Version 3, November 2011 **E1X1**

Delivery lists and applications of the Elliott 152, 153 and Nicholas computers.

These machines were the first three stored-program electronic digital computers to be designed and built at the Borehamwood Laboratories of Elliott Brothers (London) Ltd. The Elliott company was an instrument-making enterprise founded in 1804 which had, since about 1908, been engaged in manufacturing electro-mechanical gunnery-control analogue computers for the Royal Navy. In October 1946 the Admiralty helped the company to open a new research laboratory at Borehamwood expressly for carrying out classified work on naval radar and anti-aircraft fire control (ie gunnery). The first Admiralty contract was for a digital fire-control system called MRS5, at the centre of which was the Elliott 152 computer.

Delivery list for the Elliott 152.
The 152 was a one-off, real-time on-line computer, the first (rather unreliable, off-line) version of which was working at Borehamwood by about September 1950. The unreliability of the first version was due to the mechanics of the rack-chassis plugging system, pcb tracking problems and insufficient cooling. A re-built and enhanced version was working from about March 1951 on simple programs. The 152 was used in earnest for radar signal analysis in May/June 1952 and effectively shut down on 30th June 1952 at the conclusion of an Admiralty contract. (See reference 1 in section X5). Only one 152 computer was built.

Delivery list for the Elliott 153 (the *DF computer*).
The 153 computer was produced in response to an Admiralty contract, dated 1949, to speed up the calculation of direction-finding (DF) fixes. During the Cold War, it became very important to be able to locate potentially hostile military assets by taking bearings on their radio transmissions. Listening stations were established world-wide, many of them connected by the Defence Teleprinter Network (DTN).

Because there were several practical sources of error, both predictable and unpredictable, it was preferable to obtain bearings from several stations before calculating the position of a particular target. The algorithm was complex. The Admiralty, acting for GCHQ, therefore decided to install a single central DF computer, into which teleprinter reports from DF stations world-wide could be fed. The chosen site was a Naval WT station at Irton Moor near Scarborough, at which DF facilities were already well-developed.

The Borehamwood Laboratory of Elliott Brothers (London) Ltd. was given the contract to design the DF computer. The internal Borehamwood project-number for the machine was 153. After some delay, the 153 project gained momentum in 1952. The computer was delivered to Scarborough in mid-August 1954. However, it was a further 18 months before the complete system of computer plus teleprinter connections was fully operational. The

153 remained in satisfactory use until the late 1960s (see reference 1, section E1/X5). Only one 153 computer was built.

Delivery list for the Elliott Nicholas.

Nicholas was the name given to an in-house computer built for, and partly by, the Theory Division of Elliott's Borehamwood Laboratory. The design was started in early 1952 and Nicholas was completed in December of that year. The first major problem, consisting of trajectory calculations requiring a program of about 1,400 instructions, was begun on January 1st 1953. The application concerned a defence contract for a guided bomb. Many other (unrelated) applications followed. Nicholas provided a valuable in-house computing service for the Theory Group at Borehamwood until 1958. It was also used by customers, who could hire time at one old penny a second (£15 per hour). Nicholas was the first computer to use nickel magnetostrictive delay-line storage – hence the name. Only one Nicholas computer was built.