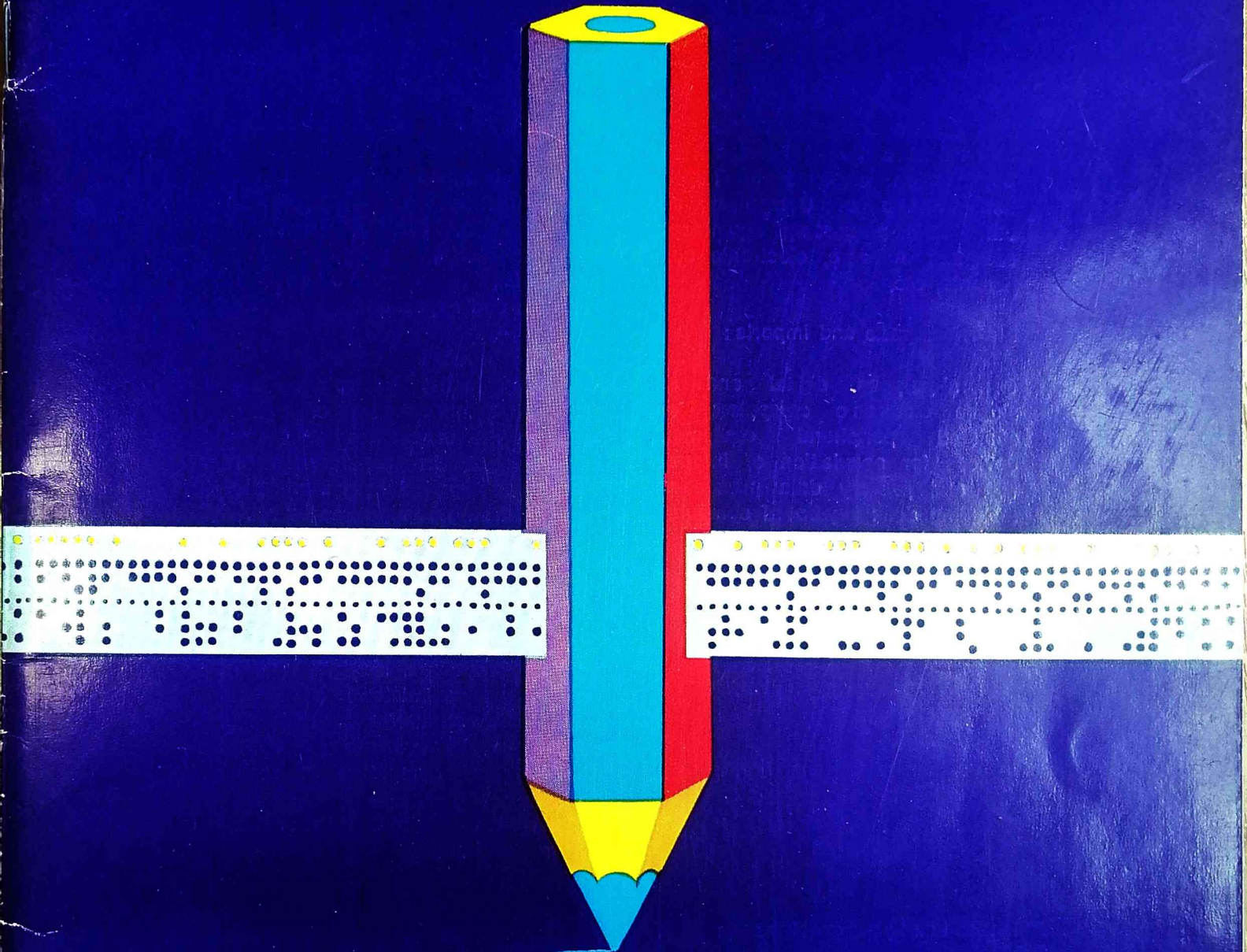


COMPUTER EC-1033



One of the models of the EC 3BM Integrated System of Electronic Computers is represented by the EC-1033 Computer being a third generation machine.



USSR—MOSCOW



USSR · MOSCOW

V/O Electronorgtechnica (known as ELORG) is a Soviet Foreign Trade Organization engaged in Imports and Exports of Computers and other data processing equipments, computer software, electronic components, etc.

ELORG exports and imports :

General-purpose digital and analogue electronic computers, associated peripheral equipment, devices for acquisition of information and primary data processing, including desk key-board computers and punching calculators.

ELORG offers for export electronic equipment: valves, semi-conductor devices, integrated circuits, microwave instruments, gas-discharge devices, T.V. and oscillographic camera tubes, photomultipliers, photocells, ferromagnetic devices, resistors and capacitors.

ELORG renders assistance to Customers in the assembly, setting-up and commissioning of equipment in the organization and carrying-out of the maintenance of equipment supplied from the USSR and in training foreign specialists.

ELORG has set up Techno-Commercial Liaison Centres in about 27 Countries including India, where Soviet Computers are installed. Fully equipped Spare Parts go-downs are maintained at these Centres which provide technical support to the customers. ELORG has supplied computers to more than 100 Computer Centres abroad including in Bulgaria, Czechoslovakia, Hungary and India.

Please send your enquiries to :

ELORG, Smolenskaja Sennaya Pl. 32/34, Moscow, G. 200/121200 U.S.S.R.
Cable : ELORG MOSCOW 200 Tel. : 251-39-46 Telx : 7586.

New Delhi : U.S.S.R. Trade Representation in India,
Plot Nos. 6 and 7, Block 50E,
Nyaya Marg, Chanakyapuri,
New Delhi-110 021.
Tel. 699105

Bombay Office : U.S.S.R. Trade Representation in India, (Bombay Branch)
"AVANTIKA", 46, Dr. G. Deshmukh Marg, Bombay-400 026.
Cable : 'UNESHTORG' BOMBAY, Tel. : 363691-92 Telex : 011-4106.



USSR-MOSCOW

COMPUTER EC-1033

Associates:



Marketed in India through:



COMPUTRONICS
INDIA



CO-OPERATION

EC Computers have been developed as an answer to the demand for a series of powerful but economical computers. In creating this series, the Soviet Union joined forces with other members of CMEA and has now achieved a highly integrated co-operation in product development and production. This co-operation covers mainframes, software and peripherals.

The EC Series offers small, medium-size and large computer systems that are upward compatible with each other. This is regarded as essential, because software economy is becoming ever more crucial to modern data processing.

Today users in the Soviet Union, CMEA countries, and Western Europe are benefiting from this co-operation. Every day more and more users are processing their data on EC Series computers.

The co-operation required for this vast computer project — one of the largest in the world — has been a success.

THE REYAD (EC) PROJECT

The activities of the Reyad Project began after the participating countries signed a multilateral agreement in 1969. The Russian word Reyad' means 'line', and indicates that the product developers set out right from the start to create a compatible series that would span all then-known needed computer sizes. One aim of the product development project was to develop a computer series that would last well into the 1980s. The countries co-operating in the Reyad Project are the Soviet Union, German Democratic Republic, Bulgaria, Hungary, Poland, Czechoslovakia, Romania and Cuba. Under the prevailing division of tasks, most of the products are manufactured by plants in

the Soviet Union, while the smaller member-countries of the CMEA concentrate on sets of systems suitable for their capacities. In its totality the Reyad Project has employed thousands of scientists. Today many thousands of people are engaged in production of the EC Computer Series, while large groups of software engineers are creating the software systems to go with the hardware.

According to scientists and leading representatives of the computer industry in the west, the Reyad Project is one of the most successful product-development programmes ever undertaken.

EC COMPUTERS

The EC Computer systems include a series of program-compatible models.

The program compatibility, standard construction and standard codes utilized in the EC computer systems as well as peripherals common to the computers of all models provide :

Solution of a great variety of scientific and engineering, economic, and information-logical problems which involve, intake, storage, and processing of information;

punched card and punched tape data output;

printer output;

punched card and punched tape data input;

magnetic tape, magnetic drum and magnetic disk reading or storage;

communication with subscribers over telephone and telegraph system;

Associates :



Marketed in India through :



**COMPUTRONICS
INDIA**



USSR-MOSCOW

data exchange (input-output) with DISPLAY units.

Associated with the EC Computer systems are developed software systems which include:

set of service routines — SOSR (KTO);

disk operating system — DOS which includes control and service programming intended for uniform functioning of all models, automatic preparation and execution of programs and increases the programmers' abilities;

operating system-OS(OC) which has a greater power and is more complicated. It calls for a larger memory and higher processor speed as compared with the DOS of the EC integrated system and provides the compatibility of the Users' program regardless of the actual configuration of generated system.

EC-1033 COMPUTER FEATURES

EC-1033-computer is a further development of the family of the Unified System of Electronic Computers, offering program compatibility with computers, of the Unified System. The EC-1033 is positioned between high productivity and medium productivity models. Its high efficiency in solving engineering and scientific problems is achieved through a speed of 200,000 operations per second (according to Gibson's estimate) and in solving business problems-through a speed of 150,000 operations per second (according to estimate GPO-UW II).

EC-1033 - Its expansibility is achieved through the availability of one multiplexor channel allowing for the connection of up to 256 devices and each selector channel-up to 128 devices according to the Electronic Computer standard interface re-

quirements. The software system permits the executing of User's special programs.

EC-1033 - trunk organization of the processor and channels which provides versatile biconditional implication linkages at the level of functional modules of these devices.

EC-1033 - microprogram control of all procedures in the processor and the multiplexor channel.

EC-1033 - microprogram realization of individual diagnostic procedures of the processor and the channels.

EC-1033 - economic and continuous control of the data both in the storage and transmission process and in the translation process.

EC-1033 - economic informative monitoring of control signal sequences.

EC-1033 - use of integrated circuits of the medium-scale integration.

EC-1033 - preferable correlation between the cost and capacity.

The general purpose applications of the computer are ensured by a common set of instructions, standard i-o interface, direct control facilities, paging protection of the contents of main storage both in recording and accessing in case of program and machine checks and by the software system of the OS/EC.

The reliability of the computer is secured by the economical realization, the use of microcircuits of the medium-scale integration, modular organization and an effective machine-program system of error recovery.

The capacity of the EC-1033 machine is several times that of the EC-1030 computer due to:

Associates:



Marketed in India through:



**COMPUTRONICS
INDIA**



use of new quick algorithms of the most of instructions :

use of an unique trunk organization of the processor and the channels;

material decrease in the machine cycle;

development of a main storage two and more times the capacity of storages used before and better parameters of the cycle and the access;

development of a multifunctional memory used as the basis for a local memory and the registers of the processor and the channels;

development of multiplexer channel storages and protection keys on the basis of integrated circuits 155PY2;

development of an economic and high-speed module of microcircuit storage memory.

TECHNICAL AND SERVICE CHARACTERISTICS

Multiprogramming operation..	15 working programs simultaneously in parallel operation of the processor and peripherals
Channels :	
organization	trunk type
control	by software microprograms
number of channels ...	1 multiplexer and 3 selector channels
data vetting	by even parity
Working memory capacity ..	256—1024 kbytes (where K = 1024). Data and address check by odd parity check
Processor :	
organization	trunk type
control	by microprograms
machine cycle	300 ns
digit per word	32 bits and 4 check bits
data vetting	by even parity
check of control signals	informative
diagnostics	hardware and microprograms with automatic recovery at the instructions level
prefetching	3 instructions of PP format
Capacity	up to 200,000 operations/s
External storage	magnetic tape store; magnetic disk store
Formation of complexes	multimachine systems with use of common field of external storage common channels, and direct control facilities
Compatibility	program compatible with models EC-1022, EC-1032 EC-1040, EC-1052 and EC-1060
Power supply	3-phase 380/220 V 50 Hz line
Power consumption	40 kVA in the main set
Operating duty	continuous three-shift or one-two shift with shut-down
Protection	supply power protection against unauthorized access to the wiring and controls of the main control desk and protection of the main memory against hardware and program errors

Associates :



Marketed in India through :



**COMPUTRONICS
INDIA**



USSR-MOSCOW

CENTRAL PROCESSOR UNIT SET **CENTRAL PROCESSOR UNIT (CPU)**

Processor-channel and control desk EC-2433	1
Operational storage device EC-3208	1
Power supply rack EC-1033/C000	1

PERIPHERALS

Multiplexor Channel :

Device EC-7077	1
Punched card reader EC-6019	1
Punched tape reader EC-6022	1
Punched card output device EC-7012	1
Punched tape output device EC-7022	1
Alphanumerical printer EC-7032	1

Selector Channels :

Magnetic tape store control unit EC-5517	1
Magnetic tape store EC-5017 (EC-5012-01, EC-5010-01)	1
Magnetic tape store control unit EC-5525	1
Magnetic tape store EC-5025	1
Removable magnetic disk store control unit EC-5561	1
Removable magnetic disk store EC-5061	1

DATA PREPARATION

Card data preparation and decoding unit EC-9011	2
Card verifier EC-9013	1
Punched tape preparation device EC-9024	2

Notes :

1. The working memory may be enlarged to 1024 kbytes, the CPU set being supplemented by peripherals in compliance with the requirements for the interface, including magnetic tape and disk stores up to 8 pieces.

2. The codes of the devices included in the machine configuration may change with newly developed devices.

SYSTEM OF SERVICE **ROUTINES SOSR**

Program description	1 set
Program listings and instructions	1 set
Punched cards	2 sets
Magnetic tape	1 set

Associates:



Marketed in India through:



COMPUTRONICS
INDIA



SOFTWARE

(PROGRAM STORAGE MEDIUM AND SERVICE DOCUMENTATION)

SERVICING EQUIPMENT

Description of the System (OS/EC)

Description and instructions 3 sets
Magnetic tapes 1 set

Removable magnetic disk store tester EC-A503

Logic SIEs tester EC-A102

Supply unit tester EC-A001

All-purpose supply unit EC-0822 of tester EC-0021
Special SIEs tester EC 0021

Attachment for testing nonstandard supply units
EC-A003

Peripherals tester EC-7720

Instrument EC-A501 for checking magnetic tape
store

Tester of peripheral devices cells

Instrument for checking standard elements
EC-A502

REQUIREMENTS FOR PREMISES

To ensure normal operation conditions the following should be prepared before the installation of the machine :

computer room,

room for preparation of medium,
service documentation library,
servicing equipment room,

room for attending personnel,
programmer's room,
storage room.

Associates:



Marketed in India through:



**COMPUTRONICS
INDIA**



USSR-MOSCOW

COMPUTER ROOM

Floor area	120 m ² for installation of the central processor unit set
Height	3 m min.
Doors	2 m in height, 1.5 m in width
Illumination	190-260 lx (at a height of 1 m from the floor surface)
Ambient temperature	from + 5 to + 40°C
Atmospheric pressure	760 ± 30 mm Hg.
Relative humidity	up to 95% at + 30°C
Dust content	75 nkg/m ³ , max. with particles 3 µm in size
Floor load	up to 700 kg/m ²
Cable laying	in special channels under floor or false floor
Floor	smooth, even, well insulated
Grounding	in compliance with the general requirements of the Rules for Grounding Electrical installations. It is recommended to supply the machine from a separate feeder which is not electrically coupled with welding equipment, building machines and other consumers operating with peak loads.
Most favourable environment conditions	ambient temperature + 22 ± 2°C and relative humidity of 65 ± 5%

To provide most favourable environmental conditions, it is recommended to seal the room hermetically, use airconditioning and install the magnetic disk and tape units in separate enclosures protected from dust.

The Seller has designed the EC-1033 computer's operation course for users of appropriate

qualifications, the training being conducted on conventional terms.

Upon completion of the course of training the participants who have passed their examinations are presented an EC-1033 operation certificate.

Associates:



Marketed in India through:





SOFTWARE OF EC-1033 MACHINE

The machine is supported by a full range of software including a system of service routines (SOSR) and an OS/EC operating system designed for the Integrated System of Computers (EC Computers).

The purpose of the SOSR is to check the EC-1033 machine hardware for functioning and to make their check-out easier.

The EC Computers operating system provides:

single-program, multiprogram, multiprocessor and multisystem operation and also real-time and time sharing operations both with local data handling and through the use of data teleprocessing systems;

simultaneous handling up to 15 problems in the multiprogramming operation;

effective planning and control of the data exchange between the working memory and the peripherals, offering the user flexibility in the organization of and access to the data regardless of the type of the device carrying the data;

programs fully independent of the specifications of the peripherals connected which frees the operator from the need to adapt the program to the external device in use;

well developed system of i-o control, software means for recovery and facilities for program debugging;

generation aids allowing automatic formation of an operating system of real hardware configuration and applications;

possibility of enlarging the operating system;

convenient communication between the operator and the machine.

The OS/EC operating system makes it possible to utilize the most effective and powerful translators of the basic programming languages such as ALGOL, FORTRAN, PL/1, COBOL, RPG (Report Program Generator) and ASSEMBLER.

The OS/EC operating system provides a stacked job operation, system-to-operator communication, recording of the system operation, possibility of enlarging the functions and fields of applications, operation of the system in the time-slice mode, overlap of batch processing and time-slice mode, real-time operation, automatic acquisition of initial data directly from the source, their storage, up-dating and automatic processing, operation through communication channels, functioning of graphic i-o devices, automatically delimited access to protected data sets and a wide series of facilities for automatic preparation, debugging and execution of tasks.

The OS/EC operating system has two basic multiprogramming operations. These are a multiprogramming duty with a fixed number of tasks (programs) and a multiprogramming duty for a variable number of tasks. The OS/EC system may perform the single-program functions in which case its multiprogramming abilities are not used. These modes of operation differ on the one hand in the multiprogramming organization and on the other hand in the minimum working memory required for the use of this or that mode of operation.

When performing a single-program duty, the OS/EC system fulfils the jobs in an extremely sequential manner. Each moment of time there is

Associates:



Marketed in India through:



**COMPUTRONICS
INDIA**



USSR-MOSCOW

only one program executed in the working memory. The single-program operation calls for a minimum working memory and can be performed on an working memory of 65 kbytes.

The multiprogramming operation with a fixed number of tasks (a minimum working memory of 128 kbytes) provides simultaneous operation of a fixed number jobs (not more than 15) determined by the statistic storage allocation either obtained in the system generation or set by the operator.

If that is the case, the computation process may be unparalleled within the job frame by organizing tasks which are fulfilled in the multiprogramming operation. The maximum number of tasks to be executed simultaneously should not exceed 255. The resources of the computer are allocated dynamically.

The multiprogramming operation with a variable number of programs (the minimum working memory is of 256 kbytes) provides a simultaneous operation of any number of jobs (not more than 15) determined at a given period of time by the state of the dynamically allocated resources of the computer installation including the working memory.

For each job the working memory is allocated dynamically. Therefore, the number of jobs depends on the number of requests made by the programs being executed and is a variable. The computation process may be unparalleled by organizing programs simultaneously executed in the multiprogramming operation. The maximum number of programs being executed simultaneously is not specified but is determined dynamically as dictated by the machine resources available.

The OS/EC-1033 machine allows the following uses :

Stacked job operation, batch teleprocessing, time-sharing operation, dialogue operations, real-time operation, and participation of a computer in multiprocessor and multimachine configuration.

In the batch-processing mode of operation a continuous flow of job is processed with an automatic transfer from one job to another. The operator's participation in the processing of jobs is minimum which cuts down the number of his errors. The job stream is entered directly from an input device (a card reader, tape reader, etc.) which is directly coupled to the computer installation.

A stream of jobs may be processed either in multiprogramming or single program operations. After a job has been entered, input queues are formed which are usually disk-carried. A job is fetched from the queue either sequentially or on a priority basis. The job queues may be augmented with new jobs. This augmentation may be done randomly, even when the queues are not yet processed completely. The job execution results are recorded on a disk forming output queues.

After the job has been executed, the results are outputted from the output queue on a system output device (alphanumeric printer, card punch, magnetic tape unit, etc.) The output may be either sequential or may be on a priority basis. There are no input and output queues in the single-program operations. If that is the case, jobs (job items) are sequentially read from the system input device, the output being directly to the system output device. In the multiprogramming mode a direct output to the system output devices is possible in the job processing operation either.

Associates:



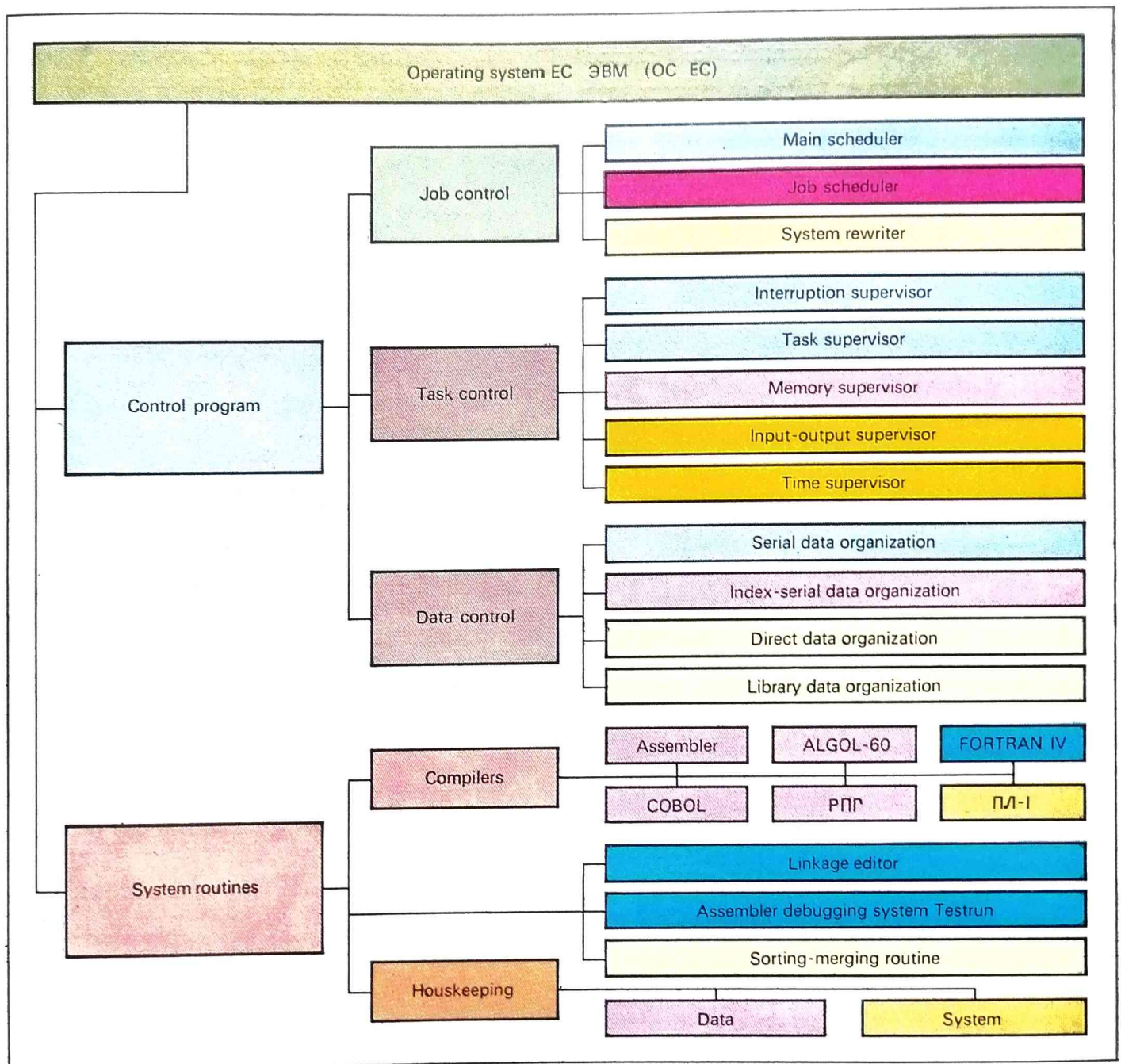
Marketed in India through.



COMPUTRONICS
INDIA



USSR-MOSCOW



Associates:



Marketed in India through:



COMPUTRONICS
INDIA



USSR-MOSCOW

In the batch teleprocessing the input of a job stream as well as the output of results are made on remotely located terminal connected to the computer through a communication channel (telegraph, telephone or other). A terminal used in the batch teleprocessing mode includes punched card readers, punched card punchers, alphanumeric printer.

The control program of an OS/EC operating system includes :

initial loader which adjusts the working memory, loads the operating system nucleus and loads a nucleus initialization routine;

nucleus initialization routine which prepares system tables, checks the tables and peripherals for conditions, adjusts the system data sets and communicates with the operator with a view to operational changing of the operating system abilities;

job scheduler which provides reading the input streams of jobs, sequence or priority processing of jobs (depending on the OS/EC mode of operation), initialization of execution of several jobs simultaneously, reading and interpreting the statements of the job control language, allocation of the computer resources for the job, calling of catalogued procedures, automatic allocation of the volumes on external media, asynchronous reading of the input data and output of the output data of the job, and making records in the System Log;

master scheduler which accomplishes the operator-to-system communication. The master scheduler and the job scheduler are included by the job control routines;

supervisor which processes all types of interruptions, controls the execution of one or several programs, source memory, links among modules, operation of overlay structure programs, system clock, data access resident programs, facilities protecting the working memory, requests for i-o operations, dynamically loading programs in the working memory, overlap of the operation of the channels with the processor, operation of the system in the timeslice mode, overlap of batch processing and time-slice operation, functioning of multi-processor systems. The supervisors perform the function of task control;

data control routines which provide input and output of data having sequential, index sequential, library, and random organization, merging records into blocks and segmentation of blocks into records, overlap of i-o and processing operations, processing system and user labels of the volumes and data sets, automatic positioning of volumes, analysis and processing of erroneous situations in the i-o operations and device independence of programs;

routines designed to control the recovery from failures, accomplish the processing of interruptions caused by the machine check maps, record hardware errors in the processor, channels and peripherals, retry the malfunction instruction of the processor or channel, if possible, complete selectively the task affected by malfunction, form the record of malfunction in the Log and change over the system to the wait condition, if no recovery from failure is possible.

The system processing programs of the OS/EC are as follows :

linkage editor which connects separately translated object and load modules into one load module ready for execution, forms load

Associates :



Marketed in India through :



COMPUTRONICS
INDIA



USSR-MOSCOW

modules with overlay structure, changing the programs by replacing, deleting and relocating program sections; and reserves storage for common areas generated by the compilers;

loader which edits and directly loads the edited modules for execution at one point of the job.

sort/merge set of routines designed to arrange random items in an ordered sequence, sort records in compliance with their control fields, combine files located on stores (up to 32 magnetic tapes and 6 disks with input files), create check points and perform starts from these points and perform multivolume and multi-file input and multivolume output;

test translator (Testran) designed to debug Assembler programs and provide outprint of storage areas, general purpose registers and registers with floating point, print system blocks and tables, hold the logic of the program being debugged with offering corresponding printed information, execute the program being debugged in the routing operation, and edit and outprint the debugging data in corresponding formats;

utility programs which relocate data sets (items) from one medium to another print and punch data sets, print the system catalogue, volume contents on disks and contents of libraries, update the libraries, modify the catalogue prepare and mark direct-access volumes and magnetic tapes, edit records in the data sets, collect information about errors and print them in a form convenient for the User.

The OS/EC 1033 translators include compilers for the following languages: ASSEMBLER, RPG, FORTRAN IV, PL/1 COBOL, and ALGOL-60.

The teleprocessing software makes it possible to transmit information to a computer and from it through telegraph and other channels of communication. The teleprocessing facilities allow several remote terminals operate simultaneously with the computer. The teleprocessing software includes two access methods. These are BTAM (Basic Telecommunications Access Method) and TCAM (Telecommunication Access Method). These access methods find their applications in all systems performing teleprocessing operations (batch teleprocessing, dialogue systems, time-sharing systems, real time systems, information searching systems, various ACS, etc.).

The graphic processes provided by the software allow the computer system to operate with alphanumeric and graphic displays. These processes include a graphic access method and subprograms of graphic programming and also allow a display to be used as an operator's console.

The generation facilities of the EC-1033 machine provide adjustments over wide ranges to actual hardware configurations of the integrated computer system and to the problems being solved.

COMPUTER COMPONENTS

CENTRAL PROCESSOR UNIT SET

This includes three devices each of which is housed in a typical rack as follows:

processor-channels and the control desk EC-2433;

operational storage device EC-3208;

power supply rack EC-1033/C000.

Associates:



Marketed in India through:



**COMPUTRONICS
INDIA**



USSR-MOSCOW

EC-2433 PROCESSOR-CHANNELS AND CONTROL DESK

EC-2433 — routing organization providing equal links at the level of functional units.

EC-2433 — effective hardware checking which covers about 70 per cent of the equipment.

EC-2433 — off-line microdiagnostics which makes it possible to improve reliability materially and cut down the recovery time.

EC-2433 — utilizes the microprogram control of all procedures performed in the processor and the channels.

The high efficiency of the EC-2433 unit is ensured by :

- routing organization;
- use of integrated memory units;
- economic module of read-only memory EC-1033/H001 with a swapping cycle of 300 ns.

The power is supplied to the processor and the channels from the supply rack EC-1033/C000. The power consumption of the processor and the channels together with the supply rack is 5 KVA.

Processor

The processor performs the arithmetic and logic functions of processing data, controls the operation of the channels and organises services on interruption requests and organises the operation of timer.

The processor has a continuous economic check of data storage, transmission and conversion and also an informative monitoring of control signals.

The high reliability of the processor is ensured by the automatic microdiagnostics with the recovery of computing process at the instruction level.

TECHNICAL CHARACTERISTICS

Control word size, bits	32 (4 of which are check bits)
Arithmetic unit capacity, bits	32
Main operations execution speed, us :	
adding-subtracting with fixed point	1.4-2.7
adding-subtracting with floating point	4.5
multiplying with fixed point	8.5
multiplying with floating point	9.5
dividing with fixed point ..	14.6
dividing with floating point	17.7
Short operations execution time, us	1.4-2.7

Associates :



Marketed in India through .



COMPUTRONICS
INDIA



USSR-MOSCOW

channels

The channels provide an offline data exchange between the operational storage unit and all the peripherals through an i-o standard interface.

The EC-1033 machine has one general-purpose, three selector and one multiplexor channels.

The selector channels control the data transfer between the operational storage unit and

the high-speed peripherals. The selector channels operate only in the burst mode.

The multiplexer channel controls the data transfer among the low-speed peripherals.

The multiplexer channel operates both in the burst mode and the multiplex mode.

The general-purpose channel provides communication between the channels and the processor and the operational storage unit.

TECHNICAL CHARACTERISTICS

Selector channel :

speed, kbytes/s	800
number of control units that may be connected to one channel without repeaters	10
maximum number of i-o devices connected to one channel	256

Multiplexer channel :

number	1
number of subchannels ..	32(expandable to 256)
number of i-o devices connected without repeaters ..	10
maximum number of i-o devices that may be connected to one channel	256
speed, kbytes/s:	
multiplex mode	70
burst mode	350

Associates:



Marketed in India through:



COMPUTRONICS
INDIA



USSR-MOSCOW

EC-3208 OPERATIONAL STORAGE DEVICE

The EC-3208 device performs the function of the basic working memory of the EC-1033 machine.

The unit includes eight ferrite-core storage modules with access system of 2.5D.

The capacity of each storage module is 64 kbytes.

The following modes of operations are provided for the working memory :

data record in a full word or in bytes;

data read in full word and their output to the processor;

record interrupt and transfer to read operation on a signal from the processor;

data read with subsequent record by the specified byte of all units;

diagnostic operations : mixed address record (read), information overlay, check code set up, byte check and set up, and record of the content of address register in the data register;

memory protection at power supply faults.

TECHNICAL CHARACTERISTICS

Capacity, kbytes	1024
Word size, bytes	4
Cycle time, us	1.2
Access time, us	0.7
Power supply :	380/220
voltage, V	
frequency, Hz	50
power consumption, kVA..	5
Mass, kg.	1000

Associates :



Marketed in India through .



**COMPUTRONICS
INDIA**



USSR-MOSCOW

EC-1033/C000 POWER SUPPLY RACK

The EC-1033/C000 rack is designed to supply controlled voltage power to the EC-2433 unit and

to control the power supply to all the computer devices when they operate simultaneously.

TECHNICAL CHARACTERISTICS

Structure	unitized
Controlled voltage outputs, V	5; 6.3; 27
Power supply:	
voltage, V	380/220
frequency, Hz	50
Mass, kg	740

PERIPHERALS

THE EC-7077 PRINTER (A PRINTER WITH A CONTROL UNIT)

The EC-7077 printer is designed for data exchange between the operator and the processor through a standard i-o interface. Besides, it informs the channel about its state.

The printer can perform both the multiplex- and burst-mode functions.

When the data are received and transmitted their check is by the hard-ware facilities.

The operator communication with the processor is accomplished in the DEBC code. Characters may be printed in two colours when use is made of a corresponding tape.

The EC-7077 printer has a control desk carrying the controls and indicators.

TECHNICAL CHARACTERISTICS :

Printing speed, characters/s	upto 10
Number of copies	5
Number of printed characters	93
Maximum number of characters in line	106
Main line spacing, mm	4.25
Width of paper chart, mm	280
Power supply:	
voltage, V	220
frequency, Hz	50
Power consumption, kVA	200
Dimensions, mm	1000 x 620 x 900

Associates:



Marketed in India through:



**COMPUTRONICS
INDIA**



USSR-MOSCOW

EC-5017 MAGNETIC TAPE STORE

The EC-5017 magnetic tape store is designed for use as an external storage on-line with the EC-1033 machine.

The design of the store unit is progressive in its engineering solution. Use is made of a monoroller feed unit for the magnetic tape and unitized construction. Wide applications are found by microelectronic devices with resultant high reliability, convenient use and long service life.

The magnetic tape feed unit must be built on the basis of a quick-response d-c electric motor providing the necessary start-stop characteristics of the tape transport.

The tape buffer device is represented by vacuum columns in which active photocells are used as transducers. When combined with a special d-c motor for the tape drive capstan, it forms a simple and reliable servosystem for the reel drive.

The writing-reading (reproduction) route built up of integrated circuits and discrete components writes and reads the data by the HBH-1 method (non-return-to-zero with inverse of number).

The automatics and control system built up of integrated circuits only performs the following operations: loading, unloading, speeded up rewinding, search and detection of the tape beginning and end markers, etc. Provision is made to make the reading possible during the back motion of the tape.

The read-write head assembly MT employs MT units with a 3.81 mm. clearance between the gaps of the write and read heads. The MT assembly allows the MT unit to be moved away from the tape during the loading and rewinding operations.

The EC-5017 store operates with the EC-5517 control unit. It is connected to the latter through a standard small interface.

TECHNICAL CHARACTERISTICS :

Access mean time, s	75
Tape speed in operation, m/s	2
Rewinding time of standard reel, min	2.5 max.
Data packing density, bit/mm	8 and 32
Data recording method	HBH-1 (non-return-to-zero with inverse of number)
Number of tracks	9
Maximum data transmission speed, kbyte/s	64
Zone-to-zone spacing, mm :	
minimum	12.7
rated	15.2
Tape size :	
maximum length, m	750
width, mm	12.7
Reel outer diameter, mm	267
Container outer diameter, mm	296
Power supply :	
voltage, V	380/220
frequency, Hz	50
Power consumption, kVA	2
Dimensions, mm	720 x 750 x 1600

Associates:



Marketed in India through.



COMPUTRONICS
INDIA



USSR-MOSCOW

EC-5025 — MAGNETIC TAPE STORAGE UNIT :

Magnetic tape storage unit EC-5025 is meant for working as secondary storage unit within the configuration of unified series computers.

Following are the highlights of construction of the storage unit: mono roller tape movement method, block principle of construction, use of micro electronics alongwith discrete electro elements, use of LED indication.

Devise EC-5025 is completely compatible logic as well as hardware wise with EC-5017.

Write/read track, constructed on discrete components and integral circuits facilitates writ- ing and reproduction of data by two methods :

phase coded (PC) with density 1600 BPI and without return to zero with inversion WRZ -1 with density 800 BPI.

The presence of two writing method in stor- age unit facilitates to use data archives written by WRZ -1 method and allows to gradually re- write it on magnetic tape with the use of more advance method PC.

Semi automatic loading of magnetic tape is provided in the storage unit. Magnetic heads module is removed during loading and rewinding of tape. The device EC-5025 has got inbuilt hard- ware check for offline checking of the device.

The storage unit works alongwith controller unit EC-5525 and is connected to it through standard interface.

TECHNICAL CHARACTERISTICS :

Average selection time	100 seconds
speed of tape in work mode	2 meters per second
rewind time for the standard spool	not more than 2 minutes
density of information	1600 and 800 BPI
method of writing information	PC and WRZ -1
Number of tracks	9
Maximum speed of data transfer :	
during PC	126 K. Bytes per second
during WRZ -1	64 K. Bytes per second
Distance between zone :	
minimum	12.7 mm
nominal	15.2 mm
Dimensions of tape :	
maximum length	750 metres
width	12.7 mm
outer diameters of the spool	267 mm
outer diameters of the tape container	296 mm
Power supply	380/220 volts; 50 HZ
Power consumption	2 K. Watts
Dimensions	790 X 750 X 1600 mm

Associates :



Marketed in India through :



**COMPUTRONICS
INDIA**



USSR-MOSCOW

EC-5052

REMOVABLE MAGNETIC DISK STORE

The EC-5056 store unit is designed to perform the function of an external storage device.

This store unit is connected to a computer through the EC-5551 and EC-5561 control unit. Up to 9 EC-5056 (EC-5052) stores may be connected to a control unit.

Constructionally the store unit is made in the form of a rack. To provide access to the disk pack the rack has a hinged transparent cover.

The top of the rack houses the electromechanical assembly including :

- carriage with magnetic heads;
- disk pack drive;
- actuator of the magnetic head carriage;
- write-read unit.

The bottom part of the rack contains the logic unit including:

- control circuits;

- control circuits for switching the magnetic heads;
- control circuits for the magnetic head positioner;
- power supply control unit;
- ventilation system.

The removable disk pack includes 11 recording disks and fully complies with the Standards in force. The disk surface are coated with Ferromagnetic material.

The shoe of the magnetic head floating element is made of hard ceramic alloy which makes it possible to use the given disks for operation with disks having ferrolacquer magnetic coating.

The electromechanical drive system of magnetic heads is built around a quick-response d-c motor with a flat printed rotor. The system provides the required quick response of the drive, possesses long service life, resists to environmental factors, and is easy to operate.

The electronic circuits of the store unit employ integrated circuits and discrete components.

TECHNICAL CHARACTERISTICS :

Capacity of a removable disk pack, Mbyte	7.25
Number of working surfaces in a pack	20
Number of spindles	1
Recording method	two-frequency
Number of heads	10
Number of tracks on each surface	200 + 3 spare
Disk search time, ms :	
minimum	25
maximum	150
medium	75
Mean time of access to information, ms	90
Disk speed, rpm.	2400
Data distribution	random
Data exchange rate, kbyte/s	156
Disk pack replacement time, min	1
Number of data i-o channels	1
Data recording check principle	time selection
Power supply :	
voltage, V	380/220
frequency, Hz	50
Power consumption, kVA	1.5

Associates :



Marketed in India through .



COMPUTRONICS
INDIA



USSR-MOSCOW

EC-5061 REMOVABLE MAGNETIC DISK STORE

The EC-5061 store unit is designed to perform the function of an external storage device.

This store unit is connected to a computer through the EC-5561 control unit. Upto 9 EC-5061 stores may be connected to a control unit.

Constructionally the store unit is made in the form of a rack. To provide access to the disk pack the rack has a hinged transparent cover.

The top of the rack houses the electromechanical assembly including :

- carriage with magnetic heads;
- disk pack drive;
- actuator of the magnetic head carriage;
- write-read unit.

The bottom part of the rack contains the logic unit including :

- control circuits;
- control circuits for switching the magnetic heads;

control circuits for the magnetic head positioner;

- power supply control unit;
- ventilation system.

The removable disk pack includes 11 recording disks and fully complies with the Standards in force. The disk surfaces are coated with Ferro magnetic material.

The shoe of the magnetic head floating element is made of hard ceramic alloy which makes it possible to use the given disks for operation with disks having ferrolacquer magnetic coating.

The electromechanical drive system of magnetic heads is built around a quick-response d-c motor with a flat printed rotor. The system provides the required quick response of the drive, possesses long service life, resists to environmental factors, and is easy to operate.

The electronic circuits of the store unit employ integrated circuits and discrete components.

TECHNICAL CHARACTERISTICS :

Capacity of a removable disk pack Mbyte	29
Number of working surfaces in a pack	20
Number of spindles	1
Recording method	two-frequency
Number of heads	20
Number of tracks on each surface	200+3 spare
Disk speed	2400 R.P.M.
Disk search time, ms :	
minimum	20
maximum	80
medium	50
Mean time of access to information ms ..	90
Data distribution	random
Data exchange rate kbytes	312
Disk pack replacement time min.	1
Number of data i-o channels	1
Data recording check principle	time selection
Power supply :	
voltage V	380/220
frequency Hz	50
Power consumption kVA	1.5

Associates :



Marketed in India through :



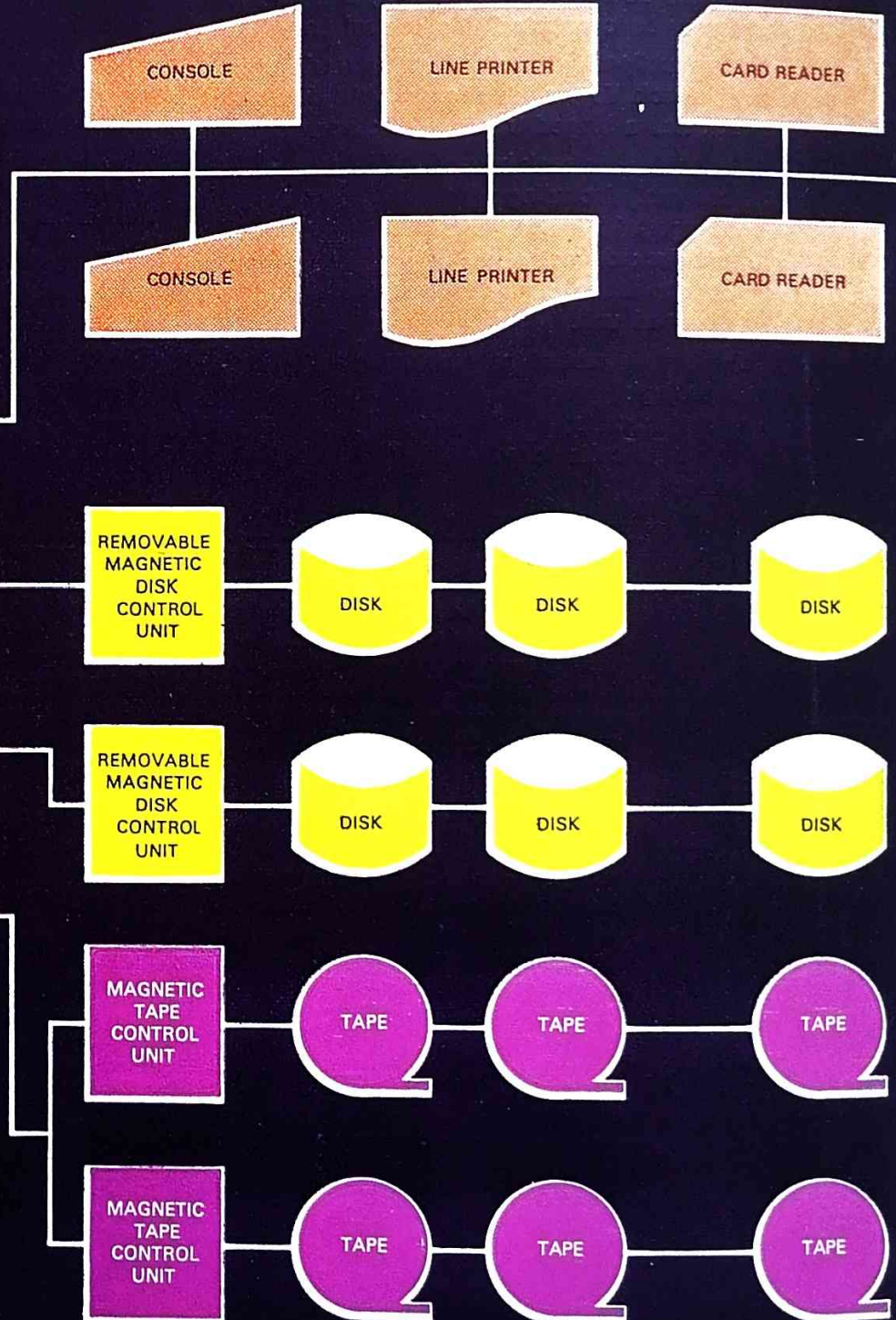
COMPUTRONICS
INDIA



USSR - MOSCOW

BLOCK DIAGRAM OF PERIPHERALS

CENTRAL PARTS



Associates:



Marketed in India through:

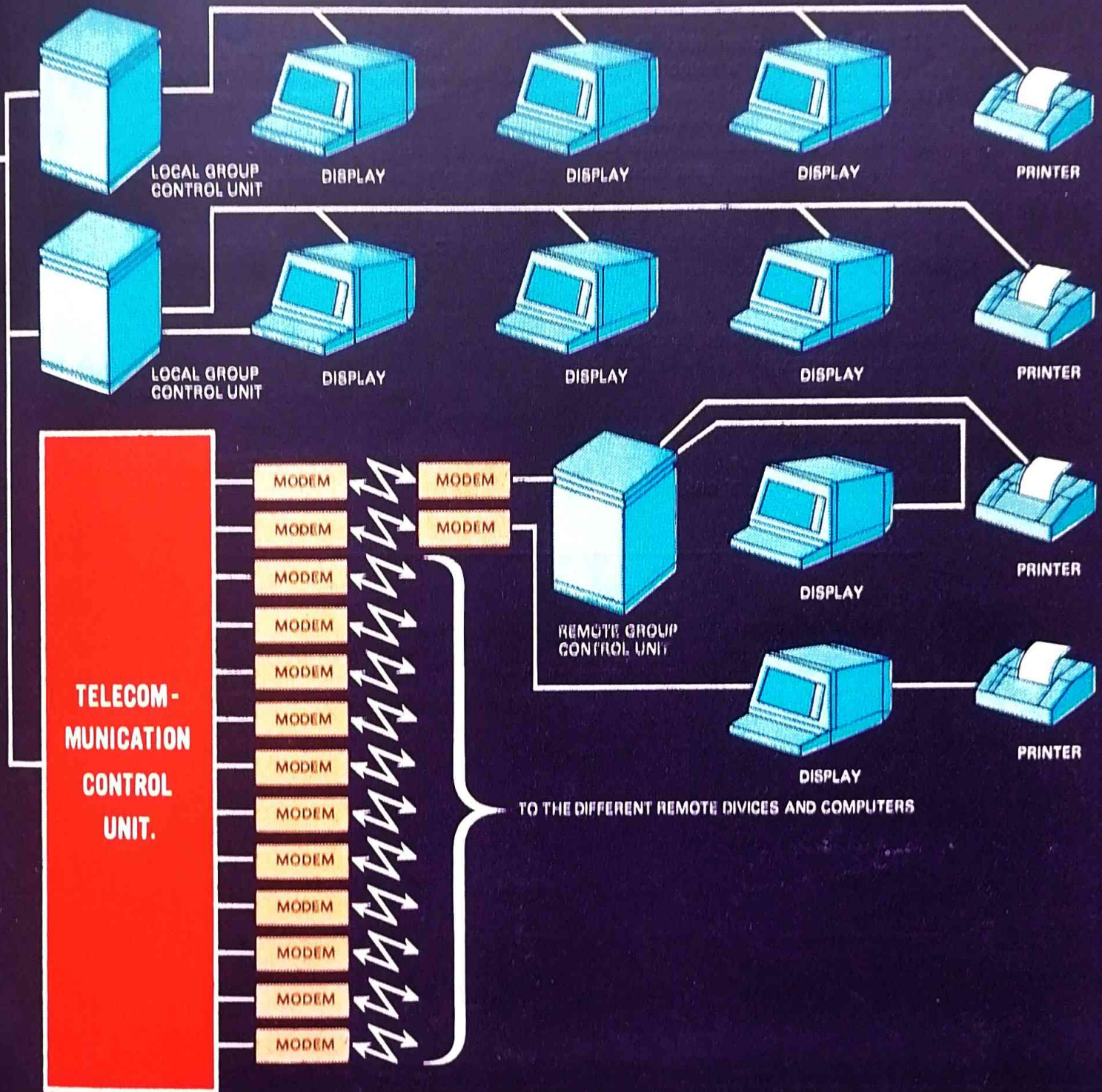


**COMPUTRONICS
INDIA**



TELNET - MODCOM

EC-1033 COMPUTER L DEVICES



Associates:



Marketed in India through:



**COMPUTRONICS
INDIA**



USSR-MOSCOW

EC-5517 MAGNETIC TAPE STORE CONTROL UNIT

The purpose of the EC-5517 unit is to control the operation of magnetic tape stores.

The EC-5517 unit can be connected to two channels (a selector channel or a selector sub-channel of the multiplexer channel) of one or two different computers, provided it is operated alternatively. The EC-5517 unit carries out data exchange with a channel only in the burst mode of operation.

The unit is connected to the channels through a standard input-output interface.

Upto 8 magnetic tape stores of distinct types may be connected to the control unit. Mixed connections are possible either.

The operation in the RECORD-PLAYBACK mode is accomplished with one of the stores connected, while the other may perform the REWIND and REWIND AND UNLOAD operations.

The control unit writes data on a magnetic tape and reads information from it with packing densities of 8 and 32 double characters/mm. The writing method is "nonreturn-to-zero with inverse of number" (HBH-1).

When the data is repeatedly read from the tape, the control unit corrects single and group errors, if they occur along one track.

The control unit provides circuits for monitoring the data being processed and the equipment performance.

The EC-5517 control unit can operate in two modes :

off-line mode (from the control panel of the unit);

on-line mode (as a part of the computer system).

The control unit is underlain by integrated circuits and discrete elements.

TECHNICAL CHARACTERISTICS :

Connection to channel	through standard input-output interface
Code and number of simultaneously connected stores	up to 8 stores, types EC-5012, EC-5017, EC-5019, EC-5022
Mixed connections	allowed
Maximum data transmission rate, kbytes/s	64
Power supply :	
voltage, V	380/220
frequency, Hz	05
Power consumption, kVA	1 max.
Dimensions, mm	1200 x 750 x 1600

Associates:



Marketed in India through:



COMPUTRONICS
INDIA



USSR-MOSCOW

EC-5525 — MAGNETIC TAPE STORE CONTROL UNIT :

Magnetic Tape Store Control Unit EC-5525 is meant for controlling magnetic tape storage devices EC-5025 and EC-5017.

Device EC-5525 facilitates interaction of channel circuits, having high speed with circuits of low speed controlling the storage units.

The device receives and executes instructions from channel, transfers data between storage unit and channel, checks correctness of data being sent to storage unit and being received from it, processes information describing status

of the device and conditions in which the last operation was finished.

The device facilitates work with two channels of the same or different computer systems, increases reliability of the read information due to automatic corrections of single and group errors accuracy on one track during face coded write method, and also the result of correction during repeated reading by method WRZ-1.

The device EC-5525 having been constructed on the basis of integral circuits and discrete elements has got exhaustive check system for the information being processed and equipment.

TECHNICAL CHARACTERISTICS :

Method of connection to channel

Number and code number of the storage units that can be connected to the device

Maximum speed of data transfer

Power supply

Power consumption

Dimensions

Standard interface

upto 8 storage unit of type
EC-5025 and EC-5017

126 K. Bytes per second

380/220 Volts; 50 HZ

1 K. Watt

1200 X 750 X 1600 mm

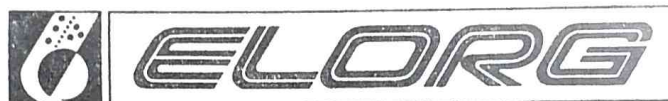
Associates :



Marketed in India through :



COMPUTRONICS
INDIA



USSR-MOSCOW

EC-5551 (EC-5551M)

REMOVABLE MAGNETIC STORE CONTROL UNIT :

The EC-5551 unit is designed to control the operations of external storage devices employing removable magnetic disks covered by the EC computers' Nomenclature.

Up to 8 external storage devices can be connected to the control unit. The data exchange is accomplished with one of the stores logically connected to the control unit.

The EC-5551 control unit is furnished with a two-channel switch for operation in a multisystem mode. The unit may be connected either to a selector.

The data transmission between the control unit and the channel is carried out in 8-bit bytes with an additional check position while the data

flow between the control unit and a store is accomplished in the bit-by-bit manner with the use of cyclic file checks.

Constructionally the EC-5551 unit is built as typical rack. It includes the following functional units':

Central Control Unit;
Microcommand storage unit;
Arithmetic-logic assembly;
Storage interface unit;
Channel interface unit;
Supply unit;
Engineer's console.

The unit has hardware facilities intended for monitoring the data being processed checking the performance of the store units connected, and trouble shooting.

The control unit is based on the use of integrated circuits and discrete components.

TECHNICAL CHARACTERISTICS :

Number of channels to which the control unit may be connected simultaneously	2
Connection channel	through standard input-output interface
Number of removable magnetic disk storage devices EC-5052, EC-5056, EC-5050 simultaneously connected to the unit	upto 8
Maximum data transmission speed, kbyte/s	156
Power supply :	
voltage, V	380/220
frequency, Hz	50
Dimensions, mm	1200 X 750 X 1600

Associates :



Marketed in India through :



COMPUTRONICS
INDIA



USSR-MOSCOW

EC-5561 — REMOVABLE MAGNETIC STORE CONTROL UNIT :

The EC-5561 unit is designed to control the operation of external storage devices employing, removable magnetic disks covered by the EC Computers Nomenclature.

Upto 8 external storage devices can be connected to the control unit. The data exchange is accomplished with one of the stores logically connected to the control unit.

The EC-5561 control unit is furnished with a two channel switch for operation in a multisystem mode. The unit may be connected to a selector.

The data transmission between the control unit and the channel is carried out in 8-bit bytes with an additional check position, while the data flow between the control unit and a store is ac-

complished in the bit-by-bit manner with the use of cyclic file checks.

Constructionally the EC-5561 unit is built as typical rack. It includes the following functional units :

- Central control unit;
- microcommand storage unit;
- arithmetic-logic assembly;
- storage interface unit;
- channel interface unit;
- supply unit;
- engineer's console.

The unit has hardware facilities intended for monitoring the data being processed, checking the performance of the store units connected, and trouble shooting.

The control unit is based on the use of integrated circuits and discrete components.

TECHNICAL CHARACTERISTICS :

Number of channels to which the control unit may be connected simultaneously	2
Connection to channel	through standard input-output interface
Number of removable magnetic disk storage devices EC-5061, simultaneously connected to the unit	upto 9
Maximum data transmission speed, kbyte/s	312
Power supply :	
Voltage, V	380/220
Frequency, Hz	50
Dimensions mm	1200 X 750 X 1600

Associates:



Marketed in India through :



**COMPUTRONICS
INDIA**



USSR-MOSCOW

EC-6019 PUNCHED CARD READER

PURPOSE AND OPERATION PRINCIPLE

The EC-6019 punched card reader is intended for reading data punched on cards, converting the data into electric signals and feeding them into an electronic computer.

The device employs series 155 integrated microcircuits and discrete components. Punched cards are vacuum-fed, with their narrow side forward.

Information is read column by column photo-electrically.

The reader can be connected to the multiplexor or selector channel of EC computers and operate in the multiplex or burst mode.

The device can read information punched in any code without conversion and also information in the KPK-12 punched card code with its conversion into the binary information interchange code.

The speed of reading and the reading mode are set by a command from the electronic computer.

The features that make the reader differ from similar devices are a high reading speed, the use of two stackers and higher punched cards usage factor.

The reader is intended for stationary operation at an ambient temperature from 278 to 313 K (5 to 40°C), relative humidity of 65 ± 15 per cent and atmospheric pressure of $(1015 \pm 40) \cdot 10^2$ Pa (760 ± 30 mm Hg).

TECHNICAL CHARACTERISTICS :

BASIC SPECIFICATIONS

Reading speed cards/min	up to 1200
Use of punched cards, times	≥ 100
Feed hopper capacity, cards	1850 ± 100
Stacker capacity, cards	1850 ± 100 ; 300 ± 60
The device reads 80-and 45-column punched cards.	
A.C. power supply :	
Voltage, V	220/380 V + 10%
Frequency, Hz	50 ± 1 -- 15
Maximum power consumption kVA.	1.5
Mass, kg.	450
Overall dimensions, mm	1200 X 750 X 1200

Associates:



Marketed in India through:



COMPUTRONICS
INDIA



USSR-MOSCOW

EC-6022 PUNCHED TAPE READERS

The EC-6022 unit is designed to read data punched onto paper tape and enter it into a computer. In this case 5-, 6-, 7- and 8-track tapes may be used as the medium.

The location of data on the paper tape and the shape and size of the holes are in compliance with the GOST 10860-68 Specifications.

TECHNICAL CHARACTERISTICS :

Input speed lines/s	1500
Reading principle	photoelectric
Check method	by odd parity check
Tape width, mm	17.5; 22.5 and 25.4
Power consumption, kVA.	0.8 max.
Dimensions, mm	1200 X 500 X 1400
Mass, kg	200

Associates :



Marketed in India through :



COMPUTRONICS
INDIA



USSR-MOSCOW

EC-7012 PUNCHED CARD OUTPUT DEVICE

The EC-7012 device is designed for output of data transmitted from a channel in the form of electrical signals to 80-column cards.

The punched card output device is connected to the computer through a multiplexer channel and can operate in the multiplex and burst modes.

Data are punched onto cards position-after-position electromechanically. The operation of a card output is either off-line or from a computer through an i-o interface.

The device has a buffer area of one card capacity. After the card has been filled, this area

disconnects from the channel and punches the card separately.

The card is punched in all 12 positions with a packing factor of 0.7. Data are punched in cards with hardware conversion into the KPK-12 code as well as in any code without conversion.

The mode of operation is specified by the instruction code. The punch monitoring is by comparison with the aid of a unit composed of 80 echo-transmitters.

The punched card output device utilizes integrated circuits and discrete components.

TECHNICAL CHARACTERISTICS :

Output speed, cards min	250
Number and capacity of punch card pockets :	
hopper	one 1200 cards
stacker	two 1200 cards
Presentation code	KPK-12
Input data code	DEBC
Power supply :	
voltage, V	380/220
frequency, Hz	50
Power consumption, kVA	2 max.
Dimensions, mm	1350 x 650 x 1270

Associates:



Marketed in India through:



**COMPUTRONICS
INDIA**



USSR-MOSCOW

EC-7022 PUNCHED TAPE OUTPUT DEVICE

The EC-7022 device is designed for punched paper tape output of data transmitted from a multiplexer or selector channel.

The hole punching is complete. The sprocket holes are along the axis of the data holes.

The device elaborates the output instructions with conversion of the binary code into the paper tape 7 bit code and without the conversion of the output code (duplication mode) when punched into the paper tape is any 8-bit code. In the conversion mode the data are punched into an 8-track tape with parity check. In the operation without conversion the data is punched into 8- and 5-track tapes with or without parity check.

The EC-7022 device elaborates the out instructions with modifications allowing a record end flag to be punched at the end of the output file.

The unit incorporates an internal tape feed unit and a chads bin.

The operator's equipment makes it possible :

to feed (load) the paper tape manually;

to set the output mode for 8- and 5-track paper tapes;

to set the output mode with an even or odd parity check or without parity check;

to set any code of record end flag;

to set either the multiplexer or burst mode of operation.

The punch unit utilizes integrated circuits and discrete components.

TECHNICAL CHARACTERISTICS :

Connection to channel	through standard input-output Interface
Tape width, mm	17.5 and 25.4
Number of tracks	5 and 8
Mode of operation	start-stop
Punching speed, lines/s	up to 150
Data presentation code	KOI-7, any 8- and 5-bit code
Input data code	KOI-8, any 8-bit code
Check principle	odd parity hardware check and code validity check
Presence of buffer storage block	9-bit register
Power supply :	
voltage, V	380/220
frequency, Hz	50
Power consumption, VA	800
Dimensions, mm	1200 x 500 x 1190

Associates :



Marketed in India through :



**COMPUTRONICS
INDIA**



USSR-MOSCOW

EC-7032 ALPHANUMERIC PRINTER

The EC-7032 alphanumeric printer is designed for use in the EC-1033 machine system to perform the function of printed data output.

The printer is underlain by the wheel printer principle with the character wheels continuously rotating and with limited penetration of the hammers.

The printing solenoids are available in the form of modules, four solenoids in each module. The vertical start-stop movement of the paper is accomplished by two electromagnetic clutches by means of tractors. To use paper of different formats the tractors are displaced by means of handles.

When use is made of forms, the form movement is with the aid of a punched tape with four tracks.

The printer has a buffer memory of 128 bytes in capacity. The printer starts its operation after the memory is filled or on an instruction from the computer.

The printer uses hardware checks when data are transmitted from the processor to the buffer memory and from the latter to the printer.

The printer includes an operator's desk which carries the controls and indicators.

The electronic part of the printer utilizes integrated circuits and discrete components.

EC-7032 Characters

А Б В Г Д Е Ж З И Й К Л М Н О П
Р С Т У Ф Х Ц Ч Ш Щ Ъ Ы Э Ю Я
1 2 3 4 5 6 7 8 9 ! ? " , %
+ - / (,) . : ; - =
D F G I J L N Q R S T U V W Z

TECHNICAL CHARACTERISTICS :

Connection to the channel	through standard input-output interface
Paper feed :	
method	asynchronous
for the first line, ms	16
for each line that follows, ms	10 max.
Printing speed, lines/min.	900
Number of characters per line	128
Paper characteristics :	
width, mm	80—420
thickness, g/m ²	50
number of copies	5
Maximum length of tape in feed pocket, mm	1000
Power supply :	
voltage, V	380/220
frequency, Hz	50
power consumption, kVA	2
Dimensions, mm	160 x 650 1270

Associates:



Marketed in India through :



COMPUTRONICS
INDIA



USSR-MOSCOW

EC-7051 GRAPHIC RECORDING PLOTTER

The graphic recording plotter of the board type is intended for plotting on usual paper media typical machine building and construction, drawings, weather charts, block and schematic electrical diagrams against the data available from a computer through a standard channel or from a photo-read or magneto-read unit. The graphic plotter includes an electromechanical X-Y recording plotter, plotter control unit, and data interpreter.

The operating principle of the plotter lies in the conversion to a certain law of parallel binary codes into a unitary code which is subsequently converted into a linear motion of a writing unit in rectangular coordinates.

Any graphic information may be plotted by the plotter with on ink pen on a paper medium.

The coordinate system of the plotter consists of a separately actuated cross-bar and a writing unit carriage moving along it. The cross-bar motion shifts the writing unit along axis X, while the carriage moves it along axis Y.

The plotter communicates with the input information source, performs the linear and circular interpolation, and through the control unit controls the plotter executive channel made on the basis of stepping motors.

The electronic part of the plotter employs integrated circuits and discrete components.

TECHNICAL CHARACTERISTICS :

Elemental step of writing unit, mm	0.05 or 0.025
Maximum plotting speed, mm/s	50
Paper format, mm	1200 x 1150
Work field size, mm	1050 x 1000
Multicolour plotting :	
number of colours	3
colour change method	automatic
Plotting line thickness, mm	0.3, 0.5 and 0.8
Number of plotted characters	up to 255
Plotting scale	1 in 2, 1 in 1, 2 in 1
Plotted character orientation	at 16 angles through 22.5 degrees
Type of line	continuous, broken and dash lines
Input data code	serial-parallel
Power supply :	
voltage, V	380/220
frequency, Hz	50
Power consumption, kVA	2
Dimensions, mm :	
plotter	1710 x 1640 x 970
control unit	500 x 1200 x 1050
data interpreter	500 x 1200 x 1050

Associates :



Marketed in India through :



**COMPUTRONICS
INDIA**



USSR-MOSCOW

EC-7053 PAPER CHART GRAPH RECORDER UNIT

The graph recorder unit with a standard channel interface is intended for plotting typical machine building and building drawings, block and electrical diagrams and reticular graphs on paper rolls against data supplied from a machine through a standard channel or from a photo-read and magneto-read units, types C-1051 and EC-7050.

Included in the unit are an electro mechanical X-Y recording plotter of the drum type, plotter control unit and data interpreter.

The operating principle of the graph recorder unit is in converting to a certain law of parallel binary codes into a unitary code with subsequent

its conversion into a linear motion of a writing unit in rectangular coordinates.

The coordinate system of the plotter consists of a reversing transportation drum moving the rolls along axis X and writing unit drive which moves the roll over the drum generating along axis Y. Simultaneous motion along both axis is possible.

The data interpreter accomplishes communication with the input data source, performs linear and circular interpolation and controls through the control unit the execution channels of the plotter which are based on the use of stepping motors. The data interpreter performs automatic plotting to a code upto 253 characters.

The electronic part of the unit employs integrated circuits and discrete components.

TECHNICAL CHARACTERISTICS :

Connection to channel	through standard input-output interface
Elemental step of writing unit, mm	0.1 and 0.05
Maximum plotting speed, mm/s	150
Paper format, mm	878 x 20,000
Work field size, mm	841 x 1600; 730 x 1600
Multicolour recording :	
number of colours	3
colour change method	automatic
Thickness of plotting line, mm	0.3, 0.5 and 0.8
Number of plotted characters	up to 253
Plotting scale	1 in 2; 1 in 1; 2 in 1
Plotted characters orientation	at 16 angles through 22.5 degrees
Plotting line type	continuous, broken and dash lines
Input information code	serial-parallel
Power supply :	
voltage, V	380/220
frequency, Hz	50
Power consumption, kVA	1.5
Dimensions, mm :	
recording plotter	665 x 425 x 315
control unit	500 x 1200 x 1050
data interpreter unit	500 x 1200 x 1050

Associates:



Marketed in India through :



**COMPUTRONICS
INDIA**



USSR-MOSCOW

EC-7064 ALPHANUMERIC AND GRAPHIC INPUT-OUTPUT UNIT

The unit is intended for complicated drawing and designing and other calculations with displaying graphic symbols on the screen of cathode-ray tube. Provision is made to correct the displayed symbols on CRT.

The unit has no individual applications and can be operated only on-line with one of the EC computer models by connecting to a selector or multiplexer channel.

The functional components of the unit are as follows :

- control unit;
- working memory unit;
- channel interface unit;

- character and vector generators unit;
- cathode-ray tube display unit;
- alphanumeric and functional keyboard with controls;
- supply units with controls;
- light pen unit with controls;
- engineer's desk.

The unit is software controlled. The program and the data for registration are stored in a local working storage. By using the processor program and a light pen one can perform various operations on displayed data : erasing, relocation, fetching, turning, scaling, keyboard input of text to any point of the screen and other operations.

The electronic part of the unit employs integrated circuits and discrete components.

TECHNICAL CHARACTERISTICS :

Connection to standard channel	through standard input-output interface
Diagonal dimensions, mm	43
Display size, mm	250 x 250
Frame regeneration frequency, frames/s	50
Operating colour	green
Raster size, points	1024 x 1024
Vector drawing speed, mm/ms	3
Number of characters in line :	
of basic size	74
of enlarged size	49
Number of lines :	
for characters of basic size	52
for characters of enlarged size	35
Character generation method	by lines and curves
Maximum number of characters on screen (without flicker)	2100
Number of functional keys	32
Parameters or memory buffer unit :	
capacity, bytes	2 x 4096
access cycle, us	2 max.
Information code	DEBC
Power supply :	
voltage, V	380/220
frequency, Hz	50
Power consumption, kVA	2 max.
Dimensions, mm :	
control unit	1200 x 750 x 1600
table	1490 x 660 x 700
display unit	660 x 600 x 500

Associates :



Marketed in India through :



COMPUTRONICS
INDIA



USSR-MOSCOW

EC-7906 COMPLEX

The complex includes group control units EC-7566, remote consoles EC-7066 with cathode-ray tube displays and keyboard, and a printer based on the 'Consul-260' typewriter. The complex is intended for input-output of alphabetic and numeric data with the possibility of its visual supervision, editing and documenting when operating on line with the EC Computer systems.

The remote consoles may be remoted from the group control unit at a distance of 500 m.

The EC-7566 unit provides connection of four remote consoles EC-7066 with a maximum amount of information displayed on one screen equal to 960 characters (12 lines of 80 characters each) or 8 consoles — 480 characters (12 lines of 40 characters), or 16 consoles — 240 characters (6 lines of 40 characters).

By means of the keyboard of the EC-7066 unit the operator can write, erase, request the required data from a computer, correct information and send it back to the computer or print it on the type-writer.

TECHNICAL CHARACTERISTICS :

EC-7566 Unit

Distance from the computer, m	50
Number of EC-7066 units connected	up to 16
Total capacity of screens, characters	3840
Power consumption, kVA	1.5
Supply voltage from a 3-phase line, V	220/380
Dimensions, mm	50 x 1200 x 1190
Mass, kg	300

EC-7066 Remote Console

Maximum amount of information displayed, characters	960
Number of lines	12 or 6
Number of characters in line	80 or 40
Number of characters	up to 128
Power supply :	
voltage, V	220
frequency, Hz	50
Power consumption, W	250
Dimensions, mm	730 x 480 x 470
Mass, kg	50

Associates :



Marketed in India through :



COMPUTRONICS
INDIA



USSR-MOSCOW

DATA TRANSMISSION MULTIPLEXOR EC-8402

The device EC-8402 is meant for connecting communication channels of unified series of Computer Systems with Data Transmission Equipment (DTE) and facilitating two way sequential or simultaneous exchange of information between the System and all types of Subscriber's Terminals (ST) included into Teleprocessing System, and also for exchange of information via Data Transmission Multiplexor MPD-2 or MPD-3 along Semi-duplex or duplex Telephonic or Telegraphic Communication Channels, along physical lines. The work along communication channels is independent.

Input and Output of information is carried out on request of the System as well as by forced method which is provided by corresponding programmes.

The device includes Common Control Block, connection with I/O Channel Block, connection with DTE Block, special control Block and two channel switches.

Depending upon the configuration, the device facilitates connecting of semi-duplex telephone and telegraph communication channels in quantity of 8 to 176 or duplex telephone and telegraph communication channels in quantity of 4 to 88.

Alongwith two channel Switches, the device EC-8402 facilitates alternative connection to two Multiplexor Channels of one different Computer System. Two channel switch is controlled by the System or manually.

DTM EC-8402 facilitates exchange of information with Multiplexor channel through standard I/O interface.

For all remote subscribers' terminals, the device facilitates execution of instructions, formation and transmission into multi-plexor channel or status and specified status indicators, identification of control symbols and sequences of control symbols.

Standard code GOST 13052-74 is used for working with Subscribers' Terminals and code MTK-2 for work with Telegraph equipment.

While working with Subscribers' Terminals EC-8570, the device facilitates :

- Data Transmission along telephone dedicated and undedicated, telegraph undedicated communication channels;
- Start-Stop method of Receipt-Transmission of information with a speed of 100 Bytes per second;
- Connection with MODEM 200 (EC-8001) during work along telephone undedicated communication channels, with MODEM 200 and telephone calling device EC-8061 while working along dedicated telephone communication channels, with telegraph channels;
- Increase in reliability of information with the help of cross-check for parity.

While working with Subscribers' Terminals EC-8561, EC-8563 the device facilitates :

- Data exchange among telephone undedicated communication channel;
- Start-Stop method of character synchronization of information bites with a speed of 1200 & 2400 Bites per second;

Associates :



Marketed in India through :



**COMPUTRONICS
INDIA**



USSR-MOSCOW

- Start-Stop method of character synchronisation;
- Connection with MODEM 2400 (EC-8010) while working along undedicated communication channel;
- Increase in reliability of information with the help of cross parity check.

While working with Subscribers Terminals EC-8504, the device facilitates :

- data exchange along telephone undedicated communication channels;
- Receipt and transmission of information at a speed of 1200/2400 bites per second;

- Connection with MODEM 2400 (EC-8010).

While working with Subscribers' Terminals EC-8502, the device facilitates data exchange along telephone dedicated and undedicated, along telegraph undedicated communication channels.

The device facilitates Off-line checking mode with blocking of all communications of the device with Computer System and communication channel.

The device facilitates variable configuration depending upon the number of communication channels, the type of communication channels, the type of data transmission equipment and the type of remote subscribers' terminals.

TECHNICAL CHARACTERISTICS :

Method of connecting to channel	Standard I/O interface
The type and number of communication channel for remote transmission of information	upto 176 different types of communication lines can be connected; telephone dedicated and undedicated, telegraph undedicated, physical line
Speed of Data Transmission along one Communication line	50, 100, 200, 600, 1200, 2400, 4800 bytes per second
Transmission code	MTK-2 GOST 13052-74
Method of error protection	cross parity check; lengthwise check with use of cyclic code; check with use of cyclic code in correspondence with recommendations MKKTTY-41
Power supply	380/220V + 10% — 15% 50 + 1 hz
Power Consumption	not more than 9 KW
Dimensions	1200 x 860 x 1600 mms.

Associates:



Marketed in India through:



**COMPUTRONICS
INDIA**



USSR-MOSCOW

EC-8403

DATA TRANSMISSION MULTIPLEXER

When connected to a multiplexer channel, the unit may operate either in the multiplexer or burst mode.

The multiplexer may be connected to and operate with either of the two channels of a computer or of two computers.

The multiplexer employs integrated circuits, series 155.

The EC 8403 multiplexer is intended for data exchange between remote terminals and the EC computer system over telephone and telegraph channels when used with EC-1020, EC-1022, EC-1030, EC-1033, EC-1050, and EC-1060 machines.

The multiplexer provides simultaneous independent operation over the communication channels with four terminals. Over each of the communication channels connected, the multiplexer can receive and transmit data.

The multiplexer may be connected to a multiplexer or selector channel.

TECHNICAL CHARACTERISTICS

Data exchange speed, bits/s	
over telegraph channels	50
over singled out telephone channels with 4 wire terminal	1200/2400
Code for transmission over telegraph channels	MTK-2
Code for transmission over telephone channels	as per GOST 13052-67
Power supply voltage from a 3 phase line, V	220/380
Power Consumption, KVA	2 max
Dimension, mm	1200 x 750 x 1600
Mass, kg	200

Associates:



Marketed in India through:



COMPUTRONICS
INDIA



USSR-MOSCOW

EC-9001
MAGNETIC
TAPE DATA PREPARATION UNIT

The EC-9001 unit is intended for preparing data on a magnetic tape with a view to their subsequent handling on EC Computer Models.

The unit performs two operations: writing data keyed by the operator from an alphanumeric keyboard on a magnetic tape;

printing the data read from a magnetic tape when a typewriter is connected to the unit.

The data preparation unit includes a magnetic tape assembly, control unit with a buffer memory and alphanumeric keyboard. The unit accomplishes the following operations: program input, data input, data search, program search, data verification, data output, and program output.

In addition to the main operating duties, the unit performs auxiliary operations: REPEAT OPERATION, CORRECT DATA, MANUAL DUPLICATION, DATA SKIP, PROHIBITION OF AUTOMATIC DUPLICATION AND SKIP (STEP BACK) etc.

The shaping routine is entered in the unit from the keyboard if from a magnetic tape. The input data are checked, shaped and accumulated in the buffer memory of the control unit. After the last character of the source document has been entered, the data are rewritten from the buffer memory on a magnetic tape in the form of a zone. Next, the recorded information is automatically verified and an interzone spacing is formed.

The electronic part of the unit employs integrated circuits and discrete components.

TECHNICAL CHARACTERISTICS :

Number of input characters	94
Number of simultaneously operating programs	2
Packing density, lines/mm	8
Maximum zone length, characters	128
Character keying speed, character/s.....	15
Power supply :	
voltage, V	220
frequency, Hz	50
Power consumption, KVA	0.5
Dimensions, mm	1200 x 650 x 1200

Associates:



Marketed in India through:



COMPUTRONICS
INDIA



EC-9011 CARD DATA PREPARATION AND DECODING UNIT

The EC-9011 card data preparation unit is designed for punching and decoding data punched into 80-column cards in codes used by the EC computer system with column-by-column decoding at the top of card.

The unit operates in two modes: with software control and without it.

When operating with the software control, the data are keyed in by the operator in the manual operation zones, while the unit functions without the operator's intervention in the automatic operation zones. At the operator's option the operations programmed in the automatic operation zones (except horizontal duplication) may be substituted for by any other operations.

The decoding operation in the specified zones is controlled by the program card.

Decoding may be deleted on an instruction from the operator.

When operating without the software control, all the operations are controlled by the operator manually.

In both modes, if required, a part of a card may be skipped without handling or with transfer of data from foregoing card to the next one till a certain column selected by the operator.

Nonstandard code combinations are keyed in by the operator with the MULT PCH key pressed by means of numerical keys. Nonstandard code combinations are not decoded.

The electronic part of the unit utilize integrated circuits and discrete components .

TECHNICAL CHARACTERISTICS :

Speed, columns/s :		
manual punching		up to 15
punch duplication		25
Read and punch devices output rate columns/s		100
Capacity and number of pockets :		
card hopper		one, 500 cards
card stacker		two, 500 cards each
Number of coded characters received		82
Decimal tabulator capacity, positions		3, 4, 5 and 7
Number of programs		2
Number of instructions in each program		14
Card shift when observing a punched character, columns :		
forward		5
backward		5
Power supply :		
voltage, V		380/220
frequency, Hz		50
Power consumption, KVA		0.6 max.
Dimensions, mm		1370 x 860 x 1110

Associates :



Marketed in India through :



**COMPUTRONICS
INDIA**



USSR-MOSCOW

EC-9013 CARD VERIFIER

The EC-9013 card verifier is designed to manually verify 80-column cards through repeated keying of the data by the operator.

The verifier operates in two modes: with the software control and without it.

When operating in the software control mode, data are entered in the zones of manual verification by the operator manually from the keyboard, while the operation in the automatic verification,

the operation is accomplished without operator's intervention.

When an error is encountered, the card transportation is blocked for a step with a view to repeated verifying. If the error persists in the repeated verifying step, the card is notched as rejected and then is removed from the stock.

Provision is made in the verifier to reverse the card deck.

The electronic part of the verifier employs integrated circuits and discrete components.

TECHNICAL CHARACTERISTICS :

Verifying speed column/s :	
manual	up to 15
automatic	25
Read device output rate, column/s	100
Number of coded characters	
Card hopper	one, 500 cards
Card stacker	two, 500 cards each
Number of coded characters	82
Decimal tabulator capacity, positions	3, 4, 5 and 7
Number of programs	2
Power supply :	
voltage, V	380/220
frequency, Hz	50
Power consumption, KVA	0.5
Dimensions, mm	1370 x 860 x 1100

Associates:



Marketed in India through:



**COMPUTRONICS
INDIA**



USSR-MOSCOW

PUNCHED TAPE PREPARATION UNIT

PURPOSE AND OPERATING PRINCIPLE

The EC-9024 punched card preparation unit is intended for preparing information on punched tape for EC computers.

The unit can be used for compiling programs for program-controlled machine tools and for fast preparation of process flow charts.

The unit provides the following operation modes :

punching of alphanumeric information on tape by setting it on the typewriter keyboard with simultaneous printout of this information on special forms.

reproduction of punched tape;

collation of two punched tapes;

collation of two punched tapes and reproduction of a third tape;

checking of information punched on tape by comparing it with the information set on the keyboard of a typewriter;

printing of information from punched tape onto a form;

collation of two punched tapes with re-punching of a third tape and printout of the information onto a form.

The unit permits parity check of the information punched on tape by running the tape in the reading mechanism at a speed of 50 lines/s.

The additional functions performed by the unit are: search for a specified code at a rate of 50 lines/s. (SEARCH), STOP AT CODE, automatic skipping at a rate of 50 lines/s, the OVERPUNCHING and NO PUNCHING codes, etc.

The unit provides for correction of the operator's errors that appreciably raises his operating efficiency.

The operating principle of the unit is that the decoder generates sequences of control clock pulses which cause writing of information from punched tape into the register, rewriting of information from one register into another, checking of the condition of the unit, and control in different modes. In the output register, information is checked for parity by the checking circuit and is delivered to the code electromagnets of the puncher.

Information set up by the typewriter combiner is sent through the MM register to the code electromagnets and through the code converter to the output register.

Unlike other similar devices, the EC-9024 is built around series 155 integrated microcircuits and discrete elements. The unit can be used instead of the earlier EC-9020 and "Brest-1T" tape preparation units.

Associates:



Marketed in India through:



**COMPUTRONICS
INDIA**



USSR-MOSCOW

The EC-9024 is intended for stationary operation at a temperature from 5 to 40°C, relative air humidity under 95 per cent at 30°C, atmos-

pheric pressure from 84.0 to 106.7 kPa (from 630 to 800 mm Hg) in the atmosphere free from acidic and other aggressive substances.

TECHNICAL CHARACTERISTICS :

BASIC SPECIFICATIONS

Punched tape reading principle	Photoelectric
Storage medium	paper punched tape to GOST 1391-70
Data processing speed :	
In modes involving operation of typewriter, characters/s	upto 10
in repunching mode and collation with repunching, lines/s	50
A.C. power supply :	
voltage, V	220 + 10% — 15
frequency, Hz	50 ± 1
Power consumption, VA	600
Mass, kg	260
Overall dimensions, mm	1500 x 650 x 900

STANDARD EQUIPMENT

EC-9024/0000 desk
 "Konsul-260.1" typewriter
 -150 tape puncher
 Set of operating papers
 Set of spares and auxiliaries
 Set of assembly parts
 Catalogue of assembly parts and pieces

Since the unit is being continuously improved minor changes can be made in its design without prior notice.

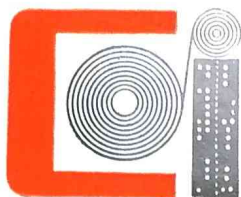
Associates:



Marketed in India through:



COMPUTRONICS
INDIA



Marketed in India through :

**COMPUTRONICS
INDIA**

M/s. Computronics India came into being in late 1971 as Marketing Agents of V/O Electronorgtechnica in India, and made a mark within six months of its inception with the delivery of a large Soviet BESM-6 Computer System to Bhabha Atomic Research Centre, Trombay. This was followed by installation of the famous Reyad (or EC) series of Computers in several cities in India. The scope of its activities was soon enlarged to Software development for export and Data Processing Consultancy. Today, the Company

has grown several hundred folds and enjoys an enviable reputation in the Computer Industry with well developed and competently manned wings covering practically all spheres of Computer activity, and its own Data Processing Centres at New Delhi, Bombay and Allahabad. The commitment of M/s. Computronics India to the twin goals of professional competence and customer satisfaction has strengthened with the years in the field of Computers and Data Processing Service.

Head Office :

16, Ring Road,
Lajpat Nagar-IV,
New Delhi-110 024.
Tel. : 611351, 611844

Bombay Office :

1, Mittal Chambers, Ground Floor,
Nariman Point, Bombay-400 021.
Tel. : 230741, 230860

Madras Office :

7-A, Kasturi Ranga Iyengar Road,
MADRAS-600 018.
Tel. : 75704

Calcutta Office :

1-G, "Everest" 1st Floor,
46/C, Jawaharlal Nehru Road,
CALCUTTA-700 071.
Tel. : 448249

Associates :



ELECTRONICS TRADE & TECHNOLOGY DEVELOPMENT CORPORATION (ETTDC)

Electronic Trade and Technology Development Corporation (ETTDC) is a Government organization set up by department of Electronics to boost trade in the field of electronics. ETTDC will sign contract on behalf of the customers with the principals and will look after their interests in the fulfilment of contract obligations.

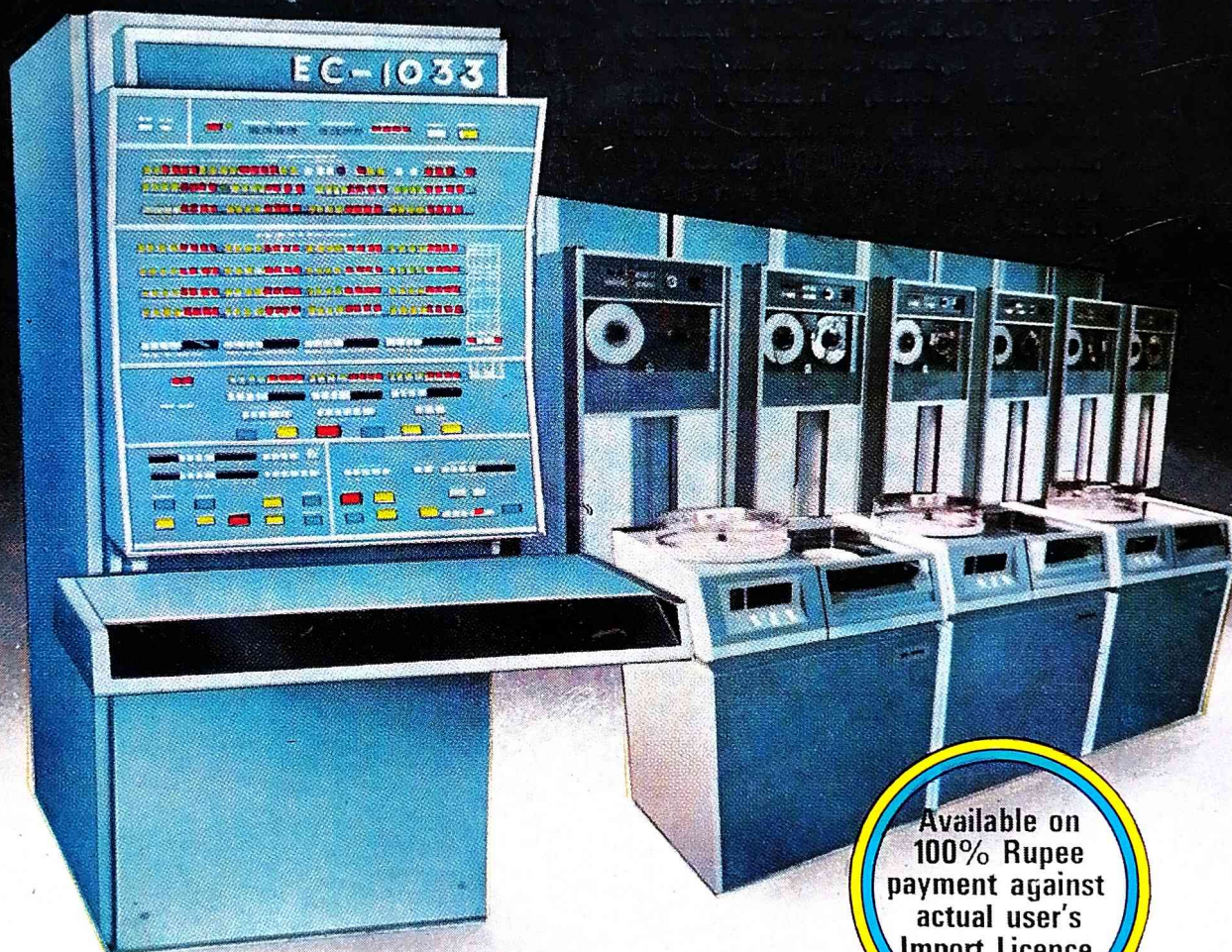
New Delhi : 15/48, Malcha Marg,
Chanakyapuri, New Delhi-110021.
Tel. : 372640, 372782, 373296

Bombay Office :

Air India Bldg., Nariman Point,
Bombay-400 021.
(Office at : Madras)

EC-1033

New high rate performance Third Generation Computer System from the U.S.S.R.



INTERADS

- Belongs to the family of the Unified System of Electronic Computers (EC Computers) of Socialist countries.
- May be expanded from a small set to a multiprocessing system, which allows to select a most adequate configuration and enables the cost-to-performance ratio to be brought up to minimum.
- Has been developed and produced by applying modern methods in design and technology.
- Has high rate of performance. It is equally efficient in scientific and business applications.

- Is designed on the advanced integrated element base, it incorporates recovery aids thus providing high reliability of the computer.
- Employs a highly effective checking, both when transmitting and transforming information.
- Low power consumption, small dimensions, few contacts and wiring connections.
- Is furnished with an automatic system of fault diagnostics, which allows for an accurate and quick detection of a block out of repair.

- May become a part of your multicomputer complex. It is fitted with direct control facilities, providing connection with other computers.
- Incorporates a modern effective software system of OC EC type. The OC EC operational system will offer wide possibilities for your specialists.
- Machine cycle 300 nsec doubled capacity primary storage of 512 K. Selector channel capacity-800 Kbytes per second.

Supplied by



V/O ELECTRONORGTECHNICA

32/34 Smolenskaja Sennaya Pl. MOSCOW-G-200/121200 U.S.S.R. Tel : 251-39-46 Telex : 7586
BOMBAY OFFICE : U.S.S.R. TRADE REPRESENTATION "AVANTIKA" 46, Dr. G. DESHMUKH MARG. BOMBAY-400 026.

Available on
100% Rupee
payment against
actual user's
Import Licence.

Marketed in India through :



**COMPUTRONICS
INDIA**
16, Ring Road,
Lajpat Nagar-IV,
NEW DELHI 110 024.
(Branches at Bombay,
Madras & Calcutta)



Associates :

**ELECTRONICS TRADE &
TECHNOLOGY DEVELOPMENT
CORPORATION (ETTDC)**
15/48, Malcha Marg, Chanakyapuri,
New Delhi-110 021.