United States Air Force's Directed Energy Weapons Experimentation

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Strategic Development Planning & Experimentation (SDPE)

Air Force Warfighting Integration Capability

Air Force (USAF) Headquarters: Total Force, multi-domain operating concepts to implement the National Defense Strategy & enhance the joint and coalition fight

- Identifies prioritized ways & means to guide future force
- Focus: Enterprise Mission Sets, Cross-Portfolio Capability, & Resource Alignment




SDPE Roles & Responsibilities

Senior Air Force-Level Support for Capability Development and Execution

- Perform AFWIC and 4-star identified priorities for experimentation, prototyping, analysis, and support capability development
- Focus: Provide rigor and capability to AF Capability & Transitional Experimentation Efforts

SDPE quickly addressing high priority AF Enterprise Needs

Ongoing SDPE Activities

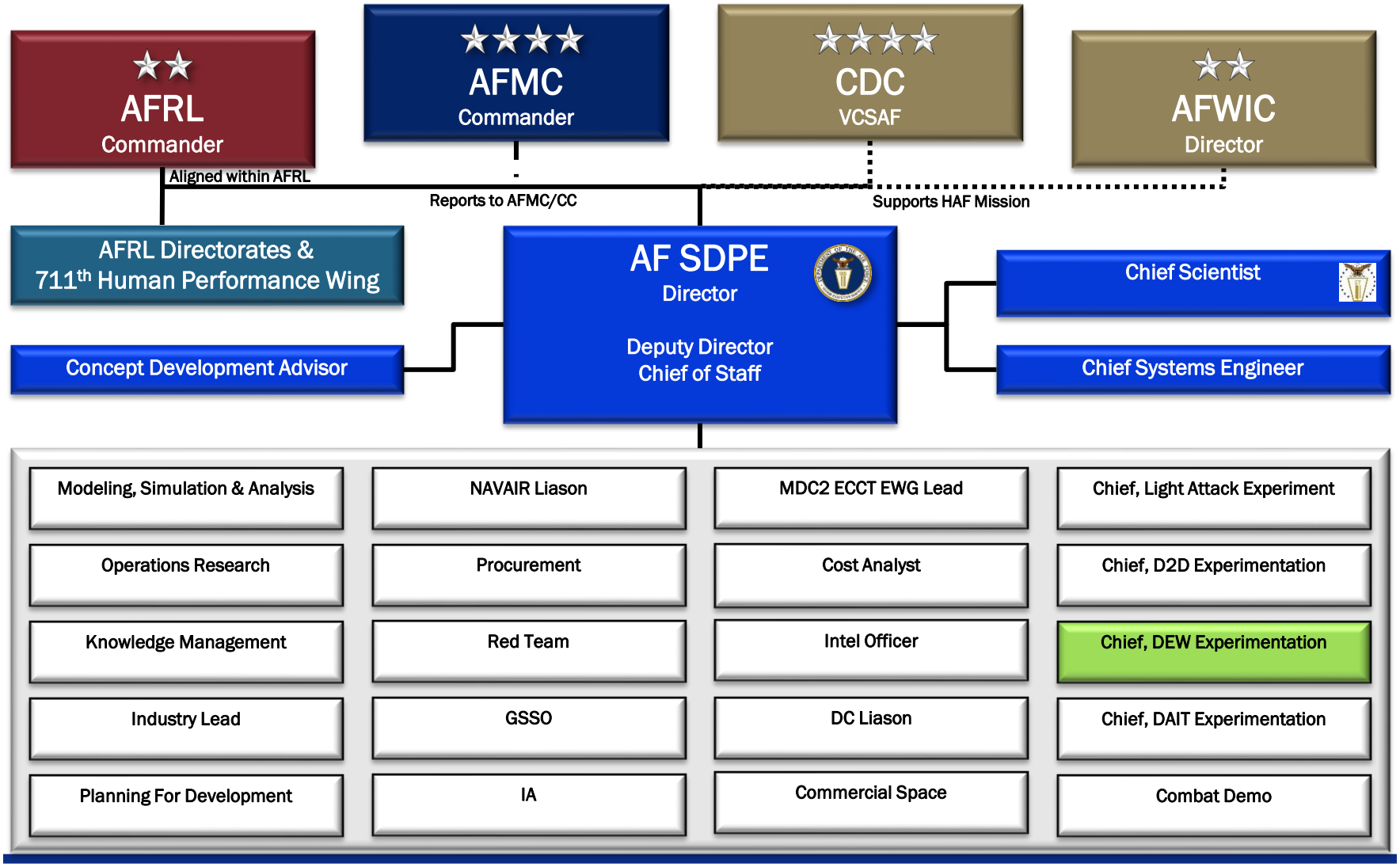
Strategic Support

- Delivering High Priority Capability Options for Long Term Air, Space, Cyber Dominance
  - Multi-Domain Command and Control
  - Air Superiority 2030
  - Electronic Warfare
- AF Capability Development
- AF Industry Engagements

Campaign Examples

- Light Attack Aircraft
- Data to Decisions (D2D)
- Defeat of Agile Intelligent Targets (DAIT)
- Directed Energy (DE) Experimentation
- AF Enterprise Model, Simulation, & Analysis
- Commercial Space Internet
- Pilot Training Next
- Personnel Recovery
- Adaptive Basing

Organizational Structure & Reporting



How We Engage With Industry

Industry Use Cases

Focusing on Engagement Left of Requirements

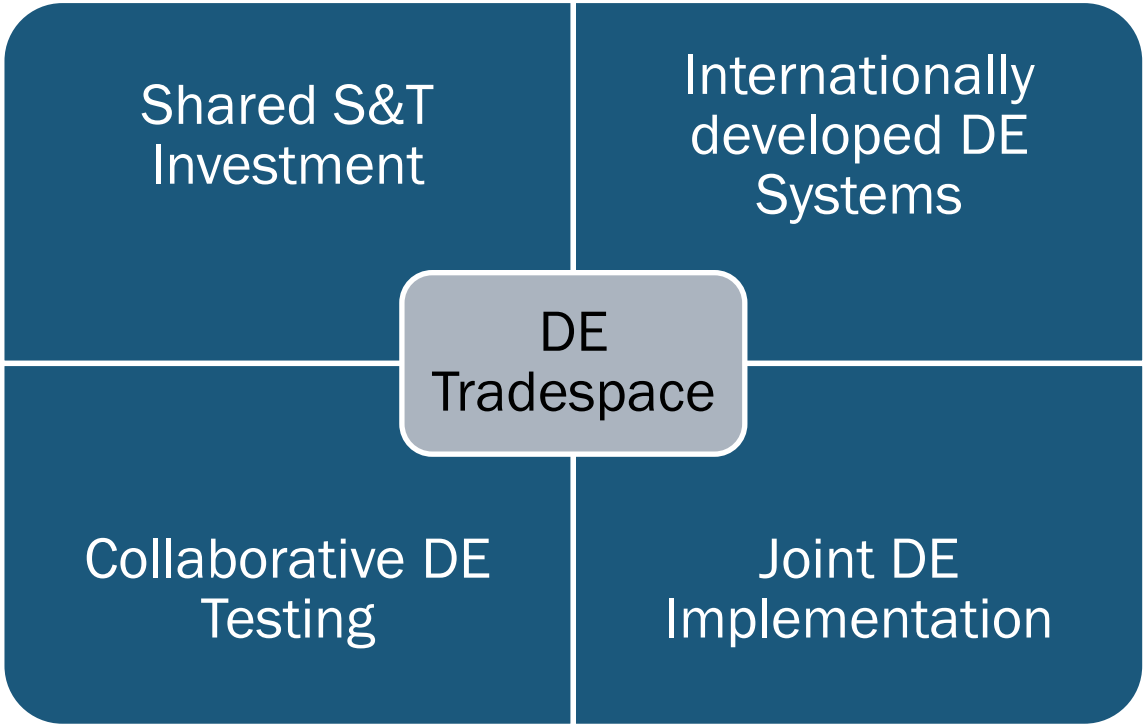
Air Force Capability Development	Continuous Process	Solicit Ideas for Air Force Problems
ECCT's	~12 month cycle	Vector ECCT's & Inform Industry
Experimentation	0-12 months	Support Individual Experiments
Analysis Infrastructure	Ongoing	Enhance Capabilities

FY18 Q2			FY18 Q3			FY18 Q4			FY19 Q1		
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	AFA SDPE ECCT Review					DAYTON DEFENSE Dayton Area Defense Contractors Association	PACA	AFA			

Major AF Capability Development Events (Multiple Commands)

Engagement Models Cannot Be "One Size Fits All"

How We Partner… With Other Countries



Engineer & Scientist Exchange Programs
Equipment Loans
Memorandums of Understanding

Data/Information Exchange Annexes
Cooperative Production Programs
Cooperative Development Agreements

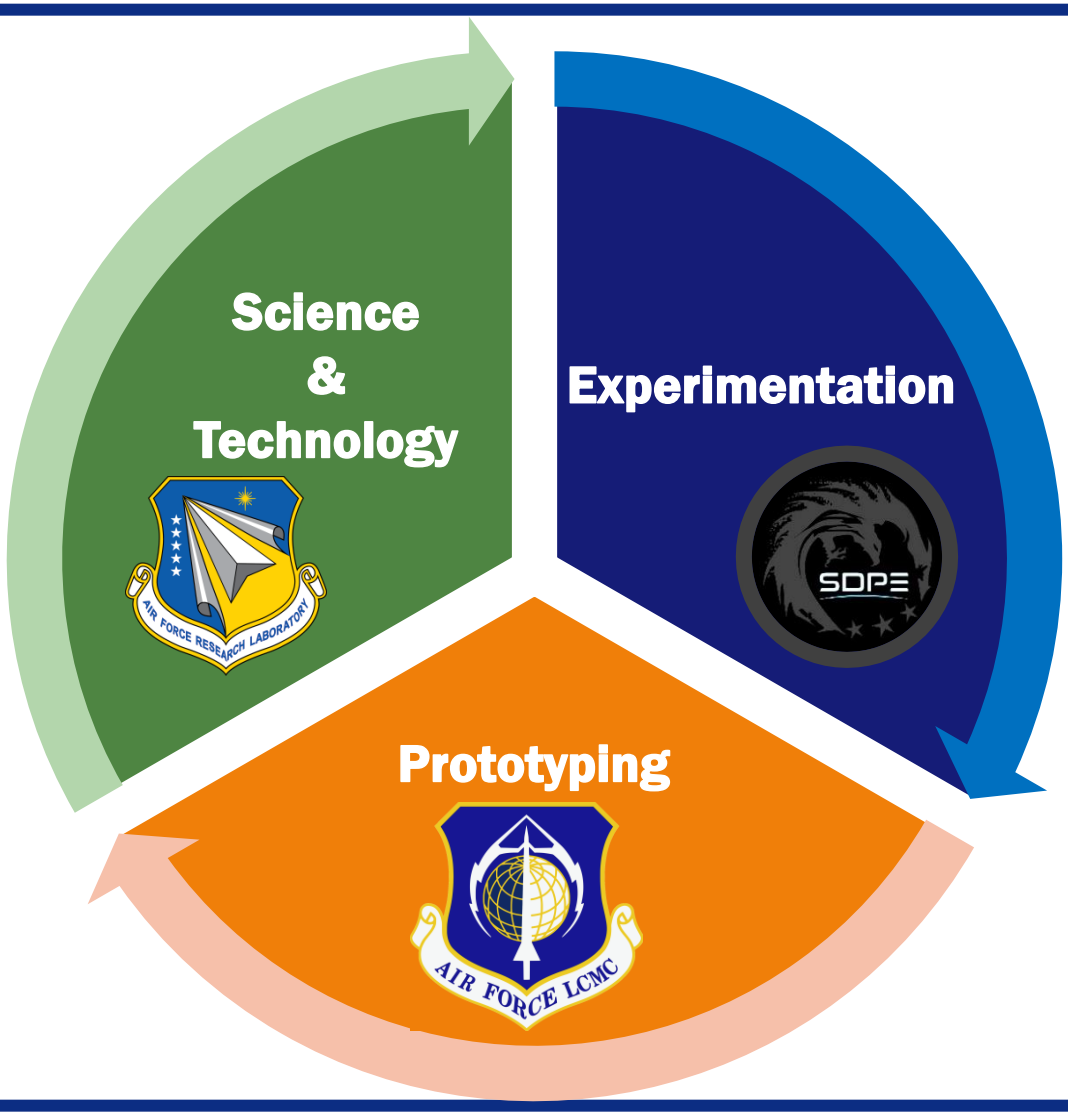
Purpose of AF DEW Flight Plan

AF Enterprise effort to support use of Directed Energy Weapons (DEWs)
Deliver key effects to the battlefield; nearly 30 directive actions

Identifies, Documents, Executes:

- Capability Gaps (where DEW are potential solutions)
- Required Investments
- Limitations/Constraints
- Test Infrastructure needs
- Transition timelines/milestones
- Life Cycle Acquisition Considerations
- Experimentation
- Transition Level Prototyping
- Science & Technology needs
- Doctrine, Organization, Training, Materiel
- Leadership and Education
- Personnel, Facilities, and Policy

Air Force Priority



Objective

Accelerate transition of DE weapons by evaluating aspects of the DOTMLPF-P spectrum via an experimental campaign

- Perform unified planning, seamless execution, and combined analysis
- Informing investment strategies by working with operators and technologists to explore doctrine, policy, Concepts of Operation, Concepts of Employment, Tactics Techniques and Procedures, etc.

Enable Developmental Planning

DEW Experimentation Campaign

- **Explore how DE weapons will be employed alongside existing:**
  - **Kinetic Weapons**
  - **Sensors**
  - **Command and Control**
  - **Battle management systems**
- **Put Warfighters at the Controls**
- **Use proven DE Prototypes**

Mission: Accelerate transition of DE Weapon Capability and Inform Strategic Investment Decisions

AF DEW Experimentation Campaign

Senior AF Leadership Summits

June 2017
February 2018

Signed by SECAF and CSAF 22 May 2017

Four Parallel Experiments

2018-2021

1. Counter Unmanned Aerial Vehicle
2. Counter Cruise Missile
3. Precision Electronic Strike
4. Large Aircraft Defense

Experimental Approach

MS&A → Wargaming → Hardware Experiments

- Red Teaming
- Acquisition/Fielding Cost Analysis
- Develop/Validate Concepts of Operation

DEW Experimentation Campaign Customers/Stakeholders/Partners

Methods of Experimentation:

Wargame, MS&A, Red Team, Prototyping, Live Fire Experimentation Event

Core Team
SDPE, AFRL, NASIC, AFTC, AFLCMC, ACC, AETC, AFGSC, AFMC, AFSOC, AMC, PACAF, USAFE, AETC

Key Campaign Input
MDA
DE Bioeffects Directorate (711th HPW)
Weather (AFLCMC/XZ, WSMR, AFIT)
Force Protection SPO (AFLCMC/HBU)
Army AMRDEC (MAFIA/JMAC)
AFSFC

Leveraging Organizations
Navy Dahlgren
US Special Operations Command
Army
Directed Energy Joint Test Office
DARPA
DTRA/JIDO

Leverage existing DE systems & development programs
(SHiELD, DENALI, HyDRA 2, etc.)

Partner with industry to explore available technological trade space

Engage DIUx to challenge non-traditional industry with relevant problems
(C-UAS around football stadiums, commercial airline protection, etc.

Getting off the Stage

United States Air Force will lead the way for Directed Energy use for years to come!

Transition DE Capabilities to lead and support the Joint Force in defending freedom, owning the high ground, and projecting power with our Allies.

4TH ANNUAL DIRECTED ENERGY SUMMIT

IDGA
Institute for Defense and Government Advancement

INTERESTED IN ATTENDING?

Future weapons, including directed energy weapons have been in the Research & Development phase for the past several years. As the US armed forces, continue to develop and innovate in order to achieve battlefield overmatch and superiority, the Directed Energy weapon systems are making their way form the R&D phase to DoD and Military programs as the next step before acquisition and force integration.

Over the three-day summit we will examine the latest DE advancements, initiatives and plans regarding technology, acquisition and service roadmaps. This event will bring together thought leaders, acquisition executives, industry solution providers, and academia in order to tackle some of the challenges that face this community in the near, mid, and far term fight. We will look to gain insight and lessons learned from warfighter perspectives on the operational challenges and requirements of DES that will influence the capabilities of this game-changing technology.

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