



introducing
a new, simplified
programming system for
the **Bendix G-15**
general purpose
digital computer

intercom 10000

EASY TO LEARN. Only four hours of training needed.

FASTEST SYSTEM OF ITS KIND in the G-15's price range.

PUNCHED TAPE & TYPEWRITER INPUT-OUTPUT

PUNCHED CARD & MAGNETIC TAPE INPUT-OUTPUT

1,200,000 words of low-cost magnetic tape memory.

FIXED OR FLOATING DECIMAL POINT INPUT-OUTPUT

Numbers may be handled exactly as they occur in problems, without moving decimal point. No scaling.

FIVE OR TWELVE DIGIT ACCURACY with same commands.

INDEX REGISTERS enable commands to be written once, and repeated on different data automatically.

COMPLETE DEBUGGING facilities for fast check-out of new programs.

1000 intercom

...all new... easy to

GENERAL DESCRIPTION

If you can learn to use a desk calculator, you can learn to use an electronic computer... in just four hours. INTERCOM 1000 is a new system of writing computer instructions that makes this possible.

Developed especially for the Bendix G-15 General Purpose Digital Computer, this major advance in technique makes it truly practical to place a computer right in the office or laboratory. There it can be used by the men who know the problems best. The inefficiency of waiting for "computing center" solutions is eliminated.

INTERCOM 1000 is a complete general purpose system, in which commands and data may be stored in the computer's internal memory. Internally stored commands can be obeyed automatically.

Each INTERCOM 1000 command results in a number of internal operations. Much time is saved, and the programmer need know only the few commands shown on the opposite page. This "command list" is short enough to be easy to understand and use, yet complete enough to give the user unusual versatility.

Each INTERCOM 1000 command is represented by a two-digit code. To write an instruction, the user need only specify the desired code, together with the four-digit memory address where he has previously stored the data on which he wishes to operate.

The portion of an INTERCOM program shown below illustrates the simplicity of problem preparation for the G-15. This program is for the calculation of

$$\frac{a^2 - bc}{d}$$

where a, b, c and d are stored in memory positions 1100, 1101, 1102 and 1103 respectively. Each operation is performed on the contents of an arithmetic register called the accumulator, and the answer appears in the accumulator.

NOTES	Command Code	Memory Address
Clear accumulator and add b	42	1101
Multiply b, in accumulator, by c	44	1102
Store bc	49	1104
Clear accumulator and add a	42	1100
Multiply a, in accumulator by a	44	1100
Subtract bc from a ²	41	1104
Divide a ² -bc, in accumulator by d	48	1103

Subroutines to calculate trigonometric, logarithmic, exponential and other functions are integral parts of INTERCOM 1000 and may be automatically inserted in any selected portion of the memory. The calculation of any subroutine function may then be called for in a program with a single command. For example, the two commands below, added to the preceding program, would enable the computation in radians of

$$\sin \sqrt{\frac{a^2 - bc}{d}}$$

NOTES	Command Code	Memory Address
Perform square root subroutine, which begins at address 1597. Leave result in accumulator.	08	1597
Perform sine subroutine, which begins at address 1442. Leave result in accumulator.	08	1442

VERSATILE COMMANDS

Although the INTERCOM 1000 command list is simple, it is complete. For example, conditional transfers of control may be based on a variety of conditions, as shown in the command list. By a single command, the contents of any memory location may be typed out in fixed or floating decimal point form.

Index registers provide facilities for writing a single set of commands which will operate automatically on different sets of data. This "address modification" feature, which can eliminate many repetitive program steps, is another reason why INTERCOM 1000 is so easy to use.

Carriage returns and tab stops can be programmed as part of the typewriter output commands. A single command is available for adjustment of the typewriter paper to any position. This feature is useful when output is to be typed in assigned spaces on a form, or in any special composition. No plugboard wiring is required.

INPUT-OUTPUT

One of INTERCOM 1000's important features is its ability to accept data for the computer without any adjustment of decimal points. With most other computers, numbers must have their decimal points moved to the far left or the numbers must be translated into an entirely different number system. With INTERCOM 1000, the number 36.052, for example, is entered into the computer in exactly that form, 36.052. Answers are also returned with the decimal point in the normal position. No scaling is required in this type of fixed point input and output.

Numbers may also be fed in and out of the computer in floating decimal point notation, with a positive or negative range of magnitude from 10⁻³⁸ to 10³⁸. This range is far larger than that of any other computer in the G-15's class.

Input and output are accomplished by the computer's typewriter, paper tape punch, and high speed photoelectric paper tape reader.

earn and use

Up to four Bendix Magnetic tape units may also be used, each providing 300,000 words of low-cost auxiliary storage. Commands are provided to read from and write on tape, write file number, search for file number, and reverse tape. Each file may consist of any number of blocks of 100 words each.

Punched card input-output devices are also available and special commands are provided for their use. Off line paper tapes may be prepared with a Flexowriter.

COMPUTATION

All internal computation is carried out in floating point form with a magnitude ranging from 10^{-38} to 10^{38} . The high upper limit of INTERCOM 1000 greatly reduces the possibility of overflow in computation, while the low bottom limit assures that numbers of very small magnitude will not be lost in computation.

INTERCOM 1000 is faster than any floating point system in the G-15 price range.

The programmer has a choice of five or twelve digit accuracy, using the same commands. The five digit system gives additional internal memory space for program and data, where higher accuracy is not required.

A command may be obeyed from internal storage or may be typed on the typewriter and directly executed. No plugboards, pegboards, or other mechanical program devices are required with the G-15.

PROGRAM CHECKOUT

Complete facilities are provided for "debugging" a new program. The operator may execute one command at a time, or query the computer to obtain operating information. A program may be executed automatically with individual commands typed out where desired. Changes may easily be made in the program from the typewriter keyboard. The computer can be told to automatically type out the commands of an INTERCOM 1000 program.

OTHER METHODS

INTERCOM 1000 has been developed for those who need and want the advantages of electronic computation but not the costs and administration problems of computing centers, large staffs of computer specialists, and extensive employee training programs.

Some firms have problems of such complexity that they do need computer experts on their staff. They too will appreciate the G-15, because of the versatility of its basic programming system. Programmers with more sophisticated needs will find that commands are available for complete control over every internal operation of the computer.

The G-15, alone in its class, offers programming systems best suited to every user. This versatility also means expandability. G-15 users find that as their problems and abilities grow in sophistication, they need only to change their methods of use, rather than purchase more expensive equipment.

command list

CODE

COMMAND

ARITHMETIC

40	Clear and Subtract
41	Subtract
42	Clear and Add
43	Add
44	Multiply
45	Clear and Add Absolute Value
47	Inverse Divide
48	Divide
49	Store

TRANSFER OF CONTROL

20	Transfer Control if Accumulator Positive or Zero
22	Transfer Control if Accumulator Negative
23	Transfer Control if Accumulator Zero
26	Mark Place and Transfer I
28	Mark Place and Transfer II
16	Return to Marked Place I
18	Return to Marked Place II
29	Transfer Control Unconditionally

INPUT-OUTPUT

50	Permit Command Type-in
51	Permit Fixed Point Data Type-in
52	Permit Floating Point Data Type-in
33	Type Fixed Point Number and Tab
38	Type Fixed Point Number and Return Carriage
32	Type Floating Point Number and Tab
34	Type Floating Point Number and Return Carriage
55	Read Punched Tape
39	Punch Paper Tape
30	Position Typewriter Paper
31	Type Tabulating Number

Additional Commands are available for use of magnetic tape, Flexowriter tape and punched cards. See Text.

SPECIAL COMMANDS

63	Ring Bell
67	Halt and Permit Manual Operation
68	Breakpoint Halt
69	Compute Automatically
08	Perform Subroutine
35	Type Command from Memory
06	Type Location of Last Command Executed

INDEX REGISTERS

70	Assign Word Base
71	Assign Word Difference
72	Assign Word Limit
73	Assign Channel Base
74	Assign Channel Difference
75	Assign Channel Limit
76	Increment Word Base
77	Increment Channel Base

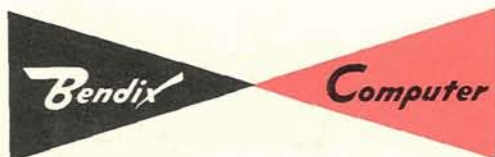


about the **G-15**

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 photo-electric paper tape reader, and a paper tape punch. Punched card equipment 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.



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