introducing a new language for automatic programming
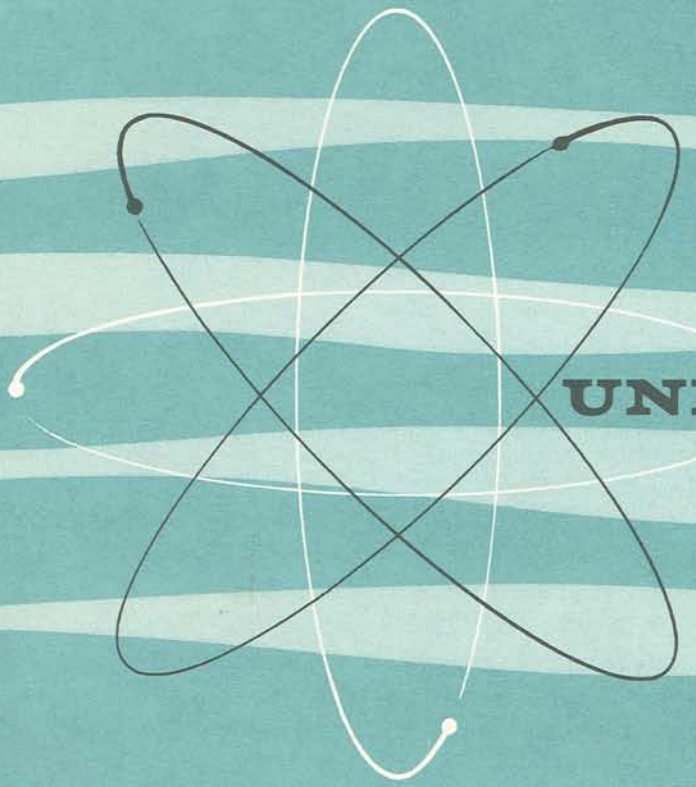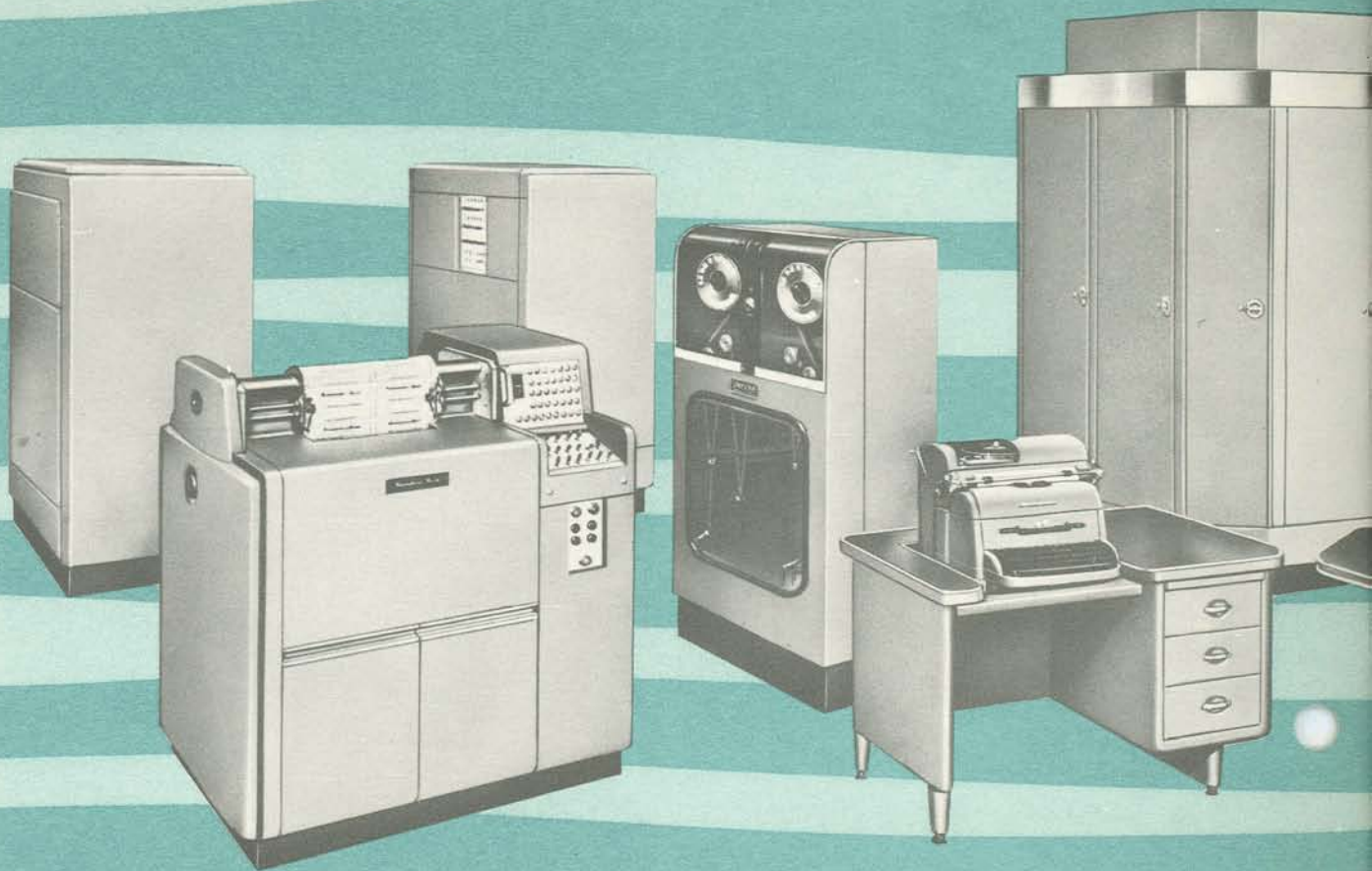
UNIVAC® FLOW-MATIC

by *Remington Rand Univac*
DIVISION OF SPERRY RAND CORPORATION

Features of **UNIVAC**®

FLOW-MATIC

**Takes You Directly
from Flow Chart
to Finished Program**

UNIVAC FLOW-MATIC is the most far-reaching development ever offered for automatic computer programming. It provides, for the first time, a means whereby the flow chart of the systems expert can be translated automatically, at electronic speed, into the language of the UNIVAC II Data-Automation System.

To program a new application, the user merely describes his systems flow chart in the English-language instructions of FLOW-MATIC. These act as a signalling index to the computer routines of the FLOW-MATIC library. When read by the UNIVAC system, the instructions cause the computer to generate for itself the various subroutines required to process the problem. It then assembles these subroutines into a finished program and records the program on magnetic tape.
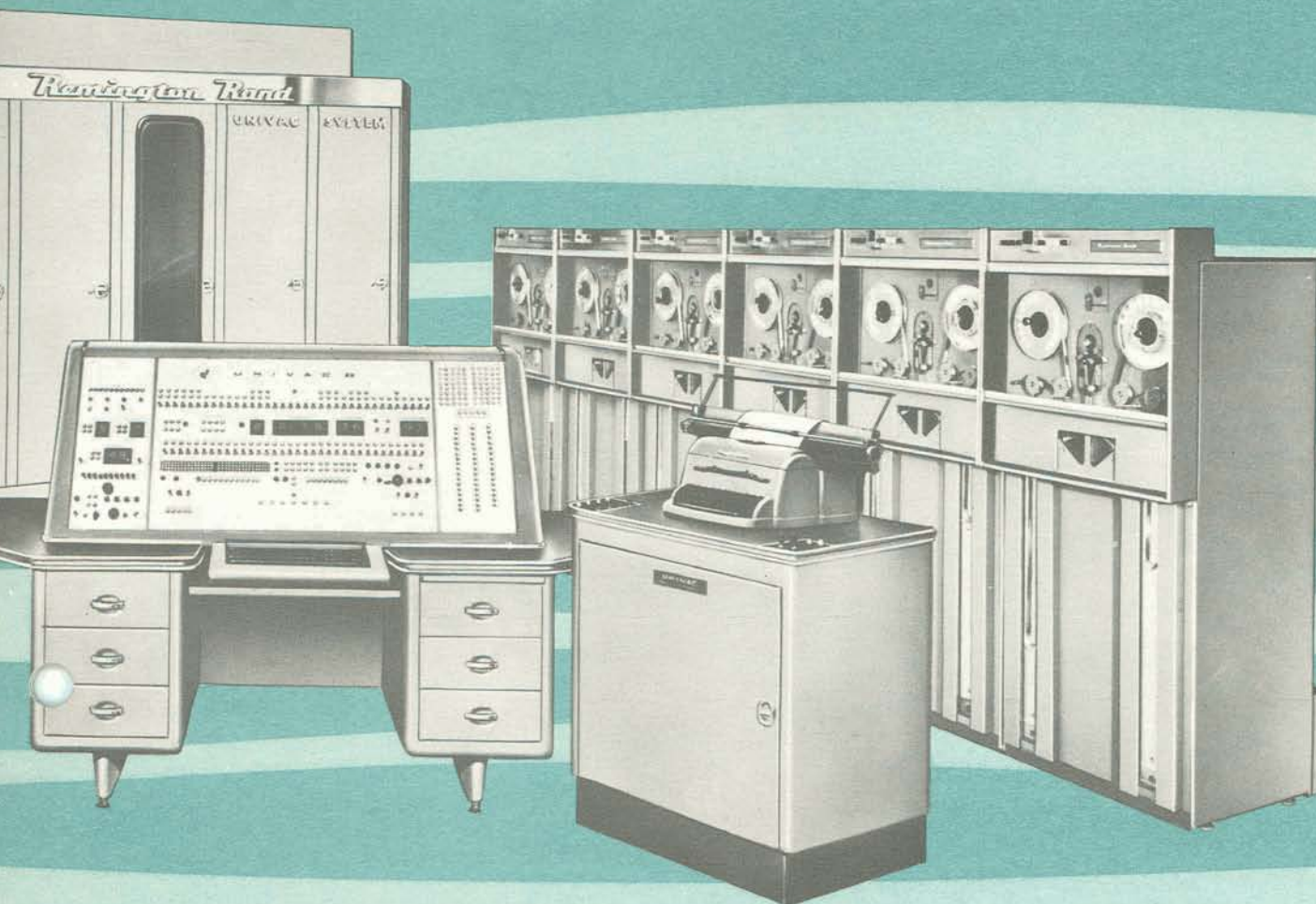
A Typical FLOW-MATIC User, After Field Tests, Summarizes These Outstanding Advantages:

"The chief advantage of such a system over previous approaches to the problem is that the use of English words describing the processes and the items concerned permits various levels of management and people most familiar with the business processes to transmit their ideas from system flow charts directly into the running programs.

"FLOW-MATIC will be instrumental in reducing program preparation time. This is accomplished by the fact that the task of writing C-10 coding can be replaced by writing English pseudo-code. Further, the method of writing pseudo-code can be easily taught to clerical workers.

"Debugging time on the computer will be appreciably reduced."

Donald G. McBrien

UNIQUE SAVINGS

## of the

UNIVAC

FLOW-MATIC

SYSTEM

1

Virtually Eliminates Your Coding Load

Your skilled programmers are freed from clerical drudgery to do more creative work. FLOW-MATIC shifts emphasis of the programming effort from detailed coding to problem definition and systems analysis. Slashes drastically the time required to program new or altered UNIVAC applications.

4

Increases Program Efficiency and Accuracy

FLOW-MATIC uses built-in standard conventions, based on the extensive experience of UNIVAC users and the very best coding techniques. Because these are introduced automatically into the program, greater coding efficiency is achieved. And, since the components of the program are correct, since they are compiled by FLOW-MATIC and the UNIVAC system—a checked routine for the most reliable computer known— the checking out of the program design is both shortened and simplified.
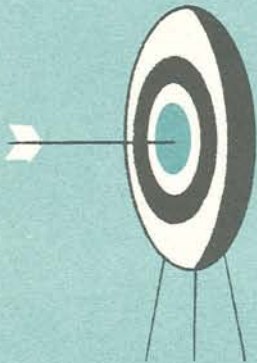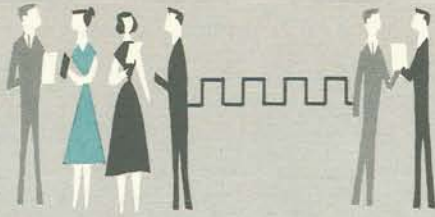
7

Increases the User's Skill in Systems Analysis

By its very nature, FLOW-MATIC concentrates the programming effort on problem definition and systems analysis and design. It is the thought, energy, and ingenuity devoted to these areas which determine the extent of the tremendous savings that the UNIVAC system can accomplish.
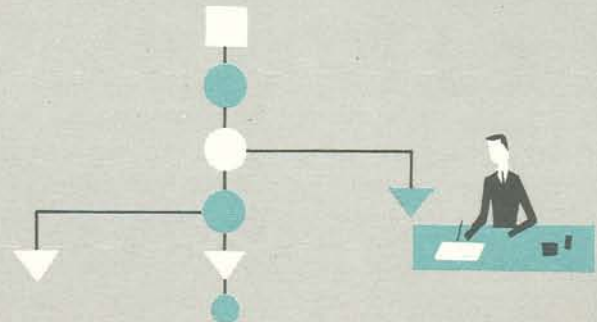
2

Breaks the Communications Barrier Between Programming and Management Groups

Since FLOW-MATIC uses English through all preliminary stages of an application, the programming is intelligible to all who understand the application. This makes available to the programming effort the knowledge of many experts previously excluded.

3

Provides Maximum Programming Flexibility

The FLOW-MATIC program incorporates two types of information: (1) operational instructions, and (2) description of data to be operated upon. Either can be altered radically without affecting the other. As conditions change, the original FLOW-MATIC program can be used to recompile new computer code automatically.

5

### Drastically Reduces Training Time

In just a few days, users can be trained in the basic characteristics of the UNIVAC system and in the FLOW-MATIC method of programming. With FLOW-MATIC, it is not necessary to have a large staff of trained programmers. The more complicated, time-consuming training in techniques of computer coding need be taught only to those few people selected to become highly skilled career programmers.

6

Effects New Computer Savings in Applications Never Before Feasible

The ease and simplicity of FLOW-MATIC programming makes possible the use of the computer for many one-shot jobs which up until now have been impractical to program. Similarly, because of the ease with which FLOW-MATIC programs can be changed, it is also now practical to program pilot systems to speed the development of more efficient systems design.
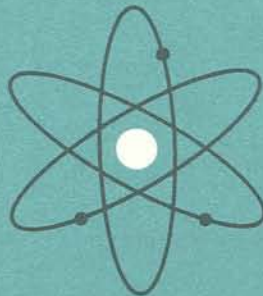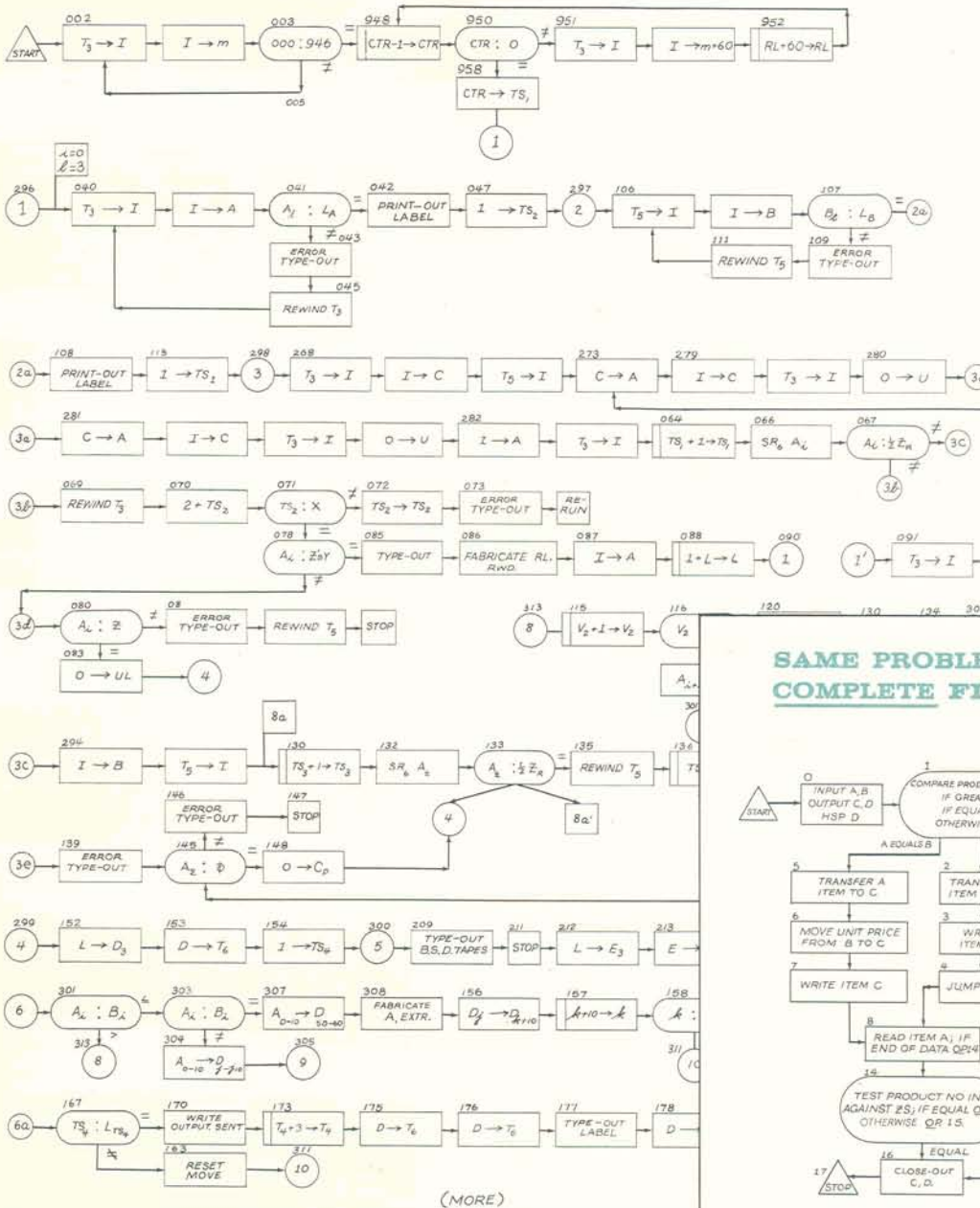
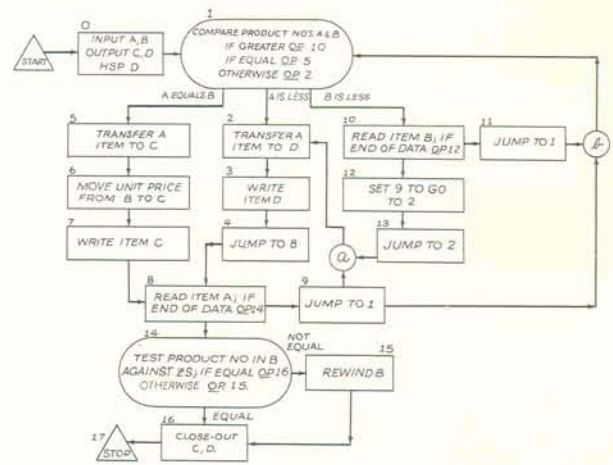### + Support of the Leaders in Programming Research

FLOW-MATIC, like nearly all of the UNIVAC automatic programming techniques, has been developed for UNIVAC system users, to meet their individual needs. This is the result of a firm Remington Rand Univac policy that users are to be provided, not with equipment alone, but with the best *complete* system available. It is your assurance that, as new developments in program design emerge from the research facilities of Remington Rand Univac, they will immediately be made available to you, as one of the ever-growing family of UNIVAC users. You can be sure, too, that you will be sharing the developments of a programming staff that has no equal anywhere, in years of experience, in knowledge of computer techniques, and in engineering of systems design.

OLD SYSTEM—_PARTIAL_ PROBLEM FLOW CHART

The English-language pseudo-code of **Flow-Matic** causes the **Univac** system to automatically compile and write its own computer code. Thus, both flow charts and codes are made intelligible to the non-programmer as well as to the programmer. Many weeks of extensive training and the countless hours spent in coding each application are hurdled by this revolutionary new development.

(MORE)

SAME PROBLEM— COMPLETE FLOW-MATIC CHART

CONVENTIONAL COMPUTER CODE

Addr			Comment
		300000	READ INSTR. TAPE
940	160000	L00945	BLK.CT. : LIMIT
1	B00944	Q00949	
2	A-0955	U00940	
3	C00944	000000	BLK.CT.
4	000000	000006	READ DATA
5	000000	000000	
6	130000	U00940	
7	300940	F00945	
8	B00945	H00945	FINAL READ TEST
9	S-0955	Q00958	
950	L00956	300060	INCREMENT READ LINE
1	130000	A-0957	
2	B00951	000000	TO READ TEST
3	C00951	U00949	
4	B00945	000001	
5	000000	000000	
6	000000	000060	
7	000000	U00296	
8	G00690	000001	
9	000001	000968	
960	R00970	U00968	
1	S-0955	H00945	READ BACK
2	230000	H00940	LABEL CHECK
3	B00949	L00961	
4		Q00966	
5		U00962	READ LINE
6	130000	300940	
7		U00940	SET CONNECTOR
8	B00970	A-0971	
		000000	(MORE)

FLOW-MATIC CODE

(0) INPUT INVENTORY FILE-A PRICE FILE-B; OUTPUT PRICED-INV FILE-C UNPRICED-INV FILE-D; HSP D.

(1) COMPARE PRODUCT-NO(A) WITH PRODUCT-NO(B); IF GREATER GO TO OPERATION 10; IF EQUAL GO TO OPERATION 5; OTHERWISE GO TO OPERATION 2.

(2) TRANSFER A TO D.

(3) WRITE-ITEM D.

(4) JUMP TO OPERATION 8.

(5) TRANSFER A TO C.

(6) MOVE UNIT-PRICE(B) TO UNIT-PRICE(C).

(7) WRITE-ITEM C.

(8) READ-ITEM A; IF END OF DATA GO TO OPERATION 14.

(9) JUMP TO OPERATION 1.

(10) READ-ITEM B; IF END OF DATA GO TO OPERATION 12.

(11) JUMP TO OPERATION 1.

(12) SET OPERATION 9 TO GO TO OPERATION 2.

(13) JUMP TO OPERATION 2.

(14) TEST PRODUCT-NO(B) AGAINST ZZZZZZZZZZZZ; IF EQUAL GO TO OPERATION 16; OTHERWISE GO TO OPERATION 15.

(15) REWIND B.

(16) CLOSE-OUT FILES C, D.

(17) STOP. (END)

Mastering a knowledge of the complicated techniques and symbols of conventional computer flow charts requires a long training period. **Flow-Matic** charting, however, can be easily grasped by anyone with a knowledge of the application to be programmed.

UNIVAC the first name in electronic computing

...a data-automation system for every need

UNIVAC System. For data-automation which involves large volumes of input and output.

UNIVAC 60 & 120 Punched-Card Computers. For speeding and simplifying the procedures of punched-card systems.

UNIVAC FILE-COMPUTER. For instantaneous random access to large-scale internal storage— plus computation.

UNIVAC SCIENTIFIC System. For complex and intricate computations of engineering and research.