PULSED POWER BIBLIOGRAPHY

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Abstract

As a vibrant and growing field of endeavor, pulsed power has a need at this time for an organized collection of literature pertinent to the field. As a result, a comprehensive bibliography of pulsed power is being compiled to provide researchers and students in this field a guide to the literature. The bibliography will consist of citations pertaining to energy storage, switching, particle beam generation and transport, power conditioning and transport, breakdown, and diagnostics. The bibliography will contain four indices organized by subject category, title, author, and corporate affiliation. In addition, there will be a listing of conferences relevant to the pulsed power field. Each citation will include title, author(s) and affiliation(s), abstract, and key words. Of utmost importance, citations not generally available will include the present location of the document. Two bibliographies, one classified and one unclassified, will be printed automatically from a computerized data base and will be in loose leaf form to facilitate updating. Publication of the first edition is planned for September - October 1982. The philosophy of the bibliography, as well as the computer facility used to utilize the data base, will be discussed. Outside contributions are heartily welcome.

Introduction

With pulsed power and high-voltage technologies playing a greater role in weapons research, nuclear weapons' effects simulation, fusion power research, power distribution, materials processing, and even medical research, the past two decades have seen a rapid expansion of these two technologies from a novelty to a growing and vital part of the research establishment. This rapid growth has, of course, produced an attendant growth in published literature relevant to pulsed power. However, the fact that pulsed power is a young technology and is of an applied engineering nature, has resulted in the occurrence of several adverse conditions. Since there is no journal dedicated to publishing pulsed power articles, research relevant to pulsed power must be published when and where possible. This haphazard publishing policy results in many hours spent in literature searches that could otherwise be avoided, or work may be repeated unnecessarily because a paper was not found at all. In addition, much work has been published only in report form, which may be difficult to find at best. This paper is reporting an effort by the Air Force Weapons Laboratory (AFWL) to fill the need for an organized listing of the literature by compiling a comprehensive bibliography of pulsed power. It is planned that this bibliography will provide not only a quick reference to the available literature, but also a guide to direct the reader to obscure and hard to find documents that relate to pulsed power.

Material to be Included

The AFWL pulsed power bibliography will reference documents in the following areas:

Conference and Reviews
Breakdown Studies
Diagnostics
Energy Storage
Insulation
Particle Beam Generation and Propagation
Power Conditioning
Switching (Including Electrode and Insulation Degradation)

with each of the above serving as a main heading. In addition, each main heading will include several subheadings (such as Thyratrons, Spark Gaps, etc. under Switching) to provide additional categorization. A section entitled Reviews and Conferences will also be included. All review articles and conference proceedings, in addition to being included in the appropriate subject category, will be placed in this section for easy reference. Types of documents to be referenced will include, but not be limited to, journal articles, research reports, contractor reports, books, and lecture notes. Any other type of document will be considered for inclusion if it has been published and is available.

Publication Format

The pulsed power bibliography will be published as two documents, one open circulation and one restricted. Each will be published in loose leaf form as four cross referenced sections ordered by title, subject, author, and author's affilitions. The section indexed by title will include the following information:

1. Accession number
2. Title
3. Authors and their affiliations
4. Type of document (including volume No. for journal articles and report number for reports and lectures)
5. Availability of all non-journal citations that are available from an information service
6. Abstract with number of references
7. Key words
8. Copyright
9. Security record on all classified documents

as in Fig. 1.

TITLE (DE)

250
DETAILED DESIGN, FABRICATION AND TESTING OF AN ENGINEERING PROTOTYPE COMPENSATED PULSED ALTERNATOR

Report Documentation Page

Form Approved
OMB No. 0704-0188

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See also ADM002371. 2013 IEEE Pulsed Power Conference, Digest of Technical Papers 1976-2013, and Abstracts of the 2013 IEEE International Conference on Plasma Science. Held in San Francisco, CA on 16-21 June 2013. U.S. Government or Federal Purpose Rights License.

14. ABSTRACT
As a vibrant and growing field of endeavor, pulsed power has a need at this time for an organized collection of literature pertinent to the field. As a result, a comprehensive bibliography of pulsed power is being compiled to provide researchers and students in this field a guide to the literature. The bibliography will consist of citations pertaining to energy storage, switching, particle beam generation and transport, power conditioning and transport, breakdown, and diagnostics. The bibliography will contain four indices organized by subject category, title, author, and corporate affiliation. In addition, there will be a listing of conferences relevant to the pulsed power field. Each citation will include title, author(s) and affiliation(s), abstract, and key words. Of utmost importance, citations not generally available will include the present location of the document.

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			
unclassified	**unclassified**	**unclassified**	**SAR**	**4**	

W. L. Bird and H. H. Woodson
University of Texas, Austin, TX 78712
LLL Report No. UCRL 15213 (03/1980)

The design, fabrication, and test results of a prototype compensated pulsed alternator are discussed. The prototype compulsator is a vertical shaft single phase alternator with a rotating armature and salient pole stator. The machine is designed for low rep rate pulsed duty and is sized to drive a modified 10 cm Beta amplifier. The load consists of sixteen 15 mm x 20 mm x 112 cm long xenon flashlamps connected in parallel. The prototype compulsator generates an open circuit voltage of 6 kV, 180 Hertz, at a maximum design speed of 5400 rpm. At a maximum speed, the inertial energy stored in the compulsator rotor is 3.4 MJ. 1 Ref.

Primary Keywords: Compulsator; High power; Laminated rotor; Compensating windings; High average flux density; Time varying armature circuit

Secondary Keywords: Pulse shaping; Simulation; Magnetic field mapping; Design notes

Fig. 1. Sample Bibliography Citation, Indexed by Title

In the interest of brevity, the sections grouped by subject, author, and author's affiliations will include:

1. Accession number
2. Title
3. Authors and their affiliations
4. Type of document
5. Keywords

as in Figs. 2, 3, and 4, respectively.

SWITCHES, CLOSING

Thyratrons

716
HIGH VOLTAGE, LOW INDUCTANCE HYDROGEN THYRATRON STUDY PROGRAM

R. F. Caristi and D. V. Turnquist
E. G. & G., Salem, MA 01970
ERADCOM Report No. DELET-TR-78-2977-F (01/1981)

Primary Keywords: Thyratrons; Switches; Pulse Generators; Blumleins; Pulse Modulators; Nanosecond Pulsers; High Voltage Components

1296
INSTANT START THYRATRON SWITCH

S. Merz and D. Turnquist
E. G. & G. Inc., Salem, MA 01970
ERADCOM Report No. DELET-TR-79-0270-1 (01/1981)

Primary Keywords: Thyratron; Hydrogen Thyratron; Cold Cathode

Secondary Keywords: Gas Filled Device; Switch Tube

1283
LECTURES ON HIGH-VOLTAGE AND PULSE POWER TECHNOLOGY; LECTURE 7: THYRATRONS AND IGNITRONS

W. J. Sarjeant
Los Alamos Scientific Laboratory,
Los Alamos, NM 87544
LASL Report No. LA-UR-80-517 (10/1981)

Primary Keywords: Thyratron; Ignitron; Theory; Application; State-of-the-art; Devices Under Development; Trigger Circuit; Recovery Time

Secondary Keywords: Charging Circuit; Delay; Recovery Mechanism

Thyristors

1260
LIGHT-FIRED THYRISTOR DEVELOPMENT

D. K. Page, L. L. Lowry, and P. Rai-Choudhury
Westinghouse Electric Corporation,
Pittsburgh, PA 15235
EPRI Report No. EL-776 (04/1978)

Primary Keywords: Thyristor; Power Electronics; Optical Triggering System

Fig. 2. Sample Bibliography Citation, Indexed by Subject.

AUTHOR (Bird)

Bird, W.L.

250
DETAILED DESIGN, FABRICATION AND TESTING OF AN ENGINEERING PROTOTYPE COMPENSATED PULSED ALTERNATOR

W. L. Bird and H. H. Woodson
University of Texas, Austin, TX 78712
LLL Report No. UCRL 15213 (03/1980)

Primary Keywords: Compulsator; High power; Laminated rotor; Compensating windings; High average flux density; Time varying armature circuit

Secondary Keywords: Pulse shaping; Simulation; Magnetic field mapping; Design notes

Borovkov

215
DESIGN AND CONSTRUCTION OF AN INDUCTIVE STORAGE UNIT FOR LASER PUMPING

I.I. Artamonov, B.A. Barikhin, V.V. Borovkov, and V.I. Kashintsov
Kvantovaya Elektron. (moscow, USSR)
SOV. J. QUANTUM ELECTRON. VOL. 9, NO. 1, PP 70-73 (01/1979)

Primary Keywords: Inductive Storage; Exploding Wire; Complex Loads; Theory; Experiment

Secondary Keywords: Laser Pumping; Flash Lamps; Circular Spark Gap

Brice, C. W.

574
PARAMETER ESTIMATION FOR GENERATOR SIMULATION STUDIES

R. P. Webb
Georgia Institute of Technology,
Atlanta, GA 30332

C. W. Brice
Georgia Institute of Technology
Atlanta, GA 30332

O. T. Tan
LSU, Baton Rouge, LA 70803

C. C. Lee
LSU, Baton Rouge, LA 70803

AFAPL Report No. AFAPL-TR-77-69 (11/1977)

Primary Keywords: Generator Modeling Sensitivity Analysis; Parameter Identification; Simulation

Fig. 3. Sample Bibliography Citation, Indexed by Author

CORPORATE AUTHOR

LSU, Baton Rouge, LA 70803

574
PARAMETER ESTIMATION FOR GENERATOR SIMULATION STUDIES

R. P. Webb
Georgia Institute of Technology,
Atlanta, GA 30332

C. W. Brice
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O. T. Tan
LSU, Baton Rouge, LA 70803

C. C. Lee
LSU, Baton Rouge, LA 70803

AFAPL Report No. AFAPL-TR-77-69 (11/1977)

Primary Keywords: Generator Modeling; Sensitivity Analysis; Parameter Identification; Simulation

Maxwell Laboratories, Inc., Woburn, MA 01801

1259
HIGH POWER MAGNETOHYDRODYNAMIC SYSTEM (VOL I)

D. W. Swallom, O. K. Sonju, D. E. Meader and H. Becker
Maxwell Laboratories, Inc., Woburn, MA 10801

AFAPL Report No. AFAPL-TR-78-51 (07/1978)

Primary Keywords: Portable Power Supplies; MHD Generators; Fast Start Power Supplies; Compact MHD Generator; Burst Power Supplies; High Performance MHD Generator; Lightweight Megawatt Power Supplies; Cesium Seeding of MHD Gases; JP-4 Fueled MHD

1258
HIGH POWER MAGNETOHYDRODYNAMIC SYSTEM (VOL II)

D. W. Swallom, O. K. Sonju, D. E. Meader and H. Becker
Maxwell Laboratories, Inc., Woburn, MA 01801

AFAPL Report No. AFAPL-TR-78-51 (07/1978)

Primary Keywords: Portable Power Supplies; MHD Generators; Fast Start Power Supplies; Compact MHD Generator; Lightweight MHD; Lightweight Megawatt Power Supplies; Cesium Seeding of MHD Gases; JP-4 Fueled MHD

Fig. 4. Sample Bibliography Citation, Indexed by Corporate Author

The subject, author, and corporate author indices will be cross referenced to the title index by title and accession number.

Implementation

The bibliography is being implemented on the system 2000 data base manager by Intel to facilitate sorting, printing and updating of the bibliography. This data base manager is coupled to a FORTRAN program written at AFWL to provide automatic ordering and printing of all of the aforementioned indices, as well as a search feature for on-line use. The search feature allows the user to search all or part of each citation using a specified search code and then preview the same or other parts of each citation found at his terminal. These citations can then be printed off-line if desired In addition, the program includes a feature that allows checking each title for duplication as it is added to the data base. If any title is found to be identical to a title already on the data base or to another title that is currently being added to the data base, a message is printed to the users terminal and that title is rejected. If, in fact, the title does not belong to a duplicate citation, it can be added later using another program feature. Thus, by utilizing the computer, the bibliography can be compiled in the most efficient manner.

Contributions and Availability

All contributions to the bibliography from outside sources will be most welcome. Obviously, the more complete the bibliography is, the more useful it will be. Due to the extensive literature search performed at the AFWL technical library, it is probable that a large portion of the open literature documents have already been obtained. However, any articles published in journals or other periodicals not generally devoted

to physics or engineering will gladly be accepted if they are of a technical nature. A copy of all documents submitted for inclusion in the bibliography will be required for permanent retention by the AFWL. Documents to be submitted for inclusion should be forwarded to:

AFWL/CA
Kirtland AFB
Albuquerque, NM 87117
ATTN: R. L. Druce (or A. H. Guenther)

with the permanent retention copy included. Also, Dr. Druce will be visiting installations with libraries too voluminous to be copied and transported to the AFWL. Invitations for a visit should be forwarded to the above address. The bibliography will be made available to the public for a nominal fee to cover printing and handling. The proposed publication date is flexible but is slated for September - October 1982. In addition, it is intended that all organizations making a significant contribution to the pulsed power bibliography will receive a complimentary copy of the published document.