POWERFUL, LOW COST
...EASY TO USE

Bendix

G-15

GENERAL PURPOSE DIGITAL COMPUTER
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.
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 INTERCOM 1000 system. The principal difference in the two systems is that POGO compiles an optimum machine language program 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.

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 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 unequaled by other computers of its size.

SPECIFICATIONS using basic programming system

<table>
<thead>
<tr>
<th>EXECUTION TIMES</th>
<th></th>
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<tbody>
<tr>
<td>Add and subtract</td>
<td></td>
</tr>
<tr>
<td>Single precision</td>
<td>0.27 msec.</td>
</tr>
<tr>
<td>Double precision</td>
<td>0.54 msec.</td>
</tr>
<tr>
<td>Multiply and divide</td>
<td></td>
</tr>
<tr>
<td>Single precision</td>
<td>2.16 to 16.4 msec.</td>
</tr>
<tr>
<td>Double precision</td>
<td>2.16 to 32.8 msec.</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>STORAGE</th>
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<tbody>
<tr>
<td>2176 words of magnetic drum memory</td>
<td></td>
</tr>
<tr>
<td>16 words are fast access...0.54 msec. average</td>
<td></td>
</tr>
<tr>
<td>2500 word searchable, high-speed paper tape magazines</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>BUFFERING</th>
<th></th>
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<tr>
<td>108 words of memory drum may be used as a buffer, to allow computation during input and output operations.</td>
<td></td>
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<table>
<thead>
<tr>
<th>AUXILIARY STORAGE</th>
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<tbody>
<tr>
<td>See magnetic tape units, under accessories.</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>NUMBER SYSTEM</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Decimal, input/output</td>
<td></td>
</tr>
<tr>
<td>Serial binary, internal</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WORD SIZE</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Single precision</td>
<td>7 decimal digits, input/output</td>
</tr>
<tr>
<td>29 binary digits, internally</td>
<td></td>
</tr>
<tr>
<td>Double precision</td>
<td>14 decimal digits, input/output</td>
</tr>
<tr>
<td>58 binary digits, internally</td>
<td></td>
</tr>
</tbody>
</table>

Any command may be specified to be single or double precision.
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, magazine-loaded tape, 2500 words per magazine.

speed: Read or search—250 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

**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

**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 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

**DIGITAL DIFFERENTIAL ANALYZER**
model DA-1


speed: 34 iterations per 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

BOSTON 16, 80 Boylston Street, CApitol 7-0450
CHICAGO 11, 919 N. Michigan Avenue, Michigan 2-6692
CLEVELAND 13, 55 Public Square Building, CHerry 1-7789
DALLAS 1, 1511 Bryan Street, Riverside 7-8805
DETROIT 37, 12950 West Eight Mile Road, JOordan 6-8789
KANSAS CITY 11, MO., 3430 Broadway, VAlenette 1-8681
LOS ANGELES, 291 S. La Cienega Blvd., Beverly Hills, California, OLander 5-9610
NEW YORK 17, 205 East 42nd Street, Room 1205, ORegon 9-6990
SAN FRANCISCO, 1330 Broadway, Oakland 12, California, GLeencourt 2-3664
TUCSON, P.O. Box 4333, University Station, MAin 3-0106
WASHINGTON 6, D.C., 1000 Connecticut Avenue N.W., STerling 3-0311
CANADA, Computing Devices of Canada P. O. Box 508, Ottawa 4, Ontario, Canada, TA1bot 8-2711
OTHER COUNTRIES, Bendix International Division 205 E. 42nd Street, New York 17, New York, MUrray Hill 3-1100

Service centers in all principal cities throughout the United States.

Bendix

THE BENDIX CORPORATION

Computer Division, Los Angeles 45, California
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**

**Applications**

- Airborne computer design
- 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

*Continued*
Air traffic control study
Distribution of radio-active materials on a surface
Heat transfer studies
Information retrieval
Lamp research
Radar research
Study of optimum designs for electromechanical devices
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 equations
Simultaneous linear and non-linear algebraic equations
Statistical analysis for quality control
Sum of squares and correlation coefficients

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

Optical lens design
Ray tracing

Catalytic cracking
Crude oil reservoir studies
Distillation equipment design
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
Stress-strain and pulse-propagation data for fibers

Classroom instruction
Executive training
Laboratory experimentation
Statistical analysis for animal industry

Industrial Research
Machine Tool Industry
Mathematical Analysis
Nuclear Research
Optical Industry
Petroleum Industry
Textile Industry
Universities

DIVISION OF BENDIX AVIATION CORPORATION

5630 ARBOR VITAE STREET, LOS ANGELES 45, CALIFORNIA
Punched Card 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.
about the **G-15**

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.
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 alphanumerical 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. P. Staderman
O. P. Staderman
Director of Marketing

Prices are subject to change without notice.
## LITERATURE LIST

### EQUIPMENT

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

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<td>Wind Tunnel Data Reduction, 6 page report (M.I.T.)</td>
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<td>206</td>
<td>Inertial Navigation Development, 2 page application and reliability report (BuShips)</td>
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<tr>
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<td>Oil Application Survey, 4 pages</td>
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<tr>
<td>208</td>
<td>General Purpose Computer in Academic Life, 6 pages</td>
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<tr>
<td>209</td>
<td>Invoice Preparation and Account Updating, 2 pages</td>
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<tr>
<td>210</td>
<td>Inventory Control Program at Queen Knitting Mills, 4 pages</td>
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<tr>
<td>211</td>
<td>Solution of Seven Simultaneous Equations with the DA-1, 4 page report</td>
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<tr>
<td>212</td>
<td>All available data on G-15 civil engineering applications</td>
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<tr>
<td>213</td>
<td>Pipeline Design &amp; Optimum Use Report, 2 pages (Texas Gas Transmission Co.)</td>
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<td>Petroleum &amp; Seismic Problems, six 2 page reports</td>
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<td>215</td>
<td>Radar Antenna Design, 5 page report (Bendix Radio Div.)</td>
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<td>Mechanical Design Problems, 5 page report (Bendix Products Div.)</td>
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<td>UCLA's Engineering Executive Program, American Engineer reprint</td>
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<td>218</td>
<td>Evaluation of Fresnel Integrals, 8 page bulletin</td>
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<td>219</td>
<td>List of Typical G-15 Applications</td>
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### PROGRAMMING

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<tbody>
<tr>
<td>100</td>
<td>INTERCOM 1000 programming and operating manual, 28 pages</td>
</tr>
<tr>
<td>101</td>
<td>INTERCOM 1000 pocket reference card</td>
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<tr>
<td>102</td>
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<td>POGO Programming Manual, 16 pages</td>
</tr>
<tr>
<td>104</td>
<td>AUTOPOINT 24 descriptive brochure, 24 pages</td>
</tr>
</tbody>
</table>

A partial list of data available on request.

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### REQUEST FOR ADDITIONAL INFORMATION

- **Applications…Comments**

  ![Box Image](image)

  - Please send the data requested at right.
  - Please have a qualified Bendix Computer Representative make an appointment to discuss potential applications.
  - Please have a qualified Bendix Computer Representative call on me next time he is in this area.
  - Please add my name to your mailing list to receive data on new equipment and applications.

  **Applications…Comments**

  ![Box Image](image)

Name

Company

Address

City Zone State

Please circle literature list number(s) desired.