

402E

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CONSULT

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**ELLIOTT**

FOR

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**ELECTRONIC  
COMPUTING**

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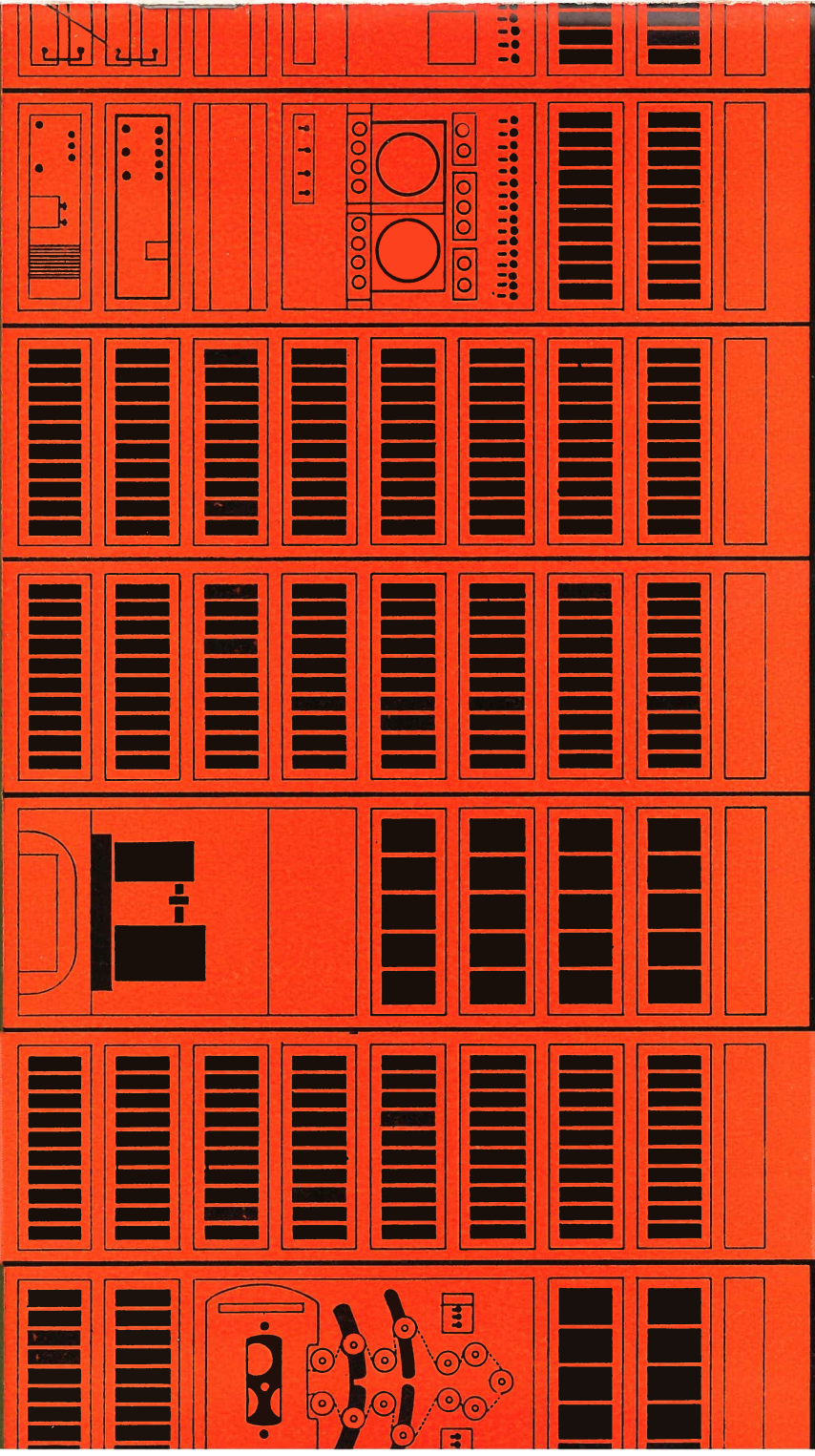
402F

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A MEMBER OF THE ELLIOTT-AUTOMATION GROUP

**ELLIOTT**

THE ELLIOTT 402 SERIES OF ELECTRONIC DIGITAL COMPUTERS

402



**BIGGER**

drum store capacity—now 5,000 words.

**BETTER**

operating, testing and tape editing facilities.

**FASTER**

—multiplies at 300 operations per second.

**ELLIOTT**

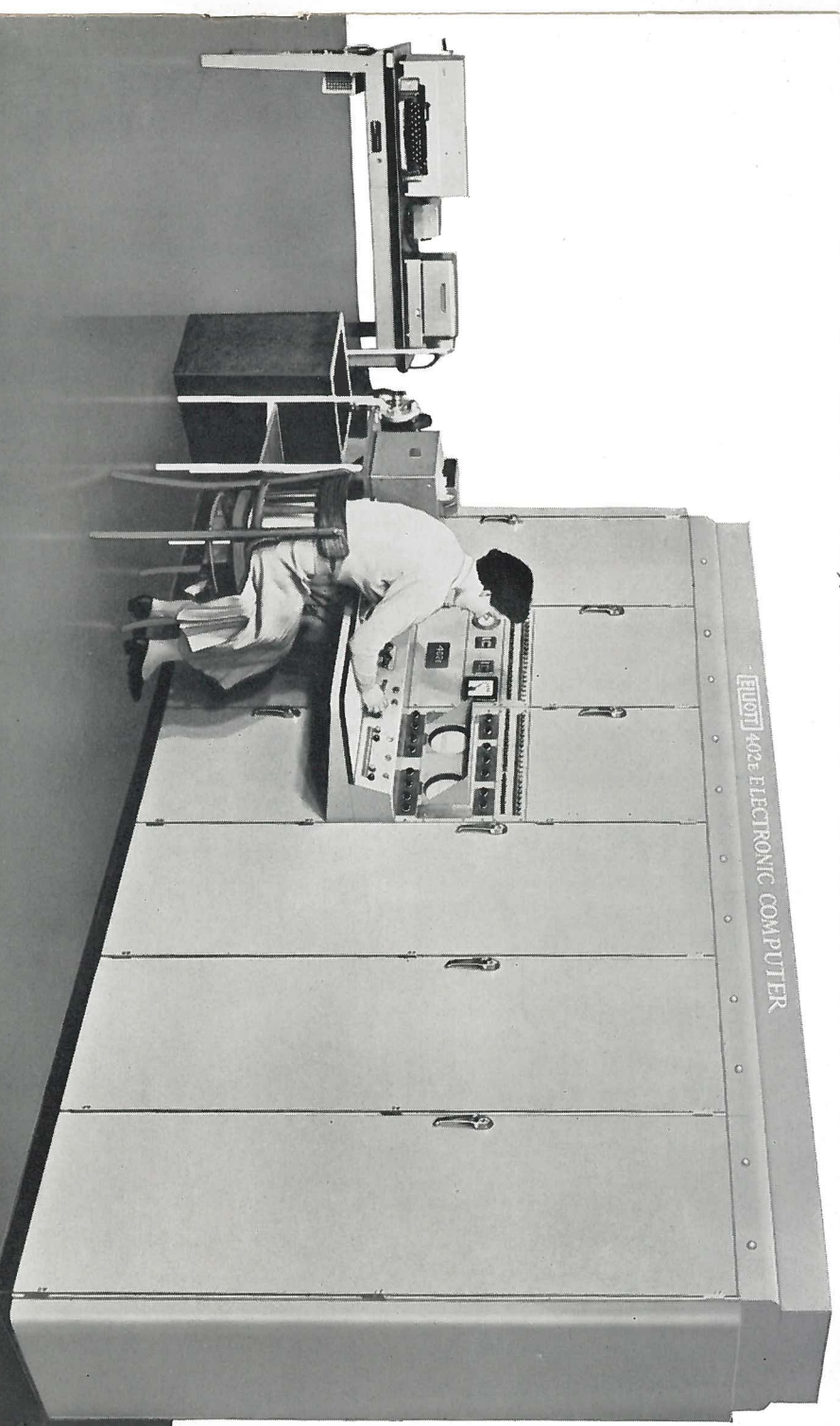
**402E**

Particularly designed for scientific, engineering and statistical problems, the Elliott 402E speeds design, effects production economies and enables best use to be made of skilled technical and scientific personnel.

**UNLIMITED STORAGE**

available with the standard Magnetic Film Unit.

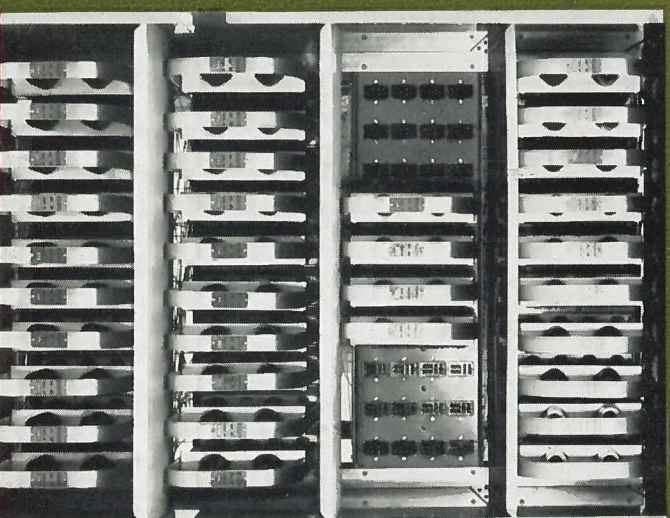
**EASIER TO PROGRAM THAN ANY OTHER MACHINE OF ITS CLASS**



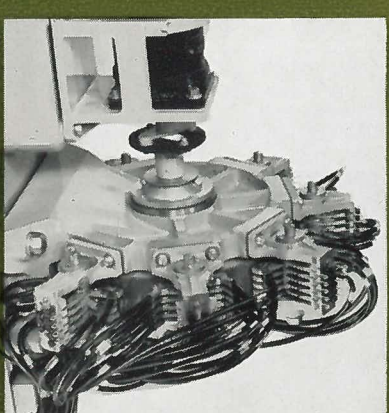
**ELLIOTT**

**402E**

**THE COMPUTER AND SOME OF THE COMPONENTS OF THE 402 SERIES**



The plug-in unit type of construction, pioneered in the Elliott 401 computer, simplifies the routine testing of all components during periods of preventive maintenance.



The typical plug-in units shown—the AB logical unit and the AN nickel delay line unit—are taken from the 402E computer.



The well-known Elliott magnetic drum with increased storage capacity has the advantage of outstanding reliability, access and ease of maintenance, due to open type of construction use. As many as 50 storage tracks are available, each holding up to binary digits.

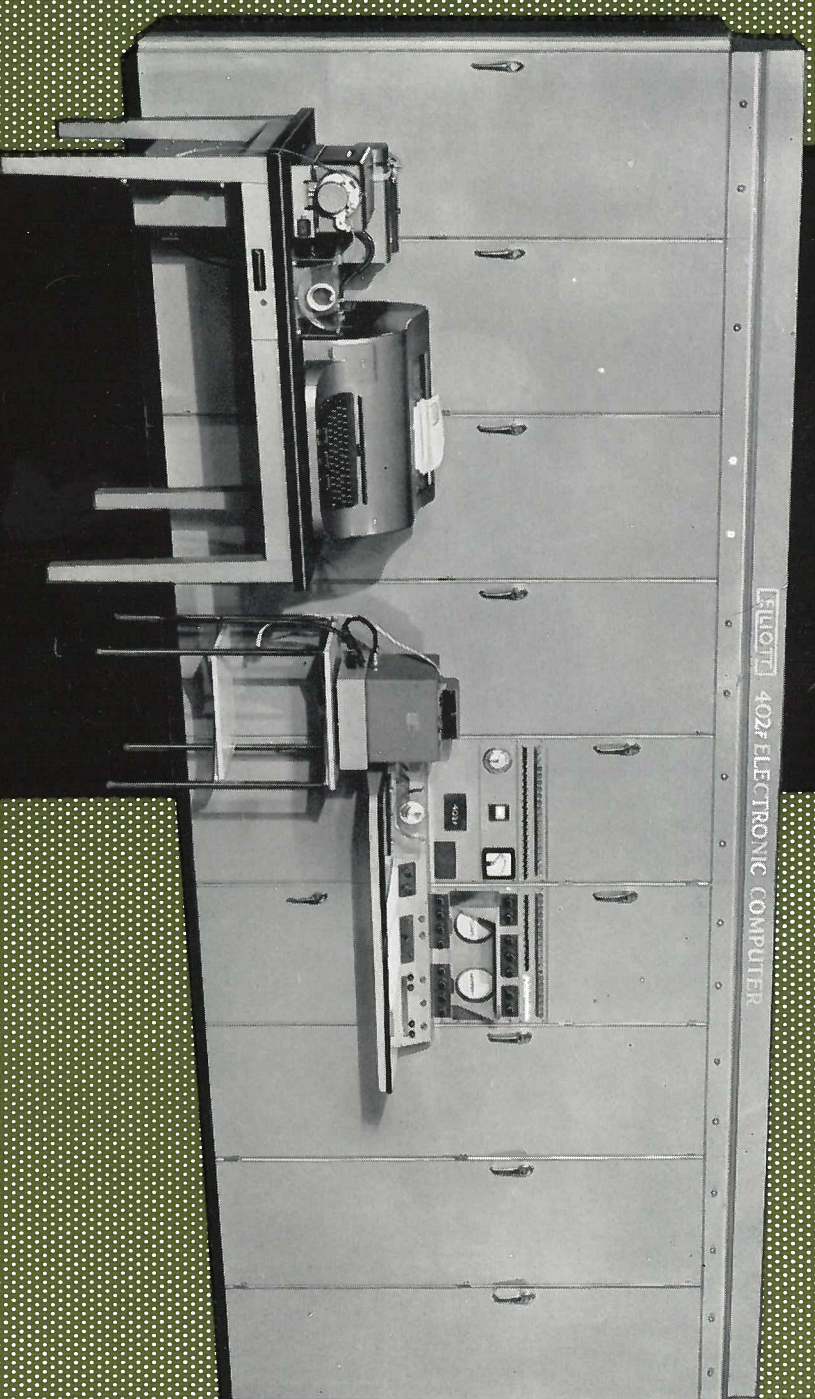


**FOR RESEARCH, DEVELOPMENT AND DESIGN IN ENGINEERING, SCIENCE AND MATHEMATICS**

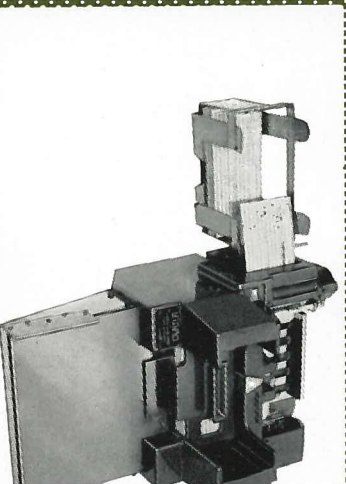
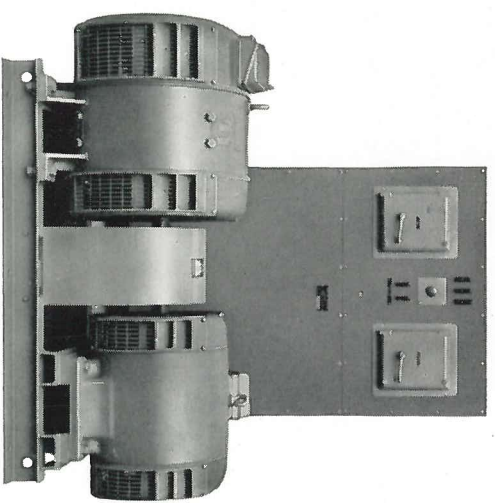


Organisations engaged in research and development frequently meet problems involving complex mathematical analysis. The stability of a concrete building; the structure of a complex molecule; the economics of tanker operation; the design of a nuclear power station—the investigation and solution of such problems as these call for considerable mathematical skill.

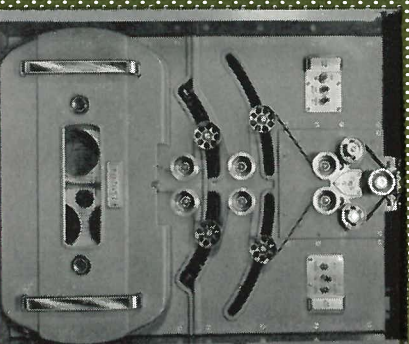
The Elliott 402F meets this challenge with FLOATING POINT operation. Brilliant logical design has enabled the complex circuits necessary for FLOATING POINT operation to be made available as an additional feature of the 402 series of computers, so that a minimum of new development has been combined with existing 402 operational experience.



The motor-alternator and associated switchbox control gear ensure that mains fluctuations do not affect the performance of the computer.



The Elliott High-speed Punched-card Reader converts data recorded on standard punched cards into electronic form at a rate of up to 400 cards per minute.



The Elliott Magnetic Film Unit provides unlimited storage capacity for the 402 series of computers.

# SPECIFICATION

## CONSTRUCTION

Each of the Computers in the Elliott 402 Series consists of an assembly of individually ventilated cabinets containing standard plug-in units, a magnetic drum store, stabilised power supplies and a built-in control console. The cabinets are constructed of stove enamelled duralumin, with doors back and front, and are finished in Quaker grey. The 402E computer incorporates 225 plug-in units in 6 cabinets, while the 402F computer includes 400 plug-in units in 9 cabinets.

## INPUT

By 5-hole punched paper tape, read photoelectrically at speeds up to 180 characters per second, or by manual input from the built-in Number Generator.

## OPTIONAL INPUT

From standard size punched cards, read photoelectrically, column by column, at speeds up to 400 cards per minute.

## OUTPUT

By 5-hole punched paper tape, punched at 25-33 characters per second, and subsequently interpreted at 10 characters per second.

## COMPUTING SPEEDS

Digit rate 333,000 per second	Word length 32 digits	Word time 0.1 milliseconds	Addition and subtraction 0.2 milliseconds	Multiplication and division 3.3 milliseconds
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## ORDER CODE

Each order specifies a single operand, together with the address of the next order. Seven B-line registers are available for modifying orders.

## STORAGE

Seventeen nickel delay line single-word registers, including accumulator, form the immediate access store. The magnetic drum store has 39 tracks each containing 128 words (except track 0). Each track has its own fixed read/write head.

## AUXILIARY STORAGE

Data transfer rate 400 words per second; one reel of 35 mm magnetic film holds approximately 300,000 words stored on 6 information tracks.

## TAPE HANDLING EQUIPMENT

Input tape reader, output tape punch, tape transmitter and teleprinter with keyboard and reperforator are supplied.

## OTHER EQUIPMENT AND FACILITIES

A motor-alternator and switchbox control for isolating the computer from the mains supply are provided. 10% spare plug-in units, 10% spare components and a quarterly maintenance service are included with the computer. A test panel for testing plug-in units, together with a trolley-mounted oscilloscope and tool kit, are supplied. The control console built into the computer allows inspection of any part of the store (by means of two built-in oscilloscopes) and variation of the power supplies for marginal testing purposes, in addition to the normal operating controls.

## DIMENSIONS AND WEIGHTS

402E Computer	11'5" × 3'8" × 6'9"	20 cwt	(348 cm × 112 cm × 206 cm)	1020 kgm
402F Computer	16'10" × 3'8" × 6'9"	31 cwt	(514 cm × 112 cm × 206 cm)	1570 kgm
Tape Handling Equipment (table mounted)	4' × 2'6" × 3'6"	2½ cwt	(122 cm × 76 cm × 107 cm)	130 kgm
Motor-alternator	4'3" × 1'8" × 2'	10 cwt	(130 cm × 51 cm × 61 cm)	510 kgm
Switchbox Control	3' × 1'8" × 4'8"	4½ cwt	(92 cm × 51 cm × 141 cm)	220 kgm

## POWER REQUIREMENTS

402E Computer	7kVA, 415V, 50 c/s, 3-phase with neutral and earth.
402F Computer	11kVA, 415V, 50 c/s, 3-phase with neutral and earth.

Specifications are subject to alteration without notice.



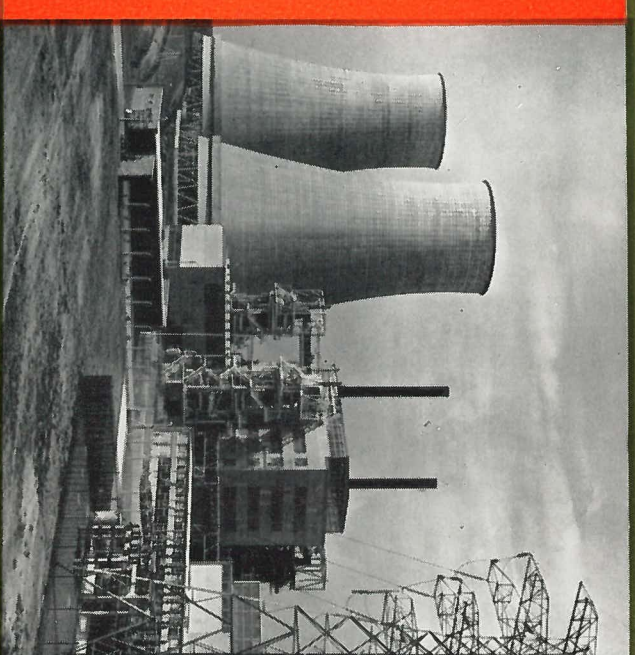
# COMPUTING SERVICE

A MATHEMATICAL PROGRAMMING AND COMPUTING SERVICE, BASED ON AN ELLIOTT 402 SERIES COMPUTER, IS AVAILABLE ON A MACHINE-TIME HIRE BASIS. BELOW ARE THREE TYPICAL PROBLEMS ALREADY SOLVED BY THIS SERVICE



Many aircraft and ships now use the Decca Navigator System to determine position. For a given area a chain of master and three slave stations is set up as a lattice of hyperbolae is superimposed on a map. Points for plotting these hyperbolae are now calculated on an Elliott 402 and in the last year a quarter of a million points for eight chains have been computed.

Work done by Metropolitan-Vickers Electrical Co. Ltd., on a 402 has included the solution of reactor control and safety problems and the determination of flux changes in a reactor under long term irradiation. The first type of problem reduced to the solution of a set of simultaneous mixed ordinary and first order partial differential equations, and the second problem to the solution of a pair of simultaneous non-linear second order partial differential equations.



Work done for the oil industry has included an estimation of the structure of an oilfield so that predictions could be made of future behaviour, and a choice taken between the various possible methods of increasing the oil production. The fitting of an algebraic equation, describing the observed flow of oil as a function of known parameters, involved over a million multiplications and was completed in one day.

