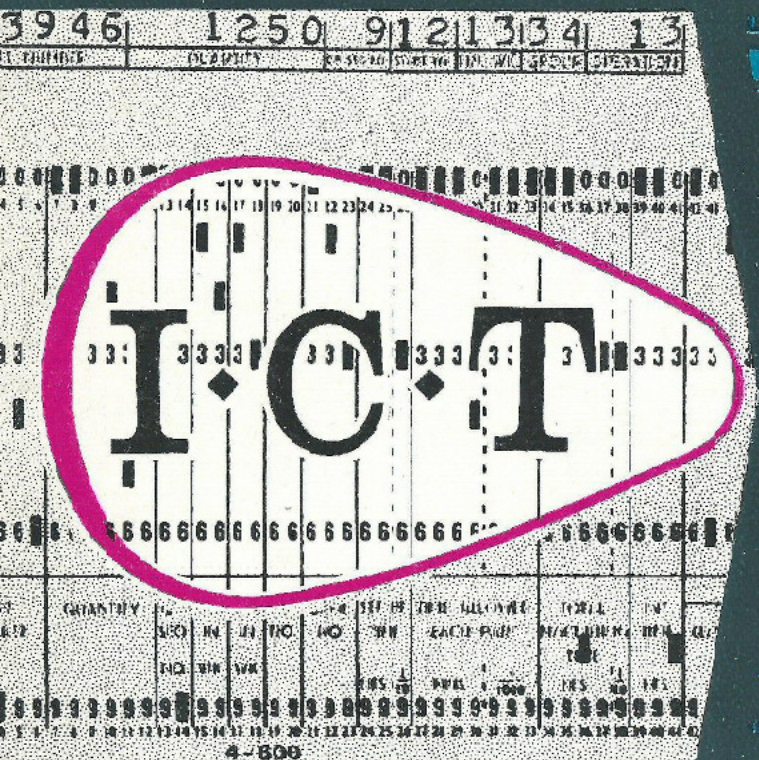


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I-C-T DATA PROCESSING: ELECTRONIC COMPUTERS



NUMBER	DATA	NUMBER
1	111	11
2	1111	1
3	11	11
4	11	11
5	11	11
6	11	11
7	11	11
8	11	11
9	11	11
10	11	11
11	11	11
12	11	11
13	11	11
14	11	11
15	11	11
16	11	11
17	11	11
18	11	11
19	11	11
20	11	11
21	11	11
22	11	11
23	11	11
24	11	11
25	11	11
26	11	11
27	11	11
28	11	11
29	11	11
30	11	11
31	11	11
32	11	11
33	11	11
34	11	11
35	11	11
36	11	11
37	11	11
38	11	11
39	11	11
40	11	11

type 1202

general purpose computer

INTERNATIONAL COMPUTERS AND TABULATORS LIMITED

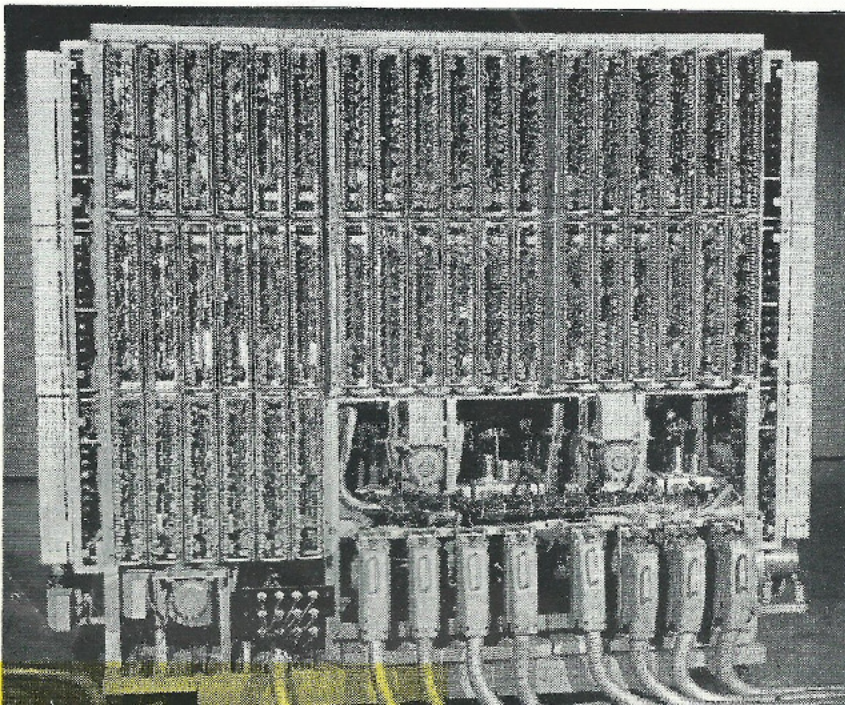
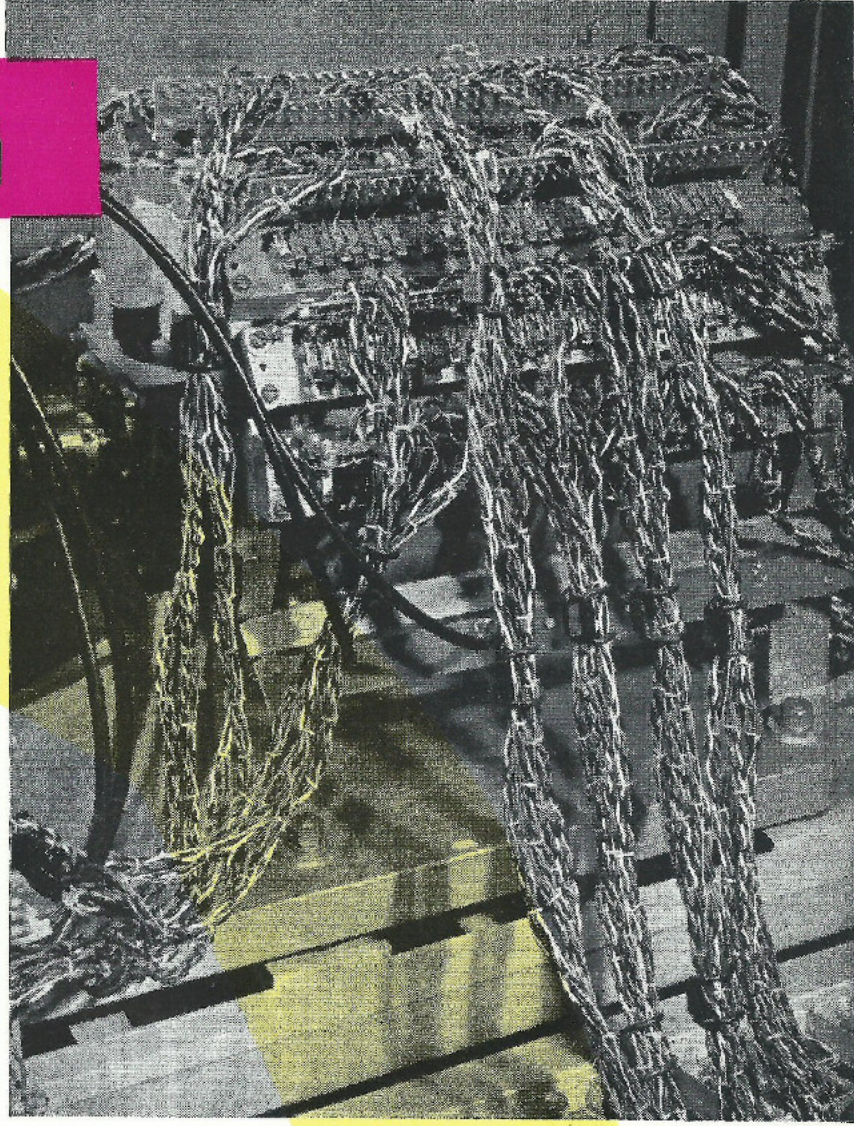
electronic computer

magnetic drum

... to hold the program and to store appropriate input, output and working data plus accumulated results; the last by means of rapid transfer switching to and from the processing unit.

The drum, housed in its own cabinet, has a capacity of 4,096 words on 256 tracks—16 groups of 16 tracks numbered 0—15; each track of 16 words, with a read/write head; word length is 40 binary digits. Drum revolutions at 50 per second, give a basic word time of 1.25 milliseconds, and an average access time of 10 milliseconds. Two of the tracks form output buffers, but when not so used, can be part of normal storage capacity. Track switching is electronically controlled, and consecutive words can be read from different tracks.

Optimum programming is achieved by an I.C.T sub routine. A library of sub routines, for other programming purposes, is available.



... consists of four 40 position valve registers, designated A, M, B, and Q. Adders are linked to registers A and Q. Registers M, B and Q are also used as immediate access stores. The four registers can transfer information to and from each other or the magnetic drum; shift numbers contained within registers; carry out testing functions on A, M and Q to allow the computer—depending on the conditions found—to branch along different paths of a program.

Next instruction can be called from Registers M, B or Q, or from the drum. Addition or subtraction in A and Q; a succession of numbers on the drum can be added together

I.C.T type 1202

input

QUANTITY				PRICE	TOTAL EARNINGS				BONUS EARNINGS			
0	0	0	0	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9	9	9	9

... by punched cards—still the most flexible form of maintaining records—easily machine sorted and processed. Cards—each with 960 possible punching positions—form unit documents and are fed into the computer at a rate of 100 per minute.

Alphabetic or numeric information not required for computation can be directly listed on the line printer. Up to 64 of the 80 columns of each card can be read directly into the computer for processing; 24 to 64 columns into the alpha/numeric store for indirect transfer to line printer or card punch.

... is a particularly important facility in the 1202 Computer, enabling automatic storage of the program on the drum. Binary punched cards can be used for input and output. On input—12 rows of binary digits per card, each row of 40 digits.

Binary program cards hold 12 instructions. In this way, a program initially punched on

denary cards can be automatically converted to binary punching for use as a permanent program.

Output—12 binary numbers per card, each of 53 digits (number+drum location+one spare digit). Binary output cards, giving a saving in card consumption, are used as re-entry input data for subsequent computer operations.

One binary card stores the same amount of information as 12 denary cards, giving 1,100% increased input speed and corresponding card saving.

BINARY PUNCHING

TYPE 1202 PROGRAM SHEET

LINE NO.	OPERATION	DRUM LOC.	SC.	LOC.	A	M	B	Q
1	GA	0112	0	0112	0	0	0	0
2	BW	0117	0	0117	0	0	0	0

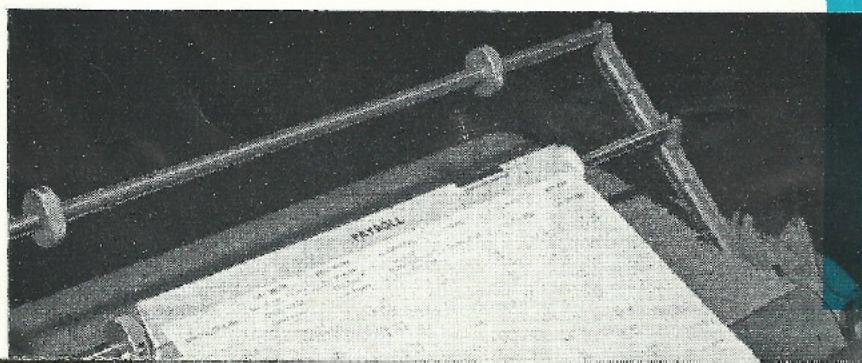
AUTOMATICALLY CONVERTED INTO

12 DENARY CARDS

1 BINARY CARD

FOR FASTER PROCESSING

output



from the computer is provided by a line

INTERNATIONAL COMPUTERS AND TABULATORS LIMITED

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I.C.T.

I.C.T

type 1202

The I.C.T Type 1202 Electronic Computer is a small, low priced digital computer suitable for general data processing applications in industry, commerce, local and national government. The latest development of the successful 1200 series, the Type 1202 is extremely flexible, economical and simple, both in appraisal and application.

arrangement

The computer comprises five units:

card reader with line printer

magnetic drum unit

electronic arithmetic unit

console

card punch



input

I.C.T 80-column cards, punched with information in alphabetic, decimal, binary or other notations, using a card reader operating at 100 cards a minute.

output

Results printed on a line printer at 100 lines a minute, or punched on cards in decimal or binary notation at 100 cards a minute.

transfer

Information transferred directly from card reader to line printer when required.

storage

The magnetic storage drum is of 4,096 words capacity, on 256 tracks—16 groups of 16 tracks, 16 words per track. The drum revolves at 50 r.p.s., giving average access time of 10 milliseconds.

registers

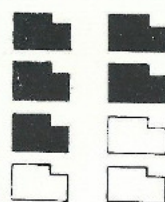
Four registers of one word length each; three of the registers can be used as immediate access stores.

arithmetic

The computer adds, subtracts, multiplies and divides; shifts within and between the registers; converts automatically into and from binary; add/subtract time is 2.5 milliseconds, plus access time.

other features

The computer is a binary machine with a basic word length of 40 binary digits, serial mode of working; word time is 1.25 milliseconds; the 1+1 address code easily permits optimum programming.



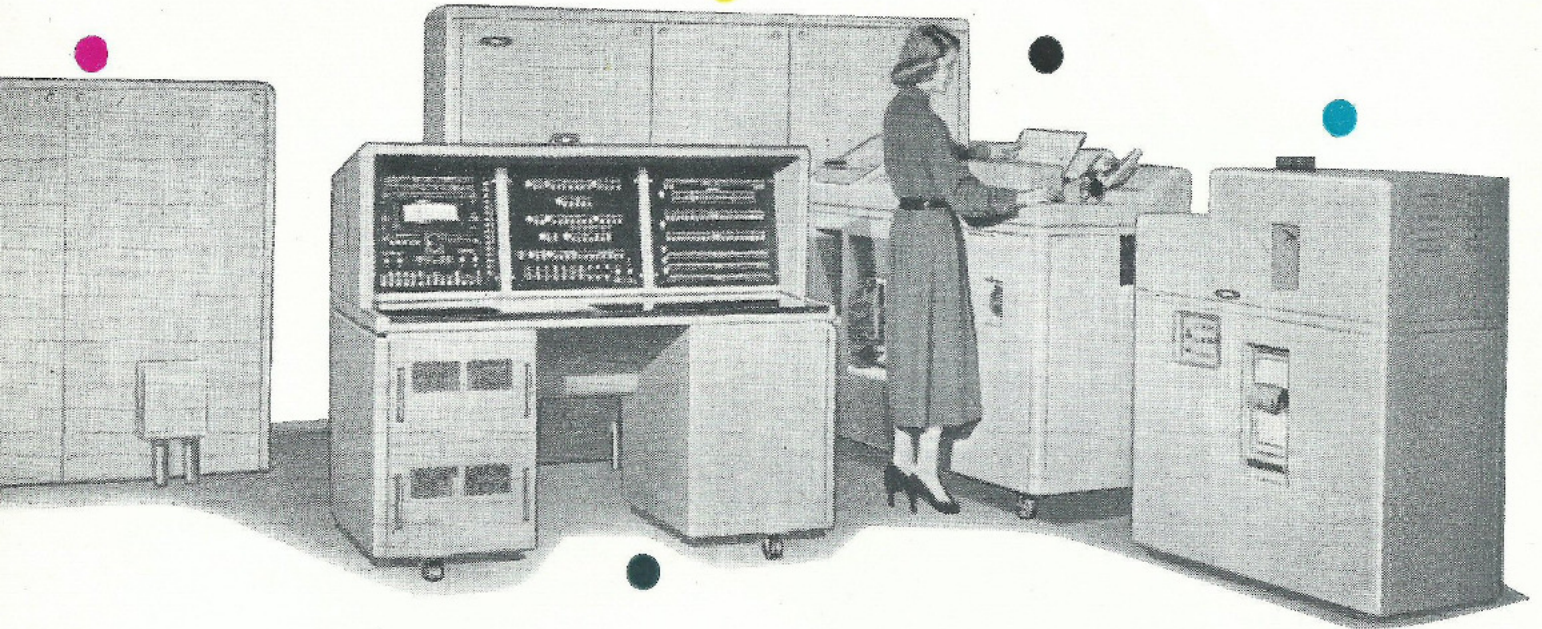
more than half

of the commercial computers ordered delivered in Great Britain are I.C.T series general purpose electronic computers.

NATIONAL GOVERNMENT

uses 1200 series computers for large-scale stores accounting and provisioning integrated with bill paying and costing; for statistical control analysis arising from subsidy payments; for large payrolls.

electronic computer



LOCAL GOVERNMENT

for income and expenditure analysis; rate assessment and demands; payroll accounting and stores control.

BRITISH RAILWAYS

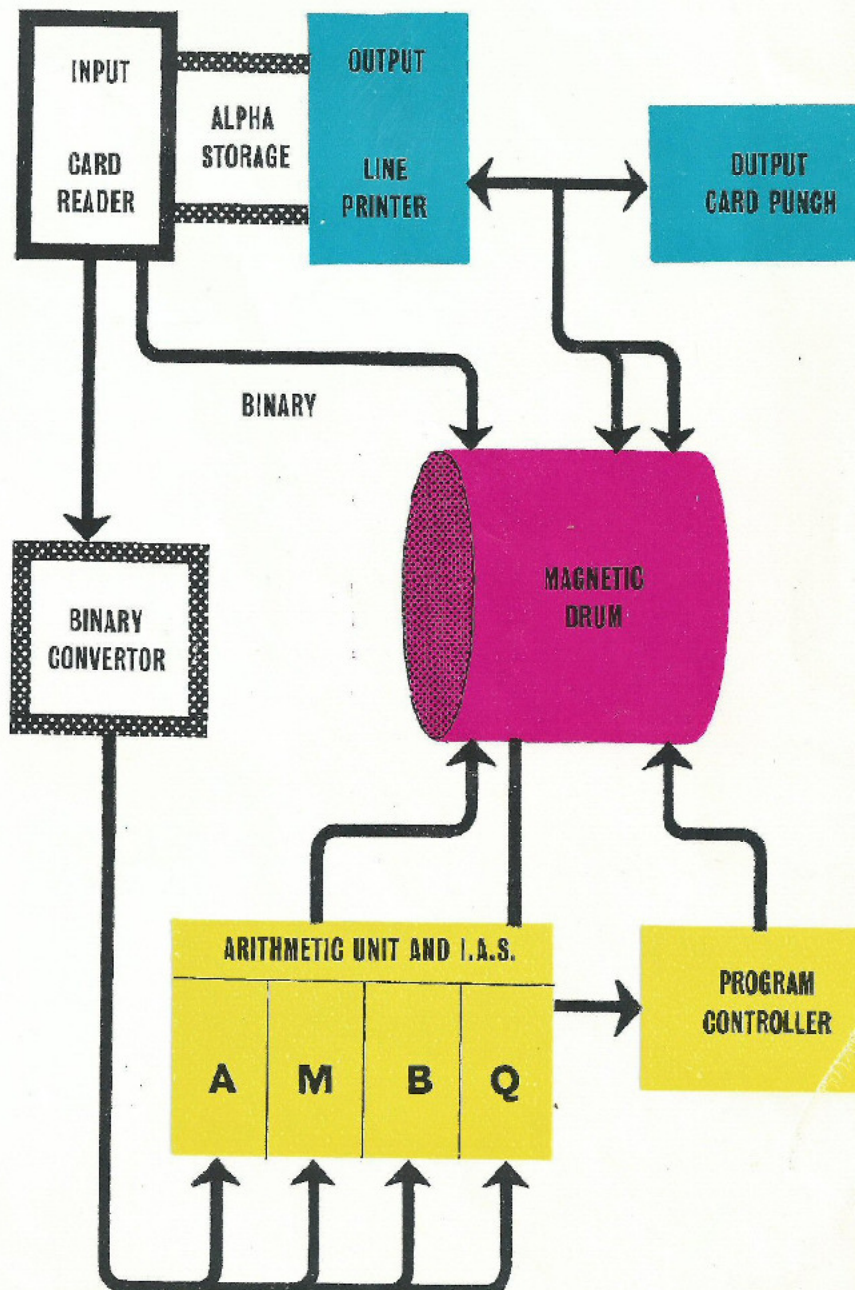
and other nationalized industries, for large payrolls initiated by feeding into the computer daily starting and finishing times; for stock control and stores accounting.

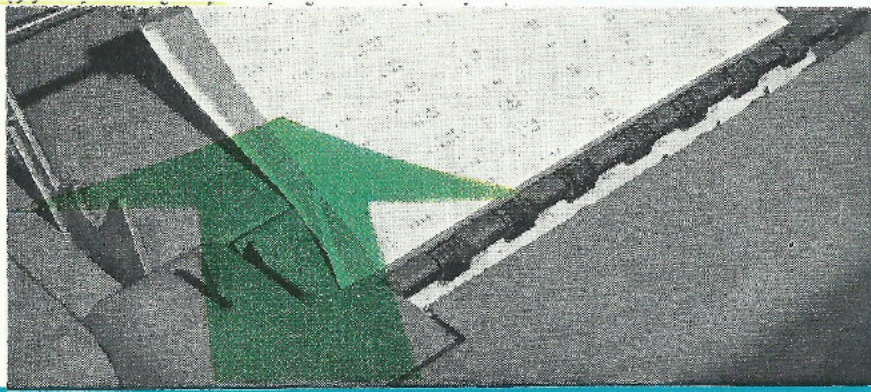
INDUSTRY

in over 30 installations in the United Kingdom—for technical calculations in engineering; cost variance statements; production control including feed-back; management by exception; routine accounting procedures; operations research; large payrolls.

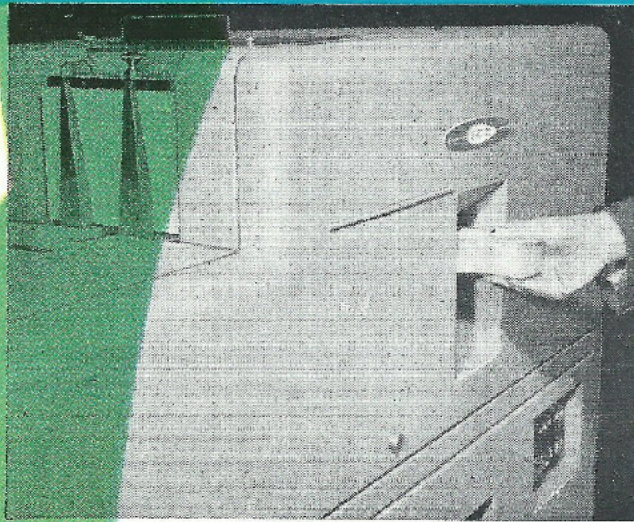
In other parts of the world it is being used for stock control and provisioning; census and statistical work; control of large-scale agricultural schemes; payrolls.

All these diverse applications lead to the integration of wages, costing, production control, stores control, provisioning and financial analysis. The goal is a single information system—the aim of scientific management.



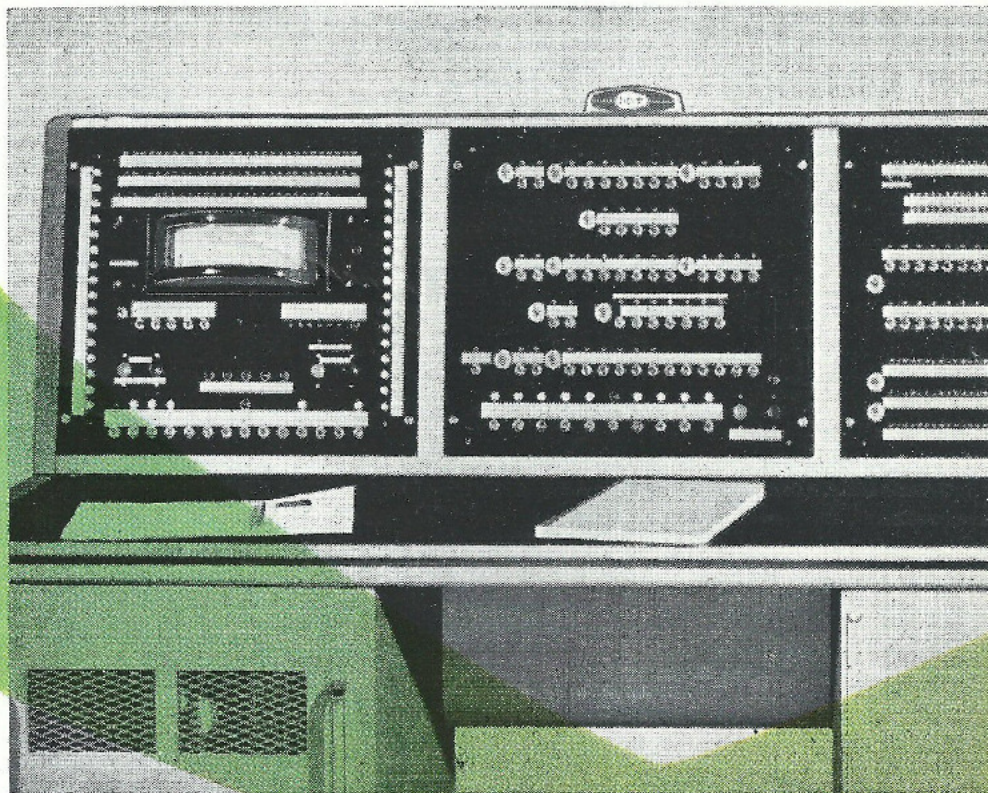


printer and a card punch. The printer consists of an alpha/numeric print unit 100 characters wide, operating at 100 lines per minute. The unit prints in one line up to 64 digits from the computer, together with data derived directly from input cards and the alpha/numeric storage unit. Format flexibility is achieved by plugboard control.



The card punch—at a speed of 100 cards per minute—will punch 64 decimal digits from the computer in any columns of the card, together with characters from the alpha/numeric storage unit.

Blank column detection checking is used for output punching, and there is a full parity check on binary punched output.



data processing

With the Type 1202 Electronic Computer all the a to give backing to the computer and to provide the into order for sequential processing on the computer tape-controlled card punch.

Such a data processing system, which can be evolved size, I.C.T. makes available its full resources in d

arithmetic unit

in A without a fresh order for each addition. For multiplication, the multiplier is placed in M, the multiplicand in B or Q, forming a double length product in A and M. Calculations of $A+(B \times C)$ can be performed in the identical time required for a single multiplication.

For division, the divisor is placed in A, the dividend in B, forming the quotient in Q.

Addition or subtraction, together with transfer of instruction to the program controller, takes 2.5 milliseconds. Average time for multiplication by an eight decimal factor is approximately 20 milliseconds. For division, a 40 binary digit quotient can be formed in a maximum of 50 milliseconds.



console

... houses the control switches and neon displays of the registers and the program controller. It has two main functions. It is used by the programmer in the testing and checking required during compilation of programs, and by the engineer

in conducting the preventive maintenance needed to ensure that the computer remains in efficient working order.

The right-hand part of the display panel shows in binary form the contents of the four registers. The centre part shows the stage of the program controller operation, and also carries the operation switches. The left-hand side contains the instruments required by the engineer.

Any program is initiated by setting a single instruction on the switches.

... benefits of the range of fully tried, tested and proved I.C.T ancillary equipment are immediately available, ... of integrated data processing. As an instance—variable input data received at random can be sorted off-line. Records received in the form of punched paper tape can be automatically converted to punched cards by the

... with the help of I.C.T, may include a few or many other punched card machines. Whatever the system or its manufacture, training and in many other spheres—proof of the inclusive nature of I.C.T service.