10000001 (129) and operate the DEPOSIT NEXT switch to store this number at memory location 5. (*A2, A0* lit) Then set *D0* through *D7* all to 0 and operate the DEPOSIT NEXT switch to store the all-zero number at memory location 6 (*A2, A1* lit).

7 Store the add instruction at memory location 7 by setting *D0* through *D7* for 10000000 (128) and operating the DEPOSIT NEXT switch. When executed, this instruction adds the number in the accumulator to the number stored in register B and places the result in the accumulator (*A2, A1, A0* lit).

8 To store the result at address 130, first store the instruction at memory location 8 by setting *D0* through *D7* for 00110010 and operating the DEPOSIT NEXT switch (*A3* lit). Set *D0* through *D7* for 10000010 and operate the DEPOSIT NEXT switch. The least-significant eight bits of address 129 are now stored at memory location 9 (*A3, A0* lit) Set *D0* through *D7* to 0 and operate the DEPOSIT NEXT switch. The most-significant eight bits of address 129 are now stored at memory location 10 (*A3, A1* lit).

9 A program that adds the contents of address 128 to the contents of address 129 and stores the result in address 130 has now been loaded into the computer. With the use of a "jump" instruction, you can now create a program loop that will direct the computer back to memory location 0 and allow repeating this addition procedure continuously for as long as desired. Store the jump instruction at memory location 11 by setting *D0* through *D7* for 11000011 and operating the DEPOSIT NEXT switch (*A3, A1, A0* lit). Set *D0* through *D7* to 0 and operate the DEPOSIT NEXT switch *twice*. The 16-bit address 0 is now stored at memory locations 12 and 13 (*A3, A2, A0* lit).

Before we can run this program, we have to load the two numbers we want added into addresses 128 and 129. For example, if we wanted to add 12 to 8, the procedure would be as follows:

Set address switches *A0* through *A15* for 0000000010000000 (128) and operate the EXAMINE switch (*A7* lit). Set *D0* through *D7* for binary 12 (00001100) and operate the DEPOSIT switch (*A7* still lit). Set *D0* through *D7* for binary 8 (00001000) and operate the DEPOSIT NEXT switch. The binary numbers for 12 and 8 are now stored at address locations 128 and 129, respectively (*A7, A0* lit).

Set address switches *A0* through *A15* to 0 and operate the EXAMINE switch (all A LED's are off). Operate the RUN switch, and the program will execute at a rate of about 30,000 times per second. Operate the STOP switch. Set the address switches to address 130 (10000010) and operate the EXAMINE switch. LED's *D0* through *D7* will display the sum of the two numbers added, which is 20, in binary format (00010100).

Basics of Programming. If you have never done any programming, it may seem a little mysterious at first, but the basic ideas of programming

GLOSSARY OF COMPUTER JARGON

Access time — Time interval between the instant at which information is called for storage and the instant at which delivery is complete.

Accumulator — Part of the logical-arithmetic unit of a computer used for intermediate storage, to form algebraic sums, or other intermediate operations.

Address — Label, name, or number identifying a register, location, or unit where information is stored.

Assembler — Translates input symbolic codes into machine instructions.

Bit — Abbreviation of binary digit; a single character in a binary number.

Buffer — Isolating circuit used to avoid reaction of a driven circuit upon its driving circuit.

Byte — Group of binary digits usually operated upon as a unit. Usually shorter than a word.

Clock — Time-keeping device used to synchronize the computer.

Data — Basic elements of information which can be processed or produced by a computer.

Hold — Function of retaining information in one storage device after transferring it to another device, in contrast to clear.

Instruction — Coded program step that tells the computer what to do for a single operation in a program.

Interrupt — Break in the normal flow of a system or routine such that the flow can be resumed from that point at a later time.

Jump — Depart from the normal sequence of executing instruction in a computer (synonymous with branch).

Memory — Storage. A device that holds information that can be extracted at a later time.

Processor — Device capable of receiving data, manipulating it, supplying results usually of an internally stored program.

Programming — Art of reducing the plan for the solution of a problem to machine-sensible instructions.

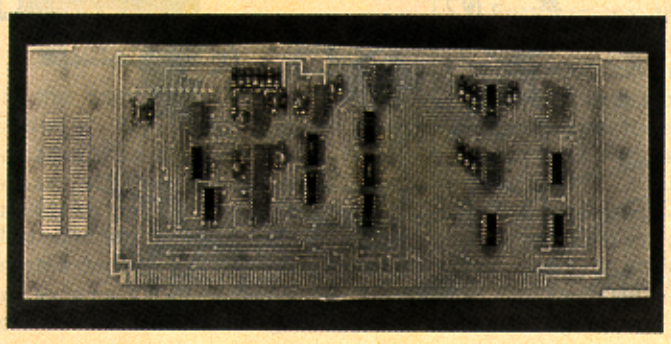
Register — Device for the temporary storage of one or more words to facilitate arithmetical, logical, or transferral operations.

Stack — Portion of a computer memory and/or registers used to temporarily hold information.

Subroutine — Set of instructions in machine code to direct the computer to carry out a well-defined mathematical or logical operation; a part of a routine.

Word — Set of characters that occupies one storage location and is treated by the computer as a unit and is transported as such. Word lengths are fixed or variable, depending on the particular computer being used.

Definitions were extracted from "Computer Dictionary" by Charles J. Sippl and Charles P. Sippl, published by Howard W. Sams & Co., Inc., The Bobbs-Merrill Co. Inc., Number 20943, 484 pages, $8.95 (in Canada $11.95).



Shown at far left is the display board atop the control board, with cables that connect to other boards. The central processor unit is shown in the center, and the control board at near left. Not shown is memory board, which holds 17 IC's.