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Design of a preamplifier card for the photomultiplier tubes of a Gamma Camera

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The service provided by the Gamma Cameras (GC) in the nuclear medicine departments fails because of their breakdown, generally due to the associated electronics and not to the physical detection components. For this reason, it was decided to develop an electronic system that allows the recovery and optimization of disused GC, starting with the design of the preamplifier for each photomultiplier tube (PMT). The circuit was designed and simulated and the list of components necessary for the construction of the preamplifier was generated, as well as the printed circuit board was designed for its assembly. By simulating the preamplifier this worked in linear mode. This determines that the amplitude of the output signal is proportional to the amount of charge delivered by the detector. This card allows an automatic adjustment of the signals of the PMTs as do the modern GC. Besides, the circuit was designed and simulated for 37 and 75 PMTs, and the printed circuit board was designed for both cases.

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