

GEN - Generic Technologies

CD1 - EEE Components, Photonics, MEMS

Programme Reference	Activity Title	Budget (k€)	ITT status
GT17-600ED	Analog to digital converter for image detector readout applications	1,100	ITT to be issued Q3/Q4 2024
GT17-601ED	Space evaluation of chip-on-board assembly for non-hermetic applications	350	ITT to be issued Q3/Q4 2024
GT17-602MM	Environmental evaluation of a hybrid image sensor	500	
GT17-603ED	Space evaluation of a millimeter-wave GaN MMIC process	500	
GT17-604MM	Radiation testing of a COTS general purpose image sensor	750	
GT17-605ED	Modelling of radiation effects in nanoscale FinFET technology and assessment of mitigation techniques for space applications	500	
GT17-606ED	Exploitation of Silver sintering technology	500	
GT17-607QE	Radiation screening of COTS microcontrollers for small satellites	250	ITT to be issued Q1/Q2 2024
GT17-608ED	High voltage and high energy wet Tantalum capacitor	300	
GT17-609QE	FPGA based radiation experiment testbed	800	ITT to be issued Q3/Q4 2024
Total CD1		5,550	

CD2 - Structures, Mechanisms, Materials, Thermal

Programme Reference	Activity Title	Budget (k€)	ITT status
GT17-610MS	Electroless nickel immersion gold surface (ENIG) finish for electronic assemblies	500	
GT17-611MT	Retractable MLI cover for external payloads	450	ITT to be issued Q3/Q4 2024
GT17-612MS	Space thermoplastic composite assemblies	500	ITT to be issued Q3/Q4 2024
GT17-613QE	Lightweight radiation shielding materials	500	ITT to be issued Q3/Q4 2024
GT17-614QE	Conductive white coatings for extreme environments	500	ITT to be issued Q3/Q4 2024
GT17-615MT	Loop heat pipe using advanced manufacturing	600	ITT issued
GT17-616MS	Actuator design and commanding technologies optimisation for micro- vibration minimisation	500	ITT to be issued Q4 2024
GT17-617MS	Long lifetime electrical power and signal transfer technology	500	
Total CD2		4,050	

CD3 - Avionic Systems

Programme Reference	Activity Title	Budget (k€)	ITT status
GT17-618SA	Image processing and navigation module	750	
GT17-619ED	End-to-end on-board data handling architecture based on optical high-speed links	1,200	ITT to be issued Q3/Q4 2024
GT17-620ED	OBPMark benchmarks for on-board data processing	800	
GT17-621SA	Reliable attitude determination and control system development for nanosats	1,000	ITT issued
GT17-622ES	Data relay RF simulator system	900	
GT17-623ED	RISC-V instruction set architecture simulation model and emulation in virtual platform for hardware-software codesign	500	
GT17-624ES	Low-SWaP hybrid deep-space transponder	1,200	
GT17-625QQ	RTEMS SMP Extensions qualification	700	
GT17-626SW	Satellite mode definition, RAMS, FDIR and autonomy engineering tool	800	
GT17-627EF	GNSS antenna for lunar applications	1,000	
GT17-628EF	High performance COTS processor and module for machine learning applications	3,750	
Total CD3		12,600	

CD4 - Electric Architecture, Power and Energy, EMC

Programme Reference	Activity Title	Budget (k€)	ITT status
GT17-629EP	Cost reduction of photovoltaic assembly	1,000	
GT17-630EP	Lithium-Carbon fluoride electrochemistry ultra high specific energy primary cell	1,000	
GT17-631EP	Delta development and qualification of solar cells for environment specific optimisation	1,000	
GT17-632EP	High frequency switched latch up current limiter module	750	ITT to be issued Q3/Q4 2024
GT17-633EP	Very low power DC/DC converter for gate drivers	700	
GT17-634EP	Technologies to accurately estimate the battery state of charge	600	
GT17-635EP	Digital isolator with integrated low power converter	1,200	
GT17-636EP	Cost reduction and yield increase of solar cells	1,000	ITT to be issued Q3/Q4 2024
GT17-637EP	High pressure water pump development for regenerative fuel cell systems	950	
GT17-638EP	Immunity to in-band electromagnetic interference for radio-frequency receivers using signal modulation	1,000	
Total CD4		9,200	

CD5 - Radiofrequency & Optical Systems and Products

Programme Reference	Activity Title	Budget (k€)	ITT status
GT17-639EF	Miniaturised deployable antenna for small and nano satellites	750	ITT to be issued Q3/Q4 2024
GT17-640EF	Digital processing unit for RF payloads and microwave instruments	900	
GT17-641ED	Prototyping of a 56 Gbaud extreme short range high-speed serial interface	900	
GT17-642MM	Adaptive optical lenses for compact optical corrections in small satellite payloads	800	
GT17-643MM	Space compatible high power pulsed laser emitters	500	
GT17-644EF	Advanced manufactured complex shaped ceramic materials for RF applications	750	
GT17-645MM	Short comb LIDAR with modulation and frequency adapted for different atmospheric molecules	1,500	
GT17-646EF	Advanced coating technologies for RF equipment with complex geometries	750	
GT17-647EF	Advanced RF integration techniques for application in highly dense millimetre- wave active antennas	800	
Total CD5		7,650	

CD6 - Life & Physical Science Payloads, Life Support, Robotics & Automation

Programme Reference	Activity Title	Budget (k€)	ITT status
GT17-648MM	Sustainable biopolymers for space applications	600	
Total CD6		600	

CD7 - Propulsion, Space Transportation and Re-entry Vehicles

Programme Reference	Activity Title	Budget (k€)	ITT status
GT17-649SA	Active shock and vibration isolation system for launcher vehicle ride comfort	1,200	
GT17-650MP	Pressure regulator for electric, chemical and cold gas propulsion systems	1,000	
GT17-651MP	High-pressure latching valve for electric propulsion	900	
GT17-652MP	Miniaturised, high-pressure isolation valve for nanosatellite propulsion	400	ITT to be issued Q3/Q4 2024
GT17-653MP	Miniaturised pressure regulator for nanosatellite propulsion	600	
GT17-654MP	Non-intrusive diagnostic system for advanced propellants	600	
GT17-655SA	Autonomous and adaptive retro-propulsive precision flight and landing systems	1,200	
GT17-656MP	Transient LOX/LNG combustion in launcher applications	900	
GT17-657SA	Closed-loop control of throttleable engines	1,000	
Innovative propulsion			
GT17-658MP	Secondary heat exchanger for combustion chamber cooling of rocket engines	500	
GT17-659MP	Cryogenic engines for in-space applications	1,500	
GT17-660MP	Cryogenic boost pump	1,500	
GT17-661MP	Advanced manufacturing including additive manufacturing of a full propulsion system in small scale	1,000	
Total CD7		12,300	

CD8 - Ground Systems and Mission Operations

Programme Reference	Activity Title	Budget (k€)	ITT status
GT17-662GS	Multi-frequency cryo-feed for deep space applications	2,000	
GT17-663GS	Manufacturing of high-power frequency selective surfaces using innovative techniques	800	
GT17-664GS	Segmented mirror telescope development	500	ITT to be issued Q1/Q2 2024
GT17-665GS	High-power adaptive optics for laser momentum transfer	900	ITT to be issued Q3/Q4 2024
GT17-666GS	Scalable real time radar processing hardware platform	1,200	
GT17-667GD	Ready-to-use cloud native ground segment for scalability from large to small satellites	2,000	ITT to be issued Q3/Q4 2024
GT17-668GD	Simulation as a service	1,250	
GT17-669GD	Resilient remote and distributed, multi-centre, multi-asset operations	1,500	
GT17-670GD	Evolved operational user interfaces	1,200	
Total CD8		11,350	

CD9 - Digital Engineering

Programme Reference	Activity Title	Budget (k€)	ITT status
GT17-671GD	Operational validation of extended reality use cases for space operations	1,200	
GT17-672SW	Use of augmented reality and virtual reality in collaborative and cooperative space applications	1,200	
GT17-673QQ	Satellite failure data log with combined design and in-orbit data	400	
GT17-674QQ	Digitalization evolution of the dependability return of experience dashboard	400	
GT17-675GS	Disruption Tolerant Networking (DTN) network management	900	
GT17-676MS	Methods to compare the measured 3D configuration of an object with its digital models for consistency verification	500	
GT17-677SY	Immersive space design environment	500	
GT17-678SY	Model-based user interaction environment	750	
Total CD9		5,850	

CD10 - Astrodynamics, Space Debris and Space Environment

Programme Reference	Activity Title	Budget (k€)	ITT status
GT17-679EP	Network of platform magnetometers and data pipeline for space environment monitoring	300	
GT17-680SD	Integrated modelling of debris mitigation compliance assessments associated with interplanetary return trajectories	450	ITT to be issued Q4 2024
GT17-681SD	Interface between space traffic and air traffic management units	400	
GT17-682SD	Manoeuvre pattern inference for safe operations	450	
GT17-683SD	Robust attitude uncertainty estimation for debris removal	500	ITT to be issued Q3/Q4 2024
GT17-684SD	Development of daytime and multispectral space debris observation capabilities	500	
Total CD10		2,600	

High Performance Data Processor (HPDP) (CD3 – Avionic Systems)

Programme Reference	Activity Title	Budget (k€)	ITT status
GT1H-601ED	On-board computing technologies based on a new high-performance data processor supporting machine learning applications	10,000	
Total HPDP		10,000	

GEN - Generic Technologies – Artificial Intelligence

CD3 - Avionic Systems

Programme Reference	Activity Title	Budget (k€)	ITT status
Guidance Navigation and Control (GNC)			
GT1I-601SA	Machine learning for attitude and orbit control systems failure detection isolation and recovery applications	650	
GT1I-602SA	Artificial intelligence techniques for spacecraft attitude control and estimation	750	ITT to be issued Q1/Q2 2024
GT1I-603SA	Advanced verification and validation techniques for neural network-based AOCS/GNC systems	600	
GT1I-604SA	Deep neural network for robust satellite model matching	500	ITT to be issued Q3/Q4 2024
GT1I-605SA	Robust real-time constrained optimal control using machine learning	600	ITT to be issued Q3/Q4 2024
GT1I-606SA	AI-based GNC/AOCS systems validation and verification evolution	1,000	
AI on the Edge			
GT1I-607ED	On-board detection of space weather events	500	
GT1I-608SW	Qualified software machine learning toolkit for space hardware	900	
GT1I-609ED	Architecture for offline processing and machine learning in mass-memories	800	ITT to be issued Q3/Q4 2024
GT1I-610EF	Reference onboard datasets for evaluation of machine learning models	800	
GT1I-611EF	Closed loop AI cognitive synthetic aperture radar	1,200	ITT to be issued Q1/Q2 2024
GT1I-612ED	AI based end-to-end satellite failure management and prognostic	1,400	
GT1I-613ED	On board processing enablers for AI for operations	500	
GT1I-614ED	Advanced heterogeneous inference data processing module	2,000	
Total CD3		12,200	

CD7 - Propulsion, Space Transportation and Re-entry Vehicles

Programme Reference	Activity Title	Budget (k€)	ITT status
Other			
GT1I-615MP	Space propulsion test anomalies dataset for machine learning assisted fault detection and isolation	800	
Total CD7		800	

CD8 - Ground Systems and Mission Operations

Programme Reference	Activity Title	Budget (k€)	ITT status
AI for mission operations automation			
GT1I-616GD	AI based decision support system for mission operations	1,200	ITT issued
GT1I-617GD	AI for automation of operations preparation and operational simulation	1,700	
GT1I-618GD	AI for automation of mission operations systems testing and validation	2,300	
GT1I-619GD	AI for automation of satellite health monitoring and ground operations	3,000	ITT issued
Total CD8		8,200	

CD9 - Digital Engineering

Programme Reference	Activity Title	Budget (k€)	ITT status
Other			
GT1I-620GD	Artificial intelligence based source code scanning open-source tool	450	
GT1I-621SY	AI digital assistant to power MBSE development	500	
Total CD9		950	

GEN - Generic Technologies - Digitalisation

CD3 - Avionic Systems

Programme Reference	Activity Title	Budget (k€)	ITT status
Model-based Systems Engineering (MBSE)			
GT1D-601SW	Model-based execution platform for space applications	1,000	ITT to be issued Q3/Q4 2024
Total CD3		1,000	

CD4 - Electric Architecture, Power and Energy, EMC

Programme Reference	Activity Title	Budget (k€)	ITT status
Simulation			
GT1D-602EP	Translator of hardware description language models into simulation languages	300	
Total CD4		300	

CD8 - Ground Systems and Mission Operations

Programme Reference	Activity Title	Budget (k€)	ITT status
Model-based Systems Engineering (MBSE)			
GT1D-603GD	End to end digital continuity for validation and simulation	600	ITT to be issued Q4 2024
Digital spacecraft			
GT1D-604GD	Pilot digital twin spacecraft for operations and assembly, integration and test with a pilot mission	3,500	ITT to be issued Q3/Q4 2024
Total CD8		4,100	

CD9 - Digital Engineering

Programme Reference	Activity Title	Budget (k€)	ITT status
Model-based Systems Engineering (MBSE)			
GT1D-605GD	Integrated web-based digital engineering framework software	2,000	ITT issued
GT1D-606SW	Model-based system engineering for interface management	500	
Model-based Systems Engineering (MBSE), Data management			
GT1D-607SY	Space system ontology: industrial tool interface development	500	
Model-based Systems Engineering (MBSE), Data management, Simulation			
GT1D-608SY	Functional and geometry model-based engineering	500	ITT to be issued Q1/Q2 2024
GT1D-609SW	Natural language processing for model-based systems engineering	500	
Simulation			
GT1D-610EP	Software layer for failure mode effects analysis at electronics circuit level	300	
Data management			
GT1D-611SY	Engineering data hub tooling extension development	500	
Data management, Simulation			
GT1D-612MS	Structural digital twin to optimise development and verification activities	1,000	ITT to be issued Q3/Q4 2024
Digital spacecraft, Data management			
GT1D-613SY	Methodology to update operational models of a spacecraft system	800	
GT1D-614SY	Concept phase operational simulation	500	ITT to be issued Q4 2024
GT1D-615SY	Digital spacecraft data management	400	
Total CD9		7,500	

GEN - Generic Technologies – Quantum Technologies

CD1 - EEE Components, Photonics, MEMS

Programme Reference	Activity Title	Budget (k€)	ITT status
GT1Q-601MM	Development of the capabilities and performance metrics in non-linear and hybrid integrated photonics for quantum applications	500	
Quantum sensing			
GT1Q-602MM	Ultra-efficient compact carrier envelope frequency detection unit for optical frequency combs	500	
GT1Q-603MM	Ultracompact 778 nm rubidium secondary optical frequency standard	1,000	
GT1Q-604MM	Heterogeneously integrated silicon nitride photonic integrated based optical frequency comb	1,000	
Total		3,000	

CD5 - Radiofrequency & Optical Systems and Products

Programme Reference	Activity Title	Budget (k€)	ITT status
Quantum computation			
GT1Q-605SW	Processing EO/Science products and big data using quantum methods	500	
Quantum sensing			
GT1Q-606MM	Highly efficient, rapid Rubidium BEC physics package using a combined G- MOT and magnetic chip system	2,000	
GT1Q-607MM	Development of Strontium G-MOT for dual use applications in matter wave interferometry and optical atomic frequency standards	2,000	
Total		4,500	

GEN - Generic Technologies - Cybersecurity

CD3 - Avionic Systems

Programme Reference	Activity Title	Budget (k€)	ITT status
GT1Y-601ES	Intrusion detection prevention module for secure avionics bus	2,500	
GT1Y-602ES	Confidential computing: implementing spacecraft operations using trusted execution environments	2,000	
GT1Y-603ES	Security segregation and isolation in a satellite	2,000	
GT1Y-604ES	Agile post-quantum space data link security protocol hardware module	3,300	ITT to be issued Q1/Q2 2024
GT1Y-605ES	End-to-end supply chain protection	3,000	ITT issued
GT1Y-606ES	CCSDS delay-tolerant networking BPsec module	2,000	
GT1Y-607ES	IP over CCSDS including internet protocol security module	1,200	
Total CD3		16,000	

CD5 - Radiofrequency & Optical Systems and Products

Programme Reference	Activity Title	Budget (k€)	ITT status
GT1Y-608ES	Low-cost resilient software defined radio platform for satellite applications	450	ITT to be issued Q1/Q2 2024
GT1Y-609ES	Radiofrequency firewall for satellites	4,000	
Total CD5		4.45	

CD8 - Ground Systems and Mission Operations

Programme Reference	Activity Title	Budget (k€)	ITT status
GT1Y-610GD	Secure communication and operations for the operational simulator	2,000	
GT1Y-611GD	Security architecture for federated operations	3,000	
GT1Y-612GD	Zero trust architecture for mission ground segments	2,000	ITT to be issued Q1/Q2 2024
Total CD8		7,000	

CD9 - Digital Engineering

Programme Reference	Activity Title	Budget (k€)	ITT status
GT1Y-613GD	Consolidation of a secure systems engineering toolset for space missions	5,000	ITT to be issued Q4 2024
GT1Y-614GD	Quantum qualification and certification technology platform	8,000	ITT to be issued Q3/Q4 2024
Total CD9		13,000	