BIBLIOGRAPHY OF DOCUMENTS RELATED TO THE THEORY, OPERATION, PERFORMANCE AND APPLICATIONS OF COAXIAL PLASMA GUNS (REVISED EDITION)

David W. Price

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Final Report

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This report has been reviewed and is approved for publication.

David W. Price
DAVID W. PRICE, Ph.D.
Project Officer

FOR THE COMMANDER

BILLY W. MULLINS, Maj, USAF
Dep Chief, High Energy Plasma Division

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Coaxial plasma guns are used to create physical conditions (plasma and dense plasma foci) of interest to the Air Force. Experimental and theoretical coaxial plasma gun research has been performed since the early 1960's to the present. Research on coaxial plasma gun topics has been done in the Soviet Union, East and West Europe, Japan, the United States and the Third World. This report is the second bibliographic collection of unclassified unlimited distribution references dealing with coaxial plasma guns. (The first collection was prepared in September 1988.) The references deal with the theory, operational behavior, performance and applications of coaxial plasma guns and dense plasma foci under laboratory research conditions. Other related topics are referenced as well. A total of 1050 separate documents and reports are listed.
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INTRODUCTION

This bibliography is provided for use in the analysis and operation of coaxial plasma guns. Plasmas in these guns are formed by inserting gases into the gun muzzle and applying high voltage across the gun electrodes. The gas is ionized by the induced electric field, causing a radial current $J$ formation. This radial current $J$ produces an azimuthal magnetic field $B_\phi$. The $J \times B$ force drives the current with an axial velocity $v_z$. This axial current can then be used in a variety of ways, many of which are summarized in the references reported here.

Because the focus of this bibliography is on coaxial plasma guns, references to other plasma guns are limited. Some references are provided, however, if the source reports parameters applicable to the coaxial gun. Papers on the dense plasma focus (DPF) are also cited, not for the focus physics, but because the DPF is generated with a coaxial gun and affected by the coaxial gun plasma generation. Compact toroids are also mentioned for similar reasons. Although such articles are not usually directed toward coaxial plasma guns, they do contain relevant information.

BIBLIOGRAPHIC INFORMATION AND RELATED COMMENTS

This bibliography contains many references which apply to the theory, operation and performance of coaxial plasma guns. There is no intent to ignore any relevant source. However, the references cited here are only
provide a partial listing. They are limited, by necessity, with the following restrictions:

1. Abstracts are not generally referenced. Only abstracts having pertinent detailed information or extended abstracts (over two pages in length) are cited.

2. Foreign references, unless translated into English, are not cited. This is no reflection on non-English language published research, but on the linguistic limitations of the compiler. When available, both the translation and the original reference are cited.

3. If a relevant preprint is published elsewhere, it is not referenced.

4. Only relevant unclassified, unrestricted sources or sources available in the open literature are cited. References bearing security restrictions are not presented.

As the compiler, I directly accessed all the references cited here. If I could not access a potential reference, then it is not cited. Although all cited references are both unclassified and cleared for public distribution, accessibility of these documents may be limited by source availability and cannot be assured.
The maximum available bibliographic information is reported for the interested reader. The sole exception to this policy of maximum reporting is in the listing of the authors. Some references report only initials, not the full names. That practice is followed here to limit the length of the citations.

Some referenced authors do not use languages with a Roman alphabet (e.g., the Cyrillic of the Russian Language or the ideograph structure of the Japanese language) and spelling of authors' names can be inconsistent. The rule in this bibliography is to follow the source document spelling.

This is the second version of the bibliography on this topic. (The first bibliography was produced by the compiler in September 1988.) This bibliography incorporates the recently published work by scientists from the Soviet Union, Eastern bloc nations and other nations of the Third World. It also reflects an increased recent interest in the dense plasma focus.

Although I have gone to some effort to verify the citations in this bibliography, the possibility for mistakes in a work of this length is very real. While I have tried to list as many relevant documents as I can find, I realize that I may have omitted pertinent documents from this listing. If the users of this document find errors or have addenda to the listing, I would appreciate their feedback. Comments will be used to correct later versions of this bibliography.
ACKNOWLEDGMENT

I am indebted to the efforts of the Weapons Laboratory Technical Library (WL/SUL) for their efforts in obtaining the materials cited in this bibliography. Were it not for their consistent and persistent work, it is doubtful this bibliography could have been prepared.
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