

List of probable English Electric DEUCE computer deliveries.

<i>Delivery date</i>	<i>No. of machines</i>	<i>Customer & location</i>	<i>Application/ remarks</i>
Feb 55	1	EE Nelson Research Lab., Stafford	Internal computing service for the English Electric Co.
May 55	1	National Physical Lab., Teddington	NPL Computing Service. Machine switched off July 1966.
May 55	1	Royal Aircraft Establishment, Farnborough. (RAE)	Aircraft research. Machine known as GERT.
?	1	EE, Marconi House, Strand, London	Computing Bureau
?	1	EE, Main Works, Stafford	Transformer design.
June 56	1*	Bristol Aeroplane Co., Filton.	Machine switched off July 1968. (by then British Aircraft Corp.)
Aug 56	1	New South Wales University of Technology, Sydney, Australia.	Machine known as UTECOM
Sept 56	1	Atomic Weapons Research Establishment, Aldermaston	
Dec 56	1	RAE, Farnborough	Machine known as DAISY
Feb 57	1*	Bristol Siddeley Aero-Engine Co., Patchway, Bristol.	Machine probably switched off soon after 1964.
June 57	1	BP, Aldgate, London	Seismic work.
Sep 57	1	Short Bros & Harland, Belfast	Aircraft design
Nov 57	2	EE Co. (later BAC), Warton, near Preston	Aircraft design
Feb 58	2	EE Mechanical Engineering Lab., Whetstone, Leicester.	
?/58	1	Glasgow University	
?/58	1	Central Bureau of Statistics, Norsk Regnesentral, Oslo, Norway	
Nov 58	1	EE Co., Guided weapons Division, Luton	
?	3*	Ministry of Agriculture, Fisheries & Food, Guildford, Surrey.	Three MAFF computers taken out of service in March 1971.
Late 59?	1	Liverpool University	Later (1964) moved to Stafford Technical College, Beaconsfield.
?	1	Queens University Belfast	
?	1	National Engineering Labs. (DSIR), East Kilbride.	
?	1	Central Electricity Generating Board, London	
?	2	EE Computers Bureau, Kidsgrove	
?	1	UK Atomic Energy Authority, Capenhurst	
??/60	1	EE Co., Liverpool	
?	1	Admiralty Research Establishment, Teddington	
?	1	EE Co., Stafford	

Notes on the above Table.

Most former employees from the English Electric Co. Ltd. (EE) agree that the total number of DEUCE computers built was **33**. Here are three possible sources of confusion about the exact number.

(1). Name changes associated with the two aircraft factories in the Bristol area, both of which had DEUCE computers until at least 1964 when the computing needs were taken over by a KDF9. Firstly, in 1956 the Bristol Aeroplane Co., Filton, split into Bristol Aircraft (Filton) and Bristol Aero Engines (Patchway). Bristol Aircraft at Filton eventually merged with several major British aircraft companies to form the British Aircraft Corporation (BAC), becoming British Aerospace in 1977 and later BAE Systems. Secondly, Bristol Aero Engines, Patchway, was merged in 1959 with Armstrong Siddeley Motors to form Bristol Siddeley Engines Ltd. In 1968 Bristol Siddeley Engines became part of Rolls-Royce Ltd.

(2). There is some doubt about the three machines shown for the Ministry of Agriculture, Fisheries & Food (MAFF). For example John Barrett [eedeuce@optusnet.com.au] wrote: "I find three machines at MAFF very doubtful. I was one of the engineers there, leaving in November 1961. There was no mention of additional machines when I left and my wife kept in contact with the staff there and additional machines were never mentioned". However, an article in *Computer Weekly* for 20th May 1971 says: "In March this year, three DEUCE machines were taken out of service at the Ministry of Agriculture & Fisheries' computer centre in Guildford, Surrey".

(3). Confusion may sometimes arise due to one machine being passed on by an original organisation to another location, when a DEUCE became surplus to the first site's requirements. For example Marconi, part of the English Electric empire, was known to have had a DEUCE computer at its Chelmsford headquarters but the date of installation has not yet come to light. The presence of the DEUCE at AWRE Aldermaston might have been withheld from some publicly-available lists on security grounds.

The contents of the above Table is based on information given by P J (Jeremy) Walker: Jeremy 'at' dial-barn.co.uk - see:

www.members.optusnet.com.au/deucepix/pjwalker.htm

See also:

<http://members.dodo.com.au/~robin51/deuce.htm>

<http://members.dodo.com.au/~robin51/deuce.htm>

Additional comments come from <http://users.tpg.com.au/eedeuce/people.html#sindex> and from Peter Stanley [phstanley 'at' tiscali.co.uk] and Robin Vowels [robin_v 'at' bigpond.com].

For information on the DEUCE at NPL, see *Turing's Legacy – a history of computing at the National Physical Laboratory 1945 – 1995*. D M Yates. Published by the Science Museum, London, 1997.

What version of DEUCE? What options and facilities?

There were four 'versions' of DEUCE computers, known as Mark 0, Mark I, Mark II and Mark IIA. Various equipment options were also provided over the years, for example number of columns used in the card reader/punch, whether paper tape input/output devices were an option, whether automatic instruction modification (AIM) was fitted, A full check-list of the possibilities, as at September 1961, is given below.

According to Robin Vowels, "Models delivered before about September 1957 were the "original" DEUCE, and later known as Mark 0, to distinguish them from post-September 1957 machines which were called Mark I and which were the standard or basic machine. All except one of these were upgraded in the field to Mark I.

"Some machines may have been installed as a different model and subsequently upgraded in the field. A Mark I machine could be upgraded in the field to Mark II, but this would have been much more expensive than just buying a Mark II, and although I do not know of any machine that was upgraded that way, it doesn't mean that none was.

"The Ministry of Agriculture, Fisheries, & Food had three DEUCE, and if the first one was delivered before about 1959, it would have been a Mark I. If so, possibly it was upgraded to Mark II, as they are known to have had three Mark II.

"A Mark IA or Mark IIA machine had seven extra delay lines of 32 words each. While it is true that the Mark I machines had separate devices for input and output, adapted from Hollerith machines, and the Mark II had a single combined reader and punch from IBM, the essential difference was that the Mark I machine was for scientific uses, whereas the Mark II was for scientific and commercial uses. The Mark II had hardware for converting card columns to 6-bit characters and vice versa, and that this hardware conversion was buffered to and from store and was completely automatic, while the Mark I required programmed input and output. The 80 column Read and Punch equipment (IBM 528) could also read and punch in the same manner as the Mark I machines, namely, programmed input and output. In other words, the Mark II was upwards compatible with the Mark I".

Check-list from *DEUCE News* 66, September 1961, pages 3 – 5, in an article by C B Bisham of EE Kidsgrove.

The two images given below list the facilities of "all 30 DEUCE's at present in service", together with a key to the abbreviations used in the first image. The two images constitute a valuable chronology of the modifications and enhancements to DEUCE computers that took place in the period February 1955 to September 1961.

The 30 installations included in the first image are:

Bristol Aircraft (2 machines); Bristol Engines (2 machines); BP London; CEGB London; EE Kidsgrove (2 machines); EE London Computing Service; EE Nelson Research Labs.; EE Luton; EE Stafford; EE Warton (2 machines); EE Whetstone (2 machines); Glasgow

University; Liverpool University; MAFF Guildford; Marconi Chelmsford; National Engineering Labs., East Kilbride; CBS Norway; NPL Teddington; Queens University Belfast; Royal Aircraft Establishment Bedford; RAE Farnborough (2 machines); Short Brothers Belfast; UK Atomic Energy Authority; University of New South Wales, Australia.

The abbreviations included in the second image include:

AIM Automatic Instruction Modifier – providing the effect of an index register

DL Delay line – in this context, a short mercury delay line.

G Graph plotter – providing visualization of functions, diagrams, etc.

The two images, which have been provided by David Leigh, are given on the following two pages.

Simon Lavington.

	Mark	RS	AIM	64 COL.	80 COL.	MT	Δ DL'S	5 PO	7 PI	7 PO	MN	EF	HR	PF	BC	G
Bristol (Aircraft) 1	I	*	*	*				*a			*	*			*	
Bristol (Engines) 2	I	*	*	*											*	
Bristol (Aircraft) 3	I	*	*	*							*	*			*	
Bristol (Engines) 4	I	*	*	*							*	*	*		*	
B.P. London	O	*									a*					
C.E.G.B. London	I	*	*	*		4							*			
E.E. Kidsgrove CCS 5	IIA	*	*	*	*	4	*		*	(*)	*	*	*			
E.E. Kidsgrove CCS 6	I	*	*	*					*	*	*	*	*			*
E.E. L.C.S.	I	*	*	*							*					
E.E. N.R.L. 2	II	*	*	*	*	4					*	*	*			
E.E. Luton	I	*	*	*							*	*	*			
E.E. Stafford	IIA	*	*	*	*	6	*				*	*	*			
E.E. Warton 1	I	*	*	*					(*)	(*)	*a		*			
E.E. Warton 2	I	*	*	*					(*)	(*)	*	*	*			
E.E. Whetstone 1	I	*	*	*					*	*	*a			*a		
E.E. Whetstone 2	IIA	*	*	*	*		*		*	*	*	*	*			
Glasgow University	I	*	*	*					*	*b	*	*				
Liverpool University	I	*	*	*					*	*	*	*				
M.A.F.F. Guildford	IIA	*	*	*	*		*				*	*	*			
Marconi's W.T. Chelmsford	II	*	*	*	*						*	*	*			
N.E.L. East Kilbride	I	*	*	*					*	*	*a					
Norway, C.B.S.	II	*	*	*	*				*		*	*	*			
N.P.L. Teddington	O	*	*			*a					*a					
Queens University Belfast	I	*	*	*					*	*	*	*	*			
R.A.E. Bedford	II	*	*	*	*						*	*	*			
R.A.E. Farnborough 1	I	*	*	*				*	*				*			
R.A.E. Farnborough 2	I	*	*	*				*	*				*			
Shorts, Belfast	I	*	*a	*					*	*b						
U.K.A.E.A., Capenhurst	II	*	*	*	*						*	*	*			
Uni. Tech., N.S.W.	aI		*	*												

(*)	Order received and machine awaiting conversion.
a	Non standard.
b	Without parity cancellation.
Mark 0	has 32 col. read/punch without AIM or RS.
Mark I	has 64 col. read/punch with AIM and RS
Mark II	has 80/64 col. read/punch with AIM, RS, EF.
Mark IIA	has 80/64 col. read/punch with AIM, RS, EF, HR and 7 "A" DL's
RS	Request stop on N, S, D.
AIM	Automatic Instruction Modifier.
MN	Magnetic drum indicators on control panel.
MT	Magnetic tape with the stated number of decks.
5 PO	5-hole paper tape output.
7 PO	7-hole paper tape output.
7 PI	7-hole paper tape input.
EF	Extended facilities on control panel: magnetic drum indicators, P1 and P15 I.S. lamps; RS on N, S, D, L; P1 key on External Tree.
HR	Head shift interlock rationalisation.
BC	Batching counter on punch.
PF	Program controlled job number and counter reset on punch.
G	Graph Plotter.