

# ELLIOTT

# 9000

Volume 1: FUNCTIONAL SPECIFICATION

Part 5: INSTALLATION

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## Chapter 1: GENERAL

### 1.1 Introduction

This section provides information on the installation of the ELLIOTT 900 Computing System. To aid delivery and installation, customers will be requested to complete a questionnaire; a typical one is shown in Appendix I.

The sites for basic systems will not normally be surveyed unless specifically requested by the customer. A basic system consists of a central processor with 8192 words of store, a punch and reader and/or teleprinter, together with the associated control logic and power units. In the United Kingdom, when a larger-than-basic system is ordered, the site will be surveyed by the Elliott Installation Services Department and a layout scheme provided. The transportation, installation and commissioning for all U. K. sites is organised by Elliotts.

In Europe, the site for a larger-than-basic system can be surveyed by the Installation Services Department, if the customer finds it difficult to supply by letter the information required. Elliott's will also organise transport, installation and commissioning on the European Continent.

For sites in the U. K. and Europe, advice on anything concerning installation can be obtained from:-

Installation Services,  
Computer Field Service Division,  
Elliott-Automation Computers Limited,  
Elstree Way,  
Borehamwood,  
Hertfordshire.

In other parts of the world, the equipment is normally shipped to the nearest port and special arrangements are made for final delivery, installation and commissioning.

Details of services provided to sites outside the U. K. and Europe can be obtained from:-

Elliott-Automation (International) Limited,  
Elstree Way,  
Borehamwood,  
Hertfordshire.

## 1.2 Environment

The 900 System is designed to withstand a wide range of environmental conditions, so that reliable operation is ensured in a normal office environment of temperature range 10 to 30 °C and relative humidity range of 20 to 95% without condensation.

A large system can dissipate several kilowatts of power, so that it may be advisable to fit extractor fans in the room for the comfort of the operator.

Accumulation of dust in the working area, particularly where magnetic tape is used, should be minimised by daily cleaning with vacuum cleaner or impregnated duster, and removal of waste paper.

## 1.3 Computer Location

The 900 System can be used in any place where a normal office environment is maintained.

When located in a room, the floor area required should include space for any off-line data preparation equipment that will be used. This equipment should also be included when estimating floor loading and mains supply requirements. With a larger-than-basic system, the use of a false floor to conceal cable runs is at the discretion of the customer. In order to facilitate maintenance and servicing, it is desirable to allow a clearance of 90 cm (3 ft) at the front and rear of each desk and peripheral device.

Fluorescent lighting is recommended and the illumination should be 45 lumens per square foot measured at a height of three feet above floor level.

Most of the equipment is housed in standard desks having dimensions of width 109 cm (43 inches), height 94 cm (37 inches) and depth 66 cm (26 inches).

The standard desks are supported by four feet each having a diameter of 5 cm (2 inches). Measurements of the point loadings on the feet of a central processor desk (DPA 1), with paper tape and teleprinter controller (DPA 211) fitted and punch, reader and control unit placed on top of the desk, gave a maximum loading on any one foot of  $322 \text{ kN/m}^2$  ( $46.5 \text{ lb/in}^2$ ).

#### 1.4 900 Computer System

Details of the equipment comprising the 900 System are given in Table 1.

TABLE 1  
ELLIOTT 900 Computer System

Equipment and Cat.No.	Description	Dimensions H x W x D cm(in)	Weight kg (lb)	Max.Power Consumption (KVA)	Max.Heat Dissipation J/s (Btu/h)
Central Processor with 8K Store (DPA 1)	Computer with 8192 Store, Power Supply, Fans and Mains Filter in Standard Desk	94(37) x 109(43) x 66(26)	118 (260)	0.2	200 (680)
Control Unit (DPA 51)	Control Unit (usually stands on processor desk)	17.8(7) x 49.5(19.5) x 18.2(7.2)	8.2 (18)	0.01	10 (34)
Additional 16K Store (DPA 111)	Additional 16384 Store and Power Supply in Standard Desk	94(37) x 109(43) x 66(26)	118 (260)	0.04	40 (135)
Additional 8K Store (DPA 121)	Additional 8192 Store and Power Supply in Standard Desk	94(37) x 109(43) x 66(26)	111 (245)	0.04	40 (135)
Additional 8K Store with Store Access Control (DPA 122)	Additional 8192 Store, Power Supply and Store Access Control Unit in Standard Desk	94(37) x 109(43) x 66(26)	113 (250)	0.05	50 (170)
Paper Tape and Teleprinter Controller (DPA 211)	Power Supply, Logic Rack and Interface Boards. (Normally housed in Central Processor Desk)		45.4 (100)	0.1	100 (340)

On Line Adaptor (DPA 212)	One logic board, located in DPA 211					
Paper Tape Reader (DPA 221)	Tape Reader (250 c.p.s.), associated logic located in DPA 211	24.8(9.75) x 15.6(6.2) x 23.5(9.25)	5.4 (12)	0.2	200 (680)	
Paper Tape Punch (DPA 231)	Tape Punch (110 c.p.s.), associated logic located in DPA 211	33(13) x 25.4(10) x 48.3(19)	26.5 (60)	0.7	690 (2390)	
Teleprinter (DPA 241)	Teleprinter with stand, associated logic located in DPA 211	84.7(33.4) x 47.3(18.6) x 47(18.5)	27.2 (60)	0.2	200 (680)	
Multiplexer (2 channels) (DPA 312)	Logic rack, Entry panel, Power Supply	Normally housed in spare capacity of other desks	25 (55)	0.06	60 (205)	
Multiplexer (4 channels) (DPA 314)	Logic rack, Entry panel, Power Supply	Normally housed in spare capacity of other desks	25 (55)	0.09	90 (305)	
Multiplexer (6 channels) (DPA 316)	Logic rack, Entry panel, Power Supply	Normally housed in spare capacity of other desks	25 (55)	0.12	120 (410)	
Multiplexer (8 channels) (DPA 318)	Logic rack, Entry panel, Power Supply	Normally housed in spare capacity of other desks	25 (55)	0.15	150 (510)	
900/4100 Interface Matching Unit (2 channels) (DPA 322)	Logic rack, Entry panel, Power Supply	Normally housed in spare capacity of other desks	25 (55)	0.06	60 (205)	900 1.5

Equipment and Cat.No.	Description	Dimensions H x W x D cm(in)	Weight (kg (lb))	Max. Power Consumption (KVA)	Max. Heat Dissipation J/s (Btu/h)
900/4100 Interface Matching Unit (4 channels) (DPA 324)	Logic rack, Entry panel, Power Supply	Normally housed in spare capacity of other desks	25 (55)	0.09	90 (305)
900/4100 Interface Matching Unit (6 channels) (DPA 326)	Logic rack, Entry panel, Power Supply	Normally housed in spare capacity of other desks	25 (55)	0.12	120 (310)
900/4100 Interface Matching Unit (8 channels) (DPA 328)	Logic rack, Entry panel, Power Supply	Normally housed in spare capacity of other desks	25 (55)	0.15	150 (510)
900/NPL Interface Matching Unit (1 channel) (DPA 331)	Logic rack, Entry panel, Power Supply	Normally housed in spare capacity of other desks	25 (55)	0.06	60 (205)
900/NPL Interface Matching Unit (2 channels) (DPA 332)	Logic rack, Entry panel, Power Supply	Normally housed in spare capacity of other desks	25 (55)	0.09	90 (305)



900/NPL Interface Matching Unit (3 channels) (DPA 333)	Logic rack, Entry panel, Power Supply	Normally housed in spare capacity of other desks	25 (55)	0.12	120 (410)
900/NPL Interface Matching Unit (4 channels) (DPA 334)	Logic rack, Entry panel, Power Supply	Normally housed in spare capacity of other desks	25 (55)	0.15	150 (510)
9 Kc/s Magnetic Tape(1 handler) (DPA 341)	Control desk and Console with 1 handler	Control desk 94(37) x 109(43) x 66(26) Console 160(63) x 152(60) x 78(31)	68 (150)	0.5	250 (860)= 280 (620)
9 Kc/s Magnetic Tape (2 handlers) (DPA 342)	Control desk and Console with 2 handlers	Control desk 94(37) x 109(43) x 66(26) Console 160(63) x 152(60) x 78(31)	68 (150)	2.5	250 (860)= 375 (830)
9 Kc/s Magnetic Tape (3 handlers) (DPA 343)	Control desk and Console with 3 handlers	Control desk 94(37) x 109(43) x 66(26) Console 160(63) x 152(60) x 78(31)	68 (150)	0.5	250 (860)= 470 (1040)

Equipment and Cat.No.	Description	Dimensions H x W x D cm(in)	Weight kg (lb)	Max. Power Consumption (KVA)	Max. Heat Dissipation J/s (Btu/h)
9 Kc/s Magnetic Tape (4 handlers) (DPA 344)	Control desk and Console with 4 handlers	Control desk 94(37) x 109(43) x 66(26) Console 160(63) x 152(60) x 78(31)	68 (150) 570 (1250)*	0.5 5.0	250 (860)= 2500 (8600)=
Digital Plotter (DPA 381)	Plotter and Controller on stand	105.5(41.5) x 67(26.5) x 34.5(14.5)	36.3 (80)	0.2	200 (680)
Standard Desk (DPA 611)		94(37) x 109(43) x 66(26)	50 (110)	-	-
Computer and Store Power Supply (Standard) (DPA 621)	Power Supply Unit		31.7 (70)	0.3	300 (1025)
Peripheral Power Supply (Standard) (DPA 622)	Power Supply Unit		13.6 (30)	0.15	150 (410)
Peripheral Power Supply (Special) (DPA 623)	Power Supply Unit		15.9 (35)	0.2	200 (680)

\* Point loading of 830 kN/m<sup>2</sup> (120 lb/in<sup>2</sup>) assuming equal loading on all six feet.

= average figure

## 1.5 Power Supplies

The mains supply required for 900 systems is 230 V  $\pm$  10%, 50 c/s  $\pm$  1 c/s.

The basic 900 System consisting of a central processor with punch and reader and/or teleprinter, together with the associated control logic, can be operated from a single 13A switched socket.

A small installation consisting of the basic system with peripheral devices which do not include a backing store, can be operated from 13A switched sockets which should all be on the same ring main. In certain circumstances it may be necessary to fit filters in the computer mains input lines.

At sites where the mains-borne interference level is likely to be high (e.g. where arc-welding equipment or motors having large starting currents are located nearby) a separate circuit from the main distribution board is recommended.

Installations which include a backing store, and large installations in general, should be operated from a separate circuit from the main distribution board with mains filters fitted at the computer room. This supply should preferably be single phase. Appendix 2 outlines the electrical requirements for such installations.

If equipment which is likely to radiate interference (e.g. R.F. heating equipment) is installed near the computer, the equipment should be screened.

A sufficient number of 13A sockets should be provided for the connection of test equipment for servicing purposes and reserved for this use only.

1.6 Cables

The basic systems are supplied with a standard set of cables.

The layout and cable lengths required for larger systems will normally be specified by the Installation Services Department and submitted to the customer for approval. The cables for the 900 System are either 3, 7, 12, 16 or 25 feet long.

For additional information on cables and connections refer to Appendix 3.

1.7 Packaging and Transport

The customer may be requested to provide the labour for off loading the company's vehicles and moving the equipment under Elliot supervision. The special handling equipment is carried in the company's vehicles, but a crane or fork lift may also be required. Requests for these will be made in advance by the Installation Services Department.

Appendix 1: SUMMARY OF THE QUESTIONNAIRE AND INFORMATION SHEET

Specification of computer.

Customer's name and address.

Site address and name of its representative.

THE COMPUTER ROOM

Which floor is it to be located on?

Dimension of room?

Please provide a plan of the access route and the computer room.

Maximum permissible floor loading?

POWER SUPPLIES

Quote: volts, frequency and current, also the tolerance on the voltage and frequency.

Is earth connection provided? If so, what is the earth loop impedance?

Are there any existing power points; what is the type of connector and its rating?

Are there any known sources of interference near the computer room?

ACCESS

Width of corridors (if any).

Steps to be negotiated and ramps if available (etc.).

Lift (if any) and its particulars.

Hours during which the installation can be carried out.

Is a local labour force available. If so, how many men?

Is a mechanical hoist available? If so, lifting capacity, etc.

Is there a service road?

Are there any restrictions on waiting time? (details).

900

1.5

Is Police permission required before unloading can take place?

Any obstacles to be encountered between the vehicle and the building? (If so, details).

Are there any restrictions on the use of Elliott labour on site?

Any further information.

Appendix 2: ELECTRICAL INSTALLATION NOTES

Basic and small 900 installations which do not include a backing store are normally supplied from 13A ring main sockets. When a separate mains supply is provided it should meet the following requirements.

1. The installation should conform to the latest edition of the I. E. E. Regulations for the Electrical Equipment of Buildings.
2. The mains supply for the computer installation should be a separate circuit from the main distribution board. Any ventilation equipment, lighting, etc., associated with the computer installation must not be supplied from this circuit.
3. The mains supply cables must be run in earthed metal conduit or trunking unless mineral-insulated copper-covered cable is used.
4. The conduit or trunking or outer surface of M. I. C. C. cable must not be used as an earth return path.
5. The conduit or trunking must not contain any cables which are not part of the computer installation and must not contain any cables connected to ventilation equipment, lighting, etc., which may be associated with the computer installation.
6. The connection to earth will normally be provided by the electricity supply authority, in the form of the metal sheath of the incoming supply cable to the building.

7. Where such an earth connection is not available the earth connection may be made instead to an earth electrode buried in the ground. The I. E. E. Regulations for earth loop impedance must be met.
8. Water pipes, gas pipes or lighting conduit must not be used as an earth connection.
9. The conductor which connects the computer system to earth must meet the following requirements:-
  - (a) Its resistance must not exceed 1 ohm. The I. E. E. Regulations for earth-loop impedance requirements must also be met and these may imply less than 1 ohm.
  - (b) The cross-sectional area of conductor must not be less than that of the mains supply cables.
  - (c) It must not serve as an earthing conductor for other equipment.
  - (d) It must be insulated.
  - (e) The route taken by the conductor must be as direct as practicable in order to minimise R. F. impedance.
  - (f) An earth conductor may be connected to any equipment via the earth pin of a 13A connector, providing the above requirements are met.
10. The supply must be controlled by a master switch and associated H. R. C. fuse or miniature circuit-breaker installed in a readily accessible position in the computer room.



11. The mains filter unit must be fitted after the master switch and before the distribution wiring. If a 3-phase supply is used a filter should be fitted in each phase and neutral conductor, decoupling each phase and neutral conductor to a common earth.
12. Distribution should be via junction boxes to the central processor and to peripherals. The earth connection must be insulated from the frame of the junction box.
13. The supply to the central processor and to each peripheral unit should each be protected by an H. R. C. fuse or miniature circuit-breaker. The type of fuse or circuit-breaker chosen must have adequate current-breaking capacity for the particular mains supply.
14. The mains supply should preferably be 1-phase. If the mains supply is 3-phase the master switch and filter will be 3-phase, the computer load being divided into three 1-phase groups. In arranging this the following points must be observed:-
  - (a) Each cabinet of a group of related peripheral devices (e.g. Magnetic Tape Handlers and Controller) must be supplied from the same phase.
  - (b) The layout of the computer installation and the 3-phase distribution must be such that there is not less than 6 feet distance between any mains-voltage terminals of any one cabinet and any mains-voltage terminals of any other cabinet which is connected to a different phase.

The distance is to be measured around any permanently-fixed barriers (e.g. building partitions), but is to be measured directly where normally-present barriers (e.g. cabinet side panels and doors) can be removed during servicing and maintenance.

15. The master switch and protection, filter, all mains supply cables and junction boxes, conduit and trunking are to be provided by the customer.

Recommended makers are:-

English Electric for fuses, switchfuses and distribution fuseboards.

Dorman and Smith for switches, miniature circuit-breakers and miniature circuit-breaker distribution boards.

Belling-Lee for mains filters. Details of suitable filters can be obtained from the Installation Service Department.

Appendix 3: CABLEFORM AND CONNECTION TABLE

Description	Equip. Cat. No. DPA	Connected to	Using Cableform (C/F No.)	Standard Lengths (feet)	Remarks
Central Processor	1	Mains	260	20	Supplied with Central Processor
Control Unit	51	Central Processor	Not allocated (2)	2½	Supplied with Control Unit
Additional 16K Store	111	Central Processor or	Not allocated (3)	9	Supplied with Store
		1st Additional Store	Not allocated (2)	3	If 2nd Add. Store is not in same desk as 1st alternative length must be specified (DPA 131)
Additional 8K Store	121	Central Processor or	Not allocated (3)	9	Supplied with Store
		1st Additional Store	Not allocated (2)	3	If 2nd Add. Store is not in same desk as 1st alternative length must be specified (DPA 131)
Additional 8K Store with SAC	122	Central Processor or	Not allocated (3)	9	Supplied with Store
		1st Additional Store	Not allocated (2)	3	If 2nd Add. Store is not in same desk as 1st alternative length must be specified (DPA 131)
P.T. & Teleprinter Controller	211	Central Processor	Not allocated (3)	3 Approx.	Supplied with Controller
On-Line Adaptor	212	P.T. & Teleprinter Controller	-	-	C/F's not required
On-Line Program Facility	213	P.T. & Teleprinter Controller	-	-	C/F's not required

Description	Equip. Cat. No. DPA	Connected to	Using Cableform (C/F No.)	Standard Lengths (feet)	Remarks
Interface Unit for 2nd PTS	215	Central Processor & 1st PTS 2nd PTS and Mains	273 & 274	20	) Supplied with ) ) Interface Unit
			275 & 276	6	
			260	20	
P.T. Reader	221	P.T. & Teleprinter Controller	254 & 255	4 & 3½	Supplied with Reader
P.T. Punch	231	P.T. & Teleprinter Controller	256 & 257	5¼	Supplied with Punch
Teleprinter	241	P.T. & Teleprinter Controller	Not allocated (2)	16	Supplied with Teleprinter
Multiplexer 2 Channels	312	Central Processor	263 & 267*	7, 12 & 16	*Earth Link required if system has 9Kc/s MT C/F lengths must be specified
Multiplexer 4 Channels	314	Central Processor	263 & 267*	7, 12 & 16	*Earth Link required if system has 9Kc/s MT C/F lengths must be specified
Multiplexer 6 Channels	316	Central Processor	263 & 267*	7, 12 & 16	*Earth Link required if system has 9Kc/s MT C/F lengths must be specified
Multiplexer 8 Channels	318	Central Processor	263 & 267*	7, 12 & 16	*Earth Link required if system has 9Kc/s MT C/F lengths must be specified
903/4100 IMU 2 Channels	322	Central Processor or Multiplexer	263 & 264	3, 7, 12, 16 & 25	C/F lengths must be specified

Description	Equip. Cat. No. DPA	Connected to	Using Cableform (C/F No.)	Standard Lengths (feet)	Remarks
903/4100 IMU 4 Channels	324	Central Processor or Multiplexer	263 & 264	3,7,12,16 & 25	C/F lengths must be specified
903/4100 IMU 6 Channels	326	Central Processor or Multiplexer	263 & 264	3,7,12,16 & 25	C/F lengths must be specified
903/4100 IMU 8 Channels	328	Central Processor or Multiplexer	263 & 264	3,7,12,16 & 25	C/F lengths must be specified
903/NPL IMU 1 Channel	331	Central Processor or Multiplexer	263 & 264	3,7,12,16 & 25	C/F lengths must be specified
903/NPL IMU 2 Channels	332	Central Processor or Multiplexer	263 & 264	3,7,12,16 & 25	C/F lengths must be specified
903/NPL IMU 3 Channels	333	Central Processor or Multiplexer	263 & 264	3,7,12,16 & 25	C/F lengths must be specified
903/NPL IMU 4 Channels	334	Central Processor or Multiplexer	263 & 264	3,7,12,16 & 25	C/F lengths must be specified
9Kc/s Mag. Tape System (1 Handler) 9Kc/s Mag. Tape System (2 Handlers)	341	Controller	263 & 264 + Earth Link	3,7,12,16 & 25	C/F lengths must be specified
	342	Connected or Multiplexer	263 & 264 + Earth Link	3,7,12,16 & 25	C/F lengths must be specified
		To	and Mains	268	15 & 30
9Kc/s Mag. Tape System (3 Handlers) 9Kc/s Mag. Tape System (4 Handlers)	343	Handler Console	269 + Earth Link	12,16,20 & 25	C/F lengths must be specified
	344	Connected and Mains To	270	15 & 30	C/F lengths must be specified

Description	Equip. Cat. No. DPA	Connected to	Using Cableform (C/F No.)	Standard Lengths (feet)	Remarks
Digital Plotter (All Types)	381	Central Processor or Multiplexer	263 & 264	3,7,12,16 & 25	C/F lengths must be specified
		and Mains	97	15 & 30	C/F lengths must be specified
Oscilloscope Display	391	Central Processor or Multiplexer	263A & 264A	3,7,12,16 & 25	C/F lengths must be specified
		and Mains	268	15 & 30	C/F lengths must be specified
Computer and Store Power Supply	621	Add. Stores and Mains Filter Unit (in CP)	Not allocated (1)	2	Supplied with Power Supply
			Not allocated (1)	2½ & 9	Supplied with Power Supply
Peripheral Power Supply (Standard)	622	Multiplexer or IMU (Not NPL)	-	-	C/F's not required
Peripheral Power Supply (Special)	623	Multiplexer or IMU (Inc. NPL)	-	-	C/F's not required
Display Unit	871	Central Processor	Not allocated (3)	10	Supplied with Display
Marginal Test Unit	881	Central Processor	Not allocated (1)	10	Supplied with Test Unit