1301 Technical Specification (taken from ICT pamphlet "1301 Data Processing System Specification and Order Code" reference P134/12.61/2MR/FP)

PRINCIPAL TECHNICAL DETAILS

WORD LENGTH	12 decimal or sterling digits including sign
P.R.F.	1 megacycle per second
INPUT DATA	Both numeric (decimal or sterling) and alphabetical information can be read into the computer, processed, stored, printed out in all print positions.
INSTUCTION FORM	The single address system is used. Each word normally contains two instructions, though certain instructions of double length use a whole word
CHECKING	All transfers out of both the drum and the core store are checked. An error correcting code is used for the tape units
INTERNAL MODE	Serial-parallel.
NUMBER BASE	Binary-coded decimal
ELECTRONICS	Solid state components and transistors are used throughout.

ARITHMETIC FUNCTIONS

ADDITION AND SUBTRACTION	Decimal or sterling (21 micro-seconds to obey).
MULTIPLICATION	Decimal or sterling (170 micro-seconds average per multiplier digit).
DIVISION	Decimal or sterling by program.
PROGRAMMING	. An automatic coding system will be available as an aid to programming the computer

INPUT

1 – CARD READER TYPE 590/0

Each 80-column card is read twice and checked by program.

Cards fed endwise at 600/minute, face downwards, column 80 leading.

Independent rows of 12 photocells and associated amplifiers for reading and checking of punched information.

Hopper capacity 2000 cards.

Stacker capacity 2000 cards

Auxiliary stacker capacity 500 cards.

OUTPUT

1 – CARD PUNCH TYPE 600/0

100 fully punched 80-column cards a minute.

Each punched card is read and checked by program.

Hopper capacity 800 cards.

Stacker capacity 650 cards with offset facility.

IMMEDIATE ACCESS CORE STORE

400 words of immediate access core storage.

Up to a total of 2000 words in multiples of 400 words.

MAGNETIC DRUM

12000 words are stored in 60 channels of 200 words/channel.

Electronic channel selection is used and the average access time is 5.7 ms.

Up to a total of eight can be fitted.

CONTROL AND VISUAL DISPLAYS (CONSOLE)

OPERATOR AND PROGRAMMER

On-off control and warning indicators associated with the principal units. Indicators which display the contents of the registers and switches which enable the programmer to set numbers into the registers.

ENGINEERS

Additional indicators and switches for maintenance together with the meters and controls for marginal checking.

MAGNETIC TAPE

GENERAL

Two alternative magnetic tape systems are available as additional specification to the basic 1301 system. These are referred to as the High Speed and Standard systems. An automatic break-in facility is provided whereby the main program is interrupted whenever a tape unit requires access to the computer. One tape may be read and one written simultaneously.

NUMBER OF UNITS

From one to eight tape decks may be specified. Decks associated with a particular computer must all use the same tape system.

TAPE LENGTH

Each reel contains 3600 feet of tape.

BLOCK LENGTH

Variable.

CHECKING

Automatic correction of single bit errors; detection of double bit errors.

CONTROL UNIT

A magnetic tape control unit is added to the computer if a tape system is specified. It comprises the deck address selector unit and the data transfer unit.

QUEUING FACILITY

More than one tape may be assigned the same reference number. Consecutive reels of the same file, loaded and ready for use, will be automatically processed in sequence and while the second reel is running through the first may be rewound.

	STANDARD SYSTEM	HIGH SPEED SYSTEM
Tape width	½ inch	1 inch
Reel length	3600 feet	3600 feet
Channels used		
Total	10	10
for data	4	8
for checking	6	8
Digits per inch	300	600
Inches per second	75	150
Word Length	12 digits, including sign	12 digits, including sign
Alphabetic characters (zone and numeric)	2 digits	2 digits
Digit rate per second	22500	90000
Block length	variable up to limit imposed by IAS available	variable up to limit imposed by IAS available
Inter block gap	0.9 – 1.29 ins	1.12 – 1.35 ins
Inter block gap time	12.0 – 19.4 ms	7.5 – 11.2 ms
Automatic error correction	of single bit errors in digit	of single bit errors in any digit pair
Error detection	Yes	Yes

OPERATION

The operator's area is laid out to give a clear view of all lights. The operator's portion of the central control panel and of the individual input/output units have a common background colour. Particular attention has been paid to the layout and design of the controls to provide maximum clarity and ease of operation. The desk portion has been treated to unify the front area and ample space is provided for two people to sit at the central controls. There is space at the card reader for card boxes adjacent to the hopper and stacker, and guide rails to assist in moving full boxes and to prevent accidental damage to the desk in that area. There are two lockers on the right of the control desk, which can be used by the operator and for storage of log sheets and manuals. The transparent cover for the printer reduces noise level. Except for the back row of units, the computer is below eye level.

SIZE

The front area of the computer including the main electronics unit is 4' 8" high, and this height has been maintained in order that it does not cut the room into walled units when installed. The back unit is 6' 2" tall. It is necessary in considering installation to provide a minimum of 3' 6" clearance round all units, for ease of access to the equipment for maintenance. The minimum room size for a basic 1301 installation, including this clearance, is 24' x 24'.

APPROXIMATE WEIGHTS OF UNITS

BASIC INSTALLATION	lbs
Central processor (transported in 2 sections) 2 x 315=	630
Immediate access core store (first 400 words)	500
Magnetic drum electronic unit	160
Magnetic drum	380
Card reader	250
Line printer	750
Card punch	640
Power supply unit	200
Control and display	300
Paper trolley	30
Approximate weight of basic installation	<u>3840</u>

SCALEABLE ITEMS	
Immediate access core store – per additional 400 words	130
Magnetic drum – per additional drum	360

Magnetic tape control unit   1675
Magnetic tape decks – per deck   600

POWER SUPPLY

3 phase, 4 wire, 50c/s, 346/450V. The computer will also operate on 40 c/s and 60 c/s with minor modifications. The power consumption is 7kVA for a basic installation, rising to 11.2kVA for one with 8 drums. When the machine is, in addition, fitted with magnetic tape, the consumption can rise to approximately 30.8kVA when 8 decks are connected. A typical one drum, four magnetic tape installation has a power consumption of 19kVA.
The high degree of reliability and long life of solid-state devices are combined with low power dissipation. The need for forced air cooling is considerably reduced and the unit is more compact. The lower working temperature also leads to greater reliability and longer life of other circuit components. Power supply equipment is reduced and other advantages include low operating voltages, which make service testing of live circuits easier and safer, and an immunity from noise interference, which is promoted by the generally lower impedance levels.

INSTALLATION

The basic machine is transported in its constituent cabinets, the largest of which is 6' 9" x 2' 8", and assembled on site. Levelling devices are fitted to all units, unevenness of the floor is taken up in the variation of the depth of the plinth.
The punch unit can be pulled away from the power supply unit to provide access for maintenance.

CABLING

The need for under-floor wiring or floor cables has been reduced to a minimum. Special connections are eliminated altogether where magnetic tape is not specified.

AIR CONDITIONING

Heat generated by the basic machine amounts to 5 kW and air conditioning is not normally required. Where magnetic tape units are included in the system, air conditioning is required for those units.

NOISE REDUCTION

Precautions have been taken to ensure that the level of noise emanating from the installation will be as low as possible.

CARD AND PAPER TROLLEY

In view of the distinctive visual treatment of the 1301, a card trolley have been designed to harmonise with the overall design.