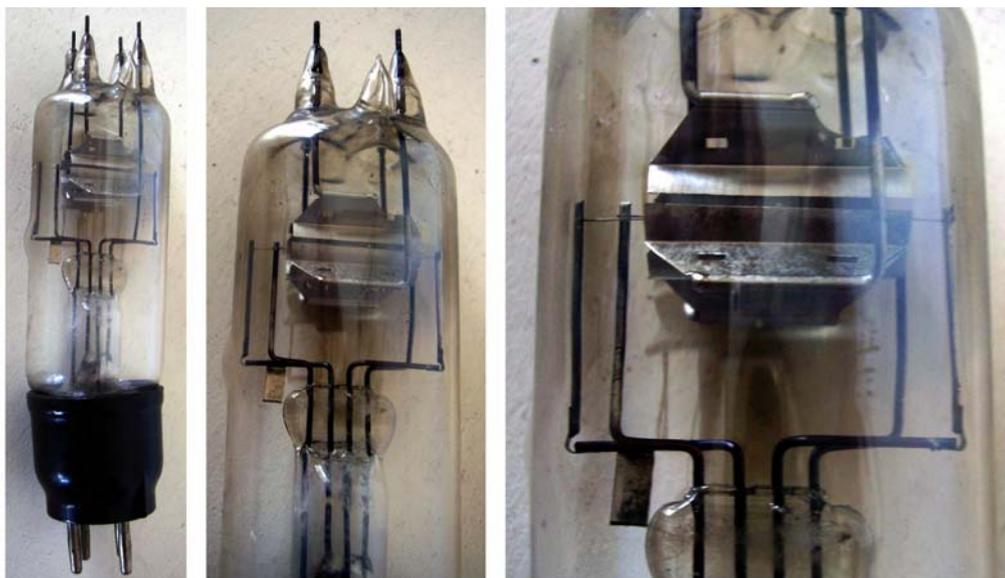


GEC E880 Magnetron, Lab Prototype # 3

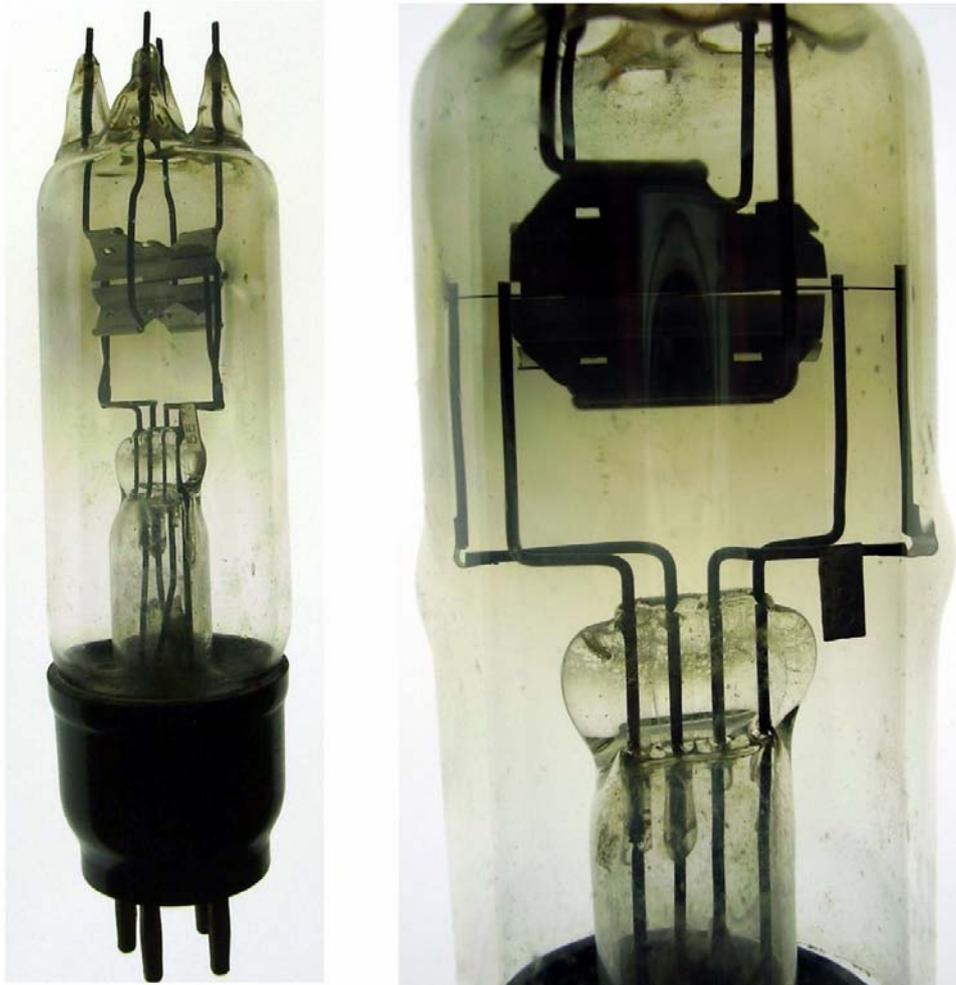


Here the most intriguing laboratory prototype of the GEC E880, eventually approved as NT75. Split-anode four-segment type, in accordance with the trend of the mid-1930s proposed by Posthumus of Philips and widely accepted in Europe. Each segment is rigidly supported by one of the four top pins and together they form a cylinder approximately 15 mm long and 7.5 mm in diameter. In addition to the filament and to the four plate segments, this sample shows a second wire close to the filament and parallel to it, almost certainly a grid for direct modulation of the RF. The collection includes other GEC gridded samples, the [GEC experimental #3](#), with a quasi-conventional grid, and the [GEC experimental #4](#), in which the grid is formed by two parallel wires. Megaw talks of his experiments on direct modulation of its magnetron for a ship-to-ship secure communication system and then that this prototype was probably designed and assembled when the decision was taken of using a pulse modulation to transmit telegraphic signals. The Megaw's paper (*) on the communication system does not provide details on how many prototypes were tried to test the performance of such a solution but almost certainly he tried to place a control grid in the electrodes of the E880 design, since he evidences the unacceptable power drop due to the direct modulation.

The basic electrode structure, the base and top pins and the same bulb are identical to those of the NT75. A small label inside shows the figure 557 punched on it. Some details are worth of note. Four thick wires, about 1mm in diameter, come up from the glass pinch, to support both the ends of the filament and of the grid wires. The external pair, the one that holds the filament, at the end of the horizontal sections is connected to the vertical segments by a pair of small springs which keep the filament under tension. The filament almost touches the glass wall, while in correspondence with the springs the wall has two small bulges, almost forming niches in which the springs can move.

See also the GEC E880 [Type 1](#) and [Type 2](#) experimental magnetrons.

* The development of the magnetron and of the entire ship-to-ship secure communication set for which the E880 was designed is described by the same Megaw in the [papers of the International Congress](#) held in Rome in 1947 on the 50th anniversary of the discovery of the radio by Marconi.



View of the magnetron and of some internal details. The small springs at the end of the horizontal segments of the external rods and the containing bulges in the glass bulb can be appreciated in the second photo.