1 of 1

SAND93-1422
Unlimited Release

(BARS) - BIBLIOGRAPHIC RETRIEVAL SYSTEM*

Sandia Shock Compression (SSC) Database
Shock Physics Index (SPHINX) Database

Vol. 1: UNIX Version Query Guide
Customized Application for INGRES

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ABSTRACT

The Bibliographic Retrieval System (BARS) is a database management system specially designed to retrieve bibliographic references. Two databases are available, i) the Sandia Shock Compression (SSC) database which contains over 5700 references to the literature related to stress waves in solids and their applications, and ii) the Shock Physics Index (SPHINX) which includes over 8000 further references to stress waves in solids, material properties at intermediate and low rates, ballistic and hypervelocity impact, and explosive or shock fabrication methods. There is some overlap in the information in the two data bases.

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Bibliographic Retrieval System (BARS)

Query Guide

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Section 1: Introduction

The Bibliographic Retrieval System (BARS) is a database management system specially designed to retrieve bibliographic references. Two databases are available, i) the Sandia Shock Compression (SSC) database which contains over 5700 references to the literature related to stress waves in solids and their applications, and ii) the Shock Physics Index (SPHINX) which includes over 8000 further references to stress waves in solids, to material properties at intermediate and low rates, ballistic and hypervelocity impact, and explosive or shock fabrication methods. There is some overlap in the information in the two data bases.

The databases are particularly useful in locating openly published information regarding the dynamic behavior of materials under impact, explosive, or pulsed radiation which have a very wide variety of defense and industrial applications, including ballistic and space debris penetration, explosive demolition and excavation, accident analysis, and various materials processing methods like powder compaction metallurgy, forging and upsetting, and explosive forming, hardening, welding, perforating, material synthesis, etc.

The SSC database was originally developed by J. R. Asay, D. E. Grady, R. A. Graham, and M. E. Kipp of Sandia National Laboratories, and C. E. Anderson, J. S. Wilbeck, and J. C. Hokanson of Southwest Research Institute [13,14]. Its initial implementation used INGRES on DEC VAX computers [9]. The data have been corrected and transposed to the present UNIX/INGRES version by G. von Laven of Advanced Software Engineering and T. Parker of Re/Spec Inc. using [3-8], [10-12], and [15-17]. The SSC represents 3 man-years of effort.

The SPHINX database was developed by W. Herrmann of Sandia National Laboratories and K. Mulholland of Career Services of New Mexico, originally in a PC/DOS version [1], and has been extensively revised, corrected and transposed to the present INGRES version by G. von Laven and T. Parker. It also represents 3 man-years of effort.

The BARS system allows retrieval of bibliographic information using flexible Boolean search criteria based on author names, affiliations, countries, year of publication, keywords, or words contained anywhere in the records, including titles. Retrieved references may be sorted in a variety of ways, for example by author and year, by affiliation and author, etc.

Output may be viewed on the screen, sent to a printer, or stored in a file in one of several output formats. The simplest formats include abbreviated and full ASCII listings of the contents of the records. Formatted output suitable for input to the LaTeX typesetting program may also be obtained. With minor editing, this may then be included in TeX manuscripts to produce professionally formatted reference lists. The TeX system itself is not included, but may be purchased separately from one of several commercial suppliers.

The UNIX version of BARS uses INGRES¹ to manage the database and user interface. Document and bibliographic data can be contained in fields arranged in nine different templates (book, conference, journal, letter, memo, miscellaneous, thesis, technical report, and visuals) according to the form of the original documents. Data for the SSC database utilizes the miscellaneous template only. Data in fields associated with *affiliation*, *author's names*, *category*, *classification*, *distribution category*, and *keywords* are managed in global glossaries to eliminate redundancy and maintain consistency across the database.

The Bibliographic Retrieval System (BARS) was developed by RE/SPEC, Inc. and Advanced Software Engineering for Sandia National Laboratories (SNL). This document is written for BARS users who only query the database. Separate documents "BARS User's Guide" [2] and "BARS System's Guide" [3] are available for BARS users who update the database. A version of BARS for PC/DOS is also available [1].

Visual Cues

You will find the following typographic conventions throughout the User's Query Guide.

<u>Type Style</u>	<u>Used For</u>
bold font	Emphasis
<i>italic font</i>	Fieldnames; Sort Options
<i>bold italic font</i>	Menu Options; User Commands
CAPS	Emphasis
BOLD CAPS	Main Menu Options

Software Availability

A copy of the UNIX version of BARS/SSC/SPHINX (for use with INGRES 6.0 or higher) may be obtained by applying to the Director, Energy Science and Technology Software Center, PO Box 1020, Oak Ridge, TN 37831-1020. Installation instructions for the UNIX version are included in the "BARS User's Guide" [2] and "BARS System's Guide" [3]. A copy of the PC/DOS runtime version of BARS/SSC/SPHINX is available from the same source. Specify the desired media in your request.

1. INGRES is a relational database management system marketed by Ingres Corporation.

Section 2: How to Start BARS

Before you can run BARS you need to set your search path and define the environment variables used by the software. (Your Database Administrator (DBA) may have already done this for you. If not, see Appendix A.)

You must start BARS in a shelltool, otherwise your function keys will not be mapped properly.

To start BARS, type *bars* at the operating-system prompt.

> *bars* (carriage return)

When the Main Menu comes up, you may then access the functions of BARS.

Section 3: Menus and Forms

BARS MENUS provide various action options. Menus consist of titles, a list of options, and a command line, which includes an indication of the function keys used to select the action (see Figure 3-1 for example). In order to select an option:

1. Place the cursor on your choice using the arrow keys and press the control key associated with the *Go* option displayed in the command line at the bottom of the menu.

OR

2. Press the control key associated with the *Command* option displayed in the command line at the bottom of the menu and then type the command abbreviation.

BARS FORMS collect or display information (see Figure 3-2) for example.

It is always possible, when in a menu or form, to reach the command line by pressing <F2>.

Some command lines do not fit on one line and are continued. The presence of a continuation command line is signalled by a ">". In order to scroll to the right on the continuation command line, press <Shift> ">". To scroll back to the left, press <Shift> "<".

A context sensitive Help function is available from any form or menu from the command line.

Main Menu

When BARS starts, the Main Menu is displayed on the screen. The Main Menu (refer to Figure 3-1) allows access to the various BARS capabilities.

Main Menu

Bibliographic Abstract Reference System (BARS)

Database: ssc

Abbrev	Description
SEL	Select Bibliographic Entries
SORT	Sort Bibliographic Entries
RET	Retrieve Bibliographic Entries
OUT	Output Selected and Sorted Entries
NEXT	Next Bibliographic Entry
PREV	Previous Bibliographic Entry
MAINT	Maintain Glossaries and Entries

Go(L2) Command(F5) Help(R7) Stop(F4)

Figure 3-1. BARS main menu.

To make a menu selection

1. Place the cursor on your choice using the arrow keys and press the control key associated with the *Go* option displayed at the bottom of the screen.

OR

2. Press the control key associated with the *Command* option and then type the command abbreviation.

Each option displayed in the command line at the bottom of the screen has an associated control key dependant on the terminal type.

Go - selects the option the cursor is currently on.

Command - prompts for the command abbreviation and selects it. (The command abbreviation is listed to the left of the control key displayed at the bottom of the screen.)

Help - displays help text.

Stop - quits the BARS system and returns to the operating system prompt.

The menu options are described next.

SEL - Select Bibliographic Entries

The Select Bibliographic Entries submenu provides the capability to specify selection criteria. These selection criteria are used to retrieve bibliographic entries when you select the **RET** or **OUT** options from the main menu. All the bibliographic entries will be selected if no selection criteria are specified. When the Select Bibliographic Entries (SEL) option is chosen, a new command line appears at the bottom of the menu with the following items

All_Templates - will bring up the required Select Criteria form. Ignore all other templates (book, conference, journal, letter, memo, miscellaneous, thesis, technical report, and visuals). They are not used by the SSC. If you inadvertently get into any other template, return to the Main Menu by selecting **END** from the command line and start over.

Typing ">" three times (or "<" once) will move through the continuation command line to more selections.

Help - will display the help text.

End - will return to the Main Menu.

Select Criteria Form

The Select Criteria form (see Figure 3-2 for example) allows selection criteria to be specified. Selection criteria may be entered into the various fields on the form. Move to the next field with <Tab>. Move to the previous field with <Ctrl P>. In scrollable fields, like author and keywords, use up and down arrow keys to access additional lines. There is an implicit AND operator between fields and between columns (i.e. *author(s) surname, author(s) first and middle names,*

affiliation, keywords) of a table. There is an implicit OR logical operator between rows of a table. For details on how to specify selection criteria, see Section 4: Specifying Selection Criteria on page 12.

```

BARS - Selection Criteria for Miscellaneous

Accession:                Category:                Org No.:
                        Year:
Author(s) Surname:      First and Middle Names:  Affiliation/Organization:
+-----+-----+-----+
|               |               |               |
+-----+-----+-----+
Title:
Reference:

Keywords:                Location:
+-----+-----+-----+
|               | Sand No.:  |
|               | Distrib.: |
|               | Class:    |
+-----+-----+-----+
Comments:                RS No.:

Blank(L2)  Last_Select(L3)  Select(L4)  Help(R7)  End(F3)

```

Figure 3-2. Selection Criteria for Miscellaneous form.

The command line options are as follows.

Blank - blanks out all the fields in the form.

Last_Select - displays the last selection criteria specified.

Select - saves the selection criteria just entered and returns to the Main Menu. These criteria will be used to retrieve bibliographic entries when you select the RET or OUT options from the Main Menu.

Help - displays help text.

End - returns to the Main Menu.

SORT - Sort Criteria Form

The Sort Criteria form (see Figure 3-3) allows you to specify sort criteria. A sort criterion is specified by an ascending order number (1-16) in any of the fields on the form. The data will be sorted first by the field with the smallest order number, then by the field with the second smallest order number, and so on. If no sort criteria are specified, the default will be used to sort data by primary *author, year, and affiliation*.

BARS - Sort Criteria

Author Surname:
First and Middle:
 Year:
 Month:
 Day:
 Title:

Accession:
Affiliation:
Template:

Category:
Class:
Distribution:
Location:
Org No.:
RS No.:
Sand No.:

Use Pub Year instead of Conf Year? N
(For sorting conferences only)

Last(L2) Save(L3) Help(R7) End(F3)

Figure 3-3. Sort Criteria form.

The command line options are as follows.

Last - displays the last sort criteria specified.

Save - saves the sort criteria just entered and returns to the Main Menu. These criteria will be used to sort the selected bibliographic entries when you select the RET or OUT options from the Main Menu. If no sort criteria are specified, the entries will be sorted in ascending order by primary *author, year, and affiliation*.

Help - displays help text.

End - returns to the Main Menu without saving the sort criteria.

RET - Retrieve Bibliographic Entries Option

The RET option retrieves all the bibliographic entries from the database that match the specified selection criteria and displays them on the screen using the specified sort criteria. Enter select and sort criteria using SEL and SORT before choosing this option or the defaults will be used. All the bibliographic entries in the database will be retrieved if no selection criteria are specified. The entries will be sorted in ascending order by primary *author*, *year*, and *affiliation* if no sort criteria are specified. The bibliographic entries are displayed on the screen one at a time in Maintenance forms.

Maintenance Form

The Maintenance form (see Figure 3-4) displays entry information. The command line can be reached by pressing <F2>. The options are as follows.

BARS - Miscellaneous Maintenance			
Accession: 0	Year: 0	Category:	Org No.: 0
Author(s) Surname:	First and Middle Names:	Affiliation/Organization:	
+-----+-----+-----+			
+-----+-----+-----+			
Title:			
Reference:			
Keywords:		Location:	
+-----+		Sand No.:	
		Distrib.:	
		Class:	
+-----+		RS No.:	
Comments:			
Blank(L3) Add(L4) Save(R1) Delete(R2) Retire(R3) Copy_Row(R5) Glossary(R6)			
Print/Store Help(R7) End(F3) NEXT PREV			

Figure 3-4. Miscellaneous Maintenance form.

Blank, Add, Save, Delete, Retire, Copy_Row, Glossary - These options require update/edit privileges. It is possible to change the fields on the form, but the changes cannot be saved.

Print/Store - can be selected by typing "print" and pressing <Enter> which will display the print/store command line. The **Print** option sends a copy of the screen to your installation's default printer. The **Store** option prompts you for a file name and then saves a copy of the screen under that name. If no path is specified with the file name, the file will be saved in the user's home directory.

Help - displays help text.

End - returns you to the Main Menu.

NEXT - can be selected by typing "next" or "n" in the command line and pressing <Enter> which will display the next retrieved bibliographic entry.

PREV - can be selected by typing "prev" in the command line and pressing <Enter> which will display the previous retrieved bibliographic entry.

Output Selected and Sorted Entries Submenu

The Output Selected and Sorted Entries submenu allows you to print, or save to a file, all the bibliographic entries from the database that match the specified selection and sort criteria. Enter select and sort criteria before choosing this option or the defaults will be used. Use the **SEL** and **SORT** options from the main menu to specify selection and sort criteria respectively. All the bibliographic entries in the database will be selected if no selection criteria are specified. The entries will be sorted in ascending order by primary *author*, *year*, and *affiliation* if no sort criteria are specified. When the Output Selected and Sorted Entries (**OUT**) option is chosen, a new command line appears at the bottom of the menu with the following items

Save - displays the Save Output command at the bottom of the Main Menu.

Print - displays the Print Output command at the bottom of the Main Menu.

Help - displays help text.

End - returns to the Main Menu.

Save Output Submenu

The Save Output command allows you to save the output to a file using any of the following formats: **Short_Format**, **T_{EX}_Format**, and **AskSam_Format**.

The **Short_Format** saves the output to the specified file in ASCII format with the following information: *authors*, *title*, *reference*, *accession number*.

The **T_{EX}_Format** saves the output to the specified file in T_{EX} format as follows: `\refrnce{-authors}{title}{reference}{accession number}`.

The *AskSam_Format* saves the output to the specified file using the AskSam format (see Figure 3-5 for example).

TEMPLATE[	@miscellaneous]	ACCESS#[	accession number]
AUTHOR[	authors]		
AFFILIATN[	affiliations]		
TITLE[	title]		
REFERENCE[	reference]		
		YEAR[	year]
KEYWORDS[	keywords]		
NOTES[	comments]		

Figure 3-5. *AskSam_Format* template. Italics denote data..

Print Output Submenu

The Print Output submenu allows you to print the output using *Short_Format*. The output is sent to your default printer.

Section 4: Specifying Selection Criteria

To retrieve bibliographic entries from the database to display, print, or save to a file, you must specify **Selection Criteria**. Selection Criteria are values that the user enters in the Select Criteria form to retrieve bibliographic entries from the database that match the specified criteria.

Retrievals may be qualified by the use of logical operators, comparison operators, character pattern matching, and bracket expressions.

Logical Operators: AND, OR, NOT

The AND operator retrieves those entries that meet all specified criteria. The OR operator retrieves those entries that meet any of the specified criteria. There is an implicit AND operator between fields and between columns of a table. There is an implicit OR operator between rows of a table. The NOT operator retrieves those entries that do not meet the specified criteria.

Comparison Operators: =, !=, <, <=, >, >=

The comparison operators are used to select a range of values or to compare two values. Table 1 shows the list of operators and a short description for each.

Table 1: Comparison Operators

Operator	Description
=	equal to
!=	not equal to
<	less than
<=	less than or equal to
>	greater than
>=	greater than or equal to

Character Pattern Matching: ?, *

Pattern matching is used to match any number of characters with the use of wild cards. The question mark character (?) matches a single character while the star character (*) matches zero or more characters. Pattern matching may only be used with character fields and the equal (=) and not equal (!=) comparison operators. The backslash character (\) removes the special meaning of the question mark (?) and star (*) characters.

Bracket Expressions: [, \]

Bracket expressions may be used in conjunction with pattern matching to further qualify retrievals. If, for instance, you know that the *author(s) surname* starts with P or S then you can

enter '[PS]*' in the field. Such a query would retrieve all the entries whose *author's surname* starts with P or S. Table 2 summarizes the pattern-matching and bracket-expression characters.

Table 2: Pattern-Matching Characters

Character(s)	Description
?	matches a single character
*	matches zero or more characters
\	removes special meaning of special characters
[...]	matches any characters between the brackets

Example 1

Figure 4-1 shows the search qualifications to retrieve all the entries after 1980 for authors Duvall and Taylor that contain the words 'Shock Waves' in the *title* field. Notice the use of the pattern-matching character star to match any preceding or trailing arbitrary characters in the title.

BARS - Select Criteria (Applies to All Templates)

Accession: Year: >= 1980 Use Pub Year? N (Y/N)
Month: Day:
Author(s) Surname: First and Middle Names: Affiliation/Organization:

Duvall		
Taylor		

Title: '*Shock Waves*'
Category:
Class:
Distrib.:
Location:
Org No.:
RS No.:
Sand No.:
Keywords:
Comments:

Figure 4-1 Select criteria for example 1.

There is an implicit OR operator between the rows of the author table and an implicit AND operator between the *author(s) surname*, *title*, and *year* fields. This query will translate into something like: "(year >= 1980 AND (author(s) surname = 'Duvall' OR author(s) surname = 'Taylor') AND (title = '*shock waves*'))".

The output will be sorted by *title* and *author(s) surname* as specified in Figure 4-2.

BARS - Sort Criteria	
Author Surname: 2	
First and Middle:	
Year:	Use Pub Year Instead of Conf Year? N
Month:	(For sorting conferences only)
Day:	
Title: 1	
Accession:	
Affiliation:	
Template:	
Category:	
Class:	
Distribution:	
Location:	
Org No.:	
RS No.:	
Sand No.:	

Figure 4-2 Sort criteria for example 1.

To request a copy of the output use the *Save* or *Print* option from the Output Selected and Sorted Entries submenu. For more information about the submenu, see Output Selected and Sorted Entries Submenu on page 10. The following is a sample of the output using the *Short_Format*.

Hixson, R. S., Bellamy, P. M., Duvall, G. E., and Wilson, C. R., Effect of Shock Waves on the Absorption Spectrum of Ruby, Shock Waves in Condensed Matter-1981, edited by Nellis, W. J., Seaman, L. and Graham, R. A. (American Institute of Physics, New York, 1982), pp. 282-286, SSC# 12907.

Taylor, P. A., Growth and Decay of One-Dimensional Shock Waves in Chemically Reacting Multiphase Mixtures, Sandia National Laboratories Report No. SAND83-0730, Albuquerque, NM, 70 pp., April 1983, SSC# 12552.

Example 2

Figure 4-3 shows the search qualifications to retrieve all the entries between 1985 and 1990 from USSR that contain the words 'Shock Loading' in the *title* field. Notice the use of the pattern-matching character star to match any preceding or trailing arbitrary characters in the title. There is an implicit AND operator between the *year*, *affiliation*, and *title* fields. This query will translate into something like: "(year >= 1985 AND year <= 1990 AND affiliation = '*USSR*' AND title = '*Shock Loading*')".

BARS - Select Criteria (Applies to All Templates)		
Accession:		
Year:	>= 1985 and <= 1990	Use Pub Year? N (Y/N)
Month:		Day:
Author(s) Surname:	First and Middle Names:	Affiliation/Organization:
		USSR
Title:	*Shock Loading*	
Category:		
Class:		
Distrib.:		
Location:		
Org No.:		
RS No.:		
Sand No.:		
Keywords:		
Comments:		

Figure 4-3 Select criteria for example 2.

No sort criteria were specified for this output. Hence, the output will be sorted using the default criteria: *author*, *year*, and *affiliation*. For more information about sort criteria, see SORT - Sort Criteria Form on page 8.

To request a copy of the output, use the *Save* or *Print* option from the Output Selected and Sorted Entries submenu. For more information about the submenu, see Output Selected and Sorted Entries Submenu on page 10. The following is a sample of the output using the *AskSam_-Format*.

```

@@
TEMPLATE[ @miscellaneous]          ACCESS#[ 13636]
AUTHOR[ Egorova, N. V.; Chernyi, V. G.; Chernyi, G. I.]
AFFILIATN[ Kiev, USSR]
TITLE[ Viscosity of Soils Under Shock Loadings]
REFERENCE[ J. Appl. Mech. & Tech. Phys. 26 (1), 147-149 (1985)]
YEAR[ 1985]
KEYWORDS[ EMPH:experimental analysis; EMPH:experimental data; MATL:clay;
MATL:geophysical; MATL:loam; MATL:loess; MATL:sand; MATR:mechanical; PHEN:shock
viscosity; PHEN:stress-volume; PROP:rheologic; PROP:viscosity;
THEO:elastic-plastic; THEO:elastic-viscoplastic]
NOTES[ SSC3636, PAPER ID: 85E001, FULL KEYWORDING]

```

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Appendix A

Your search path must include the directory with BARS executable code (for example: /home/bdbsys). The recognized values for environment variables are enclosed in curly brackets next to the environment variable that applies. These variables are defined when you source the barsuser_login file in the BARS directory (see below for example). The default, if any, is underlined. Some are required as noted.

- BARS_HELP indicates where BARS help files are located (required).
- BARS_DBN is the name of the database. If it is undefined, you will be prompted for the database name when you invoke BARS. Ask your Database Administrator (DBA) for the database name(s) you have access to (optional).
- BARS_SEARCHTYPE {CASEINSENSITIVE, CASESENSITIVE} indicates whether queries to the database should be case sensitive or case insensitive (optional).
- BARS_NAMEMC {USEBICKEL, USENONE} instructs BARS to use Bickel's algorithm for finding different spellings of the same name or to not use it (optional).
- BARS_PATTERN_MATCH {STAR, PERCENT} indicates which set of character pattern matching symbols you want to use. STAR uses the question mark character (?) to match a single character and the star character (*) to match zero or more characters. PERCENT uses the underscore character (_) to match a single character and the percent character (%) to match zero or more characters (optional).

Example:

Include in your .cshrc file:

```
set path = (. ~ ~ $lpath /bin /usr/ucb /usr/bin /etc /usr/etc /usr/local \
/home/bdbsys )

setenv II_SYSTEM /usr/local/r6
set path = ($II_SYSTEM/ingres/{bin,utility} $path)
source /home/bdbsys/barsuser_login
```

Include in your .login file:

```
if ($TERM == "sun") then
    setenv TERM_INGRES sunf
endif
```

Distribution List

Sandia National Laboratories:

1020 W. Herrmann (5)
1153 G. A. Samara
1425 J. H. Biffle
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