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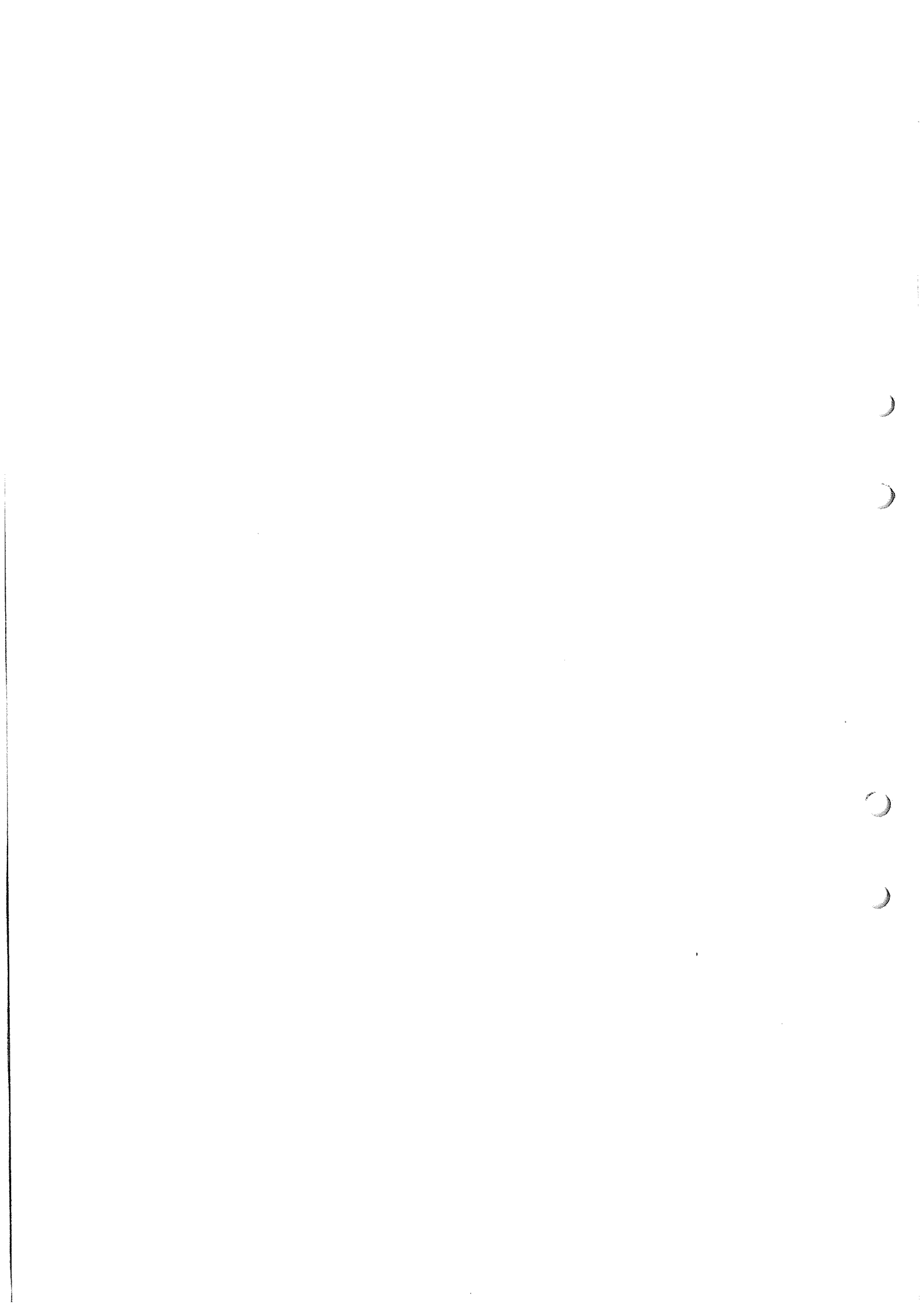
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System Components

Introduction

The Alfaskop System 41 was made possible by a long-term development program that embraced ergonomics, state-of-the-art terminal system architecture and sophisticated software systems.

The Alfaskop System 41 used in IBM 3270 emulations is an intelligent, programmable terminal system that prepares and sends information to an IBM host computer and obtains information in return.

The Alfaskop System 41 hardware consists of communication processors, display units, peripheral control units, printer units and flexible disk units which can be combined in various configurations.

The Alfaskop System 41 hardware is also available in a version that fulfils stringent requirements with regard to computer security and vulnerability to disturbances.



Fig. 1. Alfaskop System 41 hardware



A system component is a functional hardware or software unit. The system components mentioned in this section can be used in a terminal system intended for IBM 3270 emulations.

The two-wire cable used to interconnect units in Alfaskop System 41 comprises a shielded twisted pair.

Hardware

Communication Processor 4101

Communication Processor 4101 is intended for modem connection via the CCITT V 24/28 interface. Transfer rates range up to 19200 bps.

The communication processor controls communication between the host computer and the terminals. The communication processor is used in configurations where more than one display unit or more than one printer are to be connected to the same modem (cluster configurations).

The basic version of Communication Processor 4101 can accommodate up to eight terminal connections and can be connected to one host computer.

Normally a terminal connection can connect one display unit (with or without an attached printer unit), one peripheral control unit (with an attached printer unit) and one flexible disk unit.

Communication Processor 4101 is intended for large clusters and can be expanded to provide up to 32 terminal connections.



Fig. 2. Communication Processor 4101



Functionally, Communication Processor 4101 can be subdivided as follows

- Synchronous Communication Adapter 4194 or Synchronous Communication Controller 4195
- Microprocessor
- Memory
- Memory expansion (MRW 4191)
- Direct memory access
- Terminal selection control
- Terminal Unit Adapter 4181

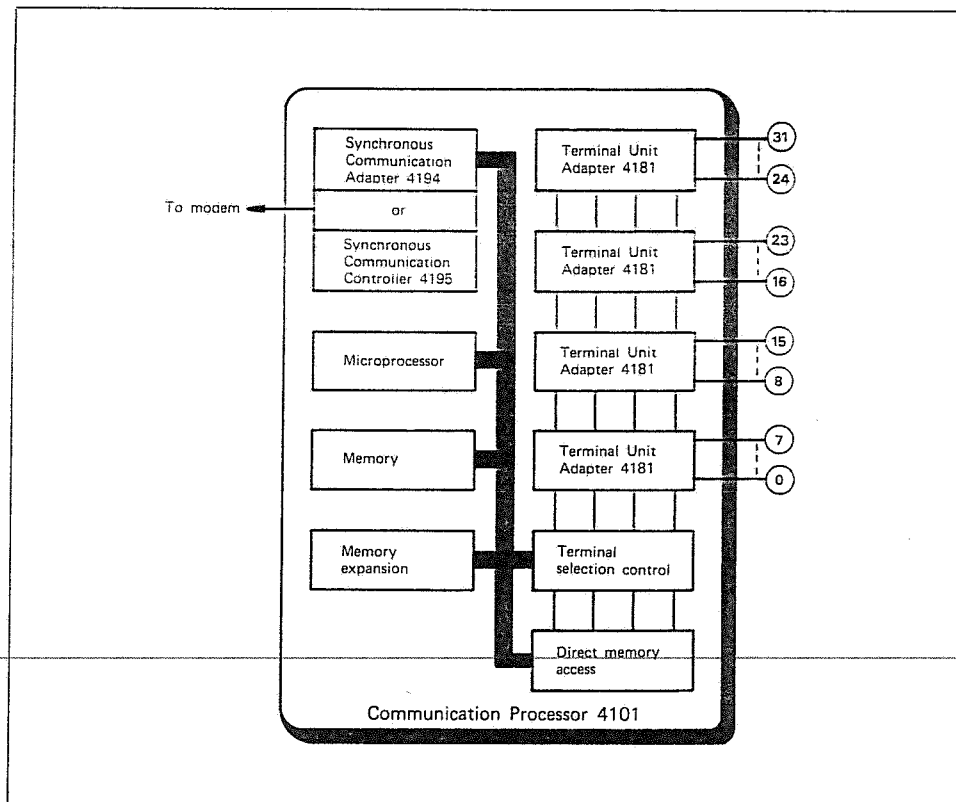
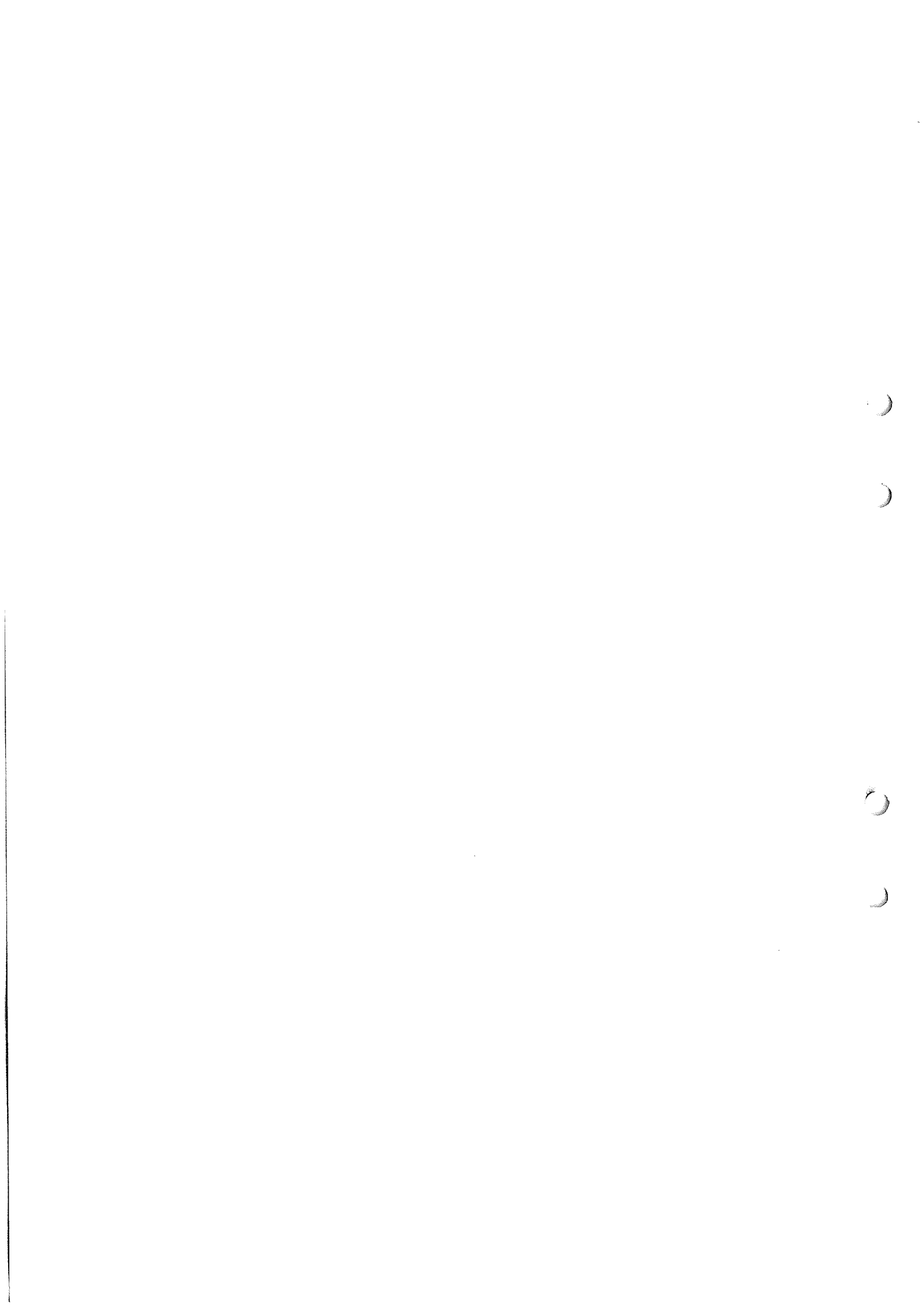


Fig. 3. Block diagram of Communication Processor 4101

The synchronous communication adapter converts serial data, received from the communication line, to parallel data used in the communication processor and vice versa. Line transmission is synchronous and can comply with either the BSC or the SDLC protocol.

The microprocessor is an 8-bit LSI processor with an addressing capability of 64 Kbytes.

The basic memory (read/write memory, RWM) has a capacity of 32 Kbytes and it can be expanded to a maximum of 64 Kbytes. The software that controls the operation of the Alfaskop System 41 is stored on diskettes. When power is turned on, the software is loaded into the memory.



One Terminal Unit Adapter 4181 enables eight two-wire cables (or coaxial cables) to be connected to the communication processor. Each additional Terminal Unit Adapter 4181 expands the number of two-wire (or coaxial) connections by eight. The maximum number of connections is 32.

The terminal unit adapter consists mainly of a switch matrix that is controlled by the microprocessor via the terminal selection control.

Direct memory access (DMA) transfers are initiated by the microprocessor. DMA transfer includes:

- Internal polling of terminals
- Host computer communication
- Internal communication between terminals

If a display unit requests a data transfer to an assigned flexible disk unit, the microprocessor makes the connection by sending control information to the terminal selection control. The display unit then addresses the flexible disk unit directly and the microprocessor is asked to break the connection when the transfer is completed.

For emulation of IBM models B and D the maximum instantaneous data transfer rate is 1,000,000 bytes per second for both write operations (outbound transfer) and read operations (inbound transfer).

Communication Processor 4102

Communication Processor 4102 is intended for local connection to an IBM selector, block multiplexer or multiplexer channel.

For emulation of IBM model A the maximum instantaneous data transfer rate is 650,000 bytes per second for write operations and 400,000 bytes per second for read operations.

The basic version of Communication Processor 4102 can accommodate up to eight terminals. Communication Processor 4102 can be expanded to provide up to 32 terminal connections.

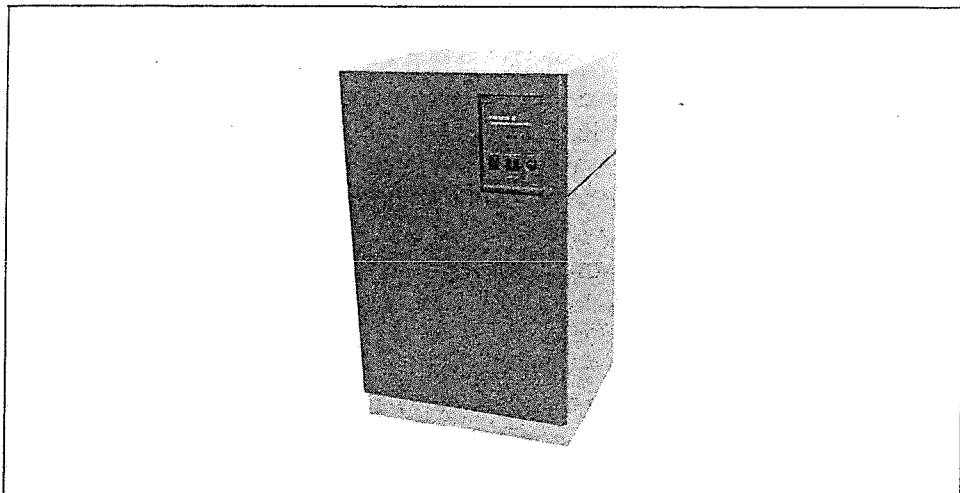


Fig. 4. Communication Processor 4102



Functionally, Communication Processor 4102 can be subdivided as follows

- Channel communication controller
- Microprocessor
- Memory
- Memory expansion (MRW 4191)
- Direct memory access
- Terminal selection control
- Terminal Unit Adapter 4181

Communication Processor 4102 is built up on the same principles as Communication Processor 4101. It differs only with regard to the communication interface.

The channel communication controller is designed for direct connection to an IBM System 360/370, an IBM 303X, the IBM 4300 Series or an IBM 308X data channel.

The rest of the functional blocks are the same in the two communication processors.

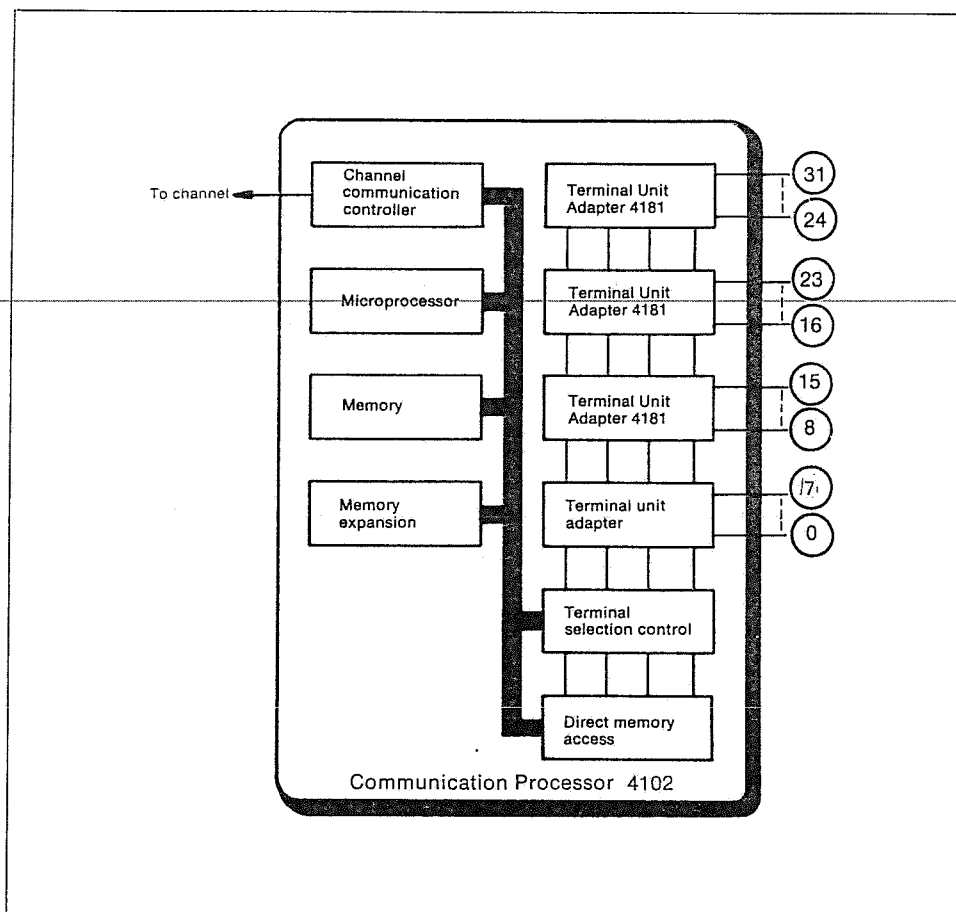


Fig. 5. Block diagram of Communication Processor 4102

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Communication Processor 4103

Communication Processor 4103 incorporates a single-drive flexible disk unit (for 8" diskettes).

Communication Processor 4103 is intended for modem connection via the CCITT V 24/28 interface. Transfer rates range up to 19200 bps.

The basic version of Communication Processor 4103 is provided either with a terminal unit adapter with two terminal connections or a terminal unit adapter with eight terminal connections and can be connected to one host computer. Two-wire cables or coaxial cables can be used to connect the terminals.

Communication Processor 4103 is intended for small clusters. The basic version with eight terminal connections can be expanded to provide 16 terminal connections. The basic version with two terminal connections cannot be expanded.



Fig. 6. Communication Processor 4103

In Communication Processor 4103, the communication-processor part is built up on the same principles as Communication Processor 4101 and the flexible-disk-unit part is built up on the same principles as Flexible Disk Unit 4120.

It differs only with regard to the following:

- Communication Processor 4103 is available in two basic versions: one with eight terminal connections which can be expanded to provide 16 terminal connections and one with two terminal connections which cannot be expanded.
- The terminal unit adapter is the same for two-wire terminal connections and coaxial cable connections (only Connector Kit Assembly 4004 must be changed).
- An extra flexible disk drive cannot be inserted.
- The internal flexible disk unit is connected to the first terminal connection. This means that an external flexible disk unit cannot be attached to this terminal connection.



Functionally, Communication Processor 4103 can be subdivided as follows:

Communication-processor part

- Synchronous Communication Adapter 4194 or Synchronous Communication Controller 4195
- Microprocessor
- Memory
- Memory expansion (MRW 4191)
- Direct memory access
- Terminal selection control
- Terminal unit adapter

Flexible-disk-unit part

- Microprocessor
- Memory
- Flexible disk adapter with direct memory access transfer
- Flexible Disk Drive 4121

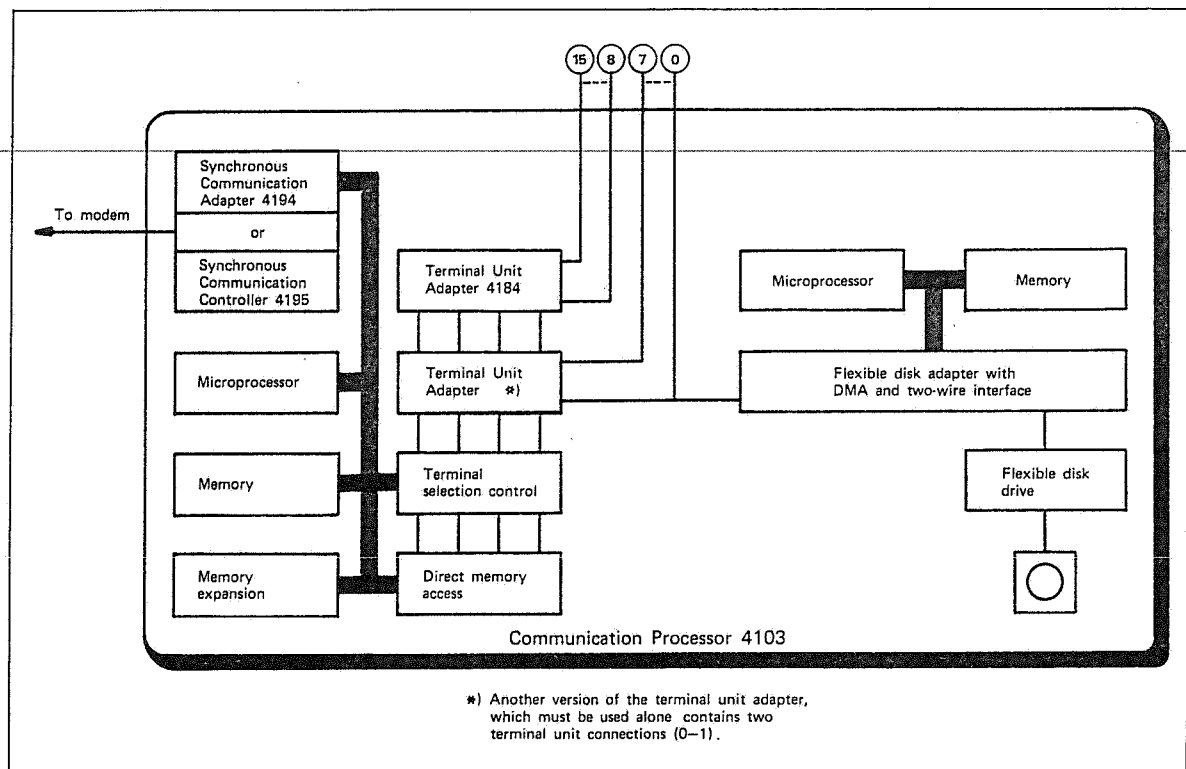


Fig. 7. Block diagram of Communication Processor 4103

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Display Units

The display units are attractive, operator-oriented units of the cathode ray tube type.

The display units feature an anti-glare screen, and they are also equipped with a pull-out hood which can be used to keep out disturbing light. The display units can be tilted and swiveled, thus ensuring comfortable, convenient viewing for each individual operator.

The program-defined screen formats are provided with an extra line for terminal system messages.

Each character is displayed in a character cell consisting of 9×16 dots (except in 32- and 43-line formats), thus ensuring crisp, clear characters and minimizing risk of misreading. Because of ergonomic considerations we recommend that you do not use the 43-line per screen format.

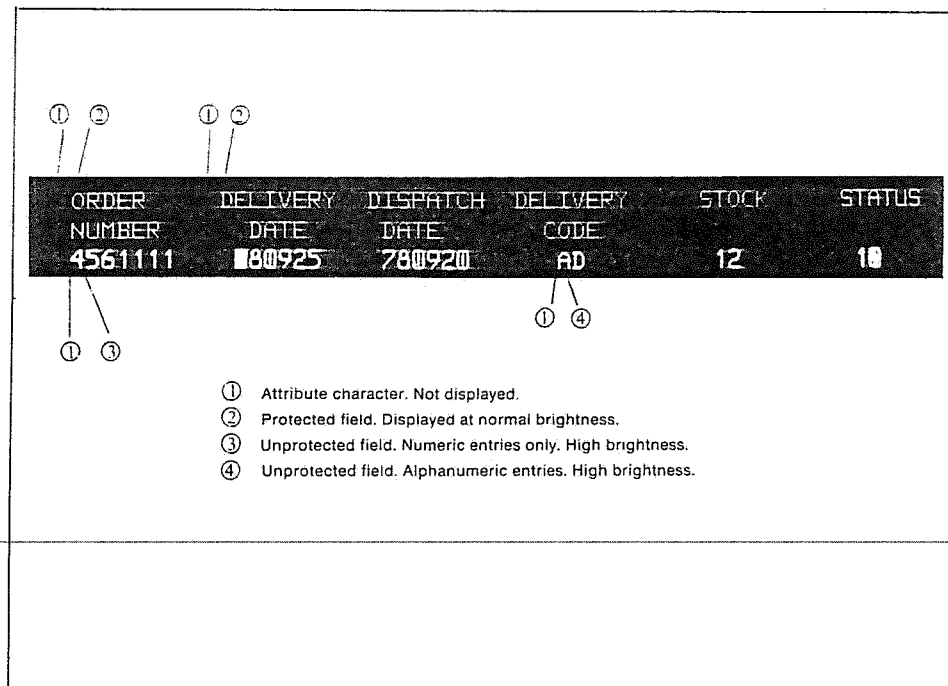


Fig. 8. Examples of character layouts.

Fields can be displayed with high or normal brightness (Display Unit 4110, Display Unit 4111 and Workstation 3111) and they can be made non-visible. Fields can be displayed in red, blue, green or white (Display Unit 4112 in base colour mode). Fields can also be displayed in green or white (Display Unit 4112 in monochrome mode). Flashing fields and underlining are provided. The cursor can be displayed either as an underscore or a filled-in rectangle. The cursor can flash or glow steadily.

Display Unit 4110, Display Unit 4111, Display Unit 4112 and Workstation 3111 are available for cluster configurations (connection to the communication processor). Display Unit 4110 is also available for single display-unit configurations (modem connection).



Display Unit 4110*Display Unit 4110, Characteristics*

Connection:	To communication processor (cluster configuration) or directly to modem (single display-unit configuration)
Screen colour:	Amber
Field presentation:	High brightness Normal brightness Non-visible
Formats:	24 lines × 80 characters 32 lines × 80 characters 43 lines × 80 characters
Effective screen size:	Height 180 mm Width 258 mm
Character cells:	9 horizontal × 16 vertical dots for 24-line formats 9 × 12 for 32-line formats 9 × 9 for 43-line formats
Dot matrices:	7 × 13, 7 × 10 and 7 × 8
Refresh rate:	50 Hz

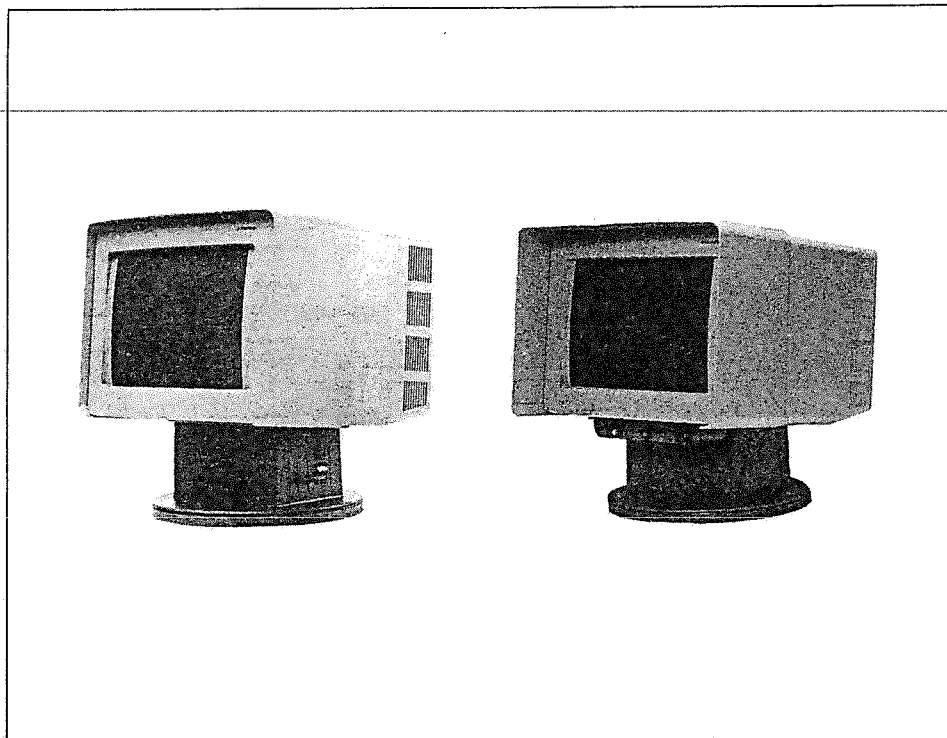


Fig. 9. Display Unit 4110 (the most recent design to the right)

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Display Unit 4110, Operation

Functionally, Display Unit 4110 can be subdivided as follows:

- Microprocessor
- Memory
- Memory expansion (MRW 4191)
- Two-wire Interface Adapter 4182
- Keyboard interface
- Cathode ray tube unit (CRU)
- CRU interface
- Selector Pen Device 4130
- Synchronous Communication Adapter 4194 (single display-unit configuration)
- Asynchronous Communication Adapter 4193, if a V 24/28 printer is to be connected.

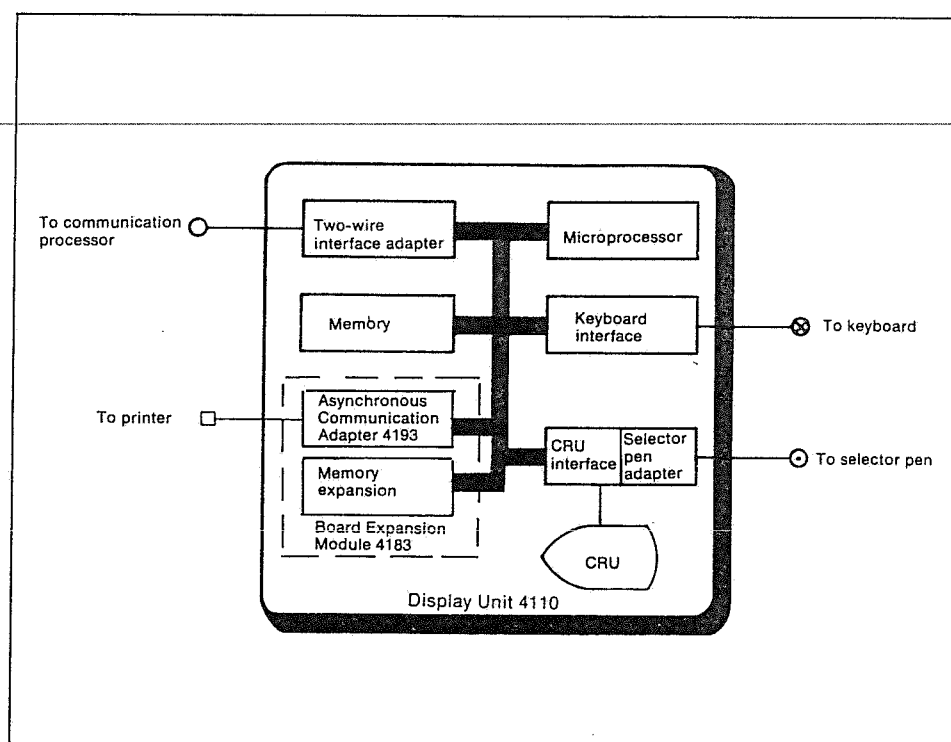


Fig. 10. Block diagram of Display Unit 4110 in cluster configuration



The microprocessor is an 8-bit LSI processor with an addressing capability of 64 Kbytes.

The basic memory has a capacity of 32 Kbytes and it can be expanded to a maximum of 64 Kbytes. Board Expansion Module 4183 is needed if the memory is to be expanded.

The display unit is connected to the communication processor via a two-wire cable. Coaxial cable can also be used. The two-wire interface adapter includes circuits that provide galvanic isolation from the communication processor.

The two-wire interface adapter converts serial information, sent to/from the communication processor, to parallel data used in the display unit. The data sent on the two-wire cable is frequency-modulated and the transfer rate is 300 Kbits per second. The interface adapter also includes circuits for direct memory access.

When Display Unit 4110 is used in single display-unit configurations the interface adapter serves as an adapter for the flexible disk unit.

Synchronous Communication Adapter 4194 is the same adapter that is used in Communication Processor 4101. The adapter converts serial data received from the communication line to parallel data used in the display unit and vice versa. Line transmission is synchronous and can comply with the BSC protocol.

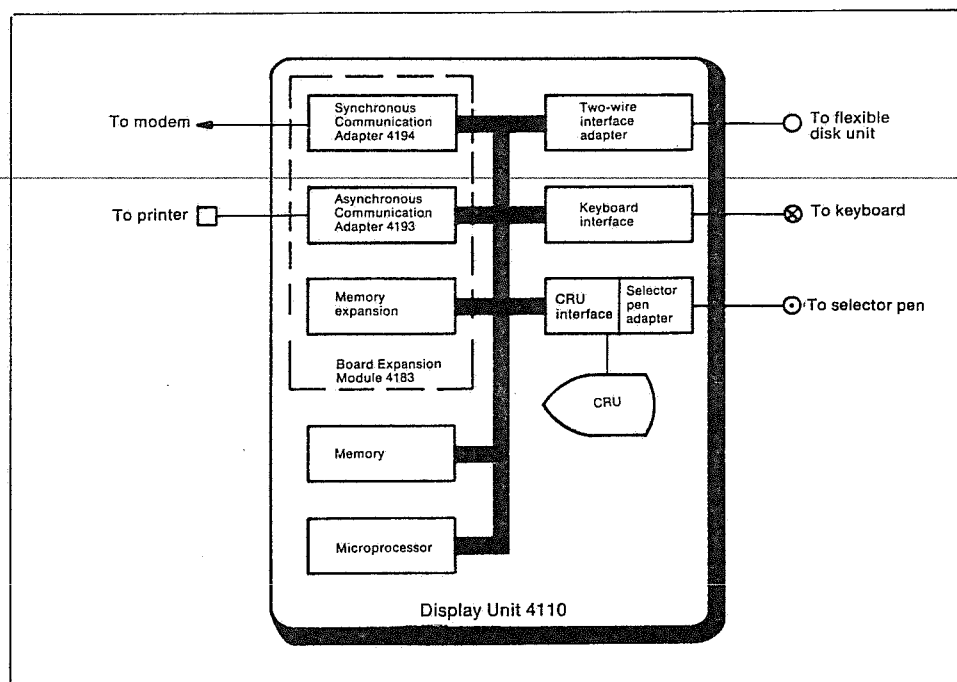
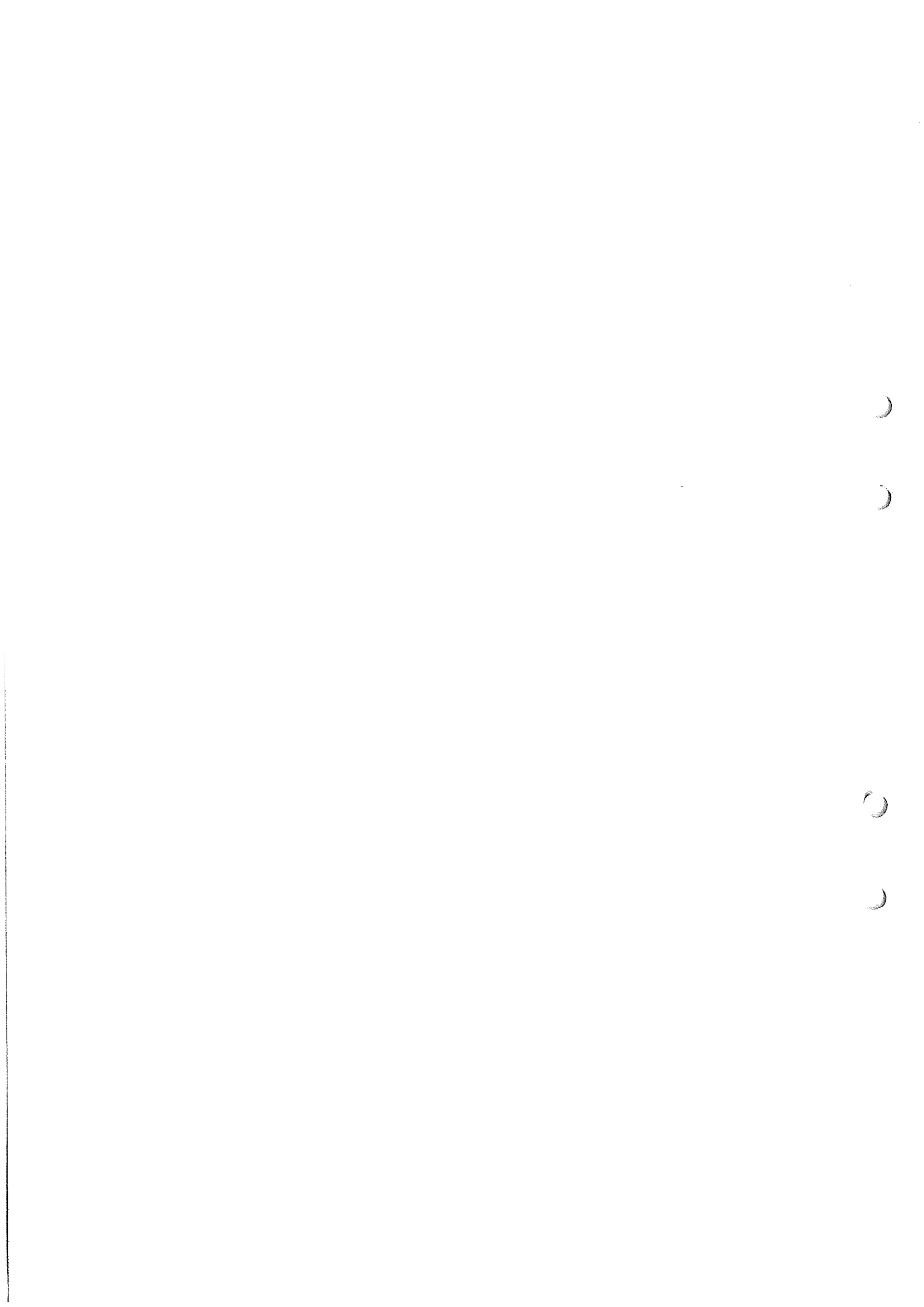
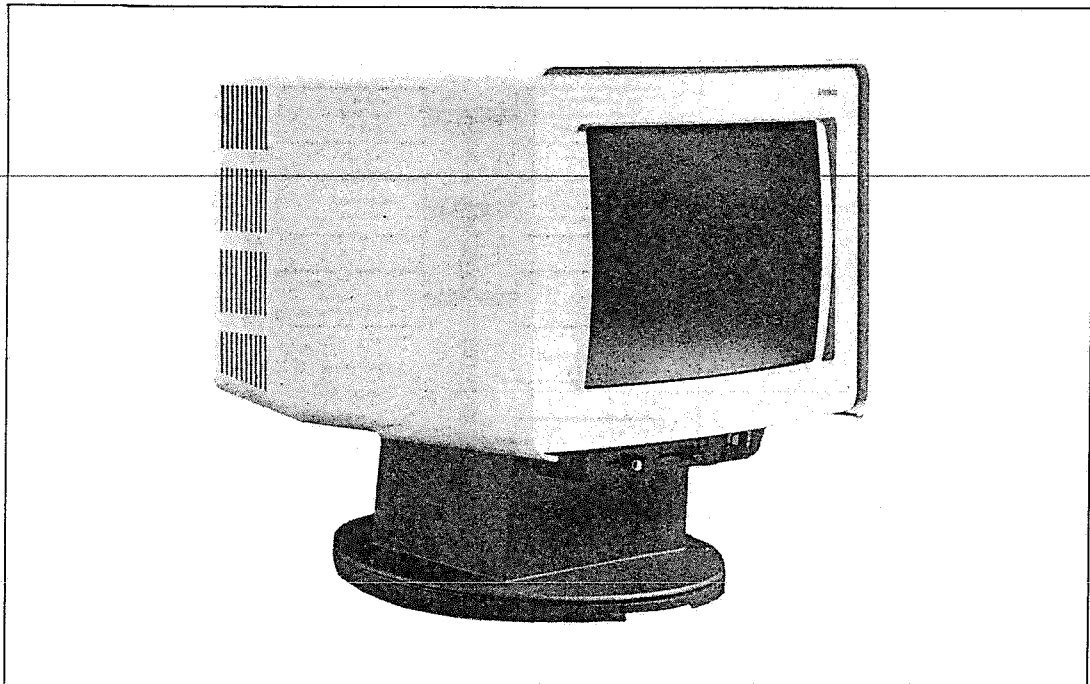


Fig. 11. Block diagram of Display Unit 4110 in single display-unit configuration



Display Unit 4111*Display Unit 4111, Characteristics*

Connection:	To communication processor (cluster configuration)
Screen colour:	Amber
Field presentation:	High brightness Normal brightness Non-visible
Formats:	24 lines × 80 characters 32 lines × 80 characters 43 lines × 80 characters
Effective screen size:	Height 180 mm Width 258 mm
Character cells:	9 horizontal × 16 vertical dots for 24-line formats 9 × 12 for 32-line formats 9 × 9 for 43-line formats
Dot matrices:	7 × 13, 7 × 10 and 7 × 8
Refresh rate:	50 Hz

*Fig. 12. Display Unit 4111*



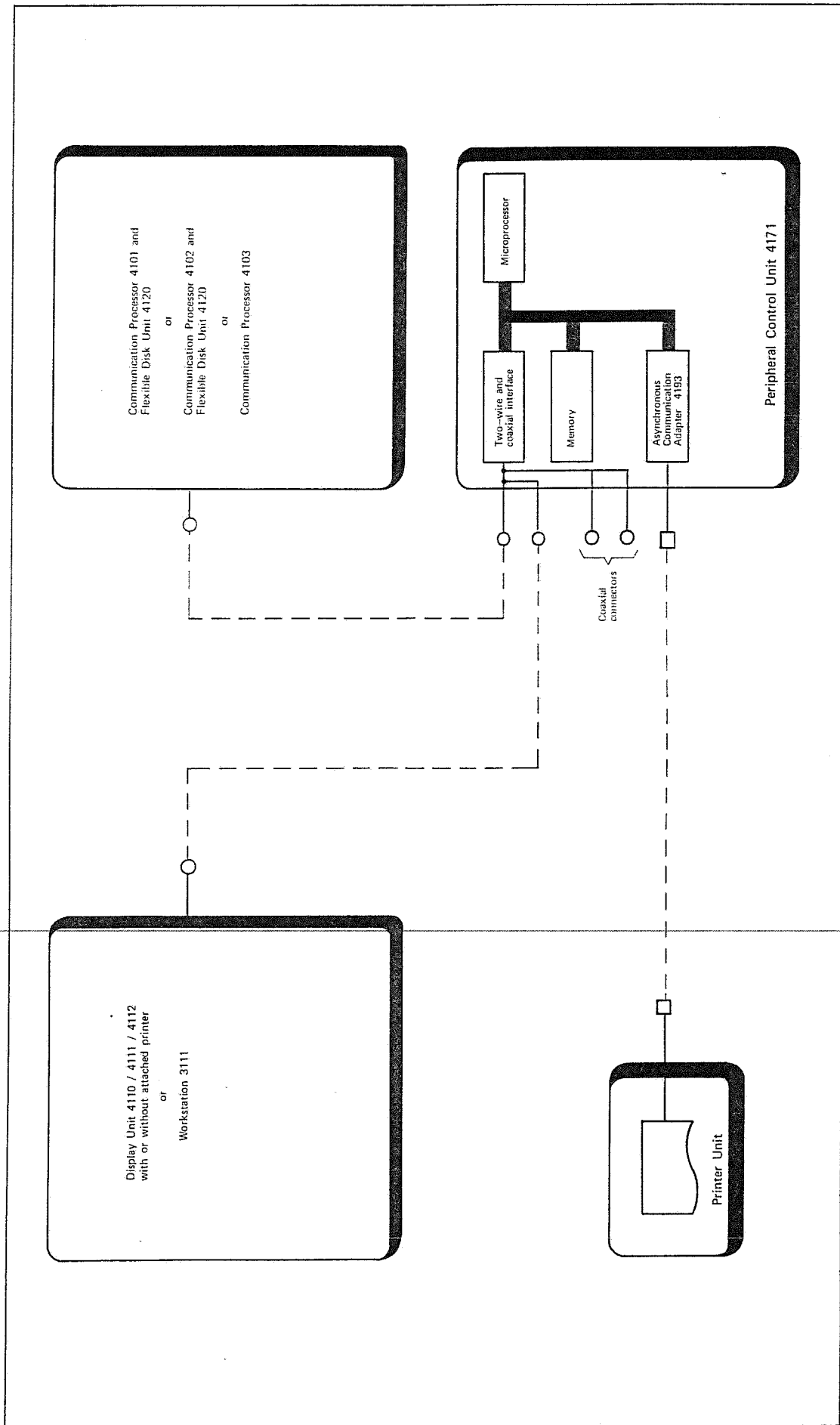


Fig. 21. Cluster configuration that includes Peripheral Control Unit 4171, a printer unit and a display terminal



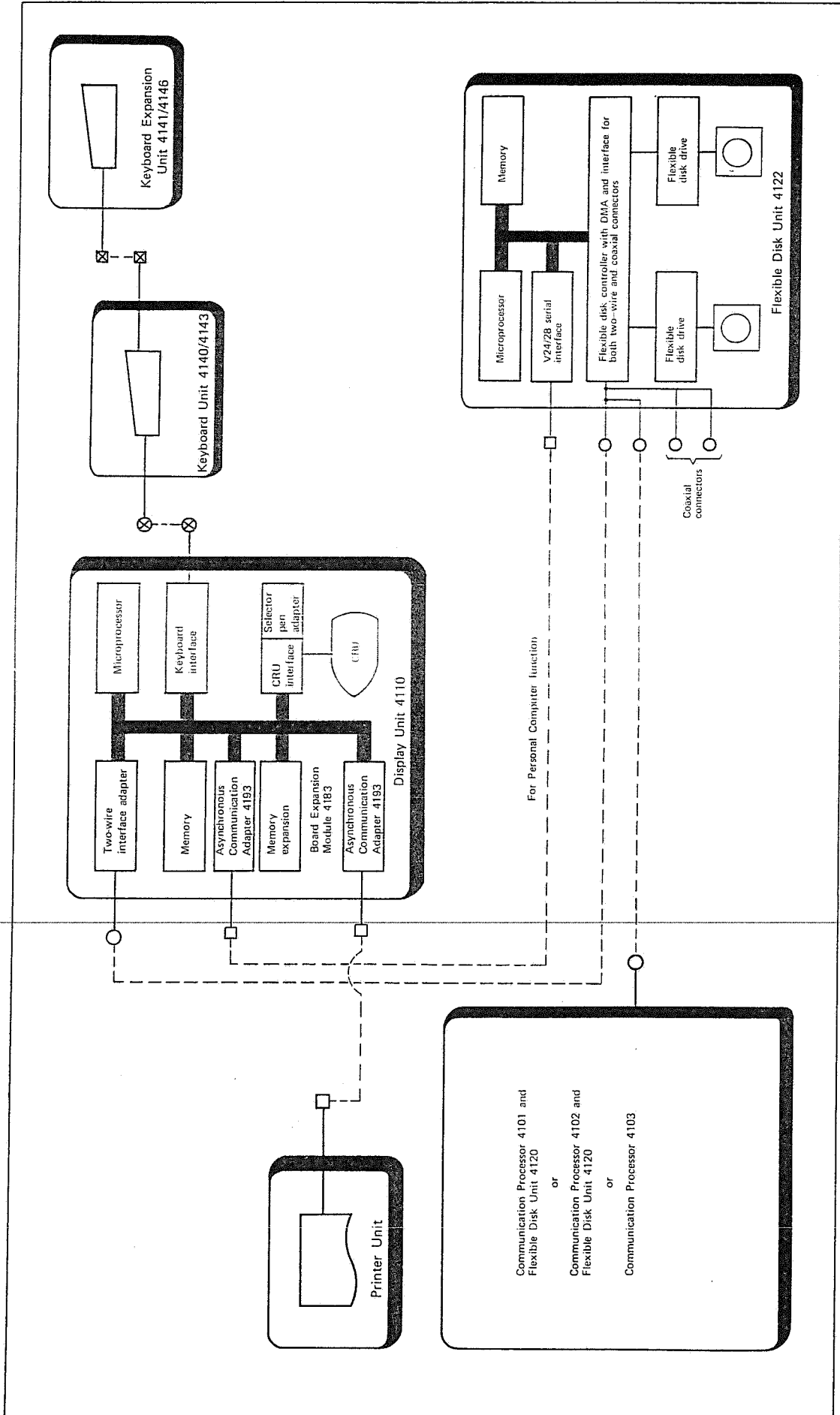


Fig. 22. Cluster configuration that includes Flexible Disk Unit 4122, Display Unit 4110 and a printer unit (Personal Computer Facility available)



Software

The Alfaskop System 41 software is divided into system software and application software (also called program products).

System software is defined as programs, primarily an operating system, that are fundamental to the operation of the Alfaskop System 41.

Application software is defined as programs that perform a function for the user and usually interact with and rely upon the system software.

System Software

The system software is divided into two main parts:

- Basic software
- Emulation software

Basic Software

All software components operate under the control of, and with the assistance of, an *operating system* that permits a number of programs, communication lines and terminals to be handled and processed concurrently.

The operating system carries out:

- CPU scheduling
- Memory management

- Interrupt-initiated program control
- I/O processing
- Start/restart initialization
- Error detection

The operating system that is used in the terminal and the communication processor consists of modules used by both.

The *terminal-console-functions* software provides numerous functions such as

- System customizing
- Dump functions



- Test functions
- Internal and external communication line monitoring
- System utility functions (including flexible disk utilities)

Emulation Software

The following IBM 3270 system components are emulated by the Alfaskop System 41:

Local non-SNA

- Control Unit 3274, B and D models
- Display Station 3278, models 2, 3 and 4
- Display Station 3279, models 2A and 3A
- Display Station 3178
- Printer Unit 3287, models 1 and 2

Remote operation BSC

- Control Unit 3274, C models
- Display Station 3278, models 2, 3 and 4
- Display Station 3279, models 2A and 3A
- Display Station 3178
- Printer Unit 3287, models 1 and 2

Remote operation SNA/SDLC

- Control Unit 3274, C models
- Display Station 3278, models 2, 3 and 4
- Display Station 3279, models 2A and 3A
- Display Station 3178
- Printer Unit 3287, models 1 and 2

Local SNA

- Control Unit 3274, A models
- Display Station 3278, models 2, 3 and 4
- Display Station 3279, models 2A and 3A
- Display Station 3178
- Printer Unit 3287, models 1 and 2



Application Software

The application software (program products) consists of either on-line functions or programs run off-line in the Alfaskop System 41.

Alfaskop Personal Computer Facility

The Alfaskop Personal Computer Facility provides the Alfaskop user with the facilities of a personal computer.

The Alfaskop Personal Computer uses the p-system™ operating system, version IV (p-system is a trademark of Softech Micro Systems, Inc.).

This operating system provides the user with facilities such as program chaining, dynamic overlays, dynamic virtual memory allocation, block I/O service and transparent execution of programs written in different languages.

The operating system permits programming and compiling in Basic and UCSD Pascal (UCSD Pascal is a trademark of the Regents of the University of California, San Diego) as standard. A Fortran compiler can be added as an option.

The Alfaskop Personal Computer software package can also be combined with standard business applications, e.g. LogiCalc (LogiCalc is a trademark of Software Products International, Inc.), ProCalc (ProCalc is a trademark of Software Products International, Inc.) and LogiQuest (LogiQuest is a trademark of Software Products International, Inc.).

For more detailed information see Personal Computer, User's Introduction (E90003100E) and Personal Computer, Software Manual (E90003014E).

Alfaedit/Alfabatch Package

The Alfaedit/Alfabatch program product provides the user with local storage and data handling facilities. In addition to these editing facilities Alfaedit/Alfabatch includes functions for batch transmission to and from a host computer.

Text and source code can be edited and printed locally by the Alfaskop user. The text is entered and edited in files which are created by the user.

Suitable prompts are displayed at each step of the editing process. Each prompt is displayed at the bottom of the screen, together with the name of the function and the key which the user should press in order to execute it.

The files can be transmitted (batch transmission) to the host computer for storage, compilation or testing. The user specifies the files to be transmitted using forms on the screen.

The terminal can also receive (batch transmission) host computer output for editing, correction and documentation. Files received from the host computer can either be printed out or transferred to a diskette.



Transmission complies with the IBM 3780 BSC protocol.

For more detailed information see the Alfaedit/Alfabatch Reference Manual (E90003101E).

Alfaword package

The Alfaword software package provides the Alfaskop user with local word processing facilities.

Alfaword is used locally for word processing and printout of text in a cluster configuration. Alfaword can use any printer or flexible disk unit in the cluster.

The operator can thus create files and documents locally using the functions of a modern word processing system.

Alfaword is controlled using menus and forms displayed on the screen and commands issued via the keyboard. The most common Alfaword functions can be invoked with a single key stroke. A keyboard template indicates the special Alfaword functions of these keys.

For more detailed information see the Alfaword Reference Manual (E90002399E).

Alfaword Transfer Facility

The Alfaword Transfer Facility provides a means for the Alfaskop System 41 user to transfer Alfaword documents to and from a host computer. The Alfaword Transfer Facility can be used in any IBM emulation supported by Alfaskop, provided that a host computer application program has been developed (under CICS or IMS for example) by the user. The transmission procedure is defined and supported by Alfaskop. This procedure is described in the Alfaword Transfer Facility Reference Manual (E90003096E). The format of an Alfaword document is also described. A document entitled Alfaword Transfer Facility – Sample Host Computer Application Program (E90003174E) presents a listing of a host computer application program developed in COBOL under CICS.

The user specifies the document to be transferred to or received from the host computer using forms on the screen.

