This booklet is intended to serve as a directory of source materials in the field of operations research, rather than as a bibliography per se. As such, it is a survey of the major bibliographic tools, indexing services, and general information sources that are relevant to the field. Most entries have been annotated briefly to indicate the value of the work for operations research. Citations are organized into separate sections for indexes and abstracts, bibliographies, dictionaries, directories, primary sources, introductions and guides, and handbooks. Within each section, entries are listed alphabetically by title, and there is also a cumulative title index of all works cited in the booklet.
OPERATIONS RESEARCH: An Elementary Guide to the Literature

Edward W. Neroda
Van Kleinsmid Library
University of Southern California
The purpose of this work is to serve as a directory of source materials in the field of operations research. It is intended to be a guide to the literature of OR (operations research,) not a bibliography per se. Nor is this guide to be considered exhaustive in its survey since such a compendium is usually beyond the needs of most students, librarians and OR specialists. This then is a survey of the major bibliographic tools, indexing services and general information sources which are of importance to the field of operations research.

Most entries in the guide have been annotated. The goal of these brief descriptions is to familiarize the inquirer as to the value of a specific work to OR, since the majority of the citations at first glance would not appear to have much utility. Descriptions of the physical format of the publications such as specific indexes, frequency of cumulation, etc. generally has been omitted in this guide since these characteristics are more than amply explained in the works themselves.

What follows below is a capsulized view intending to answer the most basic of questions concerning OR, that is, what is operations research?
2. CPL Exchange Bibliography #403

Management Science, Operational Research, Operations Research, or simply OR are four of the most frequently used names to describe the branch of science which investigates and devises solutions to management problems through the application of the scientific method. The history of this field, like that of human knowledge in general, has its roots in antiquity. But if we consider OR as being conceived in previous centuries, its birth certainly occurred during World War II in Great Britain and the United States. Original applications were in war strategy and optimum use of vital resources. Post-war reconstruction of Europe gave a new horizon to OR, this phase being the beginning of non-military development and utilization of OR. Civilian application in the U.S. did not occur until the 1950's when the tempo of commercial activity made a virtual necessity of OR.

Operations research is founded on the assumption that within economic activity there exists a high degree of order. OR seeks to define this order, to quantify, and to understand complete operating systems so as to maximize their effectiveness. Some of the basic characteristics of OR are the following:

I TOTAL SYSTEMS APPROACH
II USE OF INTER-DISCIPLINARY RESEARCH TEAMS
III USE OF THE SCIENTIFIC METHOD, I.E. OBSERVE, HYPOTHE- SIZE, TEST, CONTROL

While most early business and military applications of OR were in scheduling, quarterly plans, inventory control, etc., now all facets of decision making problems may be analyzed by an OR
3. CPL Exchange Bibliography #403

team. Today one finds OR involved in the construction of mathematical, economic, and statistical descriptions of models of decision and control problems. Evaluation of the consequences of decision choices and devising appropriate measures of effectiveness are yet other basic applications of OR.

Before proceeding, a note concerning the arrangement of citations. The guide is arranged into seven categories:

1. INDEXES AND ABSTRACTS
2. BIBLIOGRAPHIES
3. DICTIONARIES
4. DIRECTORIES
5. PRIMARY SOURCES
6. INTRODUCTIONS AND GUIDES
7. HANDBOOKS

The entry in each section is alphabetically arranged by title of the work with each title being given a unique number which will be the basis of locating a title when using the index which is located at the end of the guide.

INDEXES AND ABSTRACTS

Abstracts may be expected to provide both the full bibliographic data necessary for retrieval of specific documents and a summary of the content of listed works. The purpose of the abstract is to allow the inquirer to rapidly survey a vast amount of material in a capsulized fashion in order to narrow his search to a specific body of information.
Objectiveness and universality of coverage are goals which many abstracting services attempt to attain within specific subject fields. The abstracts tend to be arranged along subject lines which vary in specificity. Usually the abstracts are indexed for author and title access. These indexes almost universally will be found to cumulate.

Indexes are basically the same as the abstracts save the fact that they omit the descriptions of the articles. One must therefore rely on the alphabetical subject arrangement which appears in the majority of the indexes and what clues the titles of the citations may give for an idea of the content of the specific work. Most indexes and abstracts publish lists of the journals which they survey.


This monthly review medium seeks to cover world literature in applied mechanics and related engineering science. It is selective, not universal in literature surveyed. OR and all its major facets are covered. Emphasis on applied OR rather than experimental or theoretical OR is to be expected.


Published monthly with an emphasis on British sources, this journal contains no abstracts. Covering such fields as OR and scientifically oriented management, it is a good source of citations. Emphasis is on applied OR.


Published by one of the benchmarks of American bibliographical work, this subject index serves as an access point to many areas of OR. Depth of coverage in specialized sub-fields is wanting since this index is basically designed for the generalist.
5. CPL Exchange Bibliography #03


It deals primarily with use of digital computers, with lesser emphasis on analogue and hybrid varieties. Regular listings are to be found under operational research, boolean algebra, linear programming, network models, statistics.

025 **Computing Reviews.** New York: Association for Computing Machinery, V.1-, 1960-, monthly.

Aiming to furnish computer oriented specialists with critical information about current publications in computer sciences, it contains sections on application, mathematics of computation, hardware, software as well as subsections on simulation and modeling as well as OR.

030 **Dissertation Abstracts International.** Ann Arbor, Michigan: University Microfilms, V.1-, 1938-, monthly.

Beginning with volume 27 (1961) the abstracts were divided into humanities and sciences sections. The latter covers approximately 300 institutions in the U.S. and Canada. This abstract gives access to doctoral dissertations submitted to University Microfilms. It is a relevant source for all facets of OR. Subject access through the IC index is problematic since it is prone to non-explicit author constructed titles.

035 **Engineering Index.** New York: Engineering Index Inc., V.1-, 1894-, monthly.

This abstracting journal covers all areas relating to engineering with a world-wide scope. Organization and access is excellent with some 12,000 subject headings. It lists hundreds of cross references for OR covering all facets. This is unquestionably a valuable source of OR material especially in the experimental and applied fields.


This is an index to other works in the field of mathematics which contain tables of data, i.e. prime numbers, factor tables, probability, binomial coefficients. It also gives availability of machine readable data. Limited in value by its publication date.
5. **CPL Exchange Bibliography**

### 045 Interdok, Directory of Published Proceedings: Series S'MET, Science, Engineering, Medicine, Technology. Harrison, New York: Interdok Corporation, 1965-

A good source of information issued by associations or societies which may not have been widely distributed. Many relevant entries to OR, plus helpful cross references.


This tool is organized into five sections: digest, abstracts and reviews, abbreviations, authors, and subject index. Abstracts have been divided into small subject sectors which allow rapid access to specific fields of interest. This is the first index or abstract to search if one is extremely limited in research time. It contains sources of current bibliographies.

### 055 Management Information Systems Index. Detroit: American Data Processing, V.1-, 1962-


Encompassing all phases of mathematics, from history and biography to optics and geophysics, it is world-wide in its scope. Many sections relevant to OR such as systems control, matrix theory, probability, statistics, and a specific section on OR appear, making this an important source.


*GT indexes the Government Research and Development Reports see following citation: 070.*


This source covers U.S. government and government contracted work. It is divided into 22 subject fields over half of which contain material relevant to OR. Sections covering mathematical sciences (12), electronics and electrical engineering (9) and military sciences (15) are particularly rich in information.

Reviewing all aspects of OR, it is aimed at executive non-specialists, in other words, the abstracts cover material which is not extremely technical. Construction of this abstract allows the subscriber to maintain a card file system of these abstracts.


Well indexed abstracting journal covering all aspects of OR including Markov processes, stochastic systems, linear programming, Monte Carlo methods, queuing theory, probability, game theory, etc., not to be overlooked.


Citations concerning OR in this abstract obviously emphasize automated aspects. This abstract together with Science Abstracts Section B (085) should be searched together since there is overlap between the two.


This is an abstracting publication of Rand's non-classified studies. Occasionally they do studies which concern OR or allied fields such as policymaking, mathematical programming, planning, statistics, etc. This is not a major source, but it is worth reviewing if one is engaged in depth research.


The goal of this work is the complete coverage of all contributions to theory and method of mathematical statistics and related topics. World-wide coverage is attempted. This abstracting journal is an excellent source for the theoretical research being done in OR. Statistics being a major tool of OR, this is a valuable resource.

This abstracting service has a data base of over one million documents with a substantial amount of coverage related to OR. Operations research articles tend to be concentrated in the applied field rather than experimental or theoretical.

110 World Meetings: Social and Behavioral Sciences, Education, and Management: A Two Year Registry of Future Meetings. Chestnut Hill, Massachusetts: World Meetings Information Center Inc., V.1-, 1971-.

The title is self-explanatory. It also lists parameters for papers being accepted for these meetings, persons to contact for information. OR meetings are listed under the sub-heading mathematics.

BIBLIOGRAPHIES

Bibliographies are compilations of works, whatever their form may be, such as books, reports, proceedings, within a well defined subject field and generally arranged alphabetically by author. Bibliographies often are restricted in some manner such as date of publication, language, etc.

Even in this relatively young field of OR, one finds a proliferation of bibliographies. This is therefore not to be considered a bibliography of bibliographies, but instead, an overview of some of the classic works, as well as examples of some current bibliographies in OR subfields.

A final item to keep in mind when using a bibliography is its date of publication. These compendiums are seldom up-dated, a fact which makes them essentially retrospective research tools.
9. CPL Exchange Bibliography #403


Linear programming, a mathematical technique which deals with complex problems involving allocation of scarce resources, is the topic of this short unannotated bibliography.


This is a bibliography of the holdings of the Centre de Documentation in Paris. A continuation of Mathematiques Pures et Appliquees, this is a valuable source. It contains sections on statistics and probability, OR. Very short annotations are given in French. All documents in this bibliography are on file at the Centre.


A two volume retrospective bibliography attempting to cover all OR material prior to 1958.


It lists in separate sections monographs, reports, technical documents, journal articles, and bibliographies. All material concerns the tools and techniques of OR as related to planning community health services. Not highly technical, this work is designed for health planners and administrators.

050 International Abstracts in Operations Research.

This work has been discussed above, but it bears repeating since it is an excellent source of current bibliographies.


A dated but useful source for a retrospective search.

Network structure, network flows, random graphs, design and routing are the principle divisions of this unannotated bibliography. Emphasis is on current literature covering books, proceedings, papers and articles.


A four volume work, it covers materials on OR up to 1961. Good annotations, world-wide scope, this bibliography is one of the most important retrospective OR search tools since it covers the time prior to the commencement of the International Abstracts in Operations Research.


A non-annotated bibliography on Program Evaluation Review Technique (PERT) and Critical Path Method (CPM).


Stochastic programming, another tool of OR, is given detailed annotated treatment in this bibliography. Concentration is on methodology.


Title is self-explanatory.


Contains several hundred citations of unclassified documents dealing with aspects of systems analysis and OR.


This source is probably only useful in an extensive retrospective search.
DICTIONARIES

Included here are dictionaries which are felt to be most useful to the field of OR. Being an interdisciplinary science, one will find entries for fields related to OR, such as statistics, computer programming, etc.

One may expect to find not only definitions but also etymology, biographical data, acronyms, initialisms, and abbreviations in these works.


Contains approximately 1200 entries, with an emphasis on programming. Many tables, some biography, lists of manufacturers are included.


Prepared under the auspices of the International Statistical Institute and UNESCO, this work fills the gap in time from the publication of Statistical Dictionary (see number 195). Contains foreign language glossaries.


It attempts coverage of hardware, software, programming, logic, etc.


It gives the English language user access to mathematical terminology in French, German, Russian, and Spanish.


A reprint of the 1939 edition, its purpose is to provide the user with clear, concise definitions of statistical terms. Covers mathematical, educational, psychological, business, and biological statistics. Somewhat dated for OR but it is still useful.
DIRECTORIES

From directories one may expect to be able to locate the names of individuals or organizations and their respective addresses. No directory specifically for OR was located, however, since by nature OR involves the disciplines of mathematics and statistics, several of their directories have been included.


It contains the combined membership of the American Statistical Association, Biometric Society, and the Institute of Mathematical Statistics.


Being a directory of companies rather than persons, it is divided into three sections each giving access to the computer industry members.


Title is self-explanatory.

PRIMARY SOURCES

Principally in the form of journals, the primary source is the main mode of currency for any field including OR. No attempt at completeness has been made since it would involve the inclusion of hundreds of titles. Only an overview of the hallmark sources has been presented.


Published three times per year, this journal is useful in obtaining OR research being conducted in Canada. Abstracts of articles are in English and French. Both applied and theoretical aspects of OR are treated.
13. CPL Exchange Bibliography #403


In English, it is oriented to Japanese research in OR.


The U.S. Navy being one of the early development forces in the field of OR, this journal will continue to be a rich source of articles on mathematics, statistics, economics, nearly all of which have an emphasis on OR.


Especially strong for current research conducted in the United Kingdom, this journal is published three times per year.


Being one of the most important sources of current OR information in the U.S., articles cover all facets of this science. Abstracts are included and there is a book review section.


Oriented to the Indian milieu.


This irregular series sponsored by the Operations Research Society of America gives a state of the art view of OR. Starting with volume three, a topical approach was adopted. It is well documented.
INTRODUCTION AND GUIDES

Perhaps because of the relative youth of the OR field, one will encounter a high frequency of introductory monographs on the subject. Many of these introductions are in textbook form. The effort here has been to include those works which are considered standards of the field, sources which act in the tradition of a desk reference guide. While being comprehensive in scope, these volumes tend to be shallow in depth. Some introductions or guides for such sub-fields as queueing theory have been included.


An elementary textbook oriented to the more serious student.


Covering adaptive, stochastic and deterministic processing, this work may also be considered as an introduction to subfields in OR. The author is a professor of OR in Glasgow.


Examining the structure of decision problems from an integrated decision theory viewpoint, this is an elementary level work. It contains a good introductory level bibliography.


270 How to Find Out in Mathematics, John E. Pemberton. New York:

covers such topics as mathematical education, history and biography, sources of Russian mathematical information, etc. There is a special section on probability and statistics, as well as OR.
15. CPL Exchange Bibliography #403


An elementary handbook for application of OR to problems in business and industry. It covers objective setting, research, experiment design, analysis of results, etc.


This is an advanced textbook in OR containing extensive references and bibliographical material, exercises, tables.


Not a work for the OR specialist, but it is a good starting point for one interested in this field. Short, uncomplicated and with an adequate bibliography.


It covers management cybernetics, quantitative management and statistical management.


Another introduction to a subfield of OR, it covers CRT, PERT, heuristic methods, etc. It gives sets of problems for solution and a bibliography.


Being designed as a supplementary textbook, it serves as an introduction to a major facet of OR. It contains ample graphs, formulas, and examples.


Limited in its use of mathematics and statistics. It
16. CPL Exchange Bibliography


The purpose of this work is to enable prospective users of linear programming to recognize decision problems that may apply to this method and prepare computer programs. It assumes a prior knowledge of the field.

HANDBOOKS

Citations included in this category tend to be for practical works for the OR specialist. Heavy use of tables, graphs, formulas, and symbols may be expected. Handbooks tend to be reference materials, the types of books that would be found in the private collection of operations research personnel.


A somewhat dated but still useful one volume source of general principles of both design and utilization of computers. The work stresses technique and not theory.


This journal gives access to computer program sources which may be used for problem solution. It contains a roster of vendors, and a bibliography of articles in which programs have been described. Contains numerous entries for OR and related sub-fields.


with systems analysis, it contains many sections rele
17. CPL Exchange Bibliography #403


Its emphasis is on numerical methods and the computer; there is a separate section on statistics and ample references plus a bibliography.


It aims to be a convenient summary of theory, working rules and tabular material useful in practical application of statistics and probability. It is well indexed.


It is an excellent source of information of the federal statistical gathering system. Adequately describes sources by agency of publication. Each section contains a bibliography.


An extensive work that should be on the book shelf of anyone in the OR field, it contains over a hundred pages on probability and statistics alone.


Covering probability-distribution, chi-square, order statistics, quality control, non-parametric statistics, it is a source not to be missed.


It is a good source if you have no access to a computer.


Algebraic functions, probability integrals, hyperbolic functions, etc., are covered.
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