Pendix 615

GENERAL PURPOSE DIGITAL COMPUTER

POWERFUL, LOW COST



THE BASIC G-15 COMPUTER

is a complete computer

PUNCH

PHOTOREADER

TAPE MAGAZINE

... with many extra features

The basic G-15 computer installation is a complete operating computer system. It includes an internal magnetic drum memory of 2176 words, an alphanumeric electric typewriter, a paper tape punch and a unique high-speed photo-electric tape reader, all furnished at no added cost.

The photo-electric reader accepts 2500 word magazines of punched tape which can be kept in a convenient library and placed in reading position quickly and neatly. Under program control, tape can be searched in either direction or read at 250 characters/second, simultaneously with computation. The computer's memory can be completely loaded from paper tape in 90 seconds or less, including input checking. Thus this exclusive G-15 reader greatly expands the storage capacity of the basic computer, when such capacity is needed. The tape punch provides output at 17 characters/second.

FULL and DIRECT alphanumeric input, output and control for the computer is accomplished with the alphanumeric electric typewriter. This typewriter is FULLY alphanumeric because every upper and lower case character may be typed into and out of the G-15. It is DIRECTLY alphanumeric because the user types exactly what he sees on the keyboard. No manual encoding is required.

> The G-15 alphanumeric typewriter may be operated in alphanumeric mode or in numeric mode. Desired mode is selected manually or by a single stored command. The computer's memory may be directly addressed or interrogated, and programs may be debugged, using this unit.

NEW ALPHANUMERIC TYPEWRITER

AUTOMATIC PROGRAMMING with simplified new techniques

POGO The newest of the versatile G-15 programming systems, POGO recodes simplified programs into machine language, and selects the location in its memory where each instruction can be found in the shortest possible time. Thus, a programmer with very little experience can write high-speed production programs.

POGO commands are very similar to those used in the INTER-COM 1000 system. The principal difference in the two systems is that POGO compiles an optimum machine language program

INTERCOM 1000 With just four hours of instruction, personnel who have had no computer experience can easily solve long and complex problems, using simplified INTERCOM 1000 programming.

Since this programming system was developed, many companies have found new efficiency through high-speed computation right in the office or laboratory. There, problems can be solved not by computer experts, but by the personnel who know those problems best. This new problem-solving technique has been made possible by INTERCOM 1000. The secret is INTERCOM 1000's interpretive ability . . . to make a single, simplified command perform a number of internal computer operations. Since the operator needs to know only the few simple commands, valuable time is requiring no interpretation during computation, and reproduces it for repeated use. While INTERCOM 1000 is ideal for open shop problems, POGO may be preferred for high-speed production problems that must be solved repeatedly.

In POGO, data is handled in fixed point decimal form. Seventeen accumulator registers are available, as well as twelve index registers, which can be used to modify the effective address of any command.

saved in both training and actual programming.

INTERCOM 1000 input and output data can be in normal decimal form or can be represented by a decimal fraction preceded by a power of 10. For example, the number 186.02 may be represented in input or output as either 186.02 or as 53.18602, where the 53 represents the exponent 3, expressed in excess 50 form. Without changing commands, INTERCOM 1000 will operate with either a five or a twelve decimal digit word of positive or negative value.

INTERCOM 1000 commands are single address. Memory addresses may be modified automatically by index registers. The command list contains all arithmetic operations, transfers of control for decision making, input-output operations, and special commands for facilitating the use of subroutines.

BASIC CODING

The G-15's basic machine language system is exceptionally powerful and versatile. A modified two-address system, it includes logical extracts and various tests as well as all arithmetic operations. Using this system, the G-15 offers internal control unequalled by other computers of its size.

SPECIFICATIONS using basic programming system

EXECUTION TIMES

Add and subtract Single precision - 0.27 msec. Double precision - 0.54 msec.

Multiply and divide

Single precision -2.16 to 16.4 msec. Double precision -2.16 to 32.8 msec.

G-15 multiplication and division is of arbitrary precision. Figures above represent the range between single decimal digit precision and maximum precision. Access time to magnetic drum storage locations can be minimized and often eliminated through use of the G-15's fast access coding facilities. The time required to read any command is 0.27 milliseconds.

STORAGE

2176 words of magnetic drum memory

16 words are fast access...0.54 msec. average

2500 word searchable, high-speed paper tape magazines

BUFFERING

108 words of memory drum may be used as a buffer, to allow computation during input and output operations.

AUXILIARY STORAGE

See magnetic tape units, under accessories.

NUMBER SYSTEM

Decimal, input/output Serial binary, internal

WORD SIZE

Single precision 7 decimal digits, input/output 29 binary digits, internally Double precision 14 decimal digits, input/output 58 binary digits, internally

Any command may be specified to be single or double precision.

ACCESSORIES

No other computer offers such a wide variety of standard accessories. All of the units listed below, plus many special devices, may be connected by means of plugs on the back of computer. Thus, the user may start with the basic equipment and add expanded capacity as his needs grow.





AUXILIARY PHOTOELECTRIC PAPER TAPE READER model PR-1

Up to three units, plus the G-15 built-in reader, may be used for operations requiring two or more computer-controlled input sources. Exclusive feature: searchable, magazineloaded tape, 2500 words per magazine.

speed: Read or search – 250 characters/second



MAGNETIC TAPE UNIT model MTA-2

For auxiliary storage, up to four of these inexpensive units may be connected to one G-15. Each stores 300,000 words, and can be searched for blocks of up to 108 words or for file sections of any number of blocks.

speed: Input/output-430 characters/second

> Search-2600 characters/second



PUNCHED CARD AND TABULATOR COUPLER model CA-2

Allows use of up to three standard IBM punches, readers and tabulators with G-15, for high-speed punched card input and output, and printed output. Handles full 80 columns of mixed numeric, alphabetic and special character data. Lowest cost complete system on the market.

speed: Input– 100 cards/minute Output–

100 cards/minute 100 lines/minute



PUNCHED CARD COUPLER model CA-1

An inexpensive unit for small volume, low-cost punched card operations. One or two IBM 026 reader-punches may be used with one coupler.

speed: Input-17 columns/second Output-11

columns/second



MULTI-CODE PAPER TAPE READER model PR-2

High-speed input from 5, 6, 7 or 8 level paper tapes bearing any numeric code. Stops on one character. Immediately converts external code to G-15 code, without internal programming. External code changes can be made in seconds. Accepts tapes from the G-15 or any other device.

speed: Input-400 characters/second



DIGITAL DIFFERENTIAL ANALYZER model DA-1

Enables the G-15 to operate as a digital differential analyzer for the simplified solution of linear and non-linear differential equations. Provides 108 integrators and 108 constant multipliers.

speed: 34 iterations per second



This accessory provides compatibility between the G-15 and other computing. data handling and communications devices. Any alphanumeric code of eight levels or less can be read into the computer, operated on, and fed out in the same or another code, all under program control. The AN-1 is equipped with high-speed paper tape reading and punching devices, but may be connected directly to other input and output devices.

speed: Input/output—with standard paper tape— 60 characters/second Input/output—with other devices—up to 225 characters/second



AUXILIARY PAPER TAPE PUNCH model PTP-1

For high-speed tape punching, in addition to the G-15 built-in punch, the PTP-1 punches 5 channel tape at 60 characters per second. Easy loading. Reel-less winding device.



GRAPH PLOTTER model PA-3

For G-15 or DA-1 output. Plots one variable against another in 1/100 inch increments.

speed: Output-200 increments/second EASY TO USE

FAST AND VERSATILE

ALPHANUMERIC INPUT-OUTPUT

LOW COST PER ANSWER

LARGE STORAGE CAPACITY

EXPANDABLE

VARIED INPUT-OUTPUT

EQUIPPED FOR ON-LINE USE

ESTABLISHED USERS' ORGANIZATION

LARGE PROGRAM LIBRARY

NATIONWIDE SALES AND SERVICE

LEASE AND PURCHASE PLANS

Many industrial, scientific and merchandising organizations are finding imaginative solutions to a wide range of problems through computer inspired mathematical and data processing methods. The Bendix G-15 is the key to such progress in over 300 of these private companies and government agencies, throughout the world.

With its unusually flexible programming systems, the G-15 is ideally suited to both repetitive and non-repetitive problems, regardless of complexity. Users range from one man consulting firms to the world's largest universities and manufacturers.

You are invited to discuss the application of the G-15 to your own specific requirements. Complete literature is available on technical specifications, accessories and applications. In addition to numerous reports on a broad scope of applications, a special bulletin describes in detail the characteristics of the G-15 that make it ideal for on-line data processing and control systems. Ask for a copy.

Contact your nearest Bendix Computer office, staffed by experienced personnel. They will be happy to advise you.

SALES OFFICES

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Service centers in all principal cities throughout the United States.

THE BENDIX CORPORATION Computer Division, Los Angeles 45, California

Bendix GIG APPLICATIONS

The G-15 General Purpose Digital Computer is saving manpower and increasing efficiency in scores of progressive businesses, large and small, throughout the world. Some of the applications of G-15 users are:

Aviation Industry

Business Data Processing

Civil Engineering ...

Crystallography

Geodetics and Navigation

Hydrology

Analysis of landing gear systems Auto-pilot design Flight pattern scheduling for jet aircraft Flight test data reduction and analysis Missile component study through computer simulation Missile guidance and trajectory analysis Missile impact prediction Multiple airborne target tracking Radar antenna design Stress analysis Wind tunnel data reduction

Actuarial calculations Inventory control Labor distribution Mortgage amortization Payroll processing Sales audit and unit control Standard cost comparison

Highway construction and design Photogrammetry Sewer design based on rain run-off calculations Truss analysis Structural analysis and design Surveying Traffic analysis

Atomic form factors Computation of X-ray scattering parameters

Crystal structure factors Lengths and angles between inter-atomic vectors Two-dimensional Fourier synthesis

Cartography

Coordinate conversion

Inertial navigation studies

Navigation calculations for carrier air traffic control Shipboard navigational fixes in real time Weather computations

Backwater analysis

Correlation of factors of stream flow and reservoir storage in a hydroelectric system

Dam design

Power generation Reservoir design for maximum power output Spillway flood routing Industrial Research Machine Tool Industry

Mathematical Analysis

Nuclear Research ..

Optical Industry

Petroleum Industry

Textile Industry

Universities

Air traffic control study Distribution of radio-active materials on a surface Heat transfer studies Information retrieval

Radar research Study of optimum designs for electromechanical device Vibration and motion studies Cam design

Design of gear cutters and shaving tools Numerical control of machine tools

Analysis of variance Complex polynomials Eigen-values and Eigen-vectors Fourier analysis Generation of tables of specialized functions Matrix calculations Least square curve fitting Multiple regression analysis Probability analysis Simultaneous linear and non-linear differential eq Simultaneous linear and non-linear algebraic equa

Sum of squares and correlation coefficients

Design of nuclear power plant Design of gas-cooled power reactor Nuclear reactor simulation Nuclear and thermonuclear energy application weapons systems

Optical lens design Ray tracing

Catalytic cracking Crude oil reservoir studies Distillation equipment desigr Gas network analysis

 Harmonic analysis of ocean waves for off-shore drilling Interpretation of seismic data Oil production analysis Petroleum exploration and refining Pipeline design for gas transmission

Denier of fiber computation from resonant frequency Elasticity studies Strain gauge tests of synthetic fibers and plastic materials Strass-strain and pulse-propagation data for fibers

Classroom instruction

Laboratory experimentation

Statistical analysis for animal industry



DIVISION OF BENDIX AVIATION CORPORATION

PUNCHED CARD

Bendix

AND TABULATOR

COUPLER

... a new accessory for the Bendix G-15 Digital Computer for low cost, high performance

punched card computing and

data processing

Now, at a cost significantly below that of any similar equipment, Bendix provides a complete computing system with 100 card per minute punched card input and output, and 100 line per minute tabulation.

Heart of the system is the Bendix G-15 general purpose digital computer, which has proven its performance in over 300 successful installations.

The CA-2 coupler, a newly developed G-15 accessory, enables the computer to operate in conjunction with conventional punched card and tabulating equipment.

A full 80 columns of numeric, alphabetic, or special character information can be accommodated using only the CA-2 as a connecting link between the card equipment and the G-15. Any column of the card can contain any one of the three types of information.

Three input-output units may be connected simultaneously... Data may be read or punched by standard card units, or printed by standard tabulators. All input and output is under complete control of the computer. Computation can proceed during the input or output cycle, thus assuring maximum over-all computing speed.

In addition to the CA-2, the computer's typewriter and paper tape equipment, and auxiliary magnetic tape storage units may be used for completely versatile input, output, and storage. Both power and space requirements of the complete punched card computer system are approximately half that of other systems of this type.

A system that includes the G-15 computer, the CA-2 coupler, two summary punches and a tabulator, leases for approximately half the price of a typical medium-priced system with similar capabilities.

Whether you are now using punched card or computing equipment, or if you are delaying such plans due to high costs, you will want to learn more about this inexpensive, efficient equipment. Detailed technical information on the G-15 and the CA-2 will be sent on request. Write to the Bendix Computer Division of The Bendix Corporation, Los Angeles 45, California









The G-15 is a general purpose digital computer. Low in cost and of medium speed, it is useful for an almost unlimited range of applications. Its physical size has been kept small by the use of serial logic and time-sharing techniques in internal design.

The basic price of the computer includes an electric typewriter for input, output and control, a high-speed photoelectric paper tape reader, and a paper tape punch. The CA-2 coupler, as well as other minimum cost card couplers and magnetic tape memory units may be obtained as accessories. Special accessories include an inexpensive device which enables the computer to perform as a digital differential analyzer, for direct solution of differential equations.

G-15s are available on either a lease or purchase basis. For detailed specifications and applications data, contact the Bendix Computer office nearest you. You will be surprised at the low-cost and simplicity of electronic computation with the G-15, already serving scores of progressive businesses, large and small, throughout the world.

Bendix Computer Division



offices

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Thank You ...

... for your interest in the G-15 Computer.

In answer to your recent request, we are enclosing literature describing this equipment.

Price of the basic computer with a numeric typewriter is \$49,500 on purchase, or \$1,485 per month, including maintenance, on our lease plan. With an alphanumeric typewriter, the price is \$51,000 or \$1,530 per month.

You may use the attached card to request any of the additional information on G-15 applications and programming, listed on the back of this sheet.

If you would like to discuss the application of the G-15 to your specific requirements, please contact the Bendix Computer Office nearest you. These offices are staffed with experienced men who will be pleased to assist you.

O. PAUL STADERMAN Director of Marketing

Prices are subject to change without notice.



NO POSTAGE STAMP NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL FIRST CLASS PERMIT NO. 33210. LOS ANGELES, CALIFORNIA

POSTAGE WILL BE PAID BY THE Bendix CORPORATION

COMPUTER DIVISION

Eastern Regional Office 1000 Connecticut Ave. N.W. Washington 6, D.C.

EQUIPMENT

- G-15 Descriptive bulletin, 6 pages 1
- G-15 Computing System, technical bulletin, 16 pages 2
- 3 CA-1 Punched Card Coupler, technical bulletin, 12 pages
- CA-2 Punched Card Coupler, technical bulletin, 36 pages 4
- MTA-2 Magnetic Tape Units, technical bulletin, 12 pages 5
- Paper Tape Accessories, 1 page 6
- DA-1 Digital Differential Analyzer Accessory, 7 technical bulletin, 12 pages
- G-15 Installation Bulletin, giving space and 8 power requirements, 12 pages
- Bendix Tape Control System (Machine Tool Controls), 9 12 page brochure
- PR-2 Multi-Code Photo-Tape Reader, 5 page bulletin 10
- G-20, descriptive brochure, 20 pages 11
- G-20, technical introduction, 24 pages 12

PROGRAMMING

- INTERCOM 1000 programming and operating 100 manual, 28 pages
- INTERCOM 1000 pocket reference card 101
- 102 INTERCOM 1000 descriptive brochure, 4 pages
- POGO Programming Manual, 16 pages 103
- AUTOPOINT 24 descriptive brochure, 24 pages 104

A partial list of data available on request.

REQUEST FOR ADDITIONAL INFORMATION

- PLEASE SEND THE DATA REQUESTED AT RIGHT.

APPLICATIONS ... COMMENTS

Zone

Name Company Address City

APPLICATIONS

- 200 On-Line Computation, 12 page bulletin on data processing and control
- Gas Pipeline Design, 4 page report 201
- Turbine Design, 4 page report (McCulloch Motors) 202
- Gear Cutting Tool Design, 4 page report 203 (Fellows Gear Shaper Co.)
- 204 Cam Design, 4 page report (Eclipse-Pioneer)
- Wind Tunnel Data Reduction, 6 page report (M.I.T.) 205
- Inertial Navigation Development, 2 page application 206 and reliability report (BuShips)
- Oil Application Survey, 4 pages 207
- General Purpose Computer in Academic Life, 6 pages 208
- Invoice Preparation and Account Updating, 2 pages 209
- Inventory Control Program at Queen Knitting Mills, 4 pages 210
- Solution of Seven Simultaneous Equations with the 211 DA-1, 4 page report
- All available data on G-15 civil engineering applications 212
- Pipeline Design & Optimum Use Report, 2 pages 213 (Texas Gas Transmission Co.)
- Petroleum & Seismic Problems, six 2 page reports 214
- Radar Antenna Design, 5 page report (Bendix Radio Div.) 215
- Mechanical Design Problems, 5 page report 216 (Bendix Products Div.)
- 217 UCLA's Engineering Executive Program, American Engineer reprint
- Evaluation of Fresnel Integrals, 8 page bulletin 218
- List of Typical G-15 Applications 219

PLEASE HAVE A QUALIFIED BENDIX COMPUTER REPRESENTATIVE MAKE AN APPOINTMENT TO DISCUSS POTENTIAL APPLICATIONS.	1	2	3 4	5	6		
PLEASE HAVE A QUALIFIED BENDIX COMPUTER REPRESENTATIVE CALL ON ME NEXT TIME HE IS IN THIS AREA.	7	8	9 10	0 11	12		
] PLEASE ADD MY NAME TO YOUR MAILING LIST TO RECEIVE DATA ON NEW EQUIPMENT AND APPLICATIONS.	100	101	102	103	104		
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