Topic: N132-087

RadiaBeam Technologies, LLC

Compact Radar Antenna

Internationally known, RadiaBeam Technologies specializes in designing and building custom particle accelerator and microwave components, particle beam diagnostics, and power electromagnetic (EM) instrumentation. Actively engaged in R&D, this dynamic enterprise focuses its efforts in two areas: developing novel accelerator components and diagnostic capabilities for the research market; and increasing the maturity of particle accelerators and EM technology for the commercial market, especially advanced radiation sources for medical imaging and homeland security requirements. Supporting the Joint Non-Lethal Weapons Program, current efforts include developing compact, highly efficient antennas for high-power EM weapon systems that can destroy enemy electronics, stop/disable vehicles, and disable enemy combatants, denying them access to facilities. These non-lethal weapons provide operating forces with escalation of force options that can minimize casualties and collateral damage.

Technology Category Alignment:

RF Components for sensing, transmission and communication
Broadband/Multispectral Components and Systems
Sensors, Electronics and Photonics
Radio Frequency (RF) (non-EW)
Radio Frequency Weapons (RFW)

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SYSCOM: MARCOR
Contract: M67854-15-C-6505

Corporate Brochure: https://navystp.com/vtm/open_file?type=brochure&id=M67854-15-C-6505

Department of the Navy SBIR/STTR Transition Program

MCSC-PRR-1349

Topic # N132-087

Compact Radar Antenna

RadiaBeam Technologies, LLC

WHO

SYSCOM: MARCOR

Sponsoring Program: JNLW Program

Transition Target: JNLW Program

TPOC:
sbir.admin@usmc.mil

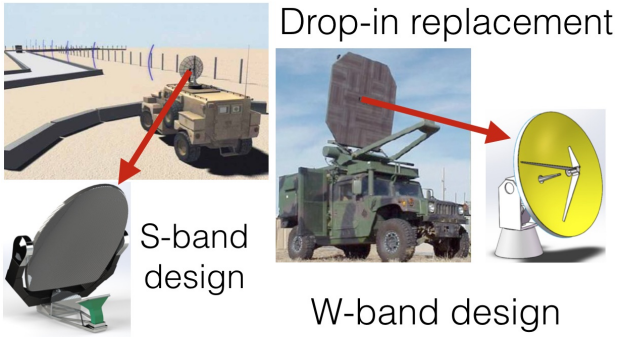
Other transition opportunities:
Other RF antenna/systems operating in similar bands.

Notes:
JNLW: Joint Non-Lethal Weapons

Warfighter Value:
• Reduce size, < 1 m length
- S-band: 0.6 m2 aperture
- W-band: 0.45 m2 aperture
• Reduce weight, < 50 pounds
• Increase range and/or reduce power consumption
• Increase maneuverability, steerability
• Reduce injuries in Non-Lethal Weapons environment

Lightweight carbon fiber reflectors

Drop-in replacement



Vehicle photos courtesy JNLWP.defense.gov; all others

WHAT

Operational Need and Improvement:
Develop a compact, highly efficient antennas for 2 seperate mobile high-power radar systems
* One operating in S-Band frequency range (2.5-3.5 GHz)
  - Radio Frequency vehicle stopping and non-lethal counter-electronics missions
* Second one operating in W-Band frequency range (95 GHz)
  - Non-Lethal counter-personnel Active Denial missions

Specifications Required:
S-Band system handling up to 20 megawatts peak power:
- > 25 dB gain; > 50% efficiency
- < 1 m length; < 0.6 m2 aperture
- +/- 5˚ x 15˚ steerability
- voltage standing wave ratio (VSWR) < 1.5

W-Band system handling up to 30 kilowatts peak power:
- < 1 m length; < 0.6 m2 aperture
- +/- 5˚ x 15˚ steerability
- VSWR < 1.5

Technology Developed:
• Superradient, ultra-compact design
• Ultra-light and strong composite construction
• High peak and average power handling capability
• Multi-band capability

WHEN

Contract Number: M67854-15-C-6505 **Ending on:** September 28, 2017

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Develop Antenna Concept Designs	N/A	Successful validation and verification of individual models	3	1st QTR FY16
S-band full power demonstration	Low	Verify high power performance	5	2nd QTR FY17
W-band full power demonstration	Med	Verify high power performance	5	4th QTR FY17
Complete Phase II Extension	Med	Achieve required specifications	6	4th QTR FY17
Partner with Prime	High	System integration and operation	8	2nd QTR FY20

HOW

Projected Business Model:
• Develop prototype and partner with prime contractor
• License or sale technology to prime contractor

Company Objectives:
• RadiaBeam will continue to be industry leader in RF technologies
• Develop technology for Non-Lethal Weapon applications
• Sell technology to US Marine Corps and/or prime manufacturers

Potential Commercial Applications:
• Non Lethal Weapons for police
• Agricultural: plant defoliation, chemical-free weed control
• Power beaming from ground to air and space
• Radar antennas for remote environmental monitoring, traffic control, ground penetration, shipborne radars

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