SUBJECT FIELD AND GROUP STRUCTURE

01 AVIATION TECHNOLOGY

- 01 Aerodynamics
- 02 Military Aircraft Operations
- 03 Aircraft
- 03.01 Helicopters
- 03.02 Bombers
- 03.03 Attack and Fighter Aircraft
- 03.04 Patrol and Reconnaissance Aircraft
- 03.05 Transport Aircraft
- 03.06 Training Aircraft
- 03.07 V/STOL
- 03.08 Gliders and Parachutes
- 03.09 Civilian Aircraft
- 03.10 Pilotless Aircraft
- 03.11 Lighter-than-Air Aircraft
- 03.12 Research and Experimental Aircraft
- 04 Flight Control and Instrumentation
- 05 Terminal Flight Facilities
- 06 Commercial and General Aviation

02 AGRICULTURE

- 01 Agricultural Chemistry
- 02 Agricultural Economics
- 03 Agricultural Engineering
- 04 Agronomy, Horticulture and Aquiculture
- 05 Animal Husbandry and Veterinary Medicine
- 06 Forestry

03 ASTRONOMY AND ASTROPHYSICS

- 01 Astronomy
- 02 Astrophysics
- 03 Celestial Mechanics

04 ATMOSPHERIC SCIENCES

- 01 Atmospheric Physics
- 02 Meteorology

05 BEHAVIORAL AND SOCIAL SCIENCES

- 01 Administration and Management
- 02 Information Science
- 03 Economics and Cost Analysis
- 04 Government and Political Science
- 05 Sociology and Law
- 06 Humanities and History
- 07 Linguistics
- 08 Psychology
- 09 Personnel Management and Labor Relations

06 BIOLOGICAL AND MEDICAL SCIENCES

- 01 Biochemistry
- 02 Genetic Engineering and Molecular Biology
- 03 Biology
- 04 Anatomy and Physiology
- 05 Medicine and Medical Research
- 06 Ecology
- 07 Radiobiology
- 08 Food, Food Service and Nutrition
- 09 Hygiene and Sanitation
- 10 Stress Physiology
- 11 Toxicology
- 12 Medical Facilities, Equipment and Supplies
- 13 Microbiology
- 14 Weapons Effects (Biological)
- 15 Pharmacology

07 CHEMISTRY

- 01 Industrial Chemistry and Chemical Processing
- 02 Inorganic Chemistry
- 03 Organic Chemistry
- 04 Physical Chemistry
- 05 Radiation and Nuclear Chemistry
- 06 Polymer Chemistry

08 EARTH SCIENCES AND OCEANOGRAPHY

- 01 Biological Oceanography
- 02 Cartography and Aerial Photography
- 03 Physical and Dynamic Oceanography
- 04 Geomagnetism
- 05 Geodesy
- 06 Geography
- 07 Geology, Geochemistry and Mineralogy
- 08 Hydrology, Limnology and Potamology
- 09 Mining Engineering
- 10 Soil Mechanics
- 11 Seismology
- 12 Snow, Ice and Permafrost

09 ELECTROTECHNOLOGY AND FLUIDICS

- 01 Electrical and Electronic Equipment
- 02 Fluidics and Fluerics
- 03 Lasers and Masers
- 04 Line, Surface and Bulk Acoustic Wave Devices
- 05 Electrooptical and Optoelectronic Devices
- 06 Acoustooptic and Optoacoustic Devices
- 07 Electromagnetic Shielding

10 POWER PROPULSION AND ENERGY CONVERSION (Nonpropulsive)

- 01 Non-Electrical Energy Conversion
- 02 Electric Power Production and Distribution
- 03 Electrochemical Energy Storage
- 04 Energy Storage

11 MATERIALS

- 01 Adhesives, Seals and Binders
- 02 Ceramics, Refractories and Glass
- 02.01 Refractory Fibers
- 03 Coatings, Colorants and Finishes
- 04 Laminates and Composite Materials
- 05 Textiles
- 06 Metallurgy and Metallography
- 06.01 Properties of Metals and Alloys
- 06.02 Fabrication Metallurgy
- 07 Miscellaneous Materials
- 08 Lubricants and Hydraulic Fluids
- 09 Plastics
- 10 Elastomers and Rubber
- 11 Solvents, Cleaners and Abrasives
- 12 Wood, Paper and Related Forestry Products

12 MATHEMATICAL AND COMPUTER SCIENCES

- 01 Numerical Mathematics
- 02 Theoretical Mathematics
- 03 Statistics and Probability

12 MATHEMATICAL AND COMPUTER SCIENCES (Continued)

- 04 Operations Research
- 05 Computer Programming and Software
- 06 Computer Hardware
- 07 Computer Systems
- 08 Computer Systems Management and Standards
- 09 Cybernetics

13 MECHANICAL, INDUSTRIAL, CIVIL AND MARINE ENGINEERING

- 01 Air Conditioning, Heating, Lighting and Ventilating
- 02 Civil Engineering
- 03 Construction Equipment, Materials and Supplies
- 04 Containers and Packaging
- 05 Couplers, Fasteners and Joints
- 06 Surface Transportation and Equipment
- 06.01 Surface Effect Vehicles and Amphibious Vehicles
- 07 Hydraulic and Pneumatic Equipment
- 08 Manufacturing and Industrial Engineering and Control of Production Systems
- 09 Machinery and Tools
- 10 Marine Engineering
- 10.01 Submarine Engineering
- 11 Pumps, Filters, Pipes, Tubing, Fittings and Valves
- 12 Safety Engineering
- 13 Structural Engineering and Building Technology

14 TEST EQUIPMENT, RESEARCH FACILITIES AND REPROGRAPHY

- 01 Holography
- 02 Test Facilities, Equipment and Methods
- 03 Recording and Playback Devices
- 04 Photography
- 05 Printing and Graphic Arts

15 MILITARY SCIENCES

- 01 Military Forces and Organizations
- 02 Civil Defense
- 03 Defense Systems
- 03.01 Antimissile Defense Systems
- 03.02 Antiaircraft Defense Systems
- 03.03 Antisatellite Defense Systems
- 04 Military Intelligence
- 05 Logistics, Military Facilities and Supplies
- 06 Military Operations, Strategy and Tactics
- 06.01 Naval Surface Warfare
- 06.02 Undersea and Antisubmarine Warfare
- 06.03 Chemical, Biological and Radiological Warfare
- 06.04 Nuclear Warfare
- 06.05 Space Warfare
- 06.06 Land Mine Warfare
- 06.07 Unconventional Warfare

16 GUIDED MISSILE TECHNOLOGY

- 01 Guided Missile Launching and Basing Support
- 02 Guided Missile Trajectories, Accuracy and Ballistics
- 02.01 Guided Missile Dynamics, Configurations and Control Surfaces
- 03 Guided Missile Warheads and Fuzes

16 GUIDED MISSILE TECHNOLOGY (Continued)

- 04 Guided Missiles
- 04.01 Air- and Space-Launched Guided Missiles
- 04.02 Surface-Launched Guided Missiles
- 04.03 Underwater-Launched Guided Missiles
- 05 Guided Missile Reentry Vehicles

17 NAVIGATION, DETECTION AND COUNTERMEASURES

- 01 Acoustic Detection and Detectors
- 02 Non-Acoustic and Non-Magnetic Submarine Detection
- 03 Direction Finding
- 04 Countermeasures
- 04.01 Radio Countermeasures
- 04.02 Acoustic Countermeasures
- 04.03 Radar Countermeasures
- 04.04 Optical Countermeasures
- 05 Optical Detection and Detectors
- 05.01 Infrared Detection and Detectors
- 05.02 Ultraviolet Detection and Detectors
- 06 Magnetic and Electric Field Detection and Detectors
- 07 Navigation and Guidance
- 07.01 Land and Riverine Navigation and Guidance
- 07.02 Underwater and Marine Navigation and Guidance
- 07.03 Air Navigation and Guidance
- 07.04 Space Navigation and Guidance
- 08 Miscellaneous Detection and Detectors
- 09 Active and Passive Radar Detection and Equipment
- 10 Seismic Detection and Detectors
- 11 Target Direction, Range and Position Finding

18 NUCLEAR SCIENCE AND TECHNOLOGY

- 01 Fusion Devices (Thermonuclear)
- 02 Isotopes
- 03 Nuclear Explosions and Devices (Non-Military)
- 04 Nuclear Instrumentation
- 05 Nuclear Power Plants and Fission Reactor Engineering
- 05.01 Nuclear Fission Reactors (Power)
- 05.02 Nuclear Fission Reactors (Non-Power)
- 06 Nuclear Radiation Shielding, Protection and Safety
- 07 Radioactivity, Radioactive Wastes and Fission Products
- 08 SNAP (Systems for Nuclear Auxiliary Power) Technology
- 09 Fission Reactor Physics
- 10 Fission Reactor Materials

19 ORDNANCE

- 01 Ammunition and Explosives
- 01.01 Pyrotechnics
- 02 Aerial Bombs
- 03 Combat Vehicles
- 04 Armor
- 05 Fire Control and Bombing Systems
- 06 Guns
- 07 Rockets
- 08 Underwater Ordnance
- 08.01 Torpedoes
- 09 Explosions
- 10 Ballistics
- 11 Nuclear Weapons
- 12 Directed Energy Weapons
- 13 Guided Munitions

20 PHYSICS

- 01 Acoustics
- 02 Crystallography
- 03 Electricity and Magnetism
- 04 Fluid Mechanics
- 05 Atomic and Molecular Physics and Spectroscopy
- 06 Optics
- 06.01 Fiber Optics and Integrated Optics
- 07 Particle Accelerators
- 08 Nuclear Physics and Elementary Particle Physics
- 09 Plasma Physics and Magnetohydrodynamics
- 10 Quantum Theory and Relativity
- 11 Mechanics
- 12 Solid State Physics
- 13 Thermodynamics
- 14 Radiofrequency Wave Propagation
- 15 Electromagnetic Pulses

21 PROPULSION, ENGINES AND FUELS

- 01 Air Breathing Engines (Unconventional)
- 02 Combustion and Ignition
- 03 Electric and Ion Propulsion
- 04 Fuels
- 05 Jet and Gas Turbine Engines
- 06 Nuclear Propulsion
- 07 Reciprocating and Rotating Engines
- 08 Rocket Engines
- 08.01 Liquid Propellant Rocket Engines
- 08.02 Solid Propellant Rocket Engines
- 09 Rocket Propellants
- 09.01 Liquid Rocket Propellants
- 09.02 Solid Rocket Propellants

22 SPACE TECHNOLOGY

- 01 Astronautics
- 02 Unmanned Spacecraft
- 03 Spacecraft Trajectories and Reentry
- 04 Ground Support Systems and Facilities for Space Vehicles
- 05 Manned Spacecraft

23 BIOTECHNOLOGY

- 01 Biomedical Instrumentation and Bioengineering
- 02 Human Factors Engineering and Man Machine Systems
- 03 Bionics
- 04 Protective Equipment
- 05 Life Support Systems
- 06 Escape, Rescue and Survival

24 ENVIRONMENTAL POLLUTION AND CONTROL

- 01 Air Pollution and Control
- 02 Noise Pollution and Control
- 03 Solid Wastes Pollution and Control
- 04 Water Pollution and Control
- 05 Pesticides Pollution and Control
- 06 Radiation Pollution and Control
- 07 Environmental Health and Safety

25 COMMUNICATIONS

- 01 Telemetry
- 02 Radio Communications
- 03 Non-Radio Communications
- 04 Voice Communications
- 05 Command, Control and Communications Systems

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Websites

Table 2-1 Basic Research Areas

Basic Research Areas		
Identifier	Area	Sub-area
B.1	Physics	
B.1.1		Radiation
B.1.2		Matter and Materials
B.1.3		Energetic Processes
B.1.4		Target Acquisition
B.2	Chemistry	
B.2.1		Materials Chemistry
B.2.2		Chemical Processes
B.3	Mathematics	
B.3.1		Modeling and Mathematical Analysis
B.3.2		Computational Mathematics
B.3.3		Stochastic Analysis and Operations Research
B.4	Computer Sciences	
B.4.1		Intelligent Systems
B.4.2		Software
B.4.3		Architecture and Systems
B.5	Electronics	
B.5.1		Solid-State and Optical Electronics
B.5.2		Information Electronics
B.5.3		Electromagnetics
B.6	Materials Science	
B.6.1		Structural Materials
B.6.2		Functional Materials
B.7	Mechanics	
B.7.1		Solid and Structural Mechanics
B.7.2		Fluid Dynamics
B.7.3		Propulsion and Energy Conversion
B.8	Terrestrial Sciences	
B.8.1		Terrain Properties and Characterization
B.8.2		Terrestrial Processes and Landscape Dynamics
B.8.3		Terrestrial System Modeling and Model Integration
B.9	Ocean Sciences	
B.9.1		Oceanography
B.9.2		Ocean Acoustics
B.9.3		Ocean Geophysics
B.10	Atmospheric and Space Sciences	
B.10.1		Meteorology
B.10.2		Space Science
B.10.3		Remote Sensing
B.11	Biological Sciences	
B.11.1		Molecular/Cellular
B.11.2		Systems/Organisms
B.11.3		Biomedical
B.12	Cognitive and Neural Science	
B.12.1		Human Performance
B.12.2		Reverse Engineering

DoD's Key Technology Areas

The following summarizes the Defense Technology Area Plan.

1	**Air Platforms** -- Fixed-Wing Vehicles; Rotary-Wing Vehicles; Integrated High Performance Turbine Engine Technology (IHPTET); Aircraft Power; High-Speed Propulsion and Fuels.
2	**Chemical / Biological Defense** -- CB Detection; CB Decontamination; CB Protection; CB Modeling and Simulation; Medical Chemical Defense; Medical Biological Defense.
3	**Information Systems Technology** – Decisionmaking; Information Assurance; Seamless Communication; Modeling & Simulation Technology; Computing and Software Technology.
4	**Ground and Sea Vehicles Technology** – Platform and system technologies that support Ground Vehicles; Surface Ship Combatants; and Submarines.
5	**Materials / Processes** -- Materials and Processes for Survivability, Life Extension, and Affordability; Manufacturing Technology; Civil Engineering; Environmental Quality.
6	**Biomedical** -- Infectious Diseases of Military Importance; Combat Casualty Care; Military Operational Medicine; Medical Radiological Defense; Medical Biological Defense; Medical Chemical Defense.
7	**Sensors, Electronics and Electronic Warfare** -- Radar Sensors; Electro-Optical Sensors; Acoustic Sensors; Automatic Target Recognition; Integrated Platform Electronics; Radio-Frequency Components; Electro-Optical Technology; Microelectronics; Electronic Materials; Electronics Integration Technology; EW Threat Warning; EW Self-Protection; EW Control.
8	**Space Platforms Technology** -- Space Vehicles; Launch Vehicles; Space Propulsion [Integrated High-Payoff Rocket Propulsion Technology (IHPRPT)].
9	**Human Systems** - - System Interfaces and Cognitive Processing; Protection, Sustainment, and Physical Performance; Personnel, Training and Leader Development.
10	**Weapons** - - Two broad categories. 1) Conventional Weapons: Countermine/Mines; Guidance and Control; Guns; Missiles; Ordnance; Undersea Weapons; and Weapon Lethality / Vulnerability. 2) Directed-Energy Weapons: Lasers; and High-Power Microwave.
11	**Nuclear Technology** - - Warfighter Support; Systems Effects and Survivability; Test and Simulation Technology; Environments and Effects; Threat Reduction.
12	**Battlespace Environments** -- Terrestrial Environments; Ocean Battlespace Environments; Lower Atmosphere Environments; Space/Upper Atmosphere Environments.

J.1.2.3			Execution of Time-Critical Missions
J.1.3		Global Information Grid	
J.1.3.1			Universal Transaction Services
J.1.3.2			Distributed Environment Support
J.1.3.3			High Assurance of Services
J.2	**Precision Fires**		
J.2.1		Mission Planning	
J.2.1.1			Planning
J.2.1.2			Surveillance and Reconnaissance
J.2.2		C4ISR	
J.2.3		Weapon Employment	
J.2.3.1			Target Acquisition
J.2.3.2			Weapon System Employment
J.2.3.3			Survivability
J.2.4		Combat Assessment	
J.3	**Combat Identification**		
J.3.1		Air to Surface	
J.3.2		Surface to Surface	
J.3.3		Surface to Air	
J.3.4		Air to Air	
J.4	**Joint Theater Missile Defense**		
J.4.1		C3I	
J.4.2		Active Defense	
J.4.3		Passive Defense	
J.4.4		Attack Operations	
J.5	**Military Operations on Urbanized Terrain**		
J.5.1		Firepower	
J.5.1.1			Situation Awareness
J.5.1.2			Weapons Effectiveness
J.5.2		Force Protection	
J.5.2.1			Situation Awareness
J.5.2.2			Weapons Effectiveness
J.5.2.3			Individual Protection
J.5.3		Maneuver	
J.5.3.1			Situation Awareness
J.5.3.2			Precision Insertion
J.5.3.3			Individual Mobility
J.6	**Joint Readiness**		
J.6.1		Joint, Combined, and Interoperability Training	
J.6.1.1			Joint
J.6.1.2			Combined
J.6.1.3			Interoperability
J.6.2		Mission Planning and Rehearsal	
J.6.2.1			Mission Planning
J.6.2.2			Mission Rehearsal
J.6.3		Status Reporting and Predictive Assessment	
J.6.3.1			Status Reporting
J.6.3.2			Predictive Assessment
J.6.4		Equipping the Force	
J.6.4.1			System Acquisition
J.6.4.2			Industrial Mobilization
J.6.5		Medical Readiness	