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Guide to QSPIRES

and the Particle Physics Databases on SLACVM

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INTRODUCTION

SLAC, in collaboration with DESY, LBL, and several other institutions, maintains many databases of interest to the high energy physics community. You do not need to have a computer account at SLAC to search through some of these databases; they can be reached via the remote server QSPIRES, set at the BITNET node SLACVM. This text describes, in great detail, how to search in the popular HEP database via QSPIRES. HEP contains bibliographic summaries of more than 200,000 particle physics papers. Other databases available remotely are also reviewed, and the registration procedure for those who would like to use QSPIRES is explained.

To utilize QSPIRES, you must have access to a large computer network. It is not necessary that the network be BITNET; it may be a different one. However, a *gateway* must exist between your network and BITNET. It should be mentioned that BITNET users have some advantages in searching, e.g., the possibility of interactive communication with QSPIRES. Therefore, if you have a choice, let a BITNET machine be your base for QSPIRES searches.

You will also need an authorization to use HEP and other databases; and you should know the set of relevant commands and rules. The authorization is free, the commands are simple, and BITNET can be reached from all over the world. Join, therefore, the group of thousands of satisfied users, log on to your local computer, and from the comfort of your office or home find, e.g., the number of citations of your most famous high energy physics paper.

If you have not yet tried this powerful tool, and do not know where and how to start exploring QSPIRES, this is the Guide for you. It is intended to be an easy-to-use reference. First read Chapter 7, find your *node manager*, obtain the authorization, and—with a little help from Chapter 2—begin discovering QSPIRES' treasures. If your node manager happens to be out of town and you do not want to wait, read Subsections 5.5.2 and 5.5.4, and try the searches for which no authorization code is required. It is always difficult to begin something new. QSPIRES searching is no exception. But it is more likely that a mental block rather than actual difficulty prevents you from making the first search.

There are many examples in each section. Practice at least some of them. As you become more experienced, try experimenting on your own, and, e.g., find what QSPIRES knows about your own work. In matter of days, if not hours, you will become an expert in the use of QSPIRES. A note of assurance: there is no way you can damage any of the databases with your experiments. If the power suddenly goes out during your search, or a suspicious message like `SLACVM node is no more defined` appears on your screen, do not despair: This time it was not your fault.

This Guide is not intended solely for beginners. I hope that even an experienced QSPIRES user will find something new and interesting in it. And if you are a node manager, and therefore, by definition, a person who knows everything about the subject of communication with QSPIRES, you may still find this text useful. Have at least one copy of the Guide at hand at all times, and be ready to give it to those who would otherwise bother you with silly questions; for pedagogical and other reasons, you should encourage them to find the answers themselves.

Chapter 1 in this Guide is a general overview of search techniques. At first reading, you can probably skip this chapter, except for Section 1.1; return to the chapter later, when you need more information about certain commands. Chapter 2 describes simple interactive searches in the HEP database, and Chapter 3 reviews more intrinsic searches in the same database. All you ever want-

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ed to know about getting OUTPUT once the search is completed can be found in Chapter 4. Chapter 5 describes interactive searches in several other SLAC databases: BOOKS, CONFERENCE, INSTITUTIONS, HITECH, SERIALS, and SEMINARS. In the same chapter, you will find information on the QUERY and WHEREIS commands which initiate searches for which no authorization is needed. Chapter 6 is devoted to interactive searches in databases maintained by the LBL Particle Data Group: PARTICLES, EXPERIMENTS, DATAGUIDE, and REACTIONS. Chapter 7 deals with noninteractive searches, and Chapter 8 describes the role of *node managers* and explains the procedure for obtaining authorization. Note that although your authorization will nominally cover only the HEP database, you will be able to access all the other databases described in this text. Appendix A gives a brief history of SLAC databases and their present status. Appendix B is an elementary review of networks and networking. Special attention is given to BITNET and to various possibilities for communications with and within that network. A compendium of command words understood by QSPIRES can be found in Appendix C. Appendix D lists five-letter code names (codens) of the most popular physics journals. Codens are important in some HEP searches.

The idea for this Guide was conceived in Summer 1990, during a visit to Bošković Institute, Zagreb, Croatia, where I gave a talk on QSPIRES. I promised to prepare a short manual based on the talk, and intended to spend no more than three days and ten pages on that project. Many months and almost two hundred pages later, this is still far from being a complete and satisfactory guide to QSPIRES' features. In spite of that, hundreds of search examples, inside tips (see, e.g., the last paragraph in Subsection 5.4.6), and plenty of information may somehow counterbalance all the shortcomings and the problematic style, and make this text a useful addition to your bookshelf.

This Guide would not have come into being without the aid of many people. In particular, the explanations, corrections and constant encouragement of Louise Addis of the SLAC Library have been invaluable. Vani Bustamante of the SLAC Publications Department skillfully arranged the text into these vivid, book-quality pages. I would also like to thank the SLAC Theory Group for their kind hospitality. Last, but not least, it should be mentioned that QSPIRES software was written by George Crane of SLAC Computing Services.

1. INTERACTIVE SEARCH PROCEDURE

A successful interactive search via QSPIRES server depends on several things. Your message should be sent to the correct address, and the search request must have the proper form so that QSPIRES can understand it. Furthermore, e-mail links to and from SLAC have to be operative, and the server ought to be up. An individual user can do little about the state of links or the server, but the rest does depend on his/her skills and abilities. In this chapter, we discuss some elements which you can control: how and where to send the query, how to formulate a search expression, how to choose an appropriate database, how to have the result of a search displayed. **Note that this chapter describes only the general search procedure.** Chapters 2 to 6 will illustrate specific search techniques in detail. If you are eager to begin a search immediately, read only Section 1.1; this will tell you where the queries are to be sent. Skip then to Chapter 2, and study the rest of Chapter 1 later.

1.1 ADDRESSING QSPIRES

There is a big difference between SPIRES and QSPIRES: SPIRES is a **database management system**; QSPIRES is a **remote server** set at SLAC's IBM 3090-200E machine. SPIRES is where various databases (e.g., the HEP database) reside; QSPIRES is only a link between you and SPIRES. Even if you do not have a computer account at SLAC and cannot reach SPIRES directly, your access to SPIRES is still possible through the QSPIRES server. Simply send all your search requests, either in interactive messages or in e-letters, to the *user* QSPIRES, at the BITNET node called SLACVM. (Note that *e-letter* is the authors' preferred name for an individual *e-mail* file.) If you use interactive messages to communicate with QSPIRES, the server's address and the search command(s) should be in the same text line. In e-letters, the address is entered into an appropriate header field, and the search command is written separately and put into the body of the letter. Almost every operating system has its own syntax and rules for sending e-mail messages and letters. If the forms suggested below do not work on your machine, please consult your local QSPIRES Node Manager or the system guru at your node for further mailing instructions.

1.1.1 SENDING INTERACTIVE MESSAGES

You can most effectively search SPIRES databases from a remote node by sending **interactive messages** to QSPIRES. This method of communication is possible from many BITNET sites. Unfortunately, the interactive link is not available to non-BITNET users, who must always use e-letters. If your network is BITNET, and you are working on an IBM machine with VM, or a similar operating system, the address may be written simply as QSPIRES at SLACVM (alternatively: QSPIRES@SLACVM). The VM *exec* for sending messages is called TELL, and messages to QSPIRES should therefore always begin with the phrase TELL QSPIRES at SLACVM; e.g.,

```
TELL QSPIRES at SLACVM  FIND AUTHOR DRELL
```

```
TELL QSPIRES at SLACVM        SHOW SUBFILE SIZE
```

Your message is transmitted over the network to QSPIRES, which immediately checks whether you are an authorized user. (If you are not, and want to become one, please read Chapter 8.) If you pass the test, QSPIRES resubmits the relevant part of your message to SPIRES, and waits for the result of the search. After awhile, a reply from QSPIRES will pop up on the screen of your terminal. The text is likely to have the form

```
From SLACVM(QSPIRES):        * Result 149 Documents
```

or

```
From SLACVM(QSPIRES):        * -The subfile has 238641 records
```

From a BITNET node with a different operating system, you will probably have to replace TELL with some other phrase, and maybe write the address differently. For example, if you are using VMS, and the JNET Mailing Software, the correct syntax might be one of the following:

```
SEND QSPIRES@SLACVM           FIND AUTHOR DRELL

$SEND QSPIRES@SLACVM.BITNET       FIND AUTHOR DRELL

SEND/BITNET SLACVM QSPIRES        FIND AUTHOR DRELL
```

Please consult your QSPIRES Node Manager or the local system operator for the correct form. A few more suggestions can be found in Appendix B. In this manual, I will always use the TELL phrase in examples related to interactive communication. If the phrase is different at your site, please insert the correct phrase below:

In all examples, **REPLACE** TELL QSPIRES at SLACVM with:

QSPIRES ALWAYS ANSWERS

You should know that QSPIRES, unlike some of your friends, **always** answers. This *always* presumes, of course, that all the links to SLACVM are up, and that QSPIRES itself is not down. If these favorable conditions are indeed satisfied, your request is immediately acknowledged by a reply message (or an e-letter), **even if no result is found.** (Unauthorized users will be informed that they cannot make searches.)

If you do not get an answer within a reasonable time, you should first assume that something is wrong with the links. (If you know how, check the links, e.g., by asking SLACVM for the time and date.) The other possibility is that QSPIRES is temporarily down, but this state should not last too long. (For the more knowledgeable: when QSPIRES is down, your QBIT, FINGER, CP QUERY, or similar command will reveal that QSPIRES is logged off. Note that QSPIRES is never logged on. Instead, when it is up, it works in a disconnected [DSC] mode.) If, within a day or two, you do not succeed in reaching QSPIRES, please contact the QSPIRES Node Manager in your institution, or send the information to QSPI@SLACVM.BITNET.

1.1.2 COMMUNICATING VIA E-LETTERS

The larger part of this manual is devoted to users who communicate with QSPIRES interactively. However, for benefit of those using e-letters (e-mail), the next three paragraphs list some basic information about this alternative kind of communication. Much more on getting data from QSPIRES via e-letters can be found in Chapter 7. Differences between interactive messages and mail files (e-letters) are explained in Appendix B.

QSPIRES accepts and reads not only interactive messages, but also e-letters. Consequently, you can send requests and receive answers even if your computer is not on the BITNET network. Your e-letter must be addressed to the *user* QSPIRES at the BITNET node called SLACVM. Apply whatever form of BITNET address is prescribed at your machine. When the address is completed, compose the body of the letter. Write the command phrase, e.g., FIND AUTHOR DRELL, and use only **one line** of text for that. Note that TELL, SEND, $SEND, etc., which played a role in interactive commands, mean nothing in an e-letter and should be omitted.

According to international standards, there should always be an empty line between the *header* and the *body* of an e-letter. Most mailing systems insert this blank line automatically, but if yours does not, put the line in by hand. One of the header lines denotes the letter's subject. QSPIRES presently does not read this *Subject* line, but in the future, there might be some role for it. We suggest that you do not state the subject in letters addressed to QSPIRES. Note also that QSPIRES reads only the first nonblank line from the body of a letter. If your letter contains more than one line of text, all but the first line will be ignored.

When your request is received by QSPIRES, and your authorization is checked, the command phrase from the letter is resubmitted to SPIRES. The answer is immediately sent back to you in an e-letter.

1.2 SEARCH PHRASE

QSPIRES understands several command verbs. For example, the commands HELP, SHOW, and EXPLAIN, initiate the retrieval of some general information on SPIRES and its databases. Such informative searching might be very useful occasionally.

However, more often, you will want to retrieve some real data, rather than general information. In that case, your search phrase must begin with the verb FIND. The FIND command is a signal to QSPIRES that you are beginning a serious search. FIND should be followed by one or more *search expressions*, in which the search criteria are listed. This section describes searches beginning with the FIND verb. A few other command verbs will be analyzed in Section 1.3. Please, remember the following fact:

QSPIRES IS NOT CASE SENSITIVE.

Even though all commands are printed in uppercase letters in this guide, you may type them in either upper or lower case.

1.2.1 HOW TO PHRASE YOUR REQUEST

A search which retrieves real data from one of the available databases may be very simple, with only one criterion stated, or may be more complex. A typical interactive search request will have at least three distinct parts: (a) the TELL command, followed by the address of SLAC's remote server; (b) the QSPIRES' command verb FIND; and (c) a <search expression>, which is perhaps the most important element in your request.

```
TELL QSPIRES at SLACVM  FIND <search-expression>
```

If you plan to explore a database other than HEP, a fourth element must be added: (d) an *option field,* in which the database name is listed.

```
TELL QSPIRES at SLACVM  FIND <search-expression> (IN <database-
                        name>
```

Search expressions are the basic building blocks of any request sent to QSPIRES. The above example illustrates the so-called *simple search.* But even in a more intricate search, with several criteria specified (see Section 1.4), the same basic blocks will be used. This time, the search expressions will be linked by logical operators (AND, AND NOT, or OR):

```
TELL QSPIRES at SLACVM      FIND <search-expression 1> AND <search-
                            expression 2> ...
```

The search expression states the criterion to be used in record searching. SPIRES' ability to retrieve a record depends entirely on your ability to formulate a search expression. Every search expression is built of three subcomponents. From left to right, these are (i) a *search term,* (ii) a *relational operator,* and (iii) a *search value(s).*

```
<search-expression> = [search-term] [relational-operator] [search-
                                   value]
```

The definition may look terribly complicated, but search expressions are, in fact, very simple. Here are some possible forms of search expressions:

AUTHOR = DRELL

TITLE PREFIX HADRON

DATE BEFORE 1988

AUTHOR, TITLE, and DATE are some of the allowed search terms; =, PREFIX, and BEFORE represent relational operators; DRELL, HADRON, and 1988 are the search values supplied by you, the searcher. **If the relational operator is not listed in a search request, the equality operator is assumed;** therefore, AUTHOR DRELL is equivalent to AUTHOR = DRELL. When one puts the three components together, the criterion for the search is formulated. You want QSPIRES to locate works by author Drell, or retrieve articles with a given leading string in the title, or find documents published before year 1988, etc. The complete message to QSPIRES, with one of the above search expressions, will have the form

TELL QSPIRES at SLACVM	FIND	AUTHOR = DRELL
address	*command verb*	*search expression*

Since no database was mentioned, the search is to be done in the HEP database. The remainder of this section is devoted to an analysis of the three subcomponents of a search expression. *Search terms* are discussed in Subsection 1.2.2; *relational operators*, in Subsection 1.2.3; and *search values*, in Subsection 1.2.4.

ABBREVIATIONS FOR QSPIRES COMMANDS

In addition to FIND, the server QSPIRES understands several other command verbs. The role of these additional commands will be explained as we proceed with the illustration of QSPIRES' abilities.

It is worth mentioning here that QSPIRES will accept not only complete English words, but also abbreviated commands. For most command words, the first three characters make the minimum allowable prefix. For example, FIN can be used in addition to FIND. Other search elements, e.g., index names, options, etc., could be abbreviated as well. In the examples, I will use both short and long forms for commands and search terms. Here is the complete list of commands that could be used for communication with QSPIRES.

FULL COMMAND	ALLOWED ABBREVIATION(S)
FIND	FIN
SHOW	SHO
EXPLAIN	EXP, EXPL, EXPLA, EXPLAI
BROWSE	BRO, BROW, BROWS
OUTPUT	OUT, OUTP, OUTPU
DISPLAY	DIS, DISP, DISPL, DISPLA
BACKUP	BAC, BACK, BACKU
HELP	HEL
QUERY	Q, QU, QUE, QUER (and also: WHOIS)
WHEREIS	WHE, WHER, WHERE, WHEREI

If you try to use an illegal command name or abbreviation, QSPIRES will send you a signal:

```
TELL QSPIRES at SLACVM  FI AUTHOR = DRELL
From SLACVM(QSPIRES):   * Unrecognized command FI
```

Admit your error, and try again.

1.2.2 SEARCH TERM (= INDEX NAME)

The first subcomponent in a search expression is a *search term. Search term* is the name of an *index* in a selected database. Thus, *search term* and *index name* are, in fact, synonyms. But what is the index? SPIRES supports a very elaborate organization of data. Every record in a database is conveniently broken into smaller pieces, and each of these fragments fits into one of the predefined *indexes.* For example, a preprint will be represented by its title stored in the *Title index,* its author(s) listed in the *Author index,* its report number recorded in the *Report-Num index,* etc. In other words, each record in SPIRES is represented by a collection of values in various indexes. (The record itself is sometimes also referred to as a *goal record.*) Every index has an *official* name, and these names should appear in search terms. The command FIND AUTHOR DRELL instructs SPIRES to locate all (goal) records that contain the value DRELL in the index named AUTHOR.

Whether a search term is typed in upper case, lower case, or a combination of the two, makes absolutely no difference to SPIRES. However, it is very important that you use a correct index name. If you are careless in spelling, or use a wrong abbreviation for a search term, the search will be unsuccessful or misleading. The following information explains how to obtain the list of valid search terms.

SHOW INDEXES (SHO IND) AND SHOW SEARCH TERMS (SHO SEA TER)

With the SHOW INDEXES (SHO IND, for short), and SHOW SEARCH TERMS (SHO SEA TER) commands, it is possible to get the list of search terms in a selected database. To get the names of indexes in the HEP database, send one of the following commands to QSPIRES:

```
TELL QSPIRES at SLACVM  SHOW INDEXES

TELL QSPIRES at SLACVM  SHO SEA TER

TELL QSPIRES at SLACVM  SHO IND (FILE
```

The first two commands instruct QSPIRES to send the list of indexes interactively (to the screen of your terminal). The option (FILE in the third one tells QSPIRES to create an e-letter, and send the required information to your e-mailbox.

To get lists of search terms in other databases, you have to select the appropriate database (see Subsection 1.3.2). The names of indexes in the BOOKS database could be retrieved by writing SHO IND (IN BOOKS; to obtain the list of indexes in the PARTICLES database, write e.g., SHOW SEARCH TERMS (IN PARTICLES TYPE, etc.

The list which is returned to you displays the name, nickname(s), and allowed abbreviation(s) for each of the indexes. It makes no difference to SPIRES whether a full index name is used, or whether one of the aliases is typed in your query. Be careful not to use a nonexistent abbreviation or a misspelled name of an index.

In QSPIRES' responses, you will notice a classification of indexes to *simple, goal,* and *qualifiers.* In your searches, you will most often use the *simple indexes.* Currently, there are twenty-three simple indexes in HEP, e.g., AFFILIATION, AUTHOR, CITATION, COLLABORATION, JOURNAL, REPORT-NUM, EXPERIMENT, TITLE, TOPIC, etc. The use of these and other HEP indexes will be illustrated in Chapters 2 and 3. The number of simple indexes in the other databases is much smaller.

The goal index contains a unique key value, which distinguishes this record from any other in the database. It would not be a good idea to choose, e.g., the authors name for the key value, because there might be many documents written by the same person. In HEP, and many other databases, the key value in the goal index is a randomly selected number (e.g., 467316). Although one can use the goal index in a search (FIND DOCUMENT = 467316), such searches are of almost no interest to regular QSPIRES users and will not be further discussed. The key value of a goal record could be used with the DISPLAY command to display the single record, e.g., DISPLAY 467316.

The third category of indexes, the qualifiers, cannot be used in one-step searches; they can only appear in a combination with some of the simple indexes. Typically, a request in which a qualifier index is used will have the form FIND <simple-index> ... AND (NOT) <qualifier> .... The qualifiers in HEP will be thoroughly covered in Section 3.4.

Some indexes will be denoted as *immediate*. This is an internal notation which should not concern general users, and you may simply ignore this characterization.

SHOW INDEX DESCRIPTION <index-name> AND SHOW INDEX INFORMATION <index-name>

In some databases, additional information on indexes can be obtained by issuing the above commands. SHOW INDEX DESCRIPTION can be shortened to SHO IND DES, and SHOW INDEX INFORMATION to SHO IND INF. Currently, no such additional information is available for databases accessible over QSPIRES. Therefore, QSPIRES returns only the most elementary information: the type and the name of the relevant index, and abbreviations.

```
TELL QSPIRES at SLACVM   SHO IND DESCRIPTION AUTHOR
From SLACVM(QSPIRES):    * Simple Index: A, AU, AUTHOR, N, NAME
TELL QSPIRES at SLACVM   SHOW INDEX INF PROPERTY (IN PARTICLES TYPE
From SLACVM(QSPIRES):    * Simple Index: PART-PROP, PP, PROP,
                         PROPERTY
```

1.2.3 RELATIONAL OPERATORS

Another subcomponent of every search expression is a relational operator. The operator links the search term and search value(s). Three different kinds of relational operators are available for searches with simple indexes: equality, inequality, and content operators. An additional type is available for searching with qualifiers: the range operators.

THE EQUALITY OPERATOR (THE DEFAULT)

This operator is used to specify a precise numeric, alphabetic, or alphanumeric value in a search expression. The operator is indicated by either the = sign or a blank space. FIND AUTHOR = DRELL is equivalent to FIND AUTHOR DRELL, and so are, e.g., FIND REPORT-NUM = LAPP-TH-60 and FIND REPORT-NUM LAPP-TH-60. Remember: if you do not list the relational operator, the equality operator is assumed. Considering the time spent on a search, the equality operator is the most effective of all relational operators.

INEQUALITY OPERATORS

The inequality relational operators are represented by mathematical symbols, but their use is not restricted to indexes containing only numeric values. SPIRES also allows their use for searching in indexes with alphanumeric and text values. The inequality operators recommended for use with QSPIRES are:

>	greater than (AFTER or AFT)
> =	greater than or equal to
<	less than (BEFORE or BEF)
< =	less than or equal to

Note that the order of symbols must follow exactly the values given in the chart above; e.g., the search expression DATE >= 1988 is correct, but DATE => 1988 is not.

If you do not like symbols, there is another way to express the *greater than* and *less than* operators. They could be replaced by the words AFTER and BEFORE, respectively. (Both lower and upper case are acceptable for these words.) Therefore, one can write DATE < 1978 as well as DATE BEFORE 1978. Likewise, the expressions DATE > JULY 91 and DATE AFTER JULY 91 both mean the same thing to SPIRES. The term AFTER can be shortened to AFT, and BEFORE to BEF.

As suggested above, inequality operators are most often used with various *date indexes* (see Subsection 1.2.4). For example, in the HEP database, they are very efficient in searches of the DATE qualifier (see Subsection 3.4.3). In the BOOKS database, they may be used with the COPYRIGHT-DATE index; in the CONFERENCE database, with the BEGINNING-DATE index, etc. Here are several more examples for search expressions with inequality operators:

```
DATE >= FEB 1988

BEGINNING-DATE <= 8 MARCH 77

COPYRIGHT-DATE AFTER 1989 (also: COPYRIGHT-DATE > 1989)

DATE-UPDATED BEFORE 8/31/91 (also: DATE-UPDATED < 8/31/91)
```

With such search expressions, one can build full search commands; e.g., for an HEP search: FIND AUTHOR = DRELL AND DATE > 1988.

CONTENT OPERATORS

Content operators are provided for use in situations that require searching for records through pattern matching or substring matching. There are eight such operators in SPIRES, but for searches via QSPIRES, we recommend the use of only two, PREFIX and LIKE. (The use of others requires large amounts of CPU-time, and can tie up the server for uncomfortably long periods of time, preventing other users from accessing QSPIRES.) The most efficient of all content operators is the PREFIX operator. The operator LIKE is pretty fast in some of the indexes, but much slower in some others. Please use LIKE only when all other resources have failed.

If you are searching a *word index* (see Subsection 1.2.4) and using content operators, your search value **should not** be longer than one word. If there is more than one word listed, only the one immediately following the content operator will actually be used, and the other will be ignored.

However, if an index is not a *word index,* the search value following a content operator may have more than one word.

The **PREFIX** operator (or PRE) specifies that any value retrieved must contain the designated alphabetic characters in sequence at the **beginning** of the value. FIND TITLE PREFIX HADRON will retrieve not only the titles with the word hadron, but also those with the words hadron**s**, hadron**ic**, etc. The search request FIND TOPIC PRE VIOLATION, C could be used to find papers with the topics Violation, C**P**; Violation, C**PT**; Violation, c**harge**, etc.

As mentioned above, in searching through the *word indexes* with the PREFIX operator (e.g., the TITLE index in HEP is such a *word index*), your search value should have no more than one word or string of characters. Otherwise, SPIRES will ignore the additional words. For example, FIND TITLE PRE SOFT GLU will be internally translated as FIND TITLE PREFIX SOFT, and the result—if any—will probably not be what you expected.

The **LIKE** operator (or LIK) is used to search for specific characters in sequence, with the option of using *wild-card* characters in the search request. Without the *wild-card* characters, the LIKE operator is functionally equivalent to the equality operator. With the *wild-cards,* however, it becomes a very flexible string-matching facility. The *wild-card* characters reserved for the LIKE operator are the *underscore-sign,* _ , and the *question-mark,* ?. The underscore indicates a single missing character or a blank space, and the question mark indicates zero or more missing characters. For example, FIND TITLE LIKE TR_CK would recover title-words t**r**a**c**k, t**r**i**c**k, and t**r**u**c**k, while FIND AUTHOR LIK DRE?L would retrieve authors D**r**e**l**l, D**r**e**ch**s**e**l, D**r**e**v**a**l**, and D**r**e**s**s**e**l. Two or more *wild-card* characters can also be combined in a single search request: FIND COLLABORATION LIKE ?ALMA_ATA? would retrieve indexed collaborations in which the Alma Ata group has participated.

If the index is not a *word index,* blanks can be included in the search value. For example, in the AFFILIATION index in HEP, which is a *phrase index,* one can use FIND AFFILIATION LIKE MEMPHIS ?STATE?. However, with a *word index,* only **one** word or uninterrupted group of characters can follow the LIKE operator. Otherwise, SPIRES might ignore your request, and the result of the search might not be what you had expected.

RANGE OPERATORS

Two range operators are available in SPIRES. These operators cause a search to retrieve records that have an indexed value within a specified range. One operator is characterized by the phrase BETWEEN <value a> AND <value b>, the other by FROM <value 1> TO <value 2>. The range operators cannot be used to search simple indexes. They are primarily used with various date qualifiers, e.g., with the DATE index in HEP. More on the range operators in Subsection 3.4.3.

1.2.4 SEARCH VALUES

The third subcomponent of every search expression is the *search value.* A search value states the value for which you would like to find a match within an index. Another very similar term, *indexed value,* will be used often in this text; please try to distinguish between the two. The *search value* is the value supplied by you, the searcher. An *indexed value* is a data element put into the SPIRES by the staff of SLAC's and DESY's libraries, or some other caretaker of the databases. In every search, your search value is compared to all the indexed values within the relevant index.

The search value is the right-most part of any search expression. For example, in the expression AUTHOR = DRELL, S., the search value is Drell, S. You can state the search value in many different ways. The precise form will depend on the index you are searching, but even within one index, variations are allowed. For example, in the AUTHOR index (HEP), both the forms DIRAC, PAUL and PAUL DIRAC are acceptable. (Note that the comma must be used if the last name is listed first.) In the DATE index (HEP), the date October 2, 1977, can be stated as 10/2/1977 or Oct 2, 77, or 2 October 1977, or October 2nd 77, etc. (However, do **not** use the European form of day/month/year, e.g., 31/3/1991 for March 31, 1991!)

There are situations in which the search value is restricted to a single word or a single string of characters, e.g., when content operators are used in searches of *word indexes*. In other searches, long phrases might be used. We shall cover the rules for forming the search values in Section 2.2 for each HEP index separately. The other databases will be covered in Chapters 5 and 6.

BROWSE <index-name>, BROWSE FIRST <index-name>, AND BROWSE LAST <index-name>

If you have difficulties determining what kind of values can be used to search a given *simple index*, use the BROWSE <index-name> command. With this command, you can retrieve 6 to 10 representative values stored in the named index. The answer might give you an idea of what sorts of values are contained in that index, and help you construct a useful search request.

```
TELL QSPIRES at SLACVM  BROWSE REPORT-NUM

TELL QSPIRES at SLACVM  BROWSE AUTHOR (IN EXPERIMENTS TYPE
```

In HEP, BOOKS, and some other databases, the result of browsing will be sent to you interactively if your system allows that. In DATAGUIDE, PARTICLES, ..., the default way of sending the answer is via e-letters. Check the table in Subsection 1.3.3 for more detailed information.

If you specify FIRST or LAST after BROWSE, QSPIRES will send you an ordered list of 10 indexed values from either the beginning or the end of the index set. The terms FIRST and LAST **may not** be abbreviated. However, the verb BROWSE can be shortened to BRO.

```
TELL QSPIRES at SLACVM  BROWSE LAST TITLE

TELL QSPIRES at SLACVM  BRO FIRST SPEAKER (IN SEMINARS TYPE
```

Only the *simple* and *goal* indexes can be browsed. You cannot use the BROWSE command for *qualifiers*. For more on browsing in HEP, see Section 2.3.

BROWSE <index-name> <value>

You can also use BROWSE to target a certain alphabetic place within an index. The command BROWSE <index-name> <value> sends a message to QSPIRES to look for the match to the value specified. QSPIRES usually responds with 10 values surrounding the specified value. If the exact value is not found, the closest match and surrounding values will be displayed.

```
TELL QSPIRES at SLACVM  BRO TITLE WINTER

TELL QSPIRES at SLACVM  BROWSE SPEAKER CREUTZ (IN SEMINARS TYPE
```

For more details, check Section 2.3, where browsing in HEP database is illustrated.

SEARCHING WITH TRUNCATED VALUES

Two very flexible tools in SPIRES enable the location of records according to a leading string of characters. One method, already described in Subsection 1.2.3, relies on the PREFIX relational operator. SPIRES allows an alternative way, which is, in many cases, even more versatile than the PREFIX search: you use the equality operator, and truncate the *search value*. To inform SPIRES that the search value is truncated, we use the special truncation character # (also called the *pound sign*). When the system encounters that character in an expression, it searches for the truncated and not for the full values.

```
TELL QSPIRES at SLACVM  FIND TITLE = WEAK# INTERACT#

TELL QSPIRES at SLACVM  FIND AUTHOR SENJANOV#
```

The first of these searches will retrieve titles like Weakly Interacting Systems, or Weak Interactions, etc. The second example could be helpful if you cannot remember the correct spelling of Goran Senjanovic's name. Note that in a *word index* you can truncate several words. Only one truncation sign may be used in *nonword* indexes.

In the above examples, the truncation character denoted the *right truncation*. In some indexes, a special kind of truncated searches may be permitted. In such special truncations, a search value could be written as STRING1#STRING2. The search finds records having indexed values that begin with the string1 sequence, and end with the string2 sequence. Such a search, if permitted in a given index, is similar to a search with the LIKE content operator.

```
TELL QSPIRES at SLACVM  FIND EXP FNA#772
```

In this search, the documents with results from FNAL-E-0772 would be retrieved.

PROBLEMS WITH THE TRUNCATION SIGN

On some computer systems, the *pound sign* (#) has a special meaning, and there might be problems in searches via QSPIRES when we want to use this sign. For example, on an IBM computer with the VM or a similar operating system, the # sign might be preselected to denote the *line end*. In that case, the sign itself, as well as the text written to the right of it, will not be sent in your message to QSPIRES. Therefore, although you write FIND TITLE SUPERSYM# SCALE, the message might be altered and transferred to QSPIRES as FIND TITLE SUPERSYM. Consequently, the system will find no results matching your intended search request.

However, on an IBM system, you can choose another *line end* sign, or temporarily disable the *line end* feature. First, issue the command CP QUERY TERMINAL. If the # sign really denotes the LINEND character, the command TERMINAL LINEND OFF will temporarily (until your next logon) enable the use of the character for SPIRES truncations. (If you want this to become a permanent change, add an instruction to that effect to your PROFILE EXEC file.)

While the terminal characteristics may affect the interactive messages, they usually do not interfere with the other forms of e-mail. Therefore, if you cannot force the system to pass through the *pound sign*, or if the problem does not originate at your machine but originates somewhere along the path to SLACVM, try an e-letter; in e-letters to QSPIRES, you will most often be able to use the truncation sign. Alternatively, send the messages with the PREFIX operator rather than the truncated search values.

ANOTHER CLASSIFICATION OF INDEXES

We learned in Subsection 1.2.2 that indexes might be *simple,* or *goal,* or *qualifiers.* There is another classification of indexes, which is based on the content rather than on the internal structure. For QSPIRES searches, the following indexes are important.

WORD INDEX: When data in an index are in the form of a text, it is often desirable to have the individual words of the text indexed separately. Most commonly, this type of indexing is applied to TITLE indexes. The TITLE index in HEP, as well as the TITLE index in the BOOKS database, are indeed such *word indexes.*

The rules for searching through a *word index* are slightly different from those used in search of a *nonword index.* When you list two or more words in a search value, and the search term corresponds to the *word index,* the system will automatically supply one or more AND operators between the words. For example, FIND TITLE CLUMPED INTERGALACTIC MEDIUM will internally be translated as find title-words CLUMPED and INTERGALACTIC and MEDIUM, and SPIRES will retrieve only the records containing all three of these words (in any order) within the TITLE index. When we use an equality operator (or, simply, a blank space) in a *word index,* there are no restrictions regarding the number of words in the search value. Remember, however, that when the content operators are used (e.g., PREFIX; see Subsection 1.2.3), your search value should not be longer than one word. Note that, e.g., in HEP, the text values appear in AFFILIATION and TOPIC indexes, but these are **not** set as *word indexes.*

PHRASE INDEX: When several words or groups of characters are indexed together, the index is called a **phrase index.** The TOPIC index in HEP is a typical example: e.g., the topic ELECTRON POSITRON, ANNIHILATION is indexed as a single *phrase,* not as three individual words.

It is important to know whether an index is a *word* or a *phrase* index, because different searching rules apply. In a *phrase index,* for example, only one truncation sign may be used; FIND TOPIC ELECTRON# POSITRON# will find nothing, but FIND TOPIC ELECTRON POSITRON, ANNIH# is correct.

PERSONAL-NAME INDEX: In almost every database available via QSPIRES, at least one index deals with people's personal names. Due to the variety of ways a name could be written, a special name-handling routine is devised to enable matching even if a search value and an indexed value are in different formats. Indexes with such a special routine are called *personal-name indexes.* The rules for matching are thoroughly illustrated in Subsection 2.2.1, where the AUTHOR index in HEP is discussed.

DATE INDEX: Just as in the case of personal names, there is a variety of ways to specify a date in a search request. To enable a successful comparison, SPIRES provides a special procedure to handle and convert dates found in your search values. If such a procedure has been built in, the index is called *date index.* We shall illustrate features of date indexes in Subsections 3.4.1 to 3.4.4, where the DATE index in HEP is discussed.

EXCLUSION LIST FOR WORD INDEXING

Frequently occurring articles and conjunctions—such as *a, an, the, and*—are usually excluded when *word indexing* is specified for an index. The database owner can form a list of such words, and instruct SPIRES to ignore words from the list in a search of that particular index. The list is called the *exclusion list.* When an excluded word is used as a search value in a search expression, SPIRES will pretend not to see the word. If all search values in a command are excluded words, the system will retrieve nothing. For instance,

```
TELL QSPIRES at SLACVM  FIND TITLE THE AND AN
```

```
From SLACVM(QSPIRES):    * No records found which match search
                         criteria
```

The excluded words in the TITLE index (HEP) are listed in Subsection 2.2.2. Similar lists for the word indexes in other databases can be found in Chapters 5 and 6.

SEARCHING WITH SPECIAL SEARCH VALUES

A problem may arise when your search value contains a special character, or a phrase with a particular meaning for SPIRES. These are the so-called reserved symbols (words). For example, you might wish to find a title with the sign > or with the word *prefix*. SPIRES tends to interpret these values as relational operators rather than search values. To avoid any possible ambiguities, in such situations you must surround the entire search value with quotation marks (**not** single quote marks!). Some reserved symbols are listed below:

```
&  |  ~  >  <  =  )  (
```

Suppose that you are searching for the topic RHO(1250), DECAY WIDTH, in the HEP database.

```
TELL QSPIRES at SLACVM   FIND TOPIC RHO(1250), DECAY WIDTH

From SLACVM(QSPIRES):    * No records found which match search
                         criteria
```

This search was unsuccessful because RHO(1250) includes parentheses, and they are also on the list of reserved symbols. When the entire phrase is sandwiched between quotation marks, the result is different:

```
TELL QSPIRES at SLACVM   FIND TOPIC "RHO(1250), DECAY WIDTH"

From SLACVM(QSPIRES):    * Result 3 Documents
```

The reserved symbols for the TITLE and TOPIC indexes in HEP, are listed in Subsection 2.2.2. Similar lists apply to other databases.

1.3 AVAILABLE DATABASES

This section lists the databases available over QSPIRES, and tells you how to select and access a particular database. The SHOW and EXPLAIN commands, which help retrieve additional information on various databases, are briefly discussed.

1.3.1 LIST OF AVAILABLE DATABASES

SPIRES controls hundreds of databases. However, only a dozen can be accessed via QSPIRES. Here is the list of the databases presently available to authorized users:

HEP	The SLAC/DESY High Energy Physics Database
BOOKS	Online Book Catalog for SLAC Library
CONFERENCE	Information on Past and Future High Energy Physics Conferences (also called CONF)
DATAGUIDE	Particle Data Group Index of Experimental Papers
EXPERIMENTS	Particle Data Group Experiment Summaries
HITECH	SLAC Technical Data Library Guide to Manufacturers Addresses and Catalogs
INST	High Energy Physics Institutions Addresses (also called INSTITUTIONS)
PARTICLES	Particle Data Group Particle Properties Listing
REACTIONS	Particle Data Group Reaction Data
SEMINARS	SLAC Compendium of Bay Area Seminars and Colloquiums
SERIALS	Online Serials Catalog for SLAC Library

In addition, the directory of e-mail addresses is available through a shortcut search with QUERY command (see Section 5.5). To get the list of available databases, issue the HELP command

```
TELL QSPIRES at SLACVM HELP
```

As a result, the QSPIRES HELP file will be sent to your e-mailbox. Note that the interactive sending of the HELP file is not possible. One of the items in the HELP file is the list of databases.

In this Guide, we shall spend most of the time illustrating searches in the HEP database. General information and specifics of searches in the other databases are described in Chapters 5 and 6.

1.3.2 HOW TO SELECT A PARTICULAR DATABASE

HOW TO SELECT HEP

HEP database, with its 223,004 particle physics references, is the one attracting the most attention. This probably explains why it was made the default choice. *Default* means that, unless you explicitly select another database, your search request is automatically processed in HEP. Similarly, if you select a different database, when the search there is completed, you are automatically returned to HEP. In other words, to search the HEP database, you just type your request, and do nothing regarding the selection process.

HOW TO SELECT OTHER DATABASES

As mentioned above, if you do nothing regarding the selection of a database, the HEP database is chosen by default. In order to inform QSPIRES that the search is to be performed in another database, you have to add the expression (IN <database-name> to the end of your message to QSPIRES. Note the open parenthesis, which signals QSPIRES that the request is followed by a

special instruction, in this case: `choose another database`. The *database-name* is a name of an available database. (Do **not** shorten the database names to the first three characters!) For example,

```
TELL QSPIRES at SLACVM  SHOW SEARCH TERMS (IN INST
TELL QSPIRES at SLACVM  FIND PLACE PARIS (IN CONFERENCE
TELL QSPIRES at SLACVM  FIND REACTION K+ (IN EXPERIMENTS TYPE
TELL QSPIRES at SLACVM  FIND DATE NEXT WEEK (IN SEMINARS TYPE
TELL QSPIRES at SLACVM  BROWSE AUTHOR (IN BOOKS
```

In all these examples, QSPIRES is instructed to send answers interactively. Note that the term TYPE was appended to the third and the fourth lines. Otherwise, the answer would have been filed and sent to your e-mailbox. On the other hand, in INST, CONFERENCE, and BOOKS databases, the TYPE is the default choice for the SHOW, FIND, and BROWSE commands, and there is no need to specify this option explicitly. See the table in Subsection 1.3.3 for more information.

Once you made a selection, you stay in the selected database until your next use of the command verb FIND.

```
TELL QSPIRES at SLACVM  FIND TITLE MORIOND PROCEEDINGS (IN BOOKS
From SLACVM(QSPIRES):   * Result 52 Books
TELL QSPIRES at SLACVM  AND DATE AFTER 1985
```

(Since there was no FIND verb in the previous line, we are still in the BOOKS database, and there is no need to repeat the selection. SPIRES continues the search in BOOKS, and reports via QSPIRES ->)

```
From SLACVM(QSPIRES):   * Result 12 Books
```

ANOTHER EXAMPLE

Note the terminology in the following example: what we call a *database* is a *subfile* in SPIRES' jargon.

```
TELL QSPIRES at SLACVM  SHOW SUBFILE SIZE (IN CONFERENCE
From SLACVM(QSPIRES):   * -The subfile has   4176 records
TELL QSPIRES at SLACVM  FIND PLACE PARIS
From SLACVM(QSPIRES):   * No records found which match search
                          criteria
```

(Oops! Our second request contained the FIND verb, so we were automatically transferred into the HEP database. PLACE is not an allowed search term in HEP, and therefore there was no positive answer. We should have used instead ->)

```
TELL QSPIRES at SLACVM  FIND PLACE PARIS (IN CONF
From SLACVM(QSPIRES):   * Result 16 Conferences
TELL QSPIRES at SLACVM  AND DATE 1990
From SLACVM(QSPIRES):   * Result 1 Conference
TELL QSPIRES at SLACVM  SHOW SUBFILE SIZE
```

```
From SLACVM(QSPIRES):    * -The subfile has 223004 records
```

(Well, this answer corresponds to the HEP database, not CONFERENCE. Remember, if SHOW is not accompanied by a *selection* option, **QSPIRES usually sends information on HEP, even if we are currently in a different database.** Another important point is that the SHOW command does not interfere with the current search; we are still in CONFERENCE, and may add another criterion to our request, without having to repeat the selection ->)

```
TELL QSPIRES at SLACVM  AND DATE JULY 1990

From SLACVM(QSPIRES):    * Result 1 Conference

TELL QSPIRES at SLACVM  FIND TITLE SUPERSYMMETRY
```

(We are now back in HEP, since the FIND command was issued, and we did not append a selection ->)

```
From SLACVM(QSPIRES):    * Result 1558 Documents
```

1.3.3 WHAT ELSE COULD BE LEARNED ABOUT DATABASES?

Use the SHOW and EXPLAIN command verbs to learn more about a chosen database. Note that neither EXPLAIN nor SHOW interrupt a search in progress. The table and examples below will illustrate various possibilities.

If the selected database is HEP, BOOKS, CONFERENCE, HITECH, INST, or SERIALS, the information retrieved with SHOW will be sent to you interactively. If you do not want this to happen, and prefer to get the information to your e-mailbox, append the option FILE to your request.

The situation is exactly the opposite if you are searching through one of the remaining databases. Then, the default choice is to send the required information to you in an e-letter; if you want the result to be sent interactively, you must add the TYPE option to the end of your request.

The chart explains which *option* to use with the SHOW verb in order to get the information either interactively or in your e-mailbox. Note that the same rules apply for the BROWSE and DISPLAY commands. (The procedure for the EXPLAIN command is different; see below.)

DATABASE	TO GET THE INFORMATION INTERACTIVELY, APPEND	TO GET THE INFORMATION INTO THE MAILBOX, APPEND
HEP	[a]	(FILE
BOOKS	(IN BOOKS	(IN BOOKS FILE
CONFERENCE, CONF	(IN CONF	(IN CONF FILE
HITECH	(IN HITECH	(IN HITECH FILE
INST	(IN INST	(IN INST FILE
SERIALS	(IN SERIALS	(IN SERIALS FILE
DATAGUIDE	(IN DATAGUIDE TYPE	(IN DATAGUIDE
EXPERIMENTS	(IN EXPERIMENTS TYPE	(IN EXPERIMENTS
PARTICLES	(IN PARTICLES TYPE	(IN PARTICLES
REACTIONS	(IN REACTIONS TYPE	(IN REACTIONS
SEMINARS	(IN SEMINARS TYPE	(IN SEMINARS

[a] For HEP, this is the default choice, and there is no need for the *option* field. See examples below.

SHOW SUBFILE DESCRIPTION (SHO SUB DES, SHO SUBDES)

This command provides a short description of a database. The allowed abbreviations are SHO SUB DES, and SHO SUBDES. You might learn, e.g., what information is contained in the goal records, and how the records are structured. The information can range from very sparse to very complete. If you use the first two examples, the information will be sent to you interactively. The last two examples instruct QSPIRES to send the description to your e-mailbox. Note that in the first example, no selection was made. Therefore, the information on the HEP database will be returned.

```
TELL QSPIRES at SLACVM  SHOW SUBFILE DESCRIPTION
TELL QSPIRES at SLACVM  SHOW SUBFILE DES (IN DATAGUIDE TYPE
TELL QSPIRES at SLACVM  SHOW SUBDES (IN BOOKS FILE
TELL QSPIRES at SLACVM  SHO SUB DES (IN EXPERIMENTS
```

SHOW SUBFILE SIZE (SHO SUB SIZ)

With this command (the allowed short form is SHO SUB SIZ), you can learn how many goal records are currently stored in the database of your choice. If you use the first two examples, the information will be sent to you interactively. The last two examples instruct QSPIRES to send the number to your e-mailbox. Note that in the fourth example, no database selection was made. Therefore, the returned information will be on the HEP database.

```
TELL QSPIRES at SLACVM  SHOW SUBFILE SIZE (IN SERIALS
TELL QSPIRES at SLACVM  SHOW SUB SIZ (IN REACTIONS TYPE
TELL QSPIRES at SLACVM  SHOW SUBFILE SIZE (IN SEMINARS
TELL QSPIRES at SLACVM  SHOW SUB SIZ (FILE
```

SHOW INDEXES (SHO IND), SHOW SEARCH TERMS (SHO SEA TER), SHOW INDEX DESCRIPTION (SHO IND DES), AND SHOW INDEX INFORMATION (SHO IND INF)

These commands provide you with a list of search terms and their valid aliases, as well as the kinds of indexes to which they correspond. See Subsection 1.2.2 for further information and examples.

SHOW FRAMES (SHO FRA)

The SHOW FRAMES command (or SHO FRA, for short) describes the available *frames* in a given database. A frame can be thought of as a way of displaying a search result. In some databases, there is a wide range of capabilities for viewing the retrieved data. For example, 18 different frames are available in HEP (see Subsection 4.2.1). In some other database, there will be only one available frame. If you use the first example below, the information will be sent to you interactively. The second example instructs QSPIRES to send the list to your e-mailbox.

```
TELL QSPIRES at SLACVM  SHOW FRAMES (IN INST
TELL QSPIRES at SLACVM  SHO FRA (IN PARTICLES
```

THE EXPLAIN COMMAND

The same information that could be obtained with the SHOW SUBFILE DESCRIPTION can also be retrieved with the EXPLAIN <database-name> command. In other words, the following two commands are equivalent.

```
TELL QSPIRES at SLACVM  EXPLAIN DATAGUIDE
TELL QSPIRES at SLACVM  SHOW SUBFILE DESCRIPTION (IN DATAGUIDE TYPE
```

However, the default for sending the information is different. With EXPLAIN, the description is sent interactively, for all the available databases. If, instead, you want to get the answer to your e-mailbox, append (FILE to your request:

```
TELL QSPIRES at SLACVM  EXPLAIN DATAGUIDE (FILE
```

1.4 CONTINUING A SEARCH

Your initial FIND command, followed by one or more search expressions, will generally produce a collection of records that satisfy the stated criteria. In some databases, QSPIRES will immediately send you the result, without waiting for your further instructions. In other databases, however, QSPIRES will tell you only how many records were retrieved, and allow you to decide what

to do with the collected data. You can choose to add more criteria and narrow or expand the search, or you may want the results to be displayed. In this section, we discuss such various possibilities. In addition, some search request defaults are mentioned.

1.4.1 COMPOUND AND ITERATIVE SEARCHES

The simple search request (Subsection 1.2.1) consists of one FIND command followed by one search expression. If the FIND is followed by **several** search expressions in the same line, the request is called a *compound* search request.

```
TELL QSPIRES at SLACVM   FIND AUTHOR BELL AND DATE 1988 AND TITLE
                         BREMS#

From SLACVM(QSPIRES):    * Result 2 Documents
```

Here, one request indicated by a single usage of the command FIND locates records fitting more than one requirement; in this case, these are the works by Bell from the year 1988, with the title-word beginning with the string brems (as in bremsstrahlung). Note that search expressions **should not** be separated by commas.

A similar search procedure, in which several criteria are issued as successive commands, is called *iterative*.

```
TELL QSPIRES at SLACVM   FIND AUTHOR BELL

From SLACVM(QSPIRES):    * Result 285 Documents

TELL QSPIRES at SLACVM   AND DATE = 1988

From SLACVM(QSPIRES):    * Result 4 Document

TELL QSPIRES at SLACVM   AND TITLE BREMS#

From SLACVM(QSPIRES):    * Result 2 Document
```

This nice little chat is still only one search request (a single FIND was used!), but now we can see the intermediate steps in the search, and react accordingly.

In both examples, the search expressions were connected by the logical operator AND. However, AND is not the only acceptable logical operator. Three operators could be used in iterative and compound procedures: AND, AND NOT, and OR. The logical operator describes how two criteria combine. *Logical operators* are sometimes referred to as *Boolean operators.*

The **AND** operator adds a limiting criterion to the search expression by requiring that both values occur as specified. Consequently, the use of AND gives us the ability to **narrow** a search from a larger result to a smaller one.

```
TELL QSPIRES at SLACVM   FIND AUTHOR FRITZSCH

From SLACVM(QSPIRES):    * Result 135 Documents

TELL QSPIRES at SLACVM   FIND AUTHOR FRITZSCH AND AUTHOR MINKOWSKI

From SLACVM(QSPIRES):    * Result 20 Documents
```

The **AND NOT** operator requires that a record that would have been included with AND be excluded from the search result. Like the AND operator, the AND NOT also **narrows** a search from a larger result to a smaller one.

```
TELL QSPIRES at SLACVM  FIND AUTHOR FRITZSCH
From SLACVM(QSPIRES):   * Result 135 Documents
TELL QSPIRES at SLACVM  AND NOT AUTHOR MINKOWSKI
From SLACVM(QSPIRES):   * Result 115 Documents
```

The OR operator specifies that records which satisfy at least one criterion be included in the search result. While before, we were able to narrow a search result with AND and AND NOT, now we can **expand** the search to include additional records.

```
TELL QSPIRES at SLACVM  FIND PLACE FREIBURG (IN CONF
From SLACVM(QSPIRES):   * Result 3 Conferences
TELL QSPIRES at SLACVM  OR PLACE FRIBURG
From SLACVM(QSPIRES):   * Result 4 Conferences
```

Note that in an iterative search, the database selection should only be made once; denote your selection in the line with the FIND verb.

Compound searching is possible in all databases available via QSPIRES. The iterative searches are somewhat less practical in DATAGUIDE, PARTICLES, EXPERIMENTS, and REACTIONS databases (see Chapter 6). More details on compound and iterative searches could be found in Chapter 3 (for HEP), and Chapters 5 and 6 (for other databases).

Special indexes, called *qualifiers*, cannot be used in simple searches. In iterative and compound searches, qualifiers may be used, but only following the logical operator(s), not following the FIND verb. See Section 3.4 for further details.

SHOW SEARCH (SHO SEA) AND SHOW RESULT (SHO RES)

In a long iterative search, one can lose track of the criteria used up to any particular point. The SHOW SEARCH (SHO SEA, for short), and SHOW RESULT (SHO RES) commands allow the user to review search expressions executed since the FIND command in the current search was issued. In addition to the search expressions, the answer will also list the number of accumulated records. After getting that information, you can continue the search, or, if you wish, display the collected records.

The two commands SHOW SEARCH and SHOW RESULT could be used interchangeably; from QSPIRES' perspective, they are identical. See Subsection 3.2.4 for examples. There are some important differences between these two commands and all the other SHOW commands. First, you do not have to append the selection option to the SHOW RESULT or SHOW SEARCH commands: they will automatically retrieve the search steps from the database in which your last FIND was issued. Furthermore, by default with these two commands, the answer will be sent to you interactively. The default could be changed simply by adding (FILE to the end of the commands. (Remember that the rules were different for the other SHOW commands; check Subsection 1.3.3.)

1.4.2 SEARCH REQUEST DEFAULTS

In this section, several search request defaults are described. Some of them are SPIRES defaults; the others originate at the QSPIRES server.

DEFAULT DATABASE (HEP)

If you do not specify a database, the HEP database is the one selected automatically. You can choose one of the other available databases by adding the (IN <database-name> option to your command line (see Subsection 1.3.2). However, such a choice is valid only until you begin the next search. If your next FIND command is not accompanied by another selection, you will be returned to HEP. Here is one such sequence:

```
TELL QSPIRES at SLACVM  FIND AUTHOR CHANDRASEK# (IN BOOKS
From SLACVM(QSPIRES):   * Result 5 Books
TELL QSPIRES at SLACVM  FIND TITLE EARLY UNIVERSE
From SLACVM(QSPIRES):   * Result 329 Documents
```

Clearly, the result 5 Books corresponds to the BOOKS database. On the other hand, the last line with the result 329 Documents characterizes a search in HEP, not in BOOKS database.

INDEX NAME

The FIND verb in your query must be always followed by an index name (= search term). Unfortunately, if the search term is missing, the system will do nothing to warn you. Therefore, carefully re-examine your query whenever an unexpected result is retrieved.

```
TELL QSPIRES at SLACVM  FIND FEYNMAN AND TITLE PLENTY
From SLACVM(QSPIRES):   * No records found which match search
                        criteria
```

However, when the missing search term AUTHOR is put in place, the result is different:

```
TELL QSPIRES at SLACVM  FIND AUTHOR FEYNMAN AND TITLE PLENTY
From SLACVM(QSPIRES):   * Result 1 Document
```

We have just learned that if a search term is missing after the FIND verb, all kinds of trouble may result. However, a missing search term in any other position of iterative or compound requests is not necessarily a problem. In such situations, the last-named index is assumed to be the missing one. For example, SPIRES interprets the following two search requests identically:

```
TELL QSPIRES at SLACVM  FIND TITLE TAU AND AUTHOR PERL AND NOT
                        AUTHOR FELD#
From SLACVM(QSPIRES):   * Result 18 Documents

TELL QSPIRES at SLACVM  FIND TITLE TAU AND AUTHOR PERL AND NOT FELD#
From SLACVM(QSPIRES):   * Result 18 Documents
```

The above rule is not valid if the last-named index was a qualifier. Suppose that a qualifier is used in a compound search; then the search term in the subsequent expression **must** be explicitly named. Note that if you misspell an index name, SPIRES will assume that this (misspelled) index is, in fact, a search value to be located with the previously named search term.

```
TELL QSPIRES at SLACVM  FIN TITLE INFRARED AND AUTOR COLLINS
From SLACVM(QSPIRES):   * No records found which match search
                        criteria
```

In the above example, the AUTHOR was spelled incorrectly as AUTOR, and the request was interpreted as FIN TITLE INFRARED AND **TITLE** AUTOR AND **TITLE** COLLINS.

DEFAULT RELATIONAL OPERATOR

When no relational operator precedes a search value, the equality operator is the assumed relational operator (more on relational operators in Subsection 1.2.3). The following two examples give an equivalent result.

```
TELL QSPIRES at SLACVM  FIN AF STANFORD U., PHYS#

TELL QSPIRES at SLACVM  FIN AF = STANFORD U., PHYS#
```

DEFAULT LOGICAL OPERATOR

When, in a *word index* search (see Subsection 1.2.4), no logical operator precedes a search value, AND is assumed to be the logical operator. The TITLE index in HEP is such a *word index*. Therefore, SPIRES interprets the following searches identically:

```
TELL QSPIRES at SLACVM  FIN TITLE OLD MODELS NEVER DIE

TELL QSPIRES at SLACVM  FIN TITLE OLD AND MODELS AND NEVER AND DIE

TELL QSPIRES at SLACVM  FIN TITLE MODELS AND TITLE DIE AND TITLE OLD
                        AND TITLE NEVER
```

With the other types of indexes, the default logical operator is not defined. FIND AUTHOR BJORKEN DRELL will not find works by Bjorken and Drell. Use instead FIND AUTHOR BJORKEN AND DRELL, or FIND AUTHOR BJORKEN AND AUTHOR DRELL.

1.4.3 DISPLAYING RESULTS

Once you have found records that meet all the criteria you have set, the records can be displayed. Details of the displaying procedure depend heavily on the selected database. Therefore, the procedure will be described for each database separately: in Chapter 4 for HEP, and in Chapters 5 and 6 for other databases. Here, I will only address some general questions facing the searcher.

HOW TO OBTAIN THE RESULT

Assuming that you are contacting QSPIRES interactively, there are two ways a search result could be sent to you: (i) **interactively**, if you are satisfied with the result being displayed on the screen of your terminal, and (ii) **via e-letter**, if you want the result to be filed and delivered to your e-mailbox. QSPIRES has its own favorite ways of sending the result, but you can always change this, by typing either TYPE or FILE in the option field following the search or output commands.

When making this decision, you should know that the number of records that could be sent interactively is generally much smaller than the number of records that could be filed and delivered to your e-mailbox. If a result is sent interactively, not only are the number of records limited, but also the total number of lines is carefully controlled to avoid jamming the network. Therefore, if your search result is big, you will probably want to use the FILE option. If, in contrast, your result consists of only a few records, and you do not need to save the result for later analysis, then TYPE will probably be the better choice.

The two above-mentioned possibilities are available only to those using the TELL (or similar) network command to reach QSPIRES. If, on the contrary, your requests are sent via e-letters, then you will be able to get the result sent only via e-letters; the TYPE option is excluded.

WHICH FORMAT TO USE?

In some databases, there is more than one way of displaying a record. For example, in HEP, there are currently 17 different so-called *frames* tailored for some special users. However, even an ordinary user can benefit from the variety of available frames. For example, in HEP, you can choose a format in which only the first author of a document is displayed, or you can opt for a frame in which all authors are listed. Similarly, you can require that the result be sent to you as a TEX file, which might be quite helpful if you are, e.g., preparing a bibliography. QSPIRES has its own favorite frames, but you can always change this by typing USING <frame-name> in the option field following the search command or output command. Frame-name denotes the official name of an available format in a given database. To get the list of frame-names, use SHOW FRAMES command (see Subsection 1.3.3). The frame-names **should not** be abbreviated.

In almost every database, one frame is designated as brief. The brief format might be used to get concise information about the records. For example, the option USING BRIEF in HEP will cause a result to be displayed with only the first author, the title of the work, and the bibliographic data (journal, volume and page, for published articles). Other formats may provide more information, but brief has one distinctive advantage: since the records are so compressed, it is possible to receive many more records than you would get with any other non-brief format. In HEP, e.g., with the default format and the FILE option, you can get, at most, 150 documents, while this number changes to 300 if you choose the brief format. See Subsection 4.2.1 for more information on HEP frames.

CAN THE ORDER BE CHANGED?

QSPIRES orders results in a certain way before it sends them away. If you do not like this order, you can change it by typing SEQUENCE <index-name> in the option field. This allows you to state your own criteria for ordering results. You might, e.g., choose an alphabetical order with respect to the first author or the title, or you can have the results displayed in chronological order with respect to the date of publication. You can use any of the available indexes (including the qualifiers) with the SEQUENCE verb. Note, however, that only one parameter can be used to order search results; SEQUENCE does not allow two (or more) arguments. See Subsection 4.2.2 for further information on how to order search results in HEP.

2. HEP DATABASE: ONE-STEP INTERACTIVE SEARCHES

This chapter is a review of simple, one-step searches in the HEP database. Most searches via QSPIRES involve the use of the FIND command. A search in which FIND is followed by only **one** search expression (see Subsection 1.2.1) is called a *simple search*. Examples for simple searches with each of the HEP indexes are given. More intricate search procedures will be described in Chapter 3.

2.1 FIND COMMAND

The command language understood by the QSPIRES server consists of simple English words, such as HELP, SHOW, EXPLAIN, OUTPUT, etc. You can use these commands to ask for assistance, to learn more on the contents and organization of various databases, or to display records retrieved by a search. However, most often you will be using the FIND command. Indeed, FIND is the basic QSPIRES command. With the FIND verb, you find the records which meet the criteria you specify. In this section, we illustrate phrases used in simple searches with FIND.

2.1.1 FIND < search-expression >

A simple, one-step search in HEP is initiated with the FIND (or FIN, for short) command, followed by a **single** search expression. Consequently, the syntax for the simple search is

```
TELL QSPIRES at SLACVM  FIND  < search-expression >
```

A search expression (see Subsection 1.2.1) consists of a search term (Subsection 1.2.2), one relational operator (Subsection 1.2.3), and some search value(s) (Subsection 1.2.4). By default, all searches via QSPIRES begin in the HEP database. Therefore, unless you change the default (see Subsection 1.3.2), your query

```
TELL QSPIRES at SLACVM  FIND AUTHOR = DRELL
```

instructs QSPIRES to gather all the records from HEP that satisfy the criterion AUTHOR = DRELL. (As discussed in Subsection 1.2.3, we could have also used a blank space instead of the equality sign between AUTHOR and DRELL.) After awhile, QSPIRES reports the number of records that meet the criterion:

```
From SLACVM(QSPIRES):    * Result 149 Documents
```

The search term in this example is AUTHOR, and we are obviously interested in works authored by Drell. The list of other possible search terms in HEP can be found in Subsection 2.1.2. We shall go through this list case by case, giving numerous examples for each of the searches.

Note that the answer lists only the **number** of the retrieved documents, but the actual documents are not displayed. By default, if your query was sent interactively, the information on the number

of the retrieved documents will also be sent interactively back to you. If you want the line `Result 149 Documents` to be filed, and sent to your e-mailbox, add the option `(FILE` to the right end of your command:

```
TELL QSPIRES at SLACVM  FIND AUTHOR = DRELL (FILE
From SLACVM(QSPIRES):   * File being sent to you via NOTE, class M
```

At this point, the search may be continued (interactively, or via e-letters), or the records could be displayed, or you could begin a new search. If you choose the last option, the above result (`149 Documents`) will be completely erased from QSPIRES' memory, and the result of your new search will be saved instead.

2.1.2 LIST OF HEP INDEXES AND THEIR ABBREVIATIONS

The chart below shows some of the indexes in HEP database. The allowed abbreviations are also mentioned. The last two rows describe special indexes, the so-called qualifiers. Qualifiers cannot be used in simple searches; their role will be explained in Section 3.4.

SIMPLE INDEXES	ALLOWED ABBREV. AND VARIATIONS
AUTHOR	A, AU, N, NAME
COLLABORATION	CN, COLLAB-NAME
AFFILIATION	AF, AFF, AFFIL, INST, INSTITUTION
TITLE	T, TI, WITH-LANGUAGE
TOPIC	TP, HEP-TOPIC, K, KEYWORD
CITATION	C, CITED, JOUR-VOL-PAGE, JVP
REPORT-NUM	R, REPT, RN
EXPERIMENT	EXP, FE, FERMILAB-EXP, FN1, SLAC-EXP
FIRST-AUTHOR	FA
JOURNAL	JI, JINDEX
PPF	PPFLIST#
ANTIPPF	PPA
QUALIFIERS	
DATE	D
PPF-SUBJECT	PS, SCL

In this and the following chapter, I will use both long and short forms for search terms. If you misspell the index name in a search request, QSPIRES will not try to help you. Instead, the system will send its standard `No records found ...` line:

```
TELL QSPIRES at SLACVM  FIND CIT PHLTA, 70B, 487
From SLACVM(QSPIRES):   * No records found which match search
                          criteria
```

In this example, `CIT` was not an allowed abbreviation for the `CITATION` index.

2.2 SAMPLE SEARCHES

In this section, we illustrate specifics of searches with each of the HEP simple indexes.

2.2.1 FIND AUTHOR (FIN A)

The AUTHOR index in HEP is the so-called *personal-name index* (see Subsection 1.2.4). This means that special rules for matching search values and indexed values apply. These rules will be thoroughly illustrated in the following examples. The author search may be phrased in many ways. For example, if you want to find all the works by S. D. Drell, you can send to QSPIRES one of the following commands:

```
TELL QSPIRES at SLACVM  FIND AUTHOR  S. DRELL
TELL QSPIRES at SLACVM  FIN AUTHOR = DRELL, SID
TELL QSPIRES at SLACVM  FIND A  S. D. DRELL
TELL QSPIRES at SLACVM  FIN A  DRELL, D.
TELL QSPIRES at SLACVM  FIND A = DRELL
```

As seen from the second and fourth examples, when you list the last name (surname) first, a comma must separate the name from the initials or the person's first (personal) name. The empty spaces following periods and commas are optional. You could as well use S.DRELL, DRELL,SID, S.D.DRELL, or DRELL,D., respectively, in expressions with no blanks. Note that the periods after initials are optional; the forms S DRELL, S D DRELL, or DRELL, D, are fine too. When both the first and the last names are used, another valid form is SID.DRELL.

In accord with SPIRES rules (see below), the third among the five opening examples above will fail to find works in which Sid Drell did not list his middle name, because in this search, SPIRES looks for both the initials S and D. On the other hand, the first example will retrieve not only works by S. Drell, but also those authored by e.g., P. S. Drell. The last example finds all authors with the last name Drell, irrespective of their first names.

Complex last names, such as Van der Lans, may be found with

```
TELL QSPIRES at SLACVM  FIND A = LANS
TELL QSPIRES at SLACVM  FIN AUTHOR = DER LANS
TELL QSPIRES at SLACVM  FIN A  VAN DER LANS
```

Similarly, if a person has two last names, the personal name algorithm allows both names to be used in a search. For example, if you want to retrieve the works by the author G. Jona-Lasinio, you can write

```
TELL QSPIRES at SLACVM  FIND A JONA-LASINIO, G.
TELL QSPIRES at SLACVM  FIND A JONA LASINIO, G.
TELL QSPIRES at SLACVM  FIN AUTHOR = JONA, G.
TELL QSPIRES at SLACVM  FIN A G. LASINIO
```

If you are unsure of the spelling of some last name, there are several ways out of the problem. Usually, the BROWSE command (see Subsection 1.2.4) is a good first step. Browsing in HEP is thoroughly described in Section 2.3.

```
TELL QSPIRES at SLACVM  BROWSE AUTHOR FADEEV
```

QSPIRES will automatically return to your terminal a selection of ten names similar to the one you mentioned, and, hopefully, you will be able to discover the right form. If you know the first few characters of a name, but do not know exactly how the name ends, use the right truncation (see Subsection 1.2.4). For example, if in doubt whether an author's name is Horowitz, Horowicz, Horowich, or Horowitch, you can use

```
TELL QSPIRES at SLACVM  FIN A HOROW#
```

In this search you will find documents associated with authors whose names begin with the stem HOROW. A truncated last name can be combined with the first name or initials (FIN A G. HOROW#; FIND AUTHOR KAPLUNOV#, VADIM), but do not truncate the first name of a person (~~FIN A DRELL, SID#~~); some misleading results might be returned. As noted in Subsection 1.2.4, some notorious machines gobble up the truncation sign #, never sending it to the next node. This happens most often in interactive messages, rarely in e-letters. If you do not know how to eliminate the problem (some hints are given in Subsection 1.2.4), either put your truncated phrase in an e-letter (more on sending e-letters to QSPIRES in Chapter 7), or apply the PREFIX relational operator (see Subsection 1.2.3).

```
TELL QSPIRES at SLACVM  FIND AUTHOR PREFIX HOROW

TELL QSPIRES at SLACVM  FIN A PRE KAPLUNOV
```

First names or initials cannot be used in a search with the PREFIX operator: all first names are ignored when SPIRES discovers that PREFIX was used in the last name.

Hyphens are stripped from the names when your query arrives to SPIRES. Therefore,

```
TELL QSPIRES at SLACVM  FIN A = ZINN-JUSTIN, J.

TELL QSPIRES at SLACVM  FIN A = ZINN JUSTIN, J.
```

will produce the same search result.

Here is how a successful interactive search might look on your screen:

```
TELL QSPIRES at SLACVM  FIN A DRELL

From SLACVM(QSPIRES):   * Result 149 Documents
```

The second line should appear on your terminal within a minute or so, after your first line is sent. (If your query was sent in an e-letter, the result of the search, Result 149 Documents, will be returned to your e-mailbox. The distinction between interactive messages and e-letters is explained in Appendix B.) Another possible dialog is

```
TELL QSPIRES at SLACVM  FIND AUTHOR NEWTON, ISAAC

From SLACVM(QSPIRES):   * No records found which match search
                          criteria
```

Well, what can we say here, but that no one is perfect. This guy, Sir Newton, never cared to send a single preprint to SLAC or DESY Libraries, and that is why no match was found.

Once we know that a search was successful, we might wish to see the result of the search. For that task, use OUTPUT command (Chapter 4). We can also add to or subtract from the result before it is displayed by continuing the search (see Chapter 3).

PERSONAL-NAME ALGORITHM DETAILS

Personal-name values in search expressions require special treatment, simply because names can be written in a number of ways. SPIRES respects the following rules for the search in which personal names appear.

If only the last name is given in your search value, the records corresponding to all persons with the same last name (irrespectively of their first names) are retrieved. If your search value lists a last name and one initial, the system will first collect all records whose surnames match the last name from your query, and then begin to compare the nonsurname portions. If the initial from your search value corresponds to the first character in an indexed personal name, the system will assume that a match is achieved. For example, FIN A SMITH, J. will retrieve all the J. Smiths, including D. **J. Smith**, John X. Y. **Smith**, Andrea-Julia **Smith**, Edward **J. Smith**, J. Edward **Smith**, etc. If a complete first name is given in your search request, the set of indexed names that match will be formed in the following way: the algorithm compares your value with the nonsurname portion of the indexed values, and the match is considered successful if the strings are equivalent to the shorter of the two values. For example, FIN A ROBERT JOHNSON, will collect all the R. Johnsons, including **R.** P. **Johnson**, and Patricia **R. Johnson**. In addition, all the **Ro Johnsons**, **Rob Johnsons**, **Robe Johnsons**, **Rober Johnsons**, and, of course, **Robert Johnsons** will be retrieved. Furthermore, all the names having the prefix Robert will also match, so works by **Roberta Johnson** and J. **Robertino Johnson** will be included in the search result. However, note that this search will not find Randy Johnson, or Pat Robin Johnson, because Randy and Robin are neither prefixes in the name Robert, nor do they begin with the string Robert. If two initials are appended to a last name in your search value, SPIRES will search for the ordered pair of such initials. For example, FIND AUTHOR A. B. COLLINS will find J. **A. B. Collins** and **Arthur B. Collins**, but not B. A. Collins or A. Collins. (The former has a wrong order of initials, the latter has only one of the two required initials). Similarly, FIND A HILL, PAT N. will recover all works by authors **P.** Norman **Hill**, and **Patricia N. Hill**, but not works by Norman P. Hill or Pat Hill. Searching when 3 or more initials are given follows the above principles.

2.2.2 FIND TITLE (FIN T)

The TITLE index in HEP is a so-called *word index* (see Subsection 1.2.4). This means that each word in a title is indexed separately when documents are being put into the database. Consequently, it is enough to know only one word from a title to be able to retrieve the corresponding document. You can also submit more than one word; the order of the words in your search value is unimportant. Here are some examples:

```
TELL QSPIRES at SLACVM  FIN TITLE  HADRON

TELL QSPIRES at SLACVM  FIN T = WEAK  INTERACTIONS

TELL QSPIRES at SLACVM  FIND T  FUN WITH FRUSTRATION

TELL QSPIRES at SLACVM  FIND TITLE  "SU(3)"
```

The first command will find all the papers in HEP in which the word hadron appears in the title. In the second example, all documents will be retrieved which have the words weak and interactions anywhere in the title, in any order. You might as well use FIN T INTERACTIONS WEAK, or separate the words by a comma, FIN T WEAK, INTERACTIONS, to still get the same result. In the third example, SPIRES will search for records with two title words, fun and frustration. The third word, with, is one of the so-called excluded words, and will not be taken into account (see Subsection 1.2.4). The other excluded words and symbols in the TITLE search (in HEP) are

a across an and by for from in into of on or the to with

_ . , : ? ! / % $ @

If any of these words or symbols appears as a search value in the TITLE search, it will be ignored.

```
TELL QSPIRES at SLACVM   FIND TITLE FROM IN , TO ON , WITH $ , BY % .
From SLACVM(QSPIRES):    * No records found which match search
                         criteria
```

In the fourth of the opening examples above, the search value is sandwiched between quotation marks, because two special reserved symbols, namely parentheses, were used in the phrase. The parentheses have a particular meaning for SPIRES (see, e.g., Subsection 1.2.4), and to clear up the ambiguity, we must surround **the entire search value** (not only the parentheses!) with quotation marks (not single quote marks!). The list of the reserved symbols in HEP is given below:

& | ; ~ ¬ > < =)(

If you intend to use any of these symbols in the title search, enclose the search value in quotes. How important are the quotation marks? Well, judge for yourself. Here is what will happen if you use (do not use) quotes:

```
TELL QSPIRES at SLACVM   FIND TITLE "SU(3)"
From SLACVM(QSPIRES):    * Result 821 Documents
TELL QSPIRES at SLACVM   FIND TITLE SU(3)
From SLACVM(QSPIRES):    * No records found which match search
                         criteria
```

We encourage you to use quotes to denote search values in any other situation which might cause ambiguities in searches. Consider, e.g.,

```
TELL QSPIRES at SLACVM   FIND TITLE LIKE INTERACTION?
From SLACVM(QSPIRES):    * Result 11667 Documents
```

In this search, SPIRES will assume that we are using the LIKE operator (see Subsection 1.2.3) to find all title-words beginning with the string interaction. (The question mark denotes a wild card in the searches with the LIKE operators.) On the other hand, a very similar search command will produce a completely different result:

```
TELL QSPIRES at SLACVM   FIND TITLE "LIKE INTERACTION?"
From SLACVM(QSPIRES):    * Result 9 Documents
```

Now, the system looks for the titles with two words, like and interaction (in any order). The question mark, being on the exclusion list (see above) was ignored. If your machine does not accept the double quotation mark in interactive communication, check and change the terminal set-

tings (see Subsection 1.2.4), or send such a query in an e-letter (more on communication with QSPIRES by e-letters, in Chapter 7).

To conclude this discussion of excluded and special words and symbols in the TITLE search, let me summarize: if you plan to use any of the special symbols in a search value, place the entire value in quotation marks; symbols and words from the exclusion list, if used as unmarked search values, are not passed to the system. Note that FIN TITLE / will yield a zero result, because / is an excluded symbol. However, FIN TITLE 1/N is OK; the symbol / is ignored when standing alone, but not when it appears in a string, as in 1/N.

Let us go back to the opening examples. Our first search (FIN TITLE HADRON) will not retrieve the plural hadrons, and the second command (FIND T = WEAK INTERACTIONS) will fail to find titles in which the word interaction (singular!) is paired with weak. To be on the safe side, use the right truncation symbol in these searches:

```
TELL QSPIRES at SLACVM  FIN TITLE HADRON#

TELL QSPIRES at SLACVM  FIND T = WEAK INTERACTION#
```

The search value hadron# will retrieve hadron, hadrons, hadronic, etc., and the search for the title weak interaction# will return titles with the pairs weak + interaction and weak + interactions. In the TITLE search, more than one word can be truncated.

```
TELL QSPIRES at SLACVM  FIN TITLE = TO# BE# OR  NOT# TO# BE#

From SLACVM(QSPIRES):   * Result 286 Documents
```

[Note: Well, I admit, this example is cheating. It really represents the compound search, not the simple one. I included it anyway. You will learn more about compound searches in Chapter 3.]

See, however, Subsection 1.2.4 regarding possible problems with the truncation sign. You can also use the content relational operators (see Subsection 1.2.3), e.g., the PREFIX or LIKE operators, in the TITLE searches:

```
TELL QSPIRES at SLACVM  FIND TITLE PREFIX SUPER

TELL QSPIRES at SLACVM  FIN T LIKE  CHROMO?MICS
```

Note that if you are searching through a *word index* (like TITLE), and using content operators, your search value should not be longer than **one word**. This is a serious restriction, which fortunately could be overcome in iterative searches (see Subsection 3.2.2).

Most hyphens are stripped from titles when documents are entered into the HEP database, with only a couple of exceptions, like high-energy, one-dimensional, right-handed, form-factor, cross-section, anti-fermion, space-time, etc. For example, do **not** use

```
TELL QSPIRES at SLACVM  FIN T GAUGE-THEORY
```

This title is indexed with two words (gauge, theory), not one (gauge-theory). Therefore, use FIN T GAUGE THEORY instead. On the other hand, the command

```
TELL QSPIRES at SLACVM  FIND TITLE HIGH-ENERGY
```

will correctly instruct SPIRES to search for the single string high-energy, and not for two words, high and energy. Note also that in the TITLE index, combinations of names such as Kobayashi-Maskawa, Weinberg-Salam, etc., are always indexed with hyphens. Your search FIND TITLE WEINBERG might retrieve documents with titles on Weinberg angle, Weinberg rule, or Weinberg equation, but will **not** collect papers in which, e.g., the Weinberg-Salam model was discussed. To get these documents, use FIN T WEINBERG-SALAM. And how

to find the articles in which Weinberg's name appears either alone or in combination with other names? Try the LIKE operator (see Subsection 1.2.3).

```
TELL QSPIRES at SLACVM  FIN TITLE LIKE ?WEINBERG?
From SLACVM(QSPIRES):   * Result 397 Documents
```

Note, however, that similar searches are very time-consuming.

We have discussed above the two-word combinations which are indexed as two separate words. In some other cases, the hyphen is stripped from such two-word combinations, and the parts **joined** into one word. This is almost always the case with the prefixes **non-**, **quasi-**, **super-**, and similar. For example, NON-ABELIAN is indexed as NONABELIAN, NON-INTERACTING as NONINTERACTING, NON-LEPTONIC as NONLEPTONIC, QUASI-STABLE as QUASISTABLE, etc. If you have any doubts on whether a hyphen is stripped or not, used or not, browse the TITLE index (e.g., BRO T GAUGE-INVARIANCE), and then use in the title-search the form found during such a browse.

Be aware that British spelling (of such words as colour, behaviour, neighbour, odour, etc.) is expelled from the TITLE index, and you should search only for American-spelled words (e.g., color, behavior, neighbor, odor, etc.).

Finally, a word on Greek characters and mathematical symbols in the TITLE search. Since character sets on the majority of contemporary keyboards lack Greek letters, subscripts, superscripts, and various special symbols, certain auxiliary conventions must be respected. Some examples are given in the chart:

TITLE-ELEMENT	INDEXED AS	TITLE-ELEMENT	INDEXED AS
π^+	PI+	$\bar{K}^0$	ANTI-K0
π^-	PI-	Z^0	Z0
π^0	PI0	η_{+-}	ETA+-
ρ'	rho-prime	Q^2	Q**2
ϕ^4	PHI**4	$\sqrt{s}$	S**(1/2)

Note that $\sqrt{s}$ is sometimes indexed with the phrase SQUARE ROOT S (three words!). The famous J/Ψ combination is indexed with two words: J and PSI. The BROWSE command can help in the verification of search values. For example,

```
TELL QSPIRES at SLACVM  BROWSE TITLE PI+
TELL QSPIRES at SLACVM  BROWSE TITLE W
```

Once you know that a search was successful, you might wish to see the result. Use the OUTPUT command (Chapter 4) to display the result. We can also add to or subtract from the result by continuing the search (Chapter 3).

2.2.3 FUN WITH TITLE SEARCHES (FOR YOUR IDLE HOURS)

The TITLE index contains some 30,000 title-words. That might look a lot, but, then again, compare this number to the number of words used by a single author, e.g., Shakespeare, or the content of a standard college dictionary (about 150,000 words). The *Top 30* list of the most often indexed words in the HEP's TITLE index can be found below. The numbers in the table denote in how many documents the particular words appeared (as of February 1992).

14989	MODEL	6855	PARTICLE	5394	MODELS
14721	THEORY	6672	PHYSICS	5317	STRUCTURE
11619	FIELD	6666	THEORIES	5212	HEAVY
11335	SCATTERING	5980	SYSTEM	5204	NEUTRINO
10222	PRODUCTION	5953	ELECTRON	5203	MASS
10071	QUANTUM	5765	NEW	5203	PROTON
9530	GAUGE	5755	NUCLEAR	5039	PARTICLES
9444	P (for PROTON)	5557	HIGH-ENERGY	5035	BEAM
7893	INTERACTIONS	5472	COLLISIONS	4976	DECAY
7520	QUARK	5456	ENERGY	4968	STUDY

One can also play with combinations of two or more words appearing in various titles. Some quite interesting combinations could be found. Try some of the following:

```
TELL QSPIRES at SLACVM  FIND TITLE THEORY OF EVERYTHING
From SLACVM(QSPIRES):   * Result 10 Documents
TELL QSPIRES at SLACVM  FIND T  THEORY OF NOTHING
From SLACVM(QSPIRES):   * Result 4 Documents
```

Killing is also a popular theme in HEP. One can find a dozen of works with combinations SUPER KILLING, PARALLEL KILLING, FIFTH KILLING, RANDOM KILLING, etc. How about these combinations:

```
TELL QSPIRES at SLACVM  FIND TITLE KILLING MAXWELL IN A BLACK HOLE
From SLACVM(QSPIRES):   * Result 1 Document
TELL QSPIRES at SLACVM  FIND T  DRAGGING AND KILLING A PARTICLE
From SLACVM(QSPIRES):   * Result 1 Documents
TELL QSPIRES at SLACVM  FIND T  ROBBING A THRONE BY KILLING RIVALS
From SLACVM(QSPIRES):   * Result 1 Document
```

Babies are popular as well: THIRD BABY, STRONG BABY, CAN BABY, WORMHOLE BABY, SPACE BABY, are all waiting for you to retrieve them. Have some free time? Find your own favorite combination (and let me know!).

2.2.4 FIND TOPIC (FIN TP)

Unlike the TITLE index, the TOPIC index is **not** a *word index*, but a *phrase index* (see Subsection 1.2.4). If a topic consists of several words, they are not indexed separately. Therefore, with the equality operator, your search value must exactly (and I really mean, **exactly**) match the complete indexed value. The topic PHOTON LIGHT NUCLEUS, NUCLEAR REACTION (which is assigned to papers describing the nuclear reaction in a light nucleus caused by a photon), e.g., will not be retrieved with FIN TP PHOTON NUCLEUS REACTION, because LIGHT was missing. Not even the phrase FIND TOPIC = PHOTON LIGHT NUCLEUS NUCLEAR REACTION will work, because the comma was forgotten. Why is SPIRES so capricious in the TOPIC search? Well, the titles of documents are chosen by authors; the topics are *assigned* by the skilled group of professionals in the DESY Library. There is no room for variations in the TOPIC index: the indexed values are selected from a sharply defined list of some 99,000 entries, and you better have this list somewhere close to you, or else your topic search might be a real pain. Here is another example:

```
TELL QSPIRES at SLACVM  FIND TOPIC CP-VIOLATION
From SLACVM(QSPIRES):   * No records found which match search
                        criteria
```

This happens because the topic phrase denoting the violation of charge and parity is VIOLATION, CP, and not CP-VIOLATION. Sometimes you can recover the correct topic phrase by using the BROWSE command, e.g., BROWSE TOPIC CP-VIOLATION, or BRO TOPIC CP (more on browsing in Subsections 1.2.4 and 2.3).

However, browsing through almost 100,000 records eats time and nerves. Fortunately, the list of all topics is available in SLAC and DESY libraries, as well as in libraries of some other major institutions. Unfortunately, a typical QSPIRES user rarely sees this fat list. Well, I hope that by now you have made a correct decision never to use the TOPIC search again. But if this is not the case, please read further.

Once you have found the correct and promising topic, your search request will finally produce a nonzero result:

```
TELL QSPIRES at SLACVM  FIN TP VIOLATION, CP
From SLACVM(QSPIRES):   * Result 2626 Documents
```

This example nicely reveals another of the shortfalls in the TOPIC search: results of searches are often extremely large. In fact, most of the 99,000 topics are used only once or twice, while a small (obviously popular) segment is assigned very, very often (check e.g., DIFFERENTIAL CROSS SECTION, EXPERIMENTAL RESULTS, FEYNMAN GRAPH, INTERPRETATION OF EXPERIMENTS, NUMERICAL CALCULATIONS, PERTURBATION THEORY, SUPERSYMMETRY, etc.). Therefore, our general recommendation is: avoid the TOPIC search unless you have access to a printed copy of the *HEP Topic List;* even if you have the list, postpone the TOPIC searches until you become really good in narrowing the search results. (This subject is explained in Chapter 3). You should also know that, while new documents added to HEP have the titles, report-numbers, and authors indexed immediately, it takes awhile for the topics to be assigned. Therefore, if you plan to analyze recent papers and new documents, do not rely on the TOPIC search; use, e.g., the TITLE search instead.

If you still want to try the TOPIC search, here are some examples:

```
TELL QSPIRES at SLACVM  FIN TOPIC HIGGS PARTICLE
TELL QSPIRES at SLACVM  FIND TP = MODEL, STRING
TELL QSPIRES at SLACVM  FIND TOPIC "DECAY WIDTH, J/PSI(3100)"
TELL QSPIRES at SLACVM  FIN TP GHOST#
TELL QSPIRES at SLACVM  FIND TP PREFIX GLUEBALL, MASS
TELL QSPIRES at SLACVM  FIN TP LIKE "F_(21?)? PRODUCTION"
```

In the first example, as explained earlier, SPIRES will look for the complete phrase `Higgs particle`, not for the combination `particle + Higgs`. If a reserved symbol appears in the search phrase (third example), the entire phrase must be enclosed in quotes. The reserved symbols in the TOPIC search coincide with the symbols mentioned in the TITLE search (see Subsection 2.2.2). However, note that the rules for hyphenation are **not** the same as those in the TITLE search. The TOPIC index might, e.g., have hyphens in words which are not hyphenated in the TITLE index. The truncation sign may be used in the TOPIC search; however, it can be used only once per search value. For example, FIN TP GHOST# will recover all documents in which the topic begins with GHOST (GHOST, GHOST, **MASSIVE**, GHOST, **DECOUPLING**, GHOST, **CURRENT**, etc.). If you cannot send the truncation sign interactively (see Subsection 1.2.4), try sending your query in an e-letter (more on the e-letters to QSPIRES in Chapter 7), or use the prefix search (e.g., FIN TP PREFIX GHOST). The other content operators, e.g., LIKE, can also be used in the TOPIC search. Conventions for the Greek characters, subscripts, superscripts, mathematical symbols, etc., are similar to those described in the TITLE search (Subsection 2.2.2).

If your search was successful, you might wish to display the result. For that task, use the OUTPUT command (Chapter 4). We can also add to or subtract from the result before it is displayed by continuing the search (Chapter 3).

2.2.5 FIND CITATION (FIN C)

This search might easily be the most thrilling search in the HEP database. For, what can be more rewarding than discovering that your own work is read, loved and cited? By using the citation search you can also find all the followup articles of somebody else's paper, and hopefully discover that no one has noticed and exploited an excellent hint from one of the paper's footnotes. However, beware! The citation search is very useful, but should be used and interpreted with great care. One of the reasons for this warning is that, at present, the source for the citation list in HEP is only the preprints received by the SLAC Library, and not the published articles. Therefore, a citation of your work by an author who did not send his/her preprint to SLAC will not be registered in the database. (Still, the citation list is formed from an impressive number of sources. For example, in 1989, the references were collected from almost 7,500 preprints.) Furthermore, you must know that citations of a paper during the months it was circulated as a preprint are lost, because only references to published articles are indexed.

How does the citation search work? When somebody sends a preprint to SLAC, all the references to published articles found in the preprint are entered in HEP. The citation search is, in fact, a search through these hundreds of thousands of collected references. Imagine that a preprint has a citation of the article published in *Physical Review,* volume **D4**, beginning on page 3388. SPIRES not only saves this reference in the collection of references, but also remembers what the source was. When you later search for the citations of the *Physical Review,* **D4**, p. 3388 article, SPIRES finds out how many times this reference was entered in the database and lists all the

sources. Consequently, you will be able to see the number of citations, and learn who made the citations. Here are some examples:

```
TELL QSPIRES at SLACVM  FIN CITATION  PHRVA, D4, 3388
TELL QSPIRES at SLACVM  FIND C  PHRVA, 4D, 3388
TELL QSPIRES at SLACVM  FIN C = PHLTA, 70B, 487
TELL QSPIRES at SLACVM  FIND CITATION RMPHA, 59, 671
```

The first example describes the search for works that have mentioned in their reference-lists the article *Phys. Rev.* **D4**, p. 3388. Note that instead of the full journal name, the five letter code-name (coden for short) was used. You can only make the citation search if you know (i) the correct coden, (ii) the volume number, and (iii) the beginning page. These data have to be ordered as above (coden, volume, page), and separated by commas. Remember, in the citation search, you do not use the year of publication, nor the author(s) name(s). Some of code-names of the more popular journals are listed in Subsection 2.3.3. To find other codens, use the BROWSE CODEN command (see Subsection 2.3.3), e.g., BRO CODEN REV. MOD. PH.

The second example for the citation search (see above) will yield exactly the same result as the first one. Namely, for journals which have section letters attached to the volumes (e.g., *Physical Review, Physics Letters, Nuclear Physics, Nuovo Cimento*, etc.), both letter-preceding-the-volume and letter-following-the-volume can be used.

Similarly, in the third example, one could have as well used FIN C = PHLTA, B70, 487. As in the other searches, the empty spaces following the commas are optional. The right truncation is allowed in this search. For example, FIN C PHLTA, B70, 4# will retrieve citations of all articles in *Physics Letters* **B70** beginning on page 4, or any of the pages between pages 40 and 49, or anywhere between pages 400 and 499. Similarly, FIN C PHLTA,B70,# will list articles citing any of the works published in *Physics Letters* **B70**. Of all the relational operators, only the equality operator can be used with FIND CITATION.

Here is another possible dialog with QSPIRES:

```
TELL QSPIRES at SLACVM  FIN C = ZEPYA, C3, 22
From SLACVM(QSPIRES):   * Result 25 Documents
```

If you now want to see the list of these 25 documents, you have to use the OUTPUT command. More on OUTPUT in Chapter 4. You can also add to or subtract from the result before it is displayed by continuing the search (Chapter 3).

TROUBLE-SHOOTING

Are you surprised because a zero result was returned in your citation search? Have you used the correct coden? Have you separated journal code-name, volume, and page number by commas? Did you have the correct volume and page numbers? Did you append the volume letter? (This letter must be appended to the *volume* number, not *page* number: ~~FIN C PHRVA, 4, D3388~~ is wrong; use FIN C PHRVA, **D4**, 3388 instead.) Finally, if all similar errors are excluded, stop for a moment and ask yourself: Do I *really* believe that someone would cite *that* article? (Just kidding!)

LIST OF WORKS WITH MOST CITATIONS IN HEP

Ever wondered what the most cited journal article is, according to HEP? Look at the chart below! The first column shows number of citations, the second lists author(s), title, and bibliographic reference for each of the *Top 30* works. This list was compiled in February 1992.

3967	**S.Weinberg** (Model of Leptons) *Phys. Rev. Lett.* 19, 1264 (1967)
2332	**Glashow, Iliopoulos, Maiani** (Weak Interactions with Lepton-Hadron Symmetry) *Phys. Rev.* D2, 1285 (1970)
2060	**Kobayashi, Maskawa** (CP Violation in Renormalizable Theory of Weak Interactions) *Progr. Theor. Phys.* 49, 652 (1973)
1845	**Georgi, Glashow** (Unity of All Elementary-Particle Forces) *Phys. Rev. Lett.* 32, 438 (1974)
1677	**Wilson** (Confinement of Quarks) *Phys. Rev.* D10, 2445 (1974)
1642	**Glashow** (Partial-Symmetries of Weak Interactions) *Nucl. Phys.* 22, 579 (1961)
1372	**Pati, Salam** (Lepton Number as Fourth "Color") *Phys. Rev.* D10, 275 (1974)
1363	**Politzer** (Reliable Perturbative Results for Strong Int.?) *Phys. Rev. Lett.* 30, 1346 (1973)
1266	**Altarelli, Parisi** (Asymptotic Freedom in Parton Language) *Nucl. Phys.* B126, 298 (1977)
1259	**Coleman, E.Weinberg** (Radiative Corrections as the Origin of Spontaneous Symmetry Breaking) *Phys. Rev.* D7, 1888 (1973)
1253	**Candelas, Horowitz, Strominger, Witten** (Vacuum Configurations for Superstrings) *Nucl. Phys.* B258, 46 (1985)
1249	**Gross, Wilczek** (Ultraviolet Behavior of Non-Abelian Gauge Theories) *Phys. Rev. Lett.* 30, 1343 (1973)
1171	**'t Hooft** (Computation of Quantum Effects Due to Four-Dimensional Pseudoparticle) *Phys. Rev.* D14, 3432 (1976)
1163	**Belavin, Polyakov, Zamolodchikov** (Infinite Conformal Symmetry in Two-Dimensional Quantum Field Theory) *Nucl. Phys.* B241, 333 (1984)
1155	**Adler** (Axial-Vector Vertex in Spinor Electrodynamics) *Phys. Rev.* 177, 2426 (1969)
1141	**Polyakov** (Quantum Geometry of Fermionic Strings) *Phys. Lett.* 103B, 207 (1981)
1128	**De Rujula, Georgi, Glashow** (Hadron Masses in Gauge Th.) *Phys. Rev.* D12, 147 (1975)
1113	**'t Hooft** (Symmetry Breaking through Bell-Jackiw Anomalies) *Phys. Rev. Lett.* 37, 8 (1976)
1112	**Belavin, Polyakov, Schwartz, Tyupkin** (Pseudoparticle Solutions of Yang-Mills Equations) *Phys. Lett.* 59B, 85 (1975)
1108	**Shifman, Vainshtein, Zakharov** (QCD and Resonance Physics. Theoretical Foundations) *Nucl. Phys.* B147, 385 (1979)
1093	**Gross, Harvey, Martinec, Rohm** (Heterotic String Th. I) *Nucl. Phys.* B256, 253 (1985)
1080	**Aubert et al.** (Exp. Observation of Heavy Particle J) *Phys. Rev. Lett.* 33, 1404 (1974)

1066	**'t Hooft, Veltman** (Regularization and Renormalization of Gauge Fields) *Nucl. Phys.* B44, 189 (1972)
1056	**Eichten, Hinchliffe, Lane, Quigg** (Supercollider Physics) *Rev. Mod. Phys.* 56, 579 (1984)
1015	**Chodos, Jaffe, Johnson, Thorn, Weisskopf** (New Extended Model of Hadrons) *Phys. Rev.* D9, 3471 (1974)
1015	**Nambu, Jona-Lasinio** (Dynamical Model of Elementary Particles ..., I) *Phys. Rev.* 122, 345 (1961)
1005	**'t Hooft** (Magnetic Monopoles in Unified Gauge Theories) *Nucl. Phys.* B79, 276 (1974)
1003	**Augustin et.al.** (Discovery of Narrow Resonance in e^+e^- Annihilation) *Phys. Rev. Lett.* 33, 1406 (1974)
996	**Guth** (Inflationary Universe: Possible Solution to Horizon ...) *Phys. Rev.* D23, 347 (1981)
982	**Gross, Wilczek** (Asymptotically Free Gauge Theories I) *Phys. Rev.* D8, 3633 (1973)

Note that 14 of these 30 papers were published in a period of only three years, 1973–75! Only 2 papers are experimental; 28 are theoretical. S. L. Glashow and G. 't Hooft each have 4 papers on the *Top 30* list, D. J. Gross, and A. M. Polyakov have 3. Eleven articles were published in *Phys. Rev.*, 8 in *Nucl. Phys.*, 7 in *Phys. Rev. Lett.*, and 4 in other journals. (Among the hundred most-cited papers, 29 were published in *Phys. Rev.*, 22 in *Nucl. Phys.*, 22 in *Phys. Rev. Lett.*, 13 in *Phys. Lett.*, and 14 in other journals.)

2.2.6 FIND AFFILIATION (FIN AF)

Sometimes it is great to know who is working on what in a particular institution or department. To get a list of documents originated at one place, use the affiliation search. The `AFFILIATION` index is a *phrase index*. This means that if you are using the equality operator, your search value must exactly match the complete, official, institution's name. (See below for an explanation of the meaning of the term *official*.)

```
TELL QSPIRES at SLACVM  FIN AFFILIATION CAL TECH
TELL QSPIRES at SLACVM  FIND AF FERMILAB
TELL QSPIRES at SLACVM  FIN AF SLAC
TELL QSPIRES at SLACVM  FIND AF = LBL, BERKELEY
```

The name of the institution in your search value must be written exactly as it appears in the PPF Address List. The blank space following a comma **must** be respected. Only the period character (.) in a name of an institution is optional. The address list is distributed free of charge by SLAC Library, and is available in many physics libraries around the world. If you do not have this list, check the `INSTITUTIONS` database (see Section 5.3 on how to search this database), or try `WHEREIS` (see Subsection 5.5.4) or `BROWSE` commands (see Subsection 2.3.2). For example, `CAL TECH` is the official name assigned to the California Institute of Technology in Pasadena. If

you do not use the correct form, and try, e.g., FIN AF CALTECH or FIN AF = PASADENA, you will get the standard no-result answer (No records found ...).

The most useful tool for searching of the correct affiliation name is the WHEREIS command. WHEREIS can be used with any element of the name or the address of an institution.

```
TELL QSPIRES at SLACVM  WHEREIS KEK

TELL QSPIRES at SLACVM  WHEREIS BOHR

TELL QSPIRES at SLACVM  WHEREIS BIELEFELD
```

In the answer to one of such commands, you will get several lines of output. The first line lists the official name followed by the code-number in parentheses. (Other lines display the complete address of the institution mentioned in your query.) Use this official name in your subsequent FIN AF search. More on the WHEREIS command in Subsection 5.5.4.

Sometimes BROWSE might help:

```
TELL QSPIRES at SLACVM  BROWSE AFFILIATION CALTECH
```

You might be lucky, and get back the required correct affiliation name. Sometimes, however, browsing will not give you a clue. You might also try the right truncation, or some of the content operators (see Subsection 1.2.3) in your search. For example, FIN AF MUNICH#, FIND AF LIKE ?BERKELEY?, FIN AFFILIATION PRE TULSA, etc.)

One possible search might look like this:

```
TELL QSPIRES at SLACVM  FIN AFFILIATION NORMAL COLLEGE

From SLACVM(QSPIRES):   * No records found which match search
                          criteria
```

Well, do not give up, there is such a thing as a NORMAL COLLEGE. Try WHEREIS:

```
TELL QSPIRES at SLACVM  WHEREIS NORMAL COLLEGE

From SLACVM(QSPIRES):   *       Xinxiang Normal Coll. (28703)

From SLACVM(QSPIRES):   *       Xinxiang Normal College

From SLACVM(QSPIRES):   *       Dept. of Physics ...
```

From the first line of the answer, we learn that the indexed value for this college is Xinxiang Normal Coll. We can now use that name to find documents originating from Xinxiang (the period in the name is optional, and I will skip it):

```
TELL QSPIRES at SLACVM  FIN AF XINXIANG NORMAL COLL

From SLACVM(QSPIRES):   * Result 14 Documents
```

Instead of writing the complete phrase, FIN AF XINXIANG NORMAL COLL, you could have also used a search command FIN AF PREFIX XINXIANG. If, at this point, you want to display titles and authors of these 14 documents, use the OUTPUT command described thoroughly in Chapter 4. One can also add to or subtract from the result before it is displayed by continuing the search (see Chapter 3).

2.2.7 FIND REPORT-NUM (FIN R)

To find out more about a certain preprint, e.g., whether it was ever published and where, use the search based on the publication number of that preprint (or report).

```
TELL QSPIRES at SLACVM  FIND R SLAC-PUB-5223

TELL QSPIRES at SLACVM  FIN REPORT-NUM = SLAC PUB 5223

TELL QSPIRES at SLACVM  FIN R CERN/UA1/TN 90-01

TELL QSPIRES at SLACVM  FIND R = PRINT-90-0081
```

In order to be able to use this search with the equality operator, you must know the correct report number. In most cases, the indexed values of the report numbers are copied directly from preprints; the form of the report numbers is determined by the institutions from which they originated. (In rare cases, a report number is slightly changed or fixed for consistency reasons).

Note that symbols such as / - ., etc., which are often found in the original documents, are ignored in your search values, and can be typed as blanks. Therefore, the first and the second example represent identical searches. Similarly, in the third example, we could have also used `FIN R CERN UA1 TN 90 01`. However, a search `FIN R SLAC 2393` will not find the `SLAC-PUB-2393` document, because `PUB` was missing. If you know only a part of the report number, e.g., digits `2393` in the above example, you can still retrieve the record. Use the truncation sign as a *wild card* in the following way:

```
TELL QSPIRES at SLACVM  FIN R SLAC#2393
```

The right truncation is also allowed, and so are all the content operators. However, we recommend using only the `PREFIX` operator; the other content operators are very slow in this index.

```
TELL QSPIRES at SLACVM  FIND R LAPP TH #

TELL QSPIRES at SLACVM  FIN REPORT-NUM PRE  LAPP TH
```

You can also make an `AFFILIATION` search to get an idea of how an institution is marking its preprints. Find several preprints from that institution, display the result, and note the form of the report numbers. Sometimes, the `BROWSE REPORT-NUM` can give you valuable hints. More on the `BROWSE` command in Subsection 2.3.2.

Unnumbered preprints are assigned `PRINT` numbers by SLAC Library staff, for filing purposes. The fourth of the examples at the beginning of this subsection searches for such an (originally) unnumbered preprint. In this example, for some very secret reasons, we want to get more information on the eighty-first unnumbered preprint received by SLAC in 1990.

The `REPORT-NUM` index has another great feature: it enables you to find documents presented at various high energy physics conferences. Namely, if the front page of a preprint associates the document with a conference, the preprint is tagged with the unique *conference-number*. For example, the preprint with the talk by Roberto Peccei at the International Workshop on Strong Coupling Gauge Theories, Nagoya, Japan, July 28–31, 1990, was tagged with the conference-number `C90/07/28`. (As you can see, this number is related to the date number of the first date of the conference.) To retrieve this and other documents presented at the Nagoya '90 Workshop, search as follows:

```
TELL QSPIRES at SLACVM  FIND R  C90/07/28
```

In order to find the conference number for a given conference, use the CONF database. For example,

```
TELL QSPIRES at SLACVM  FIND TITLE STRONG COUPL# GAUGE TH# (IN CONF
From SLACVM(QSPIRES):   * Result 2 Conferences
TELL QSPIRES at SLACVM  OUTPUT (TYPE , etc.
```

See Section 5.2 for more detailed description of the CONF database.

Once you know that your REPORT-NUM search was successful, you might wish to see the result. For that task, use the OUTPUT command (Chapter 4). You can also add to or subtract from the result before it is displayed by continuing the search (Chapter 3).

2.2.8 FIND FIRST-AUTHOR (FIN FA)

Occasionally, you will need to find paper(s) in which a certain person appears as a first author. In such a situation, your search will be much easier and faster with the FIRST-AUTHOR index. While, e.g., the search

```
TELL QSPIRES at SLACVM  FIND AUTHOR RICHTER, BURTON
```

finds almost 300 documents, the FIRST-AUTHOR search will produce a considerably lower total:

```
TELL QSPIRES at SLACVM  FIND FA RICHTER, BURTON
From SLACVM(QSPIRES):   * Result 50 Documents
```

The rules for using the FIRST-AUTHOR index are equivalent to those mentioned in Subsection 2.2.1 on the standard AUTHOR index.

2.2.9 FIND EXPERIMENT (FIN EXP)

This search index has been created recently, in answer to requests from various HEP users. The code-numbers of experiments performed at Stanford, Fermilab, Brookhaven, and some other labs, are attached to papers with new data resulting from these experiments. (The tagging is done by SLAC, Fermilab and BNL. We hope that other labs will join in with similar experiment coding in the future). Therefore, without much wandering, you can find, e.g., documents based on the FNAL-E-0617 experiment (*Study of Direct CP Violation*):

```
TELL QSPIRES at SLACVM  FIND EXP FNAL-E-0617
```

Hyphens in this search are optional. To get an idea of the form of indexed code-numbers, use the BROWSE command

```
TELL QSPIRES at SLACVM  BROWSE EXP BNL
TELL QSPIRES at SLACVM  BRO EXP LAMPF
```

More on browsing in Subsection 2.3.2 . The truncation sign can be used for right truncation, and also in a wild card search (e.g., FIN EXP FNAL#81). If your machine does not accept the # sign in interactive communication, send your query in an e-letter (more on sending e-letters to

QSPIRES in Chapter 7). You may display the search result by using the OUTPUT command (see Chapter 4).

2.2.10 FIND COLLABORATION (FIN CN)

Large experimental groups are no rarity these days. Very often, such big groups are formed by physicists from different institutions. Sometimes, an official *collaboration name* is given to an experimental project, to reflect the diversity of resources. The collaboration name usually denotes cities from which members of the collaboration are (e.g., Moscow, Paris, ...), rather than institutions. If the collaboration name appears on a preprint or on the published version of a paper, the name will be indexed in HEP. You might search for all documents related to a given collaboration by issuing the command FIND COLLABORATION <c-name>, in which <c-name> denotes the full, official collaboration name.

Unfortunately, these names are usually long and complicated, and therefore you will rarely want to use the equality operator in the COLLABORATION search. Browsing is helpful only if you know the first member of a collaboration. For example, BRO CN VIENNA will not reveal any of the collaborations in which physicists from Vienna participated, simply because their city was never listed first. You should also be aware that the BROWSE command returns only up to first 80 characters of an official name, and some collaboration names are twice as long.

It is much more efficient to use some of the content relational operators (see Subsection 1.2.3).

```
TELL QSPIRES at SLACVM  FIND COLLABORATION PREFIX ALMA ATA-BAKU

TELL QSPIRES at SLACVM  FIN CN LIKE ALMA ATA?MOSCOW?

TELL QSPIRES at SLACVM  FIND CN LIK ?VIENNA?
```

If you plan to use names of two or more participating cities, respect the official ordering in your request. FIN CN LIKE ?ALMA ATA?MOSCOW? will be successful, FIN CN LIKE ?MOSCOW?ALMA ATA? will not. If you do not know the order, use iterative searching (see Section 3.2), e.g., FIN CN LIKE ?VIENNA? ... AND CN LIKE ?PARIS?. The truncation sign can also be useful in some situations. It could be used to denote the right truncation (FIN COLLABORATION ALMA ATA-BAKU#), and also used as the wild card (FIND CN SEATTLE#COLLABORATION).

Note that the hyphen, which separates members of a collaboration, **must** be used. This is **not** an optional character in the COLLABORATION searches.

Some collaboration names are related to experiments' numbers, e.g., E802 COLLABORATION, FERMILAB E653 COLLABORATION, others use detector names (OPAL COLLABORATION) or a search subject (EUROPEAN MUON COLLABORATION). Browse in the vicinity of an expected name to find the correct form.

2.2.11 FIND PPFLIST# (FIN PPF)

The SLAC Library's weekly publication, *Preprints in Particles and Fields* (PPF), announces new preprints received by the library. You can get these lists via e-mail, by using the command FIND PPFLIST# <PPF-number>.

Indexed PPF numbers consist of four digits. The first two digits denote the year, the last two the week in which the PPF was published. For example, the PPF list issued in the eleventh week of 1989 is indexed as `8911`. To see the list of preprints announced in that copy, use

```
TELL QSPIRES at SLACVM  FIND PPF 8911 (OUTPUT BRIEF
```

Note that the search result will contain more than 100 documents (typically about 150), and the output therefore must be sent to you as a file, in the `brief` format (see Subsection 4.2.1 for an explanation).

To check what the latest available issue of PPF is, try `BROWSE LAST PPF` command (see Subsection 2.3.1):

```
TELL QSPIRES at SLACVM  BRO LAST PPF
```

In the returned information, the most recent PPF number will be listed at the bottom.

The publications from the *Antipreprint List* can also be retrieved, by using similar methods of search. Use the commands `FIND ANTIPPF < PPA-number >`, and `BROWSE LAST ANTIPPF` to get the list of preprints turned into published articles, and the latest available PPA-number.

If you want to download the PPF lists for your institution on a regular basis, there is a very suitable format-frame for doing that; please, get in touch with QSPI@SLACVM.BITNET for further details.

2.2.12 FIND JOURNAL (FIN JI)

This index has been introduced in an attempt to enable searches in which, e.g., only those works of a given author (collaboration, affiliation, ...) which are published in a journal of your choice are retrieved. You might, e.g., remember seeing an interesting article by Fred Gilman in *Physical Review Letters*, and now want to find the paper without having to go through the list of all Gilman's works. This index is still not fully operational, but even in the present form it might be helpful.

The indexed value for a journal is the usual short name of the journal (e.g., *Phys. Rev.* for *Physical Review*, *Phys. Lett.* for *Physics Letters*, etc.), followed by the volume number. Periods in the short names are optional. Very often you will know only the journal, not the volume number. This is still fine, provided you use the truncation sign or, e.g., the `PREFIX` content operator. Here are some examples of the `JOURNAL` search.

```
TELL QSPIRES at SLACVM  FIND JI  PHYS.REV.D22
From SLACVM(QSPIRES):   * Result 241 Documents
TELL QSPIRES at SLACVM  FIN JOURNAL PREFIX  NUCL. PHYSICS
From SLACVM(QSPIRES):   * No records found which match search
                        criteria
TELL QSPIRES at SLACVM  BROWSE JOURNAL NUCL PHYSICS
```

(`QSPIRES` returns a list of journal-names near the value you listed, and you can find the correct short form. Note that it is better **not** to use periods in this browsing!)

```
TELL QSPIRES at SLACVM  FIND JI  NUCL PHYS#
From SLACVM(QSPIRES):   * Result 9602 Documents
```

Two things to remember: (i) not all the published articles have this index assigned, and there are still many examples of inconsistent use of short names, so do not rely entirely on this index; (ii) the index is primarily designed for use in combination with some other index (for more details, please check Sections 3.2 and 3.3, on iterative and compound searches).

2.2.13 OTHER INDEXES IN HEP

The remaining indexes in HEP do not seem to have too much importance for ordinary QSPIRES users. These are SLAC-TOPICS (STP), DESY-CLASS-CODE (CODE1), ENERGYRANGE-CODE (E), CORPORATE-AUTHOR (CA), DATE-UPDATED (DU), ORDER-DATE (OD), DRN, SSC, and XCITE. You can play with these indexes, by using, e.g., browsing (see Section 2.3) to learn more about the type of indexed values.

Two qualifier indexes, DATE (D), and PPF-SUBJECT (PS), are discussed in Section 3.4. They cannot be used in simple searches. The browse-only CODEN index is discussed in Subsection 2.3.3.

2.2.14 PREVIEW OF A COMING ATTRACTION: FIND SPICITE

A new index will be introduced in the near future. It will (probably) be called SPICITE, and will enable the user to obtain more information on a published article about which only the reference is known. The search will be very similar to the citation search (see Subsection 2.2.5). A search in which you would, e.g., try to learn who the authors are of a paper published in *Nuclear Physics* **B256**, on page 253, would look like

```
TELL QSPIRES at SLACVM  FIND SPICITE NUPHA,B256,253
```

NUPHA, in this example, is the five-letter code name (coden) of the journal. Just as in the CITATION search, the coden is followed by the volume and the page numbers. After a successful search, use the OUTPUT command (Chapter 4) to display the result.

2.3 BROWSE COMMAND

At the beginning of a search, it is often difficult to determine what the proper form is for search values in a given index. The BROWSE command could help you to get an idea of what sorts of values are indexed, so that you can construct a useful search request. A BROWSE search is similar to scanning records in an alphanumerically arranged card file. Several ways in which the BROWSE command can be used are illustrated in the following subsections. It should be noted that browsing does not interrupt a search in progress.

2.3.1 BROWSE < index-name >

The BROWSE < index-name > command gives you a list of 6 to 8 random indexed values for a given simple index. The list of simple indexes in HEP can be found in Subsection 2.1.2. (See also Subsection 1.2.4 for more details on browsing.) BROWSE can be shortened to BRO.

```
TELL QSPIRES at SLACVM   BROWSE TOPIC
From SLACVM(QSPIRES):    * COULOMB, GAUGE
From SLACVM(QSPIRES):    *  DEUTERIUM
From SLACVM(QSPIRES):    * GRAVITATION, ANTENNA
From SLACVM(QSPIRES):    * PSI MESONS, WIDTH ...
From SLACVM(QSPIRES):    * RADIATION, PRIMARY
```

Not particularly useful; but still, sometimes it helps to better formulate your next search. If you specify FIRST or LAST between the BROWSE and the index name, the display will begin sequentially, starting at either the beginning or the end of the index record set. The first (or last) ten values will be displayed.

```
TELL QSPIRES at SLACVM   BROWSE FIRST TITLE
TELL QSPIRES at SLACVM   BRO LAST AF
```

Neither FIRST nor LAST may be abbreviated in these commands. However, the short forms for index names are allowed. If you use a wrong index name, QSPIRES will send you the message:

```
From SLACVM(QSPIRES):    * Invalid syntax or index name
```

When you are using the BROWSE command in the HEP database, by default, the retrieved values are sent interactively to your terminal. If you want the answer to be filed, and sent to your e-mail mailbox, append the (FILE option to your BROWSE command:

```
TELL QSPIRES at SLACVM   BRO LAST PPF (FILE
```

2.3.2 BROWSE <index-name> <value>

If a user wishes to look at a specific part of an index, he/she must specify where to begin browsing. The BROWSE <index-name> <value> command will instruct the system to display the indexed values alphabetically surrounding the specified value. If your specified value does not appear in the index, QSPIRES will return the values surrounding that point in the index where the value would appear.

The command can be used with all simple indexes (AUTHOR, AFFILIATION, TITLE, REPORT-NUMBER, TOPIC, CITATION, ...), but it is particularly important in searches in which the search terms and the indexed values must match exactly (e.g., in the REPORT-NUMBER or AFFILIATION searches). When your BROWSE (or BRO, for short) command is received, SPIRES returns a set of 10 nearby values. Here is an example.

```
TELL QSPIRES at SLACVM   BROWSE AUTHOR SENJANOVIK
From SLACVM(QSPIRES):    * Senf
```

```
From SLACVM(QSPIRES):    * Sengupta
From SLACVM(QSPIRES):    * Senichev
From SLACVM(QSPIRES):    * Senin
From SLACVM(QSPIRES):    * Senjanovic
From SLACVM(QSPIRES):    * Senju ...
From SLACVM(QSPIRES):    * Sennhauser
```

The returned list will (hopefully) reveal the correct form of the indexed value. In the above example, the correct name was `Senjanovic`. If, in the returned list, you do not find the term you were hoping for, continue by using, e.g., the last (tenth) returned value as the starting term in your followup browsing (`BRO A SENNHAUSER`). That will reveal several more nearby names.

It is important to remember that browsing does not interrupt your current session with `QSPIRES`. You can use `BROWSE` in a middle of a search, get a set of suggestions, and continue with the search. (In contrast, the `FIND` command discards the result of any previous search.) You cannot combine the `LAST` or `FIRST` options from Subsection 2.3.1 with the `BROWSE <index-name> <value>` command.

When you are browsing in the `HEP` database, by default, the 10 nearby values are sent interactively to your terminal. If you want the answer to be filed and sent to your e-mailbox, append the `(FILE` option to your `BROWSE` command:

```
TELL QSPIRES at SLACVM  BROWSE AUTHOR SENJANOVIK (FILE
```

Both short and long names of indexes can be used with the `BROWSE` command.

```
TELL QSPIRES at SLACVM  BRO A CZYZEW
TELL QSPIRES at SLACVM  BROWSE TITLE PUNISHMENT
TELL QSPIRES at SLACVM  BRO T BEAUTY
TELL QSPIRES at SLACVM  BROWSE TOPIC FIFTH FORCE
TELL QSPIRES at SLACVM  BRO TP COUNTERS
TELL QSPIRES at SLACVM  BROWSE CITATION PRLTA, 65
TELL QSPIRES at SLACVM  BRO C FZKAA
TELL QSPIRES at SLACVM  BROWSE AFFILIATION HARVARD
TELL QSPIRES at SLACVM  BRO AF CALTECH
TELL QSPIRES at SLACVM  BROWSE REPORT-NUM FNAL
TELL QSPIRES at SLACVM  BRO R ITP-SB
TELL QSPIRES at SLACVM  BROWSE EXPERIMENT CERN-LEP
TELL QSPIRES at SLACVM  BRO EXP KEK
```

If you use a wrong index name, `QSPIRES` will send you the message:

```
From SLACVM(QSPIRES):    * Invalid syntax or index name
```

Do **not** use `BRO TITLE PION#` or similar phrases in browsing. If you are interested in titles with the stem `PION`, use `BRO TITLE PION` instead. It makes no sense to append the truncation sign to the search value when the `BROWSE` command is sent. Due to the specific order of characters in

SPIRES (first signs, then letters, then numbers), the truncation sign might only direct SPIRES to the wrong part of the index.

2.3.3 BROWSE CODEN (BRO CODEN)

CODEN index is a *browse only* index. This means that you can BROWSE, but not FIND, in this index. The BROWSE CODEN (or BRO CODEN) command enables you to browse through the code-names of journals. This helps when you want to figure out what the proper coden is of a particular journal (see Subsection 2.2.5), or if you wish to find which journal is hidden behind a given coden:

```
TELL QSPIRES at SLACVM  BRO CODEN ANNALS OF PHYSICS

TELL QSPIRES at SLACVM  BROWSE CODEN INTERNATIONAL

TELL QSPIRES at SLACVM  BROWSE CODEN PTPKA
```

BROWSE CODEN is specially useful before or during the CITATION search (see Subsection 2.2.5). Do not use the FIND command with the CODEN index:

```
TELL QSPIRES at SLACVM  FIND CODEN PTPKA

From SLACVM(QSPIRES):   * No records found which match search
                        criteria
```

If you do not list a value for the search term, and use just the BROWSE CODEN command, you will be returned a sample of 6 random values of the CODEN index (see also Subsection 2.3.1)

When you are browsing in the HEP database, by default, the answer is sent interactively to your terminal. If you want the answer to be filed, and sent to your e-mailbox, append the (FILE option to your BROWSE CODEN command:

```
TELL QSPIRES at SLACVM  BROWSE CODEN INTERNATIONAL JOURNAL (FILE
```

CODE-NAMES FOR SOME MORE POPULAR JOURNALS

The following chart lists codens for some of the journals in which the high-energy physicists often publish their articles. A more extensive list can be found in Appendix D. Note that the code names on the front of your favorite journal may not be the same as the coden used in HEP.

JOURNAL NAME	CODEN	JOURNAL NAME	CODEN
ANN. MATH.	ANMAA	NUOVO CIM.	NUCIA
ANNALS PHYS. (NEW YORK)	APNYA	NUOVO CIM. LETT.	NCLTA
ANN. REV. NUCL. SCI.	ARNUA	PHYS. LETT.	PHLTA
COMMUN. MATH. PHYS.	CMPHA	PHYS. REPT.	PRPLC
EUROPHYS. LETT.	EULEE	PHYS. REV	PHRVA
FORTSCHR. PHYS.	FPYKA	PHYS. REV. LETT.	PRLTA
HELV. PHYS. ACTA	HPACA	PHYSICA	PHYSA
INT. J. MOD. PHYS. A	IMPAE	PROC. ROY. SOC. LOND. - A	PRSLA
J. MATH. PHYS.	JMAPA	PROG. THEOR. PHYS.	PTPKA
J. PHYS. A	JPAGB	REPTS. PROG. PHYS.	RPPHA
J. PHYS. G	JPHGB	REV. MOD. PHYS.	RMPHA
JETP LETT.	JTPLA	SOV. J. NUCL. PHYS.	SJNCA
MOD. PHYS. LETT. A	MPLAE	SOV. PHYS. JETP.	SPHJA
NATURE	NATUA	TEOR. MAT. FIZ.	TMFZA
NUCL. INSTRUM. METH.	NUIMA	YADERNAYA FIZ.	YAFIA
NUCL. PHYS.	NUPHA	Z. PHYS.	ZEPYA

3. CONTINUING A SEARCH IN HEP

This chapter describes the continuation of a search. We will rarely have only one criterion per request. More often, it will be a combination of two or more criteria. We can search for an author and title, or for only the most recent works with a given topic, etc. In the first section of the chapter, an overview of such searches will be given. The second section is a more detailed study of iterative searches. Compound searches are the subject of the third section. In the fourth part, the special search terms, the so-called *qualifiers*, are described. They cannot be used independently, but must always be used in combination with some *simple* search terms.

3.1 SEARCHES WITH MORE THAN ONE CRITERION

In the previous chapter, we covered the simple, one-step search. Your `FIND` command, followed by a single search term, caused the system to gather a list of the records that fulfilled the criterion. However, often such a simple search will not give a satisfactory result, either because the result contains more records than it would be practical to send, or because we want to apply some other criteria to filter the documents selected by the first command. `QSPIRES`, fortunately, keeps track of our requests, opening the possibility for a continuation of a search in the *iterative* procedure.

Additionally, `SPIRES` can handle more than one search expression per request, and therefore another option is available, the so-called *compound* search. This section is an overview of iterative and compound searches. A description of logical operators, which serve as links between search expressions, is also included. The current limits on the number of records that could be sent over `QSPIRES` are mentioned.

3.1.1 ITERATIVE AND COMPOUND REQUESTS

Imagine someone initiating a search by sending the query `FIND TITLE HADRON#`, and getting from `QSPIRES` the answer `Result 7784 Documents`. Transferring a file with that many documents would most likely lead to network jamming. Furthermore, the user would be stuck with an enormous quantity of data, but with only a limited ability at hand to sort these documents and select out those that are really useful. Would not it be better to let `SPIRES`, with its superb search and retrieval abilities, proceed with the selection using further criteria provided by the user? And that is just what can be done! `QSPIRES` saves the opening question, allowing the user to add as many sequels as needed to narrow the search result to a reasonable number of documents. When a single search consists of several successive commands, it is called *iterative*. It is still only one search (which is indicated by one `FIND` verb), but it locates records fitting more than one requirement.

```
TELL QSPIRES at SLACVM   FIND T HADRON#
From SLACVM(QSPIRES):    * Result 7784 Documents
```

```
TELL QSPIRES at SLACVM  AND A ZUMINO, B.

From SLACVM(QSPIRES):   * Result 1 Document
```

In this case, Zumino's article with the (truncated) title HADRON# was retrieved. Articles with the same title-word but not authored by Zumino, and other papers by Zumino, did not make it to the final search result.

There are no limits to the number of questions one can ask in an iterative cycle. However, if the interval between two successive questions is longer than 30 minutes, you might lose the entire result collected to that point. That is, QSPIRES usually waits no longer than 30 minutes for your reaction; if your QSPIRES question (or any other signal that you are still there, well and alive) does not reach SLAC within that time, the accumulated results are erased. This means that you will have to start the search all over again. (Only exceptionally, when QSPIRES is not busy, may the result stay in the system for up to an hour.)

The time window is usually long enough for users communicating interactively with QSPIRES, but might be a serious limitation for non-BITNET and other users who are sending e-letters to the server. For these letter writers, it would be wiser to put all the criteria in a single line rather than risking the time-limit–related loss of the result. Such a shortcut is indeed possible, in the so-called *compound* search. The compound search works much like an iterative search. However, search expressions (two or more) are not sent separately, but are connected by logical operators in a single-line command.

```
TELL QSPIRES at SLACVM  FIND TITLE HADRON# AND A ZUMINO AND DATE
                        BEFORE 88

From SLACVM(QSPIRES):   * Result 1 Document
```

Finally, even if all your criteria in an iterative (or compound) search are met, the result still might be too large to mail. In that case, you will have to break the result into smaller fragments, and receive them in several pieces. One example on how to make such forced partitions can be found in Subsection 3.4.4. The limits on the number of records that may be returned by QSPIRES are described below.

3.1.2 MAXIMUM NUMBER OF RECORDS RETURNED TO USER

For your orientation, here are the current limits on the number of HEP records that may be returned when a user issues an OUTPUT command. (More on OUTPUT in Chapter 4.)

* When the results are to be sent interactively to the screen of a user's terminal:

- BRIEF format: **100 lines of text (usually, 30 documents)**
- all other formats: **10 documents**

* When the results are to be sent as a file to the user's e-mailbox:

- BRIEF format: **300 documents**
- all other formats: **150 documents**

For an explanation of what the *format frames* are, see Subsection 4.2.1.

3.1.3 BOOLEAN LOGIC

In iterative and compound search procedures, the expressions are connected by logical operators. These operators, sometimes referred to as Boolean operators, describe how two criteria combine. George Boole (1815–64) was a British mathematician and philosopher. He was also one of the founders of the symbolic logic which allowed mathematical methods to be applied to nonquantifiable entities. And that is why his work became relevant to SPIRES. To make a search faster and more efficient, we must be able to relate, compare, and combine two or more *nonquantifiable* options. Thanks to Boole, we can use the conjunctions AND, AND NOT, or OR to establish these relationships. (Also see Subsection 1.4.1.) Typical two-criteria, compound queries will have the form

```
TELL QSPIRES at SLACVM  FIND <expression I>  AND  <expression II>
TELL QSPIRES at SLACVM  FIND <expression I>  OR  <expression II>
TELL QSPIRES at SLACVM  FIND <expression I> AND NOT <expression II>
```

In an iterative search, this might look like

```
TELL QSPIRES at SLACVM  FIND  <expression I>
From SLACVM(QSPIRES):   * Result [x] Documents
TELL QSPIRES at SLACVM  AND NOT  <expression II>
From SLACVM(QSPIRES):   * Result [y] Documents
```

Each <expression> above consists of a search term (AUTHOR, TITLE, AFFILIATION, ...) and some search value (POLYAKOV, SCATTERING, STANFORD#, ...). There could also be a relational operator between the term and the value. More on search expressions in Subsection 1.2.1.

THE AND OPERATOR

This operator adds a new limiting criterion to the search by requiring that both expressions I and II are satisfied at the same time. The logical operator AND can be replaced by the symbol & in compound searches (FIN <expression I> & <expression II>). The order of expressions is not relevant. The reverse of the order does not affect which records are retrieved.

THE AND NOT OPERATOR

This operator requires that in the search result the first criterion be satisfied, but **excludes** from the collection all the records for which the second criterion is satisfied. In other words, records that would have been included with the AND <expression II> phrase, are excluded from the result with the AND NOT <expression II>. The logical operator AND NOT can be replaced in compound searches by the symbol &~ (FIN <I> &~ <II>). Mixed notation (AND ~, & NOT) is also allowed. The order of expressions is relevant, and does affect the result.

Be very careful not to separate NOT from AND in a search. The AND NOT operator (with an empty space in the middle!) looses its meaning if the string is broken by, e.g., an index name. There is a big difference between the phrases ... **AND** TITLE **NOT** SEMILEPTONIC, and ... **AND NOT** TITLE SEMILEPTONIC. In the first example, SPIRES will search for the title-words SEMILEPTONIC and NOT (which is probably **not** what you wanted); in the second, papers with the title-word SEMILEPTONIC will be excluded.

THE OR OPERATOR

This operator specifies that records which satisfy at least one of the criteria in the search expressions be included in the result. The logical operator OR can be replaced by the symbol | in compound searches (`FIN <expression I> | <expression II>`). If there are only two criteria, the order of search expressions is not relevant. However, for three or more search expressions, the order might affect which records are retrieved. The OR operator cannot be used to search a qualifier index (see Section 3.4).

USE OF SYMBOLIC ABBREVIATIONS FOR AND, AND NOT, OR

It is important to remember that in an iterative search, a followup QSPIRES search command may not begin with the symbolic abbreviation. However, use of abbreviations in a compound search is allowed.

3.2 ITERATIVE SEARCH

A search procedure consisting of several criteria issued in successive commands is called *iterative*. The search begins with the FIND command; the search result is then modified by other commands. The expressions in an iterative search are connected by logical operators. The operators describe how the criteria combine. Once all your criteria are met, you can issue an OUTPUT command to get the result. More on OUTPUT in Chapter 4.

3.2.1 GENERAL REMARKS

Your search begins with a `FIND <expression I>` command to QSPIRES. You wait for QSPIRES to answer, and then send the sequel phrase, e.g., `AND <expression II>`. If `<expression II>` has the same search term as does `<expression I>`, then the search term does not have to be repeated. You continue by adding on as many sequels as you need to find the result that satisfies all your criteria. Browsing (see, e.g., Section 2.3) does not interrupt an iterative search.

Do **not** use symbolic abbreviations for the logical symbols &, &~, and | in the iterative search (~~`TELL QSPIRES at SLACVM & AF WARSAW U.`~~). Use the words AND, AND NOT, OR, instead (`TELL QSPIRES at SLACVM AND AF WARSAW U.`).

3.2.2 EXAMPLES OF ITERATIVE SEARCH

Here are some examples for the use of all three logical operators in iterative searches. In the first example, the topic **and** the author searches are combined.

```
TELL QSPIRES at SLACVM  FIN TP MODEL, PARTON
```

(SPIRES checks all 200,000+ documents for those with the topic `model, parton`, and reports via QSPIRES ->)

```
From SLACVM(QSPIRES):    * Result 2214 Documents

TELL QSPIRES at SLACVM  AND A BJORKEN
```

(SPIRES checks which among 2214 documents have Bjorken as a (co)author, and reports via QSPIRES ->)

```
From SLACVM(QSPIRES):    * Result 7 Documents
```

In this search, all the documents will be found to which both the topic model, parton and the author Bjorken are assigned. Even if the order of the criteria is reversed, we shall end up with the same final result.

```
TELL QSPIRES at SLACVM  FIN A BJORKEN
```

(SPIRES checks all 300,000+ documents for those written by Bjorken, and reports via QSPIRES ->)

```
From SLACVM(QSPIRES):    * Result 124 Documents

TELL QSPIRES at SLACVM  AND TP MODEL, PARTON
```

(SPIRES checks which among these 124 documents have the topic model, parton, and reports via QSPIRES ->)

```
From SLACVM(QSPIRES):    * Result 7 Documents
```

However, considering the CPU time used, the latter search is probably more efficient, because the subset of 124 documents (second example) is smaller than the subset of 2214 documents (first example), and SPIRES can find the final answer more easily.

The operator AND NOT can also be used to narrow a result.

```
TELL QSPIRES at SLACVM  FIN A BJORKEN
```

(SPIRES checks all 300,000+ documents for those written by Bjorken, and reports via QSPIRES ->)

```
From SLACVM(QSPIRES):    * Result 124 Documents

TELL QSPIRES at SLACVM  AND NOT TP MODEL, PARTON
```

(SPIRES first checks which among these 124 documents have the topic model, parton. There are 7 such documents. SPIRES excludes them from the set, and reports ->)

```
From SLACVM(QSPIRES):    * Result 117 Documents
```

In this search, all the documents written by Bjorken are divided into two categories: one containing the documents with the indexed topic model, parton; the other, all the remaining documents. Only this second subgroup is reported in the search result. The order of expression is relevant and, if reversed, gives a completely different result.

Note that AND NOT is one unit, and the two words should always be used together. Do not use phrases like ~~AND AUTHOR NOT WEINBERG~~, ~~AND TITLE NOT STRING#~~, ~~AND AF NOT SLAC~~. The correct form is **AND NOT** AUTHOR WEINBERG, **AND NOT** TITLE STRING#, **AND NOT** AF SLAC.

There is an important difference between the operators AND, AND NOT, and the logical operator OR. While AND and AND NOT narrow the result, operator OR often enlarges the search result.

```
TELL QSPIRES at SLACVM  FIN A BJORKEN
```

(SPIRES checks all 300,000+ documents for those written by Bjorken, and reports via QSPIRES ->)

```
From SLACVM(QSPIRES):    * Result 124 Documents

TELL QSPIRES at SLACVM   OR TOPIC MODEL, PARTON
```

(SPIRES checks again the whole database [with the exception of 124 documents singled out with the first command], finds those with the topic model, parton, adds them to the previously found result, and reports ->)

```
From SLACVM(QSPIRES):    * Result 2331 Documents
```

In this search, we retrieved not only all the documents authored by Bjorken, but also all the documents with the topic parton model. If a document satisfies both criteria (e.g., authored by Bjorken, and having model, parton in the topic index), it will be reported only once. The order of criteria is not relevant. If the order is reversed, the intermediate result might be different, but we still end up with the same final result.

If two successive commands in an iterative search have the same search term (= index name), there is no need to repeat the term in the second expression: the last search term in use (unless it was a qualifier) is automatically appended to that line. For example: Somebody from Santa Barbara wrote something about the 1/N expansion, but you cannot remember whether it was an ITP or a Physics Department preprint.

```
TELL QSPIRES at SLACVM   FIN AF UC, SANTA B#

From SLACVM(QSPIRES):    * Result 906 Documents

TELL QSPIRES at SLACVM   OR SANTA BARBARA, ITP
```

(SPIRES notices that the logical operator OR is not followed by a search term, and uses the search term from the previous command. Consequently, the documents with the affiliation Santa Barbara, ITP are added to the previously found result:)

```
From SLACVM(QSPIRES):    * Result 1681 Documents

TELL QSPIRES at SLACVM   AND TITLE 1/N EXPANS#

From SLACVM(QSPIRES):    * Result 1 Document
```

However, one should not insist on this rule in situations which might be confusing to SPIRES. For example, consider the search for papers on J/Ψ particle.

```
TELL QSPIRES at SLACVM   FIND TITLE PSI OR J

From SLACVM(QSPIRES):    * No records found which match search
                           criteria
```

Here SPIRES was confused by the letter J in your search request. This letter is an allowed abbreviation for the CODEN index in HEP. Although this index can be used only for browsing, SPIRES still assumes that J denotes the beginning of the next search expression, and not just another title-word. (The identical situation would happen in the search for papers on the proton or neutron, if the search request is formulated as FIN TITLE P OR N, because N is an abbreviation for the AUTHOR index.) Reformulate your request, and use, e.g., one of the following expressions:

```
TELL QSPIRES at SLACVM   FIN TITLE PSI OR TITLE J

TELL QSPIRES at SLACVM   FIN TITLE PSI OR "J"
```

Note that in the first line of an iterative search (i.e., in the line with the FIND verb), the search term must be specified.

It has already been mentioned that in the compound search (and including simple, one-step searches), only one PREFIX operator can be used per search term. The following search will therefore be unsuccessful:

```
TELL QSPIRES at SLACVM   FIN AUTHOR PREFIX GALLAG AND AUTHOR PREFIX
                         MICK

From SLACVM(QSPIRES):    * No records found which match search
                         criteria
```

In such situations, the iterative search may help. You still can have, at most, one PREFIX per line, but you can add as many lines as you wish. Try, e.g.,

```
TELL QSPIRES at SLACVM   FIN AUTHOR PREFIX GALLAG

From SLACVM(QSPIRES):    * Result 20 Documents

TELL QSPIRES at SLACVM   AND AUTHOR PREFIX MICK

From SLACVM(QSPIRES):    * Result 1 Document
```

BROWSING DOES NOT INTERRUPT THE SEARCH

At any point of a search, you can issue the BROWSE command to determine what kinds of values can be found in a given index.

```
TELL QSPIRES at SLACVM   FIN TITLE SLAC

From SLACVM(QSPIRES):    * Result 507 Documents

TELL QSPIRES at SLACVM   BRO TP SLAC
```

(QSPIRES sends a list of 10 values alphabetically surrounding the *topic* value SLAC, and still keeps your previous search result.)

```
From SLACVM(QSPIRES):    * SLAC LINAC SLC

From SLACVM(QSPIRES):    * SLAC LINAC, HISTORY

From SLACVM(QSPIRES):    * SLAC PEP STOR ...

TELL QSPIRES at SLACVM   AND TOPIC SLAC LINAC, HISTORY

From SLACVM(QSPIRES):    * Result 2 Documents
```

3.2.3 THE BACKUP (BAC) COMMAND

During an ongoing iterative search request, you might realize that your last criterion was too restrictive. Do not despair; you will not have to start the whole search from the beginning. Issuing the BACKUP command (BAC, or BACK for short) will cause QSPIRES to replace the latest reported search result (the last Result line sent by QSPIRES) with the search result one step back, if one exists. You can issue more than one consecutive backup command, thus recovering—if necessary—all the steps up to the result found with the initial FIND in the current search. However,

with BACKUP you cannot recover results of already completed earlier searches; the FIND command of an ongoing search is a border you cannot cross.

```
TELL QSPIRES at SLACVM  FIN TITLE HIGGS
From SLACVM(QSPIRES):   * Result 1945 Documents
TELL QSPIRES at SLACVM  AND A ELLIS
From SLACVM(QSPIRES):   * Result 22 Documents
TELL QSPIRES at SLACVM  AND NOT ELLIS, J
From SLACVM(QSPIRES):   * Result 6 Documents
TELL QSPIRES at SLACVM  BACKUP
From SLACVM(QSPIRES):   * Result 22 Documents
TELL QSPIRES at SLACVM  AND NOT ELLIS, S
From SLACVM(QSPIRES):   * Result 18 Documents
TELL QSPIRES at SLACVM  AND AF CERN
From SLACVM(QSPIRES):   * Result 15 Documents
TELL QSPIRES at SLACVM  BAC
From SLACVM(QSPIRES):   * Result 18 Documents
TELL QSPIRES at SLACVM  BAC
From SLACVM(QSPIRES):   * Result 22 Documents
TELL QSPIRES at SLACVM  BACK
From SLACVM(QSPIRES):   * Result 1945 Documents
```

(Note that the result 6 Documents, which was *rejected* by BACKUP after AND NOT ELLIS, J could not have been recovered again.)

```
TELL QSPIRES at SLACVM  BACKUP
From SLACVM(QSPIRES):   * Backup not possible
```

(You cannot go beyond the current search. However, SPIRES keeps the result of 1945 documents reported in the previous line, and you can continue the search.)

```
TELL QSPIRES at SLACVM  AND A GAILLARD
From SLACVM(QSPIRES):   * Result 7 Documents
```

Technically speaking, there are two kinds of backups. The one described above was initiated by you. In a different situation, you may unintentionally reduce the search result to zero by stating too many restrictive criteria. In that case, an *automatic* backup will occur. SPIRES will keep the search result that you had before the *fatal*, overly restrictive command was issued, and you will be able to continue the search.

```
TELL QSPIRES at SLACVM  FIN TITLE HIGGS
From SLACVM(QSPIRES):   * Result 1945 Documents
TELL QSPIRES at SLACVM  AND A ELLIS, J
```

```
From SLACVM(QSPIRES):    * Result 16 Documents
TELL QSPIRES at SLACVM   AND GAILLARD, M
From SLACVM(QSPIRES):    * Result 5 Documents
TELL QSPIRES at SLACVM   AND TP HIGGS PARTICLE, SEARCH FOR
From SLACVM(QSPIRES):    * Zero results, previous results retained
```

(No new search result was found. Therefore, `5 Documents` remains the *current result* from which you can continue the search, or, e.g., do the BACKUP.)

```
TELL QSPIRES at SLACVM   AND TP POSTULATED#
From SLACVM(QSPIRES):    * Result 3 Documents
```

3.2.4 SHOW SEARCH (SHO SEA) COMMAND

In a long iterative search, one can lose track of the criteria used up to that point. The SHOW SEARCH command (or SHO SEA for short) allows the user to review the search commands executed since the FIND command in the current search was issued.

```
TELL QSPIRES at SLACVM   FIN TITLE HIGGS
From SLACVM(QSPIRES):    * Result 1945 Documents
TELL QSPIRES at SLACVM   AND A ELLIS, J
From SLACVM(QSPIRES):    * Result 16 Documents
TELL QSPIRES at SLACVM   AND TP HIGGS, MASS
From SLACVM(QSPIRES):    * Zero results, previous results retained
TELL QSPIRES at SLACVM   AND TITLE MASS
From SLACVM(QSPIRES):    * Result 5 Documents
TELL QSPIRES at SLACVM   BACKUP
From SLACVM(QSPIRES):    * Result 16 Documents
TELL QSPIRES at SLACVM   AND A GAILLARD
From SLACVM(QSPIRES):    * Result 5 Documents
TELL QSPIRES at SLACVM   SHO SEA
From SLACVM(QSPIRES):    * Search command(s):
From SLACVM(QSPIRES):    * FIND TITLE HIGGS
From SLACVM(QSPIRES):    * AND A ELLIS, J
From SLACVM(QSPIRES):    * AND A GAILLARD
From SLACVM(QSPIRES):    * Result 5 Documents (Subfile HEP)
```

Note that the list will not include any illegal search requests, requests that produced `zero result` and caused an automatic backup, or results that you rejected by issuing the BACKUP command. SHOW SEARCH does not interrupt the search or modify the result. If you wish to apply any

further criteria, you can continue with the search. SHOW SEARCH, and an equivalent command, SHOW RESULT, are described more thoroughly in Subsection 1.4.1.

3.3 COMPOUND SEARCHES

A search request which lists several criteria combined in a single command is called *compound.* The rules for the compound search are very similar to those used for an iterative search. The search begins with the FIND command, followed by two or more search expressions connected with logical operators. The entire request is stated in only one line. Like in the iterative search, the logical operators describe how the criteria combine. The number of search expressions is restricted only by the length of the command line. With the TELL message, the search phrase (do not count the *address* part) should have no more than 99 characters. (In an e-letter, the command line should be no longer than 72 characters.) When you receive the search result, an OUTPUT command could be issued, or you may choose to continue the search by sending another compound or iterative command, or you can begin a new search. More on the OUTPUT command in Chapter 4.

3.3.1 GENERAL REMARKS

In compound searches, the use of the symbolic abbreviations &, &~, or | for logical symbols is allowed. This can be helpful in making a line shorter when the length of your request is approaching the limiting length. A compound search request is interpreted by QSPIRES from left to right. Therefore, by changing order in which search expressions occur, you may obtain different results. You can use parentheses to override this left-to-right interpretation. Do not use commas to separate the search expressions (~~FIND <expression I> , AND <expression II>~~). If a search expression has the same search term as the expression to the left of it, the search term does not have to be repeated. FIN AUTHOR COLLINS, B. AND JONES has the same meaning as the phrase FIN AUTHOR COLLINS, B. AND AUTHOR JONES. (However, in potentially confusing situations list all the search terms; see examples in Subsection 3.2.2.) Compound and iterative searches are very similar. Still, be aware that in certain special situations, although the same criteria are applied, the two searches will produce different results.

One can begin a search with an iterative sequence and then continue with a compound command, and vice versa.

3.3.2 EXAMPLES OF A COMPOUND SEARCH

The compound FIND command has the following general form:

```
                                        AND          AND
TELL QSPIRES at SLACVM  FIND <I> AND NOT <II> AND NOT <III> ...
                                        OR           OR
```

The roman numerals denote various search expressions consisting of a *search term*, a *relational operator*, and a *search value*. To understand how SPIRES treats a compound request, it is instructive to consider a real example.

```
TELL QSPIRES at SLACVM  FIN AUTHOR S. TING AND TITLE J AND NOT AF
                        DESY
```

SPIRES reads the command from left to right, so it first finds all the documents for which the expression AUTHOR = S. TING is true. Imagine that these documents are put into a separate stack. In the next step, the system checks only that stack and keeps the documents for which the expression TITLE = J is true. Finally, of the remaining documents, those that have the element AFFILIATION = DESY are excluded. The rest represents the search result:

```
From SLACVM(QSPIRES):   * Result 10 Documents
```

When the logical operator OR appears in a compound request, and the request has three or more search expressions, the order in which the criteria are written becomes important.

```
TELL QSPIRES at SLACVM  FIN A RICHTER, B. AND T PSI OR T J

From SLACVM(QSPIRES):   * Result 731 Documents

TELL QSPIRES at SLACVM  FIN T PSI OR T J  AND A RICHTER, B.

From SLACVM(QSPIRES):   * Result 24 Documents
```

In the first of these two examples, SPIRES found all works (co)authored by B. Richter in which one of the title-words was PSI. SPIRES then added all works from the database with the title-word J. That is why the search result is so big. In the second example, SPIRES was again working through the quest from left to right, but this time with the search expressions ordered differently. The system first found all the works in which either the title-word PSI or the title-word J appeared. In the next phase of the search, only those works were kept for which the expression AUTHOR = RICHTER, B. was true. To avoid possible ambiguities in a compound search, it might be a good idea to use parentheses. They can successfully emphasize the order in which logical operations are to be performed. More on the use of parentheses in Subsection 3.3.3.

Sometimes it is a real challenge to create a compound search with many criteria. Consider the following example. You remember an exciting article on $A_1(1070)$ resonance by Smith, and another equally well written paper on the same subject either by James and Brown or James and Jones (or maybe by all three of them?). If you decide not to use the parentheses, be ready to do some thinking. If I am not wrong, this could be done with

```
TELL QSPIRES at SLACVM  FIN A BROWN OR JONES & JAMES OR SMITH & TP
                        "A1(1070)"
```

To be sure that your long compound search is correctly formulated, try to think of it in terms of equally ordered iterative commands. In the above, FIN A BROWN would find all works by Brown, OR [author] JONES would then add all works by Jones, etc. Or, insert the parentheses to stress the order in which logical operations are to be performed. More on the use of parentheses in the next section.

TWO OR MORE PREFIX RELATIONAL OPERATORS

If your system does not accept the right truncation sign # (see Subsection 1.2.4), and you are forced to use the PREFIX operator instead, keep in mind that only **one** PREFIX can appear per search term per line. In other words, you can use FIN AUTHOR PRE AUBER AND TITLE PRE DETECT, but **not** FIN AUTHOR PRE AUBER AND AUTHOR PRE BAL. With this restriction,

the only choice for requests in which two or more PREFIXes have to be used with the same search term is the iterative procedure.

```
TELL QSPIRES at SLACVM   FIN A PRE AUBER AND A PRE BAL
From SLACVM(QSPIRES):    * No records found which match search
                         criteria
```

However, in an iterative search,

```
TELL QSPIRES at SLACVM   FIN A PRE AUBER
From SLACVM(QSPIRES):    * Result 258 Documents
TELL QSPIRES at SLACVM   AND A PRE BAL
From SLACVM(QSPIRES):    * Result 26 Documents
```

3.3.3 PARENTHESES IN SEARCH REQUESTS

Parentheses may be used in a compound search to specify explicitly the order in which search expressions are to be treated. If no parentheses are given, a search request is interpreted from left to right. In an expression with nested parentheses, the logical operations within the innermost set are performed first. If there are several groups of nested parentheses in a single request, the operations are performed from left to right within each group of parentheses, beginning with the innermost set. The following search requests have the same meaning for SPIRES:

```
TELL QSPIRES at SLACVM   FIN A BROWN OR JONES & JAMES OR SMITH & TP
                         "A1(1070)"
TELL QSPIRES at SLACVM   FIN ((((A BROWN OR JONES) & JAMES) OR SMITH)
                         & TP "A1(1070)")
TELL QSPIRES at SLACVM   FIN TP "A1(1070)" AND (((A BROWN OR JONES)
                         & JAMES) OR SMITH)
TELL QSPIRES at SLACVM   FIN (A SMITH OR (JAMES & (BROWN OR JONES))
                         & TP "A1(1070)")
```

Note that a left parenthesis can follow only the command verb FIND, a logical operator, or another left parentheses. A right parenthesis on the other hand may follow only a search value or another right parenthesis. ~~FIND R (SLAC-PUB 2347 OR LBL-91)~~ is illegal. Use FIND (R SLAC-PUB 2347 OR LBL-91) instead.

In another example, we want to find the number of citations of a certain paper, but do not want to count the self-citations.

```
TELL QSPIRES at SLACVM   FIN CITATION PRLTA,38,1440 AND NOT (A
                         PECCEI, R OR QUINN, H)
From SLACVM(QSPIRES):    * Result 831 Documents
```

(How would you formulate this request without using the parentheses?)

3.4 SEARCHING WITH QUALIFIERS

Qualifiers are special search terms that may be used only following *simple* search terms. In the HEP database, two qualifiers are presently available, DATE and PPF-SUBJECT. The qualifiers may only be used to narrow a previously found result; it is not possible to begin a search with a qualifier. ~~FIND DATE 1990~~ will not work, but FIND AUTHOR ALTARELLI AND DATE 1990 will. A qualifier is used with logical operators AND and AND NOT. The operator OR can be used only in special situations. Qualifiers are allowed in both iterative and compound searches.

3.4.1 DATE (D) QUALIFIER

DATE in HEP is a search term which cannot be used independently, but always in a combination with some other *simple* search term, e.g., AUTHOR, TITLE, etc. The qualifier DATE cannot be the first term following the FIND verb. The short form for DATE is D . The logical operators that connect the rest of the query with the DATE qualifier could be AND and AND NOT. Typical commands with a DATE qualifier have the form

```
TELL QSPIRES at SLACVM  FIND <search-expression> AND DATE <value>

TELL QSPIRES at SLACVM  FIND <search-expression> AND NOT DATE
                        <value>
```

The *date value* can be modified with relational operators =, <, >, <=, >=, **BEFORE**, and **AFTER**. In addition, two *range* operators (BETWEEN ... AND ... , and FROM ... TO ...) could be used with the DATE qualifier. Note that the content operators (Subsection 1.2.3) are not allowed in DATE searches.

HOW THE DATE INDEX IS CREATED

Each record in HEP has several dates associated with it. Some of these dates are only for the internal use of SPIRES caretakers; the others are available to all users through the qualifier DATE. If a document was received as a preprint at SLAC, the indexed date usually denotes the date listed on the preprint, or—if the preprint is undated—the date when the preprint is received. For journal articles collected by DESY staff, this might be a date close to the date of publication. Sometimes it is not easy to assign a DATE precisely, so allow for some flexibility in the DATE search.

Indexed DATE values in HEP have the form `month-year`, or, less frequently, the form `year-only`, e.g., `October 1987`, or `1975`. Note that SPIRES allows an even more precise form for dates, namely, `month-day-year`. In fact, all HEP dates are internally transformed to just such a form, with the day (and, if necessary, month) supplied automatically by SPIRES. `October 1987` is translated into `10/0/1987`, and year-only `1975` into `0/0/1975`, but an ordinary user never has a chance to see such strange internal forms. However, you should be aware that in a chronological listing, documents with `year-only` dates will come before all other documents from that year: `1990 < July 1990` (this is because `0/0/1990 < 6/0/1990`).

3.4.2 DATE VALUES USED IN SEARCHING

Please distinguish between an **indexed** DATE *value* (the one assigned to a document by SLAC or DESY Libraries, as discussed in the previous section), and a **search** DATE *value* (the value supplied by you in a search). The search DATE values can be specified in a number of ways. It is particularly convenient that several different ways of writing are automatically converted to the form found in the DATE index.

For example, you may write a date as `OCTOBER 1987`; `OCTOBER,1987`; `OCTOBER-1987`; `OCTOBER/1987`; `OCTOBER.1987`; `OCT 1987`; `OCT,1987`; `OCT-1987`; `OCT/1987`; `OCT.1987`; `10 1987`; `10,1987`; `10-1987`; `10/1987` (but **not** `10.198 7`). In all the above examples, `1987` may also be replaced by `87`, e.g., `OCTOBER 87`; `OCT 87`; `OCT/87`; `10 87`; `10,87`; `10-87`; `10/87`; etc. Similar options are available for the other months in a year: a month's name can be shortened to the first three characters (with or without the period), or you can use month's (cardinal) number. The date value could also be written as a year-only: again, two or four digits of the year could be listed.

Another, more descriptive way of writing DATE search values is, e.g., `LAST MONTH`, `LAST YEAR`, `THIS YEAR -2` (meaning two years before this year), etc.

Unlike the indexed values, the search values are **not** internally translated into the month-day-year form. When you ask SPIRES to isolate from a search result all documents written in `October 1987`, this date will not be changed into `10/0/1987`. On the contrary, SPIRES will correctly understand that you are searching for all the papers which in the system's internal notation have indexed values from `10/0/1987` to `10/31/1987`. See the table in the next subsection for more details.

3.4.3 RELATIONAL AND LOGICAL OPERATORS FOR THE DATE QUALIFIER

The following relational operators can be used with the DATE qualifier:

= < > <= >=

As explained in Subsection 1.2.3, a *blank* space can be always substituted for the equality operator =, and BEFORE and AFTER are synonyms for <, and > operators, respectively. The chart below shows indexed DATE values that would be retrieved with various forms of search requests. Because of the specific way the date values are indexed and search arguments compared, some of the results might look unexpected.

Search values following AND DATE	Indexed date values		
	1985[1)]	July 1985[2)]	August 1985[3)]
= 1985	yes	yes	yes
> 1985	no	no	no
< 1985	no	no	no
>= 1985	yes	yes	yes
<= 1985	yes	yes	yes
= 7/85	no	yes	no
> 7/85	no	no	yes
< 7/85	yes	no	no
>= 7/85	no	yes	yes
<= 7/85	yes	yes	no

[1)] translated internally to 0/0/1985; [2)] translated to 7/0/1985; [3)] translated to 8/0/1985.

In addition, special *range operators* have been created to facilitate searches with DATE (in HEP) and other *date qualifiers*. They are characterized by phrases BETWEEN <date I> AND <date II>, and FROM <date a> TO <date b>. The BETWEEN ... AND ... operator is a combination of BEFORE and AFTER (> and <) over the range of specified dates. This operator retrieves records with values in the specified range, **excluding** the values named. The FROM ... TO ... operator retrieves records containing values over the range specified, and **including** the values named. The >= and <= operators in combination can be used to perform the FROM ... TO ... function. See examples in Subsection 3.4.4 for more details.

USE OF THE OR BOOLEAN OPERATOR WITH THE DATE QUALIFIER

The qualifier DATE can be combined with the logical operators AND and AND NOT, but cannot be immediately preceded by the logical operator OR. The phrase ~~FIND T ASYMMETRY OR DATE> 1989~~ will not work. The only exception is when two or several qualifiers are joined by ORs in a *parenthetical* group.

```
TELL QSPIRES at SLACVM   FIN T ASYMMETRY AND (DATE THIS YEAR OR LAST
                         YEAR)

From SLACVM(QSPIRES):    * Result 21 Documents
```

Note that the left parenthesis must follow the logical operator, not the qualifier name. It would do no good to try ~~FIND AUTHOR 'T HOOFT AND DATE (1985 OR 86)~~.

3.4.4 EXAMPLES OF A SEARCH WITH THE DATE QUALIFIER

The DATE qualifier has an extremely important role if a search result has to be narrowed. There are, e.g., many papers with the title-word NEUTRINO, but you might be interested only in the most recent one:

```
TELL QSPIRES at SLACVM   FIND TITLE NEUTRINO
```

```
From SLACVM(QSPIRES):    * Result 4812 Documents
TELL QSPIRES at SLACVM   AND DATE LAST MONTH
From SLACVM(QSPIRES):    * Result 5 Documents
```

An equivalent result could have been obtained in a compound search `FIN T NEUTRINO & D LAST MONTH`. If you would like to find all preprints from a certain institute, and written, e.g., in Winter 1988/89, you can use

```
TELL QSPIRES at SLACVM   FIN AF LUND U. & D BETWEEN 12/89 AND 3/90
From SLACVM(QSPIRES):    * Result 25 Documents
```

A similar iterative search might be formulated. If no document is found in the time interval you denoted, the system will backup automatically:

```
TELL QSPIRES at SLACVM   FIN A DIRAC
From SLACVM(QSPIRES):    * Result 26 Documents
TELL QSPIRES at SLACVM   AND DATE = 1986
From SLACVM(QSPIRES):    * Zero results, previous results retained
TELL QSPIRES at SLACVM   AND DATE = 1987
From SLACVM(QSPIRES):    * Result 3 Documents
```

And now a search in which the operator `OR` is between two qualifiers:

```
TELL QSPIRES at SLACVM   FIN T ASYMMETRY AND DATE 1989 OR 1990
From SLACVM(QSPIRES):    * No records found which match search
                           criteria
```

(No wonder! `SPIRES` noticed the `OR` operator between `DATE 1989` and `(DATE) 1990`. This is an illegal use of qualifiers! But, with the properly placed parentheses, everything is fine again:)

```
TELL QSPIRES at SLACVM   FIN T ASYMMETRY AND (D 1989 OR 1990)
From SLACVM(QSPIRES):    * Result 83 Documents
```

The `DATE` qualifier is an ideal tool when a large result has to be broken into smaller fragments suitable, e.g., for interactive transfer.

```
TELL QSPIRES at SLACVM   FIN A DONOGHUE AND HOLSTEIN
From SLACVM(QSPIRES):    * Result 48 Documents
```

(Suppose this is too big for our purposes. We want smaller portions of the result:)

```
TELL QSPIRES at SLACVM   AND DATE THIS YEAR
From SLACVM(QSPIRES):    * Result 7 Documents
```

(If this is OK, we can now arrange for the `OUTPUT`. When the output reaches us, it is time to get another portion. We first make a backup, and then choose another time interval.)

```
TELL QSPIRES at SLACVM   BACK
From SLACVM(QSPIRES):    * Result 48 Documents
TELL QSPIRES at SLACVM   AND DATE THIS YEAR - 1
```

```
From SLACVM(QSPIRES):    * Result 12 Documents
```

(Again, an OUTPUT command can be issued, followed by BACKUP, and the process continues until all 48 documents are received in smaller packages.)

One can combine DATE and PS qualifiers in one search, but only after accumulating some results with *simple* search terms. (The PS qualifier is the subject of the next section):

```
TELL QSPIRES at SLACVM  FIN JOURNAL PHYS REPT#  AND D 88 & NOT PS T
From SLACVM(QSPIRES):   * Result 1 Document
TELL QSPIRES at SLACVM  FIN R FERMILAB# AND (DATE> 1990 OR PS ETR)
From SLACVM(QSPIRES):   * Result 265 Documents
```

Note that even in such a mixed search, the operator OR between two qualifiers is allowed only within parentheses.

3.4.5 PPF-SUBJECT (PS) QUALIFIER

PPF-SUBJECT is another special search term which cannot be used independently, but must always be used in a combination with some *simple* search term, e.g., AUTHOR, TITLE, etc. The qualifier PPF-SUBJECT cannot be the first term following the FIND verb. The short form for this qualifier is PS. The logical operators that connect the rest of the query to the PS qualifier are AND and AND NOT. Typical commands with the PS qualifier have the form

```
TELL QSPIRES at SLACVM  FIND <search-expression> AND PS <value>
TELL QSPIRES at SLACVM  FIND <search-expression> AND NOT PS <value>
```

The only relational operator allowed with the PPF-subject index is the equality operator.

HOW THE PPF-SUBJECT INDEX IS CREATED

The values in this index are assigned only to the preprints received by the SLAC library. Each preprint is given a code, or a combination of codes, depending on the subject and the character of the paper. (The same codes characterize the preprint in the weekly SLAC publication *Preprints in Particle and Fields*). Journal articles and other publications which were not received previously in the preprint form by SLAC have no value assigned to this index.

3.4.6 POSSIBLE PPF-SUBJECT VALUES

The code letter **T** denotes pure theoretical papers; **E** denotes preprints with new experimental data; **I** denotes documents discussing instrumentation for experiments (but not the accelerator technology); and **C** denotes preprints in which the computer hardware or software for data analysis in experiments is discussed. In addition, if a paper has a clear review character, it will get the code **R**. This code always comes in a combination with some of the other codes: **TR** (as well as **RT**) characterizes theory reviews, **ER** (and **RE**) experimental reviews, **ETR** (and five permutations) denotes experiment + theory reviews. Other combinations of codes are also possible, e.g., **ET** (theory with the discussion of data, or—if you prefer—experimental data and immediate consequences for a theory); **IE** (data and a detailed discussion of instrumentation), etc.

T	THEORY
E	EXPERIMENTS
I	INSTRUMENTATION
C	COMPUTERS
R	REVIEW

3.4.7 RELATIONAL AND LOGICAL OPERATORS FOR THE PS QUALIFIER

The only useful relational operator in search expressions with the PPF-SUBJECT index is the equality operator (=, or the *blank* space).

USE OF THE OR BOOLEAN OPERATOR WITH THE PS QUALIFIER

The qualifier PS can be connected to the rest of the phrase by the logical operators AND and AND NOT. It cannot be immediately preceded by the logical operator OR. The phrase ~~FIN PPF > 9100 OR PS ER~~ will not work. The only situation when OR could be used near the PPF-SUBJECT qualifier is when several qualifiers are joined by ORs in a parenthetical group.

```
TELL QSPIRES at SLACVM   FIN PPF > 9100 AND R SLAC-PUB# AND (PS E
                         OR ER)

From SLACVM(QSPIRES):    * Result 41 Documents
```

Note that the left parenthesis must follow the logical operator, not the qualifier name. It would do no good if you tried ~~FIN T MUON AND PS (E OR ER)~~.

3.4.8 EXAMPLES OF A SEARCH WITH THE PS QUALIFIER

First a warning: one should always remember that only about one-third of all the records in HEP have the indexed value for the PPF-SUBJECT, so do not rely completely on the procedure in which only this qualifier was used. Still, this qualifier might play an important role if you need to narrow your search result. There are, e.g., many authors with the name R. Smith, but if the one you are searching for writes only theoretical papers, you may formulate the search as

```
TELL QSPIRES at SLACVM   FIN A SMITH, R.

From SLACVM(QSPIRES):    * Result 296 Documents

TELL QSPIRES at SLACVM   AND PS T

From SLACVM(QSPIRES):    * Result 27 Documents
```

You can make an even stronger statement by adding another line:

```
TELL QSPIRES at SLACVM   AND NOT  PS E

From SLACVM(QSPIRES):    * Result 21 Documents
```

Similarly, if you are interested in CP violation, but do not want to read all that nonsense written by theorists about ε'/ε, you can type the command

```
TELL QSPIRES at SLACVM   FIN T EPSILON EPSILON-PRIME AND PS E AND NOT
                         PS T

From SLACVM(QSPIRES):    * Result 17 Documents
```

One can combine PS and DATE qualifiers in one search, but only after accumulating some result with *simple* search terms. (For more on the DATE qualifier, see Subsections 3.4.1 to 3.4.4.)

```
TELL QSPIRES at SLACVM   FIN TITLE MONTE CARLO AND NOT PS C AND DATE
                         1990

From SLACVM(QSPIRES):    * Result 39 Documents

TELL QSPIRES at SLACVM   FIN COLLABORATION LIKE ?PISA? AND (PS ETR
                         OR D > 88)

From SLACVM(QSPIRES):    * Result 3 Documents
```

Note that even in such a mixed search, the operator OR between two qualifiers is allowed only within parentheses.

4. DISPLAYING RECORDS FOUND BY INTERACTIVE SEARCHING

The result of a search is a set of documents that meet the given criteria. QSPIRES delays sending the documents until the OUTPUT command is issued. This command is a signal to QSPIRES that the search sequence is completed, and that you want to display the retrieved records. By default, the results from HEP are sent to your e-mail *mailbox* (e-mailbox). However, the default could be changed, and you can have the records displayed interactively on the screen of your terminal. The frame format for display, and the way the search results are ordered, could also be changed according to your needs. Various details related to the display of retrieved records are covered in this chapter.

4.1 OUTPUT COMMANDS

The OUTPUT command (or OUT, for short) is the signal to QSPIRES that a search is completed, and that you are ready for the display of the documents. Three output commands are available: OUTPUT (with no *options*), OUTPUT (FILE, and OUTPUT (TYPE. These commands will be explained in the following subsections.

4.1.1 SIMPLE OUTPUT

The simple OUTPUT command, when no *option* is attached, initiates several steps. It instructs QSPIRES to (i) reissue to the SPIRES system all the commands which have led to your current result, (ii) gather from SPIRES the documents found through such a search, and (iii) file the documents and send them to your e-mailbox, using the default output settings. You can change the step (iii) by appending some of the available *options* to the option field (see Section 4.1.3, and further). Here is one example of the use of such a simple OUTPUT command:

```
TELL QSPIRES at SLACVM  FIND T LATE UNIVERSE
From SLACVM(QSPIRES):   * Result 7 Documents
```

(At this point, you may feel that all your criteria are met; it is time for the OUTPUT command, which will cause the result to be sent to your e-mailbox. ->)

```
TELL QSPIRES at SLACVM  OUTPUT
From SLACVM(QSPIRES):   * File being sent to you via NOTE, class M
```

As you can see, the output is sent to you in a file. In several minutes (or longer, if the network traffic is high), the file will be delivered to your e-mailbox, and you can check the result. For as long as the search result saved by QSPIRES is not erased, you can keep repeating the OUTPUT command, without having to repeat the search. This is useful if you are not satisfied, e.g., with the original ordering or the displayed format. In that case, you simply modify the output by appending some of the *options* to the OUTPUT.

The OUTPUT command can be used only after some nonzero result has been gathered:

```
TELL QSPIRES at SLACVM  FIND T DEAD UNIVERSE
From SLACVM(QSPIRES):   * No records found which match search
                        criteria
TELL QSPIRES at SLACVM  OUTPUT
From SLACVM(QSPIRES):   * File being sent to you via NOTE, class M
```

However, when you open the file, you will discover the sentence: `Missing search criteria`, or the result of your previous successful search will be sent.

There is another way the OUTPUT command could be used. We strongly discourage this alternative. It is designed only for the people who cannot communicate with QSPIRES interactively, and need to have all the commands stacked into a single line. The OUTPUT is then not used as a command, but rather appended as an option to the line with the FIND verb. Such a phrase would instruct QSPIRES to file and send the result even before you have had a chance to review the number of retrieved documents. Here is an example of such a blind search:

```
TELL QSPIRES at SLACVM  FIND T WEAK OR INTERACTIONS (OUT
From SLACVM(QSPIRES):   * File being sent to you via NOTE, class M
```

(After awhile, the file still did not reach us, and we, being curious, issue the SHOW SEARCH command Section 3.2.4 ->)

```
TELL QSPIRES at SLACVM  SHOW SEARCH
From SLACVM(QSPIRES):   * Search command(s)
From SLACVM(QSPIRES):   * FIND T WEAK OR INTERACTIONS
From SLACVM(QSPIRES):   * Result: 9823 Documents (Subfile HEP)
```

Oops! Now, when the file is already sent, and probably traveling slowly from node to node, we realize that something was wrong with the request (maybe we should have used AND, not OR?). Too late! Not only we, but also the network were unnecessarily jammed with unwanted mail. (The good news is that QSPIRES really did not send all 9823 documents, but only the warning: `Your search result of 9823 records exceeds the maximum return of 150 records. Modify your search criteria to isolate a smaller selection of records and re-issue the command. Sorry for the inconvenience.`) This example explains why we do not recommend such a use of the (OUTPUT option. This shortcut could only be justified if one is sure—at 99% confidence level—that the search has retrieved a reasonably small set of documents. In all other situations, please review first the number of the retrieved documents, and only then, in a separate line, issue the regular OUTPUT command.

OUTPUT DOES NOT INTERRUPT SEARCH

It should be noted that the OUTPUT command does not interrupt your search. Even after the documents were sent, you can continue the current search.

```
TELL QSPIRES at SLACVM  FIND T NEW UNIVERSE
From SLACVM(QSPIRES):   * Result 43 Documents
TELL QSPIRES at SLACVM  OUT
From SLACVM(QSPIRES):   * File being sent to you via NOTE, class M
```

```
TELL QSPIRES at SLACVM  AND NOT AUTHOR GUTH
From SLACVM(QSPIRES):   * Result 38 Documents
```

At this point, you can issue another OUTPUT command, continue the search, or discard the search result by beginning the next search.

4.1.2 OUTPUT (FILE

When a simple OUTPUT command is issued, a search result is filed and sent to your e-mailbox. This is the default setting. The command line OUTPUT (FILE has exactly the same meaning as the OUTPUT alone. It instructs QSPIRES to collect the result of a search, and send it as a file. If you do not mind writing unnecessary phrases, append the (FILE option to your OUTPUT. If you do, skip the (FILE. The effect is the same: the result is sent to the e-mailbox. In other words,

```
TELL QSPIRES at SLACVM  OUTPUT (FILE
```

is equivalent to

```
TELL QSPIRES at SLACVM  OUTPUT
```

The short form OUT (FIL can be substituted for the full command.

4.1.3 OUTPUT (TYPE

The OUTPUT (TYPE command instructs QSPIRES to (i) reissue all the commands which led to your current result, (ii) gather the documents found with such a search, and (iii) send them interactively (as a message) to the screen of your terminal, using the default format frame. You can change the format in step (iii) and order the result differently, by appending some of the available *options*. TYPE could be shortened to TYP.

```
TELL QSPIRES at SLACVM  FIND T FANTASY
From SLACVM(QSPIRES):   * Result 3 Documents
TELL QSPIRES at SLACVM  OUT (TYP
From SLACVM(QSPIRES):   * THE G(1) PROBLEM: FACT AND FANTASY ...
From SLACVM(QSPIRES):   * By R.L. Jaffe, Aneesh Manohar ... , etc.
```

You can use the OUTPUT (TYPE only after some nonzero result has been gathered (see Section 4.1.1).

There is another method of getting the output interactively, the use of which, by the way, we strongly discourage. OUTPUT TYPE can be appended as an *option* to the line with the FIND verb. In that case, the result is sent to you before you have had a chance to review the number of retrieved documents. Here is what could happen in such a blind search:

```
TELL QSPIRES at SLACVM  FIND T GAUGE OR THEORY (OUT TYP
From SLACVM(QSPIRES):   * Your search result of 21099 records
From SLACVM(QSPIRES):   * exceeds the maximum return of 10 records.
```

```
From SLACVM(QSPIRES):    * Modify your search criteria to isolate a
From SLACVM(QSPIRES):    * smaller selection of records and re-issue
From SLACVM(QSPIRES):    * the command. Sorry for inconvenience.
```

Oops! Only now we realize that something was wrong with the search (maybe we used OR instead of AND?), and the network was unnecessarily jammed with an unwanted message. Such a use of the (OUTPUT TYPE option could only be justified if one is sure—at 99% confidence level—that the search will retrieve a reasonably small set of documents. In all other situations, please first review the number of retrieved documents, and only then, in a separate line, issue the regular OUTPUT (TYPE command.

It should be noted that the OUTPUT (TYPE does not interrupt your search. Even after the documents were sent with this command, you can continue the current search.

```
TELL QSPIRES at SLACVM  FIND T FANTASY
From SLACVM(QSPIRES):   * Result 3 Documents
TELL QSPIRES at SLACVM  OUT (TYP
```

(The result is now sent to you interactively. When the sending is over, you can continue ->)

```
TELL QSPIRES at SLACVM   OR TITLE MIRACLE
From SLACVM(QSPIRES):    * Result 6 Documents
```

At this point, you can issue another OUTPUT command, continue the search, or interrupt it by beginning the next search.

4.2 CUSTOM-DESIGNED OUTPUT

By default, when you issue the OUTPUT command, the retrieved results will be displayed in the format called PAPERS, and sequenced in the (nearly) reversed chronological order. However, you have a freedom to change these default settings. This section describes how this could be achieved.

4.2.1 CHOOSING A FORMAT FRAME

The following format frames for displaying the results retrieved from the HEP database are available:

ALLKEYS	FNAL
BRIEF	LBL
DEFAULT	NARROW
DOWNLOADADDUPD	SENDFILE
DOWNLOADCITES	SHOWFILE
DOWNLOADFULL	SSC

DOWNLOADFULLIRN	TEX
DOWNLOADPPA	TEXSEND
DOWNLOADPPF	UCLA

In the remainder of this subsection, we shall illustrate some of these formats.

SHOW FRAMES (SHO FRA)

The list of format frames in HEP database could be obtained with help of the SHOW FRAMES (or SHO FRA) command. If the information is to be displayed as a message to the screen of your terminal, use

```
TELL QSPIRES at SLACVM  SHO FRA
```

You will get the list with seventeen different display formats. We shall discuss some of these formats below. The remaining formats are created for users with special needs, and are not interesting for an ordinary user. To have the list of available HEP format frames sent to your e-mailbox, use

```
TELL QSPIRES at SLACVM  SHOW FRAMES (FILE
```

To learn more on possible frames in other databases, append (IN <database> to the SHOW FRAMES command (see Section 1.3.3).

DEFAULT FORMAT

The default format in HEP is called DEFAULT. When you issue OUTPUT, or OUTPUT (FILE, or OUTPUT (TYPE, without specifying a format frame, the search result is sent to you in this default format. A document in the displayed result is represented by its complete **title**, **all authors**, and their **affiliation**(s); if the paper is published, you will find the exact **reference**, if it is still a preprint, the **report number** and the number of **pages** will be listed.

There are limits on the number of documents that could be displayed with the default format (see Section 3.1.2): a maximum of 10 could be sent interactively, and there is a further restriction on the number of lines in one such interactive message (a maximum of 100 lines of text); if the result is filed and sent to your e-mailbox, the limit is 150 documents, and there are no limits on the number of lines. If several papers in the result have many authors (one hundred or more) it is likely that your result will be truncated in the interactive reply. In that case, the last line sent will say something like this:

```
From SLACVM(QSPIRES):    * *** Output truncated **
```

However, if your result does not have such multi-author documents, the 100 lines of text will usually be more than enough to display up to 10 documents. When you want to display more than 10 (or 150) documents, use the BRIEF format (see below). The system will never send more than the maximum allowed number of documents for a given format. If you try to cheat, QSPIRES will end its message with the phrase

```
From SLACVM(QSPIRES):    * 23 records found (limit of 10 sent)
```

(Similarly, the result sent to your e-mailbox will have a note: `Result exceeds send limit of 150`, and only 150 records will be attached.)

BRIEF FORMAT

To obtain the result in the BRIEF format, use one of the following two commands:

```
TELL QSPIRES at SLACVM  OUTPUT (TYPE BRIEF
TELL QSPIRES at SLACVM  OUTPUT (BRIEF
```

The first of the two commands will send the result interactively to the screen of your terminal, the second to your e-mailbox. The OUTPUT could be shortened to OUT, TYPE to TYP, and BRIEF to BRI. (However, **do not** try to shorten other format names.) You can also use the (BRIEF TYPE order. When you specify BRIEF, the search result is sent to you in the special BRIEF format. A document in the displayed result is represented only by its **first author**; the **affiliation** is not given; if the paper is published, you will find the exact **reference**, if it is still a preprint, the **report number** and the number of **pages** will be listed. Most often, the information (per document) fits into three or four lines of text. The main advantage of the BRIEF format is that the limits on the number of documents that could be displayed with the format are much less severe than with any other format (see Section 3.1.2). Up to 100 lines of text could be sent interactively, and since one document rarely takes more than three lines, 100 lines usually means about 30 documents. This is three times more than with the default format. If the result is filed and sent to your e-mailbox, the limit is 300 documents (twice as much as with the DEFAULT format), and there are no limitations on the number of lines. If you have to retrieve a large number of documents, the BRIEF format is probably the best choice. However, if the number of documents exceeds 30, and you try to display them interactively, it is likely that the result will be truncated. In that case, the last line sent will say something like

```
From SLACVM(QSPIRES):    * *** Output truncated **
```

Similarly, if you try to obtain more than 300 filed documents, the system will warn you with the phrase of the form

```
From SLACVM(QSPIRES):    * 612 records found (limit of 300 sent)
```

OTHER FORMATS IN HEP

If you want to try any other format, use the commands of the form

```
TELL QSPIRES at SLACVM  OUTPUT (TYPE USING <format-name>
TELL QSPIRES at SLACVM  OUTPUT (USING <format-name>
```

Note that for all formats other than BRIEF, the term USING **must** precede the format names. (USING BRIEF is an allowed but unnecessarily long alternative for the simple command BRIEF.) Format names following USING **must not** be shortened. The first of the above commands will instruct QSPIRES to send the result interactively to the screen of your terminal; the second, to your e-mailbox. The OUTPUT could be shortened to OUT, USING to USI, and TYPE to TYP. You can reverse the order of options, and write (USING <format-name> TYPE as well. The *format-name* is one of the names obtained with the SHOW FRAMES command. All the format frames other than BRIEF have the same limitations regarding the number of displayed documents: they follow the limits for the DEFAULT format (see above, and also Section 3.1.2).

You will notice SSC, UCLA, LBL, and FNAL format frames in the list of formats. These formats are very similar to that of BRIEF; the difference is a sentence added to the output which tells whether the document is available in the libraries of the respective institutions. If you are working in or near these institutions, this might be a useful information. One format frame is called ALLKEYS. With this format, you will get the data identical to those obtained with the DEFAULT format; in addition, the list of topics assigned to the document(s) will be attached. If you want to see the list of references from a retrieved document, use the DOWNLOADCITES format. The NARROW format is very similar to the BRIEF format, but the limitations on the number of displayed documents are as severe as for the default format (see above). If you know how to use the TEX macropackage

PHYZZX, try the TEX format frame. The result will be transcribed and sent to you as a TEX file, ready for printing. (It makes no sense to use this frame to get the interactive answer.) The other available format frames are designed for special users, and we shall not discuss them.

4.2.2 ORDER OF THE RESULT

Records retrieved in a search may appear to be in random order. However, if you look more carefully, you will notice that the default ordering is close to the reversed chronological ordering, with the most recent documents on the top of a file or message. This default order may not be what you want. The SEQUENCE option permits different ordering of records. You can tailor the output in such a way that the ordering is made according to, e.g., name of the first author, or report numbers of the documents, etc.

SEQUENCE <index-name>

The SEQUENCE (or SEQ, for short) is recognizable to QSPIRES only if it is issued in the *option* field of the OUTPUT command. The term SEQUENCE must be followed by an index name. Sequencing by qualifiers is also allowed. (*Strictly speaking, it is the element-name, and not the index-name, that should follow the SEQUENCE term. There are many more elements than indexes in any SPIRES database, but an ordinary QSPIRES user does not have to know and worry about such details. So, use with confidence the index name after the SEQUENCE.*) Both full and abbreviated forms for index names could be used.

Consider the following example:

```
TELL QSPIRES at SLACVM  FIND TI UNIVERSE AND DATE JULY 1990
From SLACVM(QSPIRES):   * Result 7 Documents
TELL QSPIRES at SLACVM  OUTPUT (TYPE SEQUENCE AUTHOR
```

(QSPIRES now sends to your terminal the list of documents in the default format frame, and ordered alphabetically by the first author. [Had you wanted to get the filed result, you should have skipped the TYPE, and written only OUT (SEQ AUTHOR.] The retrieved seven documents will probably fit into the 100 allowed lines of text:)

```
From SLACVM(QSPIRES):   * WHO MADE THE UNIVERSE AND WHY?
From SLACVM(QSPIRES):   * By Mickey Mouse (Disneyland) etc.
```

You could have also listed the SEQUENCE first, and only then the TYPE.

```
TELL QSPIRES at SLACVM  OUTPUT (SEQUENCE AUTHOR TYPE
```

Note, however, that SEQUENCE and <index-name> must always be paired together. There can be only one argument following the SEQUENCE verb.

The ordering by AUTHOR index is alphabetical with respect to the first author. The SEQUENCE DATE puts the oldest documents to the top of the file or message, and the most recent one to the bottom. The ordering by TITLE (SEQ TITLE) is an alphabetical ordering based on the first title-word, the SEQUENCE RN orders the documents according to indexed values for the REPORT-NUMBER, etc.

You do not have to use the default format frame with the SEQUENCE command. If you wish, add the chosen frame to the option field, e.g.:

```
TELL QSPIRES at SLACVM  OUT (SEQ AUTHOR TYPE USING BRIEF
TELL QSPIRES at SLACVM  OUTPUT (SEQUENCE D USI TEX
```

The first of these commands will instruct QSPIRES to send the result interactively to the screen of your terminal; the second, to your e-mailbox. The order of options is not important. Be careful, however, not to separate an option from its argument.

5. OTHER SLAC LIBRARY DATABASES

This chapter describes interactive searches in other databases maintained by the staff of the SLAC Library. These databases are BOOKS, CONF (or CONFERENCE), INST (or INSTITUTIONS), HITECH, SERIALS and SEMINARS. The last section in this chapter reviews QUERY and WHEREIS commands. These commands enable quick access to two directories of interest to the high energy physics community: one containing personal e-mail addresses, and the other institutions' mailing addresses.

5.1 BOOKS DATABASE

The BOOKS database is an online book catalog for the SLAC Library. It contains bibliographic summaries of more than 18,000 books. Included are textbooks, proceedings, monographs, some serials (e.g., *Annual Reviews*), etc. While searching the database, you can get a good cross-section of the most important books in high energy physics and related subjects. The newly ordered books are listed even before they arrive at the library; therefore, you can use QSPIRES to find information on the latest titles in the field. This section describes elements of the search procedure in the BOOKS database.

5.1.1 INTERACTIVE SEARCH PROCEDURE

A typical, simple, one-step interactive search request will have the form

```
TELL QSPIRES at SLACVM  FIND <search-expression> (IN BOOKS
```

In a more intricate search, several search expressions might be linked by logical operators. The selection (IN BOOKS must be specified in the line with the FIND verb. This selection will remain in effect until a new search is initiated with your next FIND command. This means that, e.g., there is no need to repeat the phrase (IN BOOKS in a followup command of an iterative search, or with an OUTPUT command.

Each search expression must have a correctly stated search term (see Section 1.2). To get the list of search terms (and they coincide with the names of indexes in the BOOKS database), send one of the following commands to QSPIRES:

```
TELL QSPIRES at SLACVM  SHOW INDEXES (IN BOOKS
TELL QSPIRES at SLACVM  SHO SEA TER (IN BOOKS
TELL QSPIRES at SLACVM  SHO IND (IN BOOKS FIL
TELL QSPIRES at SLACVM  SHOW SEARCH TERMS (FILE IN BOOKS
```

The first two commands instruct QSPIRES to send the list interactively, while the option FILE in the last two tells QSPIRES to file the list and send it to your e-mailbox. The table below shows some of the indexes that will be found in the returned list.

INDEX	ALLOWED ABBREV. AND VARIATIONS
AUTHOR	A, EDITOR, N, NAME, TRANSLATOR
TITLE	T, TI
SUBJECT	S, SH, SUBJ, TOPIC, TP
COPYRIGHT-DATE	D, CD, DATE
PUBLISHER	PUB
CONF-NUMBER	CNUM, CATALOG-NUMBER, ISBN, LN, R, REPORT-NUM, SR
CORPORATE-AUTHOR	CA
CALLNO	C, CL
STATUS	STA, CSTATUS
MEDIA	FORM

The GOAL index, not listed above, is called BOOK (and also BOOKS, IRN, KEY, or RECORD). The key value in the GOAL index is a randomly selected number. There are no *qualifiers* in the BOOKS database. Note that the COPYRIGHT-DATE is a *simple* index, and not a *qualifier*; therefore, it **can be used** even in a primary search.

Almost all the relational operators described in Subsection 1.2.3 could be used for searches in the BOOKS database. The equality operator is the most efficient, and has the widest use. The inequality operators could be applied most successfully in the COPYRIGHT-DATE searches, e.g., FIN D AFTER 1989 (IN BOOKS. Among the content operators, the recommended one is the PREFIX.

To determine the kind of values that could be used with a given simple index, issue the BROWSE command. For example,

```
TELL QSPIRES at SLACVM  BROWSE SUBJECT MICRO (IN BOOKS
TELL QSPIRES at SLACVM  BRO A KOERNER (IN BOOKS
TELL QSPIRES at SLACVM  BROWSE PUBLISHER (IN BOOKS FIL
TELL QSPIRES at SLACVM  BRO TITLE SUPER (IN BOOKS
```

The result of the browse is sent to you interactively, unless you specify the FILE option. You can also use the BROWSE FIRST and BROWSE LAST commands (for description, see Subsection 1.2.4).

In most of the BOOKS indexes, searching with truncated values (the right truncation) is allowed. In *word indexes* (e.g., in the TITLE index), you can truncate more than one word:

```
TELL QSPIRES at SLACVM  FIND T UNIFIED THEOR# PROCEED# (IN BOOKS
From SLACVM(QSPIRES):   * Result 24 Books
```

In *phrase indexes*, only one truncation sign per search value is allowed.

To learn more about the BOOKS database, send SHOW or EXPLAIN commands to QSPIRES. If you use the first two commands shown below, the answer will be sent to you interactively. The third and the fourth command will instruct QSPIRES to send the information to your e-mailbox.

```
TELL QSPIRES at SLACVM  SHOW SUBFILE DESCRIPTION (IN BOOKS
TELL QSPIRES at SLACVM  EXPLAIN BOOKS
TELL QSPIRES at SLACVM  SHO SUB DES (IN BOOKS FILE
TELL QSPIRES at SLACVM  EXP BOOKS (FIL
```

A simple search, with only one criterion specified, is not the only possibility in the BOOKS database. You can add more criteria, and narrow or expand the search in an iterative process. Note that the selection has to be displayed only in the line with the FIND verb:

```
TELL QSPIRES at SLACVM  FIND AUTHOR DRELL (IN BOOKS
From SLACVM(QSPIRES):   * Result 8 Books
TELL QSPIRES at SLACVM  AND NOT T RELATIVIST# QUANTUM
From SLACVM(QSPIRES):   * Result 6 Books
```

Alternatively, you can state several criteria in a single line, by using the compound search:

```
TELL QSPIRES at SLACVM  FIN DATE> 85 AND PUB ADDISON# AND TOPIC
                        PARTICLE# (IN BOOKS
From SLACVM(QSPIRES):   * Result 8 Books
```

In both iterative and compound searches, the logical operators AND, AND NOT, and OR describe how the criteria combine. If you lose track of the criteria used up to a given point in a search, use the SHOW SEARCH or SHOW RESULT commands (see Subsections 1.4.1 and 3.2.4). You do not have to specify (IN BOOKS with these commands.

```
TELL QSPIRES at SLACVM  SHOW SEARCH
TELL QSPIRES at SLACVM  SHO RESULT
```

Once you have found records that meet all the criteria you have set, the records could be displayed (see Subsections 1.4.3 and 5.1.4). As always, you can choose to get the result either interactively, or via e-letter, the latter possibility being the default choice. Two format frames are available for displaying records found in the BOOKS database. To get their names, issue

```
TELL QSPIRES at SLACVM  SHOW FRAMES (IN BOOKS
```

This will cause the list to be sent interactively. If you want a permanent record, append FILE to the option field:

```
TELL QSPIRES at SLACVM  SHO FRA (IN BOOKS FILE
```

Limits on the number of records that could be sent in the BRIEF and the default formats will be given in Subsection 5.1.4.

5.1.2 SIMPLE, ONE-STEP SEARCH

This section reviews searches in which only one search term is used. More intricate searches, with several criteria, are described in Subsection 5.1.3.

FIND AUTHOR (FIN A)

The AUTHOR index contains the name(s) that appear on the title page of a book, e.g., the name(s) of author(s) or editor(s). This index has many names (see the table in Subsection 5.1.1). You can use any of the allowed variations in your search. For example, to retrieve the books edited by J. Tran Thanh Van, issue `FIN EDITOR TRAN THANH VAN (IN BOOKS`, or `FIN A TRAN THANH VAN (IN BOOKS`.

The AUTHOR index in BOOKS is a *personal-name index*. This means that special rules for matching the search values and indexed values apply. The rules are thoroughly illustrated in Subsections 1.2.4 and 2.2.1. Remember that if the last name (= family name, or surname) is followed by the first name (= personal), a comma must separate the two. If the order is reversed, no comma should be used. Here are some examples:

```
TELL QSPIRES at SLACVM  FIND NAME FOCK, V. (IN BOOKS
From SLACVM(QSPIRES):   * Result 2 Books

TELL QSPIRES at SLACVM  FIN AUTHOR CHANDRAS# (IN BOOKS
From SLACVM(QSPIRES):   * Result 6 Books

TELL QSPIRES at SLACVM  FIN EDITOR VELTMAN (IN BOOKS
From SLACVM(QSPIRES):   * Result 2 Books

TELL QSPIRES at SLACVM  FIN A = ABDUS SALAM (IN BOOKS
From SLACVM(QSPIRES):   * Result 7 Books
```

If you do not want to write a long name, use only the first several significant characters and append the truncation sign. The same effect could be achieved with the PREFIX operator, e.g., `FIN A PRE CHANDRAS (IN BOOKS`. If you are not certain about the spelling of some last name, use the BROWSE command.

```
TELL QSPIRES at SLACVM  BROWSE N PAPANIKOL (IN BOOKS
```

QSPIRES will interactively return a list of 10 names alphabetically closest to the one you mentioned, and with some luck you will be able to discover the right form. Use this correct name with your FIND command.

If you misspell the name, or if no book in the database is authored/edited by the person specified in the search request, QSPIRES will send the standard `No records found ...` answer.

```
TELL QSPIRES at SLACVM  FIND AUTHOR GORBACHEV (IN BOOKS
From SLACVM(QSPIRES):   * No records found which match search
                          criteria
```

Hyphens are stripped from the names when they are indexed. For example, `Murray Gell-Mann` is indexed with two names, GELL and MANN. Similarly, hyphens are stripped from your search values. Your request

```
FIND A = M. GELL-MANN (IN BOOKS
```

will be transmitted to SPIRES as

```
FIND AUTHOR M. GELL MANN (IN BOOKS
```

which will enable a perfect match.

If you are satisfied with the search result, you might choose to display it (see Subsection 5.1.4). Alternatively, you can add to or subtract from the result by continuing the search (see Subsection 5.1.3).

FIND TITLE (FIN T)

The TITLE index contains title-words, as well as subtitles and other related information, found on the title page of a book. For example, the proceedings of the Les Houches 1982 Summer School have the following information listed on the title page:

Les Houches Summer School Proceedings, V. 39

RECENT ADVANCES IN FIELD THEORY AND STATISTICAL MECHANICS

LES HOUCHES SUMMER SCHOOL IN THEORETICAL PHYSICS, SESSION 19

LES HOUCHES, FRANCE, AUG 2—SEP 10, 1982

The series-name, title and subtitle are all indexed in the database. A TITLE search in which any of the words appearing above is used, including HOUCHES, SESSION and even AUG, will retrieve this book.

The TITLE index is a *word index*. This means that each word is indexed separately. Consequently, it is not necessary to use a complete title in a search; it is enough to know only one word to be able to retrieve the corresponding document. You can also submit more than one word; the order of the words in your search value is unimportant.

```
TELL QSPIRES at SLACVM  FIND TITLE STATISTICAL (IN BOOKS
From SLACVM(QSPIRES):   * Result 127 Books
TELL QSPIRES at SLACVM  FIN T FIELD STATIST# PROCEED# HOUCHES 1982
                        (IN BOOKS
From SLACVM(QSPIRES):   * Result 1 Book
```

Frequently occurring articles and conjunctions such as *a, an, the, and,* etc., are ignored in the TITLE search. There is also a list of *reserved* symbols, which contains characters and symbols with special meanings for SPIRES. Whenever such a reserved symbol is used in a search value, the complete search value must be surrounded by quotation marks. The list of excluded and reserved symbols in the BOOKS database is identical to the one in HEP (see Subsection 2.2.2).

FIND COPYRIGHT-DATE (FIN CD, FIN DATE)

As already stressed, the COPYRIGHT-DATE (or CD, or DATE) index in the BOOKS database is a *simple index*, not a *qualifier*. Unlike in HEP, you can actually find a given date in a primary, one-step search.

```
TELL QSPIRES at SLACVM  FIND DATE 1991 (IN BOOKS
From SLACVM(QSPIRES):   * Result 73 Books
```

The COPYRIGHT-DATE index contains the year in which a book was printed. Only the year is indexed; therefore it is unwise to specify a more precise date, e.g., FIN CD MARCH 7, 1987 (IN BOOKS.

Note that a date appearing in a title of a book may differ from the copyright date. For example, the proceedings of the 1982 Les Houches Summer School have the copyright date 1984. If you know the year in which a book was published, use FIND COPYRIGHT-DATE command.

```
TELL QSPIRES at SLACVM  FIND CD = 84 (IN BOOKS
```

If, on the contrary, you know the date related to the title or subtitle of a book, use the FIND TITLE search.

```
TELL QSPIRES at SLACVM  FIND TITLE 1982 (IN BOOKS
```

In the COPYRIGHT-DATE search you can use the short form (84) or the long form (1984) for a year. In the TITLE search, as a rule, the long form should be used.

If you are interested only in recent books, use the inequality sign,

```
TELL QSPIRES at SLACVM  FIN COPYRIGHT-DATE LAST YEAR (IN BOOKS
```

The inequality operators described in Subsection 1.2.3 could also be used with the COPYRIGHT-DATE index. The words BEFORE and AFTER could be used instead of the symbols <and>, respectively.

FIND PUBLISHER (FIN PUB)

SLAC Library regularly orders books of interest for the high energy physics, and a search in the PUBLISHER index may produce a good catalog of high energy physics books by a given publisher.

The PUBLISHER index is a *phrase index* (see Subsection 1.2.4). For example, the indexed value ACADEMIC PRESS cannot be retrieved by issuing FIN PUB ACADEMIC (IN BOOKS or FIN PUB PRESS (IN BOOKS. The entire string must be used, thus

```
TELL QSPIRES at SLACVM  FIND PUBLISHER ACADEMIC PRESS (IN BOOKS
From SLACVM(QSPIRES):   * Result 493 Books
```

Alternatively, the right truncation symbol or the PREFIX operator might be combined with just the first part of a publisher name:

```
TELL QSPIRES at SLACVM  FIND PUBLISHER ACADEMIC# (IN BOOKS
TELL QSPIRES at SLACVM  FIN PUB PRE ACADEMIC P (IN BOOKS
```

If you are not certain about the correct name of a publisher, browse the PUBLISHER index:

```
TELL QSPIRES at SLACVM  BRO PUBLISHER ADDISON (IN BOOKS
TELL QSPIRES at SLACVM  BROWSE PUB MCGRAW (IN BOOKS
```

FIND SUBJECT (FIN S)

This index is useful if you have a complete list of subjects assigned to books obtained by the SLAC Library. To my knowledge, such a list is not widely distributed, and you might therefore be inclined not to make a SUBJECT search. If you still want to try it, use the BROWSE command first, to get an idea of the kinds of values that are indexed.

```
TELL QSPIRES at SLACVM  BRO SUBJECT QUANTUM (IN BOOKS
TELL QSPIRES at SLACVM  BROWSE S PARTICLE PHYS (IN BOOKS
TELL QSPIRES at SLACVM  BRO S STATISTIC (IN BOOKS
```

When you find an interesting subject, e.g., PARTICLE PHYSICS--CONFERENCES, keep in mind that the SUBJECT index is not a *word index*, but a *phrase index*. Consequently, you have to list a complete subject in your search value, not just particular words:

```
TELL QSPIRES at SLACVM  FIN SUBJECT CONFERENCES PARTICLE (IN BOOKS
From SLACVM(QSPIRES):   * No records found which match search
                        criteria
TELL QSPIRES at SLACVM  FIND S PARTICLE PHYSICS--CONFERENCES (IN
                        BOOKS
From SLACVM(QSPIRES):   * Result 1368 Books
```

Alternatively, use the truncation sign or the PREFIX operator to shorten the request: FIN S QUANTUM FIELD# (IN BOOKS, FIN S PREFIX MULTIPARTICLE (IN BOOKS, etc. If you are totally desperate, try the LIKE relational operator:

```
TELL QSPIRES at SLACVM  FIN SUBJECT LIKE ?PROGRAMMING? (IN BOOKS
From SLACVM(QSPIRES):   * Result 329 Books
```

FIND CONF-NUMBER (FIN CNUM)

Books related to conferences are tagged by an additional index. This is the CONF-NUMBER (CNUM) index. The indexed values are of the type C82/08/25. In other words, the letter C is followed by the two-digit year number, two-digit month number (08, not 8!), and two-digit day number, where day, month and year correspond to the first day of the meeting or the conference. The CNUM identifies a conference uniquely. If two or more conferences begin on the same day, their CNUMs will have an additional digit. For example, C89/06/21.2 denotes the *second* conference that began on June 21, 1989. The CNUM used in the BOOKS database is the same one identifying the conference in the CONFERENCE database (see Subsection 5.2.2).

If you want to check whether proceedings of a conference that was held in September 1989 are available, use, e.g.,

```
TELL QSPIRES at SLACVM  FIND CNUM PREFIX C89/09 (IN BOOKS
TELL QSPIRES at SLACVM  FIN CNUM C89/09# (IN BOOKS
```

Of course, if you know the exact conference number, there is no need to make the truncation or use the PREFIX operator.

OTHER INDEXES IN THE BOOKS DATABASE

Sometimes the author of a book is not a single person, but rather a corporate entity, such as the United States Congress, or the American Physical Society, etc. You can search for such an author by using the CORPORATE-AUTHOR (CA) index, e.g., FIND CA U.S. SENATE (IN BOOKS. This index is a *word index*, and you can search for any word or words from the corporation name: FIN CA SOCIETY PHYS# (IN BOOKS.

The other indexes are of little or no interest to a general user. For example, CALLNO contains the SLAC Library catalog numbers of books; STATUS lists the information on storage and status of a particular book (e.g., *lost*, etc.); MEDIA specifies whether a document is in a printed version, or maybe a tape, microfiche, diskette, etc.

5.1.3 CONTINUING A SEARCH

In the previous section, we covered simple searches in the BOOKS database. If we have more than one criterion, we can formulate an iterative or a compound search.

COMPOUND SEARCH

The compound search request is similar in form to the simple search. The criteria are listed in only one line; the request begins with the FIND command, and ends with the selection (IN BOOKS. The main difference is that a compound search has more than one search expression; the logical operators AND, AND NOT, and OR are used to connect the search expressions. The symbolic abbreviations for logical operators are allowed.

```
TELL QSPIRES at SLACVM  FIN DATE> 85 & PUB ADDISON# & TOPIC
                        PARTICLE# (IN BOOKS
```

If two or more consecutive search terms in a compound search are identical, there is no need to repeat the search term each time. The following two requests have the same meaning to SPIRES.

```
TELL QSPIRES at SLACVM  FIN AUTHOR MARSHAK & A BARGER AND NOT A RYAN
                        (IN BOOKS

TELL QSPIRES at SLACVM  FIN A MARSHAK AND BARGER AND NOT RYAN (IN
                        BOOKS
```

SPIRES reads the command from left to right. If the operator OR appears in your request, be very careful with the order of search expressions. You can also stress the order of executions in a compound command by using parentheses (see Subsection 3.3.3 for similar examples in HEP).

ITERATIVE SEARCH

When a single search consists of several successive commands, it is called iterative. Although it takes more than one line to form an iterative request, it is still only one search; this is indicated by only one FIND verb.

```
TELL QSPIRES at SLACVM  FIN DATE> 85 (IN BOOKS
From SLACVM(QSPIRES):   * Result 2919 Books
TELL QSPIRES at SLACVM  AND PUB GORDON#
From SLACVM(QSPIRES):   * Result 12 Books
TELL QSPIRES at SLACVM  AND TOPIC PARTICLE#
From SLACVM(QSPIRES):   * Result 6 Books
```

If the search term is not changed from one line of an iterative search to the other, the search term does not have to be repeated. For example, to find all books in the SLAC Library published in 1990 or 1991, use

```
TELL QSPIRES at SLACVM  FIN DATE 90 (IN BOOKS
From SLACVM(QSPIRES):   * Result 472 Books
TELL QSPIRES at SLACVM  OR 91
```

```
From SLACVM(QSPIRES):    * Result 545 Books
```

Do not use the symbolic abbreviations &, &~, or | in iterative commands.

```
TELL QSPIRES at SLACVM  FIN DATE 90 (IN BOOKS
From SLACVM(QSPIRES):   * Result 472 Books
TELL QSPIRES at SLACVM  | 91
From SLACVM(QSPIRES):   * Unrecognized command |
```

Instead, use the full names, AND, AND NOT, and OR. At any point of your search, you can issue the BROWSE command to determine what kinds of values can be found in a given index. Do not forget to append (IN BOOKS to the line with the BROWSE command. Browsing does not interrupt your search.

```
TELL QSPIRES at SLACVM  FIN TITLE LES HOUCHES (IN BOOKS
From SLACVM(QSPIRES):   * Result 28 Books
TELL QSPIRES at SLACVM  AND SUBJECT STATISTICAL PHYSICS
From SLACVM(QSPIRES):   * Zero results, previous results retained.
TELL QSPIRES at SLACVM  BRO SUBJECT STATISTICAL PHYS (IN BOOKS
```

(QSPIRES now sends a list of 10 subject values alphabetically surrounding the term statistical phys. Among them, you will find the *correct* term.)

```
TELL QSPIRES at SLACVM  AND SUBJECT STATISTICAL MECH#
From SLACVM(QSPIRES):   * Result 2 Books
```

In a long iterative search, one can lose track of the criteria used up to that point. The SHOW SEARCH command (or SHO SEA) allows the user to review the search commands executed since the FIND command in the current search was issued. At the end of the above search, you can, e.g., issue the command

```
TELL QSPIRES at SLACVM  SHO SEA
From SLACVM(QSPIRES):   * Search command(s):
From SLACVM(QSPIRES):   * FIN TITLE LES HOUCHES
From SLACVM(QSPIRES):   * AND SUBJECT STATISTICAL MECH#
From SLACVM(QSPIRES):   * Result 2 Books (Subfile BOOKS)
```

The SHOW RESULT (SHO RES) is an alternative command which gives the same result as the SHOW SEARCH.

In an ongoing iterative search request, you can also use the BACKUP command, which will cause QSPIRES to replace the latest reported search result with the search result one step back, if one exists. For example, we can continue the above search by issuing the BACKUP command:

```
TELL QSPIRES at SLACVM  BACKUP
From SLACVM(QSPIRES):   * Result 28 Books
```

(However, you cannot go beyond the current search. The FIND command is the border one cannot cross:)

```
TELL QSPIRES at SLACVM  BACKUP
```

```
From SLACVM(QSPIRES):    * Backup not possible
```

5.1.4 DISPLAYING RECORDS FOUND BY A SEARCH

QSPIRES delays sending documents until you issue the OUTPUT command. When, in a search, you become satisfied with the search result, OUTPUT is a signal to QSPIRES that the search is completed and that you are ready to display the documents.

OUTPUT

By default, the results from the BOOKS database are sent to your e-mailbox. If, at the end of your search, you issue the OUTPUT (OUT for short) command, QSPIRES collects and arranges documents found through such a search, and automatically sends them to your e-mail address.

```
TELL QSPIRES at SLACVM   FIN TITLE CHAOS AND SUBJECT NONLINEAR# AND
                         D>87 (IN BOOKS
From SLACVM(QSPIRES):    * Result 8 Books
TELL QSPIRES at SLACVM   OUT
From SLACVM(QSPIRES):    * File being sent to you via NOTE, class M
```

You could have achieved the same effect by replacing OUTPUT with the OUTPUT (FILE command. Keep in mind that OUTPUT does not interrupt your search; after the documents were sent, you can continue by adding further criteria to your current search.

For the benefit of non-BITNET users who are unable to reach QSPIRES interactively, it is possible to combine the FIND and the OUTPUT in a single line.

```
TELL QSPIRES at SLACVM   FIN TITLE SCATTERING (IN BOOKS OUTPUT BRIEF
From SLACVM(QSPIRES):    * File being sent to you via NOTE, class M
```

We **strongly** discourage the use of this alternative by those QSPIRES users who have the capability to communicate interactively. Such users should first review the number of retrieved documents, and only then issue the OUTPUT command in a separate line.

OUTPUT (TYPE

By default, the results from the BOOKS database are sent to your e-mailbox. However, you can change this default by adding the option (TYPE to your OUTPUT command. If you do that, the result will be sent to you interactively.

```
TELL QSPIRES at SLACVM   FIN TITLE CHAOS AND SUBJECT NONLINEAR# AND
                         D>87 (IN BOOKS
From SLACVM(QSPIRES):    * Result 8 Books
TELL QSPIRES at SLACVM   OUT (TYP
```

(QSPIRES now sends the retrieved documents interactively to the screen of your terminal.)

Keep in mind that OUTPUT does not interrupt your search; after the documents are sent, you can continue by adding further criteria to your current search.

CHOOSING FORMAT FRAME

Two format frames are available for displaying results from the BOOKS database,

BRIEF	QSPIRES (default format)

The format called QSPIRES is the default format frame. If you do not make an attempt to specify the frame, the result will be displayed in the QSPIRES format.

The other format is called BRIEF. Unlike the BRIEF format in the HEP database, the BRIEF format in BOOKS is almost as complete as the default format. In fact, it sometimes takes more lines to display a result in the BRIEF format than in the default (QSPIRES) format.

There is a big advantage to using the BRIEF format in BOOKS. Aesthetically, the BRIEF format frame, with narrow lines, looks much better when displayed interactively than the result displayed with the other format. Furthermore, in the BRIEF format, you can retrieve many more documents than in the QSPIRES default format. Below you can see the present limits.

* When the results are to be sent interactively to the screen of a user's terminal:

- BRIEF format: 100 lines of text (usually, 15 documents)
- QSPIRES format: 10 documents

* When the results are to be sent as a file to the user's e-mailbox:

- BRIEF format: 300 documents
- QSPIRES format: 150 documents

To inform QSPIRES that you want to choose the BRIEF format, append the BRIEF option (alternatively, **USING** BRIEF) to your OUTPUT command:

```
TELL QSPIRES at SLACVM  OUTPUT (BRIEF
TELL QSPIRES at SLACVM  OUT (FIL USI BRIEF
TELL QSPIRES at SLACVM  OUTPUT (USING BRIEF TYP
```

The first two lines will instruct QSPIRES to send the result to your e-mailbox; the third one will produce an interactive reply. While FILE can be shortened to FIL, TYPE to TYP, and USING to USI, the format name **should not** be shortened.

If you want, for some reason, to name the default format explicitly, add USING QSPIRES to the option field. USING (or USI) is **required** with any format frame other than BRIEF.

ORDER OF THE RESULT

The default order of records retrieved in a search is nearly chronologically reversed, with more recent books on the top of a file or message. This default order may not be what you really want. The SEQUENCE option permits you to achieve a different order. For example, the documents could be sorted alphabetically, according to the first author: OUTPUT (FILE SEQUENCE AUTHOR, or OUT (SEQ A TYPE. Order by TITLE is an alphabetical ordering based on the first title-word of books: OUT (SEQUENCE T, or OUT (TYPE SEQ TITLE. The SEQUENCE COPYRIGHT-DATE puts the oldest documents at the beginning of a file, and the most recent ones at the end: OUT (SEQUENCE COPYRIGHT-DATE FIL, or OUTPUT (TYP SEQ D, etc. Note that in INST database, some of the abbreviated index names cannot be used as arguments of the SEQUENCE command. For example, while SEQ D or SEQUENCE COPYRIGHT-DATE works fine, the option SEQUENCE **DATE** is not allowed.

You do not have to use the default format frame with the SEQUENCE option. Change it, if you wish, by adding the BRIEF or USING BRIEF to the option field.

```
TELL QSPIRES at SLACVM  OUTPUT (SEQUENCE CD BRIEF
TELL QSPIRES at SLACVM  OUT (FIL USI BRIEF SEQ AUTHOR
TELL QSPIRES at SLACVM  OUTPUT (SEQ TITLE BRIEF TYP
```

The first two lines will instruct QSPIRES to send the result to your e-mailbox; the third one will produce an interactive reply. The order of options is not important. Be careful, however, not to separate an option from its argument.

5.2 CONF(ERENCE) DATABASE

The CONF(ERENCE) database is a catalog of past (since 1972) and forthcoming high energy physics conferences. It includes more than 4,000 listings for conferences, schools and workshops related to elementary-particle physics. General meetings of large professional societies of interest to the high energy physics community are also listed. This section describes elements of the search procedure in the CONF database.

5.2.1 INTERACTIVE SEARCH PROCEDURE

A typical, simple, one-step interactive search request will have the form

```
TELL QSPIRES at SLACVM  FIND <search-expression> (IN CONF
```

In a more intricate search, several search expressions might be linked by logical operators. The selection (IN CONF must be specified in the line with the FIND verb. The long form (IN CONFERENCE can also be used. The selection will remain in effect until a new search is initiated with your next FIND command. This means that, e.g., there is no need to repeat the phrase (IN CONF in a followup command of an iterative search, or with an OUTPUT command.

Each search expression must have a correctly stated search term (see Section 1.2). To get the list of search terms (and they coincide with the names of indexes in the CONFERENCE database), send one of the following commands to QSPIRES:

```
TELL QSPIRES at SLACVM  SHOW INDEXES (IN CONF
TELL QSPIRES at SLACVM  SHO SEA TER (IN CONFERENCE
TELL QSPIRES at SLACVM  SHO IND (FIL IN CONFERENCE
TELL QSPIRES at SLACVM  SHOW SEARCH TERMS (IN CONF FILE
```

The first two commands instruct QSPIRES to send the list interactively, while the option FILE in the last two tells QSPIRES to file the list and send it to your e-mailbox. The table below shows some of the indexes to be found in the returned list.

INDEX	ALLOWED ABBREV. AND VARIATIONS
CNUMBER	C, C#, CNUM, R
TITLE	T, TI, PROC, PROCEEDINGS, ED, EDITOR, PBN
PLACE	P, PL
BEGINNINGDATE	D, DATE
SUBJECT	S, K, KEY, KEYWORD, CN, CALL, CALLNUM, CT, CATCHTITLE
KEY-WORDS	KW
SPONSOR	SP, SPON
SLAC-NAMES	SLAC, SSC-NAMES, SSCN

The GOAL record, not listed above, is called CONFERENCE (and also CONFERENCES, or RECORD). The key value of the GOAL record is a randomly selected number. The GOAL record in this database is not indexed, and you cannot use it for searching. There are no *qualifiers* in the CONF database. Note that BEGINNING--DATE is a *simple* index, and not a *qualifier;* therefore, you can use it even in a primary search.

Almost all the relational operators described in Subsection 1.2.3 could be applied in the CONF database. The equality operator is the most efficient, and has the widest use. The inequality operators could be used most successfully in the BEGINNING-DATE searches, e.g., FIN D>= JULY 91 AND D <= SEPT 91 (IN CONF. Among the content operators, the recommended one is the PREFIX. Note, however, that in a request line, only **one** PREFIX per search term is allowed. The range operators, which are allowed only in searches with qualifiers, may not be used in this database because all the indexes are simple.

To determine the kind of values that could be used with a given simple index, issue the BROWSE command, e.g.,

```
TELL QSPIRES at SLACVM  BROWSE PLACE (IN CONF
TELL QSPIRES at SLACVM  BRO SUBJECT K DECAYS (IN CONFERENCE
TELL QSPIRES at SLACVM  BROWSE TITLE VIOLATION (IN CONF FILE
TELL QSPIRES at SLACVM  BRO SPONSOR (IN CONF
```

The result of the browse is sent to you interactively, unless you specify the FILE option. You can also use the BROWSE FIRST and BROWSE LAST commands (for description, see e.g., Subsection 1.2.4).

In most of the CONFERENCE indexes, searching for truncated values (the right truncation) is allowed. With the *word indexes* (e.g., the TITLE index), you can truncate more than one word:

```
TELL QSPIRES at SLACVM  FIND T UNIF# THEOR# (IN CONFERENCE
From SLACVM(QSPIRES):   * Result 36 Conferences
```

In *phrase indexes,* only one truncation sign per search value is allowed.

To learn more about the CONF database, send SHOW or EXPLAIN commands to QSPIRES. If you use the first two of the following commands, the answer will be sent to you interactively. The third and the fourth command will instruct QSPIRES to send the information to your e-mailbox.

```
TELL QSPIRES at SLACVM  SHOW SUBFILE DESCRIPTION (IN CONF
TELL QSPIRES at SLACVM  EXPLAIN CONF
TELL QSPIRES at SLACVM  SHO SUB DES (IN CONF FILE
TELL QSPIRES at SLACVM  EXP CONF (FIL
```

Do **not** use the long database name CONFERENCE with these commands; for some technical reasons, only the short name, CONF, works with the EXPLAIN and SHOW SUBFILE DESCRIPTION.

A simple search, with only one criterion specified, is not the only possibility in the CONF database. You can add more criteria, and narrow or expand the search in an iterative process:

```
TELL QSPIRES at SLACVM  FIND TITLE LEPTON (IN CONFERENCE
From SLACVM(QSPIRES):   * Result 29 Conferences
TELL QSPIRES at SLACVM  AND DATE AFTER 1988
From SLACVM(QSPIRES):   * Result 6 Conferences
```

(Note that the selection has to be displayed only in the line with the FIND verb.) Alternatively, you can state several criteria in a single line, by using the compound search.

```
TELL QSPIRES at SLACVM  FIN DATE> 85 AND KEY HADRON# AND NOT T
                        COLLISION# (IN CONF
From SLACVM(QSPIRES):   * Result 45 Conferences
```

In both iterative and compound searches, the logical operators AND, AND NOT, and OR describe how the criteria combine. If you lose track of the criteria used up to a given point in a search, apply the SHOW SEARCH or SHOW RESULT commands. You do not have to specify (IN CONF with these commands.

```
TELL QSPIRES at SLACVM  SHOW SEARCH
TELL QSPIRES at SLACVM  SHO RESULT
```

Once you have found records that meet all the criteria you have set, the records could be displayed (see Subsection 1.4.3 and 5.2.4). As always, you can choose to get the result either interactively, or via e-letter, the latter possibility being the default choice. Several format frames are available for displaying records found in the CONFERENCE database. To get the list of frames, issue

```
TELL QSPIRES at SLACVM  SHOW FRAMES (IN CONF
```

This will cause the list to be sent interactively. If you want a permanent record, append FILE to the option field:

```
TELL QSPIRES at SLACVM  SHO FRA (IN CONF FILE
```

Limits on the number of records that could be sent in BRIEF and other formats will be given in Subsection 5.2.4.

5.2.2 SIMPLE, ONE-STEP SEARCH

This section reviews searches in which only one search term is used. More intricate searches, with several criteria, are described in Subsection 5.2.3.

FIND TITLE (FIN T)

The TITLE index contains words from conference titles. However, this is not the only information you will find in this index; if conference proceedings were published, the title, editor(s), and publisher of the proceedings will be indexed in the TITLE index. For example, the following data for the SLAC's 16th Summer Institute are entered in the TITLE index:

16th SLAC Summer Institute on Elementary Particle Physics

PROBING THE WEAK INTERACTION: CP VIOLATION AND RARE DECAYS

Proceedings, Edited by Eileen Brennan, Stanford, Calif., SLAC, 1989

A TITLE search in which any of the words appearing above are used, including 16TH, ELEMENTARY, PROCEEDINGS, BRENNAN and even CALIF., will retrieve data on this meeting.

The TITLE index is a *word index*. This means that each word is indexed separately. Consequently, it is not necessary to use a complete title in a search; it is enough to know only one word of that title to be able to retrieve the corresponding record. You can also submit more than one word; ordering of the words in your search value is unimportant.

```
TELL QSPIRES at SLACVM   FIND TITLE SUMMER (IN CONF
From SLACVM(QSPIRES):    * Result 141 Conferences
TELL QSPIRES at SLACVM   FIN T 16# SUMMER PROCEED# STANFORD 1989 (IN
                         CONF
From SLACVM(QSPIRES):    * Result 1 Conference
```

Frequently occuring articles and conjunctions like *a, an, by, the, and,* etc., are ignored in the TITLE search. There is also a list of *reserved* symbols, which contains characters and symbols with special meanings for SPIRES. Whenever such a reserved symbol is used in a search value, the complete search value must be surrounded by quotation marks. The list of excluded and reserved symbols in the CONFERENCE database is almost identical to the one in HEP (see Subsection 2.2.2). The two lists differ only in the word *with*, which is excluded in HEP, but a valid search term in CONF database.

If you misspell the title-word or editor's name, QSPIRES will send the standard `No records found` ... answer; therefore, be careful with spelling. In the following example, the word *summer* is misspelled:

```
TELL QSPIRES at SLACVM   FIND TITLE SUMER (IN CONF
From SLACVM(QSPIRES):    * No records found which match search
                         criteria
```

When you are satisfied with the search result, you may choose to display it (see Subsection 5.2.4). Alternatively, you can add to or subtract from the result by continuing the search (see Subsection 5.2.3).

FIND EDITOR (FIN ED)

As mentioned above, editor(s) of conference proceedings are also listed in the TITLE index. It is not surprising that this index has so many names, e.g., TITLE, EDITOR, PROCEEDINGS, etc.; you may find it more convenient to search for EDITOR = <editor-name> than for TITLE = <editor-name>. It needs to be stressed that choosing one or the other name of the index is only a matter of convenience, because both searches will retrieve the same records:

```
TELL QSPIRES at SLACVM  FIND EDITOR BRENNAN (IN CONF
From SLACVM(QSPIRES):   * Result 5 Conferences

TELL QSPIRES at SLACVM  FIN TITLE = BRENN# (IN CONF
From SLACVM(QSPIRES):   * Result 5 Conferences
```

If you do not want to type somebody's long name, use only the first several significant characters and append the truncation sign. The same effect could be achieved with the PREFIX operator, e.g., FIN ED PRE TANNEN (IN CONF. If you are not certain about the spelling of some last name, try the BROWSE command.

```
TELL QSPIRES at SLACVM  BROWSE EDITOR FAISNER (IN CONF
```

QSPIRES will return interactively a list of 10 terms alphabetically surrounding the one you mentioned. The list will contain not only editors, but also the other words indexed in the TITLE index; with some luck, you will be able to find the right form. Use this correct name with your FIND command.

Please remember that the EDITOR (an alias for the TITLE) index, although it may list names, **is not** a *personal-name index*, but a *word index*. The difference between the two is explained in Subsection 1.2.4.

FIND PROCEEDINGS (FIN PROC)

If you know the title of some published proceedings and want to learn more about the corresponding conference, use the TITLE index, or—equivalently—the PROCEEDINGS index (PROCEEDINGS is another alias for TITLE).

```
TELL QSPIRES at SLACVM  FIND PROC INTERNAT# WORKSH# NEXT GENER#
                        COLLIDERS (IN CONF
From SLACVM(QSPIRES):   * Result 1 Conference
```

The retrieved result, when displayed, will tell you the full title, place, and date(s) of the conference. You may alternatively use the index name TITLE, and still get the same result.

FIND BEGINNING-DATE (FIN D)

The BEGINNING-DATE (or D, or DATE) index in the CONFERENCE database is a *simple index*. Unlike HEP, wherein the DATE index can be used only in a secondary search, here you are able to find a given date directly:

```
TELL QSPIRES at SLACVM  FIND DATE 11 AUG 1991 (IN CONF
From SLACVM(QSPIRES):   * Result 1 Conference
```

The BEGINNING-DATE index contains the beginning dates of conferences. The indexed values are in the form month/day/year. However, this index is a *date-index* (see Subsections 1.2.4 and 3.4.2), and in your search value, you can specify a date in various ways, e.g., FIN D MARCH 8, 1987 (IN CONF, FIN DATE 3/8/87 (IN CONF, FIN DATE 8TH MAR 1987 (IN CONFERENCE.

To get the list of all the conferences beginning in August 1991, request

```
TELL QSPIRES at SLACVM  FIND D = 8-91 (IN CONF
```

```
From SLACVM(QSPIRES):    * Result 14 Conferences
```

(The equal sign is optional.) Similarly, to find all the 1991 conferences, issue

```
TELL QSPIRES at SLACVM  FIND BEGINNING-DATE 1991 (IN CONFERENCE
```

Sometimes, it will be useful to use inequality signs in a search. To get a list of conferences to be held after a given date, write

```
TELL QSPIRES at SLACVM  FIN DATE>= JUN 92 (IN CONF
```

The other inequality operators described in Subsection 1.2.3 could also be used with the BEGINNING-DATE index. The words BEFORE and AFTER may replace the symbols <and>, respectively.

The following forms are also allowed:

```
TELL QSPIRES at SLACVM  FIND DATE LAST YEAR (IN CONF
TELL QSPIRES at SLACVM  FIN BEGINNING-DATE NEXT MONTH + 6 (IN CONF
```

The last phrase means 6 months after next month.

FIND PLACE (FIN P)

You can find all the past and/or future conferences in a given place (town, city, country other than USA, state in USA, etc.). If the place is a small town or a suburb, the large nearby city will also be indexed. The PLACE index is a *word index*. Here are several examples for the simple PLACE search:

```
TELL QSPIRES at SLACVM  FIND PLACE SIERRA NEVADA SPAIN (IN CONF
TELL QSPIRES at SLACVM  FIND P SANTA BARB# (IN CONF
TELL QSPIRES at SLACVM  FIN PL PRE LENIN (IN CONF
TELL QSPIRES at SLACVM  FIND PLACE CA (IN CONFERENCE
TELL QSPIRES at SLACVM  FIN P SINGAPOOR (IN CONF
```

The command FIN PLACE CA (IN CONF retrieves all past and future conferences in California, because CA is the zip code for this United States state. The last example will retrieve no records, because the name is spelled incorrectly. BROWSE the PLACE index to find the correct term:

```
TELL QSPIRES at SLACVM  BRO PLACE SINGAP (IN CONF
TELL QSPIRES at SLACVM  BROWSE P BRUXELLES (IN CONFERENCE
```

FIND SUBJECT (FIN S)

This index is useful if you have a complete list of the subjects (or keywords) assigned to conferences by the SLAC Library staff. To my knowledge, such a list is not widely distributed, and you might therefore be inclined not to make a SUBJECT search. If you still want to try it, use the BROWSE command first to get an idea of what kinds of values are indexed.

```
TELL QSPIRES at SLACVM  BRO SUBJECT QUANTUM (IN CONF
TELL QSPIRES at SLACVM  BROWSE S PARTICLE (IN CONF
TELL QSPIRES at SLACVM  BRO S STATISTIC (IN CONF
```

When you find an interesting subject, e.g., HIGH ENERGY PHYS 25TH SINGAPORE, keep in mind that the SUBJECT index is a *phrase index* (see Subsection 1.2.4). Consequently, you have to list a complete subject in your search value, not only particular words:

```
TELL QSPIRES at SLACVM  FIN SUBJECT HIGH ENERGY PHYS (IN CONF
From SLACVM(QSPIRES):   * No records found which match search
                        criteria
TELL QSPIRES at SLACVM  FIND S HIGH ENERGY PHYS 25TH SINGAPORE (IN
                        CONF
From SLACVM(QSPIRES):   * Result 1 Conference
```

Alternatively, use the truncation sign or the PREFIX operator to shorten the request: FIN S HIGH ENERGY PHYS# (IN CONF, FIN S PREFIX HEAVY IONS, etc. Only if you are totally desperate should you try the LIKE relational operator:

```
TELL QSPIRES at SLACVM  FIN SUBJECT LIKE ?FUTURE?COLLIDER? (IN
                        CONFERENCE
From SLACVM(QSPIRES):   * Result 1 Conference
```

However, this and similar searches will take a lot of CPU time. A much better solution is to search for topics through the KEY-WORDS index, see below.

FIND KEY-WORDS (FIN KW)

The values in this index are constructed from the individual words appearing in the SUBJECT index. If the subject WORKSHOP: KAON FACTORY VANCOUVER 1989 is assigned to a conference, the words WORKSHOP, KAON, FACTORY, VANCOUVER, and 1989 are indexed in the KEY-WORDS index. You will be able to retrieve related records by searching for:

```
TELL QSPIRES at SLACVM  FIND KEY-WORDS FACTORY (IN CONFERENCE
TELL QSPIRES at SLACVM  FIN KW FACTORY AND KAON (IN CONF
TELL QSPIRES at SLACVM  FIND KW WORKSHOP AND KAON AND FACTORY (IN
                        CONFERENCE
```

Technically, the second and the third examples do not represent simple searches, because the word AND was used to separate two search terms. The presence of AND is a consequence of a peculiarity characterizing the KEY-WORDS index in CONF. While in other *word indexes*, the Boolean AND is the assumed relational operator and there is no need to write it explicitly (compare, e.g., to searches in the TITLE index above), the KEY-WORDS index does not have this default built in. Therefore, the operator AND, which links keywords in your search request, should be put in explicitly.

The PREFIX search and right truncation are allowed in this index. All but the last of the following examples will successfully retrieve some useful information:

```
TELL QSPIRES at SLACVM  FIN KW PRE FUTUR AND COLLIDERS (IN CONF
TELL QSPIRES at SLACVM  FIN KW FUTUR# AND PRE COLLID (IN CONF
TELL QSPIRES at SLACVM  FIN KW FUTUR# AND COLLID# (IN CONF
TELL QSPIRES at SLACVM  FIN KW PRE FUTUR AND PRE COLLID (IN CONF
```

The last phrase above will fail, because two PREFIX operators are used with the same search term in the same line, which is forbidden.

You can also browse the KW index to learn what kinds of values are in it.

FIND CNUMBER (FIN C)

For classification purposes, every conference is given a unique conference number. The same number characterizes books (in the BOOKS database) and preprints (in the HEP database) related to the conference. The conference numbers in the CONFERENCE database are listed in the CNUMBER (C, CNUM) index. The indexed values are of the type C82/08/29; the letter C is followed by a two-digit year number, two-digit month number (08, not 8!), and two-digit day number, where day, month, and year correspond to the first day of a meeting or a conference. The CNUMBER uniquely identifies a conference. If two or more conferences begin on the same day, their CNUMBERs will have an additional digit. For example, C89/06/25.2 denotes the *second* conference that begun on June 25, 1989.

You will rarely use this index to search for a conference. If you know the beginning date, it makes more sense to search the BEGINNING-DATE index (see above). That is, with the BEGINNING DATE, you will not have to worry about additional digits for conferences beginning on the same date. A conference number is always displayed in the output; use this number in other databases, e.g., in HEP (see Subsection 2.2.7) and BOOKS (see Subsection 5.1.2) to find the documents related to that particular conference.

OTHER INDEXES IN THE CONF DATABASE

Sponsors of conferences are indexed in the SPONSOR (or SP) index. For example, FIND SP NATO (IN CONF will find all conferences sponsored by NATO. Browse the SPONSOR index to see the kinds of indexed values. This index is a *word index*.

The SLAC-NAMES (or SLAC, for short) index lists speakers from SLAC at a given conference. This is a *personal-name index*. The search FIN SLAC-NAMES PERL, M. (IN CONF will find conferences at which Martin Perl was an invited speaker, etc.

The PPF index in the CONF database shows the issue of the PPF publication in which a conference was announced.

The other indexes are of little or no interest to a general user. For example, DESY-CODE contains the DESY Library code for the conference; DATE-ADDED is a date index with the date when a conference was entered into the database, etc. If you have some spare time, please do browse and search these indexes; perhaps you will be able to find something interesting and useful.

5.2.3 CONTINUING A SEARCH

In the previous section, we covered the simple searches in the CONFERENCE database. If we have more than one criterion, we can formulate either an iterative or a compound search.

COMPOUND SEARCH

The compound search request is similar in form to the simple search. The criteria are listed in only one line; the request begins with the FIND command, and ends with the selection (IN CONF. The main difference is that a compound search has more than one search expression; the logical

operators AND, AND NOT, and OR are used to connect the search expressions. The symbolic abbreviations for logical operators are allowed.

```
TELL QSPIRES at SLACVM  FIN PLACE HAWAI# AND TITLE UNDERWATER AND D
                        1976 (IN CONF
From SLACVM(QSPIRES):   * Result 1 Conference
```

If two or more consecutive search terms in a compound search are identical, there is no need to repeat the search term each time. The following two requests have the same meaning to SPIRES.

```
TELL QSPIRES at SLACVM  FIN PLACE BRIGHTON OR PLACE SUSSEX (IN CONF
TELL QSPIRES at SLACVM  FIN PLACE BRIGHTON OR SUSSEX (IN CONF
```

SPIRES reads the command from left to right. If the operator OR appears in your request, be very careful with the order of search expressions. You can also stress the order of executions in a compound command by using parentheses (see Subsection 3.3.3 for similar examples in HEP).

ITERATIVE SEARCH

When a single search consists of several successive commands, it is called iterative. Although it takes more than one line to form an iterative request, it is still only one search; this is indicated by its having only one FIND verb.

```
TELL QSPIRES at SLACVM  FIN DATE> THIS YEAR (IN CONF
From SLACVM(QSPIRES):   * Result 194 Conferences
TELL QSPIRES at SLACVM  AND PLACE JAPAN
From SLACVM(QSPIRES):   * Result 10 Conferences
TELL QSPIRES at SLACVM  AND KW NUCLEUS AND COLL#
From SLACVM(QSPIRES):   * Result 1 Conference
```

If the search term is not changed from one line of an iterative search to another, the search term does not have to be repeated. For example, to find all the conferences announced for 1991 or 1992, use

```
TELL QSPIRES at SLACVM  FIN DATE 91 (IN CONF
From SLACVM(QSPIRES):   * Result 180 Conferences
TELL QSPIRES at SLACVM  OR 1992
From SLACVM(QSPIRES):   * Result 193 Conferences
```

Do not use the symbolic abbreviations &, &~, or | in iterative commands.

```
TELL QSPIRES at SLACVM  FIN DATE 90 (IN CONF
From SLACVM(QSPIRES):   * Result 305 Conferences
TELL QSPIRES at SLACVM  & TITLE ELECTRON LASER
From SLACVM(QSPIRES):   * Unrecognized command &
```

Instead, use the full commands AND, AND NOT, or OR. At any point of your search, you can issue the BROWSE command to determine what kinds of values can be found in a given index. Do not forget to append (IN CONF to the line with the BROWSE command. Browsing does not interrupt your search.

```
TELL QSPIRES at SLACVM  FIN TITLE HIGH ENERGY PHYSICS (IN CONF
From SLACVM(QSPIRES):   * Result 331 Conferences
TELL QSPIRES at SLACVM  AND SUBJECT ROCHESTER SERIES#
From SLACVM(QSPIRES):   * Zero results, previous results retained.
TELL QSPIRES at SLACVM  BRO SUBJECT ROCHESTER SER (IN CONF
```

(QSPIRES now sends a list of 10 subject values alphabetically surrounding the term rochester ser. Among them, you will find the correct term.)

```
TELL QSPIRES at SLACVM  AND SUBJECT ROCHESTER CONF#
From SLACVM(QSPIRES):   * Result 11 Conferences
```

In a long iterative search, one can lose track of the criteria used up to that point. The SHOW SEARCH command (or SHO SEA for short) allows the user to review the search commands executed since the FIND command in the current search was issued. At the end of the above search, you can, e.g., issue the command

```
TELL QSPIRES at SLACVM  SHO SEA
From SLACVM(QSPIRES):   * Search command(s):
From SLACVM(QSPIRES):   * FIN TITLE HIGH ENERGY PHYSICS
From SLACVM(QSPIRES):   * AND SUBJECT ROCHESTER CONF#
From SLACVM(QSPIRES):   * Result 11 Conferences (Subfile CONF)
```

The SHOW RESULT (SHO RES) is an alternative command which gives the same result as SHOW SEARCH.

In an ongoing iterative search request, you can also use the BACKUP command, which will cause QSPIRES to replace the latest reported search result with the search result one step back, if one exists. For example, we can continue the above search by issuing the BACKUP command:

```
TELL QSPIRES at SLACVM  BACKUP
From SLACVM(QSPIRES):   * Result 331 Conferences
```

(However, you cannot go beyond the current search. The FIND command is the border one cannot cross:)

```
TELL QSPIRES at SLACVM  BACKUP
From SLACVM(QSPIRES):   * Backup not possible
```

5.2.4 DISPLAYING RECORDS FOUND BY A SEARCH

QSPIRES delays sending documents until you issue the OUTPUT command. When, in a search, you become satisfied with the search result, the OUTPUT is a signal to QSPIRES that the search is completed and that you are ready to display the documents.

OUTPUT

By default, the results from the BOOKS database are sent to your e-mailbox. If, at the end of your search, you issue the OUTPUT (OUT for short) command, QSPIRES collects and arranges documents found through such a search, and sends them to your e-mail address automatically.

```
TELL QSPIRES at SLACVM  FIN TITLE PARTICLE PHYS# AND PLACE
                        DUBROVNIK (IN CONF
From SLACVM(QSPIRES):   * Result 10 Conferences
TELL QSPIRES at SLACVM  OUT
From SLACVM(QSPIRES):   * File being sent to you via NOTE, class M
```

You could have achieved the same effect by replacing OUTPUT with the OUTPUT (FILE command. Keep in mind that OUTPUT does not interrupt your search; after the documents were sent, you can continue by adding further criteria to your current search.

For the benefit of non-BITNET users who are unable to reach QSPIRES interactively, it is possible to combine FIND and OUTPUT in a single line.

```
TELL QSPIRES at SLACVM  FIN KEY-WORDS PHENOMENOL# AND UNIFIED (IN
                        CONF OUTPUT
From SLACVM(QSPIRES):   * File being sent to you via NOTE, class M
```

We strongly discourage the use of this alternative by those QSPIRES users who have the capability to communicate interactively. Such users should first review the number of retrieved documents, and only then issue the OUTPUT command in a separate line.

OUTPUT (TYPE

By default, the results from the CONFERENCE database are sent to your e-mailbox. However, you can change this default by adding the option (TYPE to your OUTPUT command. If you do this, the result will be sent to you interactively.

```
TELL QSPIRES at SLACVM  FIN DATE FEBRUARY 87 AND PLACE SCHLAD# (IN
                        CONF
From SLACVM(QSPIRES):   * Result 1 Conference
TELL QSPIRES at SLACVM  OUT (TYP
```

(QSPIRES now sends the retrieved documents interactively to the screen of your terminal.)

Keep in mind that OUTPUT does not interrupt your search; after the documents are sent, you can continue by adding further criteria to your current search.

CHOOSING A FORMAT FRAME

Three format frames are available for displaying results from the CONFERENCE database,

BRIEF PREVIEW1 (default format) DOWNLOAD

Unlike the BRIEF format in HEP database, the BRIEF format in INST is as complete as the default format. In fact, it sometimes takes more lines to display a result in the BRIEF format than in the zdefault format. The default format is called PREVIEW1. If you do not attempt to specify the frame, the result will be displayed in the PREVIEW1 format. The third format frame, DOWNLOAD, is designed for the use of the database caretakers.

There is a big advantage to using the BRIEF format in CONFERENCE. Aesthetically, the BRIEF format frame, with narrow lines, looks much better when displayed interactively than does the result displayed with the default format. Furthermore, in the BRIEF format, you can retrieve more documents than in the PREVIEW1 default format. Below, you can see the present limits.

* When the results are to be sent interactively to the screen of a user's terminal:

- BRIEF format: 100 lines of text (usually, 8 - 12 records)
- other formats: 10 records

* When the results are to be sent as a file, to the user's e-mailbox:

- BRIEF format: 300 records
- other formats: 150 records

To inform QSPIRES that you want to choose the BRIEF format, append the BRIEF option (alternatively, USING BRIEF) to your OUTPUT command:

```
TELL QSPIRES at SLACVM  OUTPUT (BRIEF
TELL QSPIRES at SLACVM  OUT (FIL USI BRIEF
TELL QSPIRES at SLACVM  OUTPUT (USING ERIEF TYP
```

The first two lines will instruct QSPIRES to send the result to your e-mailbox; the third one will produce an interactive reply. While FILE can be shortened to FIL, TYPE to TYP, and USING to USI, the format name **should not** be shortened.

If you want to use the DOWNLOAD format, or, for some reason, wish to name the default format explicitly, add USING DOWNLOAD or USI PREVIEW1 to the option field. USING (or USI) is required with any format frame other than BRIEF.

ORDER OF THE RESULT

The default order of records retrieved in a search is nearly chronological, with more recent conferences at the end of a file or message. The default order may not be what you want. The SEQUENCE option permits you to achieve a different order. For example, the records could be sorted alphabetically, according to the place: OUTPUT (FILE SEQUENCE PLACE or OUT (SEQ PL TYPE. Order by TITLE is an alphabetical order based on the first title-word of conferences: OUT (SEQUENCE T, or OUT (TYPE SEQ TITLE, etc. Note that in CONF database, some of the abbreviated index names cannot be used as arguments of the SEQUENCE command. For example, while SEQ PL or SEQUENCE PLACE works fine, the option SEQUENCE P is not allowed.

You do not have to use the default format frame with the SEQUENCE option. Change it, if you wish, by adding the BRIEF or USING BRIEF (or USING DOWNLOAD) to the option field.

```
TELL QSPIRES at SLACVM  OUTPUT (SEQUENCE SPONSOR BRIEF
TELL QSPIRES at SLACVM  OUT (FIL USI BRIEF SEQ PLACE
TELL QSPIRES at SLACVM  OUTPUT (SEQ TITLE BRIEF TYP
```

The first two lines will instruct QSPIRES to send the result to your e-mailbox; the third one will produce an interactive reply. The order of options is not important. However, be careful not to separate an option from its argument.

5.3 INST(ITUTIONS) DATABASE

The INST (or INSTITUTIONS) database is a catalog of high energy physics institutions. It contains about 4,000 listings for institutes, laboratories and university departments in which some research on elementary particle physics is performed. Addresses from six continents and almost one hundred countries are included. Browsing through the INST database enables you to find complete mailing addresses, and the relevant phone, telex, and fax-machine numbers. This section describes elements of the regular search procedure in the INST database. (A shortcut to the INST database, with the use of the WHEREIS command, is described in Subsection 5.5.4.)

5.3.1 INTERACTIVE SEARCH PROCEDURE

A typical, simple, one-step interactive search request will have the form

```
TELL QSPIRES at SLACVM  FIND <search-expression> (IN INST
```

In a more intricate search, several search expressions may be linked by logical operators. The selection (IN INST must be specified in the line with the FIND verb. The long form (IN INSTITUTIONS can be used as well. The selection will remain in effect until a new search is initiated with your next FIND command. This means, e.g., that there is no need to repeat the phrase (IN INST in a followup command of an iterative search.

Each search expression must have a correctly stated search term (see Section 1.2). To get the list of search terms (and they coincide with the names of indexes in the INST database), send one of the following commands to QSPIRES:

```
TELL QSPIRES at SLACVM  SHOW INDEXES (IN INST

TELL QSPIRES at SLACVM  SHO SEA TER (IN INSTITUTIONS

TELL QSPIRES at SLACVM  SHO IND (IN INST FIL

TELL QSPIRES at SLACVM  SHOW SEARCH TERMS (IN INSTITUTIONS FILE
```

The first two commands instruct QSPIRES to send the list interactively, while the option FILE in the last two tells QSPIRES to file the list and send it to your e-mailbox. The table below shows some of the indexes that will be found in the returned list.

INDEX	ALLOWED ABBREV. AND VARIATIONS
ADDRESS	A, ADD, ADDR, ADDRESS.WORDS
CATCHPHRASE	ICNCP
INSTITUTION	INST, AF, AFF, AFFILIATION, ICN, INST.CATCH.NAME
REPORT.CODE	RC
COUNTRY.CODE	CC
NODE	BN, BITNET, BITNET.NODE

The GOAL index, not listed above, is called RECORD (and also KEY, or RECORDS). The key value of the GOAL index is a randomly selected number. There are no *qualifiers* in the INST database.

Almost all the relational operators described in Subsection 1.2.3 could be applied in the INST database. However, we do not recommend the use of the inequality relational operators. The equality operator is the most efficient, and has the widest use. Among the content operators, the recommended one is the PREFIX. Note, however, that in a request line, only one PREFIX per search term is allowed. The range operators, which are allowed only in searches with qualifiers, may not be used in this database because all the indexes are simple.

To determine the kinds of values that could be used with a given simple index, use the BROWSE command, e.g.,

```
TELL QSPIRES at SLACVM  BROWSE ICNCP (IN INSTITUTIONS
TELL QSPIRES at SLACVM  BRO ADDRESS WUPPER (IN INST
TELL QSPIRES at SLACVM  BROWSE REPORT.CODE (IN INST FILE
TELL QSPIRES at SLACVM  BRO AF PADOVA (IN INST
```

The result of the browse is sent to you interactively, unless you specify the FILE option. You can also use the BROWSE FIRST, and BROWSE LAST commands (for description see, e.g., Subsection 1.2.4).

In most of the INST indexes, searching for truncated values (the right truncation) is allowed. With *word indexes* (e.g., the ADDRESS and INSTITUTION indexes), you can truncate more than one word:

```
TELL QSPIRES at SLACVM  FIND INSTITUTION SEOUL# NAT# (IN INST
From SLACVM(QSPIRES):   * Seoul National U. (6157)
From SLACVM(QSPIRES):   * Seoul National Univ.
From SLACVM(QSPIRES):   * Dept. of Physics, etc.
```

In *phrase indexes*, only one truncation sign per search value is allowed.

The above example shows that the result of a search is immediately sent to the screen of your terminal; you do not have a chance to review the number of retrieved records first. This is **contrary**

to the situation in the HEP, BOOKS and CONF databases, where sending the collected records begins only when the OUTPUT command is issued. We shall discuss this peculiarity later in the section.

To learn more about the INST database, send the SHOW or EXPLAIN commands to QSPIRES. If you use the first two of the following phrases, the answer will be sent to you interactively. The third and the fourth command will instruct QSPIRES to send the information to your e-mailbox.

```
TELL QSPIRES at SLACVM  SHOW SUBFILE DESCRIPTION (IN INSTITUTIONS

TELL QSPIRES at SLACVM  EXPLAIN INSTITUTIONS

TELL QSPIRES at SLACVM  SHO SUB DES (IN INSTITUTIONS FILE

TELL QSPIRES at SLACVM  EXP INSTITUTIONS (FIL
```

Do **not** use the short database name INST with these commands; for some technical reasons, only the long name, INSTITUTIONS, works with the EXPLAIN and SHOW SUBFILE DESCRIPTION.

A simple search, with only one criterion specified, is not the only possibility in the INST database. You can, e.g., state several criteria in a single line, by using the compound search. For example, you can combine the ADDRESS and the COUNTRY.CODE to retrieve information on an original, UK Cambridge address, not the US copycat:

```
TELL QSPIRES at SLACVM  FIN ADDRESS CAMBRIDGE AND CC UK (IN INST

From SLACVM(QSPIRES):   * Cambridge U., Cavendish Lab (990)

From SLACVM(QSPIRES):   * Univ. of Cambridge

From SLACVM(QSPIRES):   * High Energy Physics Group , etc.
```

(QSPIRES now sends a list of four Cambridge institutions interactively.)

Because your FIND command causes an immediate display of the result (see above), usually it makes no sense to add more criteria and narrow or expand the search in an iterative way. However, the iterative search is not forbidden, and if you wish, you can continue a search even after the result has been already displayed.

```
TELL QSPIRES at SLACVM  FIND ADDRESS HAMBURG (IN INST

From SLACVM(QSPIRES):   * DESY (1619)

From SLACVM(QSPIRES):   * Deutsches Electron Synchroton, etc.
```

(QSPIRES now sends a list of 11 institutions from Hamburg interactively, but you forgot to write down the interesting one! Simply continue the search ->)

```
TELL QSPIRES at SLACVM  AND ADDRESS INST# PHYS#

From SLACVM(QSPIRES):   * Hamburg U. (2283)

From SLACVM(QSPIRES):   * Univ. Hamburg

From SLACVM(QSPIRES):   * Inst. Physik,etc.
```

Note that the selection (IN INST was explicitly written only in the line with the FIND verb.

There is an even better and more efficient way to use the database. If you expect a large list of addresses which will have to be narrowed eventually, use the option RESULT (or RES for short) to instruct QSPIRES to send only a number of retrieved institutions, not their complete listings:

```
TELL QSPIRES at SLACVM  FIND ADDRESS HAMBURG (IN INST RESULT
```

```
From SLACVM(QSPIRES):    * Result 11 Records
```

(At this point, you can issue your next criterion. If you append (RESULT to your followup question again, only a number of newly retrieved institutions will be returned; if you do not use the option (RESULT, a complete listing will be sent ->)

```
TELL QSPIRES at SLACVM  AND ADDRESS INST# PHYS#

From SLACVM(QSPIRES):    * Hamburg U.(2283), etc.
```

In both iterative and compound searches, the logical operators AND, AND NOT, and OR describe how the criteria combine.

As illustrated above, the retrieved information is, by default, displayed interactively. If you want the information to be sent to your e-mailbox, change the default by attaching FILE to the option field. Use, e.g., one of the forms below:

```
TELL QSPIRES at SLACVM  FIND <search-expression> (IN INST FILE

TELL QSPIRES at SLACVM  FIND <search-expression> (FILE IN
                        INSTITUTIONS
```

Only one format frame is available to display records found in the INST database. This default format is called BRIEF. To get the frame name, type

```
TELL QSPIRES at SLACVM  SHOW FRAMES (IN INST
```

This will cause the format name to be sent interactively. If you want a permanent record, append the FILE to the option field:

```
TELL QSPIRES at SLACVM  SHO FRA (IN INST FILE
```

Limits on the number of the INSTITUTIONS records that could be sent in the BRIEF format will be given in Subsection 5.3.4.

5.3.2 SIMPLE SEARCH

This section reviews searches in which only one search term is used. More intricate searches, with several criteria, are described in Subsection 5.3.3.

FIND ADDRESS (FIN A)

The ADDRESS index is a *word index*. It contains words describing a complete mailing address of a given institution. If you know only some elements of the address, e.g., a town (a street will also do!), or a partial name of an institution, this is an index for you. You can list several words, but avoid the most common elements, like UNIV#, DEPT., PHYS#, STR#, AVE#, unless there is a specific reason to use them. Names of countries having many physics institutions should also be avoided.

Below is the complete information from the INST database on McGill University in Montreal.

```
McGill U. (4006)
McGill Univ.                    Ph: 1 514 3986494
Physics Dept.                   FTS: OFF NET Operator: 832f
```

Rutherford Physics Bldg. Telex: 526 8510
3600 University Ave. Fax: 1 514 3983733
Montreal, PQ, Canada H3A 2T8

The column directly beneath the institution code number (4006) represents the address. All words appearing in this column are indexed, including UNIV., RUTHERFORD, BLDG., MONTREAL, and even H3A. By using any combination of these words in your ADDRESS search, you will retrieve information on McGill University.

```
TELL QSPIRES at SLACVM  FIN A MCGILL MONTREAL (IN INST
From SLACVM(QSPIRES):   * McGill U. (4006)
From SLACVM(QSPIRES):   * McGill Univ.
From SLACVM(QSPIRES):   * Physics Dept., etc.
```

(QSPIRES sends the complete information interactively.)

A shortcut to the INSTITUTIONS database is described in Subsection 5.5.4. It allows one to obtain the same results with somewhat less typing:

```
TELL QSPIRES at SLACVM  WHEREIS MONTREAL MCGILL
TELL QSPIRES at SLACVM  WHEREIS ZEEMAN LAB# AMSTERDAM
```

The WHEREIS command here does the same as the command FIND ADDRESS ... (IN INST.

FIND CATCHPHRASE (FIN ICNCP)

This index is a *phrase index*. It contains official SPIRES short catch-names of institutions. Note that in the HEP database, the identical short names describe author's affiliations. The CATCHPHRASE index is not very useful as an independent search tool in the INST database, but becomes extremely important in combination with HEP searches. Consider the following example. You begin a search in the HEP database by trying to find an interesting title:

```
TELL QSPIRES at SLACVM  FIND TITLE DILEPTON CROSS-SECTION AND D
                        THIS YEAR
From SLACVM(QSPIRES):   * Result 1 Document
TELL QSPIRES at SLACVM  OUT (TYPE
From SLACVM(QSPIRES):   * ADDITIONAL Z CONTRIBUTIONS TO THE
                        ACCOMPANIED
From SLACVM(QSPIRES):   * DILEPTON CROSS-SECTION AT E+ E-
                        COLLIDERS.
From SLACVM(QSPIRES):   * By F. Diakonos, G. Katsilieris
                        (Democritos Nuclear Research Center), etc.
```

At this point, you may decide that it would be useful to contact the authors. But, how to decipher their address from this cryptic Democritos Nuclear Research Center? Nothing is easier than that: use the CATCHPHRASE index in the INSTITUTIONS database to get the complete name and address of the institution:

```
TELL QSPIRES at SLACVM  FIN ICNCP Democritos Nuclear Research
                        Center (IN INST
```

```
From SLACVM(QSPIRES):    * Democritos Nuclear Research Center (1597)
From SLACVM(QSPIRES):    * N.R.C. Democritus
From SLACVM(QSPIRES):    * P.O. Box 60228
From SLACVM(QSPIRES):    * Aghia Paraskevi, etc.
```

Since the CATCHPHRASE index is a *phrase index*, you must use the complete short name in your search value; listing only some of the words will not help. If you do not like the idea of typing the entire name, you can utilize the PREFIX operator, or the right truncation symbol:

```
TELL QSPIRES at SLACVM   FIN CATCHPHRASE PREFIX DEMOCRITOS N (IN
                         INST
TELL QSPIRES at SLACVM   FIN ICNCP DEMOCRITOS NUCL# (IN INST
```

Could the search term DEMOCR# NUCL# be used with the ICNCP index? No! This *phrase index* allows only one right truncation, and more than one would not be tolerated.

Note that the periods denoting abbreviations in this index (e.g., in UNIV., U., DEPT., MATH., ENG., SCI., etc.) are optional; you could also skip them, and write UNIV, U, DEPT, MATH, ENG, SCI, etc., in your search expressions.

If you really insist on making an independent INST search with the CATCHPHRASE index, browse the index first to get an idea on what kinds of values are indexed:

```
TELL QSPIRES at SLACVM   BRO CATCHPHRASE NATIONAL (IN INST
```

FIND INSTITUTION (FIN INST)

The INSTITUTION (or INST) index in the INSTITUTIONS database (hmm, this becomes pretty confusing, doesn't it?) is a *word index* containing the same information as the CATCHPHRASE index. However, while in the latter, the short institutions' names are indexed as *phrases*, the INSTITUTION index has each word from the short name indexed separately. For example, the short name PACIFIC SIERRA RESEARCH LOS ANGELES is indexed with five words (PACIFIC, SIERRA, etc.) in the INSTITUTION index. You can retrieve the information by using any combination of these words, e.g.:

```
TELL QSPIRES at SLACVM   FIND INST LOS ANG# SIERRA RES# (IN INST
From SLACVM(QSPIRES):    * Pacific-Sierra Research, Los Angeles
                         (31976)
From SLACVM(QSPIRES):    * Pacific Sierra Research Corp., etc.
```

It does not make too much sense to use this index in an independent search of the INSTITUTIONS database (use rather the ADDRESS index). However, as with the CATCHPHRASE index, if you happen to know the official short name of an institution (e.g., from the HEP database), this index will help you to relate the short name to the complete name and address.

Note that the often-repeated abbreviations U and U. (for university) are the excluded words for the INSTITUTION index. Therefore,

```
TELL QSPIRES at SLACVM   FIND INST U (IN INST
From SLACVM(QSPIRES):    * No records found which match search
                         criteria
```

A shortcut to the INSTITUTIONS database is described in Subsection 5.5.4. It allows one to obtain some of the results with less typing. For example, instead of FIND INST SIERRA RES# LOS ANG# (IN INST, you can use

```
TELL QSPIRES at SLACVM  WHEREIS SIERRA RES# LOS ANG#
```

The WHEREIS command does the same here as does the command FIND INSTITUTION ... (IN INST.

Browsing through the INSTITUTION index will show you some of the words from which the institutions' short names are composed.

FIND REPORT.CODE (FIN RC)

This index is very useful when you know a preprint number, and want to determine the place of origin of that preprint. For example, your search of literature (or search in HEP) revealed an interesting preprint with the report number beginning with the letter code OITS, and you wonder where this preprint comes from. Use the REPORT.CODE index to figure it out:

```
TELL QSPIRES at SLACVM  FIND RC OITS (IN INST
From SLACVM(QSPIRES):   * Oregon U. (5070)
From SLACVM(QSPIRES):   * Univ. of Oregon
From SLACVM(QSPIRES):   * Dept. of Physics
From SLACVM(QSPIRES):   * Eugene, OR 97403
```

The retrieved result shows the address to which your request for a preprint should be sent.

OTHER INDEXES IN INSTITUTIONS DATABASE

The other indexes in this database are of little or no interest to a general user. For example, DESY.AFF is a *word index* containing words describing the institutions' short names used in DESY Library publications. BITNET.NODE index contains names of some BITNET as well as some INTERNET nodes corresponding to major laboratories and institutions. (For electronic-mail addresses of individual users, search the HEPNAMES database with the QUERY command; see Subsection 5.5.2.) the COUNTRY.CODE index contains two-letter codes assigned to countries of institutions. You can use this index to get the list of all institutions from a given country. For example, the command FIN CC BR (IN INST FILE will instruct QSPIRES to send to your e-mailbox the addresses of all Bulgarian labs and institutions related to high energy physics. Browse all the other indexes to see whether you can find any interesting information in them.

5.3.3 CONTINUING A SEARCH

As already mentioned in Subsection 5.3.1, the INSTITUTIONS database is not particularly suitable for iterative searches. Unless you append the option RESULT to your initial FIND command, the addresses are returned to you even before you have a chance to review whether you want that many records or not. Still, occasionally, you will be in a situation to continue a search in an iterative way. When you have more than one criterion, you can also use a compound search to retrieve the required information.

COMPOUND SEARCH

The compound search request is similar in form to the simple, one-step search. The criteria are listed in only one line; the request begins with the FIND command, and ends with the selection (IN INST. The main difference is that a compound search has more than one search expression; the logical operators AND, AND NOT, and OR are used to link the search expressions. Symbolic abbreviations for logical operators are allowed. To find data on institutions from either St. Paul or Minneapolis, write

```
TELL QSPIRES at SLACVM  FIN A ST# PAUL OR A MINNEAPOLIS AND CC US
                        (IN INST
```

(QSPIRES interactively sends a list of 7 institutions.)

If two or more consecutive search terms in a compound search are identical, there is no need to repeat the search term each time:

```
TELL QSPIRES at SLACVM  FIN ADDRESS ST# PAUL OR MINNEAPOLIS AND CC
                        US (IN INST
```

(QSPIRES interactively sends the same list as in the previous example.)

QSPIRES always reads your command from left to right. If the operator OR appears in the request, be very careful with the order of search expressions. You can stress the order of executions in a compound command by using parentheses (see Subsection 3.3.3 for similar examples in HEP).

ITERATIVE SEARCH

When a single search consists of several successive commands, it is called iterative. Although it takes more than one line to form an iterative request, it is technically still only one search; that is indicated by only one FIND verb. Unless you add the option RESULT, each line of your iterative search will invoke a complete output of the collected information:

```
TELL QSPIRES at SLACVM  FIN CC NO (IN INST
From SLACVM(QSPIRES):   * Norway, Agric. Coll. (4944), etc.
```

(QSPIRES now sends a list of 17 institutions interactively.)

```
TELL QSPIRES at SLACVM  AND ADDRESS TRONDHEIM
From SLACVM(QSPIRES):   * Trondheim U. (7188)
From SLACVM(QSPIRES):   * Univ. of Trondheim
From SLACVM(QSPIRES):   * Inst. of Phys., etc.
```

(QSPIRES now sends a list of 3 institutions interactively.)

You can avoid this unnecessary sending of data by simply adding the term RESULT (or RES) to the option field:

```
TELL QSPIRES at SLACVM  FIN CC NO (IN INST RESULT
From SLACVM(QSPIRES):   * Result 17 Records
TELL QSPIRES at SLACVM  AND ADDRESS TRONDHEIM (RES
From SLACVM(QSPIRES):   * Result 3 Records
```

(At this point, you may issue the OUTPUT (TYPE command to get the retrieved information interactively.)

If a search term is not changed from one line of an iterative search to the other, the search term does not have to be repeated. Do not use the symbolic abbreviations &, &~, or | in iterative commands. At any point of your search, you can issue the BROWSE command to determine what kinds of values can be found in a given index. Do not forget to append (IN INST to the line with the BROWSE command. Browsing does not interrupt your search.

In an ongoing iterative search request, you can also use the BACKUP command, which will cause QSPIRES to replace the latest reported search result with the search result one step back, if one exists.

5.3.4 DISPLAYING RESULTS OF A SEARCH

In the HEP, BOOKS, and CONF databases, QSPIRES waits for your OUTPUT command before it sends the collected information. In the INSTITUTIONS database, QSPIRES usually does not delay sending the retrieved addresses; the default is: `send immediately in the BRIEF format whatever is found`, and you can change this merely by appending the option RESULT to your search request. The OUTPUT command is needed only if the RESULT option is used.

OUTPUT

If you want to review the number of retrieved records before you allow the display, use the RESULT option. If what you see pleases you, issue the OUTPUT command in the next line. OUTPUT (TYPE forces QSPIRES to send the collected information interactively to the screen of your terminal. Similarly, the command OUTPUT, as well as OUTPUT (FILE, instructs QSPIRES to send the addresses to your e-mailbox.

```
TELL QSPIRES at SLACVM  FIN ADDRESS TRIESTE (IN INST RESULT
From SLACVM(QSPIRES):   * Result 13 Records
TELL QSPIRES at SLACVM  OUT
From SLACVM(QSPIRES):   * File being sent to you via NOTE, class M
TELL QSPIRES at SLACVM  OUT (TYP
From SLACVM(QSPIRES):   * Brescia U. (9849)
From SLACVM(QSPIRES):   * Univ. Cattolica di Brescia, etc.
```

(QSPIRES now sends addresses of the first 10 institutions interactively.)

Keep in mind that none of these OUTPUT commands interrupt your search; after the documents were sent, you can continue your current search by adding further criteria.

LIMITS ON NUMBER OF DISPLAYED RECORDS

Only one format frame is available for displaying results from the INST database, the BRIEF format. Whether you use the command OUTPUT or the default *rush-immediately-whatever-is-found* way of displaying the information, the addresses will be sent in this BRIEF format. However, unless you explicitly specify BRIEF in the option field of your OUTPUT command, QSPIRES stubbornly assumes that your chosen format is something else. Consequently, the server puts

stricter restrictions on the number of the displayed records. To the best of my knowledge, here are the present limits on the number of addresses that could be sent either interactively or to your e-mailbox.

* When the results are to be sent interactively to the screen of a user's terminal:

- with

```
FIND <...> (IN INST      100 lines of text (usually, 15-20 records)
```

- with

```
OUTPUT (TYPE             10 addresses
```

- with

```
OUTPUT (TYPE BRIEF       100 lines of text (usually, 15-20 records)
```

* When the results are to be sent as a file to the user's e-mailbox:

- with

```
FIND <...> (IN INST FILE          200 addresses
```

- with

```
OUTPUT (FILE             150 addresses
```

- with

```
OUTPUT (FILE BRIEF       300 addresses
```

If you require more addresses than QSPIRES is willing to send, it reacts. Here are some possible QSPIRES' responses:

```
TELL QSPIRES at SLACVM   FIN CC US (IN INST
From SLACVM(QSPIRES):    * Your search result of 1023 records
                         exceeds the
From SLACVM(QSPIRES):    * maximum return of 200 records. Modify
                         your search
From SLACVM(QSPIRES):    * criteria to isolate a smaller selection
                         of records
From SLACVM(QSPIRES):    * and re-issue the command. Sorry for
                         inconvenience.

TELL QSPIRES at SLACVM   FIN ADDRESS GERMANY OR FRANCE (IN INST RES
From SLACVM(QSPIRES):    * Result 295 Records
TELL QSPIRES at SLACVM   OUTPUT
From SLACVM(QSPIRES):    * File being sent to you via NOTE, class M
From SLACVM(QSPIRES):    * 295 records found (limit of 150 sent)
```

ORDER OF THE RESULT

The default order of records retrieved in a search may not be what you want. The SEQUENCE option permits you to achieve a different order. For example, the records could be sorted alphabetically, according to the country code: OUTPUT (FILE SEQUENCE CC or OUT (SEQ

CC TYPE. The SEQUENCE by REPORT.CODE produces an alphabetical order based on the codes found on preprints from given institutions: OUT (SEQUENCE RC or OUT (TYPE SEQ REPORT.-CODE, etc. The order of options in your commands is not important; be careful, however, not to separate an option from its argument.

5.4 HITECH DATABASE

Although, officially, the HITECH database is only an index to manufacturers' and distributors' catalogs available in the SLAC (Technical Data) Library, this database may serve as an excellent guide to high-technology products, and addresses of their distributors and manufacturers. The database has almost 7,000 company names, and could be searched through several search terms (=indexes).

A list of these indexes may be obtained interactively with the command

```
TELL QSPIRES at SLACVM  SHOW INDEXES (IN HITECH
```

The current list, which contains six *simple* indexes and no *qualifiers*, is shown below:

INDEX	ALLOWED ABBREV. AND VARIATIONS
COMPANY	CO
ADDRESS	A, AD, ADD, ADDR, C
PRODUCT	PR, PROD
TRADE-NAME	TN
PRODUCT-WORD	PW, PWORD, TNW, TRADE-NAME-WORD
ZIPCODE	Z, ZI, ZIP

The goal record is called FIRM; it is not indexed, and cannot be used as a search term.

The COMPANY index (CO, for short) is a *word index*; it contains words found in companies' titles, e.g., CO., HEWLETT and PACKARD for the Hewlett Packard Co., or CORP., GAERTNER, and SCIENTIFIC for the Gaertner Scientific Corp., etc. A search in the COMPANY index will retrieve not only the named company, but also all the manufacturers and distributors closely related to the named company. Therefore, do not be surprised when, with the search term SONY, you get back not only the address of the Sony Corporation, but also data on ten other closely related businesses.

The ADDRESS index (or A) is another *word index*, containing all the words found in a mailing address of a company, including the company's name, street name and number, city, and country (or the two-letter postal code, for US states). However, zip-code numbers are not in the ADDRESS index.

The PRODUCT index (or PR) contains descriptive names of products manufactured or sold by a given company. Such names could be, e.g., EYEWEAR, PROTECTIVE, OVERLOAD DEVICES, FUSES, TELECOMMUNICATION, etc. Similarly, the TRADE-NAME index (TN) lists products by

trade-names. For example, in this index you can search for HIDE A BOARD, SAFE-GARD, or CADILLAC trade names. Both the TRADE-NAME and PRODUCT indexes are *phrase indexes.*

The PRODUCT-WORD index (or PW) is composed from words found in both PRODUCT and TRADE-NAME indexes. However, while the latter two are *phrase indexes,* the PRODUCT-WORD index is a *word index.* If you do not know whether a product has a trade or a generic name, the easiest way to find information on that product is to use the PRODUCT-WORD index. Similarly, if you do not know the complete phrase describing a trade name or a generic name, just choose the most likely word(s) corresponding to the product, and search the PRODUCT-WORD index.

The ZIP-CODE index (or Z) can help you find US companies by the zip codes in their addresses.

It is always a good idea to browse through a given index first, to see whether a word or phrase you are thinking of is indexed. To get the result of a browse interactively, use, e.g.,

```
TELL QSPIRES at SLACVM  BRO TRADE-NAME RAY (IN HITECH
```

There is only one format frame available for displaying the retrieved results, and it is called HITECH.ADDRESS. You do not have to remember this name; the format, being unique, is set automatically.

Limits on the number of retrieved records that could be sent by QSPIRES are listed as follows:

- with

  ```
  OUTPUT (TYPE            10 records
  ```

- with

  ```
  OUTPUT (FILE            150 records
  ```

Please send reference questions and inquiries regarding manufacturers catalogs, this database, and specifications and standards to Tech Data Librarian, Ms. Shirley Livengood-Fay, SLAC—Mail Stop 82, Stanford, CA 94309, USA (e-mail address: LISLL@SLACVM.BITNET).

5.4.1 SAMPLE SESSION IN HITECH

If you want to find information on a high-tech product, e.g., where to buy it or who the manufacturer is, the preferred way is to use the PRODUCT-WORD (or PW) index.

```
TELL QSPIRES at SLACVM  FIND PRODUCT-WORD WAVEGUID# (IN HITECH
From SLACVM(QSPIRES):   * Result 27 Firms

TELL QSPIRES at SLACVM  FIN PW TEFLON (IN HITECH
From SLACVM(QSPIRES):   * Result 47 Firms

TELL QSPIRES at SLACVM  FIND PW RAYOVAC (IN HITECH
From SLACVM(QSPIRES):   * No records found which match search
                        criteria
TELL QSPIRES at SLACVM  BROWSE PW RAYOVAC (IN HITECH
```

(QSPIRES now sends a list of 10 words alphabetically surrounding the term rayovac. Among them, you will find the correct term.)

```
TELL QSPIRES at SLACVM  FIND PW RAY-O-VAC (IN HITECH
From SLACVM(QSPIRES):   * Result 1 Firm
```

To find a company, use either the ADDRESS (A) or the COMPANY (CO) indexes.

```
TELL QSPIRES at SLACVM  FIND CO ELECTROID (IN HITECH
From SLACVM(QSPIRES):   * Result 2 Firms

TELL QSPIRES at SLACVM  FIN CO PREFIX HEWLETT (IN HITECH
From SLACVM(QSPIRES):   * Result 22 Firms

TELL QSPIRES at SLACVM  FIND ADDRESS COPERTINO (IN HITECH
From SLACVM(QSPIRES):   * No records found which match search
                        criteria
TELL QSPIRES at SLACVM  FIND A CUPERTINO (IN HITECH
From SLACVM(QSPIRES):   * Result 11 Firms

TELL QSPIRES at SLACVM  FIND (ADDRESS 16 or 16TH) AND (ST. OR
                        STREET) (IN HITECH
From SLACVM(QSPIRES):   * Result 10 Firms
```

The ZIP-CODE (Z) index may help you narrow a search to just one area of the country. For example,

```
TELL QSPIRES at SLACVM  FIND CO IBM OR ADDRESS IBM (IN HITECH
From SLACVM(QSPIRES):   * Result 25 Firms
TELL QSPIRES at SLACVM  AND Z PREFIX 941
From SLACVM(QSPIRES):   * Result 1 Firm
```

The usual rules for iterative and compound searches also apply to the HITECH database. For details, see Subsection 1.4.1.

QSPIRES delays sending information until you issue the OUTPUT command. Your OUTPUT or OUTPUT (FILE will send a result to your e-mailbox. The command OUTPUT (TYPE will instruct QSPIRES to send the result interactively. For example,

```
TELL QSPIRES at SLACVM  FIND ADDRESS ELM ST# (IN HITECH
From SLACVM(QSPIRES):   * Result 10 Firms
TELL QSPIRES at SLACVM  AND PRODUCT-WORD CUTTING TOOLS
From SLACVM(QSPIRES):   * Result 1 Firm
TELL QSPIRES at SLACVM  OUT (TYP
From SLACVM(QSPIRES):   * O.K. Tool Co., Inc.
From SLACVM(QSPIRES):   * 177 Elm St.
From SLACVM(QSPIRES):   * Milford, NH 03055 , etc.
```

Note that under the heading `TDL Holdings`, the displayed result will list the most recent catalog(s) related to that company, which are available in the Technical Data Library at SLAC.

5.5 SERIALS DATABASE

In the `SERIALS` database, you can find the holdings, location and references for all the serials in the SLAC Library. This database may serve as an excellent guide to journals covering high energy physics and related fields. The database has more than 1,200 records, and could be searched with several search terms (= indexes).

A list of indexes may be obtained interactively with the command

```
TELL QSPIRES at SLACVM  SHOW INDEXES (IN SERIALS
```

The current list contains ten simple indexes and one *qualifier.* The most interesting indexes are:

INDEX	ALLOWED ABBREV. AND VARIATIONS
TITLE	T, TI
SHORT-TITLE	AB, ABBR
CODEN	CD
PUB	P

The goal record is called `SERIAL`; it is not indexed, and cannot be used as a search term.

The `TITLE` index (or `T` for short) is a *word index;* it contains words from titles of journals and other serials; e.g., `AMERICAN`, `JOURNAL`, and `PHYSICS` represent the `American Journal of Physics`, and `CRYOGENIC`, `INFORMATION`, and `REPORT` describe the `Cryogenic Information Report`. Note that the most common words such as *a, and, for, in, of, the,* etc., are not indexed.

The `SHORT-TITLE` index (or `AB`) is a *phrase index.* It lists short titles of serials, e.g., `SCIENT. AMERICAN` for `Scientific American`, etc. Unfortunately, it is difficult to find any reasonable pattern in assigning these short titles. For example, the word `journal` is sometimes indexed as `JOUR.`, and in another entry as `JOURNAL`; some acronyms are indexed as words (e.g., `SLAC`), others in a different way (e.g., `L.B.L.`), etc. If you really must use the `SHORT-TITLE` index, it is a good idea to browse through it first.

Five-letter *code names* of journals and other serials are indexed in the `CODEN` index (`CD` for short). If you happen to know a `coden`, and want to check what the corresponding journal is (not a very likely situation), use this index in the `SERIALS` database.

Brief names of serials' publishers are indexed in the `PUB` (or `P`) index. This is another *phrase index.* Most of the publishers are described with only one characteristic word (e.g., Springer–Verlag is indexed as `SPRINGER`), but there are a few exceptions. If you browse the `PUB` index, you will find, e.g., `MILLER FREEMAN`, `DEPT OF STATE`, `SOC BRAS FISICA`, etc. To retrieve such *phrases,* you will have to use the complete term, not just particular words. The `PREFIX` operator can also

help; however, do not attempt the right truncation: in the SERIALS database, the truncation sign can be used only in TITLE searches.

Before you begin any search, it is useful to browse the targeted index, to see whether a word or phrase you are thinking of is there. To get the result of browsing interactively, use, e.g.,

```
TELL QSPIRES at SLACVM  BRO SHORT-TITLE LAN (IN SERIALS
```

There is only one format frame available for displaying the retrieved results, and it is called PUBLIC. You do not have to remember this name; the format, being unique, is set automatically.

Limits on the number of the SERIALS database records that could be sent by QSPIRES, are listed in the following table:

- with

  OUTPUT (TYPE 10 records

- with

  OUTPUT (FILE 100 records

5.5.1 SAMPLE SESSION IN SERIALS

If you want to find all journals that have either PHYSICA, PHYSICAL or PHYSICS in the title, issue one of the following commands:

```
TELL QSPIRES at SLACVM  FIND TITLE PHYSIC# (IN SERIALS
From SLACVM(QSPIRES):   * Result 145 Serials
TELL QSPIRES at SLACVM  FIN T PREFIX PHYSIC (IN SERIALS
From SLACVM(QSPIRES):   * Result 145 Serials
```

Similarly, you can use

```
TELL QSPIRES at SLACVM  FIND T NATURE (IN SERIALS
From SLACVM(QSPIRES):   * Result 3 Serials

TELL QSPIRES at SLACVM  FIN T SCI# AMER# (IN SERIALS
From SLACVM(QSPIRES):   * Result 5 Serials

TELL QSPIRES at SLACVM  FIND TITLE FISIKA (IN SERIALS
From SLACVM(QSPIRES):   * No records found which match search
                        criteria
TELL QSPIRES at SLACVM  BROWSE T FISIKA (IN SERIALS
```

(QSPIRES now sends a list of 10 words alphabetically surrounding the term FISIKA. Among them, you will hopefully find the correct term.)

```
TELL QSPIRES at SLACVM  FIND T FIZIKA (IN SERIALS
From SLACVM(QSPIRES):   * Result 6 Serials
```

A possible search in the SHORT-NAME index may look like this:

```
TELL QSPIRES at SLACVM  FIN AB COMM ON NUCL & PART PHYS (IN SERIALS
From SLACVM(QSPIRES):   * No records found which match search
                        criteria
```

(Oops! There is a *reserved* symbol & in our search value, and the entire value must therefore be surrounded by quotation marks; for an explanation, see Subsection 1.2.4.)

```
TELL QSPIRES at SLACVM  FIN AB "COMM ON NUCL & PART PHYS" (IN
                        SERIALS
From SLACVM(QSPIRES):   * Result 1 Serial
```

To find all journals published by, e.g., Springer-Verlag, use

```
TELL QSPIRES at SLACVM  BROWSE PUB SPRINGER (IN SERIALS
```

(QSPIRES now sends a list of 10 words alphabetically surrounding the term SPRINGER. Among them, you can find the correct term.)

```
TELL QSPIRES at SLACVM  FIND P SPRINGER (IN SERIALS
From SLACVM(QSPIRES):   * Result 11 Serials
```

The usual rules for iterative and compound searching also apply to the SERIALS database. For details, see Subsection 1.4.1.

QSPIRES delays sending information until you issue the OUTPUT command. Your OUTPUT or OUTPUT (FILE will send a result to your e-mailbox. The command OUTPUT (TYPE will instruct QSPIRES to send the result interactively. For example,

```
TELL QSPIRES at SLACVM  FIN T EUROPHYS# (IN SERIALS
From SLACVM(QSPIRES):   * Result 2 Serials
TELL QSPIRES at SLACVM  OUT (TYP
From SLACVM(QSPIRES):   * Europhysics News
From SLACVM(QSPIRES):   * v.1- 1969- Central Lab Library
From SLACVM(QSPIRES):   * Europhysics Letters, etc.
```

5.6 SEMINARS DATABASE

Traveling soon to the San Francisco Bay Area? Want to see whether an interesting seminar is scheduled during your visit? Use the SEMINARS database! The database lists past (beginning in 1983) and future talks, colloquia, and seminars of interest to the high energy physics community. It covers not only SLAC and Stanford, but also Berkeley, San Francisco, Santa Cruz, and other nearby places. The SEMINARS database is searchable through several indexes. A list of these indexes may be obtained interactively with the command

```
TELL QSPIRES at SLACVM  SHOW INDEXES (IN SEMINARS TYP
```

If you do not add the option TYPE, a result will be sent to your e-mailbox. The current list contains eight simple indexes and no *qualifiers*. Some of the indexes are shown below:

INDEX	ALLOWED ABBREV. AND VARIATIONS
TITLE	TI, T, TALK
SPEAKER	N, NAME
AFFILIATION	AF, INST
DATE	D
LOCATION	LOC, PLACE
SERIES	ST, SERIES.TITLE

The goal index (not listed above) is called SEMINAR; the value of the goal record is a unique, randomly assigned number.

The TITLE index (or T for short) is a *word index*; it lists words from titles of seminars or talks. For example, the talk `Test of the standard model with low energy pions` is described in the TITLE index with nine separately indexed words (ENERGY, LOW, MODEL, OF, etc.). Note that there are no *excluded* words (see Subsection 1.2.4) in this index, and you can discover, e.g., that the article `the` appeared in some 1664 seminar titles.

The SPEAKER index (or N, NAME) is a *personal-name index*. It enables searches of the SEMINARS database by seminar speakers. A small anomaly makes this *personal-name index* just slightly different from other SPIRES similar indexes: **avoid using periods after initials in your search values**. You can use with confidence, e.g., forms MICHAEL BARNETT or BARNETT, MICHAEL or M BARNETT or BARNETT, M, but **not** M. BARNETT or BARNETT, M. Do **not** use the truncation sign in this index; use the PREFIX operator instead.

Affiliation of a speaker is indexed in the AFFILIATION index (AF for short). This is a *word index*. An affiliation usually includes a brief name or acronym of the speaker's institution, and—sometimes—the town and country (if not USA) from which he/she comes.

The DATE (or D) index, of course, identifies the date of a talk. This is a *date index*, and you can use many different forms to express your search value (see examples in Subsection 5.5.6).

The LOCATION index (also called PLACE) can help search the database for the location of a seminar. This is a *word index*. You can search for the GREEN ROOM (a traditional gathering place for SLAC's theory seminars), or SLAC AUDITORIUM, or LBL, or UCSC (UC Santa Cruz), etc.

The SERIES index classifies seminars as TECHNICAL, EXPERIMENTAL, WELLNESS, ACCELERATOR PHYSICS, etc. This is another *word index*.

It is always a good idea to browse the targeted index first, to see whether a word or phrase you are thinking of is indexed. To get the result of the browse interactively, use, e.g.,

```
TELL QSPIRES at SLACVM  BRO NAME ZACHARIA (IN SEMINARS TYPE
```

If you forget to enter the TYPE option while browsing in this database, the result will be sent to your e-mailbox.

QSPIRES has somewhat peculiar rules for displaying results found by searching in the SEMINARS database. Here is what will happen if your search request has one of the following forms:

- `TELL QSPIRES at SLACVM` **`FIND <search-expression> (IN SEMINARS`**

A complete list of retrieved records is sent to your e-mailbox. The same effect is achieved if you use the option `(IN SEMINARS FILE`.

- `TELL QSPIRES at SLACVM` **`FIND <search-expression> (IN SEMINARS TYPE`**

A complete list of retrieved records is sent to the screen of your terminal interactively.

- `TELL QSPIRES at SLACVM` **`FIND <search-expression> (IN SEMINARS RESULT`**

Only a number of retrieved records (e.g., `Result 23 Seminars`) is sent interactively. If you are satisfied and want to display the records, continue by issuing the commands OUTPUT or `OUTPUT (FILE`, which will send the list of seminars to your e-mailbox, or `OUTPUT (TYPE`, to have the list of seminars sent interactively.

There is only one format frame available for displaying the retrieved results, and it is called LABEL1. You do not have to remember this name; the format, being unique, is set automatically.

Limits on the number of the SEMINARS database records that could be sent to you by QSPIRES are listed as follows:

* When results are to be sent interactively to the screen of a user's terminal:
- with

```
FIND <...> (IN SEMINARS TYPE      10 records
```

- with

```
OUTPUT (TYPE                      10 records
```

* When the results are to be sent as a file to the user's e-mailbox:
- with

```
FIND <...> (IN SEMINARS FILE      100 records
```

- with

```
OUTPUT (FILE                      150 records
```

5.6.1 SAMPLE SESSION IN SEMINARS

The use of the truncation sign is not allowed in this database. However, the PREFIX operator may normally be used, with the standard restriction: one PREFIX per search term, per line of text.

We shall first consider various search possibilities with the DATE index. Remember, the DATE index in SEMINARS is not a *qualifier*, but a regular simple index.

```
TELL QSPIRES at SLACVM  FIND DATE JUNE 1990 (IN SEMINARS RESULT
TELL QSPIRES at SLACVM  FIN D 06/--/90 (IN SEMINARS RES
TELL QSPIRES at SLACVM  FIN DATE JUNE 27, 1990 (IN SEMINARS TYP
TELL QSPIRES at SLACVM  FIN D 6/27/90 (IN SEMINARS TYPE
```

```
TELL QSPIRES at SLACVM  FIND DATE 27TH JUNE 1990 (IN SEMINARS
TELL QSPIRES at SLACVM  FIN D JUN 27TH, 90 (IN SEMINARS
TELL QSPIRES at SLACVM  FIN DATE LAST MONTH (IN SEMINARS RES
TELL QSPIRES at SLACVM  FIN DATE TOMORROW (IN SEMINARS TYP
TELL QSPIRES at SLACVM  FIN D MONDAY OF THE NEXT WEEK (IN SEMINARS
TELL QSPIRES at SLACVM  FIN D NEXT MONTH (IN SEMINARS RESULT
TELL QSPIRES at SLACVM  FIN DATE NEXT MONTH + 1 (IN SEMINARS, etc.
```

The phrase NEXT MONTH + 1 means one month after next month. For more examples on how to state a date, see Subsections 3.4.2 and 5.2.2.

If you are searching for a speaker and/or title, your search might be similar to the following one:

```
TELL QSPIRES at SLACVM  FIND SPEAKER J ZUBER (IN SEMINARS
From SLACVM(QSPIRES):   * File being sent to you via NOTE, class M
TELL QSPIRES at SLACVM  FIND SPEAKER J ZUBER (IN SEMINARS RES
From SLACVM(QSPIRES):   * Result 2 Seminars
TELL QSPIRES at SLACVM  AND DATE SEP 90 (RES
From SLACVM(QSPIRES):   * Result 2 Seminars
TELL QSPIRES at SLACVM  AND PLACE SLAC (RES
From SLACVM(QSPIRES):   * Result 1 Seminar
TELL QSPIRES at SLACVM  OUT (TYP
```

(QSPIRES now sends the retrieved data to the screen of your terminal.)

Here are several more examples:

```
TELL QSPIRES at SLACVM  FIND T WORMHOLE (IN SEMINARS
From SLACVM(QSPIRES):   * No records found which match search
                        criteria
TELL QSPIRES at SLACVM  BROWSE TITLE WORM (IN SEMINARS TYP
```

(QSPIRES now sends a list of 10 words alphabetically surrounding the term WORM. Among them, you can find the correct term.)

```
TELL QSPIRES at SLACVM  FIN T WORMHOLES (IN SEMINARS RES
From SLACVM(QSPIRES):   * Result 4 Seminars
TELL QSPIRES at SLACVM  OUTPUT (TYPE
```

(QSPIRES now sends the retrieved data to the screen of your terminal.)

Those who read all the details deserve a special reward, don't they? Here is a tip for all you cookie lovers. Try the following search (and let this info remain for your eyes only!):

```
TELL QSPIRES at SLACVM  FIN D THIS MONTH AND PLACE LIKE ?COFFEE? (IN
                        SEMINARS TYP
```

(QSPIRES now sends a list of this month's seminars at which coffee and cookies will be served.)

5.7 QUERY, WHEREIS, AND WHATIS COMMANDS

Two commands, QUERY and WHEREIS, enable you to find records in the HEPNAMES (+ BINLIST) and INSTITUTIONS databases without having to make an explicit selection of a database. Furthermore, no authorization is needed to use QUERY or WHEREIS, and you can freely retrieve data on electronic-mail addresses and institutions' addresses from any node in the world, provided it can communicate with BITNET. This section describes interactive searches with QUERY and WHEREIS commands, and also the brand new command WHATIS.

5.7.1 HEPNAMES AND BINLIST DATABASES

HEPNAMES database is the worldwide directory of electronic mail addresses of people involved with high energy physics. BINLIST is the local directory of SLAC physicists and staff. You can retrieve addresses from these two databases by issuing the QUERY command. QUERY is a signal to QSPIRES to search the NAME indexes in both HEPNAMES and BINLIST. If a match is found, QSPIRES immediately sends the retrieved records back to you. Since the NAME indexes in HEPNAMES and BINLIST are constructed as *personal-name indexes* (see Subsection 1.2.4), there are many ways in which you can state your search value. Check Subsection 5.5.2 for more details.

While it is relatively easy for caretakers to keep the local BINLIST database accurate, the reliability of the HEPNAMES database depends very much on you, the users. The updates for HEPNAMES come from many different sources, and sometimes the obtained information is old or obsolete, or clearly wrong. Furthermore, some listed addresses may be correct, but the owners never read their electronic mail, or have other, more preferred addresses. Although the database is regularly combed and checked, it is not always easy to find such errors and anomalies. Therefore, we appeal to regular QSPIRES users for help: please, check your own entries in HEPNAMES, and send possible corrections to the caretaker (the address is mentioned in Subsection 5.5.5). Similarly, if you notice errors in your friends' addresses, or know addresses which are not yet in the database, please let us know.

HEPNAMES primarily collects addresses of physicists working in a broad area of high energy physics. However, since the field is really not very well defined, we are also interested in boundary areas, such as intermediate-energy physics, gravity research, astrophysics, statistical and mathematical physics, some atomic and nuclear physics, etc. Generally, if somebody's work is listed in the HEP database, then yes, we would like to have his/her e-mail address. The database also collects and lists the addresses of support personnel: technical staff and people responsible for instrumentation in high energy institutions, the departments' and groups' secretaries and administrative assistants, library personnel, etc.

5.7.2 QUERY COMMAND

The QUERY command (or Q) allows you to search in the HEPNAMES and BINLIST databases. A general form of a simple QUERY command is

```
TELL QSPIRES at SLACVM  QUERY <person's-name>
```

For example, to find Sidney Drell's e-mail address, use one of the following forms:

```
TELL QSPIRES at SLACVM  QUERY SID DRELL
TELL QSPIRES at SLACVM  QUERY DRELL, SIDNEY
TELL QSPIRES at SLACVM  Q DRELL, S.
TELL QSPIRES at SLACVM  Q S DRELL
TELL QSPIRES at SLACVM  QUERY DRELL
TELL QSPIRES at SLACVM  QUERY PREFIX DREL
TELL QSPIRES at SLACVM  Q DREL#, S.
TELL QSPIRES at SLACVM  QUERY SID DRE# , etc.
```

Your QUERY command initiates a search in a *personal-name index*. Rules for expressing search values following the QUERY command are very similar to those described in a search of the AUTHOR index in HEP (see Subsection 2.2.1). For example, when you list the last name (= surname) first, a comma must separate the name from initials or the person's first name (= personal). If the order is reversed, no comma should be used. Therefore, use DRELL, S., or S. DRELL, but **not** S, DRELL. Periods after initials are optional. The empty spaces following periods and commas are optional as well.

If you are not certain about spelling of some last name, use the PREFIX operator (Subsection 1.2.3), or truncate the search value (see Subsection 1.2.4). If you use the PREFIX, do not list first name(s). It is also allowed to combine a first name with a truncated last name, but never truncate first names (~~QUERY SID# DRELL~~). Be patient with names in which non-English characters appear. For example, the characters ä, ö and ü are often transcribed as ae, oe and ue (and thus, e.g., Müller is indexed as MUELLER); but in some cases, ä may simply be replaced by a, etc. Therefore, do not give up if the first such search is unsuccessful; try several combinations.

If no match is found in HEPNAMES or BINLIST for the name you listed, QSPIRES will send you the following message:

```
From SLACVM(QSPIRES):   * No records found, send suggestions to
                        HEPNAMES@SLACVM
```

By default, if your QUERY command was sent interactively, QSPIRES' answer is sent interactively as well. You can change the default by appending the (FILE option to your search request:

```
TELL QSPIRES at SLACVM  QUERY JOHNSON, JOHN J. (FILE
```

With such a phrase, you instruct QSPIRES to send the answer to your e-mailbox.

The simple one-name search is not the only possibility with the QUERY command. You can retrieve more than one address by using the logical operator OR (see Subsection 1.4.1). A general form of such a compound search is

```
TELL QSPIRES at SLACVM  QUERY <name 1> OR <name 2> OR <name 3> ...
```

For example, if you want to get e-mail addresses of both Cronin and Fitch, and are too lazy to write two commands, use

```
TELL QSPIRES at SLACVM  QUERY CRONIN, J. OR FITCH, V.
```

The most frequent error with such compound commands is the use of the operator AND instead of OR (`QUERY CRONIN, J. AND FITCH, V.`). This is wrong, because the logical operator AND initiates a search for an address common to both Cronin and Fitch; since each of them has a different e-mail address, the match is never found, and the search is unsuccessful. Please, take a red pencil and clearly mark this OR in the previous example.

Sometimes you will retrieve more than one address of a person: e.g., somebody on a sabbatical leave may keep both permanent and temporary address; on many occasions, a new e-mail address is registered, but the person who provided it forgot to mention that the old address should have been deleted, etc. When QSPIRES returns several addresses, and you have no clues as to the current whereabouts of that person, play it safe and send your e-mail to all the addresses. Hopefully, at least one message will reach your correspondent. Do not forget to inform the HEPNAMES caretaker if some of these e-letters failed to reach the intended addressee.

Not all the addresses indexed in HEPNAMES are individual addresses; sometimes several people or an entire department share the same account. Such addresses are denoted as *mailboxes* in QSPIRES' answers. If you are sending an e-letter to a person with a *mailbox* address, be sure to quote his/her name in the first line of the e-letter (e.g., `For John Smith`, etc.); otherwise, your mail may never reach the person.

BITNET network addresses are indexed in HEPNAMES and BINLIST with no subdomains. For example, user IFT66003 at the BITNET node UFRJ is listed as `IFT66003 at UFRJ`. Some mailing systems will require that the node name be changed in your e-letter to `UFRJ.BITNET`. Addresses from the US–Japan–Canada HEPNET network are listed as `USER at NODE.HEPNET`; similarly, some UUCP network addresses are indexed as `USER at NODE.UUCP`. If your mailing system does not recognize the pseudo-domains HEPNET and UUCP, learn from your local mailing expert how to re-address your letter. The other node names in HEPNAMES follow the standard INTERNET form with several subdomains, the right-most one being the main one.

5.7.3 INST(ITUTIONS) DATABASE

The INSTITUTIONS (or INST) database is thoroughly described in Section 5.3. The WHEREIS command instructs QSPIRES to search two *word indexes* in this database, ADDRESS and INSTITUTION. Your search value may be one or more words from an institution's name or address. If a match is found, QSPIRES immediately sends the retrieved records back to you.

Please check in the INSTITUTIONS database to discover whether a description of the institute in which you work is complete and accurate, and send possible corrections to the database caretaker (the address is mentioned in Subsection 5.5.5.)

5.7.4 WHEREIS COMMAND

The WHEREIS command (or WHE, WHERE) enables a search of the ADDRESS and INSTITUTION indexes in the INST databases. A general form of the WHEREIS command is

```
TELL QSPIRES at SLACVM  WHEREIS <...>
```

The dots denote some of the words you associate with a given institution. Note that with WHEREIS, you do not have to specify the selection; your search is automatically performed in the INST database. To find data on, e.g., the Brookhaven National Laboratory, use one of the following forms:

```
TELL QSPIRES at SLACVM  WHEREIS BROOKHAVEN

TELL QSPIRES at SLACVM  WHEREIS BNL

TELL QSPIRES at SLACVM  WHERE UPTON

TELL QSPIRES at SLACVM  WHE PREFIX BROOK

TELL QSPIRES at SLACVM  WHEREIS NAT# LAB# BROOK#

TELL QSPIRES at SLACVM  WHERE NY 11973 , etc.
```

Your WHEREIS command initiates a search in two *word indexes*. Rules regarding the use of the PREFIX operator or the right truncation symbols in such searches are identical to those described in a searching of the ADDRESS and INSTITUTION indexes in INST (see Subsection 5.3.2).

If no match is found in the ADDRESS or INSTITUTION indexes, QSPIRES will send you the following message:

```
From SLACVM(QSPIRES):   * No records found which match search
                        criteria
```

By default, if your WHEREIS command was sent interactively, QSPIRES' answer is sent interactively as well. You can change the default by appending the (FILE option to your search request:

```
TELL QSPIRES at SLACVM  WHEREIS KALAMAZOO (FILE
```

With such a phrase, you instruct QSPIRES to send the answer to your e-mailbox.

As indicated in Subsection 5.3.2, you can combine a search in HEP with WHEREIS to find postal addresses of authors of preprints. For example, if a preprint denotes the affiliation of its authors as Bartol Research Inst., simply issue the command WHEREIS BARTOL to obtain a complete postal address of the Bartol Institute.

5.7.5 HOW TO REGISTER AND WHERE TO SEND CORRECTIONS

If you want to register your e-mail address, send a note to the caretaker of the HEPNAMES database. The caretaker's e-mail address is HEPNAMES@SLACVM.BITNET. Please mention your name, institution, and—optionally—your telephone number. If you have several addresses, you can choose to denote one as the *preferred address*. Corrections and all other correspondence related to this database should also be sent to HEPNAMES@SLACVM.BITNET.

Corrections related to the INSTITUTIONS database (e.g., new telephone or fax-machine numbers) could be reported to the caretaker of the INSTITUTIONS database. The e-mail address of the caretaker is LIRYG@SLACVM.BITNET, and regular mail could be sent to Mr. Robert Gex, SLAC—Mail Stop 82, Stanford, CA 94309, USA.

5.7.6 WHATIS COMMAND

Just at press time (June 1992), the SLAC Library announced the availability of a new database called SLACSPEAK that can be searched via QSPIRES. Use the WHATIS command to search through the SLAC Library database SLACSPEAK for expansions of SLAC-related acronyms, high energy physics-related terminology, and computing and networking terms. Environmental health and safety terms relevant to the workplace are also included. Currently, there are more than 1800 terms in SLACSPEAK.

A general form of the WHATIS command is:

```
TELL QSPIRES at SLACVM  WHATIS <...>
```

The dots denote some of the acronyms or terms for which you need a definition. Note that with WHATIS, you do not have to specify the database SLACSPEAK; QSPIRES will automatically do that for you.

So, to find the real meaning of SLD or CRID at SLAC, type:

```
TELL QSPIRES at SLACVM  WHATIS SLD

TELL QSPIRES at SLACVM  WHATIS CRID
```

Or, to investigate some networking and standardization terms, type:

```
TELL QSPIRES at SLACVM  WHATIS ANSI

TELL QSPIRES at SLACVM  WHATIS TELNET
```

To find out about some environmental safety terms, type:

```
TELL QSPIRES at SLACVM  WHATIS NEHA

TELL QSPIRES at SLACVM  WHATIS HAZARDOUS WASTE
```

Your WHATIS command initiates a search in the TERM word index. Rules pertaining to the use of the PREFIX operator or to the right truncation symbol are identical to those described for use in searching the ADDRESS and INSTITUTION indexes in INST (see Subsection 5.3.2).

If you have a recommendation for a mysterious acronym, a high energy physics term, a computing and networking term, or an environmental safety term, you may send it for review to WHATIS@SLACVM.BITNET.

The QSPIRES WHATIS command doesn't require authorization.

6. PARTICLE DATA GROUP DATABASES

The Berkeley and United Kingdom Particle Data Group (PDG), together with the Serpukhov COMPAS group, have developed four computer-searchable databases of interest to particle physicists. These databases assist in searching through literature (DATAGUIDE), provide numerical data extracted from papers (PARTICLES and REACTIONS), and contain descriptions of experiments (EXPERIMENTS). Thus, they give much additional information relating to many of the papers contained in the HEP database (Chapters 2, 3 and 4). This chapter describes the PDG databases and tells how to use QSPIRES to access them interactively.

6.1 PARTICLES DATABASE

The PARTICLES database contains data from the well-known biannual publication, *Review of Particle Properties* (RPP), and is updated once between editions of the report. RPP consists of three parts: Summary Tables (brief summary of properties of well-established particles), Miscellaneous Tables (quick reference for the practicing elementary particle physicist), and Full Listings (full description of all particles, including hypothesized). This last part, the Full Listings, is currently available via QSPIRES. Searches in the PARTICLES database and the various ways to display a search result are described in this section.

6.1.1 INTERACTIVE SEARCH: GENERAL PROCEDURE

A typical interactive search request in this database will have the form

```
TELL QSPIRES at SLACVM  FIND <search-expression> (IN PARTICLES
```

In the PARTICLES database, your search request will most often contain only one search expression; rarely will you use a more intricate search. The search request must indicate your database selection, (IN PARTICLES. This selection will remain in effect until a new search is initiated with your next FIND command.

A search expression must have a correctly stated search term (see Section 1.2). There is only one search term in this database. To get the name of the term and allowed abbreviations and variations interactively, send one of the following commands to QSPIRES:

```
TELL QSPIRES at SLACVM  SHOW INDEXES (IN PARTICLES TYPE

TELL QSPIRES at SLACVM  SHOW SEARCH TERMS (TYPE IN PARTICLES
```

SHOW INDEXES may be shortened to SHO IND, SHOW SEARCH TERMS to SHO SEA TER, and TYPE to TYP. If you want QSPIRES to send the result to your e-mailbox, either do not include TYPE in your request or replace TYPE by FILE (or FIL). The table below shows the resulting output.

INDEX NAME	ALLOWED ABBREV. AND VARIATIONS
PROPERTY	PP, PROP, PART-PROP

The goal record is called SECTION; it is not indexed, and cannot be used in a search.

The PROPERTY index is a *phrase index*; for an explanation, see Subsection 1.2.4. To determine the kinds of values that could be used in the PROPERTY index, issue the BROWSE command. For example,

```
TELL QSPIRES at SLACVM  BROWSE PROPERTY (IN PARTICLES TYP
TELL QSPIRES at SLACVM  BRO PP RHO(800) (TYPE IN PARTICLES
TELL QSPIRES at SLACVM  BROWSE PP AXION MASS (IN PARTICLES FIL
TELL QSPIRES at SLACVM  BRO PROPERTY HYPOTHETICAL (IN PARTICLES
```

With the first two commands, the browsing result is sent to you interactively; the third and fourth commands specify that the result is to be sent to your e-mailbox. You can also use the BROWSE FIRST and BROWSE LAST commands (for description, see Subsection 1.2.4).

The link between a search term and a search value in your search expression is a relational operator. Among the relational operators (see Subsection 1.2.3), the most efficient one is the *equality* operator. The recommended *content* operator in the PARTICLES database is the PREFIX. Searching on *truncated* values (right truncation) is also allowed:

```
TELL QSPIRES at SLACVM  FIND PROPERTY J/PSI MASS (IN PARTICLES
TELL QSPIRES at SLACVM  FIN PP PREFIX "ETA(C)" (IN PARTICLES
TELL QSPIRES at SLACVM  FIN PROPERTY K+- DALITZ# (IN PARTICLES
```

The result is, by default, sent to you as a file, and you do not have to specify FILE or OUTPUT to have the retrieved data delivered to your e-mailbox. You can have the result sent interactively by using the option (IN PARTICLES TYPE, but the output format in this database is not suitable for such a transfer, and it is better to use the default way of sending.

If you want first to review the number of records found, specify RESULT in the option field:

```
TELL QSPIRES at SLACVM  FIN PP "RHO(770)" (IN PARTICLES RESULT
From SLACVM(QSPIRES):   * Result 7 Sections
```

If the result seems reasonable, instruct QSPIRES to send the sections found. Simply type:

```
TELL QSPIRES at SLACVM  OUTPUT
```

The OUTPUT (FILE command will produce the same effect. The OUTPUT (TYPE will cause the result to be sent interactively, but this command is not recommended, because the output format is purposely designed for file transfer, not for interactive communication. Only one format frame is available for displaying records found in the PARTICLES database. You can get the format name by typing

```
TELL QSPIRES at SLACVM  SHOW FRAMES (IN PARTICLES TYPE
```

This will instruct QSPIRES to send the information interactively. If you want a permanent record, use

```
TELL QSPIRES at SLACVM  SHO FRA (IN PARTICLES
```

or

```
TELL QSPIRES at SLACVM  SHO FRA (IN PARTICLES FILE
```

Limits on the number of records that can be sent in this default format will be given in Subsection 6.1.3.

To learn more about the PARTICLES database, send SHOW or EXPLAIN commands to QSPIRES. If you use the first two commands presented below, the answer will be sent interactively. However, avoid interactive display of the explanation note, because it is long, unreadable if sent interactively, and truncated after the first one hundred lines of output. Rather, use the third and fourth commands, which instruct QSPIRES to send the complete information to your e-mailbox.

```
TELL QSPIRES at SLACVM  SHOW SUBFILE DESCRIPTION (IN PARTICLES TYPE
TELL QSPIRES at SLACVM  EXPLAIN PARTICLES
TELL QSPIRES at SLACVM  SHO SUB DES (IN PARTICLES
TELL QSPIRES at SLACVM  EXP PARTICLES (FIL
```

6.1.2 FIND PROPERTY (FIN PP)

The PARTICLES database has only one index, the PROPERTY index (also called PP, PROP, and PART-PROP); yet the indexed values are organized in such a way that two different kinds of searches are possible. Depending on how your search request is formulated, you can get either *all* available information on a particle, or just a *single* property, e.g., the mass or decay modes of the particle. If your search request contains a particle name only, e.g., FIND PROPERTY "CHI/C2(1P)" (IN PARTICLES, then the answer will show everything on $\chi_{c2}(1P)$ that could be found in the Full Listings section of the *Review of Particles Properties*, i.e., mass, width, decay modes, partial widths, branching ratios, etc. If you do not want all these data, append the specific property in which you are interested to the particle name, e.g., FIND PROPERTY "CHI/C2(1P) BR" (IN PARTICLES to get only the information related to the branching ratios of $\chi_{c2}(1P)$. Some of the indexed terms used to describe particle properties are listed in the chart below; always combine them with a particle name. Keep in mind that the PROPERTY index is a *phrase index* (Subsection 1.2.4), meaning that you must use all the words characterizing an entry and respect the ordering of the words.

TERMS USED TO DESCRIBE PROPERTIES

The following table lists the properties used the most often to describe particles. A property should follow a particle name, e.g., FIND PP <particle-name> <property> (IN PARTICLES. Some properties are ascribed to only a few particles; others might appear very often, e.g., HEADER, MASS, etc.

HEADER	REF
MASS	FOOT
WIDTH	POLE
MODES	POLARIZATION
BR	DALITZ-PLOT
PW	FORM-FACTOR
MOMENT	DECAY-PARAM
QUANTUM-NUMBER	CHARGE-ASYMM

HEADER denotes basic information found at the beginning of each particle's listing in *Review of Particle Properties*. For example, `FIN PP ETA HEADER (IN PARTICLES` will only show the name(s) and quantum numbers of the η particle. Append the `MASS` attribute to a particle name if you want to obtain the list of measured values for that particle's mass and/or mass difference. `WIDTH` should be used if you want to learn the total width, total rate, or mean life of a particle (also differences and/or ratios of them). `MODES` denotes decay modes, e.g., `FIN PP D0 MODES (IN PARTICLES`. The term `BR` corresponds to branching ratios, and `PW` to partial widths or rates.

REF attached to a particle name will instruct `QSPIRES` to send all references for the particle. For example, the information on the Z mass obtained with the command `FIN PP Z MASS (IN PARTICLES` relates `ABRAMS 89B` to the experimental value of 91.14 ± 0.12 GeV. If you then type `FIN PP Z REF (IN PARTICLES`, you will find that this reference corresponds to an article by Abrams et al. in *Phys. Rev. Lett.* 63 (1989) 2173.

The other attributes are used less often. `MOMENT` denotes electric or magnetic moment of a particle, and/or moment ratios. For example, `FIN PP N MOMENT (IN PARTICLES` will retrieve information on the neutron magnetic moment and neutron electric dipole moment. Some particles may be characterized by specific weak or electromagnetic decay parameters; use `DECAY-PARAM` to retrieve such properties, e.g., `FIN PP TAU DECAY-PARAM (IN PARTICLES`. In the output describing properties of unstable baryons, you might find some footnote marks but not the actual footnotes. These footnotes can be obtained by attaching `FOOT` to a particle name: `FIN PP "LAMBDA(1520) FOOT" (IN PARTICLES`. Pole positions (e.g., $N(2200)$ pole) are described by `POLE`. The term `POLARIZATION` relates to polarization measurements (e.g., the search value `K+- POLARIZATION` finds data on the longitudinal polarization of emitted μ^+ in K^+ decays). `DALITZ-PLOT` will reveal the Dalitz-plot slope. Some interesting quantum number(s) may be retrieved with the `QUANTUM-NUMBER` attribute, e.g., `GAMMA QUANTUM-NUMBER`.

To determine which of the properties are indexed for a given particle, use the `BROWSE` command (see Subsection 6.1.1).

HOW TO STATE PARTICLE NAMES

Particle names in this database are spelled much as you might expect. Some particles are denoted with Latin letters in literature; use the same letters in your search requests. Particles denoted with Greek letters are indexed by their English-language spelling: χ, δ, γ, μ, and ω are `CHI`, `DELTA`, `GAMMA`, `MU`, and `OMEGA`, respectively, etc. Occasionally, a full name of a particle is indexed: `AXION` for axion, `MONOPOLE` for magnetic monopole, etc. Some hypothetical particles have

long names: HYPOTHETICAL-PARTICLE CENTAURO, SUPERSYMMETRIC-PARTICLE SCALAR-ELECTRON, etc. Use BROWSE PP HYPOTHETICAL (IN PARTICLES TYPE and BRO PROPERTY SUPERSYMMETRIC (IN PARTICLES TYP to learn more about the existing indexed values. Note that for QSPIRES, the letter case of your input is not significant; you may use upper- or lower-case letters, or a combination of the two.

The J/ψ particle is indexed in this database with its complete dual name J/PSI. Charges are sometimes indexed, but a rule is difficult to formulate: use PI+-, K+-, D0, B+-, OMEGA(2250)- [but OMEGA(1670)]. Browsing helps determine which charge, if any, is indexed. Resonances are usually characterized by masses: X(1700), F'(1525), K(2)*(1980), PI(1770).

Subscripts are added to a particle name within parentheses: $b_1(1235)$ is indexed as B(1)(1235), $a_2(1320)$ becomes A(2)(1320), $\chi_{b0}(1P)$ is indexed as CHI(B0)(1P), $D_s^{\pm}$ as D(S)+-, Λ_c^+ as LAMBDA(C)+, $\pi_2(2100)$ as PI(2)(2100), etc. Star and prime are indexed with the asterisk * and apostrophe ' symbols.

Finally, it is extremely important to remember that the FIND command (though not BROWSE) requires double quotes around an entire search value in which the reserved symbols) and (appear. For an explanation, see, e.g., Subsection 1.2.4. Therefore, the first two of the following examples are correctly stated; in the last two, however, the quotes are missing or incorrectly placed, and the searches will be unsuccessful:

```
TELL QSPIRES at SLACVM   FIN PROPERTY "D*(2010)+- " (IN PARTICLES
                         RESULT
From SLACVM(QSPIRES):    * Result 5 Sections

TELL QSPIRES at SLACVM   FIND PP "ETA'(958) MODES" (IN PARTICLES RES
From SLACVM(QSPIRES):    * Result 1 Section

TELL QSPIRES at SLACVM   FIND PROPERTY "PSI(3685)" MASS (RES IN
                         PARTICLES
From SLACVM(QSPIRES):    * No records found which match search
                         criteria

TELL QSPIRES at SLACVM   FIN PP UPSILON(10580) (IN PARTICLES RESULT
From SLACVM(QSPIRES):    * No records found which match search
                         criteria
```

6.1.3 MORE ON OUTPUT

You can receive retrieved information either interactively or via a file sent to your e-mailbox. However, output is formatted in such a way that the latter possibility is the only acceptable option. The width and length of the text make an interactive reply almost useless. The following table shows the limits on the number of records mailed to you as a file. (For those who, nevertheless, want interactive answers: you can receive, at most, ten sections, or the first one hundred lines of text, whichever is smaller.)

* When the results are sent as a file to a user's e-mailbox, QSPIRES respects the following limits:

- with

```
FIND <...> (IN PARTICLES          200 sections
```

- with

```
OUTPUT                            150 section
```

The option FILE is the default option in this database, so you do not have to write FILE explicitly in your search request. An example of the use of the OUTPUT command is described in Subsection 6.1.1.

It has already been mentioned that there is only one format frame, called LISTINGS, for displaying results from this database. You do not have to say USING LISTINGS in the option field of your request because LISTINGS is the default format. There is no BRIEF format in PARTICLES database.

A final word on the output: sometimes you will find a symbol \ or a vertical bar | in the right margin of a displayed result. The vertical bar indicates that the data in this line are new or have been significantly modified since the database was last updated. The sign \ denotes continuation of text onto the next line. Once a line is full, the text might be broken in the middle of a word without regard for hyphenation rules.

For additional information, suggestions, and comments on the PARTICLES database, contact Gary Wagman, Particle Data Group, 50-308, Lawrence Berkeley Laboratory, Berkeley, CA 94720, USA, or send an e-mail message to WAGMAN@LBL.BITNET.

6.2 EXPERIMENTS DATABASE

The EXPERIMENTS database contains summaries of more than 1600 approved current and past experiments in elementary particle physics, going back to about 1975. The database covers experiments at major world labs. It is maintained by the Berkeley Particle Data Group, in collaboration with correspondents at various labs, and regional centers in Japan, the former Soviet Union, and at CERN. The database is the source for the biannual LBL-91 report, *Current Experiments in Elementary Particle Physics.* This section describes various interactive searches via QSPIRES in the EXPERIMENTS database.

6.2.1 INTERACTIVE SEARCH PROCEDURE

The EXPERIMENTS database is searchable by experiment number, experiment title, names of collaborators in the experiment and names of participating institutions. The accelerator name, detector, reaction and momentum could also be used as search values. A typical, simple, one-step interactive search request will have the form

```
TELL QSPIRES at SLACVM  FIND <search-expression> (IN EXPERIMENTS
```

In a more intricate search, several search expressions might be linked by logical operators. The selection (IN EXPERIMENTS must be specified in the line with the FIND verb. The selection will remain in effect until a new search is initiated with your next FIND command. This means that,

e.g., there is no need to repeat the phrase (IN EXPERIMENTS in a followup command of an iterative search, or with an OUTPUT command.

Retrieved results from all PDG databases are immediately sent to you, even before you have a chance to review the number of documents found. In order to change this default, append RESULT (or RES) to the option field:

```
TELL QSPIRES at SLACVM  FIND <search-expression> (IN EXPERIMENTS
                        RESULT
```

Now, only the number of the retrieved experiments, not the actual data, will be sent to you *interactively:*

```
From SLACVM(QSPIRES):   * Result nn Experiments
```

If you are satisfied with this answer, you can request the complete output; alternatively, the search might be continued with the addition of further criteria. Each search expression must have a correctly stated search term (see Section 1.2). To get the list of search terms (and they coincide with the names of indexes in the EXPERIMENTS database), send one of the following commands to QSPIRES:

```
TELL QSPIRES at SLACVM  SHOW INDEXES (IN EXPERIMENTS TYPE
TELL QSPIRES at SLACVM  SHO SEA TER (TYP IN EXPERIMENTS
TELL QSPIRES at SLACVM  SHO IND (FILE IN EXPERIMENTS
TELL QSPIRES at SLACVM  SHOW SEARCH TERMS (IN EXPERIMENTS
```

The first two commands instruct QSPIRES to send the list interactively, while the last two tell QSPIRES to file the list and send it to your e-mailbox. As seen from the fourth example, you do not have to write FILE explicitly; unless the term TYPE (or TYP) appears in the option field, the information is, by default, sent noninteractively. The table below shows some of the indexes that will be found in the returned list.

INDEX	ALLOWED ABBREV. AND VARIATIONS
EXPERIMENT	EXP, EXPT, EXPERIMENT-NUM, R, RN, REPORT-NUM
TITLE	T, TI
AUTHOR	A, AU, AUTH
AFFILIATION	AF, AFF, AFFIL, I, INST, INSTITUTION
ACCELERATOR	AC, ACC
DETECTOR	DE, DET
PUBLISHED-PAPER	PAPER, CIT, CITATION, JOUR, PUBN
DATE-APPROVED	D, DA, DATE
DATE-STARTED	DS
DATE-COMPLETED	DC
POLARIZATION	PL, POL
REACTION	RE, REA, REAC
PARTICLE	P, PART
FINAL-STATE-PART	FSP
PLAB	
ECM	

Note that the GOAL record (not listed in the table) has the same name as one of the indexes: it is called EXPERIMENTS. The key value of the GOAL record is a randomly selected number. The GOAL record in this database is not indexed, and you cannot use it to search. There are no *qualifiers* in the EXPERIMENTS database. Note that the three DATE indexes are *simple indexes*, and they can be used even in a primary search.

Almost all the relational operators described in Subsection 1.2.3 could be applied in the EXPERIMENTS database. The equality operator is the most efficient, and has the widest use. The inequality operators could be used most successfully in various *date indexes*. Among the content operators, the recommended one is the PREFIX. Note, however, that only **one** PREFIX per search term is allowed in a request line.

To determine the kinds of values that could be used with a given index, issue the BROWSE command, e.g.,

```
TELL QSPIRES at SLACVM  BROWSE PARTICLE BOTTOM (IN EXPERIMENTS TYP
TELL QSPIRES at SLACVM  BRO ACCELERATOR SLAC (IN EXPERIMENTS TYPE
TELL QSPIRES at SLACVM  BROWSE EXP LAMPF-500 (IN EXPERIMENTS FILE
TELL QSPIRES at SLACVM  BRO AFFILIATION (IN EXPERIMENTS
```

Only if you specify the TYPE option (see the first and second examples) is the result of the browse sent to you interactively. The third and the fourth lines tell QSPIRES to file the result of the browse and send it to your e-mailbox. You can also use the BROWSE FIRST and BROWSE LAST commands (for description, see, e.g., Subsection 1.2.4).

In most of the EXPERIMENTS indexes, searching on truncated values (the right truncation) is allowed. With *word indexes* (e.g., the TITLE index), you can truncate more than one word:

```
TELL QSPIRES at SLACVM   FIN T PRINC# MICROSCOP# REVERS# (IN
                         EXPERIMENTS RES

From SLACVM(QSPIRES):    * Result 1 Experiment
```

In *phrase indexes* (e.g., AFFILIATION, REACTION, CITATION), only one truncation sign per search value is allowed.

To learn more about the EXPERIMENTS database, send SHOW or EXPLAIN commands to QSPIRES. If you use the first two of the following commands, the answer will be sent to you interactively. The third and the fourth commands instruct QSPIRES to send the information to your e-mailbox.

```
TELL QSPIRES at SLACVM   SHOW SUBFILE DESCRIPTION (IN EXPERIMENTS
                         TYP

TELL QSPIRES at SLACVM   EXPLAIN EXPERIMENTS

TELL QSPIRES at SLACVM   SHO SUB DES (IN EXPERIMENTS FILE

TELL QSPIRES at SLACVM   EXP EXPERIMENTS (FIL
```

A simple search, with only one criterion specified, is not the only possibility in the EXPERIMENTS database. From time to time, you will want to add more criteria, and narrow or expand the search in an iterative process:

```
TELL QSPIRES at SLACVM   FIND AC KEK-TRISTAN (IN EXPERIMENTS RESULT

From SLACVM(QSPIRES):    * Result 4 Experiments

TELL QSPIRES at SLACVM   AND DETECTOR TOPAZ (RES

From SLACVM(QSPIRES):    * Result 1 Experiment
```

Note that the selection has to be displayed only in the line with the FIND verb. On the other hand, the option RES(ULT) must appear in every command for which you want the answer to contain only the number of the retrieved results.

You can also state several criteria in a single line, by using a compound search.

```
TELL QSPIRES at SLACVM   FIN FSP NBAR AND TITLE RARE PION# (IN
                         EXPERIMENTS RES

From SLACVM(QSPIRES):    * Result 1 Experiment
```

In both iterative and compound searches, the logical operators AND, AND NOT, and OR describe how the criteria combine.

If you lose track of the criteria used up to a given point in a search, apply the SHOW SEARCH, or SHOW RESULT commands. You do not have to specify (IN EXPERIMENTS, nor TYPE with these commands: an interactive answer will show your search steps in the most recently used database.

```
TELL QSPIRES at SLACVM   SHOW SEARCH

TELL QSPIRES at SLACVM   SHO RESULT
```

When you do not use the option RESULT in a search request, all the retrieved records are sent to you immediately following the receipt of your request. If you **do** use the RESULT option, the records could be displayed later, by issuing the OUTPUT command once all your criteria have been satisfied (see Subsection 6.2.4). As always, you can choose to get the result either interactively, or via e-letter (the author's term for an individual e-mail file), the latter possibility being

the default choice and producing much more readable output. Two format frames are available for displaying records found in the EXPERIMENTS database. To get the list of frames, issue

```
TELL QSPIRES at SLACVM  SHOW FRAMES (TYP IN EXPERIMENTS
```

This will cause the list to be sent interactively. If you want a permanent record, append the FILE instead of type to the option field, or simply send

```
TELL QSPIRES at SLACVM  SHO FRA (IN EXPERIMENTS
```

Limits on the number of records that could be sent in various formats will be given in Subsection 6.2.4.

6.2.2 EXAMPLES OF A SEARCH

This section reviews simple, one-step searches in the EXPERIMENTS database. The next section offers examples of more intricate searches in which several criteria are applied.

FIND EXPERIMENT (FIN EXP)

You can search the database by using the standard numerical code characterizing an experiment, e.g., CERN-UA-001, FNAL-791, SLAC-PEP-020, etc. As long as you enter the exact code, you will retrieve no more than one record and there is no need to use the option RESULT.

```
TELL QSPIRES at SLACVM  FIN EXP FNAL-791 (IN EXPERIMENTS

TELL QSPIRES at SLACVM  FIN EXP FNAL 791 (IN EXPERIMENTS

TELL QSPIRES at SLACVM  FIN EXP FNAL-0791 (IN EXPERIMENTS

TELL QSPIRES at SLACVM  FIN EXP FNAL 0791 (IN EXPERIMENTS
```

While the first three lines describe allowed forms for an experiment code in a search value, the last line will find no matching result: an incorrect way of writing the code was attempted. The rule for stating the experiment code is simple: a hyphen may be used, or it could be replaced by a blank; however, if the experiment's number begins with an (optional) zero, the hyphen is **required.**

In this index, you may use the truncation sign not only in *right truncations*, but also in the middle of a phrase, as a *wild card:*

```
TELL QSPIRES at SLACVM  FIN EXP FN#791 (IN EXPERIMENTS RESULT

From SLACVM(QSPIRES):   * Result 1 Experiment
```

If you use the right truncation sign or the PREFIX operator in a search, the number of the retrieved records may be quite large, and it makes sense to attach the RESULT option in such cases:

```
TELL QSPIRES at SLACVM  FIND EXPERIMENT PREFIX ANL (RES IN
                        EXPERIMENTS

From SLACVM(QSPIRES):   * Result 79 Experiments

TELL QSPIRES at SLACVM  FIN EXP LAMPF# (IN EXPERIMENTS RESULT

From SLACVM(QSPIRES):   * Result 97 Experiments
```

At this point, you could apply further criteria to narrow the search result, and then use OUTPUT to bring the result to your e-mailbox. To determine more precisely the kinds of values that are stored in the EXPERIMENTS index, use the BROWSE command.

FIND TITLE (FIN T)

The TITLE index in EXPERIMENTS is a *word index*, and very similar to all the other TITLE indexes mentioned in this guide. Each word in an experiment's title is indexed separately, and it is enough to know only one word from the title to be able to retrieve the corresponding record. You may also use more than one expected word; the order of words in your search request is unimportant.

```
TELL QSPIRES at SLACVM  FIND TITLE EFFICIENCY (IN EXPERIMENTS RES
From SLACVM(QSPIRES):   * Result 2 Experiments
TELL QSPIRES at SLACVM  FIN T DOWNSTREAM SILVER AND GOLD (RES IN
                        EXPERIMENTS
From SLACVM(QSPIRES):   * Result 1 Experiment
```

Most common words, such as *the, a, an, with,* and most of the *nonreserved* symbols ($, %, /, etc.) are ignored if they appear in your search value. These are *excluded* words (symbols). The list of such words (symbols) in the TITLE index in EXPERIMENTS coincides with the list of *excluded* entities in the TITLE index in HEP (see Subsection 2.2.2).

In addition, one must keep in mind that some symbols (e.g., parentheses, >, <, &, etc.) have a special meaning for SPIRES. These are the so-called *reserved* symbols. If you want to use them in search values in TITLE or any other index, the entire search value must be enclosed in double quotes, e.g., FIN T "P(POLARIZED)" (IN EXPERIMENTS RES.

The PREFIX operator may be used in this index, but then the search value is restricted to only one word. This is the usual behavior in all *word indexes.* To check whether supersymmetric particles are mentioned in titles of some experiments, type, e.g.,

```
TELL QSPIRES at SLACVM  FIND T PREFIX SUPER (IN EXPERIMENTS RES
From SLACVM(QSPIRES):   * Result 1 Experiment
```

However,

```
TELL QSPIRES at SLACVM  FIN TITLE PRE SUPER PARTICLES (IN
                        EXPERIMENTS RES
```

will not work: our search value consists of too many (two!) words, and although we may get a nonzero answer, the second search value (PARTICLES) will actually be ignored in the search. There are no restrictions if you use the right truncation sign, #; you can truncate as many words as you wish:

```
TELL QSPIRES at SLACVM  FIND T SUPER# SOLENO# (IN EXPERIMENTS RES
From SLACVM(QSPIRES):   * Result 1 Experiment
```

(Note that some machines do not allow you to send the *pound* sign #; check Subsection 1.2.4 for details.) If you are in doubt as to whether a word should be written with a hyphen (e.g., high energy) or as a hyphenated two-word combination (high and energy), BROWSE the TITLE index:

```
TELL QSPIRES at SLACVM  BRO TITLE HIGH-EN (IN EXPERIMENTS TYP
```

```
TELL QSPIRES at SLACVM  BROWSE T CP-VIOLAT (TYPE IN EXPERIMENTS
```

For a more complete description of searches in TITLE indexes, see, e.g., Subsection 2.2.2, which describes the FIND TITLE command in the HEP database.

FIND AUTHOR (FIN A)

The AUTHOR index in the EXPERIMENTS database is a *personal-name index* (see Subsection 1.2.4). This index contains names appearing in original proposals of experiments, as well as the names from the resulting publications. By using this index, you can, e.g., find major experiments in which a certain physicist participated.

```
TELL QSPIRES at SLACVM  FIND AUTHOR RUBBIA, CARLO (RES IN
                        EXPERIMENTS

TELL QSPIRES at SLACVM  FIND A E. MATYUSHEV# (IN EXPERIMENTS RESULT

TELL QSPIRES at SLACVM  FIN AUTHOR JAMES BJORKEN (IN EXPERIMENTS
                        RES

TELL QSPIRES at SLACVM  FIND A DIAMBRINI-PALAZZI (RESULT IN
                        EXPERIMENTS

TELL QSPIRES at SLACVM  FIN AUTHOR PALAZZI (IN EXPERIMENTS RES
```

When, in a search value, a last name (=surname) is listed first, a comma must separate the name from the initials or the person's first name (cf., RUBBIA, CARLO). A comma should not be used if the order is reversed (cf., JAMES BJORKEN). Periods after initials are optional; you can search for E. MATYUSHEV#, as well as for E MATYUSHEV#. The PREFIX operator and the right truncation could be used to shorten the typing of long last names. Note that hyphenated last names may be searched for by either of the components. BROWSE the AUTHOR index to find a correct spelling of a name:

```
TELL QSPIRES at SLACVM  BRO AUTHOR SCECOWSKI (IN EXPERIMENTS TYP

TELL QSPIRES at SLACVM  BROWSE A SCZEKOWSKY (IN EXPERIMENTS TYP

TELL QSPIRES at SLACVM  BRO A SZCZEKOWSKIJ (IN EXPERIMENTS TYP
```

If you forget the option TYPE in these commands, the answer will be sent to your e-mailbox. With TYPE, you will get interactively a list of names alphabetically surrounding the one you mentioned.

If a search is successful, you may display the result by using the OUTPUT command (see Subsection 6.2.4). Alternatively, by continuing the search you can add to or subtract from the result before it is displayed (see Subsection 6.2.3).

FIND AFFILIATION (FIN AF)

Sometimes it is interesting to know in which experiments the members of a particular institution or department are involved. Use AFFILIATION index to learn that.

```
TELL QSPIRES at SLACVM  FIN AF RUTGERS U. (IN EXPERIMENTS RESULT

From SLACVM(QSPIRES):   * Result 44 Experiments
```

(The period in U. is optional.) The returned information tells us that physicists from Rutgers University participated in forty-four major projects since 1975. If you want to get the full listing of these experiments, send the followup OUTPUT command (see Subsection 6.2.4).

The AFFILIATION index is a *phrase index* (see Subsection 1.2.4). Consequently, you must list a complete *official* institution's name in your search value. Note that the official names in the EXPERIMENTS database are **different** from the institution's names used in HEP and INSTITUTIONS databases. Therefore, you might have problems in figuring out how to describe a certain institution. Browse through a copy of the LBL-91 publication to get an idea of the form of indexed names. Universities are usually denoted by universities' names followed by the letter U. For example, use PISA U., not U. (DI) PISA, TENNESSEE U., not U. OF TENNESSEE, etc. The rules are less consistent for other institutions and labs. Often, the name of a city is mentioned in the indexed value; sometimes it precedes a name or abbreviation of an institute (MOSCOW, ITEP, STRASBOURG, CRN), sometimes it follows it (BOSKOVIC INST., ZAGREB, NIKHEF, AMSTERDAM, etc.). Your best bet is to use the BROWSE command for a check of the AFFILIATION index near an expected value:

```
TELL QSPIRES at SLACVM  BRO AF MAX PLANCK (IN EXPERIMENTS TYPE

TELL QSPIRES at SLACVM  BRO AFFILIATION PLANCK INST (IN EXPERIMENTS
                        TYP

TELL QSPIRES at SLACVM  BROWSE AF MPI, MUNICH (IN EXPERIMENTS TYP

TELL QSPIRES at SLACVM  BRO AF MUNICH, MPI (TYPE IN EXPERIMENTS
```

Hopefully, at least one of such searches will lead to the desired indexed value. Once you know the correct term, you can shorten your command by using the PREFIX operator or the right truncation sign:

```
TELL QSPIRES at SLACVM  FIN AFFILIATION NORTHWEST# (IN EXPERIMENTS
                        RES

From SLACVM(QSPIRES):   * Result 29 Experiments

TELL QSPIRES at SLACVM  FIND AF PREFIX NATIONAL RESEAR (RES IN
                        EXPERIMENTS

From SLACVM(QSPIRES):   * Result 14 Experiments
```

If you are totally desperate, try the LIKE relational operator (see Subsection 1.2.3):

```
TELL QSPIRES at SLACVM  FIN AF LIKE ?METROPOLITAN COLL? (IN
                        EXPERIMENTS RES

From SLACVM(QSPIRES):   * Result 1 Experiment
```

Warning: LIKE searches might take a lot of CPU time. QSPIRES gives up when a search lasts unacceptably long, and sends a message, No records found ...

If a search is successful, you may display the result by using the OUTPUT command (see Subsection 6.2.4). Alternatively, you can add to or subtract from the result before it is displayed by continuing the search (see Subsection 6.2.3).

FIND ACCELERATOR (FIN AC)

This index enables a search by accelerator at which an experiment is performed. An accelerator is denoted either by a single word (e.g., ANL, CESR, LAMPF), or by a hyphenated combination of two or three words (e.g., DESY-DORIS-II, KEK-PF-LINAC, SATURNE-II). At present, there are less than fifty different entries in this index, and you can retrieve almost all of them by sending several BROWSE ACCELERATOR commands to QSPIRES.

The best tactic to exploit this index is to begin browsing in the vicinity of the expected value. For example, to find the exact name used in EXPERIMENTS to describe the accelerator(s) at Brookhaven, send the following command to QSPIRES:

```
TELL QSPIRES at SLACVM  BROWSE AC BROOKHAVEN (IN EXPERIMENTS TYP
```

The answer will show that the name to be used in a further search should be BNL (for the AGS proton synchrotron), or BNL-ION (for the old Brookhaven heavy ion accelerator). To learn about the names of CERN's accelerators, you will have to send two BROWSE commands:

```
TELL QSPIRES at SLACVM  BRO AC CERN (TYPE IN EXPERIMENTS

TELL QSPIRES at SLACVM  BRO AC CERN-SPS (TYPE IN EXPERIMENTS
```

Browsing in the vicinity of terms CORNELL, FERMILAB, NOVOSIBIRSK will recover the proper terms describing corresponding accelerators in the EXPERIMENTS database. Note that Dubna is indexed as JINR, and Saclay's synchrotron as SATURN-II.

Once you know a correct term, you can use this complete name in your search value, or you may shorten your command by using the PREFIX operator or the right truncation sign:

```
TELL QSPIRES at SLACVM  FIN ACCELERATOR KEK-TRISTAN (IN EXPERIMENTS
                        RES

From SLACVM(QSPIRES):   * Result 4 Experiments


TELL QSPIRES at SLACVM  FIND AC PREFIX SERPUK (RES IN EXPERIMENTS

From SLACVM(QSPIRES):   * Result 87 Experiments


TELL QSPIRES at SLACVM  FIND AC FNAL-COLL# (RES IN EXPERIMENTS

From SLACVM(QSPIRES):   * Result 7 Experiments
```

If a search is successful, you may display the result by using the OUTPUT command (see Subsection 6.2.4). Alternatively, you can add to or subtract from the result before it is displayed by continuing the search (see Subsection 6.2.3).

FIND DETECTOR (FIN DE)

More than hundred different detectors have been used in the last fifteen years at major accelerators, and you can find experiments related to a certain detector if you know the indexed acronym for the detector. The reference table of acronyms for detectors' names can be found in the LBL-91 report. Browsing through the DETECTOR index can also occasionally be helpful. A detector is denoted either by a single word (e.g., ARGUS, CLEO, OPAL, TOPAZ, UA1), or by a hyphenated combination of two or more words (e.g., CRYS-BALL, MARK-II, HLBC-BEBC-TST).

Once you know a correct acronym, you can use this detector name in your search value, or you may shorten your command by using the PREFIX operator or the right truncation sign:

```
TELL QSPIRES at SLACVM  FIN DETECTOR OMEGAPRIME (IN EXPERIMENTS RES

TELL QSPIRES at SLACVM  FIND DE PREFIX ALPHA-PO (RES IN EXPERIMENTS

TELL QSPIRES at SLACVM  FIND DE 2-G# (RES IN EXPERIMENTS
```

If you are satisfied with the result, you may display it by using the OUTPUT command (see Subsection 6.2.4). Alternatively, you can add to or subtract from the result before it is displayed by continuing the search (see Subsection 6.2.3).

FIND PUBLISHED-PAPER (FIN PAPER, FIN CIT)

An important piece of information contained in the database is a list of published articles with new experimental results. Each of the indexed papers is linked to one of the experiments. Among other data, an output for those experiments that produced some new results will show a list of published papers. There is no doubt that a list of published papers is one of the crucial pieces of information on an experiment. It is, however, less obvious how the PUBLISHED-PAPER index may help in a search.

Still, occasionally, your only information about an experiment might be a published paper; you can then retrieve other data on the experiment by using the PAPER index. Imagine that you run into an interesting experimental paper and want to know what other publications have originated from the same collaboration. Or, somebody might have referred to a paper with new experimental results, but did not mention the authors and code of the experiment. In similar situations, you can use this index to search. Typical search requests will have the form:

```
TELL QSPIRES at SLACVM  FIND PAPER "PRL 63 (1989) 724" (IN
                        EXPERIMENTS

TELL QSPIRES at SLACVM  FIND PAPER "PR D37 (1988) 1131" (IN
                        EXPERIMENTS

TELL QSPIRES at SLACVM  FIN CIT "NP B214 (1983) 189" (IN
                        EXPERIMENTS

TELL QSPIRES at SLACVM  FIN CIT "PL B137 (1984) 329" (IN
                        EXPERIMENTS

TELL QSPIRES at SLACVM  FIN PAPER "ZPHY C42 (1989) 17" (IN
                        EXPERIMENTS
```

Note first that papers in the EXPERIMENTS database are not indexed in the same way as are papers in the HEP database. The PUBLISHED-PAPERS index is a *phrase index*, and you must follow precisely the predetermined form: a journal name is shortened usually to two, three or four characteristic letters; such an acronym is followed by a volume letter (when appropriate) and volume number, not necessarily in that order; the four-digit year of publication is in parentheses, and a page number completes the expression. Your search value should have spaces but no commas between the elements. Furthermore, the symbols), (, > and < have a special meaning to SPIRES (see Subsection 1.2.4), and whenever they appear in search values, the entire search value must be enclosed in double quotes. If you do not follow the above rules, your search in the PUBLISHED-PAPERS index will not be successful.

Browse the PUBLISHED-PAPERS index to determine the position of a volume letter with respect to the volume number. A complete reference table for abbreviations used to denote journals can be found in the LBL-91 report. The following table shows some of the acronyms.

APL	Applied Phys. Lett.	NP	Nucl. Phys.
EPL	Europhys. Lett.	PL	Phys. Lett.
JETPL	JETP Lett.	PR	Phys. Rev.
LNC	Lett. N. Cimento	PRL	Phys. Rev. Lett.
NC	N. Cimento	YF	Yadern. Fiz.
NIM	Nucl. Instr. and Methods	ZPHY	Zeit. Physik

Note that in the examples for this search, the option RESULT was not used with this index. That is because one expects no more than one experiment to be related to a given paper. When the option RESULT is not issued, the full retrieved record is automatically and immediately returned to your e-mailbox.

FIND REACTION (FIN RE)

This index contains reactions studied in a given experiment. It is a *phrase index*. While the values saved in the REACTION index are very useful in a displayed result, a search in this index is not particularly convenient. Namely, it is very difficult to determine the correct search phrases. Browsing through the index may help somewhat, and browsing through the LBL-91 brochure can be useful in finding the proper phrases describing reactions.

Here are several randomly chosen examples which will yield nonzero results:

```
TELL QSPIRES at SLACVM  FIN REACTION "N N --> X" (IN EXPERIMENTS RES
From SLACVM(QSPIRES):   * Result 1 Experiment

TELL QSPIRES at SLACVM  FIND RE "E+ E- --> TAU+ TAU-" (RES IN
                        EXPERIMENTS
From SLACVM(QSPIRES):   * Result 7 Experiments

TELL QSPIRES at SLACVM  FIN RE "K+ --> MU+ NU" (RESULT IN
                        EXPERIMENTS
From SLACVM(QSPIRES):   * Result 4 Experiments

TELL QSPIRES at SLACVM  FIN RE "PI- P --> N LAMBDA LAMBDABAR" (RES
                        IN EXPERIMENTS
From SLACVM(QSPIRES):   * Result 2 Experiments
```

The arrow denoting a reaction is composed of two minus signs and a greater-than sign. The > sign is one of the symbols having a special meaning to SPIRES (see Subsection 1.2.4), and the whole search value should be enclosed in double quotes.

If you specify your search value, as in

```
TELL QSPIRES at SLACVM      FIN RE PI- P # (RES IN EXPERIMENTS,
```

or

```
TELL QSPIRES at SLACVM  FIN RE PREFIX PI- P (RES IN EXPERIMENTS
```

you will find all the experiments in which reactions with $\pi^- p$ as an initial state were studied, regardless of the final state. Usually, the first particle on the left-hand side of a reaction denotes a beam; and the second, a target (where applicable).

If you are satisfied with the result, you may display it by using the OUTPUT command (see Subsection 6.2.4).

FIND PARTICLE (FIN P)

If one of the goals of an experiment was to study a specific particle, then such a particle is indexed in the PARTICLES index. To find the experiments in which, say, the Higgs boson is studied, use the BROWSE command first to determine how the boson is indexed, and then the FIND command to retrieve the information:

```
TELL QSPIRES at SLACVM  BRO PARTICLE HIGGS (TYP IN EXPERIMENTS
```

(QSPIRES now sends a list of 10 subject values alphabetically surrounding the term HIGGS. Among them, you will find the name by which this particle is indexed.)

```
TELL QSPIRES at SLACVM  FIN PARTICLE HIGGS (RES IN EXPERIMENTS
From SLACVM(QSPIRES):   * Result 13 Experiments
```

Here are several more examples which will find nonzero results:

```
TELL QSPIRES at SLACVM  FIN PARTICLE "K*(892)" (IN EXPERIMENTS RES
TELL QSPIRES at SLACVM  FIND P OMEGA- (RES IN EXPERIMENTS
TELL QSPIRES at SLACVM  FIN P GLUEBALL (RESULT IN EXPERIMENTS
TELL QSPIRES at SLACVM  FIN PARTICLE "J/PSI(1S)" (RES IN
                        EXPERIMENTS
```

Whenever a symbol that has a special meaning to SPIRES appears, then the whole search value should be enclosed in double quotes. In our examples, the parentheses are such special symbols (see Subsection 1.2.4). Conventions for particle names in this index are different from those used in the HEP and PARTICLES databases. A reference table for these names can be found in the LBL-91 publication.

OTHER INDEXES IN EXPERIMENTS DATABASE

The FINAL-STATE-PART (FSP) index may be used to find a single final-state particle produced in an experiment. For example, FIN FSP KS (IN EXPERIMENTS TYP will show the number of experiments in which K_S was one of the produced particles.

Three indexes are *date indexes*: DATE-APPROVED (D), DATE-STARTED (DS) and DATE-COMPLETED (DC). A search through these indexes can be done according to the procedure explained in, e.g., Subsection 5.2.2, where the BEGINNING-DATE index in CONFERENCE database was discussed. Note that the three *date indexes* in EXPERIMENTS are *simple* indexes, not *qualifiers*, and therefore they can be used in a primary search.

To find experiments in which the beam is polarized, issue the command FIND POLARIZATION BEAM (IN EXPERIMENTS RES; similarly, to find experiments in which a target is polarized, use FIN PL TARGET (IN EXPERIMENTS RES. The POLARIZATION (PL) index has only these two values indexed. The truncation sign cannot be used in the POLARIZATION index, but the PREFIX operator is allowed. Note that in some experiments both target and beam may be polarized; see Subsection 6.2.3 for an example of a search for such experiments.

The PLAB and ECM indexes may be used to search for a laboratory momentum and a center-of-mass energy within a given range. For example, FIN PLAB 800 (IN EXPERIMENTS RES, or FIN ECM 3 TO 4 (IN EXPERIMENTS RES. Energies and momenta are in GeV and GeV/c. Note an interesting possibility for writing search values with these two indexes: FIND PLAB v1 TO v2 and FIND ECM v1 TO v2. The usual inequality operators cannot be used with PLAB and ECM indexes. Use instead GT, GE, LT, LE, for *greater than, greater than or equal, less than, less than or equal,* respectively; for example, FIN PLAB LT 20 (IN EXPERIMENTS RES.

6.2.3 CONTINUING A SEARCH

If you want to apply more than one criterion, formulate an iterative or a compound search request. For more details, see Subsection 1.4.1. Several examples for these two search techniques can be found in what follows.

COMPOUND SEARCH REQUEST

In this search, records fitting more than one criterion are located. All criteria are listed in only one line and separated by Boolean operators (see Subsection 1.4.1). If no search term is mentioned with some search value, the term immediately to the left of the missing one is assumed (FIN AUTHOR WOODY AND BERTRAND, F. means FIN AUTHOR WOODY AND **AUTHOR** BERTRAND, F.). A request must begin with the FIND command, and end with the selection (IN EXPERIMENTS modified possibly by options, such as RESULT, TYPE, etc. Here are several examples for compound searches:

```
TELL QSPIRES at SLACVM   FIN EXP PRE SACLAY & A PERROT, F. (RES IN
                         EXPERIMENTS
From SLACVM(QSPIRES):    * Result 10 Experiments
TELL QSPIRES at SLACVM   OUTPUT
From SLACVM(QSPIRES):    * File being sent to you via NOTE, class M

TELL QSPIRES at SLACVM   FIN AC SLAC# AND P BOTTOM AND NOT AF LBL#
                         (IN EXPERIMENTS
From SLACVM(QSPIRES):    * File being sent to you via NOTE, class M

TELL QSPIRES at SLACVM   FIN POLARIZATION BEAM AND TARGET (IN
                         EXPERIMENTS RES
From SLACVM(QSPIRES):    * Result 75 Experiments
TELL QSPIRES at SLACVM   OUTPUT (FILE
From SLACVM(QSPIRES):    * File being sent to you via NOTE, class M

TELL QSPIRES at SLACVM   FIN T NEW PARTICLES & PLAB 140 TO 200 (RES
                         IN EXPERIMENTS
From SLACVM(QSPIRES):    * Result 1 Experiment
```

```
TELL QSPIRES at SLACVM  OUTPUT
From SLACVM(QSPIRES):   * File being sent to you via NOTE, class M
```

ITERATIVE SEARCH REQUEST

It takes more than one line to form an iterative search request, but technically, this is still only one search. The request consists of several successive commands, but there is only one FIND verb. Similarly, it is enough to make the selection (IN EXPERIMENTS only once, in the line with the FIND command. Unless you add the option RESULT to the end of each line, every successive command in an iterative search will initiate an output of the information collected up to that point of the search. In what follows, all the examples for the compound search are now transformed to illustrate iterative searching:

```
TELL QSPIRES at SLACVM  FIN EXP PRE SACLAY (RES IN EXPERIMENTS
From SLACVM(QSPIRES):   * Result 61 Experiments
TELL QSPIRES at SLACVM  & A PERROT, F. (RES
From SLACVM(QSPIRES):   * Unrecognized command &
```

(QSPIRES does not allow the use of symbolic abbreviations for Boolean operators in iterative searches!)

```
TELL QSPIRES at SLACVM  AND A PERROT, F. (RES
From SLACVM(QSPIRES):   * Result 10 Experiments
TELL QSPIRES at SLACVM  OUTPUT (FILE
From SLACVM(QSPIRES):   * File being sent to you via NOTE, class M

TELL QSPIRES at SLACVM  FIN AC SLAC# (RES IN EXPERIMENTS
From SLACVM(QSPIRES):   * Result 59 Experiments
TELL QSPIRES at SLACVM  AND P BOTTOM (RES
From SLACVM(QSPIRES):   * Result 2 Experiments
TELL QSPIRES at SLACVM  AND NOT AF LBL#
From SLACVM(QSPIRES):   * File being sent to you via NOTE, class M

TELL QSPIRES at SLACVM  FIN POLARIZATION BEAM (IN EXPERIMENTS RES
From SLACVM(QSPIRES):   * Result 186 Experiments
TELL QSPIRES at SLACVM  AND TARGET (RES
From SLACVM(QSPIRES):   * Result 75 Experiments
TELL QSPIRES at SLACVM  OUTPUT (FILE
From SLACVM(QSPIRES):   * File being sent to you via NOTE, class M

TELL QSPIRES at SLACVM  FIN T NEW PARTICLES (RES IN EXPERIMENTS
From SLACVM(QSPIRES):   * Result 15 Experiments
```

```
TELL QSPIRES at SLACVM  AND PLAB 140 TO 200 (RES
From SLACVM(QSPIRES):   * Result 1 Experiment
TELL QSPIRES at SLACVM  OUTPUT (FILE
From SLACVM(QSPIRES):   * File being sent to you via NOTE, class M
```

6.2.4 DISPLAYING RECORDS FOUND BY A SEARCH

Records stored in the EXPERIMENTS database are not suitable for interactive sending, and in this section, we shall only discuss methods for obtaining retrieved data to one's e-mailbox. There are two different ways by which that could be achieved. If you expect your criteria to be satisfied by only a small number of experiments, use the search command

```
TELL QSPIRES at SLACVM  FIND <search-expression> (IN EXPERIMENTS
```

It will not only initiate a search, but also instruct QSPIRES to send the file with retrieved records to your e-mailbox:

```
From SLACVM(QSPIRES):   * File being sent to you via NOTE, class M
```

Limits on the number of records sent in this manner are mentioned below. However, if you first want to review the number of retrieved experiments, append the option RESULT (or RES) to the option field:

```
TELL QSPIRES at SLACVM  FIND <search-expression> (IN EXPERIMENTS
                        RES
From SLACVM(QSPIRES):   * Result nn Experiments
```

Now, if you are satisfied with this answer, issue the OUTPUT (or OUT) command to get the complete records:

```
TELL QSPIRES at SLACVM  OUTPUT
From SLACVM(QSPIRES):   * File being sent to you via NOTE, class M
```

Limits applying to this method of retrieving data are mentioned below.

In both cases, we shall get the result displayed in the default format, called PROP1. If you want to change this default, mention explicitly the format you prefer (see below).

CHOOSING A FORMAT FRAME

As explained in Subsection 6.2.1, the command SHOW FRAMES will help you determine the names of two formats available in EXPERIMENTS database. They are

PROP1 (default format) BRIEF

With the PROP1 format frame, you will get the following data on an experiment: the code and name of the experiment, a list of participating institutions with names of physicists working on that experiment (*spokesperson* will be clearly marked), the accelerator and detector used in the project, a list of reactions and particles studied, a list of published papers, and some general comments on the experiment. If you choose the BRIEF format, only the code, name, and the list of collaborators in the experiment will be sent.

To get the result in the PROP1 frame, you do not have to mention the frame at all: by default, the results are sent in this format frame. To get the result in the BRIEF format, append BRIEF, or USING BRIEF to the option field, e.g.,

```
TELL QSPIRES at SLACVM  FIND <search-expression> (IN EXPERIMENTS
                        BRIEF

TELL QSPIRES at SLACVM  OUTPUT (USING BRIEF
```

The term USING (which is really redundant when coupled with BRIEF, but obligatory with any other format) could be shortened to USI. Similarly, BRIEF, **if it stands alone** (i.e., not combined with USING), can be abbreviated to BRI.

Limits on the number of records that could be sent in a file depend on the format used. Here are the current limits:

* When the results are to be sent as a file to a user's e-mailbox with the default format frame:

- with

```
FIND <...> (IN EXPERIMENTS          200 records
```

- with

```
OUTPUT                              150 records
```

* When the results are to be sent as a file to the user's e-mailbox in the BRIEF format frame:

- with

```
FIND <...> (IN EXPERIMENTS BRIEF        200 records
```

- with

```
OUTPUT (BRIEF                           300 records
```

For additional information, suggestions, or comments related to the EXPERIMENTS database, contact Dr. H. Galić, Mail Stop 81, SLAC, PO Box 4349, Stanford, CA 94309, USA, or send an e-mail message to EXPBASE@SLACVM.BITNET.

6.3 DATAGUIDE DATABASE

While the HEP database (Chapters 2 to 4) deals with **all** the papers related to high energy physics, the DATAGUIDE database explores only those papers from HEP which contain some new **experimental data**. *Data* means not only the obvious experimentally measured quantities, but some derived quantities as well, such as partial-wave phase shifts. When a paper is entered in the HEP database, all its important bibliographic information is indexed. If the same paper fits DATAGUIDE criteria, additional information will be extracted from the paper itself: a list of reactions studied and the beam momenta, a list of all the particles whose properties are being studied, and the names of the accelerator and detector at which the work was performed. All these data are indexed in the DATAGUIDE database. It should be noted that DATAGUIDE covers **all** the experimental papers with new data; another related PDG database, EXPERIMENTS, contains summaries of experiments performed only at **major** particle physics labs.

DATAGUIDE is maintained by the Berkeley Particle Data Group in collaboration with members of the Institute for High Energy Physics, Serpukhov. The database contains more than 30,000 entries. It is the source for the biannual LBL-90 report, *Guide to Data in Elementary Particle Physics*. This section describes various interactive searches via QSPIRES in the DATAGUIDE database.

6.3.1 INTERACTIVE SEARCH PROCEDURE

The DATAGUIDE database is searchable by accelerator name, detector, reaction, momentum, final state particles and some other search elements. A typical, simple, one-step interactive search request will have the form

```
TELL QSPIRES at SLACVM  FIND <search-expression> (IN DATAGUIDE
```

In a more intricate search, several search expressions might be linked by logical operators. The selection (IN DATAGUIDE must be specified in the line with the FIND verb. The selection will remain in effect until a new search is initiated with your next FIND command. This means that, e.g., there is no need to repeat the phrase (IN DATAGUIDE in a followup command of an iterative search, or with an OUTPUT command.

Retrieved results from all PDG databases are immediately sent to you, even before you have a chance to review the number of documents found. In order to change this default, append RESULT (or RES) to the option field:

```
TELL QSPIRES at SLACVM  FIND <search-expression> (IN DATAGUIDE
                        RESULT
```

Now, only the number of retrieved papers, but not the indexed information, will be sent to you. The result is sent *interactively*:

```
From SLACVM(QSPIRES):   * Result nn Papers
```

If you are satisfied with this answer, you can request the complete output; alternatively, the search might be continued with the addition of further criteria. Note that the actual experimental data from papers are not registered in the DATAGUIDE database; the output will only list the reactions and properties studied, but not the measured values.

Each search expression must have a correctly stated search term (see Section 1.2). To get the list of search terms (and they coincide with the names of indexes in the DATAGUIDE database), send one of the following commands to QSPIRES:

```
TELL QSPIRES at SLACVM  SHOW INDEXES (IN DATAGUIDE TYPE
TELL QSPIRES at SLACVM  SHO SEA TER (TYP IN DATAGUIDE
TELL QSPIRES at SLACVM  SHO IND (FILE IN DATAGUIDE
TELL QSPIRES at SLACVM  SHOW SEARCH TERMS (IN DATAGUIDE
```

The first two commands instruct QSPIRES to send the list interactively, while the last two tell QSPIRES to file the list and send it to your e-mailbox. As seen from the fourth example, you do not have to write FILE explicitly; unless the term TYPE (or TYP) appears in option field, the information is, by default, sent noninteractively. The table below shows some of the indexes that will be found in the returned list.

INDEX	ALLOWED ABBREV. AND VARIATIONS
ACCELERATOR	AC, ACC
DETECTOR	DE, DET
REACTION	RE, REA, REAC
PARTICLE	P, PART
FINAL-STATE-PART	FSP
AUTH-YEAR	ID
DATE	D
POLARIZATION	PL, POL
PLAB	
ECM	

The GOAL index (not listed in the table) is called PAPER. The key value of the GOAL index is a randomly selected number. A search through the GOAL index in this database is possible, but not very useful for a general user. There are no *qualifiers* in the DATAGUIDE database. Note that the DATE index is a *simple index*, and it can be used even in a primary search.

Almost all the relational operators described in Subsection 1.2.3 could be applied in the DATAGUIDE database. The equality operator is the most efficient, and has the widest use. The inequality operators could be used most successfully with DATE searches. Among the content operators, the recommended one is the PREFIX. Note, however, that in a request line, only **one** PREFIX per search term is allowed.

To determine the kinds of values that could be used with a given index, issue the BROWSE command, e.g.,

```
TELL QSPIRES at SLACVM  BROWSE PARTICLE BOTTOM (IN DATAGUIDE TYP
TELL QSPIRES at SLACVM  BRO ACCELERATOR SLAC (IN DATAGUIDE TYPE
TELL QSPIRES at SLACVM  BROWSE REACTION (IN DATAGUIDE
```

The result of the browse is sent to you interactively only if you specify the TYPE option (the first and second examples). The third line tells QSPIRES to file the result of the browse and send it to your e-mailbox. You can also use the BROWSE FIRST and BROWSE LAST commands (for description, see, e.g., Subsection 1.2.4).

In most of the DATAGUIDE indexes, searching with truncated values (right truncation) is allowed:

```
TELL QSPIRES at SLACVM  FIN DE CRYS# (IN DATAGUIDE RES
From SLACVM(QSPIRES):   * Result 78 Papers
```

This search will find all papers with new results based on experiments performed with the Crystal Ball large solid angle detector (CRYS-BALL, in DATABASE vocabulary) and the Crystal Box crystal array detector (CRYS-BOX).

To learn more about the DATAGUIDE database, send SHOW or EXPLAIN commands to QSPIRES. If you use the first two of the following commands, the answer will be sent to you interactively. The third and the fourth command will instruct QSPIRES to send the information to your e-mailbox.

```
TELL QSPIRES at SLACVM  SHOW SUBFILE DESCRIPTION (IN DATAGUIDE TYP
TELL QSPIRES at SLACVM  EXPLAIN DATAGUIDE
TELL QSPIRES at SLACVM  SHO SUB DES (IN DATAGUIDE FILE
TELL QSPIRES at SLACVM  EXP DATAGUIDE (FIL
```

A simple search, with only one criterion specified, is not the only possibility in the DATAGUIDE database. From time to time, you will want to add more criteria, and narrow or expand the search in an iterative process:

```
TELL QSPIRES at SLACVM  FIND PARTICLE RHO0 (IN DATAGUIDE RESULT
From SLACVM(QSPIRES):   * Result 80 Papers
TELL QSPIRES at SLACVM  AND ACCELERATOR FNAL (RES
From SLACVM(QSPIRES):   * Result 6 Papers
```

Note that the selection has to be displayed only in the line with the FIND verb. On the other hand, the option RES(ULT) must appear in every step for which you want the answer to contain only the number of retrieved results.

You can also state several criteria in a single line, by using a compound search.

```
TELL QSPIRES at SLACVM  FIN RE "PI- P --> #" AND ECM 3 TO 4 (IN
                        DATAGUIDE RES
From SLACVM(QSPIRES):   * Result 222 Papers
```

In both iterative and compound searches, the logical operators AND, AND NOT, and OR describe how the criteria combine. If you lose track of the criteria used up to a given point in a search, apply the SHOW SEARCH or SHOW RESULT commands. You do not have to specify (IN DATAGUIDE nor TYPE with these commands; an interactive answer will show your search steps in the most recently used database.

```
TELL QSPIRES at SLACVM  SHOW SEARCH
TELL QSPIRES at SLACVM  SHO RESULT
```

If you do not use the option RESULT in a search request, all retrieved records are sent to you immediately following the receipt of your request. If you do use the RESULT option, then the records could be displayed later, by issuing the OUTPUT command once all your criteria have been satisfied (see Subsection 6.3.4). As always, you can choose to get the result either interactively or via e-letter, the latter possibility being the default choice and producing much more readable output. Two format frames are available for displaying records found in the DATAGUIDE database. To get the list of frames, issue

```
TELL QSPIRES at SLACVM  SHOW FRAMES (TYP IN DATAGUIDE
```

This will cause the list to be sent interactively. If you want a permanent record, append FILE instead of TYPE to the option field, or simply send

```
TELL QSPIRES at SLACVM  SHO FRA (IN DATAGUIDE
```

Limits on the number of records that could be sent in various formats are given in Subsection 6.3.4.

6.3.2 EXAMPLES OF A SEARCH

This subsection reviews searches in which some of the available search terms are used in simple, one-step searches. The next subsection offers examples of more intricate searches in which several criteria are applied.

FIND ACCELERATOR (FIN AC)

This index enables a search by the name of the accelerator at which an experiment is performed. An accelerator is denoted either by a single word (e.g., CESR, LUND, TRIUMF), or by a hyphenated combination of two or three words (e.g., DESY-DORIS, KEK-TRISTAN, CERN-SPS). There are more than one hundred different entries in this index. One of the tactics to exploit it is to begin browsing in the vicinity of an expected value. For example, to find the exact name used in DATAGUIDE to describe the accelerator(s) at Frascati, send the following command to QSPIRES:

```
TELL QSPIRES at SLACVM  BROWSE AC FRASCATI (IN DATAGUIDE TYP
```

The answer will show that the name to be used in further search should be FRAS (for the electron synchrotron), or FRAS-ADONE (for the electron-positron ring). To learn about all of CERN's accelerators, you will have to send two BROWSE commands:

```
TELL QSPIRES at SLACVM  BRO AC CERN (TYPE IN DATAGUIDE
TELL QSPIRES at SLACVM  BRO AC CERN-SPS (TYPE IN DATAGUIDE
```

Browsing in the vicinity of terms BROOKHAVEN, ORSAY, NOVOSIBIRSK will recover the proper terms describing the corresponding accelerators in the DATAGUIDE database. If your first attempt at browsing is not successful, explore some variations. Note, e.g., that Dubna is indexed as JINR, and Ann Arbor's cyclotron as MYCH-CYC.

There is also a reference table of all the accelerator names in the LBL-90 report, under *Accelerator Names Vocabulary.* If browsing does not help, use this printed information. Once you know a correct term, you can use this complete name in your search value, or you may shorten your command by using the PREFIX operator or the right truncation sign:

```
TELL QSPIRES at SLACVM  FIN ACCELERATOR KEK-TRISTAN (IN DATAGUIDE
                        RES
From SLACVM(QSPIRES):   * Result 15 Papers

TELL QSPIRES at SLACVM  FIND AC PREFIX CHALK (RES IN DATAGUIDE
From SLACVM(QSPIRES):   * Result 1 Paper

TELL QSPIRES at SLACVM  FIND AC VAN-DE-G# (RES IN DATAGUIDE
From SLACVM(QSPIRES):   * Result 5 Papers
```

Note that names and abbreviations assigned to accelerators in the DATAGUIDE database are not necessarily identical to those used in the EXPERIMENTS database (Section 6.2).

If a search is successful, you may display the result by using the OUTPUT command (see Subsection 6.3.4). Alternatively, you can add to or subtract from the result before it is displayed, by continuing the search (see Subsection 6.3.3).

FIND DETECTOR (FIN DE)

Several hundred different detectors have been used in particle physics experiments in the last fifteen years. You can find papers based on results from a certain detector if you know the indexed acronym for the detector. The reference table of acronyms for detectors' names can be found in the LBL-90 report. Note that names and abbreviations assigned to accelerators in the DATAGUIDE database are not necessarily identical to those used in the EXPERIMENTS database (Section 6.2) and printed in the LBL-91 report. Browsing through the DETECTOR index can also be helpful occasionally. A detector is denoted either by a single word (e.g., ASTERIX, CLASP, EPICS, NUSEX, TPS), or by a hyphenated combination of two or more words (e.g., CERN-MUNICH, SPES-I, HLBC-BEBC-TST).

Once you know a correct acronym, you can use this detector name in your search value, or you may shorten your command by using the PREFIX operator or the right truncation sign:

```
TELL QSPIRES at SLACVM  FIN DETECTOR OMEGAPRIME (IN DATAGUIDE RES
TELL QSPIRES at SLACVM  FIND DE PREFIX SUPERBEN (RES IN DATAGUIDE
TELL QSPIRES at SLACVM  FIND DE ANDRO# (RES IN DATAGUIDE
```

If you are satisfied with the result, you may display it by using the OUTPUT command (see Subsection 6.2.4). Alternatively, you can add to or subtract from the result before it is displayed, by continuing the search (see Subsection 6.2.3).

FIND REACTION (FIN RE)

This index contains reactions studied in a given experiment. It is a *phrase index*. While the values indexed in the REACTION are very useful in a displayed result, a search in this index is not particularly convenient. That is, it is very difficult to determine the right search phrases. Browsing through the index may help somewhat, and browsing through the LBL-90 brochure can be useful in finding the correct phrases describing a reaction. Generally, the left-hand side of a reaction describes first a beam and then a target. The final states (right-hand side of a reaction) are ordered by increasing multiplicity, with the particles ordered alphabetically for a given multiplicity. English-language equivalent spelling of Greek characters is used for particles denoted by Greek letters. All antiparticles that are commonly written with a bar over the name are spelled with the letters BAR appended to the particle name, cf., PBAR, DELTABAR. For further conventions used in the description of particles in DATAGUIDE index, see the Introduction in the LBL-90 report.

Here are several randomly chosen examples which will yield nonzero results:

```
TELL QSPIRES at SLACVM  FIND REACTION "E+ E- --> UPSI(3S)" (IN
                        DATAGUIDE RES
From SLACVM(QSPIRES):   * Result 22 Papers

TELL QSPIRES at SLACVM  FIN RE "NUMUBAR NUCLEON --> MU+ #" (RES IN
                        DATAGUIDE
From SLACVM(QSPIRES):   * Result 79 Papers

TELL QSPIRES at SLACVM  FIN RE "K+ --> MU+ NU" (RESULT IN DATAGUIDE
From SLACVM(QSPIRES):   * Result 1 Paper
```

```
TELL QSPIRES at SLACVM  FIN RE "PI- P --> LAMBDA LAMBDABAR N" (RES
                        IN DATAGUIDE

From SLACVM(QSPIRES):   * Result 4 Papers
```

The arrow denoting a reaction is composed of two minus signs and a greater-than sign. The > sign is one of the symbols having a special meaning to SPIRES (see Subsection 1.2.4), and the whole search value should be enclosed in double quotes.

If you specify your search value as in

```
TELL QSPIRES at SLACVM  FIN RE PI- P # (RES IN DATAGUIDE
```

or

```
TELL QSPIRES at SLACVM  FIN RE PREFIX PI- P (RES IN DATAGUIDE
```

you will find all 1189 papers in which the reactions with $\pi^- p$ as initial state were studied, regardless of the final state. Note that in these two examples there was no need for quotes, because the (truncated) search values did **not** include the arrow sign.

If you are satisfied with the result, you may display it by using the OUTPUT command (see Subsection 6.2.4).

FIND PARTICLE (FIN P)

If one of the goals of an experiment is to study a specific particle, then such a particle is indexed in the PARTICLE index. To find experiments in which, e.g., the Higgs boson is studied, use first the BROWSE command to determine how the boson is indexed, and then the FIND command to retrieve the information:

```
TELL QSPIRES at SLACVM  BRO PARTICLE HIGGS (TYP IN DATAGUIDE
```

(QSPIRES now sends a list of 10 subject values alphabetically surrounding the term HIGGS. Among them, you will find the name by which this particle is indexed.)

```
TELL QSPIRES at SLACVM  FIN PARTICLE HIGGS (RES IN DATAGUIDE

From SLACVM(QSPIRES):   * Result 70 Papers
```

Here are several more examples which will find nonzero results:

```
TELL QSPIRES at SLACVM  FIN PARTICLE "LAMBDA(2020F07)#" (IN
                        DATAGUIDE RES

TELL QSPIRES at SLACVM  FIND P DIBARYON (RES IN DATAGUIDE

TELL QSPIRES at SLACVM  FIN P SQUARK (RESULT IN DATAGUIDE

TELL QSPIRES at SLACVM  FIN PARTICLE "CHI/C0(1P)" (RES IN DATAGUIDE
```

Whenever a symbol that has a special meaning to SPIRES appears, then the whole search value should be enclosed in double quotes. In our examples, the parentheses are such special symbols (see Subsection 1.2.4). Conventions for particle names in this index are different from those used in the HEP and PARTICLES databases. Generally, the English-language equivalent spelling of Greek characters is used for particles denoted by Greek letters. All antiparticles that are commonly written with a bar over the name are spelled with the letters BAR appended to the particle name, cf., PBAR, DELTABAR. A reference table for particle names used in DATAGUIDE can be found in the LBL-90 publication.

FIND FINAL-STATE-PART (FIN FSP)

The FINAL-STATE-PART index makes it possible to search papers according to particles produced in an experiment. It collects names of particles appearing on the right-hand sides of reactions indexed in the REACTION index. The organization of this index and the methods of searching it are very similar to those mentioned in the review of the PARTICLE index. To find papers in which, e.g., the $D^*(2010)$ boson production is studied, first use the BROWSE command to determine how the boson is indexed, and then the FIND command to retrieve the information:

```
TELL QSPIRES at SLACVM  BRO FSP D*(2010) (TYP IN DATAGUIDE
```

(QSPIRES now sends a list of 10 subject values surrounding the term alphabetically. Among them, you will find the name by which this particle is indexed.)

```
TELL QSPIRES at SLACVM  FIN FSP "D*(2010)#" (RES IN DATAGUIDE
From SLACVM(QSPIRES):   * Result 129 Papers
```

Here are several more examples which will find nonzero results:

```
TELL QSPIRES at SLACVM  FIN FSP "SIGMA/C(2450)" (IN DATAGUIDE RES
TELL QSPIRES at SLACVM  FIND FSP TAU+ (RES IN DATAGUIDE
TELL QSPIRES at SLACVM  FIN FSP NUEBAR (RESULT IN DATAGUIDE
TELL QSPIRES at SLACVM  FIN FSP Z (RES IN DATAGUIDE
```

Whenever a symbol that has a special meaning to SPIRES appears, then the whole search value should be enclosed in double quotes. In our examples, the parentheses are such special symbols (see Subsection 1.2.4). Conventions for particle names in this index are different from those used in HEP and PARTICLES databases.

Generally, the English-language equivalent spelling of Greek characters is used for particles denoted by Greek letters. All antiparticles that are commonly written with a bar over the name are spelled with the letters BAR appended to the particle name, cf., K*BAR(852), NBAR. A reference table for particle names used in DATAGUIDE can be found in the LBL-90 publication.

FIND AUTH-YEAR (FIN ID)

The AUTH-YEAR index in the DATAGUIDE database is useful only if you have the LBL-90 report in hand, and want a quick identification of a paper by its Document ID, a unique key by which papers are referenced in the report. Other than that, the index has a very limited usefulness for an ordinary user. The ID is composed of the name of the first author of a paper and the year of its first appearance, as in JONES 84. If there is more than one paper by the same author in the same year, the additional papers are listed as JONES 84B, JONES 84C, and so on. The AUTH-YEAR index is a *phrase index*. If the LBL-90 report says, e.g., that a certain reaction was studied by AAHLIN 80, yo · can find the complete reference, including a list of author(s), title of the paper, and other bibliographic data, by issuing

```
TELL QSPIRES at SLACVM  FIND ID AAHLIN 80 (IN DATAGUIDE
From SLACVM(QSPIRES):   * File being sent to you via NOTE, class M
```

Only the first author is indexed in AUTH-YEAR index. If you want to locate (experimental) papers in a search based on an author other than the firs' author, use, e.g., the AUTHOR index in the HEP database (see Subsection 2.2.1).

One can use the right truncation in this index, but **not** the PREFIX operator, which restriction is quite unusual for QSPIRES searches.

FIND DATE (FIN D)

This index classifies papers according to the year of their first appearance. The year may correspond to the preprint version of the paper, and therefore, in many cases, the year in the DATE index will not match the year of the published reference. The index is a *date index*. Only a year, but not a month or a day, are indexed. Therefore, searches in which the search value is stated as JAN 88 or 4/15/91 do not make much sense.

The DATE index in DATAGUIDE, unlike the DATE index in HEP, is a *simple index*, and can serve in a primary search. (The DATE index in HEP is a *qualifier* and can be used only in compound and iterative searches.) You can issue the command

```
TELL QSPIRES at SLACVM FIN DATE 88 (IN DATAGUIDE RESULT
```

to see how many papers registered in DATAGUIDE appeared in 1988. One can use the two-digit (88), or the four-digit (1988) form to describe a year in a search value. Inequality operators are allowed with DATE index.

You can add to or subtract from the result by continuing the search (see Subsection 6.2.3).

OTHER INDEXES IN THE DATAGUIDE DATABASE

To find papers describing experiments in which the beam is polarized, issue the command FIND POLARIZATION BEAM (IN DATAGUIDE RES; similarly, to find information on experiments in which a target is polarized, use FIN PL TARGET (IN DATAGUIDE RES. The POLARIZATION (PL) index has only these two values indexed. Right truncation is not allowed in this index, but you can use the PREFIX operator instead. Note that in some experiments, both target and beam may be polarized; see Subsection 6.3.3 for an example of a search for such experiments.

PLAB and ECM indexes may be used to search for a laboratory momentum and a center-of-mass energy within a given range. For example, FIN PLAB 800 (IN DATAGUIDE RES, or FIN ECM 3 TO 4 (IN DATAGUIDE RES. Energies and momenta are in GeV and GeV/c. Note an interesting possibility for writing search values with these two indexes: FIND PLAB v1 **TO** v2 and FIND ECM v1 **TO** v2. The usual inequality operators cannot be used with PLAB and ECM indexes. Use GT, GE, LT, LE, for *greater than, greater than or equal, less than, less than or equal,* respectively; for example, FIN PLAB LT 20 (IN DATAGUIDE RES.

Some other indexes in the DATAGUIDE database are not widely used, and will not be discussed here.

6.3.3 CONTINUING A SEARCH

To apply more than one criterion, we can formulate an iterative or a compound search request. For more details, see Subsection 1.4.1. Several examples of these two search techniques appear in the following material.

COMPOUND SEARCH REQUEST

In such a search, records fitting more than one criterion are located. All *criteria* are listed in only one line and separated by Boolean operators (see Subsection 1.4.1). If no search term is men-

tioned with some search value, the term immediately to the left of the missing one is assumed (FIN PARTICLE K OR KBAR means FIN PARTICLE K OR **PARTICLE** KBAR). A request must begin with the FIND command, and end with the selection (IN DATAGUIDE possibly modified by options, such as RESULT, TYPE, etc. Here are several examples of compound searches:

```
TELL QSPIRES at SLACVM  FIN P HVY-LEPTON AND AC SLAC# AND D 84 (RES
                        IN DATAGUIDE
From SLACVM(QSPIRES):   * Result 3 Papers
TELL QSPIRES at SLACVM  OUTPUT
From SLACVM(QSPIRES):   * File being sent to you via NOTE, class M

TELL QSPIRES at SLACVM  FIN RE "E- N --> #" AND (FSP RH00 OR PI-)
                        (IN DATAGUIDE
From SLACVM(QSPIRES):   * File being sent to you via NOTE, class M

TELL QSPIRES at SLACVM  FIN POLARIZATION BEAM AND TARGET (IN
                        DATAGUIDE RES
From SLACVM(QSPIRES):   * Result 154 Papers

TELL QSPIRES at SLACVM  FIN AC DESY# AND DE MARK-J & ECM 40 TO 50
                        (RES IN DATAGUIDE
From SLACVM(QSPIRES):   * Result 11 Papers
TELL QSPIRES at SLACVM  OUTPUT
From SLACVM(QSPIRES):   * File being sent to you via NOTE, class M
```

ITERATIVE SEARCH REQUEST

It takes more than one line to form an iterative search request, but technically, this is still only one search. The request consists of several successive commands, but there is only one FIND verb. Similarly, it is enough to make the selection (IN DATAGUIDE only once, in the line with the FIND command. Unless you add the option RESULT to the end of each line, every step in an iterative search will initiate an output of the information collected up to that point of search. In the following, all the examples for the compound search are now transformed to illustrate iterative searching:

```
TELL QSPIRES at SLACVM  FIN PARTICLE HVY-LEPTON (RES IN DATAGUIDE
From SLACVM(QSPIRES):   * Result 116 Papers
TELL QSPIRES at SLACVM  AND AC SLAC# (RES
From SLACVM(QSPIRES):   * Result 26 Papers
TELL QSPIRES at SLACVM  AND D 1984 (RES
From SLACVM(QSPIRES):   * Result 3 Papers
TELL QSPIRES at SLACVM  OUTPUT (FILE
From SLACVM(QSPIRES):   * File being sent to you via NOTE, class M
```

```
TELL QSPIRES at SLACVM  FIN RE "E- N --> #" (RES IN DATAGUIDE
From SLACVM(QSPIRES):   * Result 21 Papers
TELL QSPIRES at SLACVM  AND (FSP RHO0 OR PI-)
From SLACVM(QSPIRES):   * File being sent to you via NOTE, class M

TELL QSPIRES at SLACVM  FIN POLARIZATION BEAM (IN DATAGUIDE RES
From SLACVM(QSPIRES):   * Result 436 Papers
TELL QSPIRES at SLACVM  AND TARGET (RES
From SLACVM(QSPIRES):   * Result 154 Papers

TELL QSPIRES at SLACVM  FIN AC DESY# (RES IN DATAGUIDE
From SLACVM(QSPIRES):   * Result 670 Papers
TELL QSPIRES at SLACVM  AND DE MARK-J (RES
From SLACVM(QSPIRES):   * Result 64 Papers
TELL QSPIRES at SLACVM  & ECM 40 TO 50 (RES
From SLACVM(QSPIRES):   * Unrecognized command &
```

(QSPIRES does not allow the use of symbolic abbreviations for Boolean operators in iterative searches!)

```
TELL QSPIRES at SLACVM  AND ECM 40 TO 50 (RES
From SLACVM(QSPIRES):   * Result 11 Papers
TELL QSPIRES at SLACVM  OUTPUT (FILE
From SLACVM(QSPIRES):   * File being sent to you via NOTE, class M
```

6.3.4 DISPLAYING RECORDS FOUND BY A SEARCH

Records stored in the DATAGUIDE database are not suitable for interactive sending, and in this section, we shall only discuss methods for obtaining retrieved data in one's e-mailbox. There are two different ways by which that could be achieved. If you expect the criteria to be satisfied by only a small number of papers, use the search command

```
TELL QSPIRES at SLACVM  FIND <search-expression> (IN DATAGUIDE
```

It will not only initiate a search, but also instruct QSPIRES to send the file with retrieved records to your e-mailbox:

```
From SLACVM(QSPIRES):   * File being sent to you via NOTE, class M
```

Limits on the number of records sent in this manner are mentioned below. However, if you first want to review the number of retrieved papers, append the option RESULT (or RES) to the option field:

```
TELL QSPIRES at SLACVM  FIND <search-expression> (IN DATAGUIDE RES
```

```
From SLACVM(QSPIRES):    * Result nn Papers
```

Now, if you are satisfied with this answer, issue the OUTPUT (or OUT) command to get the complete records:

```
TELL QSPIRES at SLACVM  OUTPUT
From SLACVM(QSPIRES):    * File being sent to you via NOTE, class M
```

Limits applying to this method of retrieving data are mentioned below.

In both cases, we shall get the result displayed in the default format, called MAIN. If you want to change this default, mention explicitly the format you prefer (see below).

CHOOSING A FORMAT FRAME

As explained in Subsection 6.2.1, the command SHOW FRAMES will help you determine the names of two formats available in DATAGUIDE database. They are

MAIN (default format) BRIEF

With the MAIN format frame, you will be given the following data for each of the retrieved documents: title and author(s) of the paper, reprint number (if applicable) and/or publication data, name of the accelerator and detector used in the project, a list of reactions and particles studied, and some general comments on the data. If you choose the BRIEF format only the bibliographic data (title of the paper, authors and exact reference) will be sent.

To get the result in the MAIN format, you do not have to mention the frame at all: by default, the results are sent in the MAIN format. To get the result in the BRIEF format, append BRIEF, or USING BRIEF to the option field, e.g.,

```
TELL QSPIRES at SLACVM  FIND <search-expression> (IN DATAGUIDE
                        BRIEF
```

or

```
TELL QSPIRES at SLACVM  OUTPUT (USING BRIEF
```

The term USING (which is really redundant when coupled with BRIEF, but obligatory with any other format) could be shortened to USI. Similarly, BRIEF, if it stands alone (i.e., not combined with USING), can be abbreviated to BRI. The forms USING BRI and USI BRI are **not** allowed.

Limits on the number of records that could be sent in a file depend on the format used. Here are the current limits:

* When the results are to be sent as a file, to a user's e-mailbox, with the default format frame:

- with

```
FIND <...> (IN DATAGUIDE          50 records
```

- with

```
OUTPUT                            150 records
```

* When the results are to be sent as a file, to the user's e-mailbox, in the BRIEF format frame:

- with

```
FIND <...> (IN DATAGUIDE BRIEF          50 records
```

- with

```
OUTPUT (BRIEF                                  300 records
```

For additional information, suggestions, or comments related to the DATAGUIDE database, contact Gary Wagman, Particle Data Group 50-308, Lawrence Berkeley Laboratory, Berkeley, CA 94720, USA, or send an e-mail message to WAGMAN@LBL.BITNET.

6.4 REACTIONS DATABASE

The REACTIONS database collects particle physics scattering data in the form of differential and total cross sections, structure functions, polarizations measurements, density matrices, etc., from a wide range of experimental papers. In many cases, data are obtained directly from the experimenters themselves. Reactions considered include two-body and quasi–two-body scattering, e^+e^- annihilations into hadrons, photoproduction, inclusive hadron production with both hadron and lepton beams, deep inelastic scattering, etc.

REACTIONS data are compiled by the Durham/RAL Particle Data Group (UK) in collaboration with the Serpukhov COMPAS Group (the former Soviet Union). The QSPIRES version is handled by the Berkeley Particle Data Group. The database contains almost 2,000 entries, ranging from 1983 to the present. It is updated annually. This section describes various interactive searches via QSPIRES in the REACTIONS database.

6.4.1 INTERACTIVE SEARCH PROCEDURE

The REACTIONS database is searchable by reaction, observable, final state particles, detector name, momentum, experiment number, reference and the first author and some other search elements. A typical, simple, one-step interactive search request will have the form

```
TELL QSPIRES at SLACVM  FIND <search-expression> (IN REACTIONS
```

In a more intricate search, several search expressions might be linked by logical operators. The selection (IN REACTIONS must be specified in the line with the FIND verb. The selection will remain in effect until a new search is initiated with your next FIND command. This means that, e.g., there is no need to repeat the phrase (IN REACTIONS in a followup command of an iterative search, or with an OUTPUT command.

Retrieved results from all PDG databases are immediately sent to you, even before you have a chance to review the number of documents found. In order to change this default, append RESULT (or RES) to the option field:

```
TELL QSPIRES at SLACVM  FIND <search-expression> (IN REACTIONS
                        RESULT
```

Now, only the number of retrieved records, but not the indexed information, will be sent to you. The result is sent *interactively:*

```
From SLACVM(QSPIRES):    * Result nn Records
```

If you are satisfied with this answer, you can request the complete output; alternatively, the search might be continued by addition of further criteria.

Each search expression must have a correctly stated search term (see Section 1.2). To get the list of search terms (and they coincide with the names of indexes in the REACTIONS database), send one of the following commands to QSPIRES:

```
TELL QSPIRES at SLACVM  SHOW INDEXES (IN REACTIONS TYPE
TELL QSPIRES at SLACVM  SHO SEA TER (TYP IN REACTIONS
TELL QSPIRES at SLACVM  SHO IND (FILE IN REACTIONS
TELL QSPIRES at SLACVM  SHOW SEARCH TERMS (IN REACTIONS
```

The first two commands instruct QSPIRES to send the list interactively, while the last two tell QSPIRES to file the list and send it to your e-mailbox. As seen from the fourth example, you do not have to write FILE explicitly; the information is, by default, sent to you noninteractively unless the term TYPE (or TYP) appears in the option field. The table below shows some of the indexes that will be found in the returned list.

INDEX	ALLOWED ABBREV. AND VARIATIONS
REACTION	RE, REA, REAC
OBSERVABLE	OBS, YN
FINAL-STATE-PART	FSP
DETECTOR	DE, DET
PLAB	BMOM
AUTHOR	A, AU, AUTH, FIRST-AUTH-ONLY, ID, SC
EXPERIMENT	EXP, EXPT
REFERENCE	R, REF
DATE	D, Y, YEAR

The GOAL index (not listed in the table) is called RECORD (or RECORDS, REC01). The key value of the GOAL index is a randomly selected number. A search through the GOAL index in this database is possible, but not very useful for a general user. Note that the DATE index is a *simple index*, not a *qualifier*; therefore, it can be used even in a primary search.

Almost all the relational operators described in Subsection 1.2.3 could be applied in the REACTIONS database. The equality operator is the most efficient, and has the widest use. The inequality operators could be used most successfully with DATE searches. Among the content operators, the recommended one is the PREFIX. Note, however, that in a request line, only **one** PREFIX per search term is allowed.

To determine the kind of values that could be used with a given index, issue the BROWSE command, e.g.,

```
TELL QSPIRES at SLACVM  BROWSE FSP J/PSI (IN REACTIONS TYP
TELL QSPIRES at SLACVM  BRO OBSERVABLE THRUST (IN REACTIONS TYPE
TELL QSPIRES at SLACVM  BROWSE REACTION E- DEUTERIUM (IN REACTIONS
TELL QSPIRES at SLACVM  BROWSE EXPERIMENT (IN REACTIONS FILE
```

The result of this browse is sent to you interactively only if you specify the TYPE option (the first and second examples). The third and fourth lines tell QSPIRES to file the result of the browse and

send it to your e-mailbox. You can also use the BROWSE FIRST and BROWSE LAST commands (for description, see Subsection 1.2.4).

In most of the REACTIONS indexes, searching for truncated values (right truncation) is allowed:

```
TELL QSPIRES at SLACVM  FIN DE CRYS# (IN REACTIONS RES
From SLACVM(QSPIRES):   * Result 9 Records
```

This search will find all reactions analyzed with the Crystal Ball large solid angle detector (CRYS-BALL, in REACTIONS vocabulary).

To learn more about the REACTIONS database, send SHOW or EXPLAIN commands to QSPIRES. If you use the first two of the following commands, the answer will be sent to you interactively. The third and the fourth command will instruct QSPIRES to send the information to your e-mailbox.

```
TELL QSPIRES at SLACVM  SHOW SUBFILE DESCRIPTION (IN REACTIONS TYP
TELL QSPIRES at SLACVM  EXPLAIN REACTIONS
TELL QSPIRES at SLACVM  SHO SUB DES (IN REACTIONS FILE
TELL QSPIRES at SLACVM  EXP REACTIONS (FIL
```

A simple search, with only one criterion specified, is not the only possibility in the REACTIONS database. From time to time, you will want to add more criteria and narrow or expand the search in an iterative process:

```
TELL QSPIRES at SLACVM  FIND REACTION "P P --> P P" (IN REACTIONS
                        RESULT
From SLACVM(QSPIRES):   * Result 71 Records
TELL QSPIRES at SLACVM  OR REACTION "PBAR P --> PBAR P" (RES
From SLACVM(QSPIRES):   * Result 109 Records
TELL QSPIRES at SLACVM  AND OBS DSIG/DT (RES
From SLACVM(QSPIRES):   * Result 36 Records
```

Note that the selection has to be displayed only in the line with the FIND verb. On the other hand, the option RES(ULT) must appear in every step for which you want the answer to contain only the number of retrieved results.

You can also state several criteria in a single line, by using a compound search.

```
TELL QSPIRES at SLACVM  FIN A SMITH AND DATE > 86 (IN REACTIONS RES
From SLACVM(QSPIRES):   * Result 2 Records
```

In both iterative and compound searches, the logical operators AND, AND NOT, and OR describe how the criteria combine. If you lose track of the criteria used up to a given point in a search, apply the SHOW SEARCH or SHOW RESULT commands. You do not have to specify (IN REACTIONS nor TYPE with these commands; an interactive answer will show your search steps in the most recently used database.

```
TELL QSPIRES at SLACVM  SHOW SEARCH
TELL QSPIRES at SLACVM  SHO RESULT
```

If you do not use the option RESULT in a search request, all retrieved records are sent to you immediately following the receipt of your request. If you do use the RESULT option, then the records could be displayed later, by issuing the OUTPUT command once all your criteria have been satisfied (see Subsection 6.4.4). As always, you can choose to get the result either interactively or via e-letter, the latter possibility being the default choice and producing much more readable output. Two format frames are available for displaying records found in the REACTIONS database. To get the list of frames, issue

```
TELL QSPIRES at SLACVM  SHOW FRAMES (TYP IN REACTIONS
```

This will cause the list to be sent interactively. If you want a permanent record, append FILE instead of TYPE to the option field, or simply send

```
TELL QSPIRES at SLACVM  SHO FRA (IN REACTIONS
```

Limits on the number of records that could be sent in various formats are given in Subsection 6.4.4.

6.4.2 EXAMPLES OF A SEARCH

This subsection reviews searches in which some of the available search terms are used in simple, one-step searches. The next subsection offers examples of more intricate searches in which several criteria are applied.

FIND REACTION (FIN RE)

One of the principal uses of this database is to search for records containing data from specific reactions. Reactions studied in a given experiment are indexed in the REACTION index, which is a *phrase index*. Searching in this index is not particularly convenient, because it is very difficult to determine the right search phrases. Browsing through the index may help you find the correct phrase describing a reaction. Generally, the left-hand side of a reaction describes first a beam and then a target. English-language equivalent spelling of Greek characters is used for particles denoted by Greek letters. All antiparticles that are commonly written with a bar over the name are spelled with the letters BAR appended to the particle name, cf., PBAR, DELTABAR. The conventions used in the description of particles in the REACTIONS index follow those in the EXPERIMENTS database (Section 6.2); see also the relevant table in the LBL-91 report.

Here are several randomly chosen examples which will yield nonzero results:

```
TELL QSPIRES at SLACVM  FIND REACTION "P NUCLEUS --> KS X" (IN
                        REACTIONS RES
From SLACVM(QSPIRES):   * Result 1 Record

TELL QSPIRES at SLACVM  FIN RE "E- DEUT --> E-#" (RES IN REACTIONS
From SLACVM(QSPIRES):   * Result 6 Records

TELL QSPIRES at SLACVM  FIN RE "PBAR P --> JET X" (RESULT IN
                        REACTIONS
From SLACVM(QSPIRES):   * Result 12 Records
```

```
TELL QSPIRES at SLACVM  FIN RE "K+ P --> (NEUTRALS) CHARGED LAMBDA
                        P" (RES IN REACTIONS

From SLACVM(QSPIRES):   * Result 1 Record
```

The arrow denoting a reaction is composed of two minus signs and a greater-than sign. The > sign is one of the symbols having a special meaning in SPIRES (see Subsection 1.2.4), and the whole search value should be enclosed in double quotes when > is used in it.

If you specify your search value as in

```
TELL QSPIRES at SLACVM  FIN RE PI+ N # (RES IN REACTIONS
```

or

```
TELL QSPIRES at SLACVM  FIN RE PREFIX PI+ N (RES IN REACTIONS
```

you will find all the experiments in which the initial states $\pi^+ n$, π^+*nucleon*, and π^+*nucleus* were studied, regardless of the final states in the reactions. Note that in these two examples, there was no need for quotes, because the (truncated) search values did not include the arrow sign.

If you are satisfied with the result, you may display it by using the OUTPUT command (see Subsection 6.4.4).

FIND OBSERVABLE (FIN OBS)

This index contains the scattering variable studied in a given experiment. It is not very easy to determine the right search phrases to be used with this index. Some observable names are quite obvious, cf., SLOPE, SPHERICITY, ASYMMETRY, etc., but others are not as easy to guess. Browsing through the index may help somewhat in finding the correct phrases describing an observable. Some more popular observables are listed in the following chart:

APLANARITY	aplanarity	POL	any singular polarization
ASYMMETRY	any asymmetry [1]	POL.POL	double polarization exp.
DSIG/DT	different. cross section	POL.RHO	dens. matr. with pol. beam
DSIG/DOMEGA	angular distribution	SIG	total cross section
ETA	eta parameter	SLOPE	slope
FORMFACTOR	any form factor [2]	THRUST	thrust

Notes: [1] sometimes also ASYM; [2] sometimes also FORM-FACTOR.

Here are several randomly chosen examples which will yield nonzero results:

```
TELL QSPIRES at SLACVM  FIND OBSERVABLE SIG (IN REACTIONS RES
From SLACVM(QSPIRES):   * Result 773 Records

TELL QSPIRES at SLACVM  FIN OBS FORM# (RES IN REACTIONS
From SLACVM(QSPIRES):   * Result 17 Records

TELL QSPIRES at SLACVM  FIN OBS POL.POL (RESULT IN REACTIONS
From SLACVM(QSPIRES):   * Result 57 Records
```

```
TELL QSPIRES at SLACVM  FIN RE DSIG/DOMEGA (RES IN REACTIONS
From SLACVM(QSPIRES):   * Result 121 Records
```

Most often, you will combine the OBSERVABLE search term with the REACTION index search. If you are satisfied with the result, you may display it by using the OUTPUT command (see Subsection 6.4.4).

FIND FINAL-STATE-PART (FIN FSP)

The FINAL-STATE-PART index makes it possible to search for reactions according to particles produced in the reactions. The index has a collection of names of particles appearing on the right-hand sides of reactions in the REACTION index. The organization of this index and the methods of searching through it are very similar to those mentioned in the review of the EXPERIMENTS database (Subsection 6.2.1). To find papers in which, e.g., the $D^*(2010)$ boson is studied, first use the BROWSE command to determine how the boson is indexed, and then the FIND command to retrieve the information:

```
TELL QSPIRES at SLACVM  BRO FSP D*(2010) (TYP IN REACTIONS
```

(QSPIRES now sends a list of 10 subject values surrounding the term alphabetically. Among them, you will find the names by which this particle is indexed.)

```
TELL QSPIRES at SLACVM  FIN FSP "D*(2010)#" (RES IN REACTIONS
From SLACVM(QSPIRES):   * Result 42 Records
```

Here are several more examples which will find nonzero results:

```
TELL QSPIRES at SLACVM  FIN FSP "SIGMA/C(2450)+" (IN REACTIONS RES
TELL QSPIRES at SLACVM  FIND FSP TAU+ (RES IN REACTIONS
TELL QSPIRES at SLACVM  FIN FSP NUEBAR (RESULT IN REACTIONS
TELL QSPIRES at SLACVM  FIN FSP Z0 (RES IN REACTIONS
```

Whenever a symbol that has a special meaning to SPIRES appears, then the whole search value should be enclosed in double quotes. In our examples, the parentheses are such special symbols (see Subsection 1.2.4).

Conventions for particle names in this index are identical to those used in the EXPERIMENTS database. Generally, the English-language equivalent spelling of Greek characters is used for particles denoted by Greek letters. All antiparticles that are commonly written with a bar over the name are spelled with the letters BAR appended to the particle name, cf., K*BAR(892)0, NBAR. A reference table for particle names used in REACTIONS and EXPERIMENTS databases can be found in the LBL-91 publication.

FIND DETECTOR (FIN DE)

Several hundred detectors have been used in particle physics experiments in the last decade. You can search the database by using a name of a detector with which a reaction was studied. For a successful search, you must know the indexed acronym for the detector. Note that names and abbreviations assigned to accelerators in the REACTIONS database are identical to those used in the EXPERIMENTS database (Section 6.2). The reference table of acronyms for detectors' names can be found in the LBL-91 report, *Current Experiments in Elementary Particle Physics.* Browsing through the DETECTOR index can also be helpful occasionally. A detector is denoted either by a

single word (e.g., ARGUS, CLEO, OPAL, TOPAZ, UA1), or by a hyphenated combination of two or more words (e.g., CRYS-BALL, MARK-II, HLBC-BEBC-HYB).

Once you learn the correct acronym, use this detector name in a search value. The PREFIX operator and the right truncation sign are allowed in this index:

```
TELL QSPIRES at SLACVM  FIN DETECTOR OMEGAPRIME (IN REACTIONS RES
TELL QSPIRES at SLACVM  FIND DE PREFIX DBC (RES IN REACTIONS
TELL QSPIRES at SLACVM  FIND DE 2-G# (RES IN REACTIONS
```

If you are satisfied with the result, you may display it by using the OUTPUT command (see Subsection 6.4.4). Alternatively, you can add to or subtract from the result before it is displayed by continuing the search (see Subsection 6.4.3).

FIND AUTHOR (FIN A)

The AUTHOR index in the REACTIONS database is useful if you want to identify a reaction using the name of the first author of a corresponding document. This is **not** a *name index*. Only the last name (surname) of a first author is indexed, e.g., AGUILAR-BENITEZ or USHIDA. To find data on reactions studied by the first author Aarnio, type the command

```
TELL QSPIRES at SLACVM  FIND A AARNIO (IN REACTIONS RES
From SLACVM(QSPIRES):   * Result 3 Records
```

If you want to find papers with reaction data in a search based other than on the first author, use the AUTHOR index in the HEP database (see Subsection 2.2.1) to learn the name of the first author.

FIND EXPERIMENT (FIN EXP)

You can search through the database by using the standard numerical code characterizing an experiment, e.g., SACLAY-087, BNL-734, SLAC-PEP-004/009, etc. More than one record may be based on the same experiment. Here are several examples:

```
TELL QSPIRES at SLACVM  FIND EXP SACLAY-087 (IN REACTIONS RES
From SLACVM(QSPIRES):   * Result 2 Records

TELL QSPIRES at SLACVM  FIND EXP CESR-CLEO (RES IN REACTIONS
From SLACVM(QSPIRES):   * Result 17 Records

TELL QSPIRES at SLACVM  FIND EXP ITEP-E-762 (IN REACTIONS RES
From SLACVM(QSPIRES):   * Result 1 Record

TELL QSPIRES at SLACVM  FIND EXP SACLAY 087 (RES IN REACTIONS
From SLACVM(QSPIRES):   * No records found which match search
                        criteria
```

While the first three examples describe the allowed forms for an experiment code in a search value, the last example will find no matching result: an incorrect way of writing the code (with no hyphen) was attempted. In this database, an experiment code must be exactly matched to the

indexed value, and no variations are allowed. (Note that some variations are allowed in all the other databases with EXPERIMENT indexes.)

If you use the PREFIX operator or a truncation sign in a search, the number of retrieved records may be quite large:

```
TELL QSPIRES at SLACVM  FIND EXPERIMENT PREFIX FNAL (RES IN
                        REACTIONS
From SLACVM(QSPIRES):   * Result 112 Records

TELL QSPIRES at SLACVM  FIN EXP LAMPF# (IN REACTIONS RESULT
From SLACVM(QSPIRES):   * Result 33 Records
```

At this point, you could apply further criteria to narrow the search result, and then use OUTPUT to bring the result to your e-mailbox. To determine more precisely the kinds of values that are stored in the EXPERIMENT index, use the BROWSE command.

FIND REFERENCE (FIN R)

Another method of exploring the REACTIONS database is by using the REFERENCE index, which contains references of papers with reactions data. You might, e.g., know that some interesting data are published in the *Zeitschrift für Physik*, C34 (1987) 419. To get this data, issue

```
TELL QSPIRES at SLACVM  FIND REFERENCE ZP C34, 419 (IN REACTIONS
From SLACVM(QSPIRES):   * File being sent to you via NOTE, class M
```

The year of publication is not used in this index. Several other typical search requests may have the form:

```
TELL QSPIRES at SLACVM  FIND R CERN-EP-31-85 (IN REACTIONS
TELL QSPIRES at SLACVM  FIND REFERENCE PL 237B 599 (IN REACTIONS
TELL QSPIRES at SLACVM  FIND REFERENCE PL/237B/599 (IN REACTIONS
TELL QSPIRES at SLACVM  FIND REFERENCE PL,237B,599 (IN REACTIONS
TELL QSPIRES at SLACVM  FIN R NP B217, 285 (IN REACTIONS
TELL QSPIRES at SLACVM  FIN REFERENCE ZP C49/239 (IN REACTIONS
```

Note that papers in the REACTIONS database are not indexed in the same way that papers in the HEP database are. Furthermore, acronyms used for journals are sometimes different even from those used in other PDG databases.

The REFERENCE index is a *phrase index*, and you must follow precisely the predetermined form: a journal name is shortened usually to two or three characteristic letters; such an acronym should be followed by a volume letter (when appropriate) and volume number, not necessarily in that order; the page number completes the expression. Your search value could have spaces, or commas, or slashes (/) between the elements. If you do not follow these rules, your search in the REFERENCE index will not be successful.

Browse the REFERENCE index to determine the acronym and the position of a volume letter with respect to volume number. The following table shows some of the acronyms.

EL	Europhys. Lett.	PL	Phys. Lett. (e.g., PL 150B, 458)
JP	J. Phys. (e.g., JP G11, 69)	PR	Phys. Rev. (e.g., PR D28, 2896)
NC	N. Cimento (e.g., NC 79A, 181)	PRL	Phys. Rev. Lett.
NCL	Lett. N. Cimento	YF	Yadern. Fiz.
NIM	Nucl. Instr. and Methods	ZETFP	ZETF Pisma (in Russian)
NP	Nucl. Phys. (e.g., NP B213, 1)	ZP	Zeit. Physik (e.g., ZP C17, 113)

Note that in the examples above, the option RESULT was not used with this index. That is because one expects no more than one record to be related to a given paper. When the option RESULT is not issued, the retrieved record containing reactions data is automatically and immediately returned to your e-mailbox.

FIND DATE (FIN D)

This index classifies papers according to their year of appearance (for preprints) or publication (for published works). The index is a *date index*. Only a year and a month, but not a day, are indexed. Therefore, a search in which the search value is stated as JAN 88 is fine, but the specification 4/15/91 does not make much sense.

The DATE index in REACTIONS, unlike the DATE index in HEP, is a *simple index*, and can serve in a primary search. (The DATE index in HEP is a *qualifier* and can be used only in compound and iterative searches.) You can issue the commands

```
TELL QSPIRES at SLACVM  FIN DATE 88 (IN REACTIONS RESULT
TELL QSPIRES at SLACVM  FIND D SEP 1983 (IN REACTIONS RES
TELL QSPIRES at SLACVM  FIN DATE 12-89 (IN REACTIONS RESULT
```

to see how many records registered in REACTIONS appeared in 1988, September 1983, and December 1989, respectively. One can use the two-digit (88), or the four-digit (1988) form to describe a year in the search value. Similarly, a month can be specified in several ways. Inequality operators are allowed with the DATE index.

Usually, this index is combined in a search with some other indexes. You can add to or subtract from the result obtained in the DATE index by continuing the search (see Subsection 6.4.3).

OTHER INDEXES IN THE REACTIONS DATABASE

The PLAB index may be used to search for a beam momentum within a given range. For example, FIN PLAB 800 (IN REACTIONS RES, FIN PLAB GT 50 (IN REACTIONS RES or FIN PLAB 3 TO 4 (IN REACTIONS RES. Momenta are given in GeV. For colliding beams, the equivalent laboratory momentum is coded except in the case of e^+e^- collisions where PLAB shows half the center-of-mass energy in GeV. The usual inequality operators >, >=, < and <= (see Subsection 1.2.3), are not allowed with this index. Instead, use the GT (for greater than), GE (for greater than or equal to), LT (less than), and LE (less than or equal to) operators. Note an additional interesting possibility for writing search values with this index: FIND PLAB v1 **TO** v2. Other indexes in the REACTIONS database are not widely used, and will not be discussed here.

6.4.3 CONTINUING A SEARCH

To apply more than one criterion, we can formulate an iterative or a compound search request. For more details, see Subsection 1.4.1. Several examples of these two search techniques can be found in the following material.

COMPOUND SEARCH REQUEST

In such a search, records fitting more than one criterion are located. All criteria are listed in only one line and are separated by Boolean operators (see Subsection 1.4.1). If no search term is mentioned with a particular search value, the term immediately to the left of the missing one is assumed (`FIN FSP K0 OR KBAR0` means `FIN FSP K0 OR FSP KBAR0`). A request must begin with the `FIND` command, and end with the selection `(IN REACTIONS` possibly modified by options, such as `RESULT`, `TYPE`, etc. Here are several examples of compound searches:

```
TELL QSPIRES at SLACVM  FIN AUTHOR BARING# AND DATE < 1988 (IN
                        REACTIONS
From SLACVM(QSPIRES):   * File being sent to you via NOTE, class M

TELL QSPIRES at SLACVM  FIN RE "E+ E- --> HADRONS" AND OBS SIG (IN
                        REACTIONS RES
From SLACVM(QSPIRES):   * Result 53 Records
```

(This search will find all measurements of e^+e^- total cross section, including the `R` parameter!)

```
TELL QSPIRES at SLACVM  FIN RE PI- P # AND PLAB GT 100 (IN REACTIONS
                        RES
From SLACVM(QSPIRES):   * Result 50 Records

TELL QSPIRES at SLACVM  FIN RE "PBAR P --> PBAR P" & OBS DSIG/DT AND
                        D 85 (RES IN REACTIONS
From SLACVM(QSPIRES):   * Result 5 Records
TELL QSPIRES at SLACVM  OUTPUT
From SLACVM(QSPIRES):   * File being sent to you via NOTE, class M
```

ITERATIVE SEARCH REQUEST

It takes more than one line to form an iterative search request, but technically, this is still only one search. The request consists of several successive commands, but there is only one `FIND` verb. Similarly, it is enough to make the selection `(IN REACTIONS` only once, in the line with the `FIND` command. Unless you add the option `RESULT` to the end of each line, every step in an iterative search will initiate an output of the information collected up to that point of search. In the following material, all the examples of the compound search are now transformed to illustrate iterative searching:

```
TELL QSPIRES at SLACVM  FIN AUTHOR BARING# (RES IN REACTIONS
```

```
From SLACVM(QSPIRES):   * Result 4 Records
TELL QSPIRES at SLACVM  AND DATE < 88
From SLACVM(QSPIRES):   * File being sent to you via NOTE, class M

TELL QSPIRES at SLACVM  FIN RE "E+ E- --> HADRONS" (RES IN REACTIONS
From SLACVM(QSPIRES):   * Result 84 Records
TELL QSPIRES at SLACVM  AND OBS SIG (RES
From SLACVM(QSPIRES):   * Result 53 Records

TELL QSPIRES at SLACVM  FIN PI- P # (IN REACTIONS RES
From SLACVM(QSPIRES):   * Result 150 Records
TELL QSPIRES at SLACVM  AND PLAB GT 100 (RES
From SLACVM(QSPIRES):   * Result 50 Records

TELL QSPIRES at SLACVM  FIN RE "PBAR P --> PBAR P" (RES IN REACTIONS
From SLACVM(QSPIRES):   * Result 50 Records
TELL QSPIRES at SLACVM  AND OBS DSIG/DT (RES
From SLACVM(QSPIRES):   * Result 31 Records
TELL QSPIRES at SLACVM  & DATE 85 (RES
From SLACVM(QSPIRES):   * Unrecognized command &
```

(QSPIRES does not allow the use of symbolic abbreviations for Boolean operators in iterative searches!)

```
TELL QSPIRES at SLACVM  AND D 85 (RES
From SLACVM(QSPIRES):   * Result 5 Records
TELL QSPIRES at SLACVM  OUTPUT (FILE
From SLACVM(QSPIRES):   * File being sent to you via NOTE, class M
```

6.4.4 DISPLAYING RECORDS FOUND BY A SEARCH

Records stored in the REACTIONS database are not suitable for interactive sending, and in this section we shall only discuss the methods for obtaining the retrieved data in one's e-mailbox. There are two different ways to achieve this. If you expect your criteria to be satisfied by only a small number of papers, use the search command

```
TELL QSPIRES at SLACVM  FIND <search-expression> (IN REACTIONS
```

It will not only initiate a search, but also instruct QSPIRES to send the file with retrieved records to your e-mailbox:

```
From SLACVM(QSPIRES):   * File being sent to you via NOTE, class M
```

Limits on the number of records sent in this manner are mentioned below. However, if you first want to review the number of retrieved papers, append the option RESULT (or RES) to the option field:

```
TELL QSPIRES at SLACVM  FIND <search-expression> (IN REACTIONS RES
From SLACVM(QSPIRES):   * Result nn Records
```

Now, if you are satisfied with this answer, issue the OUTPUT (or OUT) command to get the complete records:

```
TELL QSPIRES at SLACVM  OUTPUT
From SLACVM(QSPIRES):   * File being sent to you via NOTE, class M
```

Limits applying to this method of retrieving data are mentioned below.

In both cases, we shall get the result displayed in the default format, called MAIN. If you want to change this default, explicitly mention the format you prefer (see below).

CHOOSING A FORMAT FRAME

As explained in Subsection 6.4.1, the command SHOW FRAMES will help you to determine the names of two formats available in REACTIONS database. They are

MAIN (default format) BRIEF

With the MAIN format frame, you will be given the following information for each of the retrieved records: title, the first author, the reference for the paper from which the data are taken, the name of the detector used in the project, and table(s) with actual data points from the reaction(s) studied.

If you choose the BRIEF format, no data points will be sent, only the bibliographic information and the detector/experiment name.

To get the result in the MAIN format frame, you do not have to mention the frame at all; by default, the results are sent in the MAIN format. To get the result in the BRIEF format, append BRIEF or USING BRIEF to the option field, e.g.,

```
TELL QSPIRES at SLACVM  FIND <search-expression> (IN REACTIONS
                        BRIEF
```

or

```
TELL QSPIRES at SLACVM  OUTPUT (USING BRIEF
```

The term USING (which is really redundant when coupled with BRIEF, but obligatory with any other format) could be shortened to USI. BRIEF, if it stands alone (i.e., not combined with USING), can be abbreviated to BRI. The forms USING BRI and USI BRI are **not** allowed.

Limits on the number of records that could be sent in a file depend on the format used. Here are the current limits:

* When the results are to be sent as a file, to a user's e-mailbox, with the default format frame:

- with

```
FIND <...> (IN REACTIONS        200 records
```

- with

```
OUTPUT                          150 records
```

* When the results are to be sent as a file, to the user's e-mailbox, in the BRIEF format frame:

- with

```
FIND <.../> (IN REACTIONS BRIEF    200 records
```

- with

```
OUTPUT (BRIEF                      300 records
```

For additional information, suggestions, or comments related to the REACTIONS database, contact Gary Wagman, Particle Data Group 50-308, Lawrence Berkeley Laboratory, Berkeley, CA 94720, USA, or send an e-mail message to WAGMAN@LBL.BITNET.

7. SENDING REQUESTS IN E-LETTERS

From most of the BITNET nodes, you can contact QSPIRES with interactive *messages*. However, if your BITNET machine has, for example, MVS operating system and no additional software for interactive communications, you will have to send your queries in electronic letters (e-letters). The same noninteractive procedure must be followed by all non-BITNET users, i.e., by those working from machines incorporated in networks such as INTERNET, HEPNET, EAN, UUCP. In order to access the SLAC databases from such an unfriendly environment, an e-letter containing a search command has to be sent to QSPIRES. (The distinction between a letter and a message is explained in Appendix B.) The search commands are almost identical to those used in interactive searching and are explained thoroughly in Chapters 2 to 6. The most inconvenient consequence of noninteractive searching is that it might take many minutes (even hours) before the QSPIRES' answer reaches you. The basics of communication with QSPIRES via e-letters are given below. Section 7.1 describes the form your letter must have in order to be understood by QSPIRES, and discusses procedures from *nearby* and *far away* nodes. Section 7.2 gives some further details of the search procedure.

7.1 HOW YOUR E-LETTER SHOULD LOOK

Your e-letter containing a search request must be properly addressed, and must have the form which QSPIRES can understand. The most efficient search procedure will depend on the time it takes your e-letter to reach SLAC. These topics are discussed in the following section.

7.1.1 QSPIRES' ADDRESS

Your request must reach the *user* (in fact, the remote server) QSPIRES at the BITNET node SLACVM. Since various networks are often interconnected through more than one gateway, there is usually more than one way to state an addressee on your e-letter. For example, from a HEPNET machine in North or South America, or Japan, the gateway LBL at the Lawrence Berkeley Laboratory may be the most convenient, and, if so, the address will probably have the form

```
LBL::"QSPIRES@SLACVM.BITNET"
```

However, from a European HEPNET node, you might be better off by sending mail to QSPIRES through the CERN gateway, using the address

```
MINT::"QSPIRES@SLACVM.BITNET"
```

To complicate things even further, SLAC's IBM 3090-200E machine is also directly connected to INTERNET, where it is known as SLACVM.SLAC.STANFORD.EDU host. The variety of choices caused serious nightmares for the writer of this manual ("How to systematically present all these possibilities?", "Where to find the names of all these gateways?", etc.). Finally, I decided to leave

this part blank, and let *you* figure out which is the best and fastest way to reach SLAC. Only a few general guidelines are listed:

- Test as many as possible different gateways; some might prove faster and more reliable.
- Test both

  `QSPIRES@SLACVM.BITNET`

  and

  `QSPIRES@SLACVM.SLAC.STANFORD.EDU (INTERNET)`

addresses. (This is not required if you are sending mail from a `BITNET` node; in that case, there are no gateways, and you simply address your letter to `QSPIRES` at `SLACVM`.)

- Test the links even before you require the registration: make searches in databases for which no authorization is needed, for example, in the directory of the e-mail addresses of high energy physicists; see Subsection 5.5.2 for the exact syntax of the command. (The registration procedure is described in Chapter 8.)
- Decide which address/gateway is the most efficient, send your registration through that channel, and stick to that choice. (If, in future, you change the path, `QSPIRES` might not recognize you as a registered user.)

7.1.2 CONTACTS FROM NEARBY SITES

A machine from which a letter can reach `QSPIRES` in 10 to 15 minutes or less will arbitrarily be defined as a *nearby* site in this Guide. Most of the US and Canada `INTERNET` nodes fit into that category. A rapidly increasing number of sites in Europe, Japan and Australia are now joining that group as well.

From such *nearby* nodes, you can make both simple, *one-step* searches, and more intrinsic, compound, and iterative searches. `QSPIRES` will keep track of your previous query for at least 30 minutes, and you can, if you wish, add further criteria to the original request. Each new step in an iterative search gives you a new 30 minutes extension for a followup. The search procedure from the nearby nodes will thus be very similar to the interactive procedure described in Chapters 2 to 6. The main difference is that all the action goes through the mail files: your search request is sent to `QSPIRES` in a special e-mail *envelope*, and `QSPIRES`' answer does not pop up on the screen of your terminal. Instead, the result is delivered to your e-mailbox.

GENERAL RULES FOR THE BODY OF A LETTER

An e-mail letter usually has a *header* and a *body*. The header contains information on the sender and recipient, date, time, and subject of the letter. `QSPIRES` presently does not read the subject line, but in the future, there might be some role for it. We suggest that you not state the subject in letters sent to `QSPIRES`; leave this line empty.

According to international standards, there should be a blank line between the header and the body of an e-letter. Most mailing systems insert this blank line automatically, but if your does not, put the line in by hand.

The body of the letter should contain *only one line*, in which your command is typed (e.g., SHOW SEARCH TERMS). If your letter has more than one line of text, all but the first line will be ignored by QSPIRES.

YOUR COMMAND

In the interactive procedure you could type,

```
TELL QSPIRES at SLACVM  FIND AUTHOR SALAM, A (IN BOOKS
```

and get the answer to your terminal screen:

```
From SLACVM(QSPIRES):    * Result 7 Books
```

On the other hand, the same request, when sent in an e-letter, should consist of a one-line text

✉

```
FIND AUTHOR SALAM, A (IN BOOKS
```

Note that only the **boldface** part of the interactive command above was used in the letter. The answer, delivered to your e-mailbox, will contain the following information:

```
Subject:                FIND AUTHOR SALAM, A

Result:                 Result 7 Books

Database:               BOOKS - On-line book catalog for the SLAC
                        library

Result 7 Books
```

At this point, you can either continue your search by sending further *criteria*, or instruct QSPIRES to deliver the complete information on these seven books, by sending your followup command

✉

```
OUTPUT
```

In the latter case, QSPIRES will send you an e-letter with the bibliographic data on the books written or edited by Professor Salam.

Avoid issuing the OUTPUT command if your search result contains many records. Rather, apply additional criteria to reduce the number of the records; there is a good chance for a delay in the transfer of a long file from QSPIRES to your site. Short files travel much faster. In many cases, the DATE qualifier (index) helps narrow your search. Also, use the BRIEF format when a compact form of the result satisfies your needs.

HOW TO CHECK WHETHER A NODE IS NEARBY

Even before you are registered, you can test various gateways to/from the SLACVM host, and decide whether your machine could be called a *nearby* one. Simply send an e-letter with the QUERY command to QSPIRES. (More on the QUERY command in Section 5.5.) For example, your letter may say

✉

```
QUERY ELLIS, J
```

which will instruct QSPIRES to search the database with e-mail addresses of HE physicists and find the address of J(ohn) Ellis. How long does it take for the answer to arrive? If it takes 20 to 30 minutes or less, your node is close enough (in the communication sense) to allow you a wide variety of simple and more complicated searches. Make more than one test; at times of the most intense traffic, there can be delays even from nearby nodes; or QSPIRES may temporarily be down.

7.1.3 CONTACTS FROM FAR AWAY SITES

I will arbitrarily define the *far away* site as the machine from which it takes more than 15 minutes to reach QSPIRES via an e-letter. Many non-US HEPNET/DECNET nodes fit into that category. Similarly, sites linked via X.400 national networks, JANET nodes in the UK, most of the UUCP computers, etc., also could be described as far away sites.

From a *far away* node you can only make a simple, *one-step* search, or a compound search, but no followup queries will be possible. This restriction in searching is a consequence of the inability of QSPIRES to keep track of your previous query for more than 30 minutes. Your question must be stated in a one-line letter, and QSPIRES' answer will also come in the mail file. Very often, your command line will have to contain an additional OUTPUT in the option field (see an example below).

GENERAL RULES FOR THE BODY OF A LETTER

See the material with the same title in Subsection 7.1.2.

YOUR COMMAND

In the interactive procedure, you might type

```
TELL QSPIRES at SLACVM  FIND CITATION ZEPYA, C3, 22
```

and get the answer to your terminal screen:

```
From SLACVM(QSPIRES):    * Result 25 Documents
```

The same request, when sent in an e-letter, may be formulated in two ways. One possibility is to use, in the letter, the one-line text


```
FIND CITATION ZEPYA, C3, 22
```

Note that only the **boldface** part of the interactive command above was used in the letter. QSPIRES' answer will contain only the *numerical* information:

```
Subject:                FIND CITATION ZEPYA, C3, 22

Result:                 Result 25 Documents

Database:               HEP - The SLAC/DESY High-Energy Physics
                        Database


Result 25 Documents
```

From a nearby node, you would be able to send the OUTPUT command in a followup request; but from a far away node, there is no time for that; QSPIRES waits for a followup some 30 minutes, and after that, erases the result. Therefore, if you want to get the complete list of documents found in the search, and not just the totals, you will have to formulate the request differently, with an OUTPUT appended:

```
FIND CITATION ZEPYA, C3, 22 (OUTPUT
```

The additional OUTPUT inserted in the option field instructs QSPIRES to send the complete result, not only the number of records.

Reminder: a big file usually travels much slower than a small one. Prevent the resulting delays by applying as much criteria as possible in your one-line compound query. More on compound search procedure in Subsections 1.4.1 and 3.3 (the latter one describes compound searches in HEP). Here is an example of a compound search in the CONF database. Your letter to QSPIRES may contain the following one line of text:

```
FIND PLACE TRIESTE & D NEXT YEAR & T SUMMER SCH# (IN CONF OUT
```

The answer will describe a summer school to be held next year in Trieste. Had you, on the contrary, chosen to use only one criterion, for example, **FIND PLACE TRIESTE (IN CONF OUTPUT**, the answer would have listed several dozens of past and future Trieste conferences.

HOW TO CHECK WHETHER A NODE IS FAR AWAY

Even before you are registered, you can test various gateways to/from SLACVM host, and decide whether your machine could be called a *nearby* or a *far away* one. Simply send an e-letter with the QUERY command to QSPIRES. (More on the QUERY command in Section 5.5.) For example, your e-letter may say

```
QUERY SLAVNOV, A. A.
```

which will instruct QSPIRES to search the database with e-mail addresses of high energy physicists and find the address of A. A. Slavnov. Measure how long it takes for the answer to arrive. If this is more than 30 minutes, your node is not close enough (in communication sense) to allow you iterative searches, and could be classified as a *far away* one. Make more than one test; sometimes, even from nearby nodes there can be delays during intense traffic, or QSPIRES may temporarily be down.

7.2 FURTHER EXAMPLES

Search commands in e-letters are very similar to those used in interactive searches. It is very useful to browse first through the relevant sections describing interactive searches in given databases, and only then to continue with this section.

This section gives a few more details related to searches in available databases. The first part is relevant for users from *nearby* sites; the second, for the *far away* users.

7.2.1 SEARCHING FROM NEARBY SITES

From *nearby* sites, you can make simple, one-step searches, compound searches, and iterative searches.

HEP DATABASE

A typical iterative search in the HEP database from a *nearby* site will have the following form (put your own search expression in; more on search expressions in Sections 1.2 and 2.1):

✉

```
FIND <search-expression-1>
```

(For example, FIND AUTHOR S. TING). You will receive the e-letter with the answer

```
Subject:  FIND <search-expression-1>

Result:                    Result nn Documents

Database:                  HEP - The SLAC/DESY High-Energy Physics
                           Database

Result nn Documents
```

Now you can use the OUTPUT command (see below) to get the list of collected documents, or you can continue the search, by sending the followup question of the form:

✉

```
<Boolean-operator>  <search-expression-2>
```

Here, <Boolean-operator> stands for operators AND, AND NOT, or OR (see Subsections 1.4.1 and 3.1.3). For example, you can type AND TITLE J. Upon receipt of the answer, you can add another step, and send to QSPIRES an e-letter with the text

✉

```
<Boolean-operator>  <search-expression-3>
```

(For example, AND NOT AF DESY). If, at this point of the search the result is narrowed down to something reasonable, send your OUTPUT command. Specify also the (BRIEF option, if the compact format of the result is acceptable to you:

✉

```
OUTPUT (BRIEF
```

You can also add other options and/or use a different format frame. Check Section 4.2. The OUTPUT command instructs QSPIRES to collect the result of the search, and send it to you as an e-mail file.

QSPIRES will send you no more than 300 documents from HEP if you use the brief format, and no more than 150 documents if any other HEP format frame is specified.

You can also use BROWSE, BACKUP, SHOW SEARCH, and other commands described in Section 3.2, for example, BROWSE TITLE FORM-FACTOR. The *compound* search (see Sections 1.4 and 3.3) is another viable alternative. An example of compound searching via e-letters is given in Subsection 7.2.2.

BOOKS, CONF, HITECH, AND SERIALS DATABASES

The search procedure in these databases from a nearby node is very similar to the one described in the previous subsection. However, your *opening* question should, additionally, indicate the database selection:

✉

```
FIND <search-expression-1> (IN <database>
```

For example, you may begin a search in the CONF database by sending the query FIN DATE NEXT YEAR (IN CONF. QSPIRES' answer will indicate how many records satisfy the criterion in your <search-expression-1>. Upon receipt of the answer, you can add another criterion. This time there is no need to mention the database; only the next FIND command will force you out of the database selected in the above example. Your followup question may have the form

✉

```
<Boolean-operator>  <search-expression-2>
```

where the <Boolean-operator> stands for operators AND, AND NOT, or OR (see Subsection 1.4.1 and 3.1.3). For example, you can type AND PLACE FRANCE. Depending on the answer on this question, you may continue the search, or use the OUTPUT command to retrieve the records found. It is useful to choose the BRIEF format frame (where available) for displaying the result. For example, your output command may be

✉

```
OUTPUT (BRIEF
```

(However, in HITECH and SERIALS databases, the BRIEF format is not defined, and the output command should be just OUTPUT.) One can add other options to the OUTPUT command, and/or use different format frames, where available. Check Sections 5.1, 5.2, and 5.4 for details. The OUTPUT command instructs QSPIRES to collect the result of the search, and send it to you as an e-mail file.

QSPIRES will send you no more than 200 records from the BOOKS database if you use the BRIEF format, and no more than 100 records if any other format frame is specified. Limits in the CONF database are 300 records for BRIEF format, and 150 for other format frames. In the HITECH and SERIALS databases, there is only one format available, and the limits are 150 and 100, respectively.

You can also use BROWSE, BACKUP, SHOW SEARCH, and other commands described in Chapter 1. For example, send BRO PUBLISHER WILEY (IN BOOKS. The *compound* search (see

Section 1.4) is another viable alternative. An example of compound searching via e-letters is given in Subsection 7.2.2.

INSTITUTIONS DATABASE

Two methods of searching are available in this database. Your search request may have the form

✉

```
FIND <search-expression> (IN INSTITUTIONS  FILE
```

The shorter form of the option field, `(IN INST  FIL`, is also allowed. For example, you may write `FIND  ADDRESS HAMBURG (IN INST  FIL`. If your search request is formulated in such a way, you will receive the e-letter with the complete list of records that satisfy the stated criterion. Note that the limit on the number of records that could be sent with the above command is 200.

If you use the above search form, no `OUTPUT` command is needed. However, the disadvantage is that you cannot first review the number of retrieved records and eventually narrow the search. If you prefer to see the number of retrieved records first, use a different form:

✉

```
FIND <search-expression> (IN INSTITUTIONS  RESULT
```

The shorter form `(IN INST RES` is also allowed. Now, the answer from `QSPIRES` will show only the number of institutions that match your criterion. At this point, you may continue the search, by sending the followup question of the form

✉

```
<Boolean-operator>  <search-expression-2> (RESULT
```

or you can request the list of institutions found, by sending to `QSPIRES` the command

✉

```
OUTPUT (BRIEF
```

One can add other options to the `OUTPUT` command, and/or choose not to mention the format name. Check Section 5.3 for details. The `OUTPUT` command instructs `QSPIRES` to collect the result of the search, and send it to you as an e-mail file.

`QSPIRES` will send you no more than 300 records from `INSTITUTIONS` database if you mention the `BRIEF` format, and no more than 150 records if you do not explicitly specify `BRIEF` in the option field.

You can also use `BROWSE`, `BACKUP`, `SHOW SEARCH`, and other commands described in Chapter 1. For example, send `BRO CATCHPHRASE CAMBRIDGE (IN INST  FILE`. *Compound* searching is also possible.

SEMINARS DATABASE

Two methods of searching are available in this database. Your search request may have the form

✉

```
FIND <search-expression> (IN SEMINARS
```

For example, you may write `FIND DATE NEXT MONTH (IN SEMINARS`. If your search request is formulated in such a way, you will receive an e-letter with the complete list of seminars that satisfy the stated criterion. Note that the limit on the number of records that could be sent with the above command is 100.

If you use the above search form, no `OUTPUT` command is needed. However, the disadvantage is that you cannot first review the number of retrieved records and eventually narrow the search. If you prefer to see the number of retrieved records first, use a different form:

✉

```
FIND <search-expression> (IN SEMINARS  RESULT
```

(`RESULT` may be shortened to `RES`.) Now, the answer from `QSPIRES` will show only the number of seminars that match your criterion. At this point, you may continue the search by sending the followup question of the form

✉

```
<Boolean-operator>  <search-expression-2> (RESULT
```

or can request the list of seminars found, by sending to `QSPIRES` the command

✉

```
OUTPUT
```

The `OUTPUT` command instructs `QSPIRES` to collect the result of the search, and send it to you as an e-mail file.

You can also use `BROWSE`, `BACKUP`, `SHOW SEARCH`, and other commands described in Chapter 1. *Compound* searching is also possible.

SEARCH FOR E-MAIL ADDRESSES (QUERY COMMAND)

You can use e-letters to retrieve the e-mail addresses from `QSPIRES`. The procedure is very similar to the one described in Subsection 5.5.2. Your one-line e-letter must have the form

✉

```
QUERY <person's-name>
```

`QUERY` may be shortened to `Q`. (`WHOIS` and `WHO` are also allowed forms.) For example, to find the e-mail address of Jean-Bernard Zuber, write `QUERY ZUBER, J.`, or `Q ZUBER, J.` *Compound* searching (see Sections 1.4 and 3.3) is possible with the `QUERY` command. One example of the compound search via e-letters is given in Subsection 7.2.2.

SEARCH FOR INSTITUTIONS ADDRESSES (WHEREIS COMMAND)

The `WHEREIS` command is a shortcut to the `INSTITUTIONS` database (see Subsection 5.5.4). You can use `WHEREIS` not only interactively, but also in e-letters, and retrieve the addresses of various institutions related to high energy physics. The procedure is very similar to the one described in Subsection 5.5.4. Your one-line e-letter must have the form

✉

```
WHEREIS <catch-word>
```

where the <catch-word> denotes a word or words that could be associated to a given institution. WHEREIS may be shortened to WHE. For example, to find the BNL address, you may try WHEREIS NAT# LAB# BROOK#, or WHE UPTON, etc.

DATAGUIDE, EXPERIMENTS, PARTICLES, AND REACTIONS DATABASES

Two methods of searching are available in these PDG databases. Your search request may have the form

✉

```
FIND <search-expression> (IN <database>
```

The <database> should be replaced with one of the database-names, DATAGUIDE, PARTICLES, EXPERIMENTS, or REACTIONS. For example, you may write FIND PP TAU DECAY-PARAM (IN PARTICLES. If your search request is formulated in such a way, you will receive an e-letter with the complete list of records that satisfy the stated criterion. Note that the limit on the number of records that could be sent with the above command is 50 from DATAGUIDE, and 200 from the other three PDG databases.

If you use the above search form, no OUTPUT command is needed. However, the disadvantage is that you cannot first review the number of retrieved records and eventually narrow the search. If you prefer to see the number of retrieved records first, use a different form:

✉

```
FIND <search-expression> (IN <database>  RESULT
```

(RESULT may be shortened to RES.) Now, the answer from QSPIRES will show only the number of seminars that match your criterion. At this point, you may continue the search by sending the followup question of the form

✉

```
<Boolean-operator>  <search-expression-2> (RESULT
```

or you can request the list of retrieved records by sending to QSPIRES the command

✉

```
OUTPUT
```

or

✉

```
OUTPUT (BRIEF
```

(The option BRIEF is not available in the PARTICLES database.) The OUTPUT command instructs QSPIRES to collect the result of the search, and send it to you as an e-mail file. The limit on the number of records that could be retrieved with the OUTPUT command from the PARTICLES da-

tabase is 150. In the other three PDG databases, the limit is 150 records with the OUTPUT command, and 300 with the OUTPUT (BRIEF command.

You can also use BROWSE, BACKUP, SHOW SEARCH, and other commands described in Chapter 1. *Compound* searching is also possible in some of these databases (check Chapter 6).

7.2.2 SEARCHING FROM FAR AWAY SITES

From a *far away* node, all your search commands, including the output command, must fit into only one line, up to 72 characters long.

HEP DATABASE

If you are searching the HEP database from a *far away* site, use the form

✉

```
FIN <expr-1> <AND|AND NOT|OR> <expr-2> <AND|AND NOT|OR> ... (OUT BRI
```

Here, <expr-1>, <expr-2>, ... denote search expressions linked with Boolean operators (AND, AND NOT, or OR). For example, your search request may be formulated as FIN A DONOGHUE AND GOLOWICZ AND D THIS YEAR (OUT BRI. If you state only one criterion in your search expression, for example, only FIN A DONOGHUE (OUT BRI, your search result may be too big, and exceed the maximum number of records that QSPIRES can send. Even if the number is within the limits, remember that large files travel through network(s) more slowly than smaller ones. Therefore, it pays off to narrow a search result down to well below the allowed limits. On many occasions the DATE index may be useful in restricting the number of retrieved documents. For example, after you find all the documents from this year, your next search request to QSPIRES may be FIN A DONOGHUE AND GOLOWICZ AND D LAST YEAR (OUT BRI, etc.

One can add other options to the option field, and/or use different format frames. Check Section 4.2 for details.

OTHER DATABASES

If you are searching in one of the other available databases from a *far away* site, use the form

✉

```
FIN <expr-1> <AND|AND NOT|OR> <expr-2> <AND|AND NOT|OR> ... (IN
                        <database> OUT BRI
```

Here, <expr-1>, <expr-2>, ... denote search expressions linked with Boolean operators (AND, AND NOT, or OR). IN <database> indicates the database name, for example, IN BOOKS, IN PARTICLES, etc. Your search request in, for example, the CONF database may be formulated as FIN TITLE PARTICLE PHYS# AND PLACE DUBROVNIK (IN CONF OUT BRI. If you state only one criterion in your search expression, for example, only FIN TITLE PARTICLE PHYS# (IN CONF OUT BRI, your search result may be too big, and exceed the maximum number of records that QSPIRES can send. Even if the number is within the limits, remember that large files travel through network(s) more slowly than smaller ones. Therefore, it pays to narrow a search result to well below the allowed limits. On many occasions, the DATE or related indexes may be useful in restricting the number of retrieved documents.

One can add other options to the option field, and/or use different format frames. Check Chapters 5 and 6 for details. In some databases, the BRIEF format is not available. Your search request in such a database may have the form


```
FIN <expr-1> <AND|AND NOT|OR> <expr-2> <AND|AND NOT|OR> ... (IN
                        <database> OUT
```

SEARCH FOR E-MAIL ADDRESSES (QUERY COMMAND)

To retrieve the e-mail address(es) of a single person from a *far away* node, use the form


```
QUERY <person's name>
```

QUERY may be shortened to Q. (WHOIS and WHO are also allowed forms.) For example, to find Howard Haber's e-mail address, write QUERY HABER, H., or Q HABER, H. Details of the procedure are described in Subsection 5.5.2. You can also retrieve addresses of several persons by sending only one e-letter; use the form


```
QUERY <person-1> OR <person-2> OR <person-3> ...
```

With such a request, you instruct QSPIRES to search for e-mail addresses of all the listed people. Warning: a common error in such a compound request is the use of AND instead of OR operators.

SEARCH FOR INSTITUTIONS' ADDRESSES (WHEREIS COMMAND)

The WHEREIS command is a shortcut to the INSTITUTIONS database (see Section 5.5.4). The procedure is very similar to the one described in Subsections 5.5.4 and 7.2.1. Your one-line e-letter must have the form


```
WHEREIS <catch-word>
```

where the <catch-word> denotes a word or words that could be associated to a given institution. WHEREIS may be shortened to WHE. For example, to find the BNL address, you may try WHEREIS NAT# LAB# BROOK#, or WHE UPTON, etc.

LIMITS ON NUMBER OF RECORDS

The following chart shows the maximum number of records that could be retrieved from a *far away* node.

DATABASE	BRIEF FORMAT	OTHER FORMATS
HEP	300	150
BOOKS	200	100
CONF	200	200
HITECH	n/a	200
INST	200	100
SEMINARS	n/a	100
SERIALS	n/a	100
DATAGUIDE	50	50
EXPERIMENTS	200	200
PARTICLES	n/a	200
REACTIONS	200	200

N/a denotes a format that is not available.

8. HOW TO GET AUTHORIZATION

QSPIRES allows a search for somebody's *e-mail address* (see QUERY command, Subsection 5.5.2), or a *postal address* of an institute or university department (see WHEREIS command, Subsection 5.5.4), without inquiring who you are, or where your message or letter is from. However, to make searches in any other database, you must have an authorization from SLAC. This chapter briefly describes the registration procedure, and the role of QSPIRES' *node managers*.

UNAUTHORIZED ACCESS TO SUBFILE HEP

So, you have tried to get some information about a paper or an author, but got only this dreadful answer. Even your appeal `TELL QSPIRES at SLACVM HELP` did not work. This happens because QSPIRES thinks that you, or the machine from which you are making the search, are not authorized. If this is true, see HOW TO REGISTER. If, on the contrary, you *are* an authorized user who already made successful searches via QSPIRES from the same node, and QSPIRES still sends this rude answer, please read the information in WHAT MAY GO WRONG.

HOW TO REGISTER

Your first step should be to talk to the volunteer who kindly took the job of the *node manager* in your institution. That person can register you, and within hours you will be able to make successful searches.

If you cannot locate the *node manager* and/or nobody ever heard of QSPIRES at this place, send a brief e-letter (*e-letter* is the author's term for an individual piece of e-mail) to QSPI@SLACVM.BITNET or QSPI@SLACVM.SLAC.STANFORD.EDU, describing where and who you are, and expressing your interest in registration. Please note: use the QSPI account, not QSPIRES, for such an e-letter. You will be given the name of the *node manager* (if there is one in this institution) or asked to find a volunteer who will take over that duty. In the former case, contact the manager, and arrange for your registration. If the latter is true, read the next section, NODE MANAGERS.

NODE MANAGERS

Being a *node manager*—particularly in a smaller institution—is a duty which, while beneficial to the community, really does not consume too much time. If no one in your institution carries this noble title, agitate and find a volunteer for the job. Once you find the volunteer, the next step requires a little paperwork. For bureaucratic purposes, a real letter with departmental letterhead (**not** an e-letter!), and signed (by the department head if possible), should be sent to Ms. Louise Addis, SLAC Library, Mail Stop 82, PO Box 4349, Stanford, CA 94309, USA.

The letter should (i) request access to QSPIRES for use of the high energy physics databases, and (ii) denote a *node manager* for the main computer network site, and give his/her e-mail address and real name. There is no charge for the QSPIRES service.

The node manager will then be given a password and instructions about authorizing others at this node. He/she will also be the person contacting QSPIRES caretakers, and giving elementary instructions to interested colleagues. The authorization of further users at this node requires no more paperwork; to authorize a new user, the node manager has only to send a one-line message or e-letter to QSPIRES.

WHAT MAY GO WRONG

If, earlier, you were able to make searches via QSPIRES, and now, suddenly, the server answers that you have no authorization, there are several possible reasons. First, be sure that you are making a search from the site which is registered. QSPIRES checks both your *user-id* (*user-name*) and the network name of the machine from which the request arrived. Only if both match is your request processed.

Sometimes, it could be arranged for more than one machine in an institute to be registered (e.g., one node manager can authorize users at several local workstations); please contact QSPI@SLACVM *if you are interested in this possibility.*

Another possible source of trouble for non-BITNET users could be an internal reorganization of the network from which they are contacting SLACVM. For example, the node name of a machine, as seen from other networks, might be altered, or the main gateway may be changed. All of this can cause QSPIRES not to *recognize* a registered user. An e-letter to QSPI@SLACVM will usually help fix the problem.

If a gateway name is a part of the address you use to reach QSPIRES, always try to use the same gateway. If you change the routine (e.g., decide to send your e-letters via CERN's instead of LBL's HEPNET/BITNET gateway, or vice versa), you may suddenly become a *stranger* to QSPIRES.

WE VALUE YOUR FEEDBACK

QSPIRES is still in the experimental phase. We do appreciate your feedback during this developmental period, and we rely particularly on node managers to report any communication problem. Please, address your comments to QSPI@SLACVM (not QSPIRES!). We take your reports seriously and will reply to all messages.

APPENDIX A: WHAT EXACTLY IS SPIRES ...?

The main topic in this Guide, QSPIRES, is the remote server which connects you to SPIRES system. And what exactly is this SPIRES thing?

BRIEF HISTORY OF SPIRES

SPIRES is the brainchild of Professor Ed Parker of the Stanford Institute for Communications Research. Around 1968, Professor Parker got an NSF grant to develop an information retrieval system tailored primarily for physicists. The name SPIRES originally meant Stanford Physics Information REtrieval System. It happened that SLAC, with its growing needs for quick and reliable information, was chosen to host the first pilot group of SPIRES users. The members of the group were physicists as well as librarians. One of the first databases organized with SPIRES covered the numerous preprints received by the SLAC Library, and was called PREPRINTS. In the years to come, both PREPRINTS and SPIRES grew up at fast pace, surpassing even the boldest expectations of their creators. SPIRES became a sophisticated information retrieval and database management system, used not only by physicists and not only in Stanford, but also at over 40 other research centers, academic and government institutions. Its success forced the change of the original name to Stanford Public Information Retrieval System. Similarly, the database PREPRINTS, which was expected never to exceed 5,000 records, gradually developed into an entire patchwork of databases containing several hundred thousands records. In 1983, Ed Parker and Louise Addis (database developer from SLAC Library) received the Special Libraries Association, Division for Physics, Astronomy and Mathematics award for the SPIRES software and the PREPRINTS database.

The PREPRINTS database, while a debut for SPIRES, was by no means the first attempt to organize data relevant and specific to high energy physics. In 1964, DESY initiated publication of HEPI (*High-Energy Physics Index*), which emphasized a very detailed topics indexing. Data were collected from articles published in reputable journals and from preprints received by DESY. From the beginning, SLAC Library used the paper version of HEPI very heavily, and found it to be the best subject approach to high energy physics. When the *prototype* version of SPIRES became operational, the DESY Library kindly provided machine readable tapes, and databases PREPRINTS and DESY were created. Subject searching of HEPI data through SPIRES was greatly improved for SLAC users. At about the same time, SLAC began publishing a weekly preprint/antipreprint newsletter *PPF* (*Preprints in Particles and Fields*). *PPF*, being quick and brief but with no subject indexing, was from the very beginning considered complementary to HEPI rather than competitive. The *PPF* publication in many ways relied on SPIRES' searching capabilities.

In the early 1970s, an even closer collaboration between DESY (K. Mellentin) and SLAC (L. Addis) in exchange and handling of information began. Particle Data Group (PDG) joined the project. By 1975, SLAC was entering about 4,000 preprint records yearly in PREPRINTS, complete with citations. HEPI was listing about 11,000 records per year. Up to 25 topic phrases ('*key-words*') were assigned to each HEPI record. The DESY database was now updated monthly (earlier it was twice a year), and duplicate records, which in HEPI were listed for both preprint and published version of the same work, were merged. Word got around the physics community about SPIRES, and many requests for access from outside users were coming to SLAC. Demands for the merger of PREPRINTS and DESY databases were heard more often. Both DESY and SLAC were willing to work out plans for such a merge. By Spring 1980, the newest version of SPIRES became

available, providing an extremely powerful tool for this task. Finally, with great efforts, the 1975-79 data from DESY database, and 1975–79 data from PREPRINTS were collected into a single HEP database. Because of space limitations, older data were not merged and remained stored separately in the OLDHEP database.

Since then, overcoming many technical, financial and legal problems, and fed by SLAC and DESY, the HEP database has been steadily growing. Fermilab, PDG at LBL, CERN, Rutherford Labs, Durham University, KEK, Kyoto University, Cal-Tech and Serpukhov have been also participating in collection and tagging of data. In early eighties, the name of the database was changed to HEP (High Energy Physics database). In 1985, the server QSPIRES was set at the SLACVM BITNET node. The server enabled use of the HEP database without requiring logon to the SLACVM host. QSPIRES software was written by George Crane, from SLAC. The main role of QSPIRES is to transfer questions from remote nodes to SPIRES, and return the answers through e-mail. By now, more than 300 institutions from 30 countries around the world have the authorization to use HEP via QSPIRES. A dialog between a remote user and QSPIRES proceeds in terms of simple, one-line messages, exchanged interactively or through electronic letters.

HEP is not the only database offered via QSPIRES. The following paragraphs show databases of interest to the high energy physics community and available for searching from remote nodes.

HEP DATABASE

HEP contains bibliographic summaries of more than 200,000 particle physics papers. Included are journal articles, preprints, technical reports, theses, etc. HEP covers all documents produced at SLAC from 1962, preprints and report holdings at SLAC Library since 1975, and all journal articles, preprints, etc., listed in the DESY High Energy Physics Index since 1975. It serves as online catalog for SLAC users, and the main source of data for the biweekly publication *Preprints in Particles and Fields* (*PPF*) which may be ordered from the SLAC Library. Clone copies of HEP also run under SPIRES at DESY, KEK, and Yukawa Institute (Kyoto University, Japan). Parts of the database are downloaded weekly to CERN and RAL/Durham. Several more institutions maintain their own databases linked to HEP and SPIRES (SSC, UCLA, Fermilab, LBL, Cal-Tech). Parts of the database are available remotely to non-SLAC users via the QSPIRES server. HEP is updated daily, maintained by SLAC and DESY, and expands at a rate of 17,000 records per year.

This database is searchable by author, title, topic, citation, report-number, institution, collaboration, and some other indexes. Logical phrases (Boolean logic), and a date qualifier can help you by narrowing or broadening a search. The BROWSE command enables a look at a random selection of values in an index, and can also be used to display up to ten terms in a particular alphabetic part of the index. Browsing is very useful when the exact form of a search value is required. Detailed description of searches in HEP database can be found in Chapters 2 to 4.

Work related to high energy physics can be entered in HEP in several ways. If the work first appeared in a preprint form, the author should send the preprint to the SLAC Preprint Library, Mail Stop 82, SLAC, PO Box 4349, Stanford, CA 94309, USA. Another copy should be sent to the DESY Library. The same procedure is valid for technical reports, theses and other similar unpublished works. When the work is published in one of the more popular high energy physics journals (whether previously distributed in the preprint form, or not) it is entered by the HEPI staff at DESY, and recorded in HEP. Books and conference proceedings are also searched for articles related to high energy physics. Therefore, authors generally do not have to send journal reprints to SLAC or DESY libraries. However, if a work is published in a less popular journal, and you would like it to be mentioned in HEP, please send a reprint with an explanatory note to SLAC Preprint Library (address is above). Sometimes, an e-mail note to PPF@SLACVM will do. Use the same e-mail address to report possible errors in HEP.

BOOKS DATABASE

BOOKS database contains bibliographic summaries of more than 18,000 books held by the SLAC Library. Included are textbooks, proceedings, lecture-notes, monographs, some serials (e.g., various *Annual Reviews*). It serves as an online catalog for SLAC users, and is also available remotely via QSPIRES. Since the books on order are also listed, browsing through the BOOKS database can give you pretty reliable information on the latest titles in high energy physics and related subjects. BOOKS is updated regularly, and expands at a rate of about 900 entries per year.

This database is searchable by author (or editor), title, and some other indexes. Logical phrases (Boolean logic), and date index can help in narrowing or broadening a search. BROWSE command allows a look at a random selection of values in an index, and displays all terms in a particular alphabetic part of the index. This is very useful when the exact form of a search value is required. The searching methods in BOOKS database are described in Section 5.1.

If you are an author or editor of a book not listed in the BOOKS database, you may wish to send a courtesy copy to SLAC Library, Mail Stop 82, SLAC, PO Box 4349, Stanford, CA 94309, USA. This is particularly important if the work was published by a small publishing company, or by an institute (e.g., conference proceedings published by a local host institution). To report possible errors in the database, use the above address (Attn: BOOKS database), or send an e-mail note to Robert Gex, LIRYG@SLACVM.

CONFERENCE DATABASE

CONFERENCE database includes more than 4,000 listings for conferences, schools and workshops, as well as general meetings of larger professional societies of interest to high energy physics community. It covers meetings held since 1972 and is also available via QSPIRES. It is updated regularly, and information on forthcoming conferences is entered as soon as it becomes available. When proceedings from a conference are published, the title, editor(s), and other bibliographic data are also recorded in the CONFERENCE database.

The database is searchable by title, place, date, keyword, and editor's name (if related proceedings are published). Boolean logic, and browsing (particularly important in the keyword search) can also be used. Each conference gets a unique **C** (onference) **-number**, related to the opening day of the conference (e.g., C90/06/07). The C-number can be helpful in finding all the preprints in HEP database related to the conference. More on these searches in Section 5.2.

If you are organizing a conference and would like to have the conference listed in the CONFERENCE database, please send the complete information (with program and poster if available) to SLAC Library (Attn: CONFERENCE database), Mail Stop 82, SLAC, PO Box 4349, Stanford, CA 94309, or send an e-mail note to CONF@SLACVM. To report possible errors in the database, use the same addresses.

INSTITUTIONS DATABASE

INSTITUTIONS database is a collection of about 4,000 addresses, phone, fax and telex numbers of sites related to high energy physics. The database is available over QSPIRES. The search procedure in the INSTITUTIONS database is described in Section 5.3. No authorization code is needed for the search of this database if a *short-cut* command, WHEREIS, is used (for more details, see Section 5.5.4).

If you want your institution address to be listed in the INSTITUTIONS database, please send the complete information to SLAC Library (Attn: INSTITUTIONS database), Mail Stop 82, SLAC,

PO Box 4349, Stanford, CA 94309, or send an e-mail note to Robert Gex, LIRYG@SLACVM. To report possible errors in the database, use the same addresses.

PARTICLES DATABASE

PARTICLES database contains the *Full Listings* (some 40,000 lines of information), from the *Review of Particle Properties* (*RPP*) publication. Note that the short *Summary Particle Properties Tables* are not included. The database covers the same years as the most recent *RPP*. It is maintained by the Berkeley PDG in collaboration with the entire authorship of the *RPP*. Updated approximately every year. Searchable by particle and particle property. Available via QSPIRES server. You can reach the caretakers of the PARTICLES database by writing to PDGSPI@SLACVM.

EXPERIMENTS DATABASE

EXPERIMENTS database contains summaries of more than 1,600 approved experiments from major particle physics labs. It covers approximately 1975 to the present. It is maintained by the Berkeley Particle Data Group (PDG), in collaboration with correspondents at various labs. Updated periodically. Searchable by experiment number, author, accelerator, detector, reaction, momentum, journal paper(s), etc. This database serves as the source for the publication *Current Experiments in Elementary Particle Physics*, LBL-91 Report. Available via QSPIRES server. You can reach the caretakers of the EXPERIMENTS database by writing to EXPBASE@SLACVM.

DATAGUIDE DATABASE

DATAGUIDE database explores those papers from HEP which contain some new experimental data. *Data* here means not only the obvious experimentally measured quantities, but some derived quantities as well. Actual data are not listed, but a detailed description of the measured values is given. The database is maintained by the Berkeley PDG in collaboration with members of the Institute for High Energy Physics, Serpukhov. It is the source for biannual *Guide to Data in Elementary Particle Physics*, LBL-90 Report. Searching via QSPIRES in DATAGUIDE database is described in Section 6.3. You can reach the caretakers of the DATAGUIDE database by writing to PDGSPI@SLACVM.

REACTIONS DATABASE

REACTIONS database contains numerical data on reactions from some 2,000 papers. Cross sections in tabular form (differential and total), structure functions, polarization measurements, and a wide range of other experimental particle physics data are included. Covers 1983 to present. Compiled by the United Kingdom PDG (University of Durham and Rutherford Labs), in collaboration with the Serpukhov COMPAS Group (USSR), and the Berkeley PDG. Updated approximately annually. Searchable by first author, reaction, lab momentum, quantity measured, final state particles, reference, etc. Available via QSPIRES server. Searches in REACTIONS database are described in Section 6.4. You can reach the caretakers of the REACTIONS database by writing to PDGSPI@SLACVM.

E-MAIL ADDRESSES

Electronic-mail addresses of high energy physicists and researchers in related fields, and the e-mail addresses of the support staff in HE institutions are collected in two SPIRES databases: one contains data on SLAC physicists and staff (it is called BINLIST), the other is world-wide oriented (and called HEPNAMES). A single *short-cut* command, QUERY (see Section 5.5.2), enables an access to both databases via QSPIRES.

Combined, BINLIST and HEPNAMES contain more than 20,000 entries. To add your e-mail address to the HEPNAMES database, or to make changes in the existing data, please send a note to HEPNAMES@SLACVM.

HITECH DATABASE

HITECH database is an index of manufacturers and distributors of high-technology products used in HE physics. The addresses, phone numbers and other useful data are listed. The database has almost 7,000 entries, and is searchable by several indexes. It is available via QSPIRES. The search technique is described in Section 5.4.1. You can reach the caretaker of the HITECH database by writing to LISLL@SLACVM.

SERIALS DATABASE

SERIALS database keeps track of all SLAC Library journal holdings. The database is an excellent guide to the journals covering high energy physics and related fields. It contains more than 1,200 records. It is available via QSPIRES and searchable by several indexes. The search technique is described in Section 5.4.3. You can reach the caretakers of the SERIALS database by writing to SERIALS@SLACVM.

SEMINARS DATABASE

SEMINARS database lists past (since 1983) and future seminars of interest to the local high energy physics community. It covers SLAC, Stanford, Berkeley, Santa Cruz, and other nearby places. It is available via QSPIRES and searchable through speaker-name, title, affiliation, and several other indexes. The search technique is described in Section 5.4.5. You can reach the caretaker of the SEMINARS database by writing to NINA@SLACVM.

APPENDIX B: NETWORKS AND NETWORKING

This appendix describes major international computer-communication networks, and reviews the procedure of sending e-mail to the QSPIRES server.

B.1 NETWORKS GENERALLY

A group of interconnected computers is called a network. Currently, there are more than a hundred different large networks, linking more than a hundred thousand computers. Within a single network, computers communicate with each other by using a certain protocol, which represents a set of standards and rules making transfers of files and electronic mail possible. Typically, networks differ in the protocols they require. Therefore, unfortunately, there is not a straightforward procedure to establish a connection between two dissimilar networks. However, by using *gateways*, even this task can be achieved. A *gateway* is a specially designated computer connected to two (or more) networks. If a pair of networks uses different protocols, the gateway computer translates one protocol into another and forwards files and electronic letters.

Computers within a network are called *nodes*. Networks transfer information by moving it from node to node. The more nodes through which a letter has to pass, the longer it takes to deliver it. The length of a file is an additional parameter determining the speed of transmission, shorter files usually being much faster. If a file has to pass through a gateway on the way from a sender to a recipient, an additional delay may be expected. Depending on the network, when a node along the path is unavailable, e.g., because the computer is down, the network may hold your file until the node again becomes available, or it can reroute it over a different path.

There is a welcome trend in the computer industry toward adopting a common standard and protocol for all networks. The process is still slow, but in a few years it will certainly lead to the establishment of even greater numbers of linked networks and easier and faster modes of communication.

NETWORKS USED BY PHYSICISTS

Physicists, and particularly high energy physicists, depend by the nature of their job on the quick and reliable exchange of information. Therefore, it is no wonder that they were among the first users and promoters of the electronic mail (e-mail). In the early years of computer communication, physicists traditionally supported and promoted the BITNET network. Today, the situation gradually changes. An entire network (HEPNET) is devoted to high energy physics, and an ever increasing number of researchers in physics departments at USA universities are joining the INTERNET network community. The remainder of this subsection is devoted to the major networks in which high energy physicists participate.

BITNET

BITNET is an international communication network linking computers at universities, colleges, and research centers on all continents except Australia and Antarctica. It is used for electronic

exchange of noncommercial information only. The European segment of BITNET is also referred to as EARN (European Academic and Research Network). Currently, there are more than 3,000 nodes on BITNET. Links with the former Soviet Union and China are under discussion and may be imminent.

The network began in 1981, and for a long time was supervised and supported by IBM (almost 45% of the nodes have IBM machines!). Today it is run by an independent organization, and funded through membership fees. The network uses the IBM transport protocol RSCS/NJE (Remote Spooling and Connection Subsystem/Network Job Entry). The individual computers run IBM's VM and OS/MVS, DEC's VMS, or AT&T's UNIX, but there are all sorts of other, smaller operating systems on the network as well. Nodes are interconnected by means of leased lines. The network has an unusual tree-like structure, with the trunk at CUNYVM (City University, New York, USA). There is **only one** route between any two sites.

Node names are nonhierarchical and limited to eight characters. Typical examples are DJUKFA21 (Machine No. 1 [code --> 1], with OS/MVS operating system [code --> 2], at the Forschungszentrum [--> **KFA**] in the city of Jülich [--> **JU**], Germany [--> **D**]), or SLACVM (Virtual Machine [--> **VM**] at Stanford Linear Accelerator [--> **SLAC**], in Stanford, USA). A typical address of a BITNET user is USER at NODE (or USER@NODE), e.g., QSPIRES at SLACVM . Sometimes, a node name is quoted as NODE.BITNET, e.g., SLACVM.BITNET. Such a longer form is useful when a mail sender is not on BITNET. Note, however, that the pseudo-domain BITNET can be usually omitted when both sender and recipient of the mail are at BITNET sites.

HEPNET

HEPNET is an international network of (mostly) VAX computers used by high energy physics researchers. It began in the USA and spread to Europe, Japan, Brazil, Canada and elsewhere. There are now some 10,000 computers in this network, most of them also connected to other national and international nets. HEPNET uses the DECNET networking protocol. This probably explains why HEPNET is sometimes wrongly referred to as the DECNET network by researchers unaware of other networks which also use DECNET protocols, but are not necessarily reachable from HEPNET. The individual computers in the network mostly run on the VAX/VMS operating system. Gateways from HEPNET to BITNET are at CERN, Geneva, Switzerland, and at LBL, Berkeley, USA. HEPNET is coordinated with the SPAN network (Space Physics ANalysis), which is another huge network that uses the DECNET protocol.

Node names in HEPNET are nonhierarchical, and are limited to six characters. Every node also has a numerical code which may be listed in decimal form (AREA.MACHINE), or as an integer (1,024 x AREA + MACHINE). For example, alternative names for the node ESANVX are 16.50, and also 16434 (=1024 x 16 + 50). ESANVX is at Cantabria University, Santander, Spain. Area codes in HEPNET typically run from 13 to 39 (mostly European nodes), and 40 to 46 (mostly Japan and North America). A typical address of a user on a HEPNET network is NODE::USER, e.g., ESANVX::THEORY. For the benefit of non-HEPNET users, the addresses might be also quoted as USER@NODE.HEPNET (in the above example, THEORY@ESANVX.HEPNET).

INTERNET

INTERNET is the largest US network, connecting academic and educational institutions, government agencies, and research laboratories in various companies. It is, in fact, a metanetwork of local and wide-area networks using the same protocol. It began in 1969 as ARPANET, an experimental network for users working on US government projects. Over time, many ARPANET nodes became gateways to newly created, smaller networks. In order to allow the interoperation of these networks, a pair of networking protocols, TCP/IP, were developed. TCP stands for Trans-

mission Control Protocol, and IP is Internet Protocol. Other groups of users (NASA, NSF, US) created other TCP/IP based networks in the 1980s. The collection of all these interoperating networks is known today as INTERNET. When designed, INTERNET was to have about 50 connected networks. However, with the recent explosion of networking, the number of interconnected networks is now approaching 1,000. There are over 60,000 nodes in all INTERNET segments. By the way, the original ARPANET is being dismantled over a period of years. First, it was split up (in 1983) so that MILNET and MINET (two military networks) were separated. The remaining users are being transferred to the new Defense Research (DRI) network.

INTERNET depends on backbone sites to pass the majority of information around the network. The routing is not predetermined as it is in BITNET. On the contrary, the decision on how a file is to be sent is based on the state of the network in a given moment. INTERNET is also connected through gateways to all other major networks. For example, INTERNET users connect to BITNET at gateways at City University (New York), Cornell University, MIT, and many others.

Node names in INTERNET are hierarchical, and often have obvious meanings. There are six top-level domains, EDU (for educational/research organizations), GOV (for civilian government organizations), COM, MIL, ORG, and NET. The top-level domain is the right-most part of a node name. Next to it, and separated by a period, is the first subdomain which more precisely defines the site of the node. For example, UTEXAS.EDU will be a common part in all INTERNET addresses at the University of Texas at Austin. Further subdomains might be added: the higher the number of subdomains, the more detailed the information about the node. For example, machines in the Physics Department at the University of Texas have the sequence PH.UTEXAS.EDU as the part of the address. One particular machine in the Department is named, e.g., LANDAU.PH.UTEXAS.EDU. Every machine in INTERNET also has a numerical address. It is usually written as four integers separated by periods. Each of these integers represents a value of an octet of a 32-bits long address. Fortunately, an ordinary user never needs to know such numerical addresses. A typical INTERNET address has the form USER@SUBDOMAIN1. ... .SUBDOMAINn.TOP-LEVEL-DOMAIN, e.g., MARY@LANDAU.PH.UTEXAS.EDU.

OTHER NETWORKS

A significant fraction of high energy physicists have access to networks other than the three mentioned in the above information. One such large group makes up the so-called independent national networks. For example, JANET is the UK Joint Academic NETwork, INFNET is an INFN (Instituto Nazionale de la Fisica Nucleare) network in Italy, DFN is a German Science Network (Deutsches Forschungs Netz), UNINETT is the Norwegian network, etc. Node names on almost all national networks are now hierarchical and similar to the names in INTERNET, the top-level domain being reserved for the two-letter ISO (International Standards Organization) country code. For example, JANET addresses end with .AC.UK, INFNET with .INFN.IT, DFN with .DBP.DE, UNINETT with UNINETT.NO, etc. Each of the national networks follows its own mailing protocol, and there is an amazing variety of operating systems on individual nodes. However, special software installed on gateway machines enables the exchange of files between the national networks and other major networks. The speed of such a communication depends on the length of transmitted files, and on the number of gateways through which the file must pass to reach the final destination. It ranges from several hours to several days in extreme cases.

Another major metanetwork in which physicists increasingly participate is UUCP. This is a worldwide collection of interconnected networks based on the UUCP protocol (Unix-to-Unix CoPy). The European branch is also known as EUNET, which is further composed of subnetworks, one in each country. JUNET (Japanese Unix Network) is another such network; ACSNET (Australian Computer Sciences NETwork) is the UUCP-based network on the fifth continent, etc. All these (sub)networks are, in a way, also national networks. However, in contrast to the networks

described in the previous paragraph, they all follow the same (UUCP) protocol, and all individual machines have operating systems based on Unix. The original UUCP addresses with characteristic exclamation marks (e.g., `munnari!adelun!user!`, which describes the *user* at machine *adelun*, on ACSNET) are slowly being phased out in favor of domain-style addresses. For example, a domain-style ACSNET address now ends with `.oz.au`. Note that UUCP is a case-sensitive network, and lower-case letters must be used in addresses. Although the major gateways leading to UUCP can automatically transform capital into lower-case letters, a prudent person will do the transformation himself/herself.

B.2 COMMUNICATING WITH BITNET SITE SLACVM

The server which transfers your requests to SPIRES, and sends you the results of the search, is set at the BITNET node SLACVM. The server's address is QSPIRES at SLACVM(.BITNET). You can benefit from SLAC's databases only if you know how to reach QSPIRES via e-mail or interactively. The following is a brief review on how to communicate with the remote server QSPIRES.

FROM A BITNET NODE

If your machine is a node on BITNET network, in most cases, you have two different ways of reaching QSPIRES. The preferred one is by sending short interactive messages; the less convenient one is to send e-letters.

NEARLY INTERACTIVE COMMUNICATION

The term *message* in this Guide denotes a brief, one-line text sent from one BITNET user to another. If the intended recipient is logged on to his/her computer, the message will be displayed at the recipient's terminal in a matter of seconds. The messages have absolute priority in transfer of information from one BITNET node to another. Most BITNET nodes support sending/receiving messages. Sometimes, this kind of communication is called interactive. If the recipient is not logged on when the message arrives, his/her machine will discard the message. If some computer along the path is not functioning, the message also gets lost: The operating system of the node that cannot forward a message will discard it. You will often be informed that a message is not delivered, and given a brief reason, but do not always count on notification. If a recipient was not logged on at the time your message reached the destination node, the recipient will not be notified later about your attempt to reach him/her. It is sad but true: one still cannot communicate interactively from all BITNET nodes. For example, the machines with the MVS operating system were not designed originally to receive or generate interactive messages. However, in many such sites, brave system operators have added modifications which allow interactive communication. Check with your local system manager if you are not certain whether the interactive communication is possible from your BITNET node.

The usual syntax for sending the messages from a machine with (IBM) VM system is

```
TELL USERID at NODE  <message>
```

or

```
TELL USERID@NODE  <message>
```

For example, to say "Hi!" to user MARCO at node CERNVM, try

```
TELL MARCO at CERNVM  Hi!
```

If your operating system is (DEC) VAX/VMS, to send a message to another BITNET node, use

```
SEND USERID@NODE  <message>
```

or

```
$SEND USERID@NODE  <message>
```

On some JES2 systems, the command could be TO, VMSG, or XMSG, depending on local implementation.

There are many other variations of the above commands, some shortcuts designed and supported only by a limited number of machines, and many other operating systems with their own procedures. Please consult your local mailing expert or system manager for the proper syntax for interactive messages.

SENDING ELECTRONIC LETTERS

If your system is unable to send interactive messages to other BITNET users (to be sure, please check with your local system manager), you can still reach people at other nodes by sending *e-letters*.

The e-letter in this Guide denotes a file, short or long (one line to several pages), delivered not directly to a terminal screen but to a recipient's electronic mailbox. In contrast to the interactive communication, the recipient of an e-letter need not be logged on when such a letter arrives; the e-letter will be saved for him/her by the system. Similarly, if the BITNET path to the recipient is not open all the way, the e-letter will be sent as far as possible and will wait at the node on this side of break. When the link is reconnected, the e-letter will automatically be sent on. Therefore, reliability is better with e-letters, but the price one pays is a slower transmission speed of communication. Sometimes, this may be a very important factor for your ability to successfully contact QSPIRES. As it is mentioned in Sections 3.1.1 and 7.2.2, QSPIRES only waits for a limited time for a sequel to your quest. If your next question does not reach the server within that period, you will be forced to start the whole search all over again.

There are as many different commands for sending letters as there are operating systems and mail softwares. Please consult your local expert for the proper form. When you send an e-letter from a BITNET node to another BITNET site, you probably do not have to use the pseudo-domain .BITNET in the destination address. Use simply USER at NODE (or USER@NODE), e.g., QSPIRES at SLACVM.

FROM ANOTHER NETWORK

Gateways unfortunately stop and discard all interactive messages. Therefore, to communicate with QSPIRES@SLACVM.BITNET from a network which is not BITNET, you can only use e-letters. Considering that gateways slow down the speed of transmission, the prospects for a successful iterative search via QSPIRES were not particularly good in the not-so-distant past. Recently, an ever-increasing number of users from INTERNET, HEPNET, and some other networks have become able to send iterative sequences of search requests to QSPIRES. We are witnessing rapid improvements in electronic communication, and what only yesterday looked impossible, might become a reality tomorrow. Therefore, do not give up if, at present, it takes *forever* for your search request to reach SLAC; in the near future, the speed of communication from your node may increase dramatically.

From a non-BITNET site, you can benefit from SLAC's databases only if you know how to reach QSPIRES via e-letters. The following is a brief review of the communication with the remote server QSPIRES.

FROM INTERNET

When an e-letter is sent from an INTERNET site to a BITNET node, it is not usually necessary to denote a gateway. However, often you have to use the pseudo-domain .BITNET as a part of the address. For example, to send a letter to QSPIRES@SLACVM, the destination address may be

```
QSPIRES@SLACVM.BITNET
```

Note that the server QSPIRES also has an INTERNET address, and it is recommended that you use this address from all INTERNET sites:

```
QSPIRES@SLACVM.SLAC.STANFORD.EDU
```

The time it takes a message sent by an INTERNET user to reach QSPIRES is typically between several minutes and several hours.

FROM HEPNET

When an e-letter is sent from a HEPNET site to a BITNET user, the address may be of the form

```
GATEWAY::"USER@NODE.BITNET"
```

To send an e-letter to QSPIRES from an European HEPNET node, you can use, for instance, the gateway called MINT at CERN, Geneva, Switzerland:

```
MINT::"QSPIRES@SLACVM.BITNET"
```

From a US node, one can use the gateway LBL, which denotes the BITNET-HEPNET gateway at LBL, Berkeley, USA:

```
LBL::"QSPIRES@SLACVM.BITNET"
```

The exact syntax for the address line depends on the mailing software installed at a particular machine.

The time it takes an e-letter to reach a BITNET site from a HEPNET node is typically measured in hours, but it also may be minutes as well as days.

FROM UUCP

To send an e-letter to QSPIRES from a UUCP node, you may try using the gateway at Pennsylvania State University, and denote the addressee as

```
psuvax!slacvm.bitnet!qspires
```

You can also send the e-letter via UUNET gateway,

```
uunet!slacvm.bitnet!qspires
```

If you are able to use domain-style addresses, try

```
qspires%slacvm.slac.stanford.edu@psuvax1.cs.psu.edu
```

or

```
qspires%slacvm.slac.stanford.edu@uunet.uu.net
```

A typical UUCP-to-BITNET delivery time might be anywhere from hours to days.

FROM OTHER NETWORKS

The exact form of the QSPIRES address will depend on your mailing software, and the local network protocol. In any case, you will have to inform your mail-system that the e-letter is to be sent to a BITNET network. You will probably be able to do that by adding the .BITNET subdomain somewhere in the address. Sometimes, you will also have to denote the gateway. From a JANET node to QSPIRES, try

```
QSPIRES%SLACVM.BITNET@UK.AC.EARN-RELAY
```

A typical OTHER NETWORKS-to-BITNET delivery time might be anywhere from hours to days.

APPENDIX C: COMPENDIUM OF COMMAND WORDS

This appendix reviews the commands, options, and other words useful in communication with QSPIRES. It gives a brief description of the use, and denotes section(s) in which the use is illustrated more thoroughly.

COMMAND WORDS

Your request will generally have a *command part* and an *option part*, separated by an open, left-hand parenthesis:

```
<command-part> ( <options>
```

If you are satisfied with the default choice of options, the option part and the separator are not needed.

In the command part, you can use the following words (upper case letters indicate minimum abbreviation of the commands):

FINd	Performs a search. Always should be followed by a search expression: FINd <search-expression>. More on search expressions in Subsection 1.2.2– 1.2.4. In a simple, one-step search, only one search expression is used. In a compound search, Subsection 1.4.1, two or more search expressions may be linked by Boolean operators, AND, AND NOT, or OR. Similar *iterative searches* are explained in Subsection 1.4.1.
SHOw	Displays internal QSPIRES information on a database or environment, e.g., SHOw INDexes, Subsection 1.2.2, SHOw SUBfile DEScription, Subsection 1.3.3, SHOw SUBfile SIZe, Subsection 1.3.3, SHOw FRAmes, Subsection 1.3.3, SHOw SEArch, Subsection 1.4.1.
EXPlain	Displays a brief description of a database listed in the argument, Subsection 1.3.3. For example, EXPlain HEP. See Subsection 1.3.3. For the list of available databases, see Subsection 1.3.1.
BROwse	Returns a sampling of indexed values, Subsection 1.2.4. May be followed by a search term, or a combination search term + search value. Other possibilities also available, see Subsection 1.2.4. BROwse helps identifying types of values acceptable in a search request.

`OUTput`	Instructs `QSPIRES` to send retrieved records, Subsection 1.4.3. May also be used as an option (see below).
`DISplay`	Displays a single document from a database if followed by a unique *record key* assigned to the document (see note in Subsection 1.2.2).
`HELp`	Sends you a file with a brief description of main commands and command phrases.
`Query`	When followed by a person's name, displays the e-mail address of the person, Subsection 5.5.2, either from the local, SLAC database, or from the global `HEPNAMES` database. Alternatively, `WHOIS` could be used instead of `Query`.
`WHEreis`	When followed by one or more address elements, displays the full addresses of `HEP` institutions that match listed criteria, Subsection 5.5.4.

OPTIONS

Your request will generally have a command part and an option part, separated by an open, left-hand parenthesis:

```
<command-part> ( <options>
```

If you are satisfied with the default choice of options, the option part and the separator are not needed. However, if you want to change something, denote your choice to the right of the parenthesis. In the option part you can use the following words (capital letters denote minimum abbreviation; lower case letter part of an option may be skipped):

`IN`	Specifies a database to be searched, Subsection 1.3.2. Should be followed by a database name, e.g., `IN BOOKS`. No selection is needed for searches in the `HEP` database, and with commands `EXPlain`, `Query`, `WHEreis`. For the list of available databases, see Subsection 1.3.1. Alternatively, `SELect` may be used instead of `IN`.
`OUTput`	Instructs `QSPIRES` to collect the retrieved records, and send them to the user. `OUTput` as an option should be used only by users from far away nodes (see Subsection 7.2.2). Other users should use `OUTput` in the command part only (see above).
`TYPe`	Instructs `QSPIRES` to return the answer with `CP TELL`, or a similar interactive command. Applies only if the interactive communication is supported by the user's system.

FILe	Instructs QSPIRES to send the answer as an e-mail file, to the user's e-mailbox.
BRIEF	displays records in the brief form, Subsection 1.4.3. Same as USIng BRIEF.
USIng	Requests an alternate QSPIRES format frame for displaying the results, Subsection 1.4.3. Should be followed by a format frame. The frame names can be obtained with SHOw FRAmes (IN <database>.
RESult	Instructs QSPIRES to send only the total number of retrieved records, not the actual records. Useful in databases in which the complete records are sent by default, e.g., in PDG databases.
SEQuence	When followed by a search term, orders data according to that term, Subsection 1.4.3.

One can list several options, and the order in which the options appear is not important. However, if an option comes with an argument, e.g., SEQUENCE NAME, the argument must be listed immediately after the option.

WORDS USED IN FOLLOWUP COMMANDS

When you communicate with QSPIRES, the first word in your message must be one of the command words listed in Subsection 1.5.1. An exception is the iterative searching (see Subsection 1.4.1): in an iterative search, your follow-up command may begin with one of the following words:

AND	Boolean operator which adds a limiting criterion to the preceding search expression, Subsection 1.4.1.
AND NOT	Another Boolean operator which adds a limiting criterion to the search expression used in the preceding request, Subsection 1.4.1.
OR	Boolean operator which expands the search result found in the preceding request, Subsection 1.4.1.
BACkup	Instructs QSPIRES to replace the latest reported search result with the search result one step back, if one exists. See examples in HEP database, Subsection 3.2.3

APPENDIX D: JOURNAL CODE NAMES (CODENS)

Listed are code names of some of the more popular journals:

ACTA PHYS AUSTRIACA (APASA)
ACTA PHYS AUSTRIACA, SUPPL (APAUA)
ACTA PHYS POLON (APPOA)
ACTA PHYS POLON-B (APOBB)
ADV MATH (ADMTA)
ADV NUCL PHYS (ANUPB)
ANN INST H POINCARE (AHPAA)
ANN MATH (ANMAA)
ANN REV ASTRON & ASTROPHYS (ARAAA)
ANN REV NUCL SCI (ARNUA)
ANNALS PHYS (NEW YORK) (APNYA)
APPL OPT (APOPA)
APPL PHYS LETT (APPLA)
ASTROPHYS J (ASJOA)
ASTROPHYS SPACE SCI (APSSB)
BULL AM MATH SOC (BAMOA)
CAN J MATH (CJMAA)
COLLECT PHENOM (CLPNA)
COMMENTS NUCL PART PHYS (CNPPA)
COMMUN MATH PHYS (CMPHA)
COMMUN PURE APPL MATH (CPAMA)
COMPUTER PHYS COMMUN (CPHCB)
CLASS QUANT GRAV (CQGRD)
EUROPHYS LETT (EULEE)
FORTSCHR PHYS (FPYKA)
FUNKT ANAL PRIB (FAAPB)
HADRONIC J (HADJM)
HELV PHYS ACTA (HPACA)
IEEE PROC (IEEPA)
INT J MOD PHYS A (IMPAE)
INVENT MATH (INVMB)
IZV AKAD NAUK SSSR, FIZ (IANFA)
J CHEM PHYS (JCPSA)
J COMPUT PHYS (JCTPA)
J MATH PHYS (JMAPA)
J PHYS (FRANCE) (JOPQA)
J PHYS A (JPAGB)
J PHYS C (JPCBA)
J PHYS G (JPHGB)
J SOV MATH (JOSMA)
J STATIST PHYS (JSTPB)
JETP LETT [ENGLISH] (JTPLA)
LETT MATH PHYS (LMPHD)
MOD PHYS LETT A (MPLAE)
MON NOT ROY ASTRON SOC (MNRAA)
NATURE (NATUA)
NUCL INSTRUM METH (NUIMA)
NUCL PHYS (NUPHA)
NUOVO CIM (NUCIA)
NUOVO CIM LETT (NCLTA)
NUOVO CIM SUPPL (NUCUA)
PHYS LETT (PHLTA)
PHYS REPT (PRPLC)
PHYS REV (PHRVA)
PHYS REV LETT (PRLTA)
PHYSICA (PHYSA)
PHYSICS (PYCSA)
PRAMANA (PRAMC)
PROC CAMBRIDGE PHIL SOC (PCPSA)
PROC NAT ACAD SCI (PNASA)
PROC PHYS - MATH SOC JAP (PPMJA)
PROC ROY SOC LOND - A (PRSLA)
PROG THEOR PHYS (PTPKA)
REPTS MATH PHYS (RMHPB)
REPTS PROG PHYS (RPPHA)
REV MOD PHYS (RMPHA)
RIV NUOVO CIM (RNCIB)
SCI SINICA (SSINA)
SCIENCE (SCIEA)
SOV J NUCL PHYS (SJNCA)
SOV MATH DOKL (SVMDA)
SOV PHYS JETP [ENGLISH] (SPHJA)
STUD APPL MATH (SAPMB)
SURVEYS HIGH ENERGY PHYS (SHEPD)
TEOR MAT FIZ (TMFZA)
YADERNAYA FIZ (YAFIA)
Z PHYS (ZEPYA)
ZH EKSP TEOR FIZ [RUSSIAN] (ZETFA)
ZH EKSP TEOR FIZ PISMA [RUSSIAN] (ZFPRA)

END

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