Psychic Psearch – Search Engine for the IBM AS/400™

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Chapter 1 : **Introduction**

Psychic Psearch is a powerful utility designed to help you generate text data-retrieval (content search) programs over any file in your database in minutes and then call those programs directly or embed them in other applications to search-enable them. Applications users refer to as "tedious" or "painful" are suddenly "easy" and "cool". Who knows, the next "killer-app" may be yours.

Using easy to follow on-line prompting you define the file and fields you want the set of search programs created for. The resulting object set, (with names prefixed according to your specification) enables you to perform:

- **Special character handling definition**
- **Character string exclusion**
- **Synonym definition**
- **Multiple word "and" search instantly gets matching records that contain all the words (or synonyms of the words) in any order.**
- **Single or multiple record selection from result set**
- **Return to caller with selected key(s)**
- **Integrate with other applications quickly and easily**
- **Interface with Client-Server applications like J.D.Edwards One World™ or with custom PC client programs or Web Browsers.**
- **String scanning to locate embedded words or codes**
- **Generic word search ("starts with")**
- **Automatic word index build and update**

The search programs use a powerful proven technique that enables content search on your data files to be ***very, very fast***. Once you have used ***Psychic Psearch*** you will not want to use anything else.

The matching records can be presented on-line through a standardized "subfile" style scrolling display that is automatically generated for you or they can be loaded to a data queue for presentation by custom/package applications, PC clients or Web Browsers.

Psychic Psearch programs can be generated over physical files, logical files, or even join files. Multiple program sets with different field references and rules can be created over the same file(s).

Best of all, if a file layout changes or a search is required over different fields or different files you can generate a custom set of standard ***Psychic Psearch*** programs in minutes. The searches generated are fast and effective and can be integrated with any application.

Chapter 2 : Installation

Preparation

Ensure the library name **PSYCHIC** has not already been used on your system. (If it has been used already call your support vendor for instructions on alternate library naming.)

All *Psychic Psearch* **master objects** use the prefix "PS". If this prefix is used on your system for database files, **and** you will be wanting to create searches over those files, contact your software provider for special instructions.

Download from the Internet

If the AS/400 you will be installing *Psychic Psearch* to has a network connection to your PC you may be able to use the automated download and install available on the Results First Inc. website (http://www.resultsfirst.com). Please visit the site for details.

Restore from tape

Load the tape provided and enter;

RSTLIB PSYCHIC DEV(name)

(Replace "name" with the appropriate tape device name.) The load takes only a few minutes and will use one to two Megabytes (1-2 MB) of disk.

(If this is a licensed copy of *Psychic Psearch* you should have been provided with one or more authorization codes. Follow the instructions found in the following chapter under the heading "Authorization Code Input" before using the product.)

That's it ! You're ready to go!

Restore from save file

RSTLIB PSYCHIC DEV(*SAVF) SAVF(lib/name)

(Replace "lib" with the library where you have stored the save file. Replace "name" with the name of the save file being used.) The load takes only a few minutes and will use one to two Megabytes (1-2 MB) of disk.

(If this is a licensed copy of *Psychic Psearch* you should have been provided with one or more authorization codes. Follow the instructions found in the following chapter under the heading "Authorization Code Input" before using the product.)

That's it ! You're ready to go!

Chapter 3 : **Authorization Code Input**

NOTE: If you have installed *Psychic Psearch* for evaluation purposes, skip this step. An authorization code disables the time out mechanisms and is provided when the software is licensed. A search generated without a key must be regenerated when a key is applied.

On a command entry line key;

PSYCHIC/PSYCHIC

and press enter. When the display appears input your authorization code(s) and press enter.

```
Psychic                     Password Master Entry
Psearch

 Type changes, press Enter.

 Primary System

     Password.....

 Run Time Systems Only

     Password 2...                        CPU Serial No 2...
     Password 3...                        CPU Serial No 3...
     Password 4...                        CPU Serial No 4...
     Password 5...                        CPU Serial No 5...
     Password 6...                        CPU Serial No 6...
     Password 7...                        CPU Serial No 7...
     Password 8...                        CPU Serial No 8...
     Password 9...                        CPU Serial No 9...
     Password 10..                        CPU Serial No 10..
     Password 11..                        CPU Serial No 11..


 F1=Help  F3=Exit  F5=Refresh  F12=Cancel
```

If you receive an error message, blank the line out and input your authorization code again. (It's a long number, so go slow and double-check your entries. If you still have a problem, check the serial number of the AS/400 you are loading the software on and make sure it is the same as the number shown on your Authorization Code letter.)

Note: The command PSYCHIC uses the "product library" feature of the OS/400 to include the library PSYCHIC in your library list. When you qualify the command execution it is not necessary for library PSYCHIC to be in your library list.

Note: If your license includes specific "Run Time Licenses", in addition to the "Primary System", you will need to generate and distribute a "test search". Do this by following the instructions found in the chapter called "Generation" and then send the generated objects to each target "run time" system to verify each of the Authorization Codes.

Psychic Psearch – Search Engine for the IBM AS/400™

Note: Any time you add or change the information on this display you will have to re-generate any *"Search Set"* created previously before the changes will take effect. (Refer to the "Generation" section for more information on "sets".)

Psychic Psearch is now ready for you to use.

Chapter 4 : Security Considerations

All *Psychic Psearch* master objects are shipped with owner QPGMR and Public Authority set to *ALL. You may change the ownership and public authority setting to suit your environment.

All objects generated by *Psychic Psearch* (when you run the command PSYCREATE as described later in the chapter "Generation") are created with the object owner as per your system defaults for the associated OS/400 create commands and with Public Authority of *ALL. After the objects have been created you can change the security setup if required.

If you customize the object owner and authorities you will need to repeat this customization whenever the applicable *Psychic Psearch* is regenerated.

No programs use adopted authority or MI (Machine Instruction).

To perform a generation you must have authority to;

- ➢ CRTRPGPGM command
- ➢ Add objects to the object library specified for the generation
- ➢ Use the *Psychic Psearch* master objects.

To execute the functions of a generated *Psychic Psearch* you need;

- ➢ USE authority to all objects generated and to the file(s) being searched
- ➢ USE authority to the OS/400 objects (CRTDTAQ, QSNDDTAQ, QRCVDTAQ,CMDEXEC)

Additional authority required to perform;

- ➢ Work With Special Characters - data update to file xxxxPFO1

- ➢ Work With Exclusion Strings   - data update/add to file xxxxPFO2

- ➢ Work With Synonyms - data update/add to file xxxxPFO3

- ➢ Apply Synonym Updates - *ALL authority to all generated files and data areas

- ➢ Index Update/Rebuild - *ALL authority to all generated files and data areas

Chapter 5 : **OS/400 Environment**

➢ Minimum Operating System Level depends on the version of *Psychic Psearch*. (Typically this will be V3R2M0 for CISC systems and V3R7M0 for RISC systems.)

➢ Requires RPG/400 Compiler for generation (not for execution).

➢ Security Level 40 Compatible.

➢ Maximum of 9,999,999 occurrences of any individual keyword within a specific file. If a specific keyword will have more than this number of matches it should be excluded. Refer to "Character String Exclusion" in the "Data Interpretation" section for more information.

➢ *Psychic Psearch* applications generated with standard license will run only on the CPU used to generate them. Special multi-CPU licenses are available.

➢ Generation program enables the input of "Target Release". OS/400 previous compiler support is required for both CL and RPG. If a generation fails, and you specified a target release, attempt a manual compile of one of your own CLP's **and** an RPG program, with the same target release input on the command prompt to verify support is installed. (The OS/400 "previous compiler" support may be a separate feature for each.)

Chapter 6 : **Generation**

Generating a Psychic Psearch Set

Defining and generating (or regenerating) the objects required to provide *Psychic Psearch* capability over any file in your DB2/400 database is fast and easy. The created objects are referred to as a *"Search Set"*.

Note: This process will create temporary files in the QTEMP library using the prefix "PS". These files are automatically deleted when the process is completed or cancelled. If you already have files in your QTEMP library beginning with "PS" save or rename them first.

Starting a generation

When you execute the command:
                PSYCHIC/PSYCREATE

you are presented with;

```
Psychic                    Generate a Search
Psearch

 Type options, press Enter.

   Library.................
   Target Release..........  *CURRENT        *CURRENT, *PRV, V2R2M0...
   Object Prefix...........
   Panel/Report Heading....
   Unique View.............
     Library...............    *LIBL         Name, *LIBL, *CURLIB
   Unique Member Name......  *FIRST          Name, *FIRST
   Unique Record Format....  *ONLY           Name, *ONLY
   Sequence View...........  *SAME           Name, *SAME
     Library...............    *SAME         Name, *SAME, *LIBL, *CURLIB
   Sequence Member Name....  *SAME           Name, *SAME, *FIRST
   Sequence Record Format..  *SAME           Name, *SAME, *ONLY
   File Maximum Records....  2               1=<30K, 2=<300K, 3=<3000K
   Maintenance Option......  3               1=Rebuild, 2=Demand, 3=Automatic
   Kind of Match...........  2               1=Same Case, 2=Ignore Case
   Command Line on panels..  1               1=Allow Command Line, 2=No Cmd Line


 F1=Help  F3=Exit  F12=Cancel
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```

Fill in the appropriate values for the *"Search Set"* you want to create.

Library

Where you want generated objects to be created. (We recommend you use a "development" work library to initially create the objects into. When you are done testing, they can be moved.)

Target Release

The OS/400 release being used where the programs will be run.

Object Prefix

Enter four characters to be used as the prefix for each object generated. Must be a valid OS/400 object name prefix. No blanks allowed.

Panel/Report Heading

The title you want to appear on all generated reports and displays.

Unique View

The name of the file that provides a unique key to the data **and** includes all the fields to be searched or displayed. Join files are permitted. The DDS keyword UNIQUE does not have to be present. Must contain at least those records present in the "Sequence View". (Only records available through the "Sequence View" will be searched.)

Library

The library where the above file is located. Used during the generation process only to capture field definitions only. You must ensure the correct file is accessed through your library list when running the generated *"Search Set"* programs.

Unique Member Name

The file member to be used by the generated programs. Defaults to *FIRST.

Unique Record Format

If the Unique View is a multi-format file, specify the record format name to use. Defaults to *ONLY.

Sequence View

The name of the file which provides the sequence you want records retrieved in if different from the unique view. Must contain fields used as key in Unique View and all fields to be searched. (DDS select/omit if present should match Unique View.)

Library

The library where the sequence view file is located. (See Unique View Library.)

Sequence Member Name

See Unique Member Name

Sequence Record Format

See Unique Record Format

File Maximum Records

Determines the indexing space allowance. Choose the lowest option that provides an allowance larger than your expected file size. (<30K indicates less than 30,000 records, etc.)

Maintenance Option

If you specify REBUILD, search word indexes will be updated only when the index rebuild function is run. (Objects required for On-Demand, Automatic Update, and Synonym Application are not created.)

If you indicate DEMAND, you will be able to call a *Psychic Psearch* routine, generated as part of the *"Search Set",* to update indexes relating to unique keys you supply. (Rebuild is also valid.)

If you use AUTOMATIC, additional objects needed for the automatic determination of change are created. (The On-Demand and Rebuild options are also available.)

Kind of Match

Enter a 1 (one) if the *"Search Set"* to be generated is to be case sensitive, a 2 (two) if character case should be ignored. (Applies only to matching, not to retrieval sequence.)

Command Lines on Panel

Enter a 1 (one) if you want a command line window accessible through the programs generated in this *"Search Set"*. Enter a 2 (two) if you do not.

```
Psychic                    Generate a Search
Psearch

 Type options, press Enter.

   Library................  PSYDEMOS
   Target Release.........  V2R3M0         *CURRENT, *PRV, V2R2M0...
   Object Prefix..........  PPD1
   Panel/Report Heading....  OS/400 Object Finder
   Unique View............  P@D1PHY
     Library..............   PSYDEMOS    Name, *LIBL, *CURLIB
   Unique Member Name......  *FIRST       Name, *FIRST
   Unique Record Format....  *ONLY        Name, *ONLY
   Sequence View..........  *SAME        Name, *SAME
     Library..............    *SAME       Name, *SAME, *LIBL, *CURLIB
   Sequence Member Name....  *SAME        Name, *SAME, *FIRST
   Sequence Record Format..  *SAME        Name, *SAME, *ONLY
   File Maximum Records....  2            1=<30K, 2=<300K, 3=<3000K
   Maintenance Option......  3            1=Rebuild, 2=Demand, 3=Automatic
   Kind of Match..........  2            1=Same Case, 2=Ignore Case
   Command Line on panels..  1            1=Allow Command Line, 2=No Cmd Line


 F1=Help  F3=Exit  F12=Cancel
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```

Field Selection

The second step in the *Psychic Psearch* "*Search Set"* generation is the selection of which fields you want to use for search and/or panel display.

```
Psychic              Generate a Search - Field Selection
Psearch

 Filter by Data Type.......
 Search for Field Name.....

 Type options, press Enter.
      1=Select as search field  2=Select as display field  3=Select as both
      6=Redefine/add new field

       Valid To  Field      Data  Field  Column
 Opt   Search    Name       Type  Length Headings
  1     YES      ODLBNM      A     10     Library
                                          Name
  3     YES      ODOBNM      A     10     Object
                                          Name
  1     YES      ODOBTP      A      8     Object
                                          Type
  1     YES      ODOBAT      A     10     Object
                                          Attribute
  3     YES      ODOBTX      A     50     Object Description
                                                          Bottom


 F1=Help  F3=Exit  F12=Cancel  F17=Top  F18=Bottom
```

Fields which are valid to search will appear with a "YES" in the "Valid to Search" column. Any character field present in both the Unique View and Sequence View is valid for search. (Numeric fields can be redefined as character.)

You can use the roll keys to page through available fields, search for a specific field name, or filter the display by field data type.

This panel also allows you to create new fields by redefining others. You can split one field into many or redefine a packed or signed numeric as character to enable search. To redefine a field, key a 6 beside that field in the option column and press enter.

Redefine Fields

When you select a field for redefinition from the field selection display you will see;

```
Psychic               Generate a Search - Redefine Fields
Psearch

 Based-on Field Name..:  ODOBTX

 Field Length.........:   50

 Column Headings......:  Object Description


 Type choices, press Enter.

      New Field Name.............:

      Start at field position....:    1

      New Field Length...........:




 F1=Help   F12=Cancel
```

When you add a new field, the field name you assign cannot already exist in either the Unique View File or the Sequence View File.
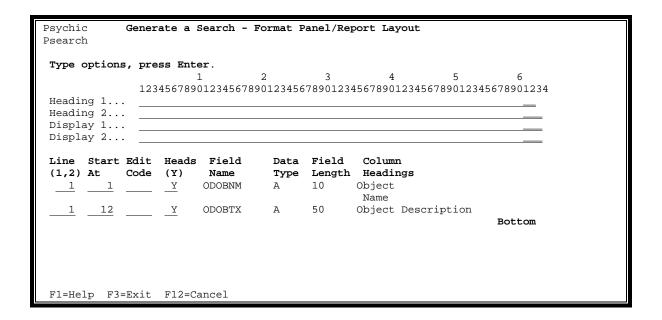
Specify the from and to position of the new field relative to the data base field containing the data to be accessed. You can redefine a numeric as alpha or split one field into many.

After defining the new field(s) you can then return to the previous screen to make your field selections.

After you have made your field selections a panel similar to the following example will appear.

Panel/Report Formatting

The fields you selected on the previous panel for display, or search and display, will be listed here.

```
Psychic        Generate a Search - Format Panel/Report Layout
Psearch

 Type options, press Enter.
                          1         2         3         4         5         6
                 1234567890123456789012345678901234567890123456789012345678901234
 Heading 1...    _____      __
 Heading 2...    _____      __
 Display 1...    _____      __
 Display 2...    _____      __

 Line  Start Edit  Heads   Field       Data  Field  Column
 (1,2) At    Code  (Y)     Name        Type  Length Headings
   1     1   ____    Y     ODOBNM      A     10     Object
                                                      Name
   1    12   ____    Y     ODOBTX      A     50     Object Description
                                                                        Bottom




 F1=Help  F3=Exit  F12=Cancel
```

Line (1,2)
The search panel you generate will present a list of records with one or two lines per record. Enter the line number you want each panel field to appear on. If you do not place any fields on line 2 it will be omitted from the generated search to enable more records to be shown.

Start At
Enter the starting position for each field to be displayed. A "ruler" is provided at the top of the screen to assist you.

Edit Code
For numeric fields only, input the standard DDS edit code which corresponds to how you want the field shown. Refer to Appendix "A" for edit code details.

Heads
Enter a "Y" if you want the column headings from the file definition to be extracted and positioned above the field on the "Heading" line.

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When you press enter after making your selections the layout will appear in the "Headings" and "Display" lines. If you do not like the layout you can change your specifications. The "Headings" lines can be adjusted manually.

```
Psychic        Generate a Search - Format Panel/Report Layout
Psearch

 Type options, press Enter.
                       1         2         3         4         5         6
              123456789012345678901234567890123456789012345678901234
 Heading 1... Object
 Heading 2... Name       Object Description
 Display 1... OOOOOOOOOO OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
 Display 2...

 Line  Start Edit  Heads  Field      Data  Field  Column
 (1,2) At    Code  (Y)    Name       Type  Length Headings
  1     1    ___   ___    ODOBNM     A     10     Object
                                                  Name
  1     12   ___   ___    ODOBTX     A     50     Object Description
                                                              Bottom




 F1=Help  F3=Exit  F12=Cancel
 Press enter to confirm.
```

If your specifications result in field overlap or line overflow an error message will be issued and the associated specification(s) will appear in reverse image.

If there are no errors and you are satisfied with the layout, press enter to confirm.

Submitting the Generation Run

Your *"Search Set"* definition is now complete.

```
Psychic            Generate a Search - Submit Generation Run
Psearch


 Library...............:  PSYDEMOS

 Object Prefix.........:  PPD1

 Panel/Report Headings..:            OS/400 Object Finder


 Type options, press enter.


    Hold on job queue.......  1  1=Execute immediately, 2=Hold on job queue




 F1=Help  F3=Exit  F12=Cancel
```

The generation process will be submitted to batch using the job queue specified for the job description PSJOBD in the library PSYCHIC. You can submit the job for immediate execution or you can submit the job on hold and release it later.

The generation will create objects in the library shown using the object name prefix you supplied.

> *WARNING: If conflicting objects exist they will be deleted*.

```
Psychic              Generate a Search - Completion
Psearch


 Library...............:   PSYDEMOS

 Object Prefix.........:   PPD1

 Panel/Report Headings..:             OS/400 Object Finder

 Generation Run I.D.....:   0000001

   Your request for generation has been submitted successfully.

   Press enter to exit Psychic Psearch.


   Warning: The generation run is single stream only. You must wait for this
            generation to complete before attempting to create another request.



 F1=Help  F3=Exit
```

The final screen confirms the submission of your generation job. Note that the generation batch job must complete before another definition can be input. (On-line selections are stored in a single temporary area referenced by the batch process.)

When you press enter or select command F3 your screen will be locked for a few moments for cleanup functions. (**Note:** If you wait to long before pressing enter on this display, your batch job may fail as it will be unable to allocate all the objects it needs.)

When the batch process completes a message will be sent to you indicating the success or failure of the generation process. Failure of the batch generation process is rare. If it occurs refer to "Problem Determination".

Objects Generated

The following objects are created for an AUTOMATIC maintenance generation (where xxxx is the four digit prefix specified during generation);

JOB DESCRIPTION...............................	xxxxJOBD
MESSAGE FILE....................................	xxxxMSGF
COMMAND...	xxxxPSYMNU
DATA AREAS......................................	xxxxDAO1 through xxxxDAO5 inclusive
PHYSICAL FILES................................	xxxxPF1 through xxxxPF12 inclusive
	xxxxPF1 through xxxxPF18 inclusive
LOGICAL FILES..................................	xxxxLF3A through xxxxLF3B inclusive
	xxxxLF9A
	xxxxMF01
DISPLAY FILES……………………..	xxxxSF01 through xxxxSF06 inclusive
	xxxxSF09 through xxxxSF11 inclusive
	xxxxSF13, 20, 26, and 27
C.L. PROGRAMS.............................…	xxxxCL01 through xxxxCL22 inclusive
RPG/400 PROGRAMS.........................	xxxxRP01 through xxxxRP36 inclusive
SOURCE FILES...................................	xxxxDDSSRC

A total of 100 OS/400 Objects will be generated into the Target Library you specified. The source file will contain a source member for each display file allowing you to modify constant information only (headings, etc.). You must not make changes that affect the I/O buffer or file level ID.

The following objects are omitted if DEMAND maintenance was requested.

C.L. PROGRAMS.............................…	xxxxCL06 & xxxxCL08
RPG/400 PROGRAMS.........................	xxxxRP17 through xxxxRP18 inclusive

The following objects are omitted if REBUILD maintenance was requested:

PHYSICAL FILES...............................	xxxxPF12
C.L. PROGRAMS.............................…	xxxxCL03, 06, and 08
	xxxxCL11 through xxxxCL13 inclusive
RPG/400 PROGRAMS.........................	xxxxRP12, and 14
	xxxxRP17 through xxxxRP18 inclusive
	xxxxRP21, 25, 28, and 35

Generation Reporting

WARNING: "Search Set" definitions are not stored. The following report is produced during the generation process. Save the spool file, or print and save the hard copy. You will need to refer to this in future if you want to reproduce this generation exactly.

```
Date: 12/13/98      Generation Run Request Listing      Psychic Psearch      Page: 1


Generation Run Identifier...:  0000001
Requested By................:  RICHARD

     Library.................:  PSYDEMOS
     Target Release..........:  V2R3M0
     Object Prefix...........:  PPD1
     Panel/Report Heading....:              OS/400 Object Finder
     Unique View.............:  P@D1PHY
        Library..............:    PSYDEMOS
     Unique Member Name......:  *FIRST
     Unique Record Format....:  *ONLY
     Sequence View...........:  P@D1PHY
        Library..............:    PSYDEMOS
     Sequence Member Name....:  *FIRST
     Sequence Record Format..:  *ONLY
     Maintenance Option......:  3          1=Rebuild, 2=Demand, 3=Automatic
     Kind of Match...........:  2          1=Same Case, 2=Ignore Case
     Command Line on screens.:  1          1=Allow Command Line, 2=No Command Line

Search Fields Details
 =====================
     Field      Data  Field   Column              Column
     Name       Type  Length  Heading 1           Heading 2
     ====       ====  ======  =========           =========
     ODLBNM     A     10      Library             Name
     ODOBNM     A     10      Object              Name
     ODOBTP     A      8      Object              Type
     ODOBAT     A     10      Object              Attribute
     ODOBTX     A     50      Object Description


Panel/Report Layout
===================
                              1         2         3         4         5         6
                    12345678901234567890123456789012345678901234567890123456789012345
Heading Line 1..........:Object
Heading Line 2..........:Name      Object Description

     Line   Start  Edit  Field       Data  Field   Column              Column
     (1,2)  At     Code  Name        Type  Length  Heading 1           Headding 2
     =====  ==     ====  ====        ====  ======  =========           ==========
      1      1           ODOBNM      A     10      Object              Name
      1      12          ODOBTX      A     50      Object Description
```

Problem Determination

You receive a message indicating the *Psychic Psearch* generation failed.

- Retrieve the generation report created before the job was submitted.
- Retrieve the job log from the submitted job.
- If you can identify and correct the problem from this information retry your generation request.

If you cannot determine the cause;

- Make sure the PSJOBD job description is set up to log fully.
- Create a temporary library to hold only the generated objects.
- Retry your generation using the temporary library as the target.
- Use *CURRENT for the Target Release.
- Retrieve the generation report created by your on-line request.
- Retrieve the job log created by the batch generation when it completes.
- Print off the content of your temporary library after the generation completes.
- Call your support provider for assistance if you cannot resolve the problem.

Regenerating an Existing Application

Some times you may want to regenerate a *Psychic Psearch* application to incorporate changes to what fields are searched or displayed, to create another slightly different version of a search set, or to incorporate facilities of a new release of *Psychic Psearch* itself. If you have previously input data for;

- Special Character Handling
- String Exclusion
- Synonym Definition

and you want to transfer this data to the new search application without having to re-key the data follow this procedure:

1. Generate the new application into a different library than the existing one, use a different prefix, or rename/move the original files before generating the new set. The corresponding files are;

    xxxxPF1 - Special Character Handling
    xxxxPF2 - String Exclusion
    xxxxPF3 - Synonyms

    (where xxxx is the prefix you chose when you generated the search set)

2. Use the copy file command (CPYF) to copy the information from the original set of files to the new set generated.

3. Run the index rebuild from the new search set as per standard documentation.

Chapter 7 : **Data Interpretation**

Psychic Psearch Master Menu

Each **Psychic Psearch** *"Search Set"* you generate comes complete with it's own menu. A "set" is the complete group of 90+ objects created by the generation process. (Refer to the section "Objects Generated" for a complete list.)

You can use this menu by executing the command **xxxxPSYMNU** (where xxxx is the prefix specified during generation) with the library containing the generated objects in your library list as well as the file being searched. You can also execute the individual functions from your own menus or a command entry line. (Like any other *CMD object type, you can use the "current library" and "product library" options through the OS/400 command "CHGCMD".)

```
Psychic                    Psychic Psearch Master Menu
Psearch                         OS/400 Object Finder

 Select one of the following:

      1. Work With Special Characters
      2. Work With String Exclusion
      3. Work With Search Synonyms

      4. Psychic Psearch
      5. Special Characters Inquiry
      6. String Exclusion Inquiry

      7. Request Index Rebuild
      8. Restart Interrupted Index Rebuild
      9. Request Synonym Maintenance Application
     10. Request Demand Index Maintenance
     11. Request Automatic Index Maintenance

 Option..



 F1=Help  F3-Exit  F12=Cancel
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```

In this chapter we will review the menu options which enable you to control how the data in the file you built this search for will be interpreted.

Note: Submitted jobs will use your system defaults for system, current, and initial library list parameters on the SBMJOB command. The Job Description (JOBD) specified on the SBMJOB command will be the xxxxJOBD object generated for this SET without library qualification. It is your responsibility to ensure the combination of your online library list and command defaults will result in the submitted job being able to access the correct *"Search Set"* and the correct occurrence of the database files named in the generation. (The library name(s) specified, if any, during generation process to identify the "Sequence View" and the "Unique View" files are not referenced. They were used for generation only and are not hard coded in the *"Search Set"*.)

Special Character Handling

Each *"Search Set"* you generate includes all the objects necessary for you to define how special characters (and single digit alpha characters) are to be handled. You can select the **Work with Special Characters** option from the menu, or call program xxxxRP01 (where xxxx is the object naming prefix assigned during generation). The program has one parameter;

Maintenance Mode　　　　　Length = 1A　　　　Y or N

(If you call the program with a value of "N" in the parameter the String Exclusion Inquiry is displayed.)

```
Psychic                 Work With Special Characters
Psearch                   OS/400 Object Finder

 Type options, press Enter.
   2=Change
     Special                      Action      Collapse
 Opt  Character  Description      Code        Code
       ¢                          2  EXCLUDE  2  NO COLLAPSE
       .         Decimal Point    1  INCLUDE  2  NO COLLAPSE
       .         Period           2  EXCLUDE  2  NO COLLAPSE
       <                          2  EXCLUDE  2  NO COLLAPSE
       (                          2  EXCLUDE  2  NO COLLAPSE
       +                          2  EXCLUDE  2  NO COLLAPSE
       |                          2  EXCLUDE  2  NO COLLAPSE
       &                          2  EXCLUDE  2  NO COLLAPSE
       !                          2  EXCLUDE  2  NO COLLAPSE
       $                          2  EXCLUDE  2  NO COLLAPSE
       *                          2  EXCLUDE  2  NO COLLAPSE
       )                          2  EXCLUDE  2  NO COLLAPSE
       ;                          2  EXCLUDE  2  NO COLLAPSE
       ¬                          2  EXCLUDE  2  NO COLLAPSE   More..

 F1=Help  F3=Exit  F5=Refresh  F12=Cancel  F23=Command Line
```

An entry is also provided on this list for you to control *Any Single Alpha* character. An alphabetic character with a blank to the right and left can be included or excluded in the same fashion as other special characters.

For each special character you can specify;

If you want to INCLUDE or EXCLUDE the character when creating search strings based on the data base file accessed.

If the character is to be excluded, you can specify if you want to replace the character with a blank (No Collapse) or compress the character string to remove the space which was occupied by the character (Collapse).

Special characters that have dual or multiple meanings (such as the decimal point and period) are differentiated on the screen by the character description. A complete list of rules regarding the

　　　　　　　25

interpretation of special characters with more than one meaning is included at the end of this section.

When you key the option "2" beside any of the special characters and press enter the change screen is presented for you to make your handling selections.

```
Psychic              Change a Special Character Entry
Psearch                     OS/400 Object Finder



 Special Character..............:  ¢


 Type changes, press Enter.


      Action Code..............  2  EXCLUDE      1=Include, 2=Exclude

      Collapse Code............  2  NO COLLAPSE  1=Collapse, 2=No Collapse





 F1=Help   F5=Refresh   F12=Cancel
```

The selections you make here DO NOT result in any updates to your database. Only the *Psychic Psearch* interpretation of your data is modified **at the time of the next Index Rebuild**.

> Note: If you have already created other *"Search Sets"* and you want to use the same handling as in one of those, simply copy the contents of file xxxxPF01 (where xxxx is the naming prefix you assigned) then run the Index Rebuild.

By first analyzing the occurrence of special characters in your data you can then use this function to make it easier for information to be found.

Special Character Recognition Rules

Some special characters have more than one use. For example, a period is shown using the same character as a decimal point. The following rules are appplied when examining the data to determine usage;

Decimal Point	b.N N.b N.N
Period	Not a decimal point
Minus Sign	b-N N-b
Special Hyphen	N-N/N N-N/NN N-N/NNN N-NN/NN N-NN/NNN N-NNN/NNN
Hyphen	Not minus sign or special hyphen
Fraction	N/N N/NN N/NNN
Slash	Not a fraction or special hyphen
Numeric Comma	N,N
Alpha Comma	Not numeric comma
Foot Sign	N'b
Single Quote	Not foot sign
Inches Sign	N"b
Double Quote	Not inches sign

(Note: **b** represents a blank. **N** represents a numeric value 0-9.)

Character String Exclusion

As part of each *"Search Set"*, you have the ability to define words or character strings to be omitted from the internal generated indexes.

Excluding words, or character strings, that have no value for your search purposes can reduce the amount of disk used to store indexes.

The ***Work With String Exclusion*** function can be selected from the generated menu or executed by calling xxxxRP03 (where xxxx is the object naming prefix which was specified during generation.)

The parameter list for calling this program is;

> Maintenance Mode   Length = 1A   Y or N

(If you call the program with a value of "N" in the parameter the String Exclusion Inquiry will be displayed.)

```
Psychic                    Work With String Exclusion
Psearch                       OS/400 Object Finder

 Position to Character String...

 Type options, press Enter.
   4=Delete


        Character String      String
 Opt    To Be Excluded        Length
        AND                      5
        THE                      5                                  Bottom








 F1=Help  F3=Exit  F5=Refresh  F6=Add  F12=Cancel  F23=Command Line
```

When the display first appears you will be shown the character strings that are to be excluded (if any). You can **delete** an exclusion definition by keying the option 4 (four) beside the string you no longer want to exclude. You can **add** a new string to be excluded by selecting F6.

If you make changes to this information you will need to run the "Index Rebuild" for them to take effect.

When F6 is selected from the *Work With String Exclusion* screen the following display appears;

```
Psychic                    Add a String Exclusion Entry
Psearch                       OS/400 Object Finder



 Type choices, press Enter.



    Character String to be excluded...    _____


    String Length to use.............  _____


  Notes:  Leading and trailing blanks are significant.

          To drop the full word "THE" but not these same characters if they
          appear within another word specify the string as " THE "
          (blankTHEblank) with a string length of 5.


 F1=Help  F12=Cancel
```

> **WARNING:** Exclusion strings must be input **<u>exactly</u>** as they would occur in your data base with the string length sufficient to include leading and trailing blank(s) as required. The excluded characters are replaced with blanks.

For example, the string specification THE with a length of three would eliminate the word *the* from the search files. It would also result in **brother** being searched as two "words" **bro** and the single character **r**.

To exclude only the word "the" you would specify a string of "*space* THE *space*" and a string length of five.

> **NOTE:** If your *"Search Set"* generation specified "same case" for the "Kind of Match" option, you must input the exclusion string with the exact upper and lower case combinations that will match the file data to be excluded.

Index Rebuild

Before using a new *"Search Set"* for the first time you must build the internal indexes. You can do this from the generated menu (xxxxPSYMNU) or by submitting the index build program directly.

To submit the rebuild directly use the SBMJOB command to execute;

> CALL xxxxCL02   PARM('N')

This process can take some time and will require a certain amount of disk space depending on the amount of data in the file this *"Search Set"* is based on that will be read based on the library list of the submitted job.

NOTE: When setting up a search for the first time it is often helpful to initially build the index over a subset of the data. This will allow you to better estimate run time and disk space requirements for a full rebuild over the entire file.

After the index rebuild has been started it must complete normally before the associated ***Psychic Psearch*** functions in this Set will be available.

Restarting Interrupted Index Rebuild

If the index rebuild ends abnormally you can either request the rebuild again or submit a restart. The restart attempts to pick up where it left off. If it cannot determine a restart point a full rebuild is performed automatically.

To request restart of an interrupted index rebuild use the SBMJOB command to run;

> CALL xxxxCL02 PARM('Y')

Search Synonyms (or "same as" searching)

Databases often contain abbreviations, incorrect spellings and alternate words that cause difficulty for traditional text data retrieval programs. It is not until a person has looked at the data, will we able to truly interpret these variations as having the same meaning.

Psychic Psearch allows you to identify two or more "keywords" as synonyms. (Unlike some indexing methods that make you specify these keywords up front, a "keyword" to *Psychic Psearch* includes every unique combination of characters separated by blanks found in the fields you selected to be search capable during the generation. In other words, every "word" or code or abbreviation is a "keyword" automatically.)

You can even enter values which do not exist in your database, but may be commonly used slang or industry specific terms, and link them to the keywords in your database you want to be treated as a match. Each search Set you generate will have it's own unique set of synonym definitions.

Note: After generating your *"Search Set"*, you will need to run the Index Rebuild function before the keywords in your database will be available to this function. (See previous page.)

When you select *Work With Search Synonyms,* or call the program xxxxRP09 (where xxxx is the naming prefix you assigned), a display similar to the following will appear;

```
Psychic                    Work With Search Synonyms
Psearch                    OS/400 Object Finder

 Position to Search Synonym.....

 Type options, press Enter.
   4=Delete


      Search                 Associated            Current
 Opt  Synonym                Keyword               Status
      ACTIVATION             ACTION                Add Pending
      ACTIVE                 ACTION                Add Pending
      ACTIVITY               ACTION                Add Pending
      ALIASES                ALIAS                 Add Pending        Bottom








 F1=Help  F3=Exit  F5=Refresh  F6=Add  F12=Cancel  F23=Command Line
```

From this display you can delete synonyms by keying the option "4" beside them. When you press enter a delete confirmation screen will appear.

You can also add new synonyms by pressing F6.

If you add or delete a keyword the "Current Status" will show as "Add Pending" or "Delete Pending". You must run the *Apply Synonym Updates* (this topic is covered in the pages that follow), or the *Index Rebuild* function (the previous topic in this chapter) for these updates to take effect.

When you press F6 on the *Work With Search Synonyms* display you will see;

```
Psychic                       Add a Search Synonym
Psearch                       OS/400 Object Finder



 Type choices, press Enter.


    Master Keyword...................    _____        F4=List


    Search Synonym...................    _____        F4=List






 F1=Help   F4=Prompt   F12=Cancel
```

On this display you will specify the keywords to be linked. A keyword that is already defined as a synonym of another keyword cannot be input as a "Master Keyword."

If you are unsure of the exact spelling of the keywords you want to input, you can use the F4 key to prompt. When you do so the *Work With Search Keywords/Synonyms* display will appear.

```
Psychic                Work With Search Keywords/Synonyms
Psearch                      OS/400 Object Finder

 Suggest Synonyms for.............
 OR Position to Keyword/Synonym...

 Type options, press Enter.
   1=Select  5=Display  6=Print
                                 Associated Keyword
 Opt    Keyword                  If Synonym
        ABNORMAL
        ACCESS
        ACCOUNTING
        ACTION
        ACTIVATION
        ACTIVE
        ACTIVITY
        ADAPTER
        ADAPTERS
        ADD
        ADDACC                                            More...

 F1=Help  F3=Exit  F5=Refresh  F12=Cancel  F21=Print  F23=Command Line
```

You can use the *Work With Search Keywords/Synonyms* panel to select a Master Keyword or to select up to seven synonyms depending on the location of your cursor when you pressed F4. (You can only input keyword Synonyms in groups of seven or less, but you can input as many groups as you need.)

On the above display panel, use the:

- "Position to Keyword" input line to control the starting point of the list.

- "Suggest Synonyms for" input line to ask *Psychic Psearch* to display only those keywords which it thinks might be a match for the value you input.

Beside one or more individual "keywords" you can input:

- Option "1" is used to select keyword(s) and return to the previous display.

- Option "5" to display the actual database occurrences of a keyword*.

- Option "6" to print the actual database occurrences of a keyword*.

(Note: The occurrences shown will be those known to your *"Search Set"*. This can be up to second if you are using the "Immediate Index Update" capabilities or up to the date/time of the last "Rebuild" or "Delayed" index update run.)

Keyword Reporting

You can also request a report listing a range of keywords or a range of keywords and their data base occurrences by pressing F21.

```
Psychic                 Request Multiple Keywords Report
Psearch                        OS/400 Object Finder


 Type choices, press Enter.


    Print From Keyword..........   _____


    Print To Keyword............   _____


    Print Detail Desired........  1  1=Keywords report only
                                     2=Keywords and matching records




 F1=Help  F12=Cancel
```

Leave the "Print From Keyword" blank to specify a low order "from" range. (Start from the beginning of the file.)

Set the "Print To Keyword" to all 9's to specify a high order "to" range. (End at the end.)

> **WARNING:** This report can be very large depending on the size of the based on file.

Apply Synonym Updates

Additions or changes to the synonym master take effect only when an *Index Rebuild* (described earlier in this chapter) is performed or when you specifically request synonym updates to be applied.

Synonym updates that have not been applied show on the W*ork With Synonyms* display with a status of "Add Pending" or "Delete Pending".

To apply pending updates select the *Request Synonym Maintenance* option nine (9) from the *"Search Set"* Master Menu (xxxxPSYMNU) created for you during the "Generation" process.

```
Psychic                  Psychic Psearch Master Menu
Psearch                     OS/400 Object Finder

 Select one of the following:

     1. Work With Special Characters
     2. Work With String Exclusion
     3. Work With Search Synonyms

     4. Psychic Psearch
     5. Special Characters Inquiry
     6. String Exclusion Inquiry

     7. Request Index Rebuild
     8. Restart Interrupted Index Rebuild
     9. Request Synonym Maintenance Application
    10. Request Demand Index Maintenance
    11. Request Automatic Index Maintenance

 Option..


 F1=Help  F3-Exit  F12=Cancel
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```

or use the SBMJOB command to run;

> CALL xxxxCL15

There are no parameters for this program. (Replace "xxxx" with the four digit prefix you assigned to this *"Search Set"* during the "Generation" process.)

This program, the rest of the objects created for this *"Search Set"* during the "Generation" process, and the occurrence of your database file they were created for must exist in the library list that will be used by the submitted job.

Demand Index Update

The demand index update enables you to have **Psychic Psearch** update your *"Search Set"* indexes for specific record keys only.

Using this facility you can have search indexes updated immediately, or "on demand" when data changes are made to the based-on file which affect the search. (If database <u>definition</u> changes are made to a file, the *"Search Set"* programs will need to be regenerated and the index rebuilt.)

Your update requests are to be loaded into the file xxxxPF12 (where xxxx is the object name prefix assigned during the generation of the *"Search Set"*). This file contains a one character transaction code field (the first field in the file) and fields created to match the key fields of the Unique File View specified during generation. Use the DSPFFD command to display or print a list of the fields and compare them to your Unique File View to determine usage.

The transaction code field, must be set to "A" for record adds, "C" for changes, or "D" for deletes.

Note: It is not necessary to process a change request every time a record in your file is updated. A change transaction <u>only</u> needs to be generated if one of the fields changed is used by the *"Search Set"* and you want that change to be reflected by the search without having to run the full Index Rebuild or Automatic Index Update process.

> *WARNING: If any of the key fields used in your Unique File View or Sequence File View is changed, you must supply both delete <u>and</u> add transactions. A "change" will <u>not</u> work.*

To execute the *Demand Index Update* and process the transactions you have placed in file xxxxPF12 you can select the *Request Demand Index Maintenance* option (10) from the *"Search Set"* Master Menu (xxxxPSYMNU)

```
Psychic                    Psychic Psearch Master Menu
Psearch                         OS/400 Object Finder

 Select one of the following:

     1. Work With Special Characters
     2. Work With String Exclusion
     3. Work With Search Synonyms

     4. Psychic Psearch
     5. Special Characters Inquiry
     6. String Exclusion Inquiry

     7. Request Index Rebuild
     8. Restart Interrupted Index Rebuild
     9. Request Synonym Maintenance Application
    10. Request Demand Index Maintenance
    11. Request Automatic Index Maintenance

 Option..



 F1=Help  F3-Exit  F12=Cancel
 (C) COPYRIGHT 320495 Alberta Ltd. 1998
```

To run the *Demand Index Update* you can also use the SBMJOB command to run:

        CALL   xxxxCL12

There are no parameters for this program. (Replace "xxxx" with the four digit prefix you specified for the *"Search Set"* during generation.)

(If the Demand Index Update seems to be taking much longer than normal to process an average number of changes you should schedule an Index Rebuild.)

Demand Index Update -Triggering Execution

If you will be using the Demand Index Update feature, (and you want to have the update triggered and run independently in a single background process rather than having multiple processes perform online calls or individual submit jobs), you can create a C/L program that will be submitted at the start of each day or automatically as a subsystem "auto-start" job.

The advantages of this method are:
- Requests to process the entries in xxxxPF12 are processed immediately without the potential delay of waiting on a job queue to run.
- All updates are processed through a single stream for improved control and logging purposes.

The following is an example of a program that waits for the arrival of an entry in a data queue. One entry type causes the program to "wake up" and run the Demand Index Update program. The other entry type requests a controlled shutdown of the program.

If you use this method your application programs would write multiple add, change or delete requests to the transaction file xxxxPF12 and then send a request to the data queue to cause the records to be processed in background without having to wait for completion of the request to move on with their next task.

```
/***         Sample Program for demand index update immediate execution. ***/
             PGM
/***         Your data queue name  and library name (replace the ? marks) ***/
             DCL      VAR(&QNAME) TYPE(*CHAR) LEN(10)  VALUE ('??????????')
             DCL      VAR(&QLIB) TYPE(*CHAR) LEN(10)  VALUE ('??????????')
/***         Your data queue length ( 1 character will work.)   ***/
             DCL      VAR(&QLEN) TYPE(*DEC) LEN(5 0) VALUE(1)
/***         Data queue variable and wait time desired ***/
             DCL      VAR(&QDATA) TYPE(*CHAR) LEN(1)
             DCL      VAR(&QWAIT) TYPE(*DEC) LEN(5 0) VALUE(-1)

/***         Start retrieving entries from the queue    ***/
LOOP:        CALL     PGM(QRCVDTAQ) PARM(&QNAME &QLIB &QLEN &QDATA &QWAIT)

/***         Now, if start up requested call Psychic Psearch ***/
             IF       COND (&QLEN *NE 0 *AND &QDATA *EQ 'G') +
                        THEN(DO)
             CALL     PGM(xxxxCL12)      /** NOTE: Replace "xxxx" with four digit prefix ***/
             GOTO     CMDLBL (LOOP)
             ENDO

/***         If shutdown requested, terminate program           ***/
             IF       COND (&QLEN *EQ 0 *OR &QDATA *EQ 'Z') +
                        THEN (DO)
             SNDMSG MSG('Psychic Psearch Update terminating immediately .') TOUSR(*SYSOPR)
             ENDDO

             ENDPGM
```

Automatic Index Update

If you selected *Automatic* as your maintenance method during generation you can have *Psychic Psearch* read your file and automatically determine what changes have occurred and perform the appropriate updates.

An image of the search fields is stored internally and compared to the current values when the update is run.

This function can be requested from the *"Search Set"* Master Menu (xxxxPSYMNU) by selecting the *Request Automatic Index Maintenance* option (11);

```
Psychic                    Psychic Psearch Master Menu
Psearch                         OS/400 Object Finder

 Select one of the following:

     1. Work With Special Characters
     2. Work With String Exclusion
     3. Work With Search Synonyms

     4. Psychic Psearch
     5. Special Characters Inquiry
     6. String Exclusion Inquiry

     7. Request Index Rebuild
     8. Restart Interrupted Index Rebuild
     9. Request Synonym Maintenance Application
    10. Request Demand Index Maintenance
    11. Request Automatic Index Maintenance

 Option..


 F1=Help  F3-Exit  F12=Cancel
 (C) COPYRIGHT 320495 Alberta Ltd. 1998
```

or by using the SBMJOB command to run;

<div align="center">CALL xxxxCL06</div>

There are no parameters.

(If the Automatic update seems to be taking much longer than normal you should schedule an Index Rebuild.)

Chapter 8 : **User's Guide**

Introduction

Psychic Psearch is a utility used to generate content search data retrieval and selection programs over files in your AS/400 database.

The generated programs allow you to search for the occurrence of multiple keywords in a data base field or combination of fields regardless of the keyword location within the field(s). (It also contains programs to automatically analyze the data in your files and generate keywords from the data. Every word, code, or combination of letters and/or numbers in the fields you want to search is automatically a keyword! No special fields to manually update or changes to your existing maintenance applications are required.)

Faster than you might believe possible, the *"Search Set"* created over your data by the *Psychic Psearch* generation process, locates those records that contain:

- All the "keywords" you specified,
- Or any defined synonym of and of the "keywords" you specified,
- In any order,
- In any of the data fields defined to be searched during generation.

Information is power. To turn data into information you have to get it from the database(s) to the people who need it - quickly, and without making them find that special product code, or customer code, or location code, etc. Think of *Psychic Psearch* as the conduit to super charge your applications and help you turn data into information.

This section provides a guide to the operation of the generated search programs. The display images shown are <u>examples</u> of a search that was generated to help technical staff locate AS/400 commands and other objects using the description when they couldn't remember the command or object name.

The search(s) you actually end up using will be similar but will have been generated over your organization's data and the panel headings and information defined at that time. You may have a Vendor Search, a Product Search, a Customer Search, an Employee Search, etc., or even multiple styles of each, all with a slightly different presentation.

A *Psychic Psearch* *"Set"* refers to a set of programs, files and other objects which have been generated based on the definitions supplied to *Psychic Psearch* as described earlier in this manual. A *"Set"* can be generated over any AS/400 database file and can be configured to search and/or display virtually any field within that file. If the search you are using isn't giving you what you need, or you think of another useful application - talk to the people who provided it to you and get a *"Search Set"* generated exactly the way you need it.

Psychic Psearch On-Line

The generated search program can be executed by selecting *Psychic Psearch* (Option 4) from the generated master menu xxxxPSYMNU,

```
Psychic                    Psychic Psearch Master Menu
Psearch                       OS/400 Object Finder

 Select one of the following:

      1. Work With Special Characters
      2. Work With String Exclusion
      3. Work With Search Synonyms

      4. Psychic Psearch
      5. Special Characters Inquiry
      6. String Exclusion Inquiry

      7. Request Index Rebuild
      8. Restart Interrupted Index Rebuild
      9. Request Synonym Maintenance Application
     10. Request Demand Index Maintenance
     11. Request Automatic Index Maintenance

 Option..



 F1=Help  F3-Exit  F12=Cancel
 (C) COPYRIGHT 320495 Alberta Ltd. 1998
```

or by calling the program xxxxCL17 (where xxxx is the object naming prefix specified during generation). This program has one optional pararmeter, the **Control Keyword (20A)**. For details on the use of this parameter refer to Chapter 9: Integrations under "Processing Online Selections". The library where the generated *"Search Set"* objects reside and the file(s) being accessed should be present in your library list.

When you call the generated *Psychic Psearch* program from within your application or from a command line you can use the built in API (Application Program Interface) capabilities to dynamically customize the search display. Without having to regenerate or recompile anything, you can add options to the primary search panel to enable your *"Search Set"* to call other programs and pass the key of the user selected record to them.

You can also have your *"Search Set"* enable the user to select one or more of the records which match a search and pass the key(s) of the record(s) back to a calling program. For example, from your Order Entry application you call your *"Search Set"* to assist the user in locating products. When the desired product is found, the user selects it on the search panel and it is automatically fed back to the Order Entry program!

This kind of integration is both powerful and easy. *The required parameter list and more information about using* **Psychic Psearch** *with your applications is supplied later on in this document in the section: Application Integration.*

When you execute the search program, from the menu or by calling the generated program directly, a display similar to the following example will appear. (Field values, headings, and panel description will reflect the definition supplied for generation.)

```
  Psychic                     Psychic Psearch
  Psearch                     OS/400 Object Finder

 Search for.....   _____   F4

 String Scan....
 Generic Search.

 Type options, press Enter.                        Matching Items Found
    1=Select          2=UserOpt1     3=UserOpt2     4=UserOpt3    5=UserOpt4

      Object
 Opt  Name       Object Description




 F1=Help F3=Exit F4=Prompt F5=Refresh  F9=Retrieve  F10=Extend Srch  F12=Cancel
 F16=Next Generic F17=Prev Generic              F22=Print All  F23=Cmd Line
```

> **Note:**   The parameters passed when calling the program determine the headings for UserOpt1, UserOpt2, etc. and the associated custom programs to be called. Another parameter tells the search program whether to allow multiple selections from the retrieved list of matches or single selection only.
>
> **If an error appears** at the bottom of your display indicating the *Psychic Psearch* is not available use F3 to exit and try again later after the rebuild or update job is complete.

On the **"Search for..."** line, input one or more "words" separated by a blank space. You can specify as many words as will fit on the 60 character input line. Valid values are any combination of characters that exist in the keyword or synonym master for this *"Search Set"*.

When you press enter the *Psychic Psearch* *"search engine"* will quickly locate and display for you records in the based-on file containing **all** of the valid values input, or any predefined synonyms of those values, in any order within the record. Just above the list headings on the right side of the display will be shown the number of matches found.

As mentioned in the introduction to this section, we will be using an underline example application that enables us to find OS/400 Commands using the description of the command rather than the short command name itself. *Psychic Psearch* customers more often will use the product to search for products by their description when they don't know the inventory or manufacturer's code, or customers and vendors by name when they don't know the account number. Keep these uses in mind when you are looking at the examples that follow.

Example: A search program has been created over a master file of AS/400 commands. On the "Search for..." line we input "CHANGE". When the enter key is pressed the *Psychic Psearch* displays the records in this file which contain the word "CHANGE".

```
 Psychic                      Psychic Psearch
 Psearch                      OS/400 Object Finder

 Search for..... CHANGE                                                   F4
                 CHANGE
 String Scan....
 Generic Search.

 Type options, press Enter.                    220 Matching Items Found
      1=Select             2=UserOpt1    3=UserOpt2    4=UserOpt3    5=UserOpt4

      Object
 Opt  Name       Object Description
      CD         Change Current Directory
      CHDIR      Change Current Directory
      CHGACGCDE  Change Accounting Code
      CHGACTPRFL Change Active Profile List
      CHGACTSCDE Change Activation Scd Entry
      CHGAJE     Change Autostart Job Entry
      CHGALRACNE Change Alert Action Entry
      CHGALRD    Change Alert Description
      CHGALRSLTE Change Alert Selection Entry
      CHGALRTBL  Change Alert Table                              More...

 F1=Help F3=Exit F4=Prompt F5=Refresh  F9=Retrieve  F10=Extend Srch  F12=Cancel
 F16=Next Generic F17=Prev Generic                  F22=Print All  F23=Cmd Line
```

The search result information counter, located on the right side just above the options line, indicates there are two hundred and twenty (220) commands which contain the word "CHANGE" in the Object Description. With only ten (10) lines showing on each page, in a traditional list display we would potentially have to scroll through twenty-two (22) pages of data to locate the entry we are interested in! With your *Psychic Psearch* you don't have to endure this annoying waste of your time any more….

We simply press **"F10" to "Extend the Search"** and key another word and have the computer refine the list for us. In this case we key "ENTRY" because the command we are looking for has something to do with changing and entry. The resulting display looks like the one on the following page.

Exclusion Search
A feature not shown in this example is **exclusion search**. The *Psychic Psearch* background, batch and online modules have the ability to search for words to be excluded as well as the previous includes capability. All features of the included words, (such as synonyms), apply equally to excluded words, with the exception of generic search and string scan which will not allow exclusion to be specified.

To specify a word for exclusion, place a "<" immediately before and a ">" immediately after the word in the search string. Note that when the *Work With Search Keywords/Synonyms* panel is used to select words for search that you can specify exclusion or inclusion at selection time.

```
Psychic                        Psychic Psearch
 Psearch                       OS/400 Object Finder

 Search for..... CHANGE ENTRY                                          F4
                 CHANGE ENTRY
 String Scan....
 Generic Search.

 Type options, press Enter.                    26 Matching Items Found
      1=Select             2=UserOpt1    3=UserOpt2    4=UserOpt3    5=UserOpt4

      Object
 Opt  Name        Object Description
      CHGACTSCDE Change Activation Scd Entry
      CHGAJE     Change Autostart Job Entry
      CHGALRACNE Change Alert Action Entry
      CHGALRSLTE Change Alert Selection Entry
      CHGAUTLE   Change Auth List Entry
      CHGCMNE    Change Communications Entry
      CHGCNNLE   Change Connection List Entry
      CHGDIRE    Change Directory Entry
      CHGEMLCFGE Change Configuration Entry
      CHGEWCBCDE Change EWC Barcode Entry                     More...

 F1=Help F3=Exit F4=Prompt F5=Refresh  F9=Retrieve  F10=Extend Srch  F12=Cancel
 F16=Next Generic F17=Prev Generic               F22=Print All  F23=Cmd Line
```

You'll notice the "Matching Items Found" has dropped from 220 to 26. We can refine the list even further by pressing "F10" again and keying "JOB". We are only interested in commands about changing job entries. The result?

```
 Psychic                        Psychic Psearch
 Psearch                        OS/400 Object Finder

 Search for..... CHANGE ENTRY JOB                                       F4
                 CHANGE ENTRY JOB
 String Scan....
 Generic Search.
 Type options, press Enter.                     5 Matching Items Found
         1=Select            2=UserOpt1   3=UserOpt2   4=UserOpt3   5=UserOpt4

      Object
 Opt  Name        Object Description
      CHGAJE     Change Autostart Job Entry
      CHGJOBQE   Change Job Queue Entry
      CHGJOBSCDE Change Job Schedule Entry
      CHGNETJOBE Change Network Job Entry
      CHGPJE     Change Prestart Job Entry                    Bottom




 F1=Help F3=Exit F4=Prompt F5=Refresh  F9=Retrieve  F10=Extend Srch  F12=Cancel
 F16=Next Generic F17=Prev Generic               F22=Print All  F23=Cmd Line
```

The five (5) records, out of more than 1500 in the data file that contain the three words we are looking for are **instantly** displayed. You'll note that the words we searched for don't have to be in the same order as in the database and can have other words in between. (Response times of one to two seconds are typical even when there are tens of thousands of records being searched!)

If you don't have *Psychic Psearch,* your alternative would be to try finding these records using traditional methods of,

➢ Position to and scroll, scroll, scroll
➢ Navigating predefined structured menus or categories
➢ An SQL query that grinds through every record in the file using the "LIKE" function
➢ Memorizing all the data so you can supply the computer with the unique code it wants

These methods could (and do) take a long time since the values we are looking for in the description, comments, names and other text fields are embedded in the data field(s). SQL, (Structured Query Language), is often touted as the generic solution to all data access needs. Unfortunately, when it comes to text search, it is similar in elegance to strip mining and requires that every request read every single record in the file and, one by one select or omit the record based on the criteria. On a multi-user system this leads to a condition we call "thrashing" and can result in a single user's request chewing up a huge chunk of system resources and slowing things down for everyone.

Psychic Psearch is a smart and elegant data retrieval solution designed specifically for this type of database file text field content search on the IBM AS/400. **Your generated *Psychic Psearch* Set will find the matching records in seconds (or less).**

In addition to being fast and smart, *Psychic Psearch* can also be flexible and helpful. As part of the configuration of each *"Search Set"* you can,

➢ Define synonyms to compensate for <u>misteaks</u> in data entry or multiple terms or short forms to describe the same thing
➢ Specify how the *"Search Set"* should deal with special characters like %, $, *, etc.

For more information on these and other capabilities, refer to the ***Data Interpretation*** section earlier in this document.

On-line Processing Options for matching records

Once a list of matching records is found the user can refine the list by altering the keywords specified or simply roll through the list until the desired record is located. (Note: A maximum of 2,000 records will be presented on-line. If you really want to be able to roll through more than this number use the "Background/Batch" search method, described later in this document in the *Application Integration* section, and your own custom program to display the retrieved records.)

When the selection character "1" (one) is keyed beside the record(s) of interest, the *"Search Set"* on-line program will return the unique key(s) associated with the record(s) back to your calling program for processing. **For example**,

> An Inventory Inquiry program normally requires you enter a unique identifier so the computer knows what item or part you want to see. This identifier is often called an Item Number, SKU, Part Number, Product Code, or something similar. Your application could be set up to allow you to call up your "Inventory Master Search" when you don't know the computer code, (like just about always). You would find what you are looking for quickly and easily based on the description of what it is (novel concept), and then have your "Inventory Master Search" tell the Inventory Inquiry program what the code is (you know, program to program).

If you are in **single selection mode** you will only be allowed to key a "1" beside a single record. (You can key options 2 through 5, if present, beside as many as you like. The availability of these options is determined by how the *Psychic Psearch* function is called. Refer to the *Application Integration* section for more information.)

If you are in **multiple selection mode** your selections will not be returned to the calling program until you press enter and there are no other outstanding requests. (i.e. None of the Search Fields have changed and no options 2 through 5 request pending.)

Multiple Selection mode allows you to key a search request and select multiple records by keying a "1" beside them. If you change your search criteria before pressing the enter key, you can select <u>additional</u> records. You can repeat this search/select process as many times as you want – *Psychic Psearch* **will remember <u>all</u> your selections.**

Using Generic Search

If you only know the <u>*starting characters*</u> of a keyword but not the full correct value, you can input the starting characters of that keyword on the *Generic Search* input line of your *"Search Set"*.

Psychic Psearch – Search Engine for the IBM AS/400™

```
Psychic                     Psychic Psearch
Psearch                     OS/400 Object Finder

 Search for....._____F4

 String Scan....
 Generic Search.. DES_____    Current Keyword... DESC

 Type options, press Enter.                  90 Matching Items Found
           1=Select      2=UserOpt1    3=UserOpt2    4=UserOpt3    5=UserOpt4
      Object
 Opt  Name        Object Description
      CHGCOSD     Change Class-of-Service Desc
      CHGCTLAPPC  Change Ctl Desc (APPC)
      CHGCTLASC   Change Ctl Desc (Async)
      CHGCTLBSC   Change Ctl Desc (BSC)
      CHGCTLFNC   Change Ctl Desc (Finance)
      CHGCTLHOST  Change Ctl Desc (SNA Host)
      CHGCTLLWS   Change Ctl Desc (Local WS)
      CHGCTLNET   Change Ctl Desc (Network)
      CHGCTLRTL   Change Ctl Desc (Retail)
      CHGCTLRWS   Change Ctl Desc (Remote WS)                    More...

 F1=Help F3=Exit F4=Prompt F5=Refresh  F9=Retrieve  F10=Extend Srch  F12=Cancel
 F16=Next Generic F17=Prev Generic                  F22=Print All  F23=Cmd Line
```

When a value is input for *Generic Search* the program locates the first keyword match ("Current Keyword") and then combines it with any keywords specifically referenced on the "Search for..." line. The resulting records (if any) are displayed along with the "Current Keyword" which matched the generic request. In the above example, "DES" is input and "DESC" is the first keyword that matches this request.

The user can select from the list of records shown, input new search criterion, or use the command keys **F16** and **F17** to request the next or previous keyword that matches the generic request being displayed. In our example, when F16 is pressed "DESCRIPTION" is the next keyword that matches our generic (keyword starts with "DES") search.

```
Psychic                     Psychic Psearch
Psearch                     OS/400 Object Finder

 Search for.....  _____F4

 String Scan....
 Generic Search. DES_____    Current Keyword... DESCRIPTION

 Type options, press Enter.                  53 Matching Items Found
           1=Select      2=UserOpt1    3=UserOpt2    4=UserOpt3    5=UserOpt4

      Object
 Opt  Name        Object Description
      ADDALRD     Add Alert Description
      ADDMSGD     Add Message Description
      CHGALRD     Change Alert Description
      CHGCRQD     Change CRQ Description
      CHGDOCD     Change Document Description
      CHGIPXD     Change IPX Description
      CHGJOBD     Change Job Description
      CHGMODD     Change Mode Description
      CHGMSGD     Change Message Description
      CHGNTBD     Change NetBIOS Description                     More...

 F1=Help F3=Exit F4=Prompt F5=Refresh  F9=Retrieve  F10=Extend Srch  F12=Cancel
 F16=Next Generic F17=Prev Generic                  F22=Print All  F23=Cmd Line
```

If we were to press the **F17 (Previous Generic)** function key at this point we would be returned to the previous panel where "DESC" was the current keyword. If we input "NETWORK" on the *Search for* line and press F17 the result of the search will be only those records that contain both the "Current Keyword" from the *Generic Search* ("DESC") and the valid keyword(s) we input on the *Search for* line ("NETWORK"). The display would look like this;

```
Psychic                    Psychic Psearch
Psearch                    OS/400 Object Finder

 Search for..... NETWORK                                              F4
                 NETWORK
 String Scan....
 Generic Search. DESC             Current Keyword... DESC

 Type options, press Enter.                    14 Matching Items Found
            1=Select       2=UserOpt1    3=UserOpt2    4=UserOpt3    5=UserOpt4
      Object
 Opt  Name       Object Description
      CHGCTLNET  Change Ctl Desc (Network)
      CHGDEVNET  Change Device Desc (Network)
      CHGLINNET  Change Line Desc (Network)
      CHGNWIISDN Change Network Interface Desc
      CHGNWSD    Change Network Server Desc
      CRTCTLNET  Create Ctl Desc (Network)
      CRTDEVNET  Create Device Desc (Network)
      CRTLINNET  Create Line Desc (Network)
      CRTNWIISDN Create Network Interface Desc
      CRTNWSD    Create Network Server Desc                         More...

 F1=Help F3=Exit F4=Prompt F5=Refresh  F9=Retrieve  F10=Extend Srch  F12=Cancel
 F16=Next Generic F17=Prev Generic               F22=Print All  F23=Cmd Line
```

> *Note:* In this example, if "DESC" and "DESCRIPTION" had been set up as synonyms, (which they probably should be), either keyword would have returned the cumulative set of matches from both. For more information, refer to the section "Search Synonyms" in the "Data Interpretation" chapter of this document.

If the **F16** (Next Generic) function key were now pressed again, the "Current Keyword" would change back to "DESCRIPTION" and be combined with the keyword "NETWORK" which we input on the *Search for* line to display all the records containing these two values. (In this case there were none.)

String Scanning

After you have used the *Search for...* and/or *Generic Search* to narrow down the records you are looking for, you can use the *String Scan* input field to search for the occurrence of a string of characters embedded within a keyword of one or more of the selected records. This is helpful when there is significant data which appears as part of multiple keywords and not as a keyword in it's own right (*Search for)* or as the starting characters of a keyword *(Generic Search).*

When a String Scan is input, your *"Search Set"* will eliminate from the display all the records that do not contain the characters specified.

Psychic Psearch – Search Engine for the IBM AS/400™

In the previous example we used a combination of the *Search for* and *Generic Search* fields to locate all records containing both the words "DESC" and "NETWORK" or synonyms of these words. (There were fourteen (14) of them.)

Now we want to narrow the list further by requesting only those records which contain the characters "NWI" because we remember the command we are after contained those characters. To do this we input "NWI" on the *String Scan* line and press the enter key.

```
Psychic                       Psychic Psearch
Psearch                       OS/400 Object Finder

 Search for..... NETWORK                                              F4
                 NETWORK

 String Scan.... NWI
 Generic Search. DESC              Current Keyword... DESC

 Type options, press Enter.                    4 Matching Items Found
      1=Select        2=UserOpt1      3=UserOpt2      4=UserOpt3      5=UserOpt4

      Object
 Opt  Name         Object Description
      CHGNWIISDN   Change Network Interface Desc
      CRTNWIISDN   Create Network Interface Desc
      DLTNWID      Delete Network Interface Desc
      DSPNWID      Display Network Interface Desc                      Bottom




 F1=Help F3=Exit F4=Prompt F5=Refresh  F9=Retrieve  F10=Extend Srch  F12=Cancel
 F16=Next Generic F17=Prev Generic                  F22=Print All  F23=Cmd Line
```

When we press enter *Psychic Psearch* scans the previously loaded records and redisplays the list including only those records containing "NWI" as we have asked. String scanning can be useful when important information such as a product size or other attribute is embedded in some kind of descriptor.

A common example of where this capability might be important is with automobile tires. Typically, the tire size looks something like P185/70R14. The "P" means passenger-car or light-truck tire. The next three digits tell you how wide the tire is in millimeters. The two digits after the slash are the "aspect ratio" - the ratio of the height of the sidewall to the tire width. (Here the sidewall height is 70 percent of the width, or about 130mm.) The "R" simply means radial ply and the two digits at the end are the diameter of the wheel in inches.

What if you were shopping for new tires on the Internet and you wanted to search an inventory file of a major auto-parts distributor/retailer and find all the available tires for a 14 inch wheel? They have thousands of products. Where do you start? If they have set up their Web site to use *Psychic Psearch* to help customers like you find products then it's easy… You input "TIRE" or "TIRES" on the *Search for* line (they would have made these synonyms so they would both return the same results) along with any manufacturer preference (or not) and "R14" on the *String Scan* line. **Presto!** Exactly what you want without having to navigate through any annoying predetermined path. **You are so pleased you order the tires and bookmark the site**.

That's the power of *Psychic Psearch*.

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Keyword Help

If you are unsure what keyword(s) to input on the *Search* for line, a list of valid values is available. This list is accessed by pressing the **F4** function key. In our OS/400 Object Finder example a screen similar to the following appears;

```
Psychic              Work With Search Keywords/Synonyms
Psearch                       OS/400 Object Finder

 Suggest Synonyms for.............
 OR Position to Keyword/Synonym...

 Type options, press Enter.
   1=Select  2=Select for EXCLUDE  5=Display  6=Print

                                 Associated Keyword
 Opt     Keyword                 If Synonym
         ABNORMAL
         ACCESS
         ACCOUNTING
         ACTION
         ACTIVATION
         ACTIVE
         ACTIVITY
         ADAPTER
         ADAPTERS
         ADD
         ADDACC                                          More...

 F1=Help  F3=Exit  F5=Refresh  F12=Cancel  F21=Print  F23=Command Line
```

From this display you can locate and select the appropriate keyword(s) to be used in the current search. If keywords were input in the *Search for* field on the previous screen before pressing F4, any selections made here are <u>added</u> to those already input. If more keywords are selected than will fit on the *Search for* input line, the excess fields are dropped.

In addition to being able to select keywords to return to the search program you can input the option number "5" beside a keyword to display records containing that specific keyword, or option "6" to print all the records where that specific keyword occurs.

Display Keyword Occurrences

When option "5" is selected from *Work With Search Keywords* a display similar to the following will appear. The format of the display will be the same as the main *"Search Set"* panel generated except there are no options. This panel shows all the records containing the one keyword or synonyms of that keyword.

```
Psychic                 Display Keyword Occurrence Details
Psearch                      OS/400 Object Finder

 Keyword............:  TCP

 Occurrences........:      50

     Object
     Name       Object Description
     ADDTCPHTE  Add TCP/IP Host Table Entry
     ADDTCPIFC  Add TCP/IP Interface
     ADDTCPLNK  Add TCP/IP Link
     ADDTCPPORT Add TCP/IP Port Restriction
     ADDTCPRSI  Add TCP/IP Remote System
     ADDTCPRTE  Add TCP/IP Route
     CFGTCP     Configure TCP/IP
     CFGTCPAPP  Configure TCP/IP Applications
     CFGTCPFTP  Configure TCP/IP FTP
     CFGTCPHTTP Configure TCP/IP HTTP
     CFGTCPLPD  Configure TCP/IP LPD
     CFGTCPSMTP Configure TCP/IP SMTP                         More...


 F1=Help  F5=Refresh  F12=Cancel
```

Keyword Reporting

You can also request a report listing a range of keywords or a range of keywords and their data base occurrences, by pressing **F21** on the *Work With Search Keywords/Synonyms* display. When you press F21 you will see;

```
Psychic                   Request Multiple Keywords Report
Psearch                        OS/400 Object Finder



 Type choices, press Enter.


    Print From Keyword.........


    Print To Keyword............  99999999999999999999


    Print Detail Desired........  1   1=Keywords report only
                                      2=Keywords and matching records




 F1=Help  F12=Cancel
```

Enter the alphanumeric range of keywords you want included on the report and the type of report you want produced.

The default "Print To Keyword" of 99999… is the highest order keyword possible. If you specify a "Print From Keyword" and leave the default for the "Print To Keyword" the report will list all keywords starting at your "from" and listing alphanumerically to the end of the file.

Option "1" prints a listing of the keywords only. Option "2" prints a list of the keywords and a detail line for **every record** that contains that keyword. Use caution when selecting option "2" – you could end up with a very, very large report.

Disable Printing Capability

Some print functions could result in a very large number of pages being produced. If desired, the "F22=Print All" function on the primary search panel, and the "F21=Print" function and option "6=Print" on the *Work With Search Keywords/Synonyms* panel can be disabled. To disable printing change the value of the data area xxxxDA05 (where xxxx is the prefix used in the associated *"Search Set"* generation) to the value "@".

Chapter 9 : **INTEGRATION**

Processing On-Line Selections

On-Line Selection Parameter List

Program Name:	xxxxCL17 (where "xxxx" is the four digit prefix as generated)
Multiple Select Mode	1A (Y,N,I)
Unique Key Data Field	(Total Length of buffer sizes of Unique Keys)
Data Queue Name	10A
Option 2 Heading	10A
Option 2 Program	10A
Option 3 Heading	10A
Option 3 Program	10A
Option 4 Heading	10A
Option 4 Program	10A
Option 5 Heading	10A
Option 5 Program	10A
Control Keyword	20A

The **Multiple Select Mode** parameter controls how the *"Search Set"* will function. (The following pages provide more details.)

> Y=Multiple Selection Mode
> N=Single Selection Mode
> I=Inquiry Only Mode (no selections allowed)

The **Unique Key Data Field** and **Data Queue Name** parameters are used to pass information back to your program. Any value in these parameters when the program is called will be ignored. The length of this field must be equal to the combined buffer length of your Unique File View Key Fields.

The **Option Heading** and **Option Program** parameters are optional. If either of these parameters are blank the corresponding option will not be available for use. If values are supplied when the program is called, the option will be available and the program specified will be called if that option number is used. The parameters passed to these sub-programs are:

1. Unique Key Data Field   Length = Total buffer length of "Unique File View" key fields
2. Option Heading   Length = 10A

The *"Search Set"* on-line selection program, that is automatically generated for you, can be called in either <u>single or multiple selection mode</u>.

The **Control Keyword** parameter is an optional parameter that provides the ability to subset a database. The Control Keyword is added **internally** to the search request and only the database records within the subset identified will be returned. Note that the user of *Psychic Psearch* will not see the Control Keyword on their screen at any time.

A typical use of this facility would be to support multiple companies within an enterprise database without having to create separate searches for each company. A unique identifier is created in the database for each company. After the end user selects a company to work in (usually at sign-on) they application system then knows to add the Control Keyword for that company to all calls to the *Psychic Psearch*.

Single Selection Mode

When called in single selection mode the program passes information back to the caller or on to the custom sub-programs through a standard parameter list. The option "1" to select is processed last as the program ends to return the parameters related to the selected record back to the calling program.

If the user selects more than one record with the option "1" an error will be issued. (Options 2 through 5 if present may be selected multiple times.)

Your custom sub-programs can use the Option Heading value to determine what action to take. This enables you to use the same *"Search Set"* for different purposes with the action to be taken determined by the heading used on the display.

Option "1" passes the unique key associated with the selected entry back to the calling program in the *Unique Key Data Field* of the **On-Line Selection Parameter List** described on the previous page.

Multiple Selection Mode

When the *"Search Set"* is called in multiple selection mode, records selected by using option "1" are loaded to a data queue in the library "QTEMP". The data queues are created using the four digit prefix specified during generation.

The receiving program, (caller) receives the name of the data queue as part of the parameter list. See **On-Line Selection Parameter List** described on the previous page.

Note: Option 2 through 5, if present, will be handled the same as in Single Select Mode.

Records in the data queue are structured as follows;

1. Unique Key Data Field   Length = Total buffer length of Unique File View Key Fields

The program receiving the list of selected records can then process them.

NOTE: A new data queue is created in QTEMP for each set of selections. When you are finished reading the entries you should delete the data queue.

The following is an example of an RPG program which will receive the unique keys passed through the data queue and dump them to a printer file. In this example the data file being searched has a Unique Key total length of seven (7).

```
FREPORT  O   F    132     OA      PRINTER
I           DS
I                                  1   30CLASS
I                                  4   70NUMBR
I                                  1   7 #DATA2
C           *ENTRY    PLIST
C                     PARM          #QNM2 10      Data Queue Name
C*
C                     MOVEL'QTEMP'  #QLB2 10      Queue Library
C                     Z-ADD7        #QLN2  50     Queue Length
C*
C           #QLN2     DOUEQ*ZEROS
C                     MOVE *ZEROS   #QQWT  50     Wait Time
C                     CALL 'QRCVDTAQ'
C                     PARM          #QNM2
C                     PARM          #QLB2
C                     PARM          #QLN2
C                     PARM          #DATA2 7      Unique Key
C                     PARM          #QQWT
C*
C           #QLN2     IFNE *ZEROS
C                     EXCPTLINE
C                     ENDIF
C*
C                     ENDDO
C*
C                     MOVE *ON      *INLR
C                     RETRN
OREPORT  E 11              LINE
O                          CLASS     10
O                          NUMBR     15
```

Using Psychic Psearch in Background Mode

Standard Keyword Search Mode

An interface to the same powerful search engine you use in the on-line program generated for each *"Search Set"* is available for use by your own on-line programs in a background mode. To use this facility, simply **call the program xxxxCL22**, (where xxxx is the four digit prefix specified during generation), with the following parameter list;

Cycle Code	Length = 1A
Page Size	2A
Search String	60A
Generic Keyword	20A
Use as Generic	1A
Number of Matches	7A
Data Queue Name	10A
Error	1A

In the *Cycle Code* parameter you should pass in one of the following codes:

> 1=New Search/First page,
> 2=Next page,
> 3=Terminate Program.

This parameter allows you to control the searching process from your on-line program. Use *Cycle Code* "1" when the user requests a new search. Use *Cycle Code* "2" for the "ROLL-UP" function. (The "ROLL-DOWN" or "BACK" function must be managed by your program.) When you exit your on-line program, use *Cycle Code* "3 to terminate the search. This will ensure files are closed and resources are properly released.

> **WARNING:** If the *Cycle Code* parameter does not contain a valid value, a full "batch" type search and load of all matching records (regardless of the "Page Size" parameter) will be performed before the program returns.

In the *Page Size* parameter you should pass in the maximum number of records that you want returned in this cycle pass. This will usually be the same value as specified in the "SFLPAG" keyword on your display file DDS – referred to a "page at a time" processing. This will result in the fastest response time. For each request the search module will return the number of record keys indicated by this parameter.

In the *Search String* parameter you should pass in the keywords, separated by blanks, that you want used to perform the search.

The *Generic Keyword* parameter can be used as an extra space for a regular search keyword or as a generic. If a value of "N" is passed in the *Use as Generic* parameter the Generic Keyword is treated as an extension of the Search String. If a value of "Y" is passed in the *Use as Generic* parameter the module search executes multiple cycles combining each keyword which matches

the generic value with the Search String. If this technique is used, records returned may not be in order and may contain duplicates.

The *Number of Matches* and *Reserved* parameters are used to pass information back to your program. Any value present in these parameters when the program is called will be blanked.

If the *Data Queue Name* parameter is blank when the program is called a new data queue (with the "xxxx" prefix) will be automatically created and the name passed back to your program in this parameter.

If the *Data Queue Name* parameter is **not** blank when the program is called, the program will attempt to delete the data queue in QTEMP with the name supplied (if one exists) and then re-create it.

The *Data Queue Name* **must** be supplied with *Cycle Code "2"* or you will receive an error.

If the *Data Queue Name* is supplied with *Cycle Code "3"* the data queue will be deleted from QTEMP (if it exists) as part of the clean up process.

The *Psychic Psearch* interface program (xxxxCL22) will find the matching records and return them to you in the data queue. Records in the data queue have only one field, the "Unique Key" of the "Unique View" specified during generation. The length of the data will be the total <u>buffer</u> length of the key field(s) defined in that file.

If an error occurs during the processing of your request, (rebuild in process, etc.), a value of "Y" will be returned in the *Error* parameter.

String Scan Mode

An alternate interface is available that is identical to xxxxCL22 with the exception of one additional parameter, and the functionality that comes with it. (The "**String Scan"** parameter will now be accepted in the list of parameters immediately AFTER the "Use as Generic" parameter and BEFORE the "Number of Matches" parameter.) To use this facility, simply **all the program xxxxCL23**, (where xxxx is the four digit prefix specified during generation), with the following parameter list shown below.

The String Scan will be applied as records are retrieved and returned page by page. (Refer to "String Scanning" in Chapter 8: User's Guide under "Psychic Psearch Online" for a description of how this function affects returned records.) **NOTE:** The Number of Matches returned by this module is BEFORE the application of the String Scan operation.

Cycle Code	Length = 1A
Page Size	2A
Search String	60A
Generic Keyword	20A
Use as Generic	1A
String Scan	**14A**
Number of Matches	7A
Data Queue Name	10A
Error	1A

Using Keyword Help In your On-line Programs

An interface to the same keyword help facility that you can access by pressing F4 from the *Psychic Psearch Online* program created during the generation process to prompt the "Search for..." field, is available for use in your own programs. When called this routine will display a list of keywords for the user to choose from.

You will probably want to use this routine in conjunction with *Using Psychic Psearch in Background Mode*. (Refer to the section by this name earlier in this document for more details.) Refer to Keyword Help in the User Guide section of this manual for information on using the help facility. To integrate the keyword help facility, call the program xxxxRP13 with the following parameter list;

Parameter Description	Length	Value
Select Mode	1A	(Y,N)
Keyword Selection 1	20A	
Keyword Selection 2	20A	
Keyword Selection 3	20A	
Keyword Selection 4	20A	
Keyword Selection 5	20A	
Keyword Selection 6	20A	
Keyword Selection 7	20A	
Suggest Synonyms For Keyword	20A	
Position to Keyword Synonyms	20A	
Allow "Select for Exclusion"	1A	(Y,N)

The *Select Mode* parameter controls how the keyword help selection option will function. **Y**=Multiple Selection Mode, **N**=Single Selection Mode. (Note: Multiple selection mode in this program is restricted to passing 7 selected keywords back to your program.)

The *Keyword Selection* parameters (1-7) are used to pass back to your program the keyword(s) selected by the user.

The *Suggest Synonyms for Keyword* parameter will cause the program to subset the keyword list prior to displaying the panel. If the user changes this value the parameter will be updated.

The *Position to Keyward/Synonym* parameter will cause the program to position the keyword list prior to displaying the panel. On return it will contain the first selection made (to enable reposition on the next cycle), unless a "Suggest Synonyms For" was requested, in which case it will be blank. If the user changes this value the parameter will be updated.

The *Allow "Select for Exclusion"* parameter if set to a value of "Y" will allow the user to use option "2" on the *Work With Keywords/Synonyms* display. Keying this option beside a keyword will place the keyword into the next available *Keyword Selection Parameter (1-7)* with a prefix of "<" and a suffix of ">" to indicate an exclusion request.

Using Psychic Psearch in Batch

An interface to the same powerful search routines you use on-line is also available for use by batch processes. To use this facility simply call the program xxxxCL20 (where xxxx is the four digit prefix specified during generation) with the following parameter list;

Search String	60A
Generic Keyword	20A
Use as Generic	1A
String Scan	14A
Number of Matches	7A
Data Queue Name	10A
Error	1A

In the *Search String* parameter you should pass in the keywords, separated by blanks, that you want used to perform the search.

The *Generic Keyword* parameter can be used as an extra space for a regular search keyword or as a generic. If a value of "N" is passed in the *Use as Generic* parameter the Generic Keyword is treated as an extension of the Search String. If a value of "Y" is passed in the *Use as Generic* parameter the batch search executes multiple cycles combining each keyword which matches the generic value with the Search String. When this technique is used, records returned may not be in order and may contain duplicates.

The *String Scan* parameter can be used in batch the same way it is used on-line. After records are selected those which do not contain the string specified, if any, are discarded.

The *Number of Matches* and *Data Queue Name* parameters are used to pass information back to your program. Any value present in these parameters or the *Reserved* parameter when the batch search program is called will be blanked.

This *Psychic Psearch* interface program (xxxxCL20) will find the matching records and return them to you in a data queue. The data queue is created in library QTEMP and the name is passed back to your program in the *Data Queue Name* parameter. Records in the data queue have only one field, the "Unique Key" of the "Unique View" specified during generation. The length of the data will be the total <u>buffer</u> length of the key field(s) defined in that file.

> **NOTE:** A new data queue is created in QTEMP for each set of selections. When you are finished reading the entries you should delete the data queue.

If an error occurs during the processing of your request, (rebuild in process, etc.), a value of "Y" will be returned in the *Error* parameter.

This routine has many valuable uses. Anywhere you want to do mass search and select on a data base where the number of records would be too large for on-line processing you should consider using this powerful feature. By setting up your own front end processors you can give users flexible reporting or record retrieval options in a fraction of the development time that run in a fraction of the normal processing time.

Users wanting to transfer records from your mainframe or file server to their Personal Computer based on flexible content selection rules can start receiving that data almost instantly. Your custom program simply reads the keys from the data queue and prepares a work file with the fields the user needs.

For example, you have a database file of customers with a sequence by customer number and you want to be able to transfer to the PC a file of all customers with a certain city. In another case you want certain street names. For the city you could create a new logical file (if the city was an independent field), (or use OPNQRYF and read the whole database), but what do you do for street names when they are in the middle of a field?

With *Psychic Psearch* you pass in your request and it starts sending back results in seconds. If you want this city or that or another you just send in one request after another. Because the programs use minimal overhead you can make as many requests as you need. Even with the street name embedded in a data field you'll get your order fast.

WARNING: This interface is appropriate when you want **all records** that match your request to be located and returned as one big block. If you use this for single threaded online processes the response time experienced by the user will be degraded and the system resources used for each request will increase significantly. For online processes we recommend "Using Psychic Psearch in Background Mode" described previously in this chapter, or use the online program generated for you and refer to "Processing Online Selections" at the beginning of this chapter for integration instructions.

Search Field Parsing and Data Validation

This API provides direct access to the *Psychic Psearch* routines that parse and analyze the data in the field(s) that were identified as a "Search Field" or as "Both" (search and display) during the generation process.

This capability can be used to evaluate new records <u>before</u> they are added to your file so you can determine if the addition of the record will result in the creation of new keywords. The string your program passes in to this API will be reviewed and matched to this *"Search Set"* database of known keywords. The program will return a list of <u>new</u> keywords that are not known. This list of keywords is passed through the data queue you identify using the parameter provided.

Some of the common uses of this function include:

- Notification to the user of the new keywords that will be created and request confirmation. (If used in conjunction with the keyword help API can allow the user to browse for, and select, an alternate keyword that already exists.)
- The associated maintenance program can be set up to require authorization by a specific user, or user in a certain group, to add new keywords.

Proactive use of this function can reduce the need for ongoing synonym or database maintenance to correct mistakes and improve the accessibility of your data through standardization of your descriptive terms.

To use this facility, call the program "xxxxRP36" (where "xxxx" is the four digit prefix assigned to the *"Search Set"* during generation) with the following parameters:

Description	Length
Cycle Code	1A
Data Queue Name	10A
Search String	Calculated

> *Search String parameter length must be the same as the total buffer length of the searchable fields as shown under the "Search Field Details" section of the "Generation Request Listing." An example of this report can be found in the "Generation" chapter under the heading "Generation Reporting.")

The *Cycle Code* parameter should be blank for normal processing or set to a value of "3" to delete the data queue, close the files and end the program.

The *Data Queue Name* parameter should contain the name of a data queue you have created, (preferably in QTEMP), that will be used to pass back the list of new keywords to you. The data queue should be long enough to contain the longest possible keyword that a user could try to create.

The *Search String* parameter should contain the data that would be loaded to the searchable fields.

Chapter 10 : **Appendix A**

The following codes are valid for use with numeric fields on the Panel/Report Formatting generation screen.

		"CR"	**Minus**	**Minus**
Edit Code Description	**No Sign**	**Sign**	**Sign(R)**	**Sign (L)**
Commas and zero balances	1	A	J	N
Commas	2	B	K	O
Zero Balances	3	C	L	P
No commas or zero balances	4	D	M	Q
Data edit	Y			
Suppress Leading zeros	Z			

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