



A -- DEVELOPMENT OF HIGH POWER G-BAND VACUUM ELECTRONIC AMPLIFIER

General Information

Document Type: Presolicitation Notice
Solicitation Number: N00173-05-R-KK06
Posted Date: Jun 16, 2005
Original Response Date:
Current Response Date:
Original Archive Date: Jun 15, 2006
Current Archive Date: Jun 15, 2006
Classification Code: A -- Research & Development
Naics Code: 541710 -- Research and Development in the Physical, Engineering, and Life Sciences

Contracting Office Address

Department of the Navy, Office of Naval Research, Naval Research Laboratory, 4555 Overlook Ave. S.W., Washington, DC, 20375

Description

The Naval Research Laboratory (NRL) has a requirement for the development of a high efficiency, high power (5W) continuous wave amplifier at a nominal frequency of 220 GHz. The amplifier shall be as compact as possible and shall operate at as low a cathode voltage as possible, consistent with good beam transport and minimal body current. As a goal, it is desired that the power amplifier tube will occupy not more than approximately 1200cm³ (exclusive of power supply), and that the cathode voltage will be not less than 3 kV and not more than 20 kV. An additional goal is to achieve an efficiency factor for this amplifier of at least 25%. It is anticipated that this effort will be conducted in three phases. The first phase would involve conducting a design study to evaluate optimum circuit design, evaluate cathode voltage/current and magnetic focusing trade-offs, evaluate the predicted performance of the proposed

amplifier, both with and without a depressed collector, and to evaluate the potential to increase the operating bandwidth beyond 400 MHz by altering the baseline design. This phase will also involve developing a complete thermal, mechanical, and electrical design for the amplifier to be developed in the second phase of the effort. It is anticipated that this phase will have a period of performance of approximately 6 months. The second phase of the effort would involve performing amplifier builds to the design developed in the first phase. This phase would emphasize basic power bandwidth performance. At the conclusion of the second phase, the contractor is required to demonstrate amplifier performance initially at their facility and subsequently at NRL, using the NRL test modulator model ETM Model 2062PD2 (20 kV max voltage, 1 A max current, 100% duty, 4 stage depressed collector capability). The anticipated period of performance for this phase is one year. The third phase of the effort involves further development of the amplifier developed in the second phase, focusing on achieving the efficiency goal by integrating a multi-stage depressed collector. This phase involves the development of the amplifier with a depressed collector following demonstration of the power, gain, and bandwidth performance of the amplifier with a simple collector in the second phase. As with the second phase, at the conclusion of the third phase, the contractor is required to demonstrate amplifier performance initially at their facility and subsequently at NRL, using the NRL test modulator described previously. It is also anticipated that this phase will have a one year period of performance. This procurement will also contain two option items. The first option item is for the development of a beam stick (gun, magnetic focusing, multi-stage depressed collector). If exercised, this option would be exercised at the beginning of the third phase, due to design considerations. The second option, if exercised, would involve delivery of an additional high power, high efficiency, amplifier of the same configuration developed under the third phase.

NRL uses Electronic Commerce (EC) to issue Requests for Proposals (RFPs) and amendments to RFPs. Paper copies of the RFP will not be provided. All responsible sources may submit a proposal, which will be considered by the agency. This solicitation and other business opportunities for NRL are available at our website <http://heron.nrl.navy.mil/contracts/listrfp.htm>
The response date published in this synopsis is the current estimated closing date. The actual closing date for proposals will be stated in the solicitation when issued. See Numbered Note(s) 25 and 26.

Point of Contact

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Place of Performance

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