

Summary of GlueX Detector Subsystems

Detector	Photon tagger	Upstream Photon veto	Start counter	Central drift	Forward drifts	Cerenkov	Time-of-flight	Barrel calorimeter	Forward calorimeter
Type	Scintillator	Scintillator	Scintillator	Straw tube	Planar chamber	Gas	Scintillator	Sci fibers	Lead glass
Energy resolution	0.1% (segmentation)	10%/√E	N/A	20%	N/A	N/A.	N/A	2% + 5%/√E	3.6% + 7.3%/√E
Channel count	192	20	40	3240	2900 anode 11,400 cathode	40	168	960	2500
Signal source	PMT	PMT	PMT	Straw tube	anode wires cathode strips	PMT	PMT	SiPMT	PMT
Physics signal	100 pe	100 pe	100 pe	25 e	25 e	5 pe	500 pe	100 pe/GeV	250 pe/GeV.
Gain in detector	10 ⁶	10 ⁶	10 ⁵	10 ⁴	10 ⁴	10 ⁶	10 ⁵	10 ⁶	10 ⁶
Typical charge	16 pC	16 pC	16 pC	40 fC	40 fC anodes 4 fC cathodes	1 pC	80 pC	16 pC/GeV	40 pC/GeV
Preamp gain	no	no	no	10 ³	10 ³ anodes 10 ⁴ cathodes	10 ²	no	no	no
Discrimination	constant fraction	no	constant fraction	no	yes (anode) no (cathode)	no	constant fraction	constant fraction	no
Time resolution	100 ps	1 ns	350 ps	1 ns	1 ns	3 ns	80 ps	200 ps	400 ps
Dynamic range	5	100	100	1000	100 anodes 1000 cathodes	10	10	500	500
FADC	8 bits 250 Msps	8 bits 250 Msps	8 bits 250 Msps	10 - 12 bits 125 Msps	Cathodes: 10 - 12 bits 62.5 Msps	8 bits 250 Msps	8 bits 250 MSPS	8 bits 250 Msps	8 bits 250 Msps
TDC	62 ps	no	62 ps	no	Anodes: 125 ps	no	31 ps	62 ps	no
Level 1 trigger	yes (low rate runs)	no	track count	no	no	no	track count	track count energy sum	energy sum