

**APPENDIX A**  
**1996 DOD MCTL MASTER LOCATOR**

## APPENDIX A

### DoD MCTL MASTER LOCATOR\*

#### MCTL Parts

*This master locator lists the 18 MCTL technology sections for Part I and their included technology areas and indicates for Parts II and III where supporting data are located. The Locator also lists additional technology areas which are addressed only for Parts II and III. A short description of the three MCTL parts is shown below.*

**Part I**      *Weapons Systems Technologies (WST)*

*Contains a list of technologies critical to the development and production of superior weapons.*

**Part II**      *Weapons of Mass Destruction (WMD) Technologies*

*Contains a list of technologies required for development, integration, or employment of nuclear, biological, or chemical weapons and their means of delivery.*

**Part III**      *Developing Critical Technologies (DCT)*

*Contains a list of technologies which, when fully developed and incorporated into a military system, will produce increasingly superior performance or maintain a superior capability more affordably.*

	PART				PART		
	<u>I</u>	<u>II</u>	<u>III</u>		<u>I</u>	<u>II</u>	<u>III</u>
	<u>WST</u>	<u>WMD</u>	<u>DCT</u>		<u>WST</u>	<u>WMD</u>	<u>DCT</u>
<b><i>AERONAUTICS SYSTEMS TECHNOLOGY</i></b>				<b><i>ARMAMENTS AND ENERGETIC MATERIALS TECHNOLOGY</i></b>			
Advanced Concept Turbine Engines			X	Air-Dispersed Explosives Systems			X
Aircraft, Fixed Wing	1.1	1.4	X	Ammunition, Small and Medium Caliber	2.1		X
Aircraft, Rotary Wing			X	Ballistic Missiles		1.1, .2	X
Air Vehicles, Unmanned		1.3	X	Bombs, Warheads, and Large-Caliber Projectiles	2.2	1.5,3.2,	X
Full Authority Digital Electronic Controls (FADEC)			X			4.2	
Gas Turbines Engines	1.2		X	Cruise Missiles		1.3	X
Guidance, Navigation, and Controls		1.4	X	Energetic Materials	2.3	4.2	X
Human (Crew) Systems Interfaces	1.3		X	Gun and Artillery Systems	2.5	1.5	X
Ramjet and Scramjet		1.3	X	Mines, Countermines, and Demolition Systems	2.6		X
Systems Integration		1.3,1.4	X	Non-Lethal Weapons			X
Test Facility, Propulsion System			X	Penetrators			X
				Regenerative Liquid Propellant Gun			X
				Safing, Arming, Firing, and Fuzing	2.4	5.7	X
				Survivability, Armor and Warhead Defeat			X

\*These listings are subject to change as Part III is developed. Technology areas may be added or deleted.

	PART		
	<u>I</u>	<u>II</u>	<u>III</u>
	<u>WST</u>	<u>WMD</u>	<u>DCT</u>
<b><i>BIOLOGICAL SYSTEMS TECHNOLOGY</i></b>			
Biological Defense Systems	3.1	3.4	X
Biological Dispersion		3.2	
Biological Detection, Warning, and Identification	3.2	3.3	X
Biological Material Production		3.1	X
<b><i>CHEMICAL SYSTEMS TECHNOLOGY</i></b>			
Chemical Defense Systems	3.1	4.4	X
Chemical Dispersion		4.2	
Chemical Material Production		4.1	
Chemical Detection, Warning, and Identification	3.2	4.3	X
<b><i>DIRECTED AND KINETIC ENERGY SYSTEMS TECHNOLOGY</i></b>			
Coil Gun and Railgun			X
Electrothermal and Electrothermal Chemical Gun			X
High-Power Microwaves			X
Lasers, Gas Dynamic and Pulsed Electrical Atomic and Molecular			X
Lasers, High Energy Chemical	4.1		X
Lasers, High Energy Excimer			X
Lasers, High Energy Free Electron			X
Lasers, High Energy Optically Pumped Gas and Solid State			X
Lasers, High Energy Solid State			X
Lasers, High Energy Transfer			X
Lasers, Short Wavelength			X
Particle Beam, Charged			X
Particle Beam, Neutral			X
Supporting Technologies for Directed Energy (DE) Systems	4.2		X

	PART		
	<u>I</u>	<u>II</u>	<u>III</u>
	<u>WST</u>	<u>WMD</u>	<u>DCT</u>
<b><i>ELECTRONICS TECHNOLOGY</i></b>			
Electronic Components	5.1		X
Electronic Materials	5.2		X
Fabrication Equipment	5.3		X
General Purpose Electronic Equipment	5.4		X
Microelectronics	5.5		X
Opto-Electronics	5.6		X
<b><i>ENVIRONMENT TECHNOLOGY</i></b>			
Camouflage			X
Control of Combat Environment			X
Micrometeorology			X
Obscurants			X
Particle Dispersion, Coagulation, Recycling, and Reverse Disposal			X
<b><i>GROUND SYSTEMS TECHNOLOGY</i></b>			
Advanced Diesel Engines	6.1		
Human Systems Interfaces for Ground Systems			X
Hybrid-Electric Propulsion Systems			X
Sensors for Ground Systems			X
Signature Control for Ground Systems			X
Structures for Ground Systems			X
Systems Integration for Ground Systems		1.1	X
Vetronics	6.2		X
<b><i>GUIDANCE, NAVIGATION, AND VEHICLE CONTROL TECHNOLOGY</i></b>			
Aircraft and Vehicle Control Systems	7.1	1.3,1.4	X
Inertial Navigation Systems and Related Components	7.2	1.1,1.2, 1.3	X
Radio and Data-Based Referenced Navigation Systems	7.3	1.1,1.3	

	PART		
	<u>I</u>	<u>II</u>	<u>III</u>
	<u>WST</u>	<u>WMD</u>	<u>DCT</u>
<b><i>INFORMATION SYSTEMS TECHNOLOGY</i></b>			
Command, Control, Communications, Computing Intelligence and Information Systems	8.1	2.1, .5	X
Computer-Aided Design and Computer-Aided Manufacturing (CAD/CAM)	8.2		X
High-Performance Computing	8.3		X
Human Systems Interfaces	8.4		X
Information Security	8.5	2.4	X
Intelligent Systems	8.6		X
Modeling and Simulation	8.7		X
Networks and Switching	8.8	2.6	X
Signal Processing	8.9	2.3	X
Software	8.10		X
Transmission Systems	8.11	2.2	X
<b><i>INFORMATION WARFARE TECHNOLOGY</i></b>			
Combat Identification			X
Electronic Attack	9.1		X
Electronic Deception			X
Electronic Protection	9.2		X
Optical Countermeasures	9.3		X
Optical Counter-Countermeasures	9.4		X
Psychological Operations			X
<b><i>MANUFACTURING AND FABRICATION TECHNOLOGY</i></b>			
Advanced Fabrication and Processing	10.1	5.9	X
Bearings	10.2		X
Computer-Aided Design, Manufacturing, Engineering, Test, and Maintenance			X
Metrology	10.3	1.1,5.9	X
Non-Destructive Inspection and Evaluation	10.4	1.1	X
Production Equipment	10.5	1.1	X
Robotics	10.6	5.9	X

	PART		
	<u>I</u>	<u>II</u>	<u>III</u>
	<u>WST</u>	<u>WMD</u>	<u>DCT</u>
<b><i>MATERIALS TECHNOLOGY</i></b>			
Armor and Anti-Armor Materials	11.1		X
Biomaterials			X
Electrical Materials	11.2		X
Magnetic Materials	11.3		X
Optical Materials	11.4		X
Signature Control Materials			X
Special Function Materials	11.6		X
Structural Materials, High Strength and High Temperature	11.5		X
<b><i>MARINE SYSTEMS TECHNOLOGY</i></b>			
Advanced Hull Forms			X
Human Systems Interfaces			X
Ocean Salvage and Deep-Sea Implant			X
Propulsors and Propulsion Systems	12.1		X
Signature Control and Survivability	12.2		X
Subsurface and Deep Submergence Vehicles	12.3		X
Systems Integration			X
<b><i>MEDICAL TECHNOLOGY</i></b>			
Advanced Field Expedient Treatment			X
Artificial Skin			X
Blood Substitute			X
Human System Monitoring and Assessment			X
Immunizations and Neutralization			X
Performance Enhancement			X

	PART		
	<u>I</u>	<u>II</u>	<u>III</u>
	<u>WST</u>	<u>WMD</u>	<u>DCT</u>
<b><i>NUCLEAR SYSTEMS TECHNOLOGY</i></b>			
Enrichment Feedstocks Production		5.1	
Fissile Materials Enrichment		5.2	
Heavy Water Production		5.12	
Inertial Confinement Fusion			X
Lithium Production		5.5	X
Manufacturing of Nuclear Components		5.9	X
Nuclear Fission Reactors	13.1	5.3	
Nuclear Materials Processing	13.2	5.2,5.4, 5.13	X
Nuclear-Related Materials		5.1,5.5, 5.12	X
Nuclear Weapons	13.3	5.6, 5.7	X
Nuclear Weapons Custody, Transport, and Control		5.11	X
Nuclear Weapons Development Testing	13.3	5.10	X
Nuclear Weapons Design and Development		5.6	X
Plutonium Extraction (Reprocessing)	13.2	5.4	
Radiological Weapons		5.8	X
Safing, Arming, Fuzing, and Firing		5.7	X
Tritium Production	13.2	5.13	
Uranium Enrichment Processes	13.2	5.2	
<b><i>POWER SYSTEMS TECHNOLOGY</i></b>			
Biological Power			X
High-Density Conventional Systems	14.1		X
Magnetohydrodynamics			X
Mobile Electric Platform Power	14.2		X
Pulsed- and High-Power Systems	14.3		X
Superconductive Power Applications			X

	PART		
	<u>I</u>	<u>II</u>	<u>III</u>
	<u>WST</u>	<u>WMD</u>	<u>DCT</u>
<b><i>SENSORS AND LASERS TECHNOLOGY</i></b>			
Acoustic Sensors, Air and Terrestrial Platform	15.1		X
Acoustic Sensors, Marine, Active Sonar	15.2		X
Acoustic Sensors, Marine, Passive Sonar	15.3		X
Acoustic Sensors, Marine Platform	15.4		X
Electro-Optical Sensors	15.5		X
Gravity Meters and Gravity Gradiometers	15.6		
Lasers	15.7		X
Magnetometers and Magnetic Gradiometers	15.8		X
Radar	15.10		
<b><i>SIGNATURE CONTROL TECHNOLOGY</i></b>			
Manufacturing and Validation	16.1	1.3,1.4	X
Readiness and Mission Support			X
Special Materials			X
System Concept Design and Integration			X
Test and System Validation			X
<b><i>SPACE SYSTEMS TECHNOLOGY</i></b>			
Astronics			X
Electronics and Computers	17.1		X
Launch Vehicles for Space Systems			X
Optronics	17.2		X
Power and Thermal Management	17.3		X
Propulsion for Space Systems	17.4		X
Qualification and Testing			X
Sensors for Space Systems	17.5		X
Signature Control and Survivability			X
Structures for Space			X
Systems Integration			X

	PART		
	I <u>WST</u>	II <u>WMD</u>	III <u>DCT</u>
<b><i>WEAPONS EFFECTS AND COUNTER-</i></b>			
<b><i>MEASURES</i></b>			
Blast and Shock Effects from Nuclear Detonations		6.2	X
High-Altitude Electromagnetic Pulse (HEMP) Effects		6.6	X
High-Power Microwave Weapons Effects			X
Induced Shock Waves From Penetrating Weapons	18.1		X
Laser Weapons			X
Nuclear Effects on Electromagnetic Signal Propagation		6.5	
Nuclear Thermal Radiation Effects		6.3	X

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	I <u>WST</u>	II <u>WMD</u>	III <u>DCT</u>
<b><i>WEAPONS EFFECTS AND COUNTER-</i></b>			
<b><i>MEASURES (cont'd)</i></b>			
Particle Beam Weapons			X
Pulsed-Power Nuclear Weapons Effects Simulation		6.8	X
Source Region Electromagnetic Pulse (SREMP) Effects		6.7	X
Transient Radiation Effects in Electronics (TREE) and System-Generated Electromagnetic Pulse Effects (SGEMP)		6.4	X
Underground Nuclear Weapons Testing		6.1	