%
Power consumption	Typical 500 W
Environment	in operation during storage
Temperature	+ 15 to + 35°C − 40 to + 70°C
Humidity	20 to 80% 20 to 90%

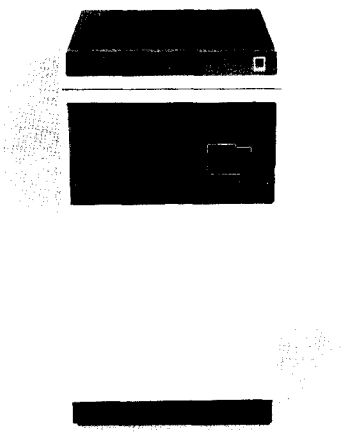
Flexible disc performance:

Capacity, unformatted	3.2 M bit
Capacity, formatted	250 K bytes
Rotating speed	360 rev/min
Packing density	
outer track	1836 BPI
inner track	3268 BPI
Track density	48 tracks/inch
No. of tracks	77
Sector per track	26
Sector length	128 bytes
Head positioning time	10 + n + 10 ms (n = No. of tracks)
Latency time	83.3 ms
Average positioning time	260 ms
Cartridge	ISO TC97 SC11 (e.g. IBM diskette)
Transfer rate	250 K bits/sec

Digital Cassette Recorder performance:

Data registration	Blocks of 256 characters max.
Cassettes	According to ECMA-34
Block gap	20 mm
Packing density	800 bits/inch
Tape length	86 m
Tape width	3.81 mm
Head type	Ferrite write/read head combined in one housing
Read procedure	Read after write with parity check for each block
Recording technique	Character serial, bit serial, phase encoded
Data transfer rate	64 K bits/sec at 19 cm/s
Write/read speed	19 cm/s
Average rewind speed	2 m/s
Data capacity	2.8 million bits per track at 100% utilization

Philips PTS 6813 Terminal Computer



INTRODUCTION AND APPLICATION

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The Philips PTS 6813 computer is planned for connection of up to 32 terminal stations. Of these up to 16 may be remote connected situated in another branch office(s) and connected to the terminal computer via modems and telephone lines. Normally a performance calculation has to be made to determine the maximum number of work stations that PTS 6813 TC can control in an application.

Philips PTS 6813 TC can also be used as a line concentrator. Its processing capacity can also be used for file management.

The processing unit of the computer handles the arithmetic and logic operations on submitted data, and also directs the transfer of information between different parts of the coincidenc-type ferrite core memory and the functional modules of the system. Data are processed in parallel form with a 16-bit basic word length.

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The functions of all the terminal modules are fully controlled by the terminal computer; even the layout of printed information can be incorporated within the program. And to decrease the chance of errors being made at the keyboard, those keys not required for a particular operation can be disabled.

Weighting techniques are used to supplement data stored in the registers and allow check digit verification further to reduce the risk of errors. Before information is forwarded to the central computer, it is automatically edited and arranged into a suitable format for subsequent processing.

The adaptability of the computer software, combined with a choice of memory capacity plus the range of peripherals, and the ease of converting it from off-line to on-line working, make the computer suitable for use in different types of decentralized and centralized enterprises. Its functional possibilities include local management of files, print-out of table data and network control.

PRODUCT DESCRIPTION

The terminal computer Philips PTS 6813 consists basically of:

- a processor, called CPU
- a memory, including a memory management unit
- channel units
- an input/output (multiplex) processor.

All these units are built into a cabinet, which also provides

Philips PTS 6813 Terminal Computer

the power supply and the operator's panel. Apart from the terminal computer itself this cabinet houses 1 or 2 flexible disc drives or and 1 or 2 digital cassette recorders.

Central Processing Unit (CPU)

The central processing unit of the Philips PTS 6813 computer is a minicomputer mounted on one single board.

The main features of the architecture of the computer are strongly related to the generalized bidirectional asynchronous I/O-bus, General Purpose bus, GP bus.

Some vital characteristics are:

- CPU timing is independent of memory timing
- Possibility of using input/output (multiplex) processor which give high throughput rate
- Bus cabling
- The CPU timing is independent of the channel unit timing

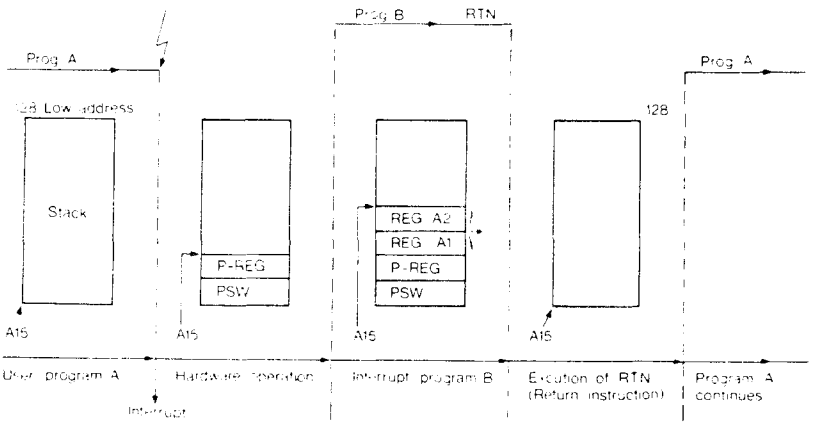
The architecture of the Central Processing Unit is based on a microprogram store which contains the information to control a series of CPU sequences during the execution of an instruction. The internal and external data path of the computer is 16 bits.

General data

16 bits, parallel transfer
15 general purpose registers + P register
64 I/O addresses
Microprogrammed
148 instructions
47 (63) interrupt levels
Addressing: direct; indirect; indexed; indexed indirect
Up to 256 external registers
Power Failure Automatic Restart and Real Time Clock
Automatic IPL-loader
32K 16 memory direct addressable
Up to 128K 16 memory addressable by means of a Memory Management Unit (MMU)

Interrupt and stacking system

The interrupt system is used for all peripheral operations and for handling internally generated interrupts. The system will handle up to 64 interrupt levels. Interrupts are handled according to their priority, which is established by pre-wiring on the channel units; the priority interrupt request is accepted and compared with the priority level of the running program. If the priority level of the in-



Operation of the interrupt and stacking system

Philips PTS 6813 Terminal Computer

terrupt is higher than that of the running program, the program is interrupted, if an enable instruction has been given, and the P-register contents (the address of the next program instruction) and the program status word (containing the priority level and information) are stored in a memory stack. A new program is then started by the interrupt and this program runs until stopped by a higher priority interrupt or until it is completed.

A hardware routine is started by the program interrupt signal after the current program instruction is completed. During this routine the P-register contents and the program status word are stacked and the stack pointer (scratch pad register 15) is decremented to point to the next free location in the stack. The 6-bit number from the priority encoder, which is the priority level of the new program register, is loaded into the priority register. This number is also used to select a location in memory which contains the starting address of the new program. The illustration shows, in a simplified form, the operation of the interrupt and stacking system.

The new pogram started by the interrupt will normally contain routines to save the contents of registers for the old program and may also include an instruction to enable the interrupt system to accept new interrupt requests.

Return to the interrupted program is initiated by a return instruction (RTN) to take the program status word and program address from the stack. The priority level of the program, contained in the status word, is loaded into the priority register and the program address is loaded into the P-register. The program then resumes and continues until completed or until interrupted by a new interrupt signal.

The bus concept

The Philips PTS 6813 terminal computer is built up according to the bus concept. Devices which are connected to the bus are divided into masters and slaves. The types of master are:

- CPU
- Input/Output (Multiplex) Processor

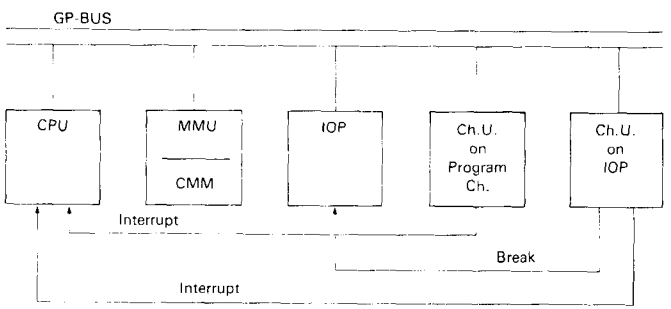
The slaves are:

- Memory Module
- Input/Output Channel Units
- Program Channel Units

The Input/Output Processor may itself be slave when it is receiving or transferring control information from the CPU.

The bus masters may acquire control of the bus by putting a request to the bus control. The bus control is a piece of logic situated in the CPU. Whenever a master requires control of the bus it sends a bus request and the bus control logic grants the bus to the master. The priority of the masters with respect to this control is a kind of daisy chain in which the actual position of the master in the chain determines its bus priority.

Once the master has control of the bus it sends a timing signal together with an address of a slave on the bus. The slave recognizes its address and sends a control signal back to the master. The master or the slave then sends the information and the master removes the control signal. After that, the control signal from the slave is removed and this is the end of the bus cycle.



The bus concept

Philips PTS 6813 Terminal Computer

General purpose registers

P-register: A 15-bit register (register 0) used as an instruction counter to contain the address of the next program instruction to be executed.

Register 1 to 14: Fourteen 16-bit general purpose registers which can be used as accumulators (to contain the intermediate results of computation), as addresses or index registers or as I/O-registers.

Register 15: A 16-bit register used as a stack pointer for the interrupt system.

Power Failure/Automatic Restart

This feature provides the means of detecting a power failure and automatically restarting a program, without loss of information.

If the AC power fails or drops below the minimum level of error-free operation, an interrupt is generated after 5 milliseconds. Power for another 2 ms is stored in the power supply. During this time all information relevant to the current program is stored by software in the core memory.

The program is automatically restarted when the power is returned, i.e. all the hardware is reset, the stored information is retrieved and the interrupted program is resumed.

Real Time Clock (RTC)

The real time clock gives an interrupt each time a timing signal is received. This signal comes from the interval timer which is tied to the power supply; one RTC-pulse for each 20 ms at 50 Hz and for each 16.67 ms at 60 Hz.

Bootstrap

By operating the key switch on the SOP (System Operator's Panel), the bootstrap, which is contained in a ROM package is automatically loaded into the main core memory and then executed. By the bootstrap, loading of the IPL-program from flexible disc or magnetic tape cassette is possible. The ROM package is located on the CPU card.

Console Typewriter interface

The console typewriter interface is a standard feature which is mounted on the CPU-card. It allows connection of a Philips PTS 6862 Console Typewriter or a teletype. (Speed: 50 char/sec)

Memory and Memory Management Unit

The memory of the Philips PTS 6813 TC is of the core type. Together with the power failure/automatic restart facility of the CPU, it ensures an immediate restart after a power break without loss of data.

The memory consists of one up to four 32K 16 modules, PTS 6825 CMM, which are inserted in reserved slots in the CPU cabinet. The time for a complete read/write cycle is 0.7 μsec. This memory module can work in interleaving mode.

The Memory Management Unit (MMU) card, which is a mandatory unit, is needed when more than 32K 16 main core memory is used in a system. The MMU card provides memory addressing and protection facilities for the system. The MMU operates under CPU bus control. The main feature is address translation which extends the main core memory up to 128K 16.

Channel Units

A channel unit is the interface between the processing unit of the terminal computer and the devices. Channel units can logically be mounted in any slot intended for channel units. If, however, they are used on multiplex channels or have device connectors on the bus side (e.g. CHCR) the position has to be fixed in each configuration.

Channel units are available for local or remote connection of working stations, for data communication interfaces for on line network, and for all the supported peripherals like magnetic tape cassette recorder, flexible disc, magnetic tape, cartridge disc, line printer and card reader.

Input/Output (Multiplex) Processor (IOP)

The IOP is used for two main purposes:

- to achieve a high transfer rate between channel units and the memory
- to unload the program from I/O-transfers.

The IOP provides for the control and automatic execution of direct transfers of variable length blocks of data between channel units of peripherals and the memory. Up to eight channel units can be handled by the IOP, each having its own hardwired priority. The PTS 6813 system can handle up to two IOP's, which are inserted in reserved slots in the computer rack.

The parameters of each block to be transferred – maximum length of transfer, type of transfer (output or input), transfer mode (character or word) and starting address – are loaded by the program into registers in the IOP, corresponding to the channel unit concerned, before each transfer commences. The IOP contains 16 program addressable working registers for this purpose.

For each data transfer, the IOP occupies the bus just once and uses one single memory cycle (cycle stealing). The transfer takes place on break request from the channel units.

The maximum transfer rate is around 1200 K word/sec. In that case no time is left for normal CPU activities.

Philips PTS 6813 Terminal Computer

MODULES OF THE TERMINAL COMPUTER

All the modules of the terminal computer are housed in a computer cabinet. This is a free standing unit containing:

- mounting shelves for up to two flexible disc drives and two digital cassette recorders
- system operator's panel
- space for an extended computer full panel
- a power supply
- a 10 slot rack, in which the CPU, the memory units and channel units are mounted. Each of these units is built on a printed circuit board.

The cassette recorders, the discs and the system operator's panel are accessible from the front and power supply unit and computer rack are accessible from the rear.

The front is covered by a door equipped with a unique lock. The rear is covered by an easy removable plate. All empty spaces are covered with inlet covers.

The fan unit is located at the bottom of the cabinet. It is provided with an easily exchangeable dust filter.

The cabinet is made of steel and has a colour conforming to the PTS 6000 series. The external dimensions of the cabinet are:

- Height: 995 mm
- Depth: 635 mm
- Width: 520 mm

Flexible Disc

The Philips PTS 6813 Terminal Computer houses one or two Flexible Disc Drives. They are placed in the upper part of the cabinet and connected to the CPU via the Channel Unit for Flexible Disc, Philips PTS 6848 CHFD, located in the rack compartment of the terminal computer. PTS 6848 can handle up to four daisy chained disc drives. Thus two drives inside the terminal computer cabinet and two drives in a free-standing unit, PTS 6879 FDU.

The flexible disc is used for program loading and as back-up medium. It also has the potential for program overlay and limited file handling.

The flexible disc can be used as a medium for data interchange between different systems. On the physical level the flexible disc is compatible to IBM 3740. On the logical level two different labelling systems are available, IBM- and TOSS-labelled discs.

The IBM-label should be chosen when the flexible disc is used as a medium for data interchange especially to and from systems others than PTS, and the TOSS-label when the disc is to be used only within PTS 6000 systems. Program loading is only available from a TOSS-formatted disc.

Digital Cassette Recorder

As an alternative to flexible disc the digital cassette recorder can be used for program loading and as back-up medium. The terminal computer can house one or two recorders (the Philips professional recorder) in the upper part of the cabinet, and connected to the CPU through the Channel Unit for Cassette Recorder and SOP (CHCR) located in the rack compartment of the terminal computer.

The recorder uses ECMA-34 cassettes. The tape length is 86 m and the tape width is 3.81 mm.

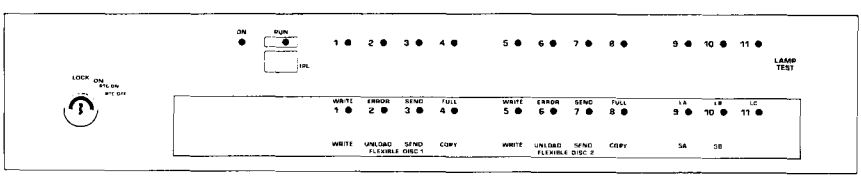
Control Panels

A System Operator's Panel is always connected to the computer. In addition, an Extended Computer Full Panel can be connected.

System Operator's Panel (SOP)

The panel is mounted at the front, and is easily accessed by the operator when the front door is opened.

Via the SOP the system operator can obtain access to the computer program and gets a visual output from the CPU. This



Layout of System Operator's Panel with a text sign

Philips PTS 6813 Terminal Computer

part of the SOP is controlled by the CHCR (Channel Unit for SOP and Cassette Recorder), which must be inserted in the computer rack. The SOP is also used to load the IPL-program.

The SOP has thirteen red indicators of LED-type. The first one indicates power on and the second indicates RUN-status. The remaining eleven indicators are under software control and mainly used for displaying different program status to the operator.

Ten push button switches are available for program and system control. The functions can be defined by the application as the switches are fully software controlled. One switch is for indicator test only. LAMP TEST.

The key switch and one push-button switch are used for loading of the bootstrap program. Another switch initiates loading of the IPL-program and further programs. The key switch has three positions: LOCK, RTC ON, RTC OFF (RTC = Real Time Clock).

The RTC selector governs the operation of the SOP and the functions of the three positions are shown in the following table.

	LOCK	RTC ON	RTC OFF
The system is able to run	Yes	Yes	Yes
The Real Time Clock is	enabled	enabled	inhibited
IPL switch operation	inhibited	enabled	enabled
Full panel switches operation	inhibited	enabled	enabled
SOP interrupt switches operation	enabled	enabled	enabled

Below the push-button switches on the SOP there is a space to place a text sign for guidance in the operation of the SOP. The picture showing the layout of the SOP also shows an example of a text sign (a self-adhesive tape) placed in this space.

Extended Full Panel

The Extended Full Panel is an element which allows the operator to dialogue with the central processing unit specially for test and debugging purposes. This panel is a separate module with its own product number, PTS 6817 EFP. When the full panel is connected, the "bootstrap" switch of the SOP is disabled. The full panel is mounted below the SOP and used in parallel with SOP.

Power Supply Unit (PSU)

The power supply unit is positioned alongside the computer rack. It converts the main AC voltage into different levels of DC voltage. Overvoltage and overload protection are both provided and a thermo-switch disconnects the mains in case of overheating.

The power supply is designed with switching technique and the input voltage can be in the range of 100-127 V ± 10% or 200-240 V ± 10%, 50 or 60 Hz.

The PSU provides the CPU with a Power Failure Signal which is used by the CPU to start up power failure and restart sequences. A reset signal resets the CPU after a power failure. A Real Time Clock with a period according to the main cycle time is also provided.

Identical power supply units are used in the basic cabinet and the extension unit. The PSU provides approximately 43 A on + 5 V, which covers the powers requirements of almost any configuration.

Computer rack

The computer rack has 10 slots which permit the insertion of 10 printed circuit boards. Some of the slots are reserved for mandatory boards and for boards which require pre-wiring of the rack or must have special connectors in the rack, for instance

- Central Processing Unit (CPU) mandatory
- Core Memory Module (CMM) 1 unit mandatory
- Channel Unit for SOP mandatory
- Memory Management Unit (MMU)
- Input/Output Processor (IOP)

The remaining slots are shared between different channel units. For larger configurations an Extension Unit, Philips PTS 6864 EXU, is used.

Philips PTS 6813 Terminal Computer

STANDARD/OPTIONS/ADAPTATIONS

The standard version of the Philips PTS 6813 Terminal Computer includes

- CPU
- 32K16 memory module
- Memory Management Unit (MMU)
- System Operator's Panel including channel unit (CHCR)
- 1 Flexible Disc Drive including channel unit (CHFD) or 1 Digital Cassette Recorder
- 1 Channel Unit for Local Terminals

Options are

- 2nd Flexible Disc Drive or 2nd Digital Cassette Recorder
- Up to three additional 32K16 memory modules
- Input/Output Processor
- Additional Channel Units for Local Terminals
- Channel Units for Remote Terminals
- Channel Units for Line Control
- Channel Units for peripherals
- Extended Full Panel

Adaptation of

- mains connection

TECHNICAL SUMMARY

Memory size	up to 128K/16
Memory modules	32K/16
Cycle time	0.7 μsec
Number of instructions	148
Interrupt levels	47 (63)
Max. number of terminals	32 of which up to 16 may be remote
Number of I/O addresses	64
Registers	15 General purpose + 1 P-register up to 256 external registers
I/O transfer rate	up to 600 000 word/sec
Dimensions and weight	
Depth	635 mm
Height	995 mm
Width	520 mm
Weight	100 kg appr.

Power	100-127 V, 200-240 V±10% 50 or 60 Hz ± 2%	
Power consumption	Typical 500 W	
Environment	in operation	during storage
Temperature	+15 to +35°C	−40 to +70°C
Humidity	20 to 80%	20 to 90%

Flexible disc performance:

Capacity, unformatted	3.2 M bit
Capacity, formatted	250 K bytes
Rotating speed	360 rev/min
Packing density	
outer track	1836 BPI
inner track	3268 BPI
Track density	48 tracks/inch
No. of tracks	77
Sector per track	26
Sector length	128 bytes
Head positioning time	10 × n + 10 ms (n = No. of tracks)
Latency time	83.3 ms
Average positioning time	260 ms
Cartridge	ISO/TC97/SC11 (e.g. IBM diskette)
Transfer rate	250 K bits/sec

Digital Cassette Recorder performance:

Data registration	Blocks of 256 characters max.
Cassettes	According to ECMA-34
Block gap	20 mm
Packing density	800 bits/inch
Tape length	86 m
Tape width	3.81 mm
Head type	Ferrite write/read head combined in one housing
Read procedure	Read after write with parity check for each block
Recording technique	Character serial, bit serial, phase encoded
Data transfer rate	64 K bits/sec at 19 cm/s
Write/read speed	19 cm/s
Average rewind speed	2 m/s
Data capacity	2.8 million bits per track at 100% utilization

Philips PTS 6000 Peripherals

The type and load of data processing in a terminal system as required by banks differ considerably. There is thus a need for different types of peripherals. The Philips PTS 6000 system therefore provides a range of peripherals which allow for the development of special terminal systems to meet specific situations.

These peripherals are: tape units, disk units, matrix line printers, card readers, console typewriters and magnetic tape cassettes.

TAPE UNITS

Although the Philips PTS 6000 terminal computers are designed for on-line working with a bank main computer, such an arrangement may not be efficient or economic, due to the reliability or the high cost of dedicated telephone lines. To meet such situations, Philips provide magnetic tape units for transferring data on cassette to standard ½ inch tapes, which can be physically transported to a central computer or EDP facility. A magnetic tape unit can also be used as a data carrier in situations where the capacity of the magnetic tape cassette is insufficient.

DISKS

Again, the ability to work on-line with a main computer is an essential feature when the main computer is used to store all customer's files. However, decentralised files may be kept because of local administrative requirements. For example, each bank of a group sharing a centralised EDP facility may be legally required to maintain its own customers' files. In addition, decentralisation decreases the bank's vulnerability to disturbances in the central system, such as caused by strikes for example.

Decentralised files are conveniently maintained in the disk units, each of which can store some 5M bytes.

PRINTERS

A large terminal system may require a local bulk-printing facility for the production of daily and monthly journals, tables, statistical information, etc. Such a facility is also essential for a program development system.

For these reasons, the Philips PTS 6000 system includes a medium-speed, highly reliable, matrix line printer.

CARD READERS

A well-designed bank terminal system not only looks to the future – it accommodates the past as well. Compatibility with existing main computers is one example of this, and another is the inclusion in the system of a card reader. This unit provides an interface with programming systems for entry from source decks, where punched cards are still in common use.

CONSOLE TYPEWRITERS

Check out and program testing is, naturally, an important part of a working bank terminal system. For this purpose, Philips offers a console typewriter, which extends the communication possibilities between the terminal computer and its programming unit.

MAGNETIC TAPE CASSETTES

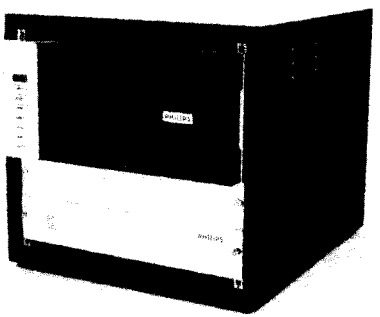
Each terminal computer is equipped with magnetic tape cassette units for data logging and program storage. These units are described in the chapters on the Philips PTS 6000 terminal computers, since they are regarded as an essential part of these computers.

FLEXIBLE DISK UNITS

Each terminal computer can be equipped with flexible disk units for data logging and program storage.

Not all peripherals will be found in every bank, but they provide the "rounding off" essential for a fully-developed bank terminal system.

Philips PTS 6164 Magnetic Tape Unit Assembly



INTRODUCTION AND APPLICATIONS

The Philips PTS 6164 Magnetic Tape Unit Assembly is a peripheral to the Philips PTS 6110 Terminal Computer, and is mainly used for

- data interchange with other systems
- transfer of data from cassette to tape and vice versa
- data logging

Data on a cassette are read by PTS 6162 (PTS 6161) Digital Cassette Recorder and are recorded by standard ½ inch magnetic tape by the PTS 6164, or vice versa.

PRODUCT DESCRIPTION

The Philips PTS 6164 Magnetic Tape Unit Assembly comprises

- ½ inch Magnetic Tape Unit (MTU) in a separate housing
- Channel Unit (CHM) mounted in the Terminal Computer PTS 6110
- Text panel on the control panel of the Terminal Computer (in English)
- Connecting cables.

The tape drive unit is mounted in a separate table-top cabinet. The phase encoding recording mode is employed on 9 channels at a density of 1600 bpi, and reels up to 7 inch diameter can be accepted. The read/write speed is 20kb/s.

OPTIONS/USER ADAPTATIONS

The text panel is adaptable in that it can be supplied to the customer's specification.

If required, an 800 bpi version may be offered.

CONNECTIONS

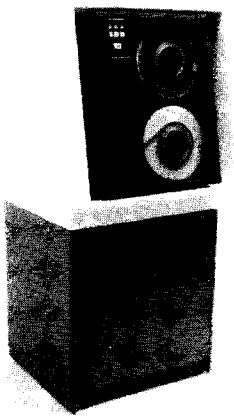
The PTS 6164 Magnetic Tape Unit Assembly is connected via two 3m cables to the channel unit CHM, which is mounted in the rack of the Philips PTS 6110 terminal computer.

The unit has its own power supply which is connected via a 2,5m safety-earthed cable to the mains.

TECHNICAL SUMMARY

Character code	ISO7 or EBCDIC	
Recording mode	PE (c.f. ANSI, X3,39-1973)	
Tape speed	12,5 ips at 1600 bpi	
Recording density	1600 bpi	
No. of read/write heads	9	
Tape reel diameter	7 inches (max.)	
Read/write speed	20kb/s	
Rewind speed	50 ips	
Start/stop time at 12,5 ips	30 ± 2ms	
Start/stop distance	0,19 ± 0,02 inches	
Block length	200 bytes of 8 bits (max.)	
Beginning of tape (BOT) and End of tape (EOT) detectors	Photo electric (IBM compatible)	
Dimensions (including CHM)	545 x 465 x 635 mm (WxHxD)	
Weight	48kg	
Power supply	220V ± 10%, 50Hz ± 4%, 220VA	
Environmental conditions	in operation	during storage
Temperature	+15 to +35°C	-40 to +70°C
Humidity	20 to 80%	20 to 95%
Heat dissipation	< 220W	

Philips PTS 6872 Magnetic Tape Unit



INTRODUCTION AND APPLICATIONS

The Philips PTS 6872 Magnetic Tape Unit is a peripheral to the Philips PTS 6810 Terminal Computer, and is mainly used for:

- data interchange with other systems
- transfer of data from cassette to tape and vice versa
- logging, in data communication systems
- back up for disk files
- program carrier

The Philips PTS 6872 handles standard ½ inch tapes. It can hold up to 30M bytes of information at maximum block length and tape length.

PRODUCT DESCRIPTION

The Philips PTS 6872 consists of a

- ½ inch magnetic tape drive
- Formatter.

The Philips PTS 6872 handles standard ½ inch tapes – 9 channels, phase encoded with 1600 bpi.

Maximum reel diameter is 10,5 inches.

The magnetic tape unit is mounted in a free-standing cabinet.

The read/write speed is 40 kb/s.

CONNECTIONS

The Philips PTS 6872 Magnetic Tape Unit is connected to the PTS 6810 Terminal Computer via the PTS 6842 Channel Unit for Magnetic Tape with a 3m long cable. Two magnetic tape units may be connected in series to one channel unit. Only the first connected magnetic tape unit need include a formatter.

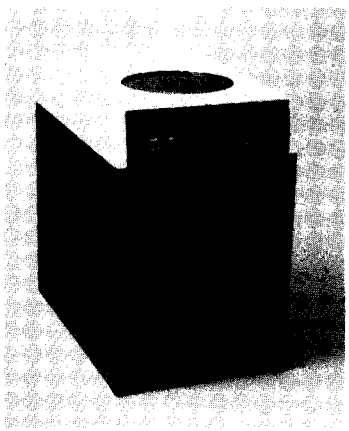
Power is fed from the normal mains supply via a standard, safety-earthed, 2,5m long cable.

It is necessary that the terminal computer includes a Philips PTS 6827 Multiplexer in order to connect a PTS 6872 Magnetic Tape Unit.

TECHNICAL SUMMARY

Character code	ISO7 or EBCDIC
Recording mode	PE (c.f. ANSI, X3, 39-1973)
Tape speed	25 ips
Recording density	1600 bpi, phase encoded
No. of read/write heads	9
Tape reel diameter	6,5 inch (min.) 10,5 inch (max.)
Tape length	730 m (max.)
Read/write speed	40 k bytes/s
Rewind speed	200 ips (average)
Stop/start time	15 ms ± 1 ms
Maximum block length	2048 characters of 8 bits
Minimum block length	18 characters of 8 bits
Beginning of tape (BOT) & End of tape (EOT) detectors	Photoelectric, IBM compatible
Dimensions (including cabinet)	1450 x 650 x 720 mm (HxWxD)
Weight	180 kg (excluding formatter) 191 kg (including formatter)
Power supply	220V ± 10%, 50Hz ± 4%, single phase
Power rating	400VA (including formatter) 300VA (excluding formatter)
Type number	PTS 6872/001 (with formatter) PTS 6872/002 (without formatter)
Environmental conditions	in operation during storage
Temperature	+15 to +35°C -40 to +70°C
Humidity	20 to 80% 20 to 95%
Heat dissipation	< 330W (including formatter) < 250W (excluding formatter)

Philips PTS 6875 Disk Unit



INTRODUCTION AND APPLICATIONS

The Philips PTS 6875 Disk Unit is a peripheral to the Philips PTS 6810 Terminal Computer, mainly for on-line storage of data files. It can also hold systems and application programs and is indispensable in the Philips PTS 6000 program development system.

The disk unit is connected to the Terminal Computer via the Channel Unit for Disk Units, Philips PTS 6844.

PRODUCT DESCRIPTION

The Philips PTS 6875 is a cartridge disk unit, mounted in a free-standing cabinet. The unit contains two disks comprising one fixed and one removeable cartridge. Each disk has a capacity of 2,66 M bytes formatted or 3,1 M bytes unformatted. The disk unit is of the moving head type, with an average positioning time of 30 ms and an average rotational delay of 12,5 ms.

The Disk Unit is connected to the Philips PTS 6810 Terminal Computer via the Philips PTS 6844 Channel Unit for Disk Unit. Two disk units can be connected to one channel unit. Data transfer between the disk and the terminal computer is at a rate of 312 000 bytes a second.

SOFTWARE

The software for the Philips PTS 6875 disk unit comprises:

- an initial program loader
- library management
- data management

With the initial program loader it is possible to load programs from the disk into the Philips PTS 6810 Terminal Computer for direct execution.

The library management allows storage and maintenance of systems programs, such as utilities, and user programs on the disk file.

Data management allows data to be stored and accessed on the disk file. Data files may be organised as sequential, random and indexed random. Data management routines are provided to read, write, rewrite and delete records from the files. Special utilities are provided for creation, deletion and reorganisation of files. In the data management software, special provisions are made to allow access to one file, and even to one record of that file, by more than one terminal station simultaneously. An exclusive access facility prohibits updating of one record by more than one terminal at the same time. Records may be blocked or unblocked with a maximum block length of 400 characters. Data are accessed in a logical sequence, which is uncoupled from their physical sequence. This guarantees the fastest possible access, as with sequential dump of a data file, for example.

CONNECTIONS

The Philips PTS 6875 Disk Unit is connected by a cable to the Philips PTS 6810 Terminal Computer via the Channel Unit for Disk Units, Philips PTS 6844. Two disk units may be connected to one Channel Unit.

The total cable length is 3,5m. The free cable length (between computer and disk unit) is 2m for the first unit and 1,75m for the second unit.

Power for the disk unit is obtained from the mains via a standard cable 2,5m long with safety earth.

Connection of a disk unit requires the presence of the Philips PTS 6827 Multiplexer in the terminal computer.

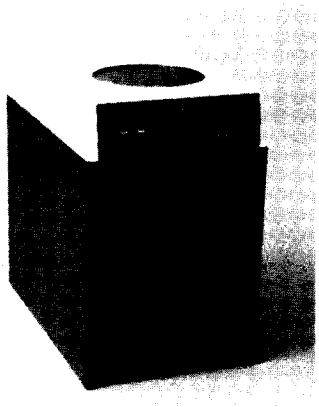
Philips PTS 6875 Disk Unit

TECHNICAL SUMMARY

Number of disks	2, one fixed and one removeable cartridge
Recording surfaces	4
Tracks per surface	204
Number of sectors per track	16
Sector length	408 bytes
Storage capacity,	
unformatted	3,1 M bytes
formatted	2,66 M bytes
Rotational speed	2400 rpm
Rotational time	25 ms
Positioning times	10 ms (cylinder to cylinder)
	30 ms average
	60 ms maximum
Average rotational delay	12,5 ms
Data transfer rate	312 000 bytes/s
Type of cartridge	IBM 5440 type
Dimensions	
height	860 mm
width	545 mm
depth	850 mm
weight	80 kg
Power requirements	220V ± 10%, 50Hz ± 2%, 500VA

Environmental conditions	in operation	during storage
Temperature	+16 to +38°C	-15 to +65°C
Humidity	20 to 80%	5 to 90%
Heat dissipation	< 400W	

Philips PTS 6876 Disc Unit



INTRODUCTION AND APPLICATIONS

The Philips PTS 6876 Disc Unit is a peripheral device in the Philips PTS 6800 Terminal Computer System, mainly for on-line storage of data files. It can also hold system and application programs and is indispensable during program development.

PRODUCT DESCRIPTION

The Philips PTS 6876 is a cartridge disc unit, mounted in a free-standing cabinet. The unit contains two discs comprising one fixed and one removable in a cartridge. Each disc has a capacity of 5,32 M bytes formatted or 6,25 M bytes unformatted. The disc unit is of the moving head type, with an average positioning time of 35 ms and an average rotational delay of 12,5 ms.

The Disc Unit is connected to the Philips PTS 6800 terminal computers via the Philips PTS 6844 Channel Unit for Disc Unit, which is housed in the cabinet of the terminal computer. Two disc units can be connected to one channel unit. Data transfer between the disc and the terminal computer is at a rate of 312 500 bytes/second.

Software

The software for the Philips PTS 6876 Disc Unit comprises

- an initial program loader
- memory management
- data management
- library management

With the initial program loader it is possible to load programs from the disc into the Philips PTS 6800 terminal computers for direct execution.

The memory management supports programs, using the disc as extended memory. With this overlay feature several large application programs are handled simultaneously.

Data management allows data to be stored and accessed on the disc file. Data files may be organized as sequential, random and indexed random. Data management routines are provided to read, write, rewrite and delete records from the files. Special utilities are provided for creation, deletion and reorganization of files. In the data management software, special provisions are made to allow access to one file, and even to one record of that file, by more than one terminal station simultaneously. An exclusive access facility prohibits updating of one record by more than one terminal at the same time. Records may be blocked or unblocked with a maximum block length of 400 characters. Data are accessed in a logical sequence, which is uncoupled from their physical sequence. This guarantees the fastest possible access, as with sequential dump of a data file, for example.

The library management allows storage and maintenance of system programs, such as utilities, and user programs on the disc file as well as development of application programs.

CONNECTIONS

The Philips PTS 6876 Disc Unit is cable connected to the Philips PTS 6800 terminal computers via the Channel Unit for Disc Unit, Philips PTS 6844. Two disc units may be connected to one channel unit. The channel unit is housed in the cabinet of the terminal computer.

The distance between the terminal computer and the disc unit must not exceed 2.3 meters, though the total signal cable length is 3.5 meters.

Each disc unit has its own standard mains cable, 3 meters long, with safety earth.

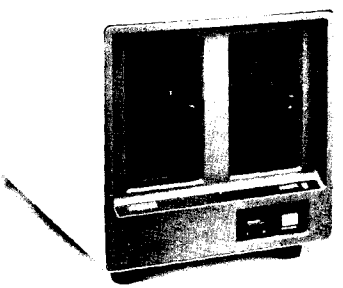
Connection of a disc unit requires the presence of the Philips PTS 6827 Input/Output Processor in the terminal computer.

Philips PTS 6876 Disc Unit

TECHNICAL SUMMARY

Number of discs	2, one fixed and one removable in a cartridge	
Recording surfaces	4	
Tracks per surface	400 + 8 spare tracks	
Number of sectors per track	16	
Sector length	412 bytes	
Storage capacity,		
unformatted	12.5 M bytes total, 6.25 M bytes/disc	
formatted	5.32 M bytes/disc	
Rotational speed	2400 rpm	
Rotational time	25 ms	
Positioning times	10 ms (cylinder to cylinder)	
	35 ms average	
	60 ms maximum	
Average rotational delay	12,5 ms	
Data transfer rate	312 500 bytes/s	
Cartridge	IBM 5440 type	
Dimensions		
height	860 mm	
width	545 mm	
depth	850 mm	
weight	80 kg	
Power requirements	200-240V ±10%, 50 Hz±3% 100-127V ±10%, 60 Hz±3% 1200 VA	
Environmental conditions	in operation	during storage
Temperature	+15 to +35°C	−40 to +70°C
Humidity	15 to 80%	15 to 90%

Philips PTS 6879 Flexible Disc Unit



INTRODUCTION AND APPLICATION

The Philips PTS 6879 Flexible Disc Unit is a peripheral device in the Philips PTS 6800 Terminal Computer System. It can be used

- for program loading
- as back-up medium
- as data file medium
- as data interchange medium

Examples of Flexible Disc applications in the Philips PTS 6000 system are

- sequential files for data storage
- simple files requiring random or indexed random access, e.g. bad accounts list
- program overlays
- storage of application programs
- off-loading – to handle peak loads in a data communication network

PRODUCT DESCRIPTION

The Philips PTS 6879 Flexible Disc Unit is a stand alone table top unit, which houses one or two flexible disc drives in a metallic cover. The drives are vertically positioned and the discs are easy to access. Also included is a power supply unit that supplies power to both drives.

On the physical level PTS 6879 FDU is compatible to IBM 3740. The Flexible Disc meets the physical and magnetic requirements as specified in ISO-standard ISO/TC 97/SC11.

On the logical level two different labelling systems are available, IBM- and TOSS-labelled discs.

The IBM-label is ideal for data interchange to and from systems other than PTS 6000. Data is recorded in EBCDIC-code and is converted to ASCII-code in the PTS 6000 system.

Note, however, that only sequential access is supported.

The TOSS-label is recommended when the Flexible Disc is only to be used within PTS 6000 systems.

For TOSS-labelled discs the following functions are supported by system software:

- sequential, random and indexed random access methods
- program loading
- overlay techniques

For IBM-labelled discs only sequential access is supported.

OPTIONS/USER ADAPTATIONS

The Philips PTS 6879 Flexible Disc Unit can be equipped with one or two disc drives.

CONNECTIONS

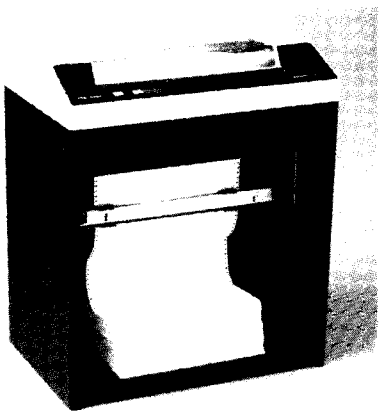
The Philips PTS 6879 Flexible Disc Unit is cable connected to the Philips PTS 6810 terminal computer via a channel unit for Flexible Disc, Philips PTS 6868 CHFD, which is housed in the cabinet of the terminal computer.

Philips PTS 6879 Flexible Disc Unit

TECHNICAL SUMMARY

Capacity, unformatted:	3.2 Mbit
Capacity, formatted:	250 Kbytes
Rotating speed:	360 rev. min
Packing density, outer track:	1836 BPI
Packing density, inner track:	3268 BPI
Track density:	48 tracks inch
No. of tracks:	77
Sector per track:	26
Sector length:	128 bytes
Head positioning time:	10 < n + 10 ms (n = No. of tracks)
Latency time:	83.3 ms
Average positioning time:	260 ms
Cartridge:	ISO TC97 SC11 (e.g. IBM 3740 type diskette)
Transfer rate:	250 K bit sec.
Dimensions	
height	400 mm
width	375 mm
depth	595 mm
weight	
with one drive	36 kg
with two drives	39 kg
Power consumption	
with one drive	175 W
with two drives	210 W
Power requirements	200-240 V +10%, 50 Hz ± 3%
	100-127 V ± 10%, 60 Hz ± 3%
Environmental conditions	in operation during storage
Temperature	+ 15 to + 35°C − 40 to + 70°C
Humidity	15 to 80% 15 to 90%

Philips PTS 6881 Matrix Line Printer



INTRODUCTION AND APPLICATIONS

The Philips PTS 6881 Matrix Line Printer is a peripheral device to the Philips PTS 6810 Terminal Computer. It can be used in back-office applications such as printing of daily and monthly journals, tables, invoices, statistical information, etc and in systems for program development.

PRODUCT DESCRIPTION

The Philips PTS 6881 Matrix Line Printer is a stand-alone, self-contained matrix printer requiring only normal office environment. It is easy to operate with simple push-button controls and has a printing speed of 200 lines per minute with a maximum of 132 characters per line.

Output is produced on continuous fan-fold paper that is automatically fed through the printer. One original and four copies can be produced simultaneously, and the pin feed mechanism can be easily adjusted for paper widths from 100 to 440 mm.

System software

The Philips PTS 6881 Matrix Line Printer is controlled via a driver under TOSS in the Philips 6810 Terminal Computer and connected to the processing unit (CPU) via a channel unit.

Commands

- Basic Write
  The requested number of characters is transmitted to the matrix line printer without any check.
- Standard Write
  The requested number of characters is transmitted to the matrix line printer. They must be within /20-/5F. Before the text, control characters such as CR/LF and top of form can be inserted in the transmit buffer.

Size

The driver takes 100 16-bit words in the Philips PTS 6810 Terminal Computer.

OPTIONS/USER ADAPTATIONS

- Ten national versions of the ISO character repertoire are available.
- Perforation step-over mechanism.
  With this mechanism, which can be set to step between 4 and 12 inches in half-inch increments, automatic form control is performed.

CONNECTIONS

The Philips PTS 6881 is connected to the Philips PTS 6810 Terminal Computer via a channel unit, either Philips PTS 6843-001 CHLP or Philips PTS 6847-001 CHCD with the use of a 5m long cable.

Power for the Matrix line printer is obtained from the normal mains supply via a standard cable, 2,5m long with safety earths.

The Philips PTS 6843-001 CHLP allows the connection of one line printer. The PTS 6847-001 CHCD allows the connection of one line printer and one Philips PTS 6885 Card Reader.

The channel unit is housed in the cabinet of the PTS 6810 Terminal Computer.

Philips PTS 6881 Matrix Line Printer

TECHNICAL SUMMARY

Printing technique	matrix, impact , 9x9 dots
Printing speed	200 lines/minute
Print positions	132 characters/line
Character repertoire	64 characters in ten national variations (ISO)
Character spacing	10 characters/inch
Line spacing	6 lines/inch, standard
Paper feed	Two paper tractors, pin feed
Form feed	Perforation step-over mechanism, 11 inch standard
Paper advance speed	
Single line	25 ms/line
Multiple lines	11 inches/s
Paper out detection	30 cm below print line
Tractor adjustments	
Left tractor	12,5 mm range
Right tractor	From 100 mm up to 440 mm (ECMA/TC/14/69/16)
Number of copies	1+4
Type	Fan-fold, edge-perforated continous forms
Width	100 to 440 mm
Height	11 inches, standard
Ink ribbon	
Type	Industry standard 1/2 inch ribbon
Reels	IBM-1443 compatible
Dimensions	
height	825 mm
width	700 mm
depth	460 mm
weight	80 kg (approx.)
Power requirements	220 V ± 10%, 50 Hz ± 2%, 300 VA

Environmental conditions	in operation	during storage
Temperature	+15 to +35°C	-40 to + 70°C
Humidity	20 to 80%	20 to 95%
Heat dissipation	250W	

Philips PTS 6881 Matrix Line Printer

Character set and code table

	2	3	4	5
0	SP	0	a2	P
1	!	1	A	Q
2	"	2	B	R
3	a1	3	C	S
4	$	4	D	T
5	%	5	E	U
6	&	6	F	V
7	'	7	G	W
8	(	8	H	X
9	)	9	I	Y
A	*	:	J	Z
B	+	;	K	a3
C	,	<	L	a4
D	–	=	M	a5
E	.	>	N	^
F	/	?	O	–

National variations applicable to the countries:	a1	a2	a3	a4	a5
	23	40	5B	5C	5D
D/A/L/CH Germany, Austria, Luxemburg, Switzerland	#	§	Ä	Ö	Ü
GB/NL/B Great Britain, Netherlands, Belgium	£	@	[	\	]
F/CH/B/L France, Switzerland, Belgium, Luxemburg	£	à	°	ç	§
E Spain, Argentina, Venezuela	£	@	[	Ñ	]
I/CH Italy, Switzerland	£	§	°	ç	É
S/SF Sweden, Finland	#	É	Ä	Ö	Å
DK/N Denmark, Norway	£	@	Æ	Ø	Å
P Portugal, Brazil	£	@	Ã	Ç	Õ
US USA, Canada, Australia	#	@	[	\	]
YU Yugoslavia	£	§	Ć	Č	Š

Philips PTS 6882 Matrix Line Printer

INTRODUCTION AND APPLICATIONS

The Philips PTS 6882 Matrix Line Printer is a peripheral device in the Philips PTS 6800 Terminal Computer System. It can be used in back-office applications such as printing of daily and monthly journals, tables, invoices, statistical information, etc and in systems for program development.

PRODUCT DESCRIPTION

The Philips PTS 6882 Matrix Line Printer is a stand-alone, self-contained matrix printer. It is easy to operate with simple push-button controls and has a printing speed of 400 lines per minute with a maximum of 132 characters per line.

Output is produced on continuous fan-fold paper that is automatically fed through the printer. One original and four copies can be produced simultaneously, and the pin feed mechanism can be easily adjusted for paper widths from 100 to 440 mm.

Software

The Matrix Line Printer Philips PTS 6882 is controlled via the standard system software by the following commands

- Basic Write

  The requested number of characters is transmitted to the matrix line printer without any check.

- Standard Write

  The requested number of characters is transmitted to the matrix line printer. They must be within /20-/5F. Before the text, control characters such as CR/LF and top of form can be inserted in the transmit buffer.

OPTIONS/USER ADAPTATIONS

- Ten national versions of the ISO character repertoire are available.

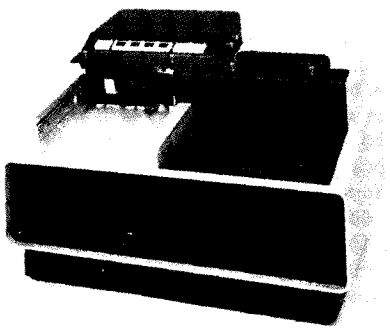
CONNECTIONS

The Philips PTS 6882 Matrix Line Printer is connected to a Philips PTS 6800 Terminal Computer via the channel unit PTS 6847 CHCD with the use of a 5 meters long cable. The channel unit is housed in the cabinet of the terminal computer.

The distance between the terminal computer and the line printer must not exceed 4 meters.

Power for the matrix line printer is obtained from the normal mains supply via a standard mains cable, 4 m long, with safety earth.

Philips PTS 6885 Card Reader



INTRODUCTION AND APPLICATIONS

The Philips PTS 6885 Card Reader is a peripheral to the Philips PTS 6810 Terminal Computer and is normally used in a programming system for entry from source decks, where punched cards are still in common use.

It may also be used for entry of batch data.

PRODUCT DESCRIPTION

The Philips PTS 6885 Card Reader is a table-top card reader, which can read standard 80 column punched cards at a speed of 300 cards per minute.

The reader is connected to the Terminal Computer PTS 6810 via the Channel Unit for Line Printer and card reader, Philips PTS 6847, to which at the same time a Philips PTS 6881 Matrix Line Printer may be connected.

Both hopper and stacker have a capacity of 1000 cards.

CONNECTIONS

The Philips PTS 6885 Card Reader is connected to the Philips PTS 6810 Terminal Computer via the Channel Unit for Line Printer and Card Reader PTS 6847 with a 5m cable.

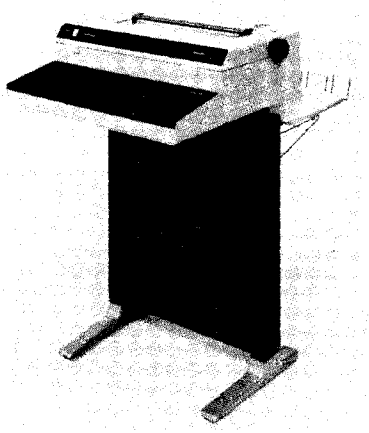
Power is obtained from the normal mains via a standard 2,5 m cable with silent earth.

TECHNICAL SUMMARY

Reading speed	300 cards/minute
Reading time	200 ms (incl. transport time)
Reading mode	column by column
Card specification	80 columns (ISO R1681 & ISO R 1682)
Hopper capacity	1000 cards (ANSI X3.11-1969)
Stacker capacity	1000 cards (ANSI X3.21-1967)
Dimensions	
height	415 mm
width	590 mm
depth	460 mm
weight	35 kg
Power	230V ± 10%, 50Hz ± 2% single phase, at start 1650VA, continuous 600VA

Environmental conditions	in operation	during storage
Temperature	+15 to +35°C	-32 to +58°C
Humidity	30 to 80%	20 to 95%
Heat dissipation	< 400 W	
Cards		
Temperature	+18 to +24°C	
Humidity	40 to 60%	

Philips PTS 6862 Console Typewriter



INTRODUCTION AND APPLICATIONS

The Philips PTS 6862 Console Typewriter extends the communication possibilities between the programmer of the Philips PTS 6810 Terminal Computer and the terminal computer itself. It is mainly used for program check out and program testing, and is therefore a desirable part of a Philips PTS 6810 test and development system.

PRODUCT DESCRIPTION

The console typewriter consists of:

- Basic Printer Unit
- Platen/pinfeed 110 ch
- Line interface TTY
- Character Generator ASCII
- Keyboard – keytop layout standard TTY
- Blank text panel
- Buzzer
- Cable 7,5 m
- Power cable 2,5 m

FUNCTIONS

The printing speed is 10 ch/s. The TTY-interface is adapted to 110 baud current loop, 2-wired half duplex.

A total of 64 characters, including space ISO-7 standard, are printable in a matrix of normally 7 x 9 dots.

The buzzer gives an acoustic alarm with a duration of approximately 100 ms upon software command.

The printer is provided with an indicator lamp and one switch for "power ON/OFF".

The printer also has a push-button for "paper run".

Line spacing control is located under the front cover.

Line spacing is switchable between 3, 4 and 6 lines/inch.

To make the last printed character visible the print head advances one step if no new data reaches the printer within approximately 0,7 seconds. When printing recontinues the print head is reversed one step before printing starts.

OPTIONS/USER ADAPTATIONS

An optional free-standing floor pedestal can be supplied for the Philips PTS 6862.

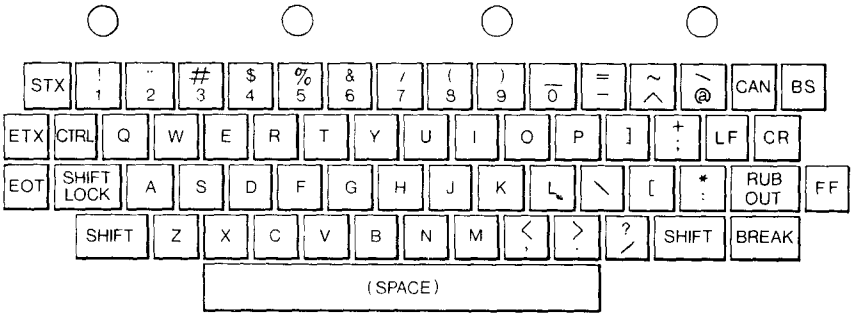
CONNECTIONS

The Philips PTS 6862 is connected via a 7,5 m cable to the TTY interface of the central processing unit of the Philips PTS 6810. Power is obtained from the normal mains via a standard 2,5 m cable with safety earth.

TECHNICAL SUMMARY

Printer:	
Number of columns	110 char/line
Character space	1/10 in. Accumulative error max. 0,4%
Character repertoire	ISO-7 64 characters, space incl
Character font	Matrix font, vertical max. eight positions with 0,4 mm spacing, horizontal max. 14 positions with 0,18 mm spacing. The font is formed by 7 x 9 dots and controlled by the character generator.
Character size	About 2,8 x 1,9 mm (7 x 9 matrix)
Printing speed	10 ch/s
Carriage return speed	100 ch/s + max. 0,2 s/line
Line space	1/3, 1/4 or 1/6 inch, manually switchable.

Philips PTS 6862 Console Typewriter



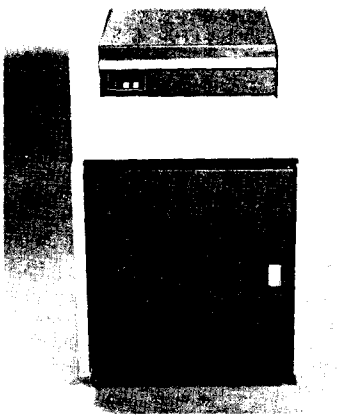
Keyboard layout

Paper	
Paper type	Pin feed, fan-folded
Distance between pins	Horizontal 314,3 mm Vertical 12,7 mm (½ inch)
Pin hole diameter	5/32 inch
Paper weight	Single sheet 45 g/m² to 110g/m² 65 g/m² is recommended Paper sets original + 3 copies about 4 x 60 g with max. 3 x 25 g/m² carbon paper
Ink ribbon	one colour, 8 mm nylon ribbon No.20
Dimensions	
width	510 mm, platen knob excluded
depth	310 mm
height	170 mm
weight	20 kg
Power	Built-in power supply 220V and 50Hz, 130VA (max.)
Environmental conditions	in operation during storage
Temperature	+15 to +35°C -40 to +70°C
Humidity	20 to 80% 20 to 95%
Heat dissipation	standby, approx. 70W printing, max. 20W

	0	1	2	3	4	5	6	7
0			SP	0	@	P	`	p
1		!	1	A	Q	a	q	
2	STX	"	2	B	R	b	r	
3	ETX	#	3	C	S	c	s	
4	EOT	$	4	D	T	d	t	
5		%	5	E	U	e	u	
6		&	6	F	V	f	v	
7		'	7	G	W	g	w	
8	BS	CAN	8	H	X	h	x	
9		)	9	I	Y	i	y	
A	LF	*	:	J	Z	j	z	
B		+	;	K	[	k	{	
C	FF	,	<	L	\	l	|	
D	CR	-	=	M	]	m	}	
E		.	>	N	^	n	~	
F		/	?	O	_	o	RUB OUT	

Code table

Philips PTS 6877 Disc Unit



The Philips PTS 6877 Disc Unit is a peripheral device in the Philips PTS 6800 Terminal Computer System, mainly for on-line storage of data files. It can also hold system and application programs and is indispensable during program development.

PRODUCT DESCRIPTION

The Philips PTS 6877 is a disc unit for removable disc pack mounted in a free-standing desk height cabinet. The unit contains one removable disc pack of five discs. Each disc pack has a capacity of 80 M bytes unformatted. The disc unit is of the moving head type, with an average access time of 30 ms.

The Disc Unit is connected to the Philips PTS 6820 terminal computers via the Philips PTS 6845 Channel Unit for Disc Unit, which is housed in the cabinet for the terminal computer. Two disc units can be connected to one channel unit. Data transfer between the disc and the terminal computer is at a rate of 9.67 M bits/second.

Software

The software for the Philips PTS 6877 Disc Unit comprises

- memory management
- data management

The memory management supports programs, using the disc as extended memory. With this overlay feature several large application programs are handled simultaneously.

Data management allows data to be stored and accessed on the disc file. Data files may be organized as sequential, random and indexed random. Data management routines are provided to read, write, rewrite and delete records from the files. Special utilities are provided for creation, deletion and reorganization of files. In the data management software, special provisions are made to allow access to one file, and even to one record of that file, by more than one terminal station simultaneously. An exclusive access facility prohibits updating for one record by more than one terminal at the same time. Records may be blocked or unblocked with a block length in multiples of 256 characters. Data are accessed in a logical sequence, which is uncoupled from their physical sequene. This guarantees the fastest possible access, as with sequential dump of a data file, for example.

CONFIGURATION

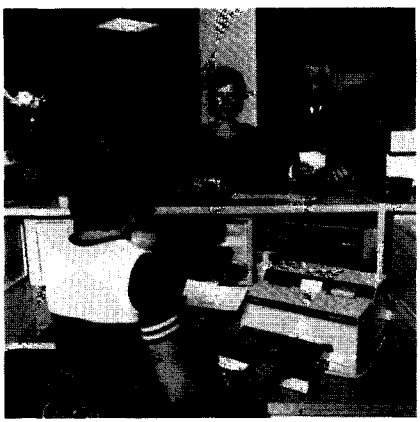
THE Philips PTS 6877 Disc Unit is cable connected to the Philips PTS 6820 terminal computer via the Channel Unit for Disc Unit, Philips PTS 6845. Two disc units may be connected to one channel unit. The channel unit is housed in the cabinet of the terminal computer.
Each disc unit has its own standard mains cable, 3 meters long, with safety earth.

Philips PTS 6877 Disc Unit

TECHNICAL SUMMARY

Number of discs	One removable disc pack
Recording surfaces	5
Servo surfaces	1
Tracks per surface	822
Storage capacity	
unformatted	80 Mbytes
formatted	72 Mbytes
Rotational speed	3600 ms average
Positioning times	30 ms average 55 ms maximum
Average rotational delay	8.3 ms
Data transfer rate	9.67 MHz bit rate
Cartridge	CDC 9877
Mains requirements	220/240 V, 50 Hz 100/120 V, 60 Hz
Environmental conditions	Temperature In operation +15 to +32°C During storage −40 to +70°C Humidity In operation 20 to 80% RH During storage 15 to 90% RH
Altitude	2000 m above sea level
Static discharge	4 kV
Dimensions	height 920 mm width 560 mm depth 915 mm
Weight	155 kg

Philips PTS 6000 Working positions



The philosophy of the Philips PTS 6000 Bank Terminal System is that it is adaptable to the individual needs of any bank.

For each bank, the total terminal system will be made up of a series of working positions, connected to the terminal computer, and having access to the bank's main computer via this terminal computer.

At each working position, specified banking operations are performed – cash handling, savings account operations, foreign exchange transactions, cheque and giro clearance, etc., and detailed records of all the transactions are kept. The manner in which these operations are organised, and the amount of work each of them involves, varies from bank to bank and from branch to branch. It follows that each working position will require a different configuration of terminal devices – keyboards, displays and printers. Added to which, the devices must not only fit the functions they have to perform, they must also fit the space available for them and, to a great degree, fit the staff who will operate them.

Thus, in building up the total bank system, each working position in each bank must be considered – what operations are to be performed, how much capacity is required. This defines which terminal devices, keyboards, displays, printers, and which types, are best suited for individual working positions.

With the Philips PTS 6000 Bank Terminal System the terminal devices are modular. They vary in function and capacity, and they can also be adapted easily to suit detailed requirements (as to printable characters, for example).

Thus, no matter how specific or unique the needs of an individual bank may be, the most appropriate configuration for each working position can always be selected, more or less 'off the shelf'.

Philips PTS 6000 Philosophy of working positions

At the working position, the various Philips PTS 6000 terminal devices – keyboards, displays and printers give the operators – the bank staff – the same benefits that the terminal system gives the bank as a whole.

Bank terminal devices

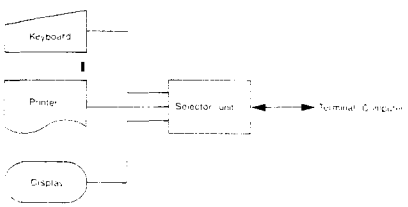
- should fit any possible application.
  Each type of Philips PTS 6000 terminal device is available in a range of functional capabilities and capacities. The requirements of any working position can be accurately met – no matter how small or large, no matter how simple or complex.
- should adapt easily to the needs of the individual operators who will have to use them.
  The Philips PTS 6000 keyboards, printers and displays can be positioned for the optimum convenience and comfort of each operator, irrespective of whether he normally has to stand or sit to work. The displays have generous viewing angles, they are clear and easy to read without strain, with normal background lighting. The terminal devices have [illegible] requirements for [illegible] they can be placed right where the operator needs them – to hand on his own desk.
  This combination of flexibility, adaptability and tolerance makes the terminal device very easy to use and thus reduces effort and fatigue.
- should fit easily into normal bank offices.
  Philips PTS 6000 terminal devices are very compact. They assist the operator to do his work, without taking up too much of his space and thus making his other work uncomfortable or awkward to carry out. They work quietly, most of them at a whisper – the others make less noise than a normal office typewriter. The operator is not distracted and fatigued by noise. The displays are clear and do not require shades or subdued lighting.
- should be reliable.
  Staff quickly learn that Philips PTS 6000 devices work smoothly, without fuss, without constant attention and adjustment. This increases the confidence of staff, confidence in their ability to handle increasing volumes of transactions without strain, and without being let down by equipment failure.
- should be easy to service.
  The modular design of the Philips PTS 6000 terminal devices, computers and peripherals ensures maximum availability. Restoration of working is quickly achieved by the replacement of a complete device – a matter of minutes. Philips' service organisation is highly-organised and widespread. Thus, staff are not subjected to annoying delays due to faulty equipment, or to the presence of servicemen working under their feet.

The Philips PTS 6000 bank terminal devices are friendly to staff – because they were designed around the needs of banking staff. They were made that way.

Philips PTS 6000 Build-up of working positions

The Philips PTS 6000 Terminal System is designed for the easy build-up of working positions for any desired banking operation. This is ensured by its compactness and modular construction, the wide choice of functions and capacities available with each type of terminal device, and the adaptability of the system hardware and software.

When it comes to the build-up of a specific system, Philips experts, working in co-operation with the bank staff, will put together the special package most suitable for the individual application, and for each working position. However, a bank considering the installation of a terminal system will like to have some background knowledge of how a working position can be built up, of how any practical requirement can be met from the modular parts.



From the block diagram we can see the possibilities. At the working position itself – the desk – is a group of terminal devices – keyboard, display, printer, selected for functions and capacities. These are the devices which the operator uses.

At any convenient position, out of the way, is the selector unit, mounted under the desk top, say. This provides the terminal devices with power and logic and handles their communications with the terminal computer.

The build up of a working position is thus very simple. It is, really, only a matter of choosing the appropriate devices from the extensive Philips range. All the physical connections between the various terminal devices are by means of cables and plugs.

This type of build up gives

- minimum space demands at the actual working position, e.g. desk top
- easy matching of bank requirements for volume and type of data to be handled at each working position.
- easy servicing – complete terminal devices are quickly exchanged.

Let's consider some actual working conditions.

A great deal of a teller's work is concerned with cash deposits and withdrawals. In the simplest case, where current accounts only are involved, he can perform his work with greatly increased efficiency using a numeric and function keyboard and an 8-signal and numeric display. These allow him to enter and receive all the transaction data. Where more capacity and flexibility are required, a choice of alphanumeric and function keyboards is available, together with a range of alphanumeric displays, and a plasma display unit capable of showing him facsimile signatures. With these, his ability to communicate with the system is greatly increased – he can handle a wider range of enquiries from customers and thus serve them, and the bank, more quickly and more efficiently. With savings account work, a teller terminal or printer will handle all his routine work – allow him to enter data, print entries and issue a receipt. At the teller's desk, in particular, space is severely restricted, and the compactness of the Philips PTS 6000 terminal devices give them an outstanding advantage.

The bank manager must have information at his fingertips, and the Philips PTS 6000 system gives him just that. A modern, well-styled compact keyboard and display unit will not look out of place in his office – or take up much space in it – and will link him directly with his own staff and also with the expert advice and information available at his head office.

In the back office, the area of administration, easy communication with the system is provided by an alphanumeric keyboard and a display unit. These will handle all types of clearing work – giros, cheques, transfers, etc. A general terminal printer will provide hard copy backup for displays and will meet all the most usual printing needs. Where large volumes of bulk data are to be handled, they can be dealt with by the faster and highly-reliable line printer, directly connected to the terminal computer.

The selector unit controls the communications between the terminal computer and the terminal devices, and also supplies the latter with power. This is an important feature of the Philips PTS 6000 system, since it removes the bulk of a power supply unit from the operator's desk. With a modular selector unit, in particular, functions can be easily and quickly changed by replacing the plug-in printed circuit boards, so that working positions

Philips PTS 6000 Build-up of working positions

configurations can be modified, e.g. expanded, at any time without difficulty.

With the Philips PTS 6000 Bank Terminal System it is easy – and economical – to build up the working positions and the terminal system required by any individual bank. All that is necessary is to define the nature and extent of the operations to be carried out – Philips can supply the devices to match.

Philips PTS 6000 Build-up of working positions

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Let's consider some actual working conditions.

A great deal of a teller's work is concerned with cash deposits and withdrawals. In the simplest case, where current accounts only are involved, he can perform his work with greatly increased efficiency using a numeric and function keyboard and a 1 line plasma display.
These allow him to enter and receive all the transaction data. Where more capacity and flexibility are required, a choice of alphanumeric and function keyboards is available, together with a range of displays.
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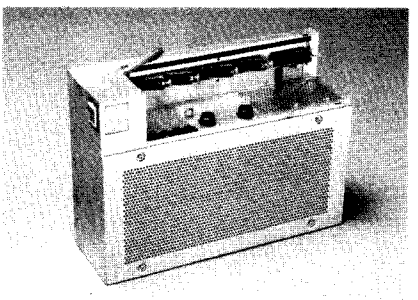
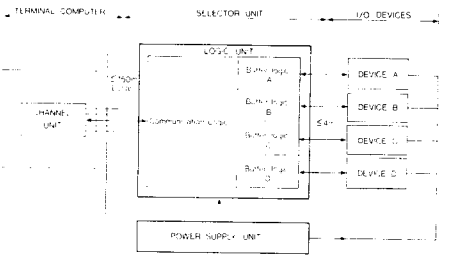
With the Philips PTS 6000 Bank Terminal System it is easy – and economical – to build up the working positions and the terminal system required by any individual bank. All that is necessary is to define the nature and extent of the operations to be carried out – Philips can supply the devices to match.

Philips PTS 6212 Selector Unit Local





Structure of selector unit

INTRODUCTION AND APPLICATIONS

The Philips PTS 6212 Selector Unit Local handles the communications between the terminal computer and the terminal devices. It also provides power for the latter.

As a result the terminal devices are more compact and fit better in their locations. The selector units are usually installed under the table or counter on which the terminal devices are located.

Their small dimensions and the absence of special environmental or power requirements make installation particularly easy. Normal mains of 220V/50Hz and free circulation of air are the only requirements.

PRODUCT DESCRIPTION

The structure of the selector unit is shown in the figure. Basically, there are two main modules – the logic module and the power supply module fitted in a metal chassis with built-in cooling fan.

The logic module can be divided into:

- Communication logic for local terminals
- Logic buffers adapted to the type of terminal device used (printers, key-boards, displays).

The logic circuits are mounted on one printed circuit board which is mounted in the metal chassis. Different versions of this board are available to suit the terminal configuration used.

The power supply module provides approximately 100W of regulated DC power. The power switch has two positions – on/off, indicated on the panel by 1/0.

Triple space characters

By inserting an optional ROM-package on the printed circuit board, one or two triple-space characters can be included in the character repertoire of a printer. These characters may take the form of special symbols, logos, etc. Note that this option also requires a new character generator in the printer.

OPTIONS/USER ADAPTATIONS

- Two triple-space characters can be generated for special symbols, logotypes, etc.
- Position of mains switch – the standard position is at the side but this can be changed to the front during installation.
- a mounting frame can be supplied as an accessory.

CONNECTIONS

The following terminal devices may be connected to the Philips PTS 6212-001 Selector Unit Local.

- one terminal printer
- one or two keyboards (Philips PTS 6232)
- one signal display (Philips PTS 6241).

The selector unit is connected via a 2 x 3 wire cable to the channel unit local of the terminal computer via a cable of 150m max. length.

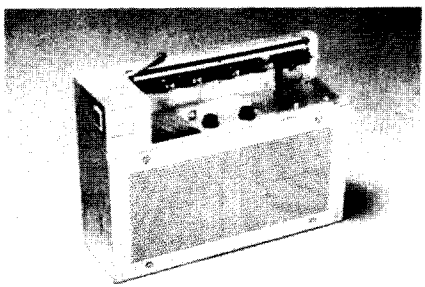
Power is obtained from the normal mains via a standard 2,5m cable and safety earth.

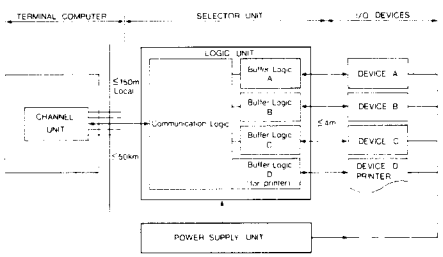
Philips PTS 6212 Selector Unit Local

TECHNICAL SUMMARY

Dimensions		
depth	135 mm	
height	300 mm	
width	420 mm	
weight	11 kg	
Power	220V ± 10% 50Hz ± 2%	
Power consumption	150VA	
Environmental conditions	in operation	during storage
Temperature	15 to +35°C	-40 to +70°C
Humidity	20 to 80%	20 to 95%
Heat Dissipation	100W	

Philips PTS 6314 Selector Unit Modular





Structure of the selector unit

INTRODUCTION AND APPLICATIONS

The Philips PTS 6314 Selector Unit is called "Modular" since the interfaces for the terminal devices are in the form of interchangeable, plug-in printed circuit boards. This modular system gives the greatest possible flexibility to the configuration of a Philips PTS 6000 working station. It also allows the configuration to be easily changed after installation.

The Philips PTS 6314 Selector Unit Modular handles the communications between the terminal computer and the terminal devices. It also provides power for the latter.

As a result the terminal devices are more compact and fit better in their locations. The selector units are usually installed under the table or counter on which the terminal devices are located. Their small dimensions and the absence of special environmental or power requirements make installation particularly easy. Normal mains and free circulation of air are the only requirements.

PRODUCT DESCRIPTION

The structure of the selector unit is shown in the figure. Basically, there are two main modules — the logic module and the power supply module fitted in a metal chassis with built-in cooling fan.

The logic module can be divided into:

— Communication logic for local or remote communication with the terminal computer.

— Logic buffers adapted to the type of terminal device used (printers, keyboards, displays).

The logic circuits are mounted on:

— a communication and printer interface board, and

— separate interface boards for the terminal devices, called device interfaces (adapter boards).

The power supply module provides approximately 100W of regulated DC power.

The power switch has two positions — on/off; indicated on the panel by 1/0.

Communication and printer interface board

The communication and printer interface board is mounted in the metal chassis. Two versions of this board are available: one handles the communication procedure for the "Channel unit for Local Terminals" the other handles the communication procedure for the "Channel unit for Remote Terminals". Both boards also have an interface for connection of a printer.

Device interfaces (Adapter boards)

In addition to the communication and printer interface board the adapter boards for terminal devices can be mounted in the selector unit modular. There is space for three adapter boards. The adapter boards have identical mechanical dimensions and can be inserted in any of the three places in the basic module.

Triple space characters

By inserting an optional ROM-package on the printed circuit board, one or two triple-space characters can be included in the character repertoire of a printer. These characters may take the form of special symbols, logos, etc. Note that this operation also requires a new character generator in the printer.

Philips PTS 6314 Selector Unit Modular

OPTIONS/USER ADAPTATIONS

- Mains connection
- Local or remote connection to the terminal computer.
- Configuration of terminal modules
- Two triple-space characters can be generated for special symbols, logotypes etc.
- Position of the mains switch — the standard position is at the short side but this can be changed to the long side during installation.

CONNECTIONS

The terminal modules are connected to the Philips PTS 6314 Selector Unit Modular via the standard 3m cables. With a special cable the length can be up to 10 meters.

For connection to a local computer the selector unit is directly connected by a 2 × 3 wire cable (maximum length 150 m) to the Channel Unit for Local Terminals of the terminal computer.

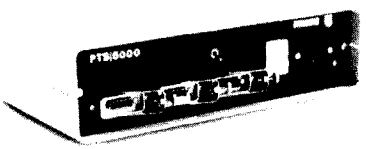
For connection to a remote computer, the selector unit is connected by a 2 × 12 wire cable to a MODEM (maximum cable length 15m) or to a Philips PTS 6471 Transfer Unit (maximum cable length 50m). A telephone line and modem then completes the connection to the Channel Unit for Remote Terminals of the terminal computer.

Power is obtained from the normal mains via a standard 2,5m cable with safety earth.

TECHNICAL SUMMARY

Dimensions		
depth	155 mm	
height	300 mm	
width	420 mm	
weight	12 kg	
Power requirement	200—240 V ± 10%, 50 Hz ± 2%	
	100—127V ± 10%, 60 Hz ± 2%	
Environmental conditions	in operation	during storage
Temperature	+ 15 to + 35°C	—40 to + 70°C
Humidity	20 to 80%	20 to 95%
Heat dissipation		

Philips PTS 6471 Transfer Unit



INTRODUCTION AND APPLICATION

The Philips PTS 6471 Transfer Unit is used to connect two remote selector units to one modem.

The Transfer Unit also includes a test facility for fault locating to the PTT domain or the remote terminal why the Transfer Units must be used in configurations where the modems do not have this test facility. (Normally the modems also include this test facility.)

Their small dimensions and the absence of special environmental or power requirements make installation particularly easy. Normal mains and free circulation of air are the only requirements.

PRODUCT DESCRIPTION

The Philips PTS 6471 Transfer Unit consists of a metal chassis fitted with a front panel and covered by a metal case. On the chassis is mounted a PC-board for the power supply and the logic functions. On the front panel is mounted three connectors and five light emitting diodes for modem functions and error indications plus an indicator lamp showing "power on".

OPTIONS/USER ADAPTIONS

Two main versions of the unit are available differing on the power supply side:

— The European standard version with Europlug, preset to 220 V mains

— The US/Canadian (UL/CSA) version with US-plug, preset to 120 V mains.

Both versions are adjustable to 100, 110, 120, 127, 200, 220, 230 and 240 V and can be used on both 50 and 60 Hz without adjustment.

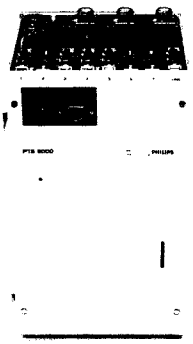
CONNECTIONS

The Philips PTS 6471 Transfer Unit is connected either to a modem (a 4 m cable) or directly to the channel unit for remote terminals in the terminal computer by a cable not exceeding 50 meters. The mains cable is 2.5 m.

TECHNICAL SUMMARY

Transfer rate	up to 9,6 K baud	
Dimensions		
depth	220 mm	
height	85 mm	
width	315 mm	
weight	2 kg	
Power		
Input	Voltage variation ± 10% 47—62 Hz	
Output	+ 5V ± 2% 200 mA + 12V ± 10% 150 mA — 12V ± 10% 150 mA	
Environmental conditions	in operation	during storage
Temperature	+ 15 to + 35°C	— 40 to + 70°C
Humidity	20 to 80%	20 to 95%

Philips PTS 6411 Modular Device Adaptor



The Philips PTS 6411 Modular Device Adaptor handles in a workstation the communication between up to 7 connected workstation modules and the terminal computer or workstation controller. In some cases it also provides power for the workstation modules. The communication takes place over a multipoint network for either locally sited (LWSI) or remotely sited (RWSI) workstations.

The PTS 6411 MDA is intended to be used in

- extended configurations with many connected modules in a workstation
- configurations where special equipment from other suppliers are connected
- configurations where terminal modules from different generations are mixed in the workstation.

The Philips PTS 6411 Modular Device Adaptor is usually installed under the table of the counter on which the workstation modules are located. The small dimensions and the absence of special environmental requirements makes installation particulary easy. Normal mains and free circulation of air are the only requirements.

PRODUCT DESCRIPTION

The Philips PTS 6411 Modular Device Adaptor is built in a rack system. It comprises

- power supply unit
- one slot for network interface board
- three slots for module interface boards
- connector panel

Power Supply
The power supply is a detachable module. It is adjustable for different voltages and frequencies. Three power cable outlets are provided for work station modules that require more power than can be supplied through SDI/SUM, for example plasma display unit. The mains cable has a length of 2.5 m. A "power on/off" switch is provided.

Network Interface
The standard network interface boards are:

- LWSI Local Workstation Interface
- RWSI Remote Workstation Interface

One at a time can be used and occupies one slot in the rack.

Module Interface
There are three (3) available slots in the rack for module interface boards. The standard board has four (4) SDI ports, with a jumper at each port it is possible to select SDI/SUM or SDI/V24 interface.

For work station modules using other interfaces than SDI, special interface boards can be developed on a project basis.

Up to seven (7) work station modules can be connected to three (3), or less, module interface boards.

Philips PTS 6411 Modular Device Adaptor

Connector Panel
The top cover of PTS 6411 MDA serves as connector panel. The connectors are

- Mains receptable.
- "LINE" for network cable. Internally connected to the network interface board.
- Up to 7 connectors for workstation modules. Internally connected to the module interface board(s).
- 3 power outlets for certain workstation modules, e.g. PDU 6386, MSU 6266, TTP 6225.

TECHNICAL SUMMARY

Mains requirement	100–130 V ±10% 200–240 V ±10% 50 or 60 Hz ±2%
Environmental conditions	Temperature In operation +10 to 35°C During storage −40 to +70°C Humidity In operation 20 to 80% RH During storage 20 to 95% RH
Heat dissipation	max 120 W
Power consumption	max 200 W
Dimensions	Depth 210 mm Height 390 mm Width 220 mm
Weight	9 kg

Philips Keyboards

The bank staff and their information system must be able to communicate with each other. To achieve this, each operator must be provided with a terminal. The most common type of device for data entry, and for requesting information is a keyboard. (The data entered, and replies from the system, will be visually preserved on a display unit, backed up with a printer for hard copy).

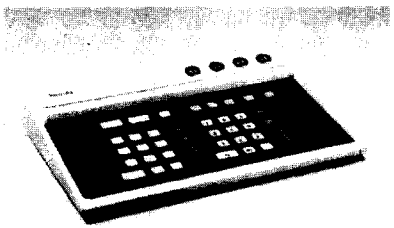
Different locations in a bank must handle different types of work, and thus have different input requirements. The Philips system therefore offers a series of keyboards. Each of these keyboards provides the functions and the capacity necessary for the location and work for which it is primarily intended. A teller, for example, usually requires only numeric and command functions from his keyboard, whereas at a general location other capacity is required as well. The Philips PTS 6000 system therefore includes a range of keyboards which provide increasing capacity from numeric and functions to alphanumeric + functions and signals.

With any of the keyboards, the functions of the keytops can be arranged to suit the particular requirements of any customer, the colours and inscriptions of the keytops are to customers' choice. The keytops are conveniently arranged for optimum accessibility, and keylock switching is provided to prevent misuse and to protect confidential information.

Mechanically, the keyboards offer considerable freedom of installation choice – they may be sunk into counters or stand free on a desk. They can be adjusted to any operator's position whether the operator normally stands or sits to work.

Any keyboard can be combined with any other terminal modules to create the optimum working system for any bank.

Philips PTS 6271 Keyboard Numeric



INTRODUCTION AND APPLICATION

The Philips PTS 6271 Keyboard Numeric is an input/output device comprising two main parts:

- an input part
  a keyboard with a keylock module
- an output part
  a lamp panel with 6 LED lamps and a bell

The keyboard consists of a numeric/function (control) part comprising a numeric pad and a group of function (control) keys.

The Philips PTS 6271 Keyboard Numeric is intended to be used for

- Data input
- Control of functions
- Program input and control of program
- Guiding the operator via a lamp panel

which makes the keyboard very well suited for all kinds of terminal use, at the counter as well as in the back office.

The extremely low profile of the Philips PTS 6271 Keyboard Numeric makes it excellent from an ergonomic point of view. It is a stand-alone unit and connected to the Philips PTS 6000 system via a cable, which makes the keyboard fully adjustable to the best ergonomic position.

PRODUCT DESCRIPTION

The Philips PTS 6271 Keyboard Numeric is made of metal and equipped with non-reflecting keytops. The keyboard comprises the following parts:

- a numeric/function part of a 12-key numeric cluster and 28 function (control) keys
- a lamp panel with 6 red LED-lamps and an easy exchangeable text panel
- a keylock switch section with up to 4 keylocks with two settings each signed 0 (off) and 1
- a bell

In total the keyboard has 39 keys besides one special shift key (A15). In the standard version of the keyboard all keys besides the keylocks and the special shift key have repeat function. If a keyswitch is kept in pressed down position the repetition starts after 1 second with a repeat rate of 10 char/sec. By an easy adjustment the repeat function can be disabled.

The keyboard has a built-in encoder.

The keyboard works with n-key roll-over function, meaning: When depressing a key, the keyboard transmits the corresponding code (data) in serial and in synchronism with "clock". After transmitting the code, the keyboard encoder starts searching for a new key depression, regardless if the old key (or keys) is (are) released or not.

Each key switch position transmits only one code except shift (A15), which transmits codes in both downwards and upwards direction.

The meaning of each key can be changed by depressing the shift key (A15), just as well as activation of each keylock can change the meaning of a certain keytop position. The actual conversion takes place in software. By means of those software conversion tables, a high degree of flexibility for the customer's application can be achieved.

The keylock switch section is designed as a separate module, which is easy to exchange to ease service. The keylock section remains at site with its proper keys. The standard version of the keyboard is equipped with two locks, one operator lock (different keys to all keyboards) and one standard supervisor lock (the same key accessible to all keyboards), with two keys to each keylock

Optionally the keylocks can be arranged according to special requirements. The total number of keylocks

Philips PTS 6271 Keyboard Numeric

are four and the following versions of the keylocks can be provided:

Type A	operator lock different keys to all keyboards = all locks different
Type B	standard supervisor lock the same key to all keyboards = all locks alike
Type C	special supervisor lock the same key to all keyboards within a certain project = all locks in a project alike

The keylock switches have two key settings marked 0 and 1. The key can only be removed in key setting "0". The keylock in operation determines the meaning that activated keys will get in the same way as for shift and control functions.

The keylock switches have no influence on the signal lamps, which are controlled from the program.

The keyboard is power failure proof and gives automatically key position at Power On.

The audiable alarm, bell function, has a duration of 100 ms. The function is controlled from the program.

OPTIONS/USER ADAPTATIONS

- The function/control keytops of the keyboard can be specified
- The text panels of the signal lamps and keylocks can be specified
- In the standard version the keyboard is equipped with an operator lock and a standard supervisor lock, but can as an option be equipped with up to four locks in a required combination
- Connection cable

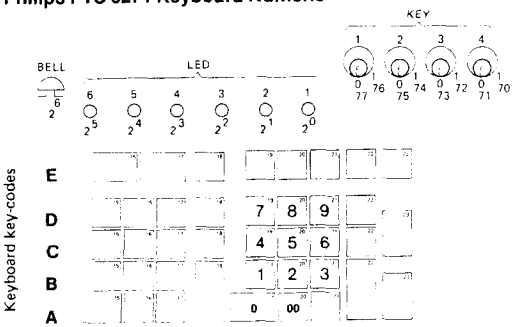
CONNECTIONS

The Philips PTS 6271 Keyboard Numeric is with a cable connected through a PTS 6000 standard interface to a Selector Unit Modular, PTS 6314, local or remote, or to a Terminal Printer, PTS 6371. The standard cable length is 3 meters. With a special cable the length can be up to 10 meters. Power for the keyboard is supplied from the unit to which it is connected

TECHNICAL SUMMARY

Input rate		
Average key-in velocity		10 char/sec
Max key-in velocity for 3 strokes		200 char/sec
Operating force		80 g ± 20% (0.7—1.0 Newton)
Keytop travel		3.5 ± 0.5 mm
Function		N-key roll-over
Number of keytops		40
Key operated switches		up to 4 with two settings each (0 and 1)
Integrated signal lamps		6 red lamps of LED-type
Dimensions		
Depth		195 mm
Height back		43 mm (key not inserted)
Height front		15 mm (20 mm from table surface to upper part of first keyrow)
Width		303 mm
Slope		8°
Weight		1.9 kg
Power requirement		+ 5V 0.6A distributed through the signal cable
Environmental conditions	in operation	during storage
Temperature	+ 15 to + 35°C	—40 to + 70 °C
Humidity	20 to 80%	20 to 95%

Philips PTS 6271 Keyboard Numeric



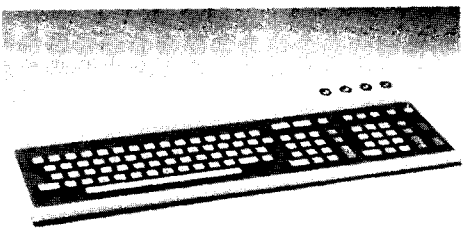
Key-number ◄——► key-code list

col / row	0	1	2	3	4	5	6	7
0		A19					E15	Key 4 →1
1	B15	B19					E17	Key 4 →0
2	B16	B20					E18	Key 3 →1
3	B17	B21					E19	Key 3 →0
4	C15	C19					E20	Key 2 →1
5	C16	C20					E21	Key 2 →0
6	C17	C21					E22	Key 1 →1
7	D15	D19					E23	Key 1 →0
8	D16	D20						
9	D17	D21						DUMMY
A	A16	A20						
B	A17	A21						DUMMY
C	A18	A22						A15 →1
D	C18	C22						A15 →0
E	D18	D22						
F	A23	D23						

Key 4 = rightmost keylock
1 = leftmost keylock
→ 1 = pressed, operated
→ 0 = released

Bit 1, 2, 3 = row
Bit 5, 6, 7 = column
Bit 8 = even parity

Philips PTS 6272 Keyboard Alphanumeric



INTRODUCTION AND APPLICATION

The Philips PTS 6272 Keyboard Aphanumeric is an input/output device comprising two main parts:

- an input part
  a keyboard with a keylock module
- an output part
  a lamp panel with 6 LED lamps and a bell

The keyboard consists of

- an alpha part similar to a normal typewriter with shift function and control function realized in software
- a numeric/function (control) part comprising a numeric pad and a group of function (control) keys.

The Philips PTS 6272 is intended to be used for

- Data input
- Control of functions
- Program input and control of program
- Guiding the operator via a lamp panel

which makes the keyboard very well suited for all kinds of terminal use, at the counter as well as in the back office.

The extremely low profile of the Philips PTS 6272 Keyboard Alphanumeric makes it excellent from an ergonomic point of view. It is a stand-alone unit and connected to the Philips PTS 6000 system via a cable, which makes the keyboard fully adjustable to the best ergonomic position.

PRODUCT DESCRIPTION

The Philips PTS 6272 Keyboard Alphanumeric is made of metal and equipped with non-reflecting keytops. The keyboard comprises the following parts:

- an alpha part with 59 keytops with shift function and control function
- a numeric/function part of a 12-key numeric cluster and 28 function (control) keys
- a lamp panel with 6 red LED lamps and an easy exchangeable text panel
- a keylock switch section with up to 4 keylocks with two settings each signed 0 (off) and 1
- a bell

In total the keyboard has 94 keys (including space) besides one CTRL-key, two alpha-shift keys, one alpha-shift lock key and one special-shift key on the numeric part.

In the standard version of the keyboard all keys, besides the keylocks, shift keys and the CTRL key, have repeat function. If a key switch is kept in pressed down position the repetition starts after 1 second with a repeat rate of 10 char/sec. By an easy adjustment the repeat function can be disabled.

The keyboard has a built-in encoder.

The keyboard works with n-key roll-over function, meaning: When depressing a key, the keyboard transmits the corresponding code (data) in serial and in synchronism with "clock". After transmitting the code, the keyboard encoder starts searching for a new key depression, regardless if the old key (or keys) is (are) released or not.

Each key switch position transmits only one code except shift and control (CTRL), which transmits codes in both downwards and upwards direction.

The meaning of each key can be changed by depressing SHIFT- or CTRL-key, just as well as activation of each keylock can change the meaning of a certain keytop position. The actual conversion takes place in software. By means of those software conversion tables, a high degree of flexibility for the customer's application is achieved.

The shift-lock keytop is indicating the activated shift mode with a LED in the keytop. The mode is shifted back

Philips PTS 6272 Keyboard Alphanumeric

to unshifted mode when the shiftlock button is pressed a second time.

The keylock switch section is designed as a separate module, which is easy to exchange to ease service. The keylock section remains at site with its proper keys. The standard version of the keyboard is equipped with two locks, one operator lock (different keys to all keyboards) and one standard supervisor lock (the same key accessible to all keyboards) with two keys to each keylock.

Optionally the keylocks can be arranged according to special requirements. The total number of keylocks are four and the following versions of the keylocks can be provided:

Type A	operator lock different keys to all keyboards = all locks different
Type B	standard supervisor lock the same key to all keyboards = all locks alike
Type C	special supervisor lock the same key to all keyboards within a certain project = all locks in a project alike

The keylock switches have two key settings marked 0 and 1. The key can only be removed in key setting "0". The keylock in operation determines the meaning that activated keys will get in the same way as for shift and control functions.

The keylock switches have no influence on the signal lamps, which are controlled from the program.

The keyboard is power failure proof and gives automatically key position at Power On.

The audiable alarm, bell function, has a duration of 100 ms. The function is controlled from the program.

OPTIONS/USER ADAPTATIONS

— A number of different keytop sets (ISO standard) to the alpha part of the keyboard has been arranged to suit available PTS 6000 character generators for printers and displays

— The function/control keytops in the numeric part of the keyboard can be specified

— The text panels of the signal lamps and keylocks can be specified

— In the standard version the keyboard is equipped with an operator lock and a standard supervisor lock, but can as an option be equipped with up to four locks in a required combination

— Connection cable

CONNECTIONS

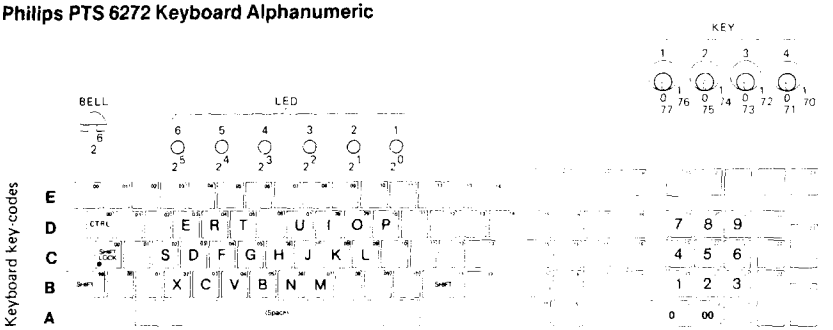
The Philips PTS 6272 Keyboard Alphanumeric is with a cable connected through a PTS 6000 standard interface to a Selector Unit Modular, PTS 6314, local or remote, or to a Terminal Printer, PTS 6371. The standard cable length is 3 meters. With a special cable the length can be up to 10 meters.

Power for the keyboard is supplied from the unit to which it is connected.

TECHNICAL SUMMARY

Input rate		
Average key-in velocity	10 char/sec	
Max key-in velocity for 3 strokes	200 char/sec	
Operating force	80 g ± 20% (0.7—1.0 Newton)	
Keytop travel	3.5 ± 0.5 mm	
Function	N-key roll-over	
Number of keytops	99	
Key operated switches	up to 4 with two settings each (0 and 1)	
Integrated signal lamps	6 red lamps of LED-type	
Dimensions		
Depth	195 mm	
Height back	43 mm (key not inserted)	
Height front	15 mm (20 mm from table surface to upper part of first keyrow)	
Width	540 mm	
Slope	8°	
Weight	3.0 kg	
Power requirement	+ 5V 0.6A distributed through the signal cable	
Environmental conditions	in operation	during storage
Temperature	+ 15 to + 35°C	—40 to + 70°C
Humidity	20 to 80%	20 to 95%

Philips PTS 6272 Keyboard Alphanumeric



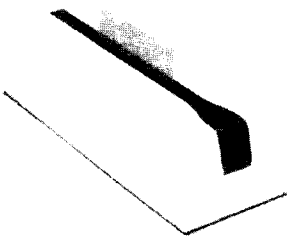
Key-number ◄——► key-code list

col / row	0	1	2	3	4	5	6	7
0		A19	A01	E10	E12	D10	E15	Key 4 →1
1	B15	B19		E01	C01	D01	E17	Key 4 →0
2	B16	B20		E02	B05	D04	E18	Key 3 →1
3	B17	B21		E03	B03	C02	E19	Key 3 →0
4	C15	C19		E04	C03	D05	E20	Key 2 →1
5	C16	C20		E05	D03	D07	E21	Key 2 →0
6	C17	C21		E06	C04	B04	E22	Key 1 →1
7	D15	D19	C12	E07	C05	D02	E23	Key 1 →0
8	D16	D20	E00	E08	C06	B02		alpha SHIFT →1
9	D17	D21	B00	E09	D08	D06		alpha SHIFT →0
A	A16	A20		B12	C07	B01		CTRL →1
B	A17	A21	E11	C13	C08	C11		CTRL →0
C	A18	A22	B08	E13	C09	C10		num SHIFT →1 ≈ A 15
D	C18	C22	B10	D13	B07	D11		num SHIFT →0 ≈ A 15
E	D18	D22	B09	D14	B06	D12		
F	A23	D23		E14	D09			

Bit 1, 2, 3 = row
Bit 4, 5, 6 = column
Bit 7 = even parity
Bit 8 = even parity

Key 4 = rightmost keylock
1 = leftmost keylock
→1 = pressed, operated
→0 = released

Philips PTS 6261 Badge Card Reader



INTRODUCTION AND APPLICATION

The Philips PTS 6261 Badge Card Reader is a read-only device for reading of track 2 (ABA) from magnetic stripes on credit cards according to ISO standard.

The reader is intended to be used for operator and client identification where an increase in velocity and security is desired.

To the Badge Card Reader (BCR) a stand-alone PIN-keyboard, for entering of PIN-numbers, can be connected (PIN = Personal Identification Number).

The Philips PTS 6261 Badge Card Reader is a stand-alone desk top unit and connected to the Philips PTS 6000 system via a cable, which makes it fully adjustable to the best ergonomic position.

PRODUCT DESCRIPTION

The reader has a read slot where the card is moved by hand. The unit can read track 2 (ABA) according to ISO-standards ISO 2894 and ISO 3554.

If in an application the card shall remain in the reader during operation of the terminal an indicator and a "stopper" is available, which is placed in the slot and is put in stop/no stop position by an easy adjustment with a screw-driver.

OPTIONS/USER ADAPTATION

— connection cable (see "Connections").

CONNECTIONS

The Philips PTS 6261 Badge Card Reader is connected with a cable through a PTS 6000 standard interface to a Selector Unit Modular, PTS 6314 local or remote, or to a Terminal Printer, PTS 6371. The standard cable length is 3 m. With a special cable the length can be up to 10 meters.

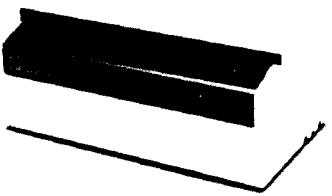
Power for the reader is obtained from the unit to which it is connected.

To the reader a PIN-keyboard can be connected via a fine cable of 3 m length. The PIN-keyboard is completely controlled from the reader.

TECHNICAL SUMMARY

Card to be used	Credit Card ISO-standard ISO2894, ISO3554	
Read	Track 2 (ABA)	
Packing density	3.0 bpmm (75 bpi) (ISO)	
Read speed	5—40 inch/sec	
Dimensions		
depth	220 mm	
height	60 mm	
width	90 mm	
weight	2 kg appr.	
Power requirements	+ 5V max 0.3 A —12V max 0.05 A distributed through the signal cable	
Environmental conditions	in operation	during storage
Temperature	+ 15 to + 35°C	—40 to + 70 °C
Humidity	20 to 80%	20 to 95%

Philips PTS 6266 Magnetic Stripe Unit



INTRODUCTION AND APPLICATION

The Philips PTS 6266 Magnetic Stripe Unit is intended for use in Philips PTS 6000 terminal stations. The unit will read and write on magnetic stripes. The stripe can be the magnetic stripe on a credit card or a selfadhesive magnetic tape placed on a passbook cover. The unit will facilitate input of client identification and transaction data. At passbook transactions the magnetic label is used for storing account number, balance and the last row printed in the passbook. The information will be read and updated at every transaction.

From credit cards the tracks 2 and 3 can be read and track 3 can be written.

To the Magnetic Stripe Unit (MSU) a stand alone PIN-Keyboard for entering of PIN-numbers can be connected (PIN = Personal Identification Number).

The Philips PTS 6266 Magnetic Stripe Unit is a stand alone desk top unit and connected to the Philips PTS 6000 system via a cable, which makes the unit fully adjustable to the best ergonomic position.

PRODUCT DESCRIPTION

The main parts are

- a read/write slot where the documents are inserted.
- a signalling lamp showing when the unit is busy and the documents must not be removed.

Read function

The unit can read track 2 or track 3 (one at a time) according to ISO-standard for reading of magnetic stripes. Selection of track 2 or track 3 is made by software. After positioning of the document a motor drives the read/write mechanism along the card/passbook.

Write function

Writing track 3 on the stripe is made with the motor driven read/write head. A read-after-write check is performed (read and write is made in separate passes).

Signal lamp

A red signal lamp is provided which is lit during the read and/or write operation. If the document by accident is removed during read or write operation, the lamp will remain lit and a message to the operator can be given on the printer or the display.

OPTIONS/USER ADAPTATIONS

— Connection cable (see "Connections").

CONNECTIONS

The Philips PTS 6266 Magnetic Stripe Unit is with a cable connected through a PTS 6000 standard interface to a Selector Unit Modular. PTS 6314 local or remote, or to a Terminal Printer PTS 6371. The standard cable length is 3 m. With a special cable the length can be up to 10 meters.

Power for the Magnetic Stripe Unit is obtained from the separate power module, PTS 6431 Power Supply Unit. The PTS 6266 MSU is connected to the PTS 6431 PSU via a standard cable of 3 m length.

To the Magnetic Stripe Unit a PIN-keyboard can be connected via a fine cable of 3 m length. The PIN keyboard is completely controlled from the MSU.

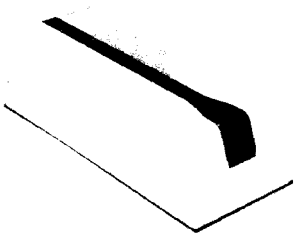
Philips PTS 6266 Magnetic Stripe Unit

TECHNICAL SUMMARY

Document to be used	Passbooks, max thickness 3 mm with a magnetic stripe located in accordance with DIN 32744. The characteristics of the magnetic material shall conform to the specifications contained in ISO 3554. Credit card, ISO-standard ISO2894, ISO 3554, DIS 4909 ISO/TC68/SCI-N33
Read	track 2 and 3
Write	track 3
Packing density track 2	3.0 bpmm (75 bpi) (ISO)
Packing density track 3	8.3 bpmm (210 bpi) (ISO)
Read/write speed	200 mm/s
Return speed	200 mm/s
Memory for write/read information	107 characters
Time to read track 3 with 50 characters	About 0.4 sec
Time to write track 3 with 30 characters	About 0.6 sec
Dimensions	
Depth	160 mm
Height	120 mm
Width	280 mm
Weight	5 kg
Power required from power supply PTS 6431	+ 5V 0.7 A —12V 0.015 A + 24V 0.25 A

Environmental conditions	in operation	during storage
Temperature	+ 15 to + 35°C	—40 to + 70°C
Humidity	20 to 80%	20 to 95%

Philips PTS 6262 Badge Card Reader



INTRODUCTION AND APPLICATION

The Philips 6262 Badge Card Reader is a read-only device for reading of track 2 and 3 from magnetic stripes on credit cards according to ISO standard.

The reader is intended to be used for operator and client identification where an increase in velocity and security is desired.

To the Badge Card Reader (BCR) a stand-alone PIN-keyboard, for entering of PIN-numbers, can be connected (PIN = Personal Identification Number).

The Philips PTS 6262 Badge Card Reader is a stand-alone desk top unit and connected to the Philips PTS 6000 system via a cable, which makes it fully adjustable to the best ergonomic position.

PRODUCT DESCRIPTION

The reader has a read slot where the card is moved by hand. The unit can read track 2 and 3 according to ISO-standards ISO 2894 and ISO 3554. The selection between track 2 and 3 is program controlled; one command for reading of track 2 and one command for reading of track 3.

If in an application the card shall remain in the reader during operation of the work station a sensor and a "stopper" is available, which is placed in the slot and is put in stop/no stop position by an easy adjustment with a screwdriver.

OPTIONS/USER ADAPTATIONS

Different connection cables are used depending on to which work station main module the PTS 6262 BCR shall be connected.

CONFIGURATION

The Philips PTS 6262 Badge Card Reader is a work station module, which is cable connected to a work station main module. The main module carries the communications- and power distribution functions for the connected modules. The connection is via the PTS 6000 standard interface, the so called Short Distance Interface (SDI). The standard cable length is 3 meters. With a special cable the length can be up to 10 meters.

To the reader a PIN-keyboard can be connected via a fine cable of 3 meters length. The PIN-keyboard is completely controlled from the reader.

TECHNICAL SUMMARY

Card to be used	Credit Card ISO-standard ISO2894, ISO3554	
Read	Track 2 and 3	
Packing density	75—210 bpi Track 2 75 bpi Track 3 210 bpi	
Read speed	5—25 inch/sec	
Dimensions depth height width weight	220 mm 60 mm 90 mm 2 kg appr.	
Power requirements	+ 5V max 0.4 A — 12V max 0.05 A distributed through the signal cable	
Environmental conditions Temperature Humidity	in operation + 15 to + 35°C 20 to 80%	during storage —40 to + 70°C 20 to 95%

Philips Terminal Printers

At the teller's desk, details of customer transactions must be printed immediately. At any working station the information entered, or answers to enquiries made, by the operator via the keyboard must often be visually recorded. Data shown on a display unit may also be required in the form of hard copy.

Different working stations have different printing requirements, and the Philips system therefore provides a series of printers. Each of the printers provides the functions and capacity necessary for the work and location for which it is intended, and occupies very little space.

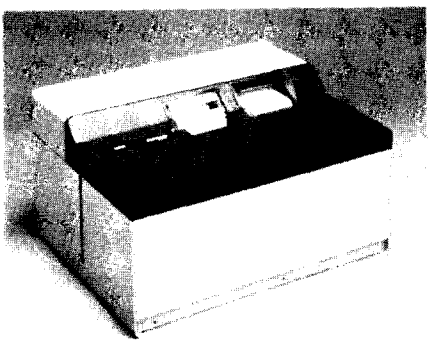
The teller terminal printers are specially designed for printing on customer documents – vouchers, cheques, passbooks etc. For other work, high-speed, continuous paper printers are available. The printers are compatible with nearly all existing systems of bank documentation. The dimensional tolerances accepted by the printers are generous, and document positioning, line feeds and character spacing can be adjusted to suit standard documents. Thus, redesign of existing documents is rarely necessary.

A variety of character repertoires is available to suit different national usages. Adjustments to characters/lines spacing and alignment can be made.

The printers are very compact, and may be sunk in or rest on the working surface. They can be operated from standing or sitting positions.

The range of printers available is such that the optimum system can be built up for any banking application.

Philips PTS 6225 Teller Terminal Printer



INTRODUCTION AND APPLICATIONS

The Philips 6225 Teller Terminal Printer is a terminal printer specially designed for over-the-counter printing applications.

It comprises three printing sections:

- a journal section, width 70 mm, printing area approx. 64 mm wide
- a tally roll section, width 70 mm, printing area approx. 64 mm wide
- a front feed section for voucher and passbook printing.

The printing speed is 80 characters per second. Its compactness makes the Philips PTS 6225 suitable for mounting into any teller's desk. It can be connected to a Philips PTS 6000 system terminal computer via a selector unit.

PRODUCT DESCRIPTION

The Philips PTS 6225 printer is a two-station combined printer. The left hand station is for vouchers, passbooks and tally rolls, and the right hand station is for journal tape. All printing is executed with one printing head.

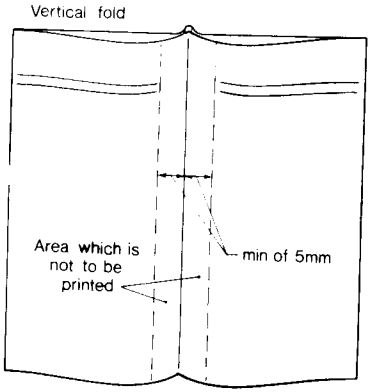
The supply reel for the journal tape is provided with an end-of-paper detector which checks the radius of the reel. When the radius falls below a preset value a warning can be given to the operator by the terminal computer.

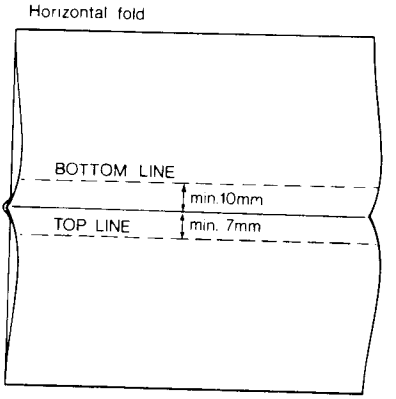
No end-of-paper detector is provided for the supply reel for the tally roll as it is partly visible to the operator.

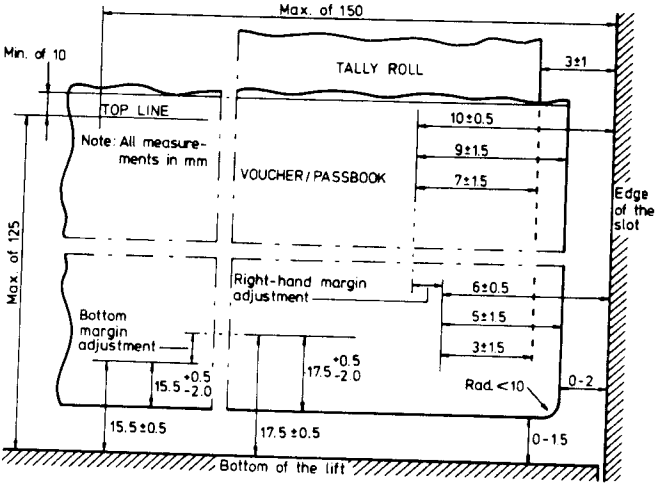
Printable documents

Tally roll	
Total width	69,5 mm ± 0,5 mm
Printing width	63,5 mm (max.) = 25 characters at character pitch of 0,1 inch
Paper roll diameter	70 mm (max.)
Supply reel shaft hole diam.	not critical
Paper weight	45 to 90 g/m^2
Line space accuracy	± 5% of nominal value
Journal tape	
Total width	69,5 mm ± 0,5 mm
Printing width	63,5 mm (max.) = 25 characters at character pitch of 0,1 inch
Paper roll diameter	70 mm (max.)
Supply reel shaft hole diam.	10,2 mm + 0,2 mm -0 mm.
Paper weight	45 to 90 g/m^2
Line space accuracy	± 5% of nominal value
Vouchers/passbooks	
Total width	100 mm (min.)
Total height	50 mm (min.)
Paper weight	
Single voucher sheet	45 g/m^2 (min.)
Voucher set	1 original + 3 copies (4 x 60 g/m^2) + 3 carbons (3 x 20 g/m^2)
Passbook thickness	3 mm (max.)
Printing area (see diagram)	
Width	150 mm (max.) incl. margin
Height	125 mm (max.) incl. margin
Accuracy of position detector	
Horizontal deviation	2,0 mm (max.)
Vertical deviation	1,5 mm (max.)
Inclination	1,5 mm (max.)
Line space accuracy	better than ± 1 mm over full vertical range

Philips PTS 6225 Teller Terminal Printer







Limitations applicable to both vouchers and passbooks

Philips PTS 6225 Teller Terminal Printer

Vouchers

Single sheet vouchers must weigh not less than 45 g/m^2 and must not transmit more light than the PTS 6000 reference voucher.

Passbooks

The maximum thickness of passbooks is 3 mm.

When using folded passbooks, a zone centered on the fold must be left out of printing. The reason is to avoid the risk of the print head getting caught up in the back, which is normally higher than the surrounding sides.

The distance between the lower edge of the bottom line is mechanically adjustable from a minimum of 15,5 mm to a maximum of 17,5 mm.

OPTIONS/USER ADAPTATIONS

- Character set
  A number of different character generators for character sets following ISO standard including national characters are available. Also so called roomless point character generators are available. Optionally character generators meeting special requirements on the character repertoire can be supplied.
- Character space
  Standard is 10 char/inch but can be changed to 12 char/inch as option.
- Line space
  Normally program controlled in steps of 1/12 inch that allow 3,4 or 6 lines/inch. The steps can be altered to 1/10 inch, thus allowing 5 and 3,33 lines/inch.
- The printer can be provided with a lockable cover for the journal tape.
- Adjustment of bottom and right-hand margin.

CONNECTIONS

The Philips PTS 6225 Teller Terminal Printer will most often be combined with a keyboard and a display device. All these units are connected via a Selector Unit Modular to the terminal computer.

Connection of the Philips PTS 6225 to the Selector Unit Modular is via two standard 3m cables. Power for the printer is obtained from the selector unit.

TECHNICAL SUMMARY

Character fount	8 x 9 matrix dot pattern
Character set	64 characters incl. space
Character spacing	10 char/inch standard 12 char/inch option
Printing speed	80 char/s
Tabulation and return speed	~ 500 mm/sek at 10 char/inch
Line spacing	
Tally roll/journal tape	6 lines/inch
Voucher/passbook	Program controlled in steps of: 1/12 inch, giving 3, 4 or 6 lines/inch 1/10 inch, giving 3,33 or 5 lines/inch
Line space accuracy	
Tally roll/journal tape	± 5% of nominal value
Voucher/passbook	± 1 mm over the full range
Accuracy for voucher/passbook position detector	
Horizontal deviation	2 mm (max.)
Vertical deviation	1,5 mm (max.)
Inclination	1,5 mm (max.) vertical deviation within the printing width
End of paper detector	
Journal tape	Yes
Tally roll	No, (reel is visible to operator)
Dimensions	
Width	370 mm
Height	180 mm (front), 210 mm (back)
Depth	300 mm
Weight	19 kg
Power	+36V ± 5% 1,2A av, 3,0 A peak + 5V ± 2%, 1,5A as supplied from selector unit
Environmental conditions	in operation during storage
Temperature	+15 to +35°C -40 to +70°C
Humidity	20 to 80% 20 to 95%
Heat dissipation	7,5W stand-by 50W whilst printing
Ink ribbon specification	8 mm, one colour nylon ca. 0,07 mm thick, Bobbin no. 20, Philips approved brand and type

Philips PTS 6225 Teller Terminal Printer

character set and code tables

ISO Standard

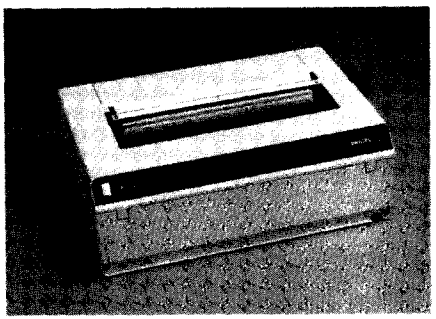
	2	3	4	5
0	SP	0	a2	P
1	!	1	A	Q
2	"	2	B	R
3	a1	3	C	S
4	$	4	D	T
5	%	5	E	U
6	&	6	F	V
7	'	7	G	W
8	(	8	H	X
9	)	9	I	Y
A	*	:	J	Z
B	+	;	K	a3
C	,	<	L	a4
D	–	=	M	a5
E	.	>	N	^
F	/	?	O	–

National variations applicable to the countries:	a1	a2	a3	a4	a5
	23	40	5B	5C	5D
D/A/L/CH Germany, Austria, Luxemburg, Switzerland	#	§	Ä	Ö	Ü
GB/NL/B Great Britain, Netherlands, Belgium	£	@	[	\	]
F/CH/B/L France, Switzerland, Belgium, Luxemburg	£	à	°	Ç	§
E Spain, Argentina, Venezuela	£	@	[	Ñ	]
I/CH Italy, Switzerland	£	§	°	Ç	É
S/SF Sweden, Finland	#	É	Ä	Ö	Å
DK/N Denmark, Norway	£	@	Æ	Ø	Å
P Portugal, Brazil	£	@	Ã	Ç	Õ
US USA, Canada, Australia	#	@	[	\	]

Roomless point

	2	3	4	5
0	SP	0	7.	P
1	0.	1	A	Q
2	1.	2	B	R
3	a1	3	C	S
4	¤	4	D	T
5	%	5	E	U
6	2.	6	F	V
7	3.	7	G	W
8	(	8	H	X
9	)	9	I	Y
A	*	:	J	Z
B	+	4.	K	a3
C	,	5.	L	a4
D	–	=	M	a5
E	.	6.	N	8.
F	/	?	O	9.

Philips PTS 6321 General Terminal Printer



INTRODUCTION AND APPLICATIONS

The Philips PTS 6321 General Terminal Printer is especially designed for printing at a general terminal and acting as hard copy back-up for a display unit. Sprocket paper feed is used for handling continuous fan-fold paper and the printing speed is 50 characters per second.

The Philips PTS 6321 General Terminal Printer can be used either as a table-top model or be built into a desk. In both cases, the compactness of the unit allows it to be installed at existing locations without the need for extensive rearrangement.

It can be connected to a Philips PTS 6000 system terminal computer via a selector unit.

PRODUCT DESCRIPTION

The Philips PTS 6321 printer is an output device used for alphanumeric printing at a general terminal or as hardcopy back-up for display. The printing operation is under the programmed control of the terminal computer in the central unit. The printer uses continuous fan-fold paper of the sprocket feed type and a pin matrix-type print head for forming clear, detailed characters with a dot pattern.

Tabulating commands and platen stepping are controlled by the terminal computer as part of the transaction routine and line spacing can be switched to three values. It is possible manually to rotate the platen to correspond to any given line, or manually to control the continuous paper-feed via a key on the printer.

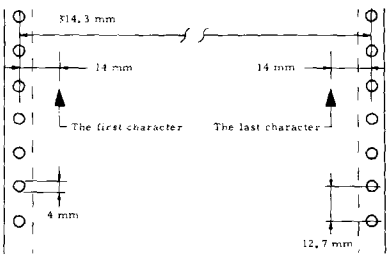
Paper specifications

The paper must be continuous fan-fold paper of the sprocket feed type.

The weight must be 40 to 90 g/m^2

Up to three copies to the original can be printed where

Original + 3 copies	60 g/m^2
carbon sheets	20 g/m^2
or comparable.	
Paper width	314,3 mm between pegs giving a printing area approx. 290 mm width, corresponding to 113 characters.



Specification of the paper to be used in the Philips PTS 6321 printer

OPTIONS/USER ADAPTATIONS

– Character generator sets of printable graphics other than those described can be supplied.

CONNECTIONS

The Philips PTS 6321 General Terminal Printer will most often be combined with a keyboard or a display device. All these units are connected via a Selector Unit Modular to the terminal computer. Connection of the PTS 6321 to the selector unit is via two standard 3m cables. Power for the printer is obtained from the selector unit.

Philips PTS 6321 General Terminal Printer

Environmental conditions	in operation	during storage
Temperature	+15% to +35°	-40 to +70°C
Humidity	20 to 80%	20 to 95%
Heat dissipation	6 W stand-by 42 W whilst printing.	
Ink ribbon specification	8 mm, one colour nylon ca. 0,07 mm thick, bobbin no. 20, Philips approved brand and type.	

TECHNICAL SUMMARY

Character fount	8 x 9 matrix dot pattern
Character set	64 characters incl. space
Character spacing	10 char/inch
Printing speed	50 char/s
Tabulation and return speed	250 mm/s (min.)
Line feed speed	45 mm/s
Line spacing	3,4 or 6 lines/inch (switchable)
Platen width	314,3 mm
Dimensions	
Width	470 mm
Height	175 mm
Depth	305 mm
Weight	17 kg
Power	+36 V ± 5%, 1,0 A av., 2,5 A peak + 5 V ± 2%, 1,2 A as supplied from the selector unit.

Philips PTS 6321 General Terminal Printer

ISO-7

	2	3	4	5
0	SP	0	a2	P
1	!	1	A	Q
2	"	2	B	R
3	a1	3	C	S
4	$	4	D	T
5	%	5	E	U
6	&	6	F	V
7	'	7	G	W
8	(	8	H	X
9	)	9	I	Y
A	*	:	J	Z
B	+	;	K	a3
C	,	<	L	a4
D	–	=	M	a5
E	.	>	N	^
F	/	?	O	_

National Variations					
Country	a1	a2	a3	a4	a5
Germany, Austria, Luxembourg, Switzerland.	#	§	Ä	Ö	Ü
Great Britain, Netherlands, Belgium	£	@	[	\	]
France, Switzerland, Belgium, Luxembourg.	£	à	°	Ç	§
Spain.	£	@	[	Ñ	]
Italy, Switzerland.	£	§	°	Ç	É
Sweden, Finland	#	É	Ä	Ö	Å
Denmark, Norway	£	@	Æ	Ø	Å
Portugal	£	@	Ã	Ç	Õ

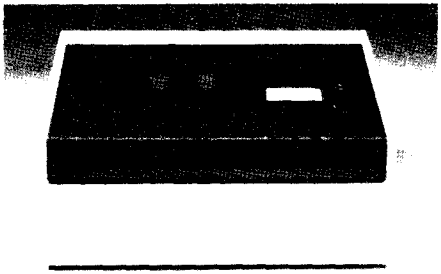
Philips PTS 6321 General Terminal Printer

Printable graphics
ISO-7 with roomless point

	2	3	4	5
0	SP	0	7.	P
1	0.	1	A	Q
2	1.	2	B	R
3	a1	3	C	S
4	¤	4	D	T
5	%	5	E	U
6	2.	6	F	V
7	3.	7	G	W
8	(	8	H	X
9	)	9	I	Y
A	*	:	J	Z
B	+	4.	K	a2
C	,	5.	L	a3
D	–	=	M	a4
E	.	6.	N	8.
F	/	?	O	9.

National Variations				
Country	a1	a2	a3	a4
Germany, Austria, Luxembourg, Switzerland	#	Ä	Ö	Ü
Great Britain, Netherlands, Belgium	£	[	/	]
France, Switzerland, Belgium, Luxembourg	£	°	Ç	§
Spain	£	[	Ñ	]
Italy, Switzerland	£	°	Ç	É
Sweden, Finland	#	Ä	Ö	Å
Denmark, Norway	£	Æ	ø	Å
Portugal	£	Ã	Ç	Õ

Philips PTS 6371 Terminal Printer



INTRODUCTION AND APPLICATIONS

The Philips PTS 6371 Terminal Printer is an output device specially designed for over-the-counter printing applications. It prints on single papers, document sets, passbooks and journal paper with a take-up roll, which is protected from unauthorized manipulation by a keylock on the cover lid.

The printing speed is 120 characters per second in both directions. The printer calculates the shortest way for the print head to next print position.

Since it is a compact unit, which can be placed as a desk top printer or cut down into the desk the Philips PTS 6371 Terminal Printer can be fully adjusted to the best ergonomic position. The printer is connected to a computer or a controller in a Philips PTS 6000 system via a cable of up to 150 meters lentgh in a star connection system and up to 850 meters in a multi-point connection system.

PRODUCT DESCRIPTION

The Philips PTS 6371 Terminal Printer is designed to be a main module in a Philips PTS 6000 work station. It is, besides being a printer, a communication unit for connected work station modules and has a power distribution function. Up to four modules, such as keyboard, display and badge card reader can be cable connected to a Philips PTS 6371 Terminal Printer. A module can be placed up to 10 meters from the printer. The standard cable length is, however, 3 meters.

Furthermore, an operator panel, which for instance can be used when the printer is shared between two or more work stations, can be inserted. The panel is placed in the front of the printer and is field installable.

The power supply of the printer is a separate module, which can be mounted either on the rear side of the printer or separately, to save space, on up to 1.5 meters distance from the printer.

The Philips PTS 6371 Terminal Printer is a two-station combined printer. The left hand station is for printing on documents like vouchers, set of forms and passbooks and the right hand station is for journal printing. All printing is executed with one print head, which automatically follows the thickness of the inserted document.

The print head is a nine needle head. One character (including the space between the characters) is built up by 14 columns with 9 dots in each. For standard character sets only 9 of the 14 columns are used. As standard the printer can print both upper and lower case alpha numeric characters according to ISO standard including twelve national character sets, the numeric OCR-A set and roomless point numerics. The actual character set is selected by the program in the computer.

Special characters, like logotypes, can be realized by adding a separate character generator in the printer for those characters.

Also the distance between the characters, the character pitch, is software controlled. There are three pitches, 1/10 inch, 1/12 inch and 1/15 inch available. By software command the pitch can be changed, which gives the possibility to print for instance 10 char/inch in the passbook and 15 char/inch on the journal.

Changing the pitch is implemented by expanding or compressing the distance between the columns, which means that both the character width and the inter character space is changed with the same factor. It is also possible to print in an expanded mode, where every column is printed twice.

Document station

The document is fed vertically into the printer through a slot in the upper part of the cover. The line feed is based on a basic step of 1/60 inch giving for instance 4, 5 or 6 lines/inch by software command. The document can be fed in both directions.

The printer indicates automatically the position of the inserted document and adjusts the printing line accordingly, which gives an accurate positioning from line to line between different print occasions.

Philips PTS 6371 Terminal Printer

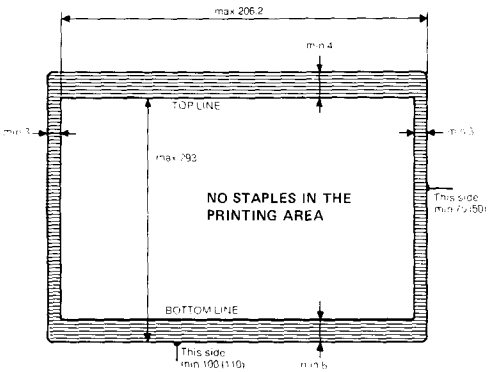
Printable documents are:
- single vouchers
  document sizes up to standing A4
- set of forms
  up to 4 copies (1 + 3) using carbon or active paper. Document sizes up to A4 with an attachment at one side or at the bottom of the set can be used
- passbooks
  with horizontal or vertical fold

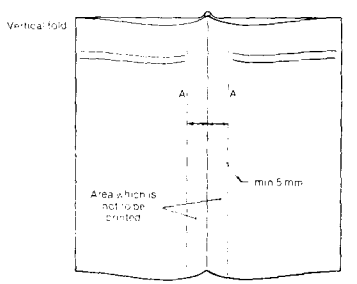
Voucher/passbook data

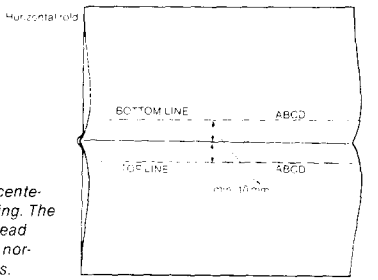
Total width	Min 100 mm Max 247 mm
Total height	Min 75 mm
Paper weight	
Single voucher sheet	60 g/m²
voucher set	1 original (60 g/m²) + 3 copies (3 × 40 g/m²) + 3 carbons (3 × 20 g/m²)
Passbook thickness	Max 3 mm
Printing area	
width	203.2 mm
height	287 mm
Accuracy of position detector	
horizontal deviation	Max 1.0 mm
vertical deviation	Max 0.7 mm
inclination	Max 1.0 mm on A4 width
line space accuracy	±0.5% over the full range

It is also possible to print on documents with a smaller height than mentioned in the voucher/passbook data above. Minimum height is 50 mm and minimum width is 110 mm. For such documents an additional bottom stop at a higher level in the printer is used. No automatic detection of vertical position is provided when this facility is used. The additional bottom stop is software controlled.

Printable area in the voucher/passbook







When using folded passbooks, a zone centered on the fold must be left out of printing. The reason is to avoid the risk of the print head getting cought up in the back, which is normally higher than the surrounding sides.

Philips PTS 6371 Terminal Printer

Journal station
The journal print station is an option which can be installed or removed in the field.

Normal paper rolls with paper width of 90 mm and a diameter not exceeding 80 mm shall be used. (70 mm diameter is recommended if the whole roll is rewound on the take-up reel.) Printing on the journal is right hand margin oriented.

The supply reel for the journal tape is provided with an end-of-paper detector, which checks the radius of the reel. When the radius falls below a preset value, which is switchable between 15 and 25.4 mm respectively, a warning can be given to the operator by the computer.

Journal tape data

Total width	90 mm
Maximum line length at	
10 char/inch	33 characters
12 char/inch	40 characters
15 char/inch	50 characters
Supply reel diameter	80 mm (max)
Paper weight	60 to 90 g/m²
End-of-paper detector	at 25.4 or 15 mm (bobbin diameter)

Serviceability
The Philips PTS 6371 Terminal Printer is provided with advanced diagnostic aids and the following features are incorporated:

- DC-on lamp, placed outside the cover at the top
- Test indicators, visible when the cover lid is opened
- Test switches, operable when the cover lid is opened
- Diagnostic programs, both in local and on-line (to the terminal computer) mode

OPTIONS/USER ADAPTATIONS
The following options, which all are field installable, are provided:

- Attached or separate power supply module
- With or without journal station
- Communication interfaces for local and remote connection to the PTS 6000 computer in a
  - — star configuration
  - — multipoint configuration
- Different side stops depending on passbook size
- Two extra connectors for work station modules
  Two connectors included in the standard version
- Operator panel
- Character generator for logotype or special characters

CONFIGURATION
The Philips PTS 6371 Terminal Printer is a work station main module, which includes communications and power distribution functions for connection of up to four work station modules designed to work with the PTS 6000 standard interface called the Short Distance Interface (SDI). Furthermore, the printer can be provided with communication interfaces allowing both local and remote connections to a PTS 6000 computer or controller in either a star or a multipoint configuration system.
The cable length to the computer for the locally connected printer can in a star configuration be up to 150 meters and in a multipoint configuration up to 850 meters.
The cable length between the printer unit and a connected module is as standard 3 meters but up to 10 meters length is possible.

The power module of the printer is connected to mains via a 2.5 m cable. If the power module is mounted separately it is connected to the printer via a 1.5 meters cable.

Philips PTS 6371 Terminal Printer

TECHNICAL SUMMARY

Character font	9 x 9 matrix dot pattern
Character set	96 characters incl space (upper and lower case) National characters Roomless point numerics OCR-A characters
Character spacing	10 char/inch 12 char/inch 15 char/inch software controlled
Printing speed	120 char/sec in both directions
Line feed speed	85—125 mm/sec
Line spacing	
journal tape	6 lines/inch
voucher/passbook	program controlled in steps of 1/60 inch giving e.g. 4, 5 or 6 lines/inch (can be set to 1—15/60 inch)
Line space accuracy	
voucher/passbook	± 0.5% over the full range
Accuracy for voucher/passbook position detector	
horizontal deviation	max 1.0 mm
vertical deviation	max 0.7 mm
inclination	max 1.0 mm vertical deviation within the printing width
End-of-paper detector	
journal tape	yes
Dimensions	
width	490 mm
height	210 mm
depth	335 mm without power supply 385 mm with power supply
weight	23.5 kg without power supply 25.1 kg with power supply

Power requirements	100—130 V/200—240 V ± 10% 50 or 60 Hz ± 2%	
Environmental conditions	in operation	during storage
Temperature	+ 15 to + 35°C	—40 to + 70°C
Humidity	20 to 80%	20 to 95%
Heat dissipation	Stand by 34 W	Operating 100 W
Ink ribbon specification	one colour nylon ca 0.09 mm thick, Philips cassette, min 22 m double sided	

Philips PTS 6371 Terminal Printer

Character set of the PTS 6371 Terminal Printer

	2	3	4	5	6	7
0	SP	0	a2	P	a6 a2	P p
1	!	1	A	Q	a	A q Q
2	"	2	B	R	b	B r R
3	a1	3	C	S	c	C s S
4	$	4	D	T	d	D t T
5	%	5	E	U	e	E u U
6	&	6	F	V	f	F v V
7	'	7	G	W	g	G w W
8	(	8	H	X	h	H x X
9	)	9	I	Y	i	I y Y
A	*	:	J	Z	j	J z Z
B	+	;	K	a3	k	K a7 a3
C	,	<	L	a4	l	L a8 a4
D	-	=	M	a5	m	M a9 a5
E	.	>	N	^	n	N a10
F	/	?	O	_	o	O

Char 1/Char 2

Character 1 will be printed if upper and lower case is selected.

Character 2 will be printed if upper case only is selected.

5 C for France I and Italy and 5 D for Italy will be capital letters when upper case only is selected.

National variations applicable to the countries:	a1	a2	a3	a4	a5	a6	a7	a8	a9	a10
	23	40	5B	5C	5D	60	7B	7C	7D	7E
Great Britain, Netherlands, Belgium	£	@	[	\	]	`	{	|	}	~
USA, Canada, Australia	#	@	[	\	]	`	{	|	}	~
France, Switzerland, Belgium Luxemburg I	£	à	°	ç	§	^	é	ù	è	¨
France, Switzerland, Belgium Luxemburg II	â	à	ê	ç	î	ô	é	ù	è	û
Italy, Switzerland	£	§	°	ç	é	ù	à	ò	è	ì
Sweden, Finland	#	É	Ä	Ö	Å	é	ä	ö	å	~
Denmark, Norway I	#	É	Æ	Ø	Å	é	æ	ø	å	~
Denmark, Norway II	£	@	Æ	Ø	Å	^	æ	ø	å	~
Germany, Austria, Luxemburg, Switzerland	#	§	Ä	Ö	Ü	^	ä	ö	ü	ß
Spain, Argentina, Venezuela	£	@	¡	Ñ	¿	`	{	ñ	}	~
Portugal, Brazil	£	@	Ã	Ç	Õ	^	ã	ç	õ	~
Yugoslavia	£	Ž	Ć	Č	Š	ž	ć	č	š	~

Philips PTS 6371 Terminal Printer

PRINT SAMPLES

UPPER CASE

Normal mode

10 char/inch

```
ABCDEFGHIJKLMNOPQRSTUVWXYZ
0123456789 0123456789ЈЧЋ
! "$%&'()*+,-./:;<=>?
```

12 char/inch

```
ABCDEFGHIJKLMNOPQRSTUVWXYZ
0123456789
!"$%&'()*+,-./:;<=>?
```

15 char/inch

```
ABCDEFGHIJKLMNOPQRSTUVWXYZ
0123456789
!"$%&'()*+,-./:;<=>
```

Expanded mode at 10 char/inch

```
ABCDEFGHIJKLMNOPQ
0123456789
! "$%&'()*+,-./:;<
```

UPPER AND LOWER CASE

Normal mode

10 char/inch

```
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
0123456789
! "$%&'()*+,-./:;<=>?
```

12 char/inch

```
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
0123456789
!"$%&'()*+,-./:;<=>?
```

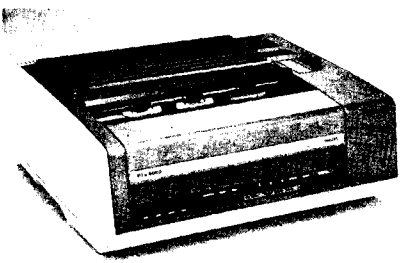
15 char/inch

```
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
0123456789
!"$%&'()*+,-./:;<=>?
```

Expanded mode at 10 char/inch

```
ABCDEFGHIJKLMNO
abcdefghijklmno
0123456789
```

Philips PTS 6374 General Terminal Printer



The Philips PTS 6374 General Terminal Printer is an alphanumerical matrix printer with built-in workstation main module functions. The same printer without main module function is called PTS 6375 GTP.

The printer is really general and can in the same installation be used both for high speed printing with normal matrix quality and high quality printout at reduced speed. This together with excellent paper handling functions makes the PTS 6374 GTP the ideal printer for the office with varying requirements like:

- hardcopy printing together with a display
- listing and management reporting
- ticket and label printing
- word processing

The PTS 6374 GTP can be used as a table top model or mounted on a pedestal. In both cases compactness of the unit allows it to be installed at existing locations without need of extensive rearrangements.

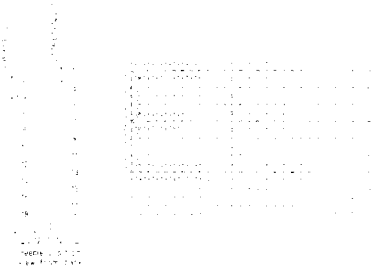
MAIN MODULE FUNCTIONS

The main module part of the PTS 6374 GTP provides the facilities for connection of other workstation modules and also for connection of the workstation itself to a local multipoint network (LWSI). The PTS 6374 GTP contains four standard interfaces for workstation modules such as keyboard, display and badge card reader. The standard cable length for workstation modules is 3 m. Up to 10 m is possible with special cable.

PRINTER DESCRIPTION

Printing Performance

The Philips PTS 6374 GTP has a printhead with 18 needles arranged in 2 columns according to figure.



This arrangement makes it possible either to print high quality upper and lower case characters as well as logotypes and other graphics in a high resolution matrix using all needles, or to print normal quality characters at a higher speed by using only one of the needle columns, i e 9 needles.

The design concept of the PTS 6374 provides for a great flexibility in adapting the printing to different appplication demands. Under control of terminal computer program the printer can be set for standard and optional character sets including national variations, for applicable character font and pitch, for line spacing, for page height and for tabulations.

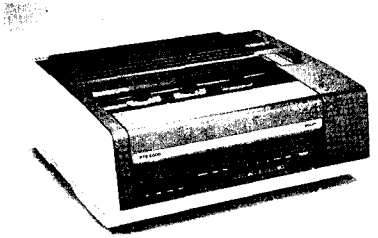
The basic character set of the PTS 6374 GTP is a full set of 96 upper and lower case characters in 12 national versions. The characters can be printed in normal Data quality font (9x9 dot matrix) with 10 or 12 characters per inch and in high quality Gothic font (18×25 dot matrix) with 10 or 12 characters per inch or proportional.

Logotypes, special characters and other fonts can also be implemented as optional character generator extensions.

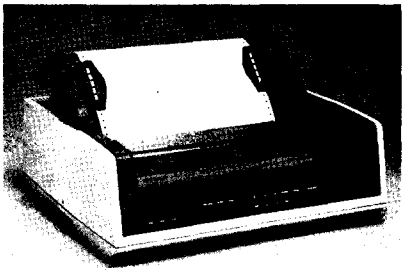
A high printspeed is maintained by automatically controlled bidirectional printing, and built-in automatic copy-control ensures a good printout also when additional copies are desired.

Philips PTS 6374 General Terminal Printer

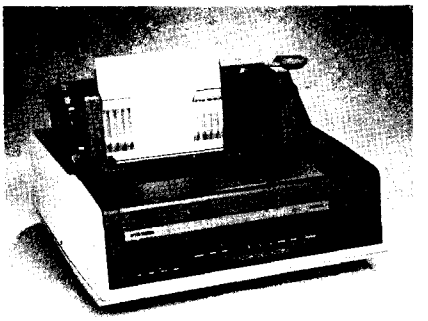
Document Handling
The PTS 6374 GTP has got the following paper handling possibilities
- Friction feed
- Tractor feed
- Front feed



Friction feed
The basic printer is equipped with friction feed type document handling. The documents used are manually inserted.



Tractor feed
A document handler of the tractor feed type for continuous, pin fed, fan-folded paper is available as a separate field installable Tractor Feed Kit. The tractor can be adjusted to different paper widths.



Front feed
With the tractor mechanism already in place another separate unit, a field installable Front Feed Kit, can be added and used for front feeding of documents.

Operator's Panel
At the front of the printer an operator's panel is positioned. This panel is used when printer parameters are to be changed. However parameters preset from the panel are superseded by software commands.

Serviceability
The modular design of PTS 6374 GTP together with builtin selftest function ensures minimum down-time.

Options
The following options are available
- 9×7 matrix character generator for printing with 15 characters per inch
- Logotype character generator

Accessories
The following accessories and kits for field adaptation are available
- Pedestal
- Tractor Feed Kit
- Front Feed Kit
- Pape Run Detection Kit

Philips PTS 6374 General Terminal Printer

TECHNICAL SUMMARY

Character font	
standard	9×9 dot matrix Data quality
standard	18×25 dot matrix Gothic
option	9×7 dot matrix Data quality
option	18×25 dot matrix Logotype or Semigraphic
Character set	96 characters inclusive upper and lower case with 12 national versions (See table)
Character spacing	
standard	10,12 char/inch with 9×9 matrix
standard	10,12, proportional with 18×25 matrix
option	15 char/inch with 9×7 matrix

Printing speed	Speed char/s	Pitch char/inch	Matrix
	150	10	9×9
	180	12	9×9
	80	10, 12	18×25
	100	proportional	18×25
option	120	15	9×7

Line spacing	3, 4, 6, 8, 12, 16, 24, or 48 lines/inch
Paper adjustment	48 steps/inch
Paper feed speed	4 ms/step (1/48 inch) 38 ms/single line (1/6 inch)
Print platen	340 mm
Left margin	Selectable 0 or 20 mm
Print width	Max 305 mm (12 inches)
Paper handling	
standard	Friction feed
accessory	Tractor feed
accessory	Front feed
Number of copies	1+3 automatic copy-control

Document	*Type*	*Width*	*Height*
friction feed	Single sheet or top glued form set	105 to 340 mm	Min 70 mm
tractor feed	Continuous fan-folded paper ISO 2784	70 to 340 mm incl paper guide	101 to 305 mm between perforations
front feed	Single sheet or bottom glued form set	105 to 305 mm	148 to 330 mm

Top of form function	Yes
Paper low detection	With tractor feed one page (A4) can be printed after paper low signal
Paper run detection	Senses paper movements (optional addition to tractor feed)
Network interface	LWSI, interface to local multipoint network
Module interface	2 SDI/SUM and 2 SDI strappable for SUM or V24
Mains requirements	100–130 V ±10% 200–240 V ±10% 50 or 60 Hz ± 2%

Environmental conditions	in operation	storage
temperature	+15 to +35°C	−40 to +70°C
humidity	20 to 80% RH	20 to 90% RH

Heat dissipation	
Standby	Approx 50 W
Operating	Approx 160 W
Dimensions	
width	520 mm
depth	445 mm
height	195 mm (friction feed)
Weight	20 kg

Philips PTS 6374 General Terminal Printer

Character set

	2	3	4	5	6	7
0	SP	0	a2	P	a6/a2	p/P
1	!	1	A	Q	a/A	q/Q
2	"	2	B	R	b/B	r/R
3	a1	3	C	S	c/C	s/S
4	$	4	D	T	d/D	t/T
5	%	5	E	U	e/E	u/U
6	&	6	F	V	f/F	v/V
7	'	7	G	W	g/G	w/W
8	(	8	H	X	h/H	x/X
9	)	9	I	Y	i/I	y/Y
A	*	:	J	Z	j/J	z/Z
B	+	;	K	a3	k/K	a7/a3
C	,	<	L	a4	l/L	a8/a4
D	–	=	M	a5	m/M	a9/a5
E	.	>	N	^	n/N	a10
F	/	?	O	_	o/O	

Char 1/Char 2

Character 1 will be printed if upper and lower case is selected.

Character 2 will be printed if upper case only is selected.

5 C for France I and Italy and 5 D for Italy will be capital letters when upper case only is selected.

National variations applicable to the countries:	a1	a2	a3	a4	a5	a6	a7	a8	a9	a10
	23	40	5B	5C	5D	60	7B	7C	7D	7E
Great Britain, Netherlands, Belgium	£	@	[	\	]	`	{	|	}	~
USA, Canada, Australia	#	@	[	\	]	`	{	|	}	~
France, Switzerland, Belgium Luxemburg I	£	à	°	ç	§	^	é	ù	è	¨
France, Switzerland, Belgium Luxemburg II	â	à	ê	ç	î	ô	é	ù	è	û
Italy, Switzerland	£	§	°	ç	é	ù	à	ò	è	ì
Sweden, Finland	#	É	Ä	Ö	Å	é	ä	ö	å	~
Denmark, Norway I	#	É	Æ	Ø	Å	é	æ	ø	å	~
Denmark, Norway II	£	@	Æ	Ø	Å	^	æ	ø	å	~
Germany, Austria, Luxemburg, Switzerland	#	§	Ä	Ö	Ü	^	ä	ö	ü	ß
Spain, Argentina, Venezuela	£	@	[	Ñ	]	^	{	ñ	}	~
Portugal, Brazil	£	@	Ã	Ç	Õ	^	ã	ç	õ	~
Yugoslavia	£	Ž	Ć	Č	Š	ž	ć	č	š	~

Philips PTS 6374 General Terminal Printer

Print samples

9×9 Data 10 char/inch

```
ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 0123456789:;<=>?
BCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 0123456789:;<=>?
CDLFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 0123456789:;<=>?
DEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 0123456789:;<=>?
 !"#$%&'()*+,-./ ◇%^_
 !"#$%&'()*+,-./ ◇%^_
```

9×9 Data 12 char/inch

```
abcdefghijklmnopqrstuvwxyz 0123456789:;<=>? !"#$%&'()*+,-./ ◇%^_
bcdefghijklmnopqrstuvwxyz 0123456789:;<=>? !"#$%&'()*+,-./ ◇%^_
cdefghijklmnopqrstuvwxyz 0123456789:;<=>? !"#$%&'()*+,-./ ◇%^_
defghijklmnopqrstuvwxyz 0123456789:;<=>? !"#$%&'()*+,-./ ◇%^_
```

18×25 Gothic 10 char/inch

```
ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 0123456789:;<=>?
BCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 0123456789:;<=>?
```

18×25 Gothic 12 char/inch

```
BCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 0123456789:;<=>?
CDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 0123456789:;<=>?
DEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 0123456789:;<=>?
   !"#$%&'()*+,-./ ◇%~^_
  !"#$%&'()*+,-./ ◇%~^_
```

18×25 Gothic proportional

```
abcdefghijklmnopqrstuvwxyz 0123456789:;<=>? !"#$%&'()*+,-./ ◇%~^_ #§ÄÖÜ`ä
bcdefghijklmnopqrstuvwxyz 0123456789:;<=>? !"#$%&'()*+,-./ ◇%~^_ #§ÄÖÜ`äö
cdefghijklmnopqrstuvwxyz 0123456789:;<=>? !"#$%&'()*+,-./ ◇%~^_ #§ÄÖÜ`äöü
defghijklmnopqrstuvwxyz 0123456789:;<=>? !"#$%&'()*+,-./ ◇%~^_ #§ÄÖÜ`äöüß
efghijklmnopqrstuvwxyz 0123456789:;<=>? !"#$%&'()*+,-./ ◇%~^_ #§ÄÖÜ`äöüß²
fghijklmnopqrstuvwxyz 0123456789:;<=>? !"#$%&'()*+,-./ ◇%~^_ #§ÄÖÜ`äöüß²±
```

Philips PTS 6374 General Terminal Printer

OVERLINE AND UNDERLINE

PITCH: 10 cpi

Overline Underline Low Line /5F Underlining Double Underline

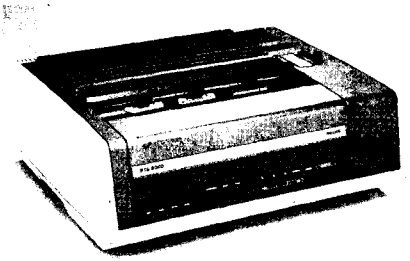
PITCH: 12 cpi

Overline Underline Low Line /5F Underlining Double Underline

PITCH: proportional

Overline Underline Low Line /5F Underlining Double Underline

Philips PTS 6375 General Terminal Printer



The Philips PTS 6375 General Terminal Printer is an alphanumerical matrix printer and workstation module in a Philips PTS 6000 workstation.

The printer is really general and can in the same installation be used both for high speed printing with normal matrix quality and high quality printout at reduced speed. This together with excellent paper handling functions makes the PTS 6375 GTP the ideal printer for the office with varying requirements like:

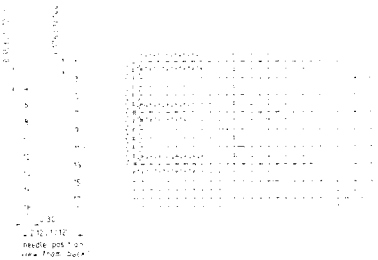
- hardcopy printing together with a display
- listing and management reporting
- ticket and label printing
- word processing

The PTS 6375 GTP can be used as a table top model or mounted on a pedestal. In both cases compactness of the unit allows it to be installed at existing locations without need of extensive rearrangements.

PRINTER DESCRIPTION

Printing Performance

The Philips PTS 6375 GTP has a printhead with 18 needles arranged in 2 columns according to figure.



This arrangement makes it possible either to print high quality upper and lower case characters as well as logotypes and other graphics in a high resolution matrix using all needles, or to print normal quality characters at a higher speed by using only one of the needle columns, i e 9 needles.

The design concept of the PTS 6375 provides for a great flexibility in adapting the printing to different appplication demands. Under control of terminal computer program the printer can be set for standard and optional character sets including national variations, for applicable character font and pitch, for line spacing, for page height and for tabulations.

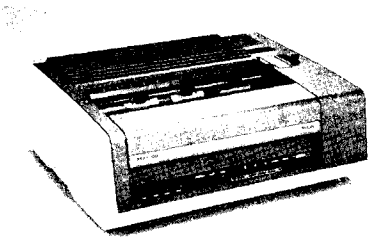
The basic character set of the PTS 6375 GTP is a full set of 96 upper and lower case characters in 12 national versions. The characters can be printed in normal Data quality font (9x9 dot matrix) with 10 or 12 characters per inch and in high quality Gothic font (18×25 dot matrix) with 10 or 12 characters per inch or proportional.

Logotypes, special characters and other fonts can also be implemented as optional character generator extensions.

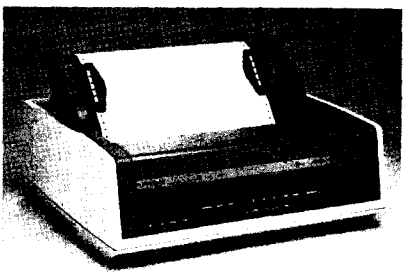
A high printspeed is maintained by automatically controlled bidirectional printing, and built-in automatic copy-control ensures a good printout also when additional copies are desired.

Philips PTS 6375 General Terminal Printer

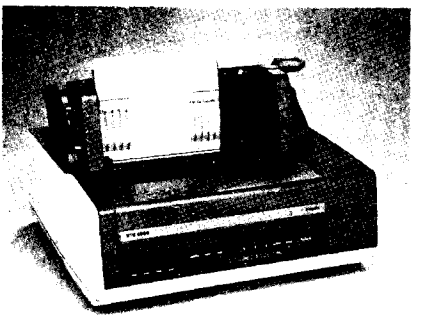
Document Handling
The PTS 6375 GTP has got the following paper handling possibilities
- Friction feed
- Tractor feed
- Front feed



Friction feed
The basic printer is equipped with friction feed type document handling. The documents used are manually inserted.



Tractor feed
A document handler of the tractor feed type for continuous, pin fed, fan-folded paper is available as a separate field installable Tractor Feed Kit. The tractor can be adjusted to different paper widths.



Front feed
With the tractor mechanism already in place another separate unit, a field installable Front Feed Kit, can be added and used for front feeding of documents.

Operator's Panel
At the front of the printer an operator's panel is positioned. This panel is used when printer parameters are to be changed. However parameters preset from the panel are superseded by software commands.

Serviceability
The modular design of PTS 6375 GTP together with builtin selftest function ensures minimum down-time.

Options
The following options are available
- 9×7 matrix character generator for printing with 15 characters per inch
- Logotype character generator

Accessories
The following accessories and kits for field adaptation are available
- Pedestal
- Tractor Feed Kit
- Front Feed Kit
- Pape Run Detection Kit

Philips PTS 6375 General Terminal Printer

TECHNICAL SUMMARY

Character font	
standard	9×9 dot matrix Data quality
standard	18×25 dot matrix Gothic
option	9×7 dot matrix Data quality
option	18×25 dot matrix Logotype or Semigraphic
Character set	96 characters inclusive upper and lower case with 12 national versions (See table)
Character spacing	
standard	10,12 char/inch with 9×9 matrix
standard	10,12, proportional with 18×25 matrix
option	15 char/inch with 9×7 matrix

Printing speed	Speed char/s	Pitch char/inch	Matrix
	150	10	9×9
	180	12	9×9
	80	10, 12	18×25
	100	proportional	18×25
option	120	15	9×7

Line spacing	3, 4, 6, 8, 12, 16, 24, or 48 lines/inch
Paper adjustment	48 steps/inch
Paper feed speed	4 ms/step (1/48 inch) 38 ms/single line (1/6 inch)
Print platen	340 mm
Left margin	Selectable 0 or 20 mm
Print width	Max 305 mm (12 inches)
Paper handling	
standard	Friction feed
accessory	Tractor feed
accessory	Front feed
Number of copies	1+3 automatic copy-control

Document	*Type*	*Width*	*Height*
friction feed	Single sheet or top glued form set	105 to 340 mm	Min 70 mm
tractor feed	Continuous fan-folded paper ISO 2784	70 to 340 mm incl paper guide	101 to 305 mm between perforations
front feed	Single sheet or bottom glued form set	105 to 305 mm	148 to 330 mm

Top of form function	Yes
Paper low detection	With tractor feed one page (A4) can be printed after paper low signal
Paper run detection	Senses paper movements (optional addition to tractor feed)
Interface	SDI/V24

Mains requirements		
	100–130 V	±10%
	200–240 V	±10%
	50 or 60 Hz	± 2%

Environmental conditions	in operation	storage
temperature	+15 to +35°C	−40 to +70°C
humidity	20 to 80% RH	20 to 90% RH

Heat dissipation	
standby	Approx 50 W
operating	Approx 160 W
Dimensions	
width	520 mm
depth	445 mm
height	195 mm (friction feed)
Weight	20 kg

Philips PTS 6375 General Terminal Printer

Character set

	2	3	4	5	6	7
0	SP	0	a2	P	a6/a2	p/P
1	!	1	A	Q	a/A	q/Q
2	"	2	B	R	b/B	r/R
3	a1	3	C	S	c/C	s/S
4	$	4	D	T	d/D	t/T
5	%	5	E	U	e/E	u/U
6	&	6	F	V	f/F	v/V
7	'	7	G	W	g/G	w/W
8	(	8	H	X	h/H	x/X
9	)	9	I	Y	i/I	y/Y
A	*	:	J	Z	j/J	z/Z
B	+	;	K	a3	k/K	a7/a3
C	,	<	L	a4	l/L	a8/a4
D	–	=	M	a5	m/M	a9/a5
E	.	>	N	^	n/N	a10
F	/	?	O	–	o/O	

Char 1/Char 2

Character 1 will be printed if upper and lower case is selected.

Character 2 will be printed if upper case only is selected.

5 C for France I and Italy and 5 D for Italy will be capital letters when upper case only is selected.

National variations applicable to the countries:	a1	a2	a3	a4	a5	a6	a7	a8	a9	a10
	23	40	5B	5C	5D	60	7B	7C	7D	7E
Great Britain, Netherlands, Belgium	£	@	[	\	]	`	{	|	}	~
USA, Canada, Australia	#	@	[	\	]	`	{	|	}	~
France, Switzerland, Belgium Luxemburg I	£	à	°	ç	§	^	é	ù	è	¨
France, Switzerland, Belgium Luxemburg II	â	à	ê	ç	î	ô	é	ù	è	û
Italy, Switzerland	£	§	°	ç	é	ù	à	ò	è	ì
Sweden, Finland	#	É	Ä	Ö	Å	é	ä	ö	å	~
Denmark, Norway I	#	É	Æ	Ø	Å	é	æ	ø	å	~
Denmark, Norway II	£	@	Æ	Ø	Å	^	æ	ø	å	~
Germany, Austria, Luxemburg, Switzerland	#	§	Ä	Ö	Ü	^	ä	ö	ü	ß
Spain, Argentina, Venezuela	£	@	¡	Ñ	¿	^	{	ñ	}	~
Portugal, Brazil	£	@	Ã	Ç	Õ	^	ã	ç	õ	~
Yugoslavia	£	Ž	Ć	Č	Š	ž	ć	č	š	~

Philips PTS 6375 General Terminal Printer

Print samples

9×9 Data 10 char/inch

```
ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 0123456789:;<=>?
BCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 0123456789:;<=>?
CDLFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 0123456789:;<=>?
DEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 0123456789:;<=>?
 !"#$%&'()*+,-./ 0%~^_
 !"#$%&'()*+,-./ 0%~^_
```

9×9 Data 12 char/inch

```
abcdefghijklmnopqrstuvwxyz 0123456789:;<=>? !"#$%&'()*+,-./ 0%~^_
bcdefghijklmnopqrstuvwxyz 0123456789:;<=>? !"#$%&'()*+,-./ 0%~^_
cdefghijklmnopqrstuvwxyz 0123456789:;<=>? !"#$%&'()*+,-./ 0%~^_
defghijklmnopqrstuvwxyz 0123456789:;<=>? !"#$%&'()*+,-./ 0%~^_
```

18×25 Gothic 10 char/inch

```
ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 0123456789:;<=>?
BCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 0123456789:;<=>?
```

18×25 Gothic 12 char/inch

```
BCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 0123456789:;<=>?
CDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 0123456789:;<=>?
DEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 0123456789:;<=>?
   !"#$%&'()*+,-./ 0%~^_
  !"#$%&'()*+,-./ 0%~^_
```

18×25 Gothic proportional

```
abcdefghijklmnopqrstuvwxyz 0123456789:;<=>? !"#$%&'()*+,-./ 0%~^_ #§ÄÖÜ`ä
bcdefghijklmnopqrstuvwxyz 0123456789:;<=>? !"#$%&'()*+,-./ 0%~^_ #§ÄÖÜ`äö
cdefghijklmnopqrstuvwxyz 0123456789:;<=>? !"#$%&'()*+,-./ 0%~^_ #§ÄÖÜ`äöü
defghijklmnopqrstuvwxyz 0123456789:;<=>? !"#$%&'()*+,-./ 0%~^_ #§ÄÖÜ`äöüß
efghijklmnopqrstuvwxyz 0123456789:;<=>? !"#$%&'()*+,-./ 0%~^_ #§ÄÖÜ`äöüß²
fghijklmnopqrstuvwxyz 0123456789:;<=>? !"#$%&'()*+,-./ 0%~^_ #§ÄÖÜ`äöüß²±
```

Philips PTS 6375 General Terminal Printer

OVERLINE AND UNDERLINE

PITCH: 10 cpi

Overline Underline Low Line /5F Underlining Double Underline

PITCH: 12 cpi

Overline Underline Low Line /5F Underlining Double Underline

PITCH: proportional

Overline Underline Low Line /5F Underlining Double Underline

Philips PTS 6000 Display units

In a bank terminal system, communication between operators and their system must be two-way. At each terminal, the system gives information to the operator, usually by means of a display device. (Hard copy of the information displayed is provided by a printer).

The amount and type of information required at each location will vary in accordance with the type of work to be done. The Philips system therefore offers a variety of display devices, each providing the functions and capacity required at the location for which it is primarily intended. A teller, for example, will often require only numeric and guidance signals, and these can normally be accommodated on a one line plasma display. Where more is required, he has the choice of the 6 line plasma. In the back-office, the highly-adaptable visual display unit gives up to 20 lines (optionally 24) of 80 characters each. This unit provides for data entry, inquiries, table look up and file handling.

The characters to be displayed can be selected from a variety of standard sets which match national alphabets and codes. The displays are clear and easy-to-read in normal background lighting, and the maximum possible positioning freedom has been designed in.

Any of the display units can be combined with the other Philips PTS 6000 terminal devices to build up the optimum terminal at any working position.

Philips PTS 6386 Plasma Display Unit

INTRODUCTION AND APPLICATIONS

The Philips PTS 6386 Plasma Display Unit is a 240 character alphanumeric output device which is used in combination with numeric and/or alphanumeric keyboards.

Its most usual location will be at the teller's desk, at which it provides:

- operator guidance
- display of keyed-in data
- display of status messages
- enquiries to files

For back office work it may be used for data entry and enquiries to files.

PRODUCT DESCRIPTION

The Philips PTS 6386 PDU is a plasma panel display using gas-discharge elements which give a bright, clear and flicker-free image.

It is designed to allow the creation of a good ergonomic workstation. Its compact design allows it to be placed for best readability and an optional stand will allow its installation in narrow workstation areas. To avoid glares from e.g. lamps the panel is recessed into the unit and a non glare screen is placed in front of the panel. The screen is bent in a curve so that lights falling into the panel are reflected away. Furthermore there is an intensity control which the operator can adjust for suitable display brightness.

A stand can be used which enables tilting of the display up and down in the range ±15°.

The Philips PTS 6386 PDU comprises a display panel and the necessary connecting cables. A separate power supply unit PTS 6431 PSU is used.

System functions

The display is controlled by programs in the terminal computer.

The following commands are given to the display unit by the terminal computer:

- Cursor down or Line feed
- Cursor left
- Cursor right
- Cursor home
- Clear
- Carriage return
- Set cursor address
- Fast output
- Cursor on/off
- Cursor blink/steady
- Random position of cursor

System software

The display is controlled via the system software of the Philips PTS 6000 terminal computer. With I/O requests it is possible to:

- Read (1) a specified number of characters.
- Set the cursor to a specified position.
- Write (2) from the set or current cursor position to the display.

(1) Read is input from keyboard used in connection with the display.

(2) Write is output to the display.

Application software

With the application software it is possible to realize different functions of the display such as:

- Editing
- Form fillout
- Tabulation
- Protected fields

Philips PTS 6386 Plasma Display Unit

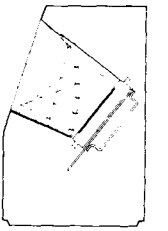
Operator commands

All keys of a keyboard are interpreted by the program, which implies that any control key of the keyboard used together with the display unit can, by program control, cause any function on the screen. Common functions for control keys are:

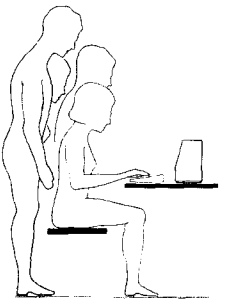
- **Clear**
  Clears the screen and places cursor at home position.
- **LF**
  Causes the cursor to move one line.
- **CR**
  The carriage return key moves the cursor to the beginning of the same line without altering the display content.
- **Home**
  The home key moves the cursor to the home position, i.e. the upper left corner.
- **Space bar**
  Advances the cursor one position to the right and alters the display content into a blank.
- **BSP**
  Non-destructive back space.
- **ETB**
  Generates a code to the computer and is normally used to indicate the end of a segment.
- **Cursor control**
  To move the cursor to any position on the screen by horizontal as well as vertical tabulations, without altering the display content.

ERGONOMICAL ASPECTS

- **Contrast**
  The text panel of the Philips PTS 6386 Plasma Display Unit is surrounded by a large dark area which improves readability considerably at a well lighted work station. Clear characters against a dark background prevent eyestrain.
- **Light intensity**
  A variable control (potentiometer) enables adjustment of screen light intensity to suit the surrounding lighting conditions and personal reuirements.
- **Screening**
  The text panel is relatively deep set in the screen housing which gives a satisfactory protection against unauthorized reading and at the same time eliminates annoying reflections.

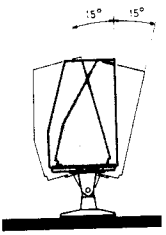


- **Reflection free**
  A deflector is positioned in front of the text panel. It is formed so that all sources of reflection such as overhead lighting, desk lighting, reflective articles etc are reflected towards the bottom of the frame house. The frame house is coated with a low luminans dark coloured paint.



- **Sitting or standing**
  The sitting position is the least tiring and most effective position for a terminal operator. In some cases the operator needs to stand up when dealing with a customer. This puts extra demands on the displays freedom from reflection. The deep inset text panel together with the anti reflex deflector gives large reflection free viewing angles both in the vertical and horizontal planes. Philips PTS 6386 PDU thus gives good readability within a large viewing area.

Philips PTS 6386 Plasma Display Unit



- **Individual position adjustment**
  Further "tailoring" to suit individual requirements is provided by an adjustable guide for vertical positioning of text display.
- **Text size, line spacing**
  Reading distance is dependent on character size and line spacing. Small characters (3-4 mm high) can be read from a distance of 50-70 cm. Philips PTS 6386 PDU has 6.5 mm high characters. This size is suitable for a reading distance of 60-120 cm but can be read without great difficulty from around two meters distance.

OPTIONS/USER ADAPTATIONS

- Ten standard variations in the character sets are available to suit national usage.
- Stand which enables tilting up and down in the range ±15°.

CONNECTIONS

The Philips PTS 6386 Plasma Display Unit is connected to a PTS 6000 system via a cable (standard length 3 m) to a Selector Unit Modular, local or remote (or to other units carrying the selector unit functions).

Power for the display unit is obtained from the separate power module, PTS 6431 Power Supply Unit. The PTS 6386 PDU is connected to the PTS 6431 PSU via a standard 3 m cable.

The power supply unit is connected to a wall socket via a 2.5 m cable with safety earth.

TECHNICAL SUMMARY

Display area	211,6 × 57,4 mm	
Panel capacity	240 characters in 6 lines of 40 characters each	
Character structure	5 × 7 dot matrix	
Dot spacing	horizontal 0,76 mm centre-to-centre vertical 1,02 mm centre-to-centre	
Character size	3,56 × 6,60 mm	
Character repertoire	64 ISO-7 characters, incl. space, with national variations.	
Transfer rate, local operation	approximately 200 char/s	
Transfer rate, remote operation	depending on line speed	
Environmental conditions	in operation	during storage
temperature	+15 to +35°C	−40 to +70°C
humidity	20 to 80%	15 to 95%

	PTS 6386 PDU	PTS 6431 PSU
Dimensions		
height	210 mm	110 mm
width	305 mm	120 mm
depth	150 mm	225 mm
weight	5.5 kg	2.3 kg
Power requirements	+ 5V ±5% 1.5A +24V±15% 1.0A −12V ±5% 0.14A	200-240V±10%, 50 Hz±3% 100-127V±10%, 60 Hz±3%
		40 W
Heat dissipation	20 W	20 W

Philips PTS 6386 Plasma Display Unit

Character set and code table

	2	3	4	5
0	SP	0	a2	P
1	!	1	A	Q
2	"	2	B	R
3	a1	3	C	S
4	$	4	D	T
5	%	5	E	U
6	&	6	F	V
7	'	7	G	W
8	(	8	H	X
9	)	9	I	Y
A	*	:	J	Z
B	+	;	K	a3
C	,	<	L	a4
D	–	=	M	a5
E	.	>	N	^
F	/	?	O	–

National variations applicable to the countries:	a1 23	a2 40	a3 5B	a4 5C	a5 5D
D/A/L/CH Germany, Austria, Luxemburg, Switzerland	#	§	Ä	Ö	Ü
GB/NL/B Great Britain, Netherlands, Belgium	£	@	[	\	]
F/CH/B/L France, Switzerland, Belgium, Luxemburg	£	à	°	ç	§
E Spain, Argentina, Venezuela	£	@	[	Ñ	]
I/CH Italy, Switzerland	£	§	°	ç	é
S/SF Sweden, Finland	#	É	Ä	Ö	Å
DK/N Denmark, Norway	£	@	Æ	Ø	Å
P Portugal, Brazil	£	@	Â	ç	Ô
US USA, Canada, Australia	#	@	[	\	]
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Philips PTS 6346 Video Display Unit

INTRODUCTION AND APPLICATIONS

The Philips PTS 6346 Video Display Unit is an output device, which together with one of the Philips PTS 6000 alphanumeric keyboards forms a display working station.

In its standard form the VDU can display up to 1280 alphanumeric characters on 20 lines of 64 characters. An optional character facility extends this capacity to 1920 characters in 24 lines of 80 characters. All characters and symbols are composed from a 7 x 9 light-point matrix (7 x 12 for lower case).

The display unit has been designed in such a way that it will allow adaptation to various requirements in a working station.

The applications can be grouped as follows:

- Inquiry/response from files
- Data Entry
- File maintenance
- Operator guidance and programmed education

PRODUCT DESCRIPTION

The Philips PTS 6346 Video Display Unit is a work station module designed to be a table top unit in conform with other PTS 6000 work station products and is housed in a metallic cover. It is possible to tilt the VDU to a viewing angel of 15° by an adjustable foot.

As an option PTS 6346 VDU can be mounted on a stand which permits an easy adjustment of the viewing angle, vertically and horizontally. The stand can be mounted in the field by a serviceman.

- Tilt −10° downwards to +30° upwards from horizontal position. The adjustment is easily done by an one hand operation.
- Turn ± 90°. The VDU is kept in position by friction.

All connectors are located on the rear and lower side of the VDU to ease vertical and horizontal adjustment. "Power on" switch, and associated "power on" lamp and manual adjustments are located on the front side easily accessible for the operator.

Non glare screen, with the filter mounted direct to the screen surface is used.

SYSTEM FUNCTIONS

The display is controlled by programs in the terminal computer and the following commands are possible:

- **Bell**
  The audible buzzer in the display is activated (frequency 2500 HZ and a duration of 100 ms). A new output of the BELL-command while the buzzer is still sounding will cause no action.
- **Cursor down or line feed**
  The cursor makes one step downwards. If the cursor is on the last line one line ROLL-UP will occur. The first line is lost.
- **Cursor left**
  Non-destructive control command. When the leftmost position is reached the cursor will remain there.
- **Cursor right**
  Non-destructive control command. When the rightmost position is reached the cursor will remain there.
- **Cursor home**
  The cursor returns to the upper leftmost position.
- **Clear**
  The screen is cleared from information and the cursor returns to the upper leftmost position.
- **Carriage return**
  The cursor returns to the leftmost position of the line.
- **Fast output**
  The command is executed on the line where the cursor is positioned. The command is always followed by two consecutive outputs, first a character which in bi-

Philips PTS 6346 Video Display Unit

nary format defines the number of times (1–80) a second character will be repeated. The second character must be a displayable character (incl space) in the range /20–/5F (/20–/7F for lower case). The outputs start in the cursor position. The cursor remains in that position.

- **Set cursor address**
  The command is always followed by two consecutive outputs in binary format with X-address (00–79) and Y-address (00–23) respective for positioning the cursor.
- **Underline start**
  Output of characters which follow after this command are provided whith underline.
- **Underline stop**
  Output of characters which follow after this command are not provided with underline. This status will also appear after power on and after CLEAR-command.
- **Low intensity start**
  Output of characters which follow after this command are displayed at low intensity.
- **Low intensity stop**
  Output of characters which follow after this command are displayed at high intensity. This command will also appear after power on and after CLEAR-command.

Other ASCII-codes, not defined as command characters and not within the character generator will not influence current terminal status nor change actual displayed characters.
If the X-address or Y-address capacity of the screen is exceeded by an incorrect command (14, 11) the cursor will not wrap around but remain in the last position or last line.

OPTIONS/USER ADAPTIONS

- Screen character cpacity
  Standard: 1280 characters, 20 lines x 64 char
  Option: 1920 characters,24 lines x 80 char
- Mains connection
  Two versions:
  - European, adjusted to 220 V (200–240 V), 2,5 m power cable with Europlug
  - UL/CSA, adjusted to 120 V (100–130 V), 2,5 m power cable with US-plug
- Connection cable
- Character repertoire
  Upper and lower case in 10 national versions of the 96 ISO character repertoire
- Stand

CONFIGURATION

The Philips PTS 6346 Video Display Unit is a work station module which is cable connected to a work station main module. The main module carries the communication functions for the connected modules. The connection is via an SDI/V24, V28 interface (SDI = Short Distance Interface). The standard cable length is 3 meters. With a special cable the length can be up to 10 meters.

The display unit has a built-in power supply and the mains cable is 2.5 m long.

TECHNICAL SUMMARY

Screen size	12 inch diagonal
Screen character capacity	
Standard	1280 characters; 64 characters per line by 20 lines
Optional	1920 characters; 80 characters per line by 24 lines
Character structure	7x9 dot matrix (7x12 dots for lower case)
Character size	3.5x2.1 mm
Distance between characters	1.2 mm for 64 character version 0.6 mm for 80 character version
Distance between the rows	3.5 mm for 64 character version 2.3 mm for 80 character version
Underline	Yes
Character repertoire	96 ISO-characters incl. space, upper and lower case with national variations
Data transmission rate	9600 bps
Parity check	No
Mode of operation	Receive only
Cursor function	Filled-in character 9x15 in inverse video
Phosphor	P4
Display control	Contrast for intensity control, power on/off
Dimensions	Width 335 mm Height 280 mm without stand (incl. feet) 405 mm incl. stand Dept 418 mm Weight 17 kg
Power requirements	100–130 V, 200–240 V ± 10 % 50 or 60 Hz ± 2 %
Heat dissipation	max 100 W
Power consumption	120 W

Philips PTS 6346 Video Display Unit

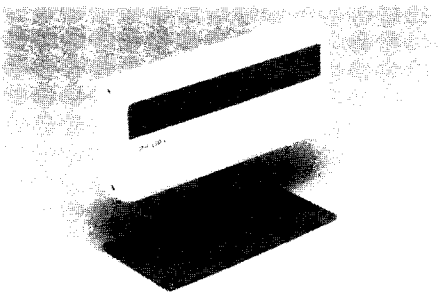
Character sets for the PTS 6346 display

	2	3	4	5	6	7
0	SP	0	a2	P	a6	p
1	!	1	A	Q	a	q
2	"	2	B	R	b	r
3	a1	3	C	S	c	s
4	$	4	D	T	d	t
5	%	5	E	U	e	u
6	&	6	F	V	f	v
7	'	7	G	W	g	w
8	(	8	H	X	h	x
9	)	9	I	Y	i	y
A	*	:	J	Z	j	z
B	+	;	K	a3	k	a7
C	,	<	L	a4	l	a8
D	–	=	M	a5	m	a9
E	.	>	N	^	n	a10
F	/	?	O	_	o	DEL

Output of 7F (DEL) means "no action".

National variations applicable to the countries:	a1	a2	a3	a4	a5	a6	a7	a8	a9	a10
	23	40	5B	5C	5D	60	7B	7C	7D	7E
Germany, Austria, Luxemburg, Switzerland	#	§	Ä	Ö	Ü	`	ä	ö	ü	ß
Great Britain, Netherlands, Belgium	£	@	[	\	]	^	¦	|	¦	~
France, Switzerland, Belgium Luxemburg	£	à	°	ç	§	^	é	ù	è	¨
Spain, Argentina, Venezuela	£	@	¡	Ñ	¿	`	¦	ñ	¦	~
Italy, Switzerland	£	§	°	ç	é	ù	à	ò	è	ì
Sweden, Finland	#	É	Ä	Ö	Å	é	ä	ö	å	~
Denmark, Norway	£	@	Æ	Ø	Å	^	æ	ø	å	~
Portugal, Brazil	£	@	Ã	Ç	Õ	^	ã	ç	õ	~
USA, Canada, Australia	#	@	[	\	]	^	¦	|	¦	~
Yugoslavia	£	Ž	Ć	Č	Š	ž	ć	č	š	~

Philips PTS 6385 Alphanumeric Display Unit



INTRODUCTION AND APPLICATION

The Philips PTS 6385 Alphanumeric Display Unit is a 40 character alphanumeric output device which is used in combination with numeric and/or alphanumeric keyboards.

Its most usual location will be at the teller's desk, where it can be used

- for operator guidance
- to display keyed-in data
- to display status messages
- for enquiry response messages

PRODUCT DESCRIPTION

The Philips PTS 6385 ADU is a LED type display to be used for alphanumeric presentation, upper case only, and the character capacity is 1 (one) line of 40 characters. The selection between the ten possible national versions is made in software.

The PTS 6385 ADU is designed to allow the creation of a good ergonomic workstation. Its compact design allows it to be placed for best readability and the placing on the stand which is a standard part of the display will allow its installation in narrow workstation areas. The stand enables tilting of the display up and down in the range of ± 15° which makes it possible to use the display for either sitting or standing tellers at system generation or in the application. Furthermore there is an intensity control on the rear right side which the operator can adjust for suitable display brightness.

FUNCTIONAL DESCRIPTION

The display is completely controlled by programs in the terminal computer. The following control commands can be given to the display by the terminal computer:

- Cursor left
- Cursor right
- Cursor home
- Clear
- Carriage return
- Test
- Set cursor address
- Fast output
- Turn on cursor
- Turn off cursor
- Blinc cursor
- Steady cursor

After power on, controlled from the interfacing unit, the cursor stands in home position. After each output the cursor will automatically step to the next write position. The cursor will stop in the leftmost and rightmost position. In the rightmost position of the line the last written character is displayed.

OPTIONS/USER ADAPTATIONS

- connection cable (see "connections")

CONNECTIONS

The Philips PTS 6385 Alplhanumeric Display Unit is a terminal module which with a cable is connected to its interfacing unit (main unit, which carries the communications- and power distribution functions for connected terminal modules). Connection to the PTS 6000 system is via PTS 6000 Standard Device Interface. PTS 6385 ADU is also power supplied from the standard interface. The standard cable length is 3 m. With a special cable the length can be up to 10 meters.

Philips PTS 6385 Alphanumeric Display Unit

TECHNICAL SUMMARY

Display area	202 x 4 mm
Panel capacity	40 characters in 1 line
Charater structure	16 segments font plus centered decimal point and colon
Character size	2,8 x 3,6 mm
Character spacing	5,0 mm (center-to-center)
Character repertoire	64 ISO characters incl. space. Ten national variations

Dimensions	
Height without stand	120 mm
Height with stand	200 mm
Width	266 mm
Depth	43 mm
Stand plate	120 x 220 mm
Weight	2 kg incl. stand and cable

Power requirement	+ 5 V average 0,4 A (max 0,8 A) distributed through the signal cable

Environmental conditions	in operation	during storage
Temperature	+ 15 to + 35°C	—40 to + 70°C
Humidity	20 to 80%	15 to 95%
Heat dissipation	Average 2 W	

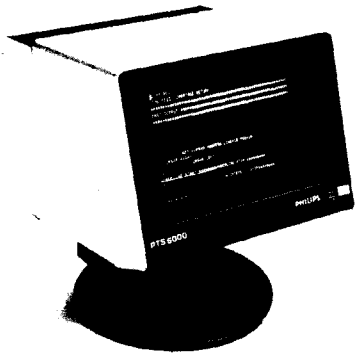
Philips PTS 6385 Alphanumeric Display Unit

Character set and code table

	2	3	4	5
0	SP	0	a2	P
1	!	1	A	Q
2	"	2	B	R
3	a1	3	C	S
4	$	4	D	T
5	%	5	E	U
6	&	6	F	V
7	'	7	G	W
8	(	8	H	X
9	)	9	I	Y
A	*	:	J	Z
B	+	;	K	a3
C	,	<	L	a4
D	–	=	M	a5
E	.	>	N	^
F	/	?	O	–

National variations applicable to the countries:	a1	a2	a3	a4	a5
	23	40	5B	5C	5D
D/A/L/CH Germany, Austria, Luxemburg, Switzerland	#	§	Ä	Ö	Ü
GB/NL/B Great Britain, Netherlands, Belgium	£	@	[	\	]
F/CH/B/L France, Switzerland, Belgium, Luxemburg	£	à	°	ç	§
E Spain, Argentina, Venezuela	£	@	[	Ñ	]
I/CH Italy, Switzerland	£	§	°	ç	É
S/SF Sweden, Finland	#	É	Ä	Ö	Å
DK/N Denmark, Norway	£	@	Æ	Ø	Å
P Portugal, Brazil	£	@	Ã	ç	Õ
US USA, Canada, Australia	#	@	[	\	]
YU Yugoslavia	£	Ž	Ć	Č	Š

Philips PTS 6347 Video Display Unit



INTRODUCTION AND APPLICATIONS

The Philips PTS 6347 Video Display Unit is an output device, which together with one of the Philips PTS 6000 alphanumeric keyboards forms a display working station.

In its standard form the VDU can display up to 1280 alphanumeric characters on 20 lines of 64 characters. An optional character facility extends this capacity to 1920 characters in 24 lines of 80 characters. All characters and symbols are composed from a 7 x 9 light-point matrix (7 x 12 for lower case).

The display unit has been designed in such a way that it will allow adaptation to various requirements in a working station.

The applications can be grouped as follows:

- Inquiry/response from files
- Data Entry
- File maintenance
- Operator guidance and programmed education

PRODUCT DESCRIPTION

The Philips PTS 6347 Video Display Unit is a main module in a Philips PTS 6000 working station. This means that besides being a display it is the communication device to which other work station modules are connected. It is designed to be a table top unit in conform with other PTS 6000 work station products and is housed in a metallic cover. It is possible to tilt the VDU to a viewing angel of 15° by an adjustable foot.

As an option PTS 6347 VDU can be mounted on a stand which permits an easy adjustment of the viewing angle, vertically and horizontally. The stand can be mounted in the field by a serviceman.

- Tilt -10° downwards to $+30^{\circ}$ upwards from horizontal position. The adjustment is easily done by an one hand operation.
- Turn $\pm 90^{\circ}$. The VDU is kept in position by friction.

All connectors are located on the rear and lower side of the VDU to ease vertical and horizontal adjustment. "Power on" switch, and associated "power on" lamp and manual adjustments are located on the front side easily accessible for the operator.

Non glare screen, with the filter mounted direct to the screen surface is used.

SYSTEM FUNCTIONS

The display is controlled by programs in the terminal computer and the following commands are possible:

- **Bell**
  The audible buzzer in the display is activated (frequency 2500 HZ and a duration of 100 ms). A new output of the BELL-command while the buzzer is still sounding will cause no action.
- **Cursor down or line feed**
  The cursor makes one step downwards.
  If the cursor is on the last line one line ROLL-UP will occur. The first line is lost.
- **Cursor left**
  Non-destructive control command.
  When the leftmost position is reached the cursor will remain there.
- **Cursor right**
  Non-destructive control command.
  When the rightmost position is reached the cursor will remain there.
- **Cursor home**
  The cursor returns to the upper leftmost position.
- **Clear**
  The screen is cleared from information and the cursor returns to the upper leftmost position.
- **Carriage return**
  The cursor returns to the leftmost position of the line.

Philips PTS 6347 Video Display Unit

- **Fast output**
  The command is executed on the line where the cursor is positioned. The command is always followed by two consecutive outputs, first a character which in binary format defines the number of times (1–80) a second character will be repeated. The second character must be a displayable character (incl space) in the range /20–/5F (/20–/7F for lower case). The outputs start in the cursor position. The cursor remains in that position.
- **Set cursor address**
  The command is always followed by two consecutive outputs in binary format with X-address (00–79) and Y-address (00–23) respective for positioning the cursor.
- **Underline start**
  Output of characters which follow after this command are provided whith underline.
- **Underline stop**
  Output of characters which follow after this command are not provided with underline. This status will also appear after power on and after CLEAR-command.
- **Low intensity start**
  Output of characters which follow after this command are displayed at low intensity.
- **Low intensity stop**
  Output of characters which follow after this command are displayed at high intensity. This command will also appear after power on and after CLEAR-command.

Other ASCII-codes, not defined as command characters and not within the character generator will not influence current terminal status nor change actual displayed characters.
If the X-address or Y-address capacity of the screen is exceeded by an incorrect command (/14, /11) the cursor will not wrap around but remain in the last position or last line.

OPTIONS/USER ADAPTIONS

- Screen character cpacity
  Standard: 1280 characters, 20 lines x 64 char
  Option: 1920 characters,24 lines x 80 char
- Mains connection
  Two versions:
  - European, adjusted to 220 V (200–240 V), 2,5 m power cable with Europlug
  - UL/CSA, adjusted to 120 V (100–130 V), 2,5 m power cable with US-plug
- Character repertoire
  Upper and lower case in 10 national versions of the 96 ISO character repertoire.

CONFIGURATION

The Philips PTS 6347 Video Display Unit is a work station main module, which includes communication functions for connection of two work station modules – a keyboard and a hard copy printer. The module interface is the PTS 6000 Short Distance Interface (SDI) for the keyboard and a PTS special connection for the hard copy printer.

The PTS 6347 VDU is provided with a communication interface for local connection to a PTS 6000 computer or a controller in a multi-point connection system. The local line to which the computer/controller and the work stations are connected can be up to 850 meters.

The cable length between the display and the connected modules is as standard 3 meters but up to 10 meters length is possible.

The PTS 6347 VDU has built-in power supply and the mains cable is 2.5 m long.

TECHNICAL SUMMARY

Screen size	12 inch diagonal
Screen character capacity	
Standard	1280 characters; 64 characters per line by 20 lines
Optional	1920 characters; 80 characters per line by 24 lines
Character structure	7x9 dot matrix (7x12 dots for lower case)
Character size	3.5x2.1 mm
Distance between characters	1.2 mm for 64 character version 0.6 mm for 80 character version
Distance between the rows	3.5 mm for 64 character version 2.3 mm for 80 character version
Underline	Yes
Character repertoire	96 ISO-characters incl. space, upper and lower case with national variations
Data transmission rate	9600 bps
Parity check	No
Mode of operation	Receive only
Cursor function	Filled-in character 9x15 in inverse video
Phosphor	P4
Display control	Contrast for intensity control, power on/off
Dimensions	Width 335 mm Height 280 mm without stand (incl. feet) 405 mm incl. stand Dept 418 mm Weight 17 kg
Power requirements	100–130 V, 200–240 V ± 10 % 50 or 60 Hz ± 2 %
Heat dissipation	max 100 W
Power consumption	120 W

Philips PTS 6347 Video Display Unit

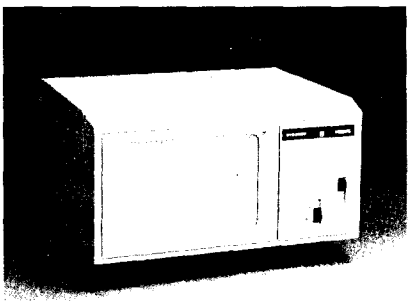
Character sets for the PTS 6347 display

	2	3	4	5	6	7
0	SP	0	a2	P	a6	p
1	!	1	A	Q	a	q
2	"	2	B	R	b	r
3	a1	3	C	S	c	s
4	$	4	D	T	d	t
5	%	5	E	U	e	u
6	&	6	F	V	f	v
7	'	7	G	W	g	w
8	(	8	H	X	h	x
9	)	9	I	Y	i	y
A	*	:	J	Z	j	z
B	+	;	K	a3	k	a7
C	,	<	L	a4	l	a8
D	–	=	M	a5	m	a9
E	.	>	N	^	n	a10
F	/	?	O	–	o	DEL

Output of 7F (DEL) means "no action".

National variations applicable to the countries:	a1	a2	a3	a4	a5	a6	a7	a8	a9	a10
	23	40	5B	5C	5D	60	7B	7C	7D	7E
Germany, Austria, Luxemburg, Switzerland	#	§	Ä	Ö	Ü	`	ä	ö	ü	ß
Great Britain, Netherlands, Belgium	£	@	[	\	]	^	¦	¦	¦	~
France, Switzerland, Belgium Luxemburg	£	à	°	ç	§	^	é	ù	è	¨
Spain, Argentina, Venezuela	£	@	¡	Ñ	]	`	¦	ñ	¦	~
Italy, Switzerland	£	§	°	ç	é	ù	à	ò	è	ì
Sweden, Finland	#	É	Ä	Ö	Å	é	ä	ö	å	~
Denmark, Norway	£	@	Æ	Ø	Å	^	æ	ø	å	~
Portugal, Brazil	£	@	Ã	Ç	Õ	^	ã	ç	õ	~
USA, Canada, Australia	#	@	[	\	]	^	¦	¦	¦	~
Yugoslavia	£	Ž	Ć	Č	Š	ž	ć	č	š	~

Philips PTS 6387 Video Display Unit



The Philips PTS 6387 Video Display Unit is a 480 character alphanumeric output device to be used as supporting display in printer oriented workstations.

Its most usual location will be at the teller's desk, where it can be used

- for operator guidance
- to display keyed-in data
- to display status messages
- for enquiry response messages.

In back office work it may be used for data entry and file enquiries.

VDU DESCRIPTION

The PTS 6387 VDU is a 6 inch CRT display. 70 Hz refresh rate ensures flicker-free presentation of black characters on white background.

Screen capacity is 12 lines of 40 characters. Magnified text can be selected by software. Screen capacity is then 12 lines of 20 elongated characters.

The PTS 6387 VDU is designed for good workstation ergonomics. Small dimensions allow it to be placed so that reading is easy. A folding out foot makes it possible to tilt the VDU to a viewing angle of 18°.

An accesory stand, permitting further adjustment of viewing angle, is also available. The stand can be mounted in the field by a serviceman.

System Functions
The display is controlled by programs in the terminal computer/workstation controller. The following commands are possible to be executed by the VDU.

- Cursor down or line feed
  The cursor makes one step downwards. If the cursor is on the last line one line ROLL-UP will occur. The first line is lost.
- Cursor left
  Non-destructive control command. When the leftmost position is reached the cursor will remain there.
- Cursor right
  Non-destructive control command. When the rightmost position is reached the cursor will remain there.
- Cursor home
  The cursor returns to the upper leftmost position.
- Carriage return
  The cursor is moved to the first position of the current line.
- Cursor off
  The cursor is extinguished.
- Cursor on
  The cursor is displayed in selected mode, blinking or steady.
- Cursor blinking
  The cursor is blinking (2.2 cycles/second).
- Cursor steady
  The cursor is displayed continuously.
- Set cursor address
  The cursor is moved to the specified address.
- Clear
  The screen is cleared from information and the cursor returns to the upper leftmost position. The visual attributes will be reset.
- Fast output
  The character following this command is displayed a specified number of times in fast output mode. The command is executed on the line where the cursor is positioned and the output starts from the cursor position. The cursor remains in that position.

Philips PTS 6387 Video Display Unit

- Underline start
  Characters which follow after this command are provided with underline.
- Underline stop
  Characters which follow after this command are not provided with underline.
- Low intensity start
  Output of characters which follow after this command are displayed at low intensity.
- Low intensity stop
  Output of characters which follow after this command are displayed at normal intensity.
- Set white background
  The entire screen will be displayed with positive contrast (black characters on white background).
- Set black background
  The entire screen will be displayed with negative contrast (white characters on black background).
- Set screen capacity 12×40
  The screen is formatted as 12 rows of 40 characters. The command also results in a clear action.
- Set screen capacity 12×20
  The screen is formatted as 12 rows of 20 elongated characters. The screen is cleared after execution of this command.
- Set screen low intensity
  All white parts of the screen will be reduced to low intensity.
- Set screen normal intensity
  The half intensity/full intensity situation, previous to the command *set screen low intensity*, is restored.
- Set national version
  One of the 12 national character sets is selected

ACCESSORY

Stand

CONFIGURATION

The PTS 6387 VDU is connected to a workstation main module via its standard module interface SDI/SUM. Standard cable length is 3 m. Up to 10 m is possible with special cable.

Data subject to change without notice

TECHNICAL SUMMARY

Screen size	6 inch diagonal
Refresh rate	70 Hz
Phosphor	P4
Screen character capacity	24 lines x 80 characters (normal) or 12 lines x 20 characters (magnified) (software selectable)
Character structure	7 x 9 dot matrix (capital letters)
Character size	2.1×3.3 mm (normal) 4.2×3.3 mm (magnified)
Cursor	Block cursor On/off Steady/blink
Visual attributes	Character: Underline Low intensity Screen: Inverse video
Character repertoire	96 ISO-characters incl space, upper and lower case with 12 national variations
Interface	SDI/SUM
Data transmission rate	9600 bps
Display control	Brightness control Power on/off
Mains requirements	100–130 V ±10% 200–240 V ±10% 50 or 60 Hz ±2%
Environmental conditions	Temperature In operation −10 to +35°C During Storage −40 to +70°C Humidity In operation 20 to 80% RH During storage 20 to 95% RH
Heat dissipation	35 W
Power consumption	35 W
Dimensions	Width 240 mm Depth 240 mm Height 145 mm excl stand 190 mm incl stand
Weight	3.5 kg

Philips PTS 6387 Video Display Unit

Character set

	2	3	4	5	6	7
0	SP	0	a2	P	a6 a2	p/P
1	!	1	A	Q	a/A	q/Q
2	"	2	B	R	b/B	r/R
3	a1	3	C	S	c/C	s/S
4	$	4	D	T	d/D	t/T
5	%	5	E	U	e/E	u/U
6	&	6	F	V	f/F	v/V
7	'	7	G	W	g/G	w/W
8	(	8	H	X	h/H	x/X
9	)	9	I	Y	i/I	y/Y
A	*	:	J	Z	j/J	z/Z
B	+	;	K	a3	k/K	a7/a3
C	,	<	L	a4	l/L	a8/a4
D	–	=	M	a5	m/M	a9/a5
E	.	>	N	^	n/N	a10
F	/	?	O	_	o/O	

National variations applicable to the countries:	a1	a2	a3	a4	a5	a6	a7	a8	a9	a10
	23	40	5B	5C	5D	60	7B	7C	7D	7E
Great Britain, Netherlands, Belgium	£	@	[	\	]	`	{	|	}	~
USA, Canada, Australia	#	@	[	\	]	`	{	|	}	~
France, Switzerland, Belgium Luxemburg I	£	à	°	ç	§	^	é	ù	è	¨
France, Switzerland, Belgium Luxemburg II	â	à	ê	ç	î	ô	é	ù	è	û
Italy, Switzerland	£	§	°	ç	é	ù	à	ò	è	ì
Sweden, Finland	#	É	Ä	Ö	Å	é	ä	ö	å	~
Denmark, Norway I	#	É	Æ	Ø	Å	é	æ	ø	å	~
Denmark, Norway II	£	@	Æ	Ø	Å	^	æ	ø	å	~
Germany, Austria, Luxemburg, Switzerland	#	§	Ä	Ö	Ü	^	ä	ö	ü	ß
Spain, Argentina, Venezuela	£	@	[	Ñ	]	^	{	ñ	}	~
Portugal, Brazil	£	@	Ã	Ç	Õ	^	ã	ç	õ	~
Yugoslavia	£	Ž	Ć	Č	Š	ž	ć	č	š	~

Data subject to change without notice

Philips PTS 6000 Software

In the PTS 6000 Bank Terminal System, both the hardware and the system applications are controlled by a software program present in the system memory. The concept of absolute software control, together with the modular design of the software, makes the system extremely flexible and so enables the user to devise an optimum solution for his particular application requirements. Moreover, the software has also been designed in such a way that the minimum of effort is needed in adapting the PTS 6000 Bank Terminal System to a bank's requirements. The software is thus employed to customise the PTS 6000 Bank Terminal System to make optimal use of the hardware configuration possibilities.

A number of different tasks (such as hardware control, transaction control and system control) must be performed by the software. To simplify matters, the software is divided into two major categories. One of these, the application software, is designed to control and perform transactions as specified by the user, and therefore varies from one bank to another. Application software is written as for a single operator, and the time-sharing and multi-tasking functions are handled by executive subsystems. The second category known as the system software is standardised and comprises an operating system, program development tools and support utilities.

The system software has interfaces with:

- the terminals
- the data communication network
- the application software
- the digital cassette recorder
- the terminal computer.
- other peripheral units of the terminal computer.

Subsystems have been developed for all of these interfaces, and each subsystem is given its own specific function.

Philips PTS 6800 Software

GENERAL

The PTS 6800 software has been specifically developed for the Philips PTS 6000 Terminal Systems. During development much emphasis was placed on the convenience of use and suitability for the different configurations. Moreover, the software has also been designed in such a way that a minimum of effort is needed to enable the user to derive an optimum solution for his particular application requirements. The software is thus designed to customize the PTS 6000 Terminal System to optimize the hardware configuration capabilities.

Each Philips PTS 6800 computer can control several terminal stations, and since the software is modular in concept, each terminal can have its own tailor-made software module. However if several terminals share idential modules, the application software is written as for a single terminal.

Supporting software such as a CREDIT-translator, linkage editor, debugging programs and utilities are available to assist in the speedy implementation of the application software.

Memory economy and programming economy is ensured by using an interpreter to carry out the individual operations of the application programs. The competition between terminals to use the central processing unit is controlled on a priority and time allocation basis by running the application packages and interpreter under the control of a Terminal Operating System (TOSS) which shares out processor time, handles I/O requests, etc. according to a defined interrupt system.

The interrupt system is used for all peripheral operations and for handling internally generated interrupts. The system handles a number of hardware interrupt levels according to their priority, which is established by pre-wiring on channel units. The priority interrupt request is accepted and compared with the priority level of the running program. If the priority level of the interrupt is higher than that of the running program, the program is interrupted and the significant register contents are stored in a memory stack. A new program is then started by the interrupt and this program runs until stopped by a higher priority or until it is completed, whereafter the interrupted program is continued.

The application software is written in CREDIT. This is an application transaction language specifically designed for use with the PTS 6800 Terminal System. It is a symbolic language containing all the functions required for terminal applications. In this way it is very easy to prepare tailor-made software modules. Some samples are given below.

Each transaction routine is controlled by the software precisely as desired and, if the terminal operator makes an error during the transaction procedure, or inadvertent tries to use the wrong procedure, an immediate warning is given to the operator and the routine is stopped until the correct procedure is carried out.

Also the layout of printed information is defined by the program. To decrease the chance of errors being made at the keyboard, those keys not required for a particular operation are disabled.

Weighting techniques are used to supplement data stored in registers and allow check digit verification to further reduce the risk of errors. Before information is forwarded, in on-line systems, it is automatically edited and arranged into suitable format for subsequent processing.

Philips PTS 6800 Software — TOSS

INTRODUCTION

TOSS (Terminal Operating System Software) is a real time operating system designed specifically for use with the PTS 6000 Terminal System, where a terminal computer out of the PTS 6800 range is used.

The concept of absolute software control, together with the modular design of the software, makes the system extremely flexible, and so enables the user to derive an optimum solution for his particular application requirements. Moreover, a transaction language called CREDIT has been designed so that the minimum of effort is needed in adapting the PTS 6000 Terminals System to the needs of any application.

The TOSS monitor aided by the intelligence of a PTS 6800 Terminal Computer enables the PTS 6000 Terminal System to handle several terminals simultaneously in use, without restricting the performance of the terminal operators. This is achieved by effectively controlling all transfers of data and operating modes of the terminal devices and by appropriately allocating processing time according to the load on each terminal.

Four main executive areas are used in the operating system to satisfy these requirements:

- dispatcher
- monitor processors
- monitor tables
- input/output drivers and interrupt routines.

An advanced data management package is available to enable transfer of data to and from disk, which supports random, sequential and indexed random files. The integrated display management facilities perform an optimal use of the display without almost any programming effort.

Furthermore a memory management technique is implemented for the application package to improve the core economy. So modules which are not frequently used can share the memory. This memory management is fully controlled by the system software.

GENERAL ORGANIZATION

The task principle

TOSS monitor is a real time monitor controlling several independent tasks that can run on different priority levels.

A task is associated to an area in the monitor describing the status and device configuration. The number of tasks is a parameter at system generation.

In a system a physical terminal is usually corresponding to one task. In on-line systems some processing is related to the trunk line, thus requiring another task. Additionally tasks can be defined for general peripherals such as disk, cassette recorder(s) and system operators panel, e.g. with a special purpose to process off-line logged transactions in recovery situations.

Each task runs its own sequence of instructions. When requested monitor function has been carried out, the task is put on queue for continued execution. This queuing is done using the principle of first in first out per priority level. Thus, a task with a high priority will interrupt a task with a lower priority. The task priority feature is used when different applications are run in the same computer.

The terminal program then is defined as a task executing the terminal functions and the terminal state is mainly described by the program counter and register contents.

A single terminal interface is implemented to perform easy writing of application, if several tasks have to be supported by the same terminal program.

Monitor configuration

The monitor is table-oriented which means that system generation consists of defining the proper table contents and, after that, linking the tables to the monitor library. The following tables are important for the configuration:

- Task control table
  containing an indication for each task in the operating system.
- Task table — one per task
  which fully describes the task configuration and is also used by the monitor to save registers when the task is in a wait state.
- Common device table
  which lists the common devices. It has the same organization as the configuration part of the task table. Some devices such as the cassette recorders can be common to all tasks. This table is referenced when a device is not found in the configuration list of the current task table.
- Device work table — one per physical device
  containing all variable information associated with a physical device.

Each device has a file code which is used to select a device at I/O requests.

Note: There is no restriction to share one device among several tasks. One device can also be referenced by several file codes.

A monitor generation program is available to define the

Philips PTS 6800 Software — TOSS

hardware configuration possibilities, this comprises definition of items such as :

- number of terminal classes
- individual terminal configurations per terminal class
- tasks definition
- type of on-line connections
- different types of terminal connections
- recording devices.

Program loading is performed normally from flexible disk, magnetic tape cassette or a disk depending on the configuration.

In order to minimize the number of program cassettes e.g. needed for different configurations in a project, a configuration program is available, which generates configuration dependent tables at program loading time. This feature enables an easy software distribution in a project where several terminal computers are included with different configurations.

TOSS SUBSYSTEMS

TOSS monitor

The TOSS monitor is built up around main functional blocks:

- the dispatcher
  which allocates control processor unit resources to the different tasks and monitor modules.
- Monitor processors
  which perform different functions such as input/output operation, activate another task, get/release of buffer, wait for a certain period of time, intertask communication etc. as described later in this chapter.
- Monitor tables
  which describe the configuration for the system and all its terminals. Monitor tables also contain work areas for devices, stack for the interrupt system, and queues for different jobs.
- I/O drivers and interrupt handlers
  which take care of all communication with the devices. The drivers generate or delete control characters that are specific for each device. The I/O drivers are written re-entrant which means that just one module (in memory) supports several identical devices simultaneously. A standard I/O interface is introduced to get the same I/O handling seen from the application program, independent of device type.

ASCII is standard code set at input and output. EBCDIC is available for DC and flexible disk. All references between user program and monitor are done using specific instructions. I/O drivers are available for devices such as:

- Teller Terminal Printer
- General Terminal Printer
- Numeric and Alphanumeric keyboard
- Character display
- Badge card reader
- Magnetic stripe unit
- System Operator's panel
- Digital Cassette Recorder
- Cartridge disk
- Flexible disk
- Console typewriter
- Magnetic tape unit
- Line printer
- Card reader
- Data communication

The modularity of the TOSS monitor enables a choice of any of the drivers, the corresponding monitor tables, and the monitor library. To generate a TOSS monitor for a specific configuration a sophisticated system generation program (SYSGEN) is available.

TOSS DATA COMMUNICATION

The data communication is implemented as a standard driver to enable TOSS to communicate with other systems. In that respect master as well as slave drivers are available. The interface to the application is such that each communicating terminal regards the line as a device upon which the application program can execute read and write requests. This interface is independent of the lineprocedure used.

The DC-driver has the following functions:

- line procedure
- buffer management
- request time out supervision
- status control

There are different drivers for different line procedures, however, only the line procedure function is different. The other parts are options and parameter controlled.

Several slave drivers are available which are serving

Philips PTS 6800 Software – TOSS

synchronous as well as asynchronous procedures such as :

- BSC multipoint (IBM 3270)
- BSC contention (IBM 2780/3780)
- SDLC (IBM 3600)
- Uniscope 100
- VIP 700
- HDLC
- MSV 1/2

Master drivers, which can be used in concentrator environment are serving protocols such as :

- BSC multipoint
- HDLC multipoint

TOSS DATA MANAGEMENT

TOSS data management contains a set of routines which enable the user to handle data recorded on a disk in an optimal way.

It has the following features :

- Multi volume organization
- All accesses to a data file are on record level
- All records within one data file are of fixed length
- Data files can be used concurrently by a variable number of tasks, or related to one task only
- System software takes care that concurrent updating of the same record by a number of tasks is not possible (exclusive access mechanism)
- Access methods :
  - Sequential access
  - Random access
  - Indexed random access
- Functions to process a record :
  - Read record
  - Write record (including rewriting)
  - Delete record
- Creation/deletion of data files can be done off-line via utility programs
- File relations are defined by the user .

Each volume of a disk contains a number of cylinders; each cylinder being divided into tracks, and a track into sectors of fixed length. User programs are not aware of this division, they only address records within a file.

A volume can be :

- A cartridge, containing a removable disk
- A disk, as a permanent feature, mounted in a disk drive
- A flexible disk
- A fixed disk

TOSS data management supports mixed disk configurations. Furthermore a data file can be divided into several extents, on several volumes. Note that the flexible disks supported by the data management are labelled according to TOSS labelling system. However, TOSS supports fully the IBM labelling for flexible disks too, so compatibility to IBM 3740 formats is included.

TOSS FILE MANAGEMENT

TOSS File Management is a tool for elementary file handling on direct access (disk) memories. File management is structured in two main parts :

1. File administration functions
   - Open an existing file
   - Create a new file
   - Close an opened file
   - Delete a file
   - Extend an existing file
   - Read file parameters
2. Input/Output functions
   - Attach file
   - Detach file
   - Read consecutive sectors
   - Write consecutive sectors

All file management functions are available in runtime.
TOSS file management is available as a layer between TOSS data management and the disk device drivers. TOSS file management can be used by the application programs even without data management.

TOSS UTILITY PACKAGE

TOSS utility package contains a number of utilities which can be called, either by the application program or via stand-alone Control Command Interpreter (CCI).

Following utilities are included :

- Create volume
- Create file
- Delete file
- Print file
- Copy volume
- Copy file to file (on disk, as well as on 1/2 inch magnetic tape or magnetic tape cassette)
- Copy cards to file
- Sort data / index file
- Create / reorganization of index file

In addition, IBM labelled flexible disks are supported with respect to :

- Create volume
- Copy files (to and from TOSS labelled flexible disks).

Philips PTS 6800 Software — CREDIT

INTRODUCTION

CREDIT is an application orientated transaction language designed specifically for use with the PTS 6800 Terminal System. It is a symbolic language containing all the functions required for terminal applications and reduces programming effort significant compared with e.g. assembler programming.

A further advantage is brought by CREDIT being an interpreter based language. Total memory requirements based on the interpreter and application program requirements are less than the needs of an application program written in a direct executable language.

The source information is first compiled into an object code by a translator and then linked to interpretative code. This code and the interpreter are then loaded into core memory where the code is interpreted and executed by the interpreter during execution time.

The main objectives of using this procedure are to provide storage economy, and to obtain an easy coding language. Furthermore, CREDIT as an interpretive language enables tracing and debugging straight-forward.

GENERAL ORGANIZATION

Source program structure

A source program consists of a number of statements. It is composed of two main parts; the Data division and the Procedure division.

The Data division contains all statements defining the working storage structure, namely, all data definition statements. It preceeds the Procedure division.

The Procedure division contains all procedural statements, namely, statements defining operations and literal constants. It can contain different main routines and subroutines, as needed by the classes of terminals involved.

Assembly language written subroutines may be linked to a CREDIT-program. Any kind of data item or literal constant may be passed as an argument to an assembly written subroutine.

Data definition statements

Data definitions have to be entered in a hierarchous structure, due to the various levels of data defining pseudo-operations. These levels are: terminal storage access defining, block defining, and variable defining.

Working storage blocks exist of the following categories:

- Common work blocks (CWB)
- Terminal work blocks (TWB)
- User work blocks (UWB)
- Swappable workblocks (SWB)

Variables exist of the following categories:

- Single variables
- Indexed variables with 1 index
- Indexed variables with 2 indexes.

These variables can be of the following types:

- Binary numericals
- BCD numericals
- String variables
- Boolean variables

Procedural statements

Procedural statements describe the operations to take place. All procedural statements are contained in the procedure division. There are several types of procedural statements:

- Arithmetic statements
- Logic statements
- String handling statements
- Branch statements
- Subroutine control statements
- Input/output statements
- Scheduling and storage control statements.

Special attention is given to the I/O statements to perform input (e.g. from keyboard) and output programming in an easy way. Therefore keytables are used in the input handling and output are defined by write lists and pictures.

Memory management

In order to make it possible to run CREDIT programs larger than physical core memory, a dynamic memory management technique can be used. The system software supervises the dynamic allocation of memory. The segments are defined by the user. Procedure division as well as data division are handled by the memory management.

Display management

To enable an advanced programming of display applications e.g. in data entry environment, inquiry etc. display handling facilities are included. With these facilities the user can build up his own display application. However, a general display management can be used to handle forms on a display in conjunction with an input device e.g. keyboard. Basic tests and

Philips PTS 6800 Software — CREDIT

controls are included and own defined tests can be supplemented.

The following functions are available:

- extended format directives, which enable an easy definition of the output part as well as the input part of the total picture.
- several standard input controls such as
  - numeric/alphanumeric
  - min./max. length
  - compulsory field
- standard functions to handle the different input and output fields and to control the cursor according to the relevant format list.

Philips PTS 6800 Software — Assembler language

The assembler language can be used for programming the system software as well as the application software, although it is mainly used for system software. Assembler operations fall into the following types:

- memory reference instructions
- register to register instructions
- constant instructions
- shift instructions
- input/output instructions
- miscellaneous
- assembly process instructions

To improve the use of the assembly language in application programming an element addressing system is available together with a set of routines which performs functions as decimal addition and subtraction, multiplication and division and a powerful editing.
Though it is still possible to use the assembly language for application programming, it is strongly advised to use CREDIT.

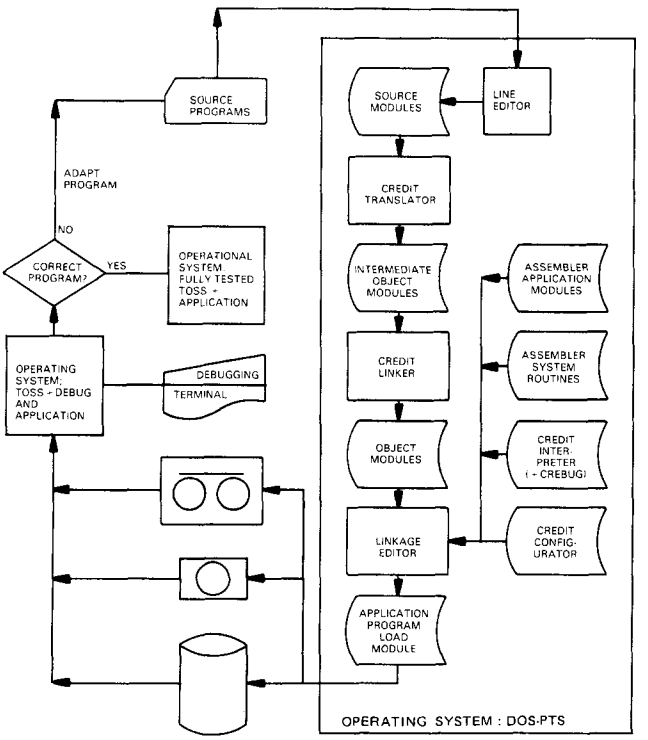
Philips PTS 6800 Software — Program Development

Program development for the PTS 6800 system is handled by the disk operating system tool DOS-PTS.
DOS-PTS provides a disk-oriented system with all the facilities for program development and giving the necessary degree of control for the secure allocation and utilisation of both user and system programs within the system.

As can be seen on the illustration, source program modules in mnemonic form are fed onto disk. This source information is then translated by a translator program into object code which is also stored on disk. Modules are then linked via the Link Editor program to form an application package. This package is dumped onto cassette, flexible disk, or disk for subsequent running together with a debugging program on the PTS 6800 Terminal Computer. The program is recycled using the line editor when necessary until the application package is finalized.

All program development tools are disk resident. The following tools can be called by control commands:

- TRANSLATOR
- LINKER
- ASSEMBLER
- LINKAGE EDITOR
- LINE EDITOR



Philips PTS 6800 Software — CREDIT translator

The CREDIT translator is a processor which converts CREDIT-source statements into intermediate object code. Source modules are translated separately, resulting in producing individual object modules.

During translation the translator generates a listing in three parts. Part one contains the CREDIT source statements, intermediate object code and error messages. The error messages are printed immediately after the source-line containing the error. An error counter is maintained by the translator and is printed at the end of the listing.

Other parts contain the data item name table and the procedure label table.

Philips PTS 6800 Software — CREDIT Linker

The CREDIT — Linker is a two pass processor which converts intermediate object code produced by the CREDIT — Translator into object code which can be processed by the Linkage Editor.

Intermediate object modules may contain references to:

- labels in same module
- literals in same module
- labels in other CREDIT — modules
- assembler application modules

The first three types of reference are satisfied by the CREDIT — Linker. The remaining types of reference must be satisfied by the Linkage Editor.

The CREDIT Linker also converts the byte oriented addressing system used in the intermediate object code to a word oriented addressing system. A set of object modules is produced which bears a one-to-one relationship to the intermediate object modules.

During the linker process relevant listings are produced with information of tables, pools, cross reference statistics etc.

Philips PTS 6800 Software — ASSEMBLER

ASSEMBLER is a programming tool which is used with the PTS 6800 software program which can be written in a low-level symbolic language. Each instruction in this language corresponds to a single instruction of one or two words in the machine language. The process of converting the program from the low-level language to machine code is called assembly and the program which performs the conversion is ASSEMBLER. An alternative description is to say ASSEMBLER is used to convert source modules written in assembly language into object modules suitable for linking to other object modules.

Additional facilities available with ASSEMBLER include error reporting and recovery, assembler listing, and the selection of peripheral devices to be used during the assembly run. A program written in assembler, cannot be used in a system with memory management.

Philips PTS 6800 Software — Linkage Editor

The Linkage Editor running under DOS-PTS provides the system with the facility to link separate object modules either for direct loading and execution or for output, to be loaded later or used within a further linkage process. By the use of linking, all the advantages of modular programming are easily available. Modules which are to be linked contain specified external references and entry points to be used during linkage. The control of the linking process, by the operator, allows for the selection of the devices and mode to be used during processing. In addition, the linkage editor includes the facility to provide a list of the concerned modules and error reporting.

Philips PTS 6800 Software — Line Editor

The Line Editor, running under DOS-PTS, provides all the facilities for updating of a source module and an additional facility to enable the alteration of a specified character string wherever such a string appears in a module.

The Line Editor operates at character, string, or line level. Functions include alteration, insertion, deletion, and listing of text. The system is extremely simple to operate as it has been designed for conversational interaction via the operator's typewriter. Editing is performed by a comprehensive set of operator messages.

An auxiliary input file can be used, to aid the manipulation of large portions of text.

Philips PTS 6800 Software — Test and Debugging

INTRODUCTION

Debugging programs are available to enable rapid error detection within programs modules, and to provide the programmer with the means to stop a program at specific points so that the contents of memory and/or registers may be checked or altered if necessary.

These debuggers offer conversational debugging facilities for CREDIT language programs or for Assembly language programs. Thus, it provides a convenient means with which the user can trace the execution of his program and perform extensive diagnostic procedures.

User programs can be processed step by step until completion, or up to a specific statement number.

Facilities include accessing the variables, commands to set or dump data, and breakpoints with conditional debugging.

FUNCTIONAL DESCRIPTION

PTS 6800 has a debugger program called CREBUG intended for debugging application programs written in CREDIT and a debugger program called DEBUG to assist the debugging of assembler written software.

The debugger operates on an interrupt basis which means that programs can run simultaneously.

The following functions are available in CREBUG:

- Relocation registers which allow the setting of module base addresses and use the relative address in the program list.
- Examine and modify data elements and memory locations
- Test and verify on data elements
- Trace parts of the program
- Program control for program start, set breakpoint, remove breakpoint, proceed, loop, etc.
- Dump memory
- Hexadecimal calculation

Data elements are related to the current tasks, however, it is easy possible to get data elements of other tasks.

The following functions are available in DEBUG:

- Relocation registers: which allow the setting of module base addresses and use the relative address in the program list.
- Register dump/modification: which allow CPU registers to be display and modified
- Memory dump/modification
- Program control: for program start, set breakpoint, remove breakpoint, proceed, loop, etc.

The debugging tools CREBUG and DEBUG can respectevely be included in the interpreter or the TOSS monitor in a test environment.

The DEBUG program operates a system console typewriter only, while CREBUG operates a system console typewriter or any general printer or display terminal (defined at system generation time).

Philips PTS 6800 Software – Utilities

Utility programs have been specially developed for use with the PTS 6000 Terminal System. The following utility programs are used with PTS 6800 system software to assist in loading, dumping, converting and copying data, and to provide necessary marking and labelling facilities during normal system operation or during program development.

DOS–PTS–UTILITIES

The PTS 6800 utility programs are delivered with the DOS-PTS software package. The following utilites are available, running under DOS-PTS.

- **CPLGEN :**

  Used to write IPL on cassette for PTS 6800 program cassettes

- **JESPER :**

  Used to convert load modules on disk and write them on cassette in a loadable form for the PTS 6800

- **PMPTS :**

  A premark program for formatting a DOS-PTS disk

- **DMPGEN :**

  Used to generate a cassette with the program DUMPER. DUMPER is used to dump core memory onto a cassette

- **PRDUMP :**

  Used to list a core dump on a line printer produced by the program DUMPER or DUMPFD

- **DUMPA :**

  Used to dump the contents of a cassette or magnetic tape onto a line printer

- **SUM :**

  Used to save the whole contents or a file of a complete disk onto magnetic tape

- **RUM :**

  Used to restore the whole contents or a file of a complete disk from a magnetic tape

- **XRF :**

  Cross reference program for source module

- **OBX :**

  Cross reference program for object modules

- **DMPGEF :**

  Used to generate a flexible with the program DUMPFD. DUMPFD is used to dump memory onto a flexible .

- **CASCOP :**

  Copies a cassette to another cassette.

- **FLXCOP :**

  Copies a flexible to another flexible.

- **PCAS :**

  Copies programs from disk load modules to a program loading cassette

- **PDISC :**

  Copies a configuration data file or a load file from a DOS-PTS format disk to a TOSS format disk

- **SYSGEN :**

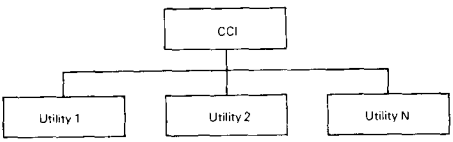
  Used to generate a TOSS monitor

- **TOSSUT -**

  Controls the running of TOSS utilities CRF, CRV, DLF and PVC under DOS–PTS.

TOSS UTILITY PACKAGE

A package which includes a TOSS monitor, Control Command Interpreter (CCI) and a number of utility functions. The Control Command Interpreter (CCI) reads input parameters necessary for the utility functions and stores them in a parameter block.
The CCI program also calls the required utility functions, thus forming the following structure for the utility package.



Each utility function is an independent subroutine which may also be incorporated in an application program environment.
Utility package comprises e.g.

- **CREATE VOLUME**

  Used to format a disk pack or flexible before it is actually used by the system. It writes a VOLUME LABEL (VL) and an empty VOLUME TABLE OF CONTENTS (VTOC) on disk. The utility program also writes cylinder identifiers in all sectors on the disk and tests for quality of each sector. If an unusable sector is found, this sector is withdrawn from the "user available area" and a dummy sector BADSPOT is created which occupies the sectors not to be used. The free space administration table in VTOC is also updated for the "badspot" area.

- **CREATE FILE**

  Used to create a file on a volume already formatted with the CREATE VOLUME utility program. The program searches for an empty space area large enough to occupy the file. If such an area is not available it searches for a maximum of 4 areas together being large enough to contain the file. The order in which the maximum of 4 volume names are given also determines the order in which a search is made for empty space.

- **DELETE FILE**

  Used to delete a data file or a file containing a loadable program from a volume. If the file to be deleted resides on more than one volume, the different volume names are entered as parameters. The free space administration table maintained in VTOC is updated for the released sectors and the file descriptor records in VTOC are set to spaces for the requested file name.

Philips PTS 6800 Software — Utilities

- **PRINT VOLUME TABLE OF CONTENTS**

  Gives a listing of all relevant data in the VTOC. The number of free records in VTOC and free space administration table are also printed.

- **PRINT DISK SECTOR**

  Gives a listing of the contents of one or more sectors on a specified disk. Output format is hexadecimal together with ASCII representation.

- **UPDATE DISK SECTOR**

  Used to change one or more positions in a specified disk sector.

- **COPY VOLUME**

  This utility is used to copy a whole disk to another one which is formatted already. Checks are performed to protect against unproper handlings.

- **COPY FILES**

  The utility can handle input as well as output files on disk, flexible disk, 1/2 inch magnetic tape, magnetic tape cassette etc. Multivolume files are supported for disk devices as well as blocking facilities for the magnetic tape device. Input files from card reader are also supported.

- **COPY PROGRAM**

  The utility is used to move a program from DOS-PTS formatted disk and place it on a TOSS formatted volume (on cartridge disk or on flexible disk)

- **WRITE IBM-LABEL FLEXIBLE DISK**

  The write IBM-labels utility is used to write the necessary lables on a flexible disk to prepare it to be used for e.g. sequential logging. The initialization is according to GA 21—9182 document. (IBM manual)

- **COPY IBM-FLEXIBLE DISK**

  This copy utility transfers data sets from an IBM labelled flexible disk to a TOSS labelled disk and the other way round.

- **SORT FILE**

  The records in a disk file are sorted according to a symbolic key contained in the the records.

- **BUILD INDEX**

  An index file will be created from an existing data file which contains a symbolic key.

- **REORGANIZE INDEX FILE**

  The reorganize index file utility will create a correctly formatted index file from a sorted input file that contains all index records.

- **PRINT INDEX TRACK**

  The utility is used to print all the data relevant to an index track of an IBM formatted disk.

- **PRINT FILE SECTION**

  The utility lists records from a TOSS formatted disk file.

- **SCAN TAPE**

  The contents of a magnetic tape or cassette can be examined.

- **UNLOAD DEVICE**

  The utility is used to unlock the door of a flexible disk drive or to unload a cassette or magnetic tape.

DATA COMMUNICATION UTILITIES

- **LINSIM / DLCSIM**

  This program is used at data communication tests to simulate the master on another PTS 6800 computer. In a number of buffers the user can specify his own test and control sequences to be transmitted. The received/transmitted data are outputted on a printer. Two different line codes are allowed, EBCDIC or ASCII. The program is procedure independent, although two versions are available for BSC, and HDLC-like procedures.

- **LINSPY / DLCSPY**

  The program is used for logging the line in a separate PTS 6800 Terminal Computer. The line information is stored in a circular buffer and printed out afterwards. To improve the printouts it is possible to define a pattern (e.g. idle poll) which is not printed but just counted. The transmitted and received data can be distinguished easily in the printout. EBCDIC as well as ASCII code is supported. The program is procedure independent, although two versions are available for BSC, and HDLC-like procedures.