Introduction to

DATATRIEVE

digital

Seminars from the world's largest minicomputer manufacturer

Introduction to Datatrieve

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DECUS- Digital Equip. Computer Users Society

SIG- special interest group

INTRODUCTION TO DATATRIEVE

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DATATRIEVE INTRODUCTION

* DATATRIEVE is an interactive data management tool used to produce reports and respond to adhoc queries.

* DATATRIEVE may be used to do some types of data entry and data set maintenance.

* DATATRIEVE is NOT a data base management system. It does NOT provide system wide control of all access to the data or its format definition.

DATATRIEVE OUTPUT CAPABILITY

* Simple Reports are very easy to produce

* Sophisticated or Complex reports are easy to produce

* DATATRIEVE provides good default output formatting

* DATATRIEVE provides powerful data subsetting capability

* DATATRIEVE provides protection for data access and data definitions

DATATRIEVE SAMPLE

PRINT FIRST 5 YACHTS

MANUFACTURER	MODEL	RIG	LENGTH OVER ALL	WEIGHT	BEAM	PRICE
ALBERG	37 MK II	KETCH	37	20,000	12	$36,951
ALBIN	79	SLOOP	26	4,200	10	$17,900
ALBIN	BALLAD	SLOOP	30	7,276	10	$27,500
ALBIN	VEGA	SLOOP	27	5,070	08	$18,600
AMERICAN	26	SLOOP	26	4,000	08	$9,895

DATATRIEVE SAMPLE

PRINT ALL YACHTS WITH MANUFACTURER = "PEARSON"

MANUFACTURER	MODEL	RIG	LENGTH OVER ALL	WEIGHT	BEAM	PRICE
PEARSON	10M	SLOOP	33	12,441	11	
PEARSON	26	SLOOP	26	5,400	08	
PEARSON	26W	SLOOP	26	5,200	09	
PEARSON	28	SLOOP	28	7,850	09	
PEARSON	30	SLOOP	30	8,320	09	
PEARSON	35	SLOOP	35	13,000	10	
PEARSON	36	SLOOP	37	13,500	11	
PEARSON	365	KETCH	36	17,700	11	
PEARSON	39	SLOOP	39	17,000	12	
PEARSON	419	KETCH	42	21,000	13	

SLIDE 1.5

THE DATATRIEVE ENVIRONMENT

* DATATRIEVE eliminates the classic program development cycle
  - Define program requirements
  - Design software
  - Develop software
  - Redefine requirements
  - Redesign software
  - ect

* DATATRIEVE is a vendor maintained product compatible with a range of PDP-11 and VAX systems.

2 versions of Datatrieve available:

DATATRIEVE - 11/VAX

VAX-11 DATATRIEVE

PHYSICAL STORAGE CHARACTERISTICS

* FILE - A logically related group of data maintained by the RMS File System as a named collection of information.

* RECORD - A grouping of related data items within an RMS file.

* FIELD - Each individual data item in a record is a field and has attributes characterizing the content and format.

LOGICAL CHARACTERISTICS

* DOMAIN - A group of records from the operating system file structure each having the same record definition. The record definition of the records of the domain may be different from the record definition of the file system.

* COLLECTION - A group of records from a domain which may be independently manipulated. Record definitions in a collection always match the record definitions of the domain from which they are obtained.

FIND - creates a collection

(Things work 60% slower when using a collection)
(Can get around it!)

YACHTS DOMAIN RECORD DEFINITION

```
01 BOAT.
   03 TYPE.
      06 MANUFACTURER     PIC X(10).
      06 MODEL PIC X(10).
   03 SPECIFICATIONS.
      06 RIG PIC X(6).
      06 LENGTH-OVER-ALL PIC XXX.
      06 DISPLACEMENT     PIC 99999.
      06 BEAM PIC 99.
      06 PRICE PIC 99999.
```

} group item

} elementary item

LIST OUTPUT

PRINT FIRST 5 YACHTS

MANUFACTURER	MODEL	RIG	LENGTH OVER ALL	WEIGHT	BEAM	PRICE
ALBERG	37 MK II	KETCH	37	20,000	12	$36,951
ALBIN	79	SLOOP	26	4,200	10	$17,900
ALBIN	BALLAD	SLOOP	30	7,276	10	$27,500
ALBIN	VEGA	SLOOP	27	5,070	08	$18,600
AMERICAN	26	SLOOP	26	4,000	08	$9,895

LIST OUTPUT

PRINT ALL YACHTS WITH MANUFACTURER = "PEARSON"

MANUFACTURER	MODEL	RIG	LENGTH OVER ALL	WEIGHT	BEAM	PRICE
PEARSON	10M	SLOOP	33	12,441	11	
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PEARSON	26W	SLOOP	26	5,200	09	
PEARSON	28	SLOOP	28	7,850	09	
PEARSON	30	SLOOP	30	8,320	09	
PEARSON	35	SLOOP	35	13,000	10	
PEARSON	36	SLOOP	37	13,500	11	
PEARSON	365	KETCH	36	17,700	11	
PEARSON	39	SLOOP	39	17,000	12	
PEARSON	419	KETCH	42	21,000	13	

LIST OUTPUT

PRINT ALL YACHTS WITH PRICE LT 10000 AND PRICE GT 0

MANUFACTURER	MODEL	RIG	LENGTH OVER ALL	WEIGHT	BEAM	PRICE
AMERICAN	26	SLOOP	26	4,000	08	$9,895
CAPE DORY	25	SLOOP	25	4,000	07	$8,995
CAPE DORY	TYPHOON	SLOOP	19	1,900	06	$4,295
ISLANDER	BAHAMA	SLOOP	24	4,200	08	$6,500
SALT	19	SLOOP	25	2,600	07	$6,590
VENTURE	21	SLOOP	21	1,500	07	$2,823
VENTURE	222	SLOOP	22	2,000	07	$3,564
WINDPOWER	IMPULSE	SLOOP	16	650	07	$3,500

LIST OUTPUT

PRINT ALL YACHTS WITH PRICE < 10000 AND
PRICE > 0 SORTED BY DISPLACEMENT

MANUFACTURER	MODEL	RIG	LENGTH OVER ALL	WEIGHT	BEAM	PRICE
WINDPOWER	IMPULSE	SLOOP	16	650	07	$3,500
VENTURE	21	SLOOP	21	1,500	07	$2,823
CAPE DORY	TYPHOON	SLOOP	19	1,900	06	$4,295
VENTURE	222	SLOOP	22	2,000	07	$3,564
SALT	19	SLOOP	25	2,600	07	$6,590
AMERICAN	26	SLOOP	26	4,000	08	$9,895
CAPE DORY	25	SLOOP	25	4,000	07	$8,995
ISLANDER	BAHAMA	SLOOP	24	4,200	08	$6,500

HELP EXAMPLE

HELP PRINT

The PRINT statement is used to print data contained in records in the CURRENT collection. The forms of the statement are:

PRINT ALL print-list [ON output-file]

PRINT print-list [ON output-file]

A print-list, if specified, lists the fields and computation to be printed, separated by commas. If a print-list is not specified, all fields contained in the record are printed.

The first form above, PRINT ALL, print all records in the CURRENT collection. The second form, PRINT, prints only the selected record of the CURRENT collection (see HELP SELECT).

Examples:

```
PRINT ALL

PRINT ALL BUILDER, MODEL, PRICE/LENGTH-OVER-ALL

PRINT PRICE
```

SLIDE 2.1

DATATRIEVE MODES

* COMMAND MODE - Normal mode of operation where user data is manipulated, formatted and printed.

* GUIDE MODE - A subset of command mode where the user is prompted and interactivly aided to perform operations.

* ADT MODE - Application Design Tool is an aid for producing record, domain and file definitions.

* EDIT MODE - A line editor for the modification of various user created definitions required by DATATRIEVE.

COMMAND MODE

* COMMANDS - Are DATATRIEVE inputs which control and modify the DATATRIEVE run-time status. These provide operations such as data access control and parameter value establishment.

* STATEMENTS - Are DATATRIEVE inputs used to manipulate data from user specified domains.

COMMAND AND STATEMENT ELEMENTS

* Keywords - All DATATRIEVE commands and statements use "keywords". All keywords have a predefined meaning which cannot be changed.

* Names - Are symbolic identifiers assigned by the user for referencing the data associated with a domain, collection or variable.

* Expressions - An element of commands or statements which results in a value or a record stream.

GUIDE MODE

Guide mode is a highly interactive prompting environment. The operations allowed in guide mode are reduced from the total capability allowed in command mode. Some features of guide mode are:

* Limited set of commands and statements. Only logically consistent commands or statements are accepted.
* Prompting to indicate the allowed commands, statements, record and field items which may be entered next by the user.
* Significant help capability to inform the user of exactly what commands, statements, records and fields may be manipulated based on the current context.

DTR> SET GUIDE

APPLICATION DESIGN TOOL MODE

* Allows specification of the record definition.

* Automatic specification of the domain definition.

* Allows specification of the file definition.

SLIDE 2.6

EDIT MODE

* In EDIT mode the user has available a line editor which can be used to edit various definitions contained in the Data Dictionary.

Try to stay away from DATATRIEVE editor.
Use favorite editor.

DATATRIEVE COMMANDS

COMMANDS are inputs to DATATRIEVE which alter the state or status of DATATRIEVE. Commands are not used to manipulate user data.

* Access Control Commands
  - READY - make a named domain available for access
  - FINISH - terminate the use of a domain
  - EXIT - terminate the DATATRIEVE session

* Status Commands
  - SHOW - display the status of various DATATRIEVE items
  - SET - establish desired conditions or parameters

* Other Commands
  - HELP - information about commands and statements
  - ADT - enter Application Design Tool mode
  - EDIT - edit a data dictionary item

DATATRIEVE STATEMENTS

STATEMENTS are inputs to DATATRIEVE which are used to manipulate user data. This manipulation can be to generate output, provide new data, modify or erase existing data.

* Output Generation
  - PRINT - produce list format output
  - SUMmary - produce a summary report format output

* Data Manipulation
  - FIND - generate a temporary collection
  - SORT - order a collection according to desired criteria

* Variable Manipulation
  - DECLARE - define a variable and its attributes
  - Assignment - assign the value of a variable based on some expression which may include constants, user input or values from one or more records

TERMINATORS, CONTINUATION AND COMMENTS

* A DATATRIEVE command or statement is terminated by a semicolon (;) or a carriage return if the input is logically complete.

* CONTINUATION is implied if the statement is not logically complete or if the last character typed before the carriage return is a hyphen (-).

* COMMENTS are indicated by an exclamation point (!) and include remaining input on the line.

↓

Comments are not stored in procedures -- takes up room.

COMPOUND STATEMENTS

A compound statement is multiple statements between "BEGIN" and "END" statements ~~or two statements connected by "WHEN"~~. Compound statements are considered single statements and may be placed anywhere a statement is allowed.

DATATRIEVE EXPRESSIONS

* VALUE Expression - A means of specifying a numeric or string value.

```
TOTAL = TOTAL + PRICE

TITLE = "STRING 1" | "STRING 2"
```

* BOOLEAN Expression - A means of specifying a true / false value.

```
PRICE EQUAL 0
```

RSE * RECORD SELECTION Expression - A means of specifying a stream of records which meet some criteria.

```
ALL YACHTS WITH PRICE EQUAL 0
```

NUMERIC VALUE EXPRESSION

* Operators allowed are:
  - + Addition
  - - subtraction or negation
  - * multiplication
  - / division

  with normal rules of precedence [* /] then [+ -] left to right.

* Parentheses may be used to order the operations as desired.

* The values used in the expression may be:
  - Constants
  - Variables
  - Prompting Values
  - Fields from records in a domain or collection
  - Items derived by table lookup
  - Statistical Functions such as MIN, MAX, AVERAGE, TOTAL or COUNT based on some record stream.

STRING VALUE EXPRESSIONS

Operators allowed are:

| Concatenate two strings to form a longer string

|| As above except all trailing spaces in the first string are ignored

RESULT1 = "STRING 1 " | "STRING 2" where
RESULT1 becomes "STRING 1 STRING 2"

RESULT2 = "STRING 1 " || "STRING 2" where
RESULT2 becomes "STRING 1STRING 2"

PRINT RESULT1 | " ABC " || RESULT2
generates
STRING 1 STRING 2 ABCSTRING 1STRING 2

BOOLEAN EXPRESSION

Boolean expressions contain relational operators to compare value expressions and may contain boolean operators to join the relational expressions.

* RELATIONAL operations result in a true / false value based on comparison or set existence

* BOOLEAN operations combine true / false values

Example

PRICE LESS-THAN 10000 AND PRICE NOT EQUAL TO 0

RELATIONAL OPERATORS

EQUAL (EQ / =)

GREATER-THAN (GT / >)

LESS-THAN (LT / <)

BETWEEN (BT)

CONTAINING

IN

ANY

NOT EQUAL (NE / NOT EQUAL)

GREATER-EQUAL (GE)

LESS-EQUAL (LE)

NOT BETWEEN (NOT BT)

NOT CONTAINING

NOT IN

BOOLEAN OPERATORS

NOT

AND

OR

with normal rules of precedence NOT then AND then OR operations.

Parentheses are allowed in boolean expressions to alter the normal evaluation.

SOME TYPICAL COMMANDS

HELP -- On-line assistance for DATATRIEVE commands, statements and topics.

* HELP [topic] [topic] ...

* HELP ADVANCED [topic] [topic]

SHOW -- Display data Dictionary information or contents.

* SHOW item [,item]...

The following

items can be used with the show command:

CURRENT	—ALL
READY	DOMAINS
RECORDS	PROCEDURES
TABLES	—COLLECTIONS
—FIELDS	FIELDS FOR domain
DICTIONARY	domain-name
record-name	procedure-name
table-name	collection-name

SOME TYPICAL COMMANDS

READY -- Access a domain

* READY domain-name [(password)] [SHARED / PROTECTED / EXCLUSIVE] [READ / MODIFY / WRITE / EXTEND]

FINISH -- Release control of a domain and collections derived from it.

* FINISH [domain] [,domain] ... If no domain name is supplied all domains are released.

EXCLUSIVE:
no one else can log on while you're on.

Extend:
Can only enter data. Cannot read or modify.

SOME TYPICAL COMMANDS

EXIT -- Terminate a DATATRIEVE session. Any READY'd domains are FINISHed.

* EXIT or (CNTRL-Z)

SET -- Specify a value for a DATATRIEVE control parameter.

SET option [, option ...]

where the allowed options are:

* DICTIONARY [file spec]
* COLUMNS-PAGE=n
* NO ABORT
* ABORT
* GUIDE
* PROMPT
* NO PROMPT

SOME TYPICAL STATEMENTS

FIND -- Produce a collection from some ~~source~~ domain or view.

* FIND rse

PRINT -- Produce a list format ouput . There are two forms of the PRINT statement:

* PRINT [[ALL] [print-list]] [ON (dev: / file-spec / *.prompt-name)] fields when printing from a collection

* PRINT [[print-list OF] rse] [ON (dev: / file-spec / *.prompt-name)]

ONLY ON COLLECTIONS

SOME TYPICAL STATEMENTS

SORT -- Sort the records of a collection according to one or more fields. Note, the records in the file are not reordered by this operation

- SORT [collection-name] BY sort-key1 [,sort-key2] ...

SUM -- Produce a summary format report from the current collection.

- SUM print-list BY sort-key [ON (dev: / file-spec / *.prompt-name)]

YACHTS DOMAIN RECORD DEFINITION

Required!

```
01 BOAT.
   03 TYPE.
      06 MANUFACTURER     PIC X(10)          QUERY-NAME IS BUILDER.
      06 MODEL PIC X(10).
   03 SPECIFICATIONS      QUERY-NAME SPECS.
      06 RIG PIC X(6)     VALID IF RIG EQ "SLOOP","KETCH","MS","YAWL".
      06 LENGTH-OVER-ALL PIC XXX             VALID IF LOA BETWEEN 15 AND 50
         QUERY-NAME IS LOA.
      06 DISPLACEMENT     PIC 99999          QUERY-HEADER IS "WEIGHT"
         EDIT-STRING IS ZZ,ZZ9               QUERY-NAME IS DISP.
      06 BEAM PIC 99.
      06 PRICE PIC 99999 VALID IF PRICE>DISP*1.3 OR PRICE EQ 0
         EDIT-STRING IS $$$,$$$.
```

Query-Name - abbreviation
Query-Header - Header on report

```
DTR>READY YACHTS

DTR>SHOW YACHTS   ! Show the definition of the YACHTS domain
DOMAIN YACHTS
 USING YACHT ON LB:[7,7]YACHT.DAT;

DTR>SHOW YACHT    ! Show the definition of the YACHT record
RECORD YACHT
 USING
01 BOAT.
   03 TYPE.
      06 MANUFACTURER PIC X(10)
         QUERY-NAME IS BUILDER.
      06 MODEL PIC X(10).
   03 SPECIFICATIONS
      QUERY-NAME SPECS.
      06 RIG PIC X(6)
         VALID IF RIG EQ "SLOOP","KETCH","MS","YAWL".
      06 LENGTH-OVER-ALL PIC XXX
         VALID IF LOA BETWEEN 15 AND 50
         QUERY-NAME IS LOA.
      06 DISPLACEMENT PIC 99999
         QUERY-HEADER IS "WEIGHT"
         EDIT-STRING IS ZZ,ZZ9
         QUERY-NAME IS DISP.
      06 BEAM PIC 99.
      06 PRICE PIC 99999
         VALID IF PRICE>DISP*1.3 OR PRICE EQ 0
         EDIT-STRING IS $$$,$$$.
;

DTR>SET PROMPT
DTR>SET COLUMNS-PAGE=80
```

DTR>HELP SET
The SET statement is used to set one or more parameters for the duration of a Datatrieve session. The form of the statement is:

SET option-1,option-2...

The set options available are:

PROMPT/NO PROMPT	Activate/deactivate incomplete line prompts ([Looking for...]).
ABORT/NO ABORT	Terminate/do not terminate a procedure or indirect command file if syntax error encountered.
DICTIONARY [file]	Establish the file specified by "file" as the current data dictionary. If "file" is omitted, the default dictionary becomes the current data dictionary.
COLUMNS-PAGE=n	Set the page width for Datatrieve and the report writer to "n". The number "n" must be between 1 and 255.
GUIDE	Enter Datatrieve tutorial mode. See HELP GUIDE for details.

For help on the report writer SET statement, see the User's Guide to Datatrieve.

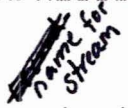
RECORD SELECTION EXPRESSION

The general form of the Record Selection Expression (RSE) contains 5 parts. These are:

- Number of records to include in the record stream produced (ALL or FIRST n)
- The name of the record stream to be produced
- The source of the records from which to produce the record stream
- A boolean expression which is used as the selector for the records which are to be members of the record stream produced
- A sort order for the record stream produced

Only the source specification of the RSE is required. All other parts are optional.

RECORD SELECTION EXPRESSION FORMAT



[ALL / FIRST n] [context-var IN]

{domain-name / collection-name / CURRENT}

[WITH boolean-expression]

[SORTED BY sort-key-1 [, sort-key-2] ...]

SLIDE 4.3

RECORD SELECTION EXPRESSION PROCESSING

1 The record stream is created from the record source based on the boolean expression, if supplied. If no expression is supplied, all records are selected.

2 The records are then sorted by the sort specification, if supplied.

3 The resultant collection becomes all records or the FIRST n, as specified.

4 If a "context-variable" was supplied that name is assigned to the ~~created collection~~ record stream.

COLLECTION RETENTION

* The collection is retained if the "rse" is used with a FIND statement and becomes the CURRENT collection.

* If the "rse" is used with other than a FIND statement, the collection is released when the processing of the statement is completed.

RECORD SORTING OPERATION

* The "sort-key" element of the "rse" has the following format:

  [ASCENDING / DESCENDING] field

* The keywords ASCENDING and DESCENDING also have the following synonyms: ASC, INCREASING, and DESC, DECREASING.

* If the sort order of an element is omitted, it defaults to the order for the previous field. The order of the first sort field defaults to ASCENDING.

Example

FIND ALL YACHTS SORTED BY BUILDER, DESCENDING PRICE

```
DTR>PRINT FIRST 5 YACHTS
```

MANUFACTURER	MODEL	RIG	LENGTH OVER ALL	WEIGHT	BEAM	PRICE
ALBERG	37 MK II	KETCH	37	20,000	12	$36,951
ALBIN	79	SLOOP	26	4,200	10	$17,900
ALBIN	BALLAD	SLOOP	30	7,276	10	$27,500
ALBIN	VEGA	SLOOP	27	5,070	08	$18,600
AMERICAN	26	SLOOP	26	4,000	08	$9,895

```
DTR>FIND ALL AFFORD IN YACHTS WITH PRICE BETWEEN
[Looking for a value expression]
DTR>5000 AND 10000
[4 records found]

DTR>SORT AFFORD BY PRICE

DTR>PRINT ALL AFFORD
```

MANUFACTURER	MODEL	RIG	LENGTH OVER ALL	WEIGHT	BEAM	PRICE
ISLANDER	BAHAMA	SLOOP	24	4,200	08	$6,500
SALT	19	SLOOP	25	2,600	07	$6,590
CAPE DORY	25	SLOOP	25	4,000	07	$8,995
AMERICAN	26	SLOOP	26	4,000	08	$9,895

```
DTR>SHOW COLLECTIONS   ! List the names of collections
Collections:
        AFFORD (also CURRENT)

DTR>SHOW AFFORD        ! List information about the AFFORD collection
Collection AFFORD
        Domain: YACHTS
        Number of records: 4
        No selected record
        Sort order: PRICE

DTR>FINISH             ! Release control of the YACHTS domain

DTR>SHOW COLLECTIONS   ! Show that collections are released
No established collections

DTR>EXIT
```

```
DTR>READY YACHTS

DTR>FIND FIRST 10 YACHTS
[10 records found]
DTR>PRINT                    ! Note, this generates an error
No record selected, printing whole collection
```

MANUFACTURER	MODEL	RIG	LENGTH OVER ALL	WEIGHT	BEAM	PRICE
ALBERG	37 MK II	KETCH	37	20,000	12	$36,951
ALBIN	79	SLOOP	26	4,200	10	$17,900
ALBIN	BALLAD	SLOOP	30	7,276	10	$27,500
ALBIN	VEGA	SLOOP	27	5,070	08	$18,600
AMERICAN	26	SLOOP	26	4,000	08	$9,895
AMERICAN	26-MS	MS	26	5,500	08	$18,895
BAYFIELD	30/32	SLOOP	32	9,500	10	$32,875
BLOCK I.	40	SLOOP	39	18,500	12	
BOMBAY	CLIPPER	SLOOP	31	9,400	11	$23,950
BUCCANEER	270	SLOOP	27	5,000	08	

```
DTR> FIND ALL COMPLETE-LIST IN YACHTS
[113 records found]

DTR>SHOW COLLECTIONS
Collections:
        COMPLETE-LIST (also CURRENT)

DTR>SHOW COMPLETE-LIST
Collection COMPLETE-LIST
        Domain: YACHTS
        Number of records: 113
        No selected record

DTR>FIND ALL YACHTS SORTED BY RIG
[113 records found]

DTR>FIND ALL MY-TYPE IN YACHTS WITH RIG=MS SORTED BY PRICE,
[Looking for next element in list]
DTR>DECENDING BEAM
Expected end of statement, encountered "BEAM"

DTR>FIND ALL MY-TYPE IN YACHTS WITH RIG=MS SORTED BY PRICE,
[Looking for next element in list]
DTR>DESCENDING BEAM
"MS" is not field, assumed literal
[5 records found]

DTR>SHOW COLLECTIONS
Collections:
        MY-TYPE (also CURRENT)
        COMPLETE-LIST

DTR>PRINT ALL MY-TYPE
```

MANUFACTURER	MODEL	RIG	LENGTH OVER ALL	WEIGHT	BEAM	PRICE
FJORD	MS 33	MS	33	14,000	11	
ROGGER FD	M/S	MS	35	17,600	11	
EASTWARD	HO	MS	24	7,000	09	$15,900
AMERICAN	26-MS	MS	26	5,500	08	$18,895
LINDSEY	39	MS	39	14,500	12	$35,900

Do the exercises for Sections 1 thru 4

R E A D I N G A S S I G N M E N T

Chapters 1 thru 4 and 8 thru 13

SLIDE 5.1

DATATRIEVE REPORT WRITER

The DATATRIEVE report writer is used to produce tabular reports in place of the list format produced by the PRINT statement. The Report Writer portion of DATATRIEVE can produce reports with various statistical functions applied to subsets of the data as well as the entire collection.

YACHTS DOMAIN RECORD DEFINITION

```
01 BOAT.
  03 TYPE.
     06 MANUFACTURER     PIC X(10)          QUERY-NAME IS BUILDER.
     06 MODEL PIC X(10).
  03 SPECIFICATIONS      QUERY-NAME SPECS.
     06 RIG PIC X(6)     VALID IF RIG EQ "SLOOP","KETCH","MS","YAWL".
     06 LENGTH-OVER-ALL PIC XXX          VALID IF LOA BETWEEN 15 AND 50
        QUERY-NAME IS LOA.
     06 DISPLACEMENT     PIC 99999       QUERY-HEADER IS "WEIGHT"
        EDIT-STRING IS ZZ,ZZ9            QUERY-NAME IS DISP.
     06 BEAM PIC 99.
     06 PRICE PIC 99999 VALID IF PRICE>DISP*1.3 OR PRICE EQ 0
        EDIT-STRING IS $$$,$$$.
```

REPORT WRITER INPUT SAMPLE

```
DTR> REPORT ALL YACHTS WITH PRICE BETWEEN 1 AND 10000 -
RW>  SORTED BY BUILDER, PRICE ON LP:
RW>  SET REPORT-NAME = "LIST BY BUILDER"
RW>  AT TOP OF BUILDER PRINT BUILDER
RW>  PRINT MODEL, SPECS
RW>  AT BOTTOM OF BUILDER PRINT COL 1, "AVERAGE FOR BUILDER ",
RW>  AVERAGE PRICE (-)
RW>  AT BOTTOM OF REPORT PRINT COL 20, " AVERAGE FOR REPORT ", SPACE 1,
RW>  AVERAGE PRICE (-)
RW>  END-REPORT
```

(-) suppresses leading for field.

SLIDE 5.4

REPORT WRITER OUTPUT SAMPLE

LIST BY BUILDER 16-Oct-81
Page 1

MANUFACTURER	MODEL	RIG	LENGTH OVER ALL	WEIGHT	BEAM	PRICE
AMERICAN						
	26	SLOOP	26	4,000	08	$9,895
AVERAGE FOR BUILDER						$9,895
CAPE DORY						
	TYPHOON	SLOOP	19	1,900	06	$4,295
	25	SLOOP	25	4,000	07	$8,995
AVERAGE FOR BUILDER						$6,645
ISLANDER						
	BAHAMA	SLOOP	24	4,200	08	$6,500
AVERAGE FOR BUILDER						$6,500
SALT						
	19	SLOOP	25	2,600	07	$6,590
AVERAGE FOR BUILDER						$6,590
VENTURE						
	21	SLOOP	21	1,500	07	$2,823
	222	SLOOP	22	2,000	07	$3,564
AVERAGE FOR BUILDER						$3,193
WINDPOWER						
	IMPULSE	SLOOP	16	650	07	$3,500
AVERAGE FOR BUILDER						$3,500
AVERAGE FOR REPORT			$5,770			

SLIDE 5.5

PARTS OF A REPORT OUTPUT

* Page Header
* Column Headers
* Control Group Header and Trailer lines
* Detail Lines
* Summary Functions for Control Groups and entire table

PARTS OF A REPORT OUTPUT

LIST BY BUILDER 16-Oct-81
Page 1

MANUFACTURER	MODEL	RIG	LENGTH OVER ALL	WEIGHT	BEAM	PRICE
AMERICAN						
	26	SLOOP	26	4,000	08	$9,895
AVERAGE FOR BUILDER						$9,895
CAPE DORY						
	TYPHOON	SLOOP	19	1,900	06	$4,295
	25	SLOOP	25	4,000	07	$8,995
AVERAGE FOR BUILDER						$6,645
ISLANDER						
	BAHAMA	SLOOP	24	4,200	08	$6,500
AVERAGE FOR BUILDER						$6,500
SALT						
	19	SLOOP	25	2,600	07	$6,590
AVERAGE FOR BUILDER						$6,590
VENTURE						
	21	SLOOP	21	1,500	07	$2,823
	222	SLOOP	22	2,000	07	$3,564
AVERAGE FOR BUILDER						$3,193
WINDPOWER						
	IMPULSE	SLOOP	16	650	07	$3,500
AVERAGE FOR BUILDER						$3,500
AVERAGE FOR REPORT						$5,770

control group header

trailer line

summary function

REPORT WRITER STATEMENTS

* REPORT -- Begin definition of a report
* SET -- Specify report related parameters
* AT TOP -- Define the output for the beginning of a report, page or control group.
* AT BOTTOM -- Define the output for the end of a report, page or control group.
* PRINT -- Define the content and format of detail lines
* END-REPORT -- End of report definition

Can only use "at Top of" or "at Bottom of" for sorted records on sorted field.

DEFINING A REPORT

A report definition begins with the REPORT statement

```
REPORT [rse] [ON (device / file-spec / *.prompt-name)]
```

and ends with the statement

```
END-REPORT
```

The other report statements appear between these statements. There must be at least a detail line PRINT or one AT BOTTOM statement to produce a summary line. All other report statements are optional.

REPORT WRITER SET COMMAND

The SET command is used within the REPORT WRITER to establish parameters used in formatting the report output.

SET keyword

The keywords which may be used are:

- REPORT-NAME="string"[/"string"]...
- DATE[="string"]
- NO DATE
- NUMBER
- NO NUMBER
- COLUMNS-PAGE=n
- LINES-PAGE=n
- MAX-LINES=n
- MAX-PAGES=n

REPORT WRITER PRINT STATEMENT

The PRINT statement is used to produce the detail lines of the report. Only a print list specification is allowed, an "rse" may not be supplied.

PRINT print-list

The print list may contain the following:

* References to fields and groups from the record
* Value expressions using record fields and/or constants
* Edit strings to specify the output format desired
* Column header definitions

In addition the following format control elements may also be supplied:

* SPACE [n] -- Relative horizontal spacing
* COL [n] -- Absolute horizontal positioning
* SKIP [n] -- Vertical skipping
* NEW-PAGE -- Position to the top of a new page

REPORT WRITER AT STATEMENT

The AT statement is used to print headers, trailers, fields, constants and summary statistics at the top and bottom of sorted data.

* For the AT TOP statement the elements may be header definitions, fields, constants or summary elements.
* For the AT BOTTOM statement the elements may only be summary elements fields and constants.

AT TOP STATEMENT

The general forms of the AT TOP statement is:

AT TOP OF (REPORT/PAGE/field) PRINT element [,element] ...

The header elements which may appear:

* NEW-SECTION
* REPORT-HEADER
* COLUMN-HEADER

The summary elements which may be used are:

* COUNT
* TOTAL
* AVERAGE
* MAX
* MIN

The summary elements produce values for the current collection. Not necessarly the record stream which the REPORT WRITER is working with; and not the current control group.

Default in RW

AT TOP OF PAGE PRINT REPORT-HEADER, COLUMN-HEADER

if 'AT TOP OF PAGE' statement is used, must also include above info or it will be replaced by your message only. Unless, of course, you do not want any Headers.

AT BOTTOM STATEMENT

The general forms of the AT BOTTOM statement is:

AT BOTTOM OF (REPORT/PAGE/field) PRINT element [,element] ...

The summary elements which may be used are:

* COUNT
* TOTAL
* AVERAGE
* MAX
* MIN

The summary elements produce values for the report, page or control group as specified by the AT BOTTOM statement.

```
DTR>REPORT ALL YACHTS WITH PRICE BETWEEN 5000 AND 15000 SORTED BY
RW>BUILDER, RIG, PRICE  ON *.where
RW>AT TOP OF BUILDER PRINT SKIP 2, BUILDER
RW>AT TOP OF RIG PRINT RIG
RW>AT BOTTOM OF BUILDER PRINT SKIP, COL 2, " FOR BUILDER ", SPACE 1,
RW> BUILDER, SPACE 5, " AVE., MAX., MIN. = " ,SPACE 1, AVERAGE PRICE (-),
RW>SPACE 1, MAX PRICE (-) ,SPACE 1, MIN PRICE (-)
RW>AT BOTTOM OF REPORT PRINT SKIP, COL 10, " REPORT AVE., MAX., MIN. " ,
RW>  SPACE 1, AVERAGE PRICE (-), SPACE 1, MAX PRICE (-),
RW>  SPACE 1, MIN PRICE (-)
RW>PRINT MODEL, LOA, DISP, BEAM, PRICE
RW>SET COLUMNS-PAGE=75
RW>SET REPORT-NAME="MY-PRICE RANGE"
RW>END-REPORT
```

MY-PRICE RANGE 16-Oct-81
Page 1

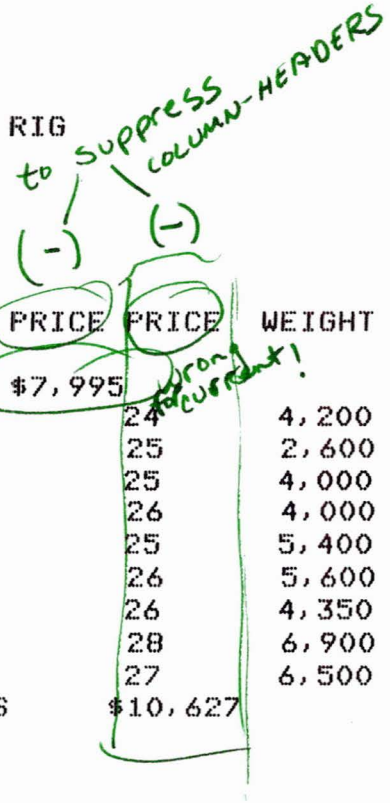
MANUFACTURER	RIG	MODEL	LENGTH OVER ALL	WEIGHT	BEAM	PRICE
AMERICAN						
	SLOOP					
		26	26	4,000	08	$9,895
FOR BUILDER AMERICAN		AVE., MAX., MIN. =		$9,895	$9,895	$9,895
CAPE DORY						
	SLOOP					
		25	25	4,000	07	$8,995
FOR BUILDER CAPE DORY		AVE., MAX., MIN. =		$8,995	$8,995	$8,995
GRAMPIAN						
	SLOOP					
		26	26	5,600	08	$11,495
		28	28	6,900	10	$14,475
FOR BUILDER GRAMPIAN		AVE., MAX., MIN. =		$12,985	$14,475	$11,495
HUNTER						
	SLOOP					
		27	27	6,500	09	$14,999
FOR BUILDER HUNTER		AVE., MAX., MIN. =		$14,999	$14,999	$14,999
IRWIN						
	SLOOP					
		25	25	5,400	12	$10,950
FOR BUILDER IRWIN		AVE., MAX., MIN. =		$10,950	$10,950	$10,950
ISLANDER						
	SLOOP					
		BAHAMA	24	4,200	08	$6,500
FOR BUILDER ISLANDER		AVE., MAX., MIN. =		$6,500	$6,500	$6,500
SALT						

```
                    SLOOP
                             19             25        2,600    07      $6,590

  FOR BUILDER   SALT                 AVE., MAX., MIN. =   $6,590  $6,590  $6,590

    TANZER
                    SLOOP
                             26             26        4,350    09     $11,750

  FOR BUILDER   TANZER               AVE., MAX., MIN. =  $11,750 $11,750 $11,750

          REPORT AVE., MAX., MIN.  $10,627 $14,999  $6,500
```

```
DTR>FIND ALL YACHTS WITH PRICE BETWEEN 5000 AND 10000
[4 records found]

DTR>REPORT ALL YACHTS WITH PRICE BETWEEN 5000 AND 15000 SORTED BY
[Looking for sort list]
RW>RIG , PRICE
RW>AT TOP OF RIG PRINT COL 1, RIG , " ROPORT AVERAGE PRICE =" AVERAGE
Expected end of report statement, encountered "AVERAGE"

DTR>END-REPORT
Expected statement, encountered "END-REPORT"

DTR>REPORT ALL YACHTS WITH PRICE BETWEEN 5000 AND 15000 SORTED
[Looking for sort list]
RW>BY RIG, PRICE
RW>AT TOP OF RIG PRINT COL 1, RIG, SPACE 3,
[Looking for next element in list]
RW>"REPORT AVERAGE PRICE = ", SPACE 2, AVERAGE PRICE
RW>PRINT COL 5, TYPE , SPACE 2, LOA , SPACE 2, DISP, SPACE 2,
[Looking for next element in list]
RW>BEAM, SPACE 2, PRICE
RW>AT BOTTOM OF RIG PRINT COL 5, "AVERAGE PRICE FOR RIG " | RIG |
[Looking for a value expression]
RW>" IS ", SPACE 2, AVERAGE PRICE
RW>END-REPORT
Enter REPORT-NAME: "REPORT BY RIG"
```

current! Be careful

REPORT BY RIG 28-Sep-81
Page 1



RIG		PRICE	PRICE	WEIGHT	BEAM	PRICE
SLOOP	REPORT AVERAGE PRICE =		$7,995			
	ISLANDER	BAHAMA	24	4,200	08	$6,500
	SALT	19	25	2,600	07	$6,590
	CAPE DORY	25	25	4,000	07	$8,995
	AMERICAN	26	26	4,000	08	$9,895
	IRWIN	25	25	5,400	12	$10,950
	GRAMPIAN	26	26	5,600	08	$11,495
	TANZER	26	26	4,350	09	$11,750
	GRAMPIAN	28	28	6,900	10	$14,475
	HUNTER	27	27	6,500	09	$14,999
	AVERAGE PRICE FOR RIG SLOOP IS		$10,627			

```
DTR>FIND ALL MY-RANGE WITH PRICE BETWEEN 2000 AND 20000
"MY-RANGE" is neither a collection nor a readied domain

DTR>FIND ALL MY-RANGE IN YACHTS WITH PRICE BETWEEN 2000 AND 20000
[22 records found]

DTR>PRINT ALL
```

MANUFACTURER	MODEL	RIG	LENGTH OVER ALL	WEIGHT	BEAM	PRICE
ALBIN	79	SLOOP	26	4,200	10	$17,900
ALBIN	VEGA	SLOOP	27	5,070	08	$18,600
AMERICAN	26	SLOOP	26	4,000	08	$9,895
AMERICAN	26-MS	MS	26	5,500	08	$18,895
CAPE DORY	25	SLOOP	25	4,000	07	$8,995
CAPE DORY	TYPHOON	SLOOP	19	1,900	06	$4,295
EASTWARD	HO	MS	24	7,000	09	$15,900
GRAMPIAN	26	SLOOP	26	5,600	08	$11,495
GRAMPIAN	28	SLOOP	28	6,900	10	$14,475
GRAMPIAN	30	SLOOP	30	8,600	09	$17,775
HUNTER	27	SLOOP	27	6,500	09	$14,999
IRWIN	25	SLOOP	25	5,400	12	$10,950
IRWIN	30	SLOOP	30	10,000	10	$19,950
ISLANDER	28	SLOOP	28	5,994	10	$15,908
ISLANDER	BAHAMA	SLOOP	24	4,200	08	$6,500
SALT	19	SLOOP	25	2,600	07	$6,590
TANZER	26	SLOOP	26	4,350	09	$11,750
TANZER	28	SLOOP	28	6,800	10	$17,500
VENTURE	21	SLOOP	21	1,500	07	$2,823
VENTURE	222	SLOOP	22	2,000	07	$3,564
WESTERLY	CENTAUR	SLOOP	26	6,700	08	$15,245
WINDPOWER	IMPULSE	SLOOP	16	650	07	$3,500

```
DTR>REPORT ALL MY-RANGE SORTED BY RIG, PRICE
RW>AT TOP OF RIG PRINT COL 2, RIG, SPACE 2, "AVERAGE PRICE FOR GROUP IS",
[Looking for next element in list]
RW>SPACE 2, AVERAGE PRICE
RW>PRINT COL 5, TYPE, SPACE 2, LOA, DISP, BEAM, PRICE
RW>AT BOTTOM OF RIG PRINT COL 2, "THE AVERAGE PRICE FOR RIG TYPE " |
[Looking for a value expression]
RW>RIG | " IS ", SPACE 1, AVERAGE PRICE
RW>END-REPORT
Enter REPORT-NAME: REPORT BY RIG TYPE
Illegal REPORT-NAME.  Re-enter or ^Z to abort.
Enter REPORT-NAME: "REPORT BY RIG TYPE"
```

REPORT BY RIG TYPE

28-Sep-81
Page 1

RIG	MODEL	PRICE	WEIGHT	BEAM	PRICE
MS AVERAGE PRICE FOR GROUP IS		$12,159			
EASTWARD	HO	24	9,000	09	$15,900
AMERICAN	26-MS	26	5,500	08	$18,895
THE AVERAGE PRICE FOR RIG TYPE MS		IS	$17,397		
SLOOP AVERAGE PRICE FOR GROUP IS		$12,159			
VENTURE	21	21	1,500	07	$2,823
WINDPOWER	IMPULSE	16	650	07	$3,500
VENTURE	222	22	2,000	07	$3,564
CAPE DORY	TYPHOON	19	1,900	06	$4,295
ISLANDER	BAHAMA	24	4,200	08	$6,500
SALT	19	25	2,600	07	$6,590
CAPE DORY	25	25	4,000	07	$8,995
AMERICAN	26	26	4,000	08	$9,895
IRWIN	25	25	5,400	12	$10,950
GRAMPIAN	26	26	5,600	08	$11,495
TANZER	26	26	4,350	09	$11,750
GRAMPIAN	28	28	6,900	10	$14,475
HUNTER	27	27	6,500	09	$14,999
WESTERLY	CENTAUR	26	6,700	08	$15,245
ISLANDER	28	28	5,994	10	$15,908
TANZER	28	28	6,800	10	$17,500
GRAMPIAN	30	30	8,600	09	$17,775
ALBIN	79	26	4,200	10	$17,900
ALBIN	VEGA	27	5,070	08	$18,600
IRWIN	30	30	10,000	10	$19,950
THE AVERAGE PRICE FOR RIG TYPE SLOOP		IS	$11,635		

THE DATA DICTIONARY

DATATRIEVE retains the definitions of DOMAINS and RECORDS in the DATA DICTIONARY. The data dictionary is a "well known" file. In addition to domain and record definitions, other object definitions may reside in the data dictionary. In general, all users use the same data dictionary, thus have the same definitions of domains, records and procedures available.

DICTIONARY OBJECTS

* Domain -- Definition of relationship between "domain-name", "record-name" and the RMS file containing the records

* Record -- Definition of a record format.

* Procedure -- A named group of commands, statements, clauses or arguments which are accessed when DATATRIEVE encounters a reference to the name.

* Table -- A list of codes and definitions used to reduce storage and validate data.

Each dictionary object must have a unique name and these names should not duplicate DATATRIEVE keywords.

DICTIONARY OBJECT PROTECTION

Each object in the dictionary has a password table associated with it when created. The password table contains a set of protection attributes associated with that object. These attributes control how users may use or modify the definitions. The protection attributes associated with dictionary objects are:

* READ
* WRITE
* MODIFY
* EXECUTE
* EXTEND
* CONTROL

DOMAIN DEFINITION

DEFINE DOMAIN domain USING record [(password)] ON file-spec;

The "domain" name supplied must be unique.

The "record" name specified need not exist when the domain is defined. The "password" is used to determine if you have "execute" privilege for the record definition when you ready the domain. The user data file need not exist when the domain definition is entered.

RECORD DEFINITION

```
DEFINE RECORD record-name USING
field 1.
field 2.
   etc
;
```

The "record-name" supplied must be unique. There must be at least one field definition and all field definitions must end with a period. The supplied record definition is entered into the data dictionary.

DTR> @ YACHT.REC

FIELD DESCRIPTORS

A field descriptor has three parts:

* Level Number -- describing the relationship between the field and other fields in the definition

* Field Name -- to identify the field

* Definition Clauses -- are required for an elementary field to define the storage and field display format.

COMMON FIELD DEFINITION CLAUSES

* EDIT-STRING -- Specifies the output format for the field when printed.

* USAGE -- Specifies the internal storage format for numeric and date fields.

* PICTURE -- Specifies the stored format of a field.

* COMPUTED BY -- The value of the field is computed upon reference, there is no storage in the record.

* QUERY-HEADER -- Defines the column header for the field when printed.

* QUERY-NAME -- Defines an alternate name for the field.

* VALID IF -- Determines validity of field value before store or modify operation is performed.

PICTURE CLAUSE

PICTURE [IS] picture-string

The "picture string" defines the format of the field value as stored. The picture string indicates field positions and can be supplied as any of the following:

'9' represents a numeric character

'S' represents a sign, and if supplied, must be the left most character positive or negative

'V' represents an implied decimal point

'X' represents an alphanumeric position.

EDIT-STRING CLAUSE

The "edit string" defines how the field is to be formatted for output. An "edit string" is a sequence of edit characters, the combination of these specifies the format of the output.

Interpertation of the edit string is based on the type of field being converted:

ALPHANUMERIC

NUMERIC

DATE

ALPHANUMERIC EDIT-STRING CHARACTERS

The allowed edit characters are:

'X' is replaced by a character from the field.

'B' causes a space to be inserted.

'/' causes a slash to be inserted

'-' causes a dash to be inserted.

'T' defines a text field. DATATRIEVE will break the field at blanks and wrap across lines to output the field.

NUMERIC EDIT-STRING CHARACTERS

The allowed edit characters are:

'Z' is replaced by digit or a blank if it matches a leading zero

.

'9' is replaced by a digit from the value.

'*' is replaced by digit or an * if it matches a leading zero .

',' a comma is inserted if there is a digit to the left.

'$' is replaced by digit or a blank if it matches a leading zero.
The last leading zero is replaced by a dollar sign ($) . Floats

'.'

DATE EDIT-STRING CHARACTERS

The allowed edit characters are:

'D' digit day of the month (1-31).

'M' letter name of the month (JAN).

'N' number of the month (1-12).

'Y' digit of the year (1981).

'J' digit of the Julian date (1-365).

'W' letter name of the week (MONDAY).

'B' is replaced by a blank.

'/' causes a slash to be inserted.

'-' causes a dash to be inserted.

'.' causes a period to be inserted.

See page 11-22 of manual

864 billion clunks in a day.

YACHTS DOMAIN RECORD DEFINITION

```
01 BOAT.
  03 TYPE.
     06 MANUFACTURER     PIC X(10)          QUERY-NAME IS BUILDER.
     06 MODEL PIC X(10).
  03 SPECIFICATIONS      QUERY-NAME SPECS.
     06 RIG PIC X(6)     VALID IF RIG EQ "SLOOP","KETCH","MS","YAWL".
     06 LENGTH-OVER-ALL PIC XXX 99      VALID IF LOA BETWEEN 15 AND 50
        QUERY-NAME IS LOA.
     06 DISPLACEMENT     PIC 99999          QUERY-HEADER IS "WEIGHT"
        EDIT-STRING IS ZZ,ZZ9              QUERY-NAME IS DISP.
     06 BEAM PIC 99.
     06 PRICE PIC 99999 VALID IF PRICE>DISP*1.3 OR PRICE EQ 0
        EDIT-STRING IS $$$,$$$.
```

USING ADT TO GENERATE DOMAIN AND FIELD DEFINITIONS

Application Design Tool mode is an interactive aid for developing record, domain and file definitions. Not all possible 'picture' definitions or record structures can be generated using ADT.

ADT mode produces a command file in response to the information supplied. This command file can be edited to include record structure and field definition information not supplied with ADT.

TABLE DEFINITIONS

Description Tables are used to validate data or convert a coded value to a longer form. A single table can be used for both operations.

A table consists of a series of a "code" and "description" pairs. There is an optional "ELSE" entry which is returned when the supplied code is not in the table.

DESCRIPTION TABLE DEFINITION

```
DEFINE TABLE table-name
"code" : "description",
"code" : "description",
"code" : "description",
ELSE "description"
END-TABLE
```

Note, the last element in the table is not followed by a comma.

PROCEDURE DEFINITIONS

Procedures are DATATRIEVE commands, statements, clauses and arguments which are named and stored in the data dictionary.

A procedure is defined as follows:

```
DEFINE PROCEDURE name
        ...
        ...
END_PROCEDURE
```

A procedure is envoked as follows:

```
:name
```

at any position where the procedure is logically consistant.

```
PRINT ALL YACHTS WITH :MY-PROC-ABC
```

DATATRIEVE EDITOR

The DATATRIEVE editor may be used to edit PROCEDURE and TABLE definitions contained in the data dictionary.

It is similar to the EDT editor in line mode.

EXTRACT COMMAND

The EXTRACT command is used to create a command file from a definition contained in the data dictionary. The command file created will contain an appropriate DELETE command and a complete object definition.

The typical use of EXTRACT is as follows:

1. Extract the desired object
2. Exit DATATRIEVE
3. Use any editor to modify the definition
4. Run DATATRIEVE
5. Execute the command file to delete and redefine the object.

Example

```
EXTRACT ON FIXIT.CMD YACHTS, YACHT
```

```
DTR>SHOW TABLES
Tables:
        RIG-TABLE

DTR>SHOW RIG-TABLE
TABLE RIG-TABLE
"SLOOP"  :  "ONE MAST",
"KETCH"  :  "TWO MASTS, BIG ONE IN FRONT",
"YAWL"   :  "SIMILAR TO KETCH",
"M/S"    :  "SAILS AND BIG MOTOR",
ELSE "SOMETHING ELSE"
END-TABLE

DTR>FIND FIRST 25 YACHTS
[25 records found]

DTR>PRINT ALL BUILDER , RIG VIA RIG-TABLE

MANUFACTURER     RIG

 ALBERG          TWO MASTS,
 ALBIN           ONE MAST
 ALBIN           ONE MAST
 ALBIN           ONE MAST
 AMERICAN        ONE MAST
 AMERICAN        SOMETHING
 BAYFIELD        ONE MAST
 BLOCK I.        ONE MAST
 BOMBAY          ONE MAST
 BUCCANEER       ONE MAST
 BUCCANEER       ONE MAST
 C&C             ONE MAST
 CABOT           ONE MAST
 CAL             ONE MAST
 CAL             ONE MAST
 CAL             ONE MAST
 CAL             ONE MAST
 CAL             ONE MAST
 CAPE DORY       ONE MAST
 CAPE DORY       ONE MAST
 CAPE DORY       ONE MAST
 CAPITAL         ONE MAST
 CARIBBEAN       ONE MAST
 CHALLENGER      ONE MAST
 CHALLENGER      ONE MAST
```

```
DTR>DEFINE PROCEDURE BOAT-REPORT
DFN>SET ABORT
DFN> FIND ALL RPT-LIST IN YACHTS WITH PRICE BETWEEN *.LOW AND *.HIGH
DFN>SORT RPT-LIST BY BUILDER, PRICE
DFN>REPORT ALL RPT-LIST ON *."OUTPUT DEVICE OR FILESPEC"
DFN>AT TOP OF BUILDER PRINT BUILDER
DFN>PRINT MODEL, SPECS
DFN>AT BOTTOM OF BUILDER PRINT COL 5, "AVERAGE PRICE ", SPACE 1
DFN>AVERAGE PRICE USING $$$,$$$.$$
DFN>END-REPORT
DFN>RELEASE RPT-LIST
DFN>END-PROCEDURE

DTR>EDIT BOAT-REPORT    ! There is an error in the AT BOTTOM statement

QED> T "BOTTOM"
        AT BOTTOM OF BUILDER PRINT COL 5, "AVERAGE PRICE ", SPACE 1
QED> S/1/1,
        AT BOTTOM OF BUILDER PRINT COL 5, "AVERAGE PRICE ", SPACE 1,
QED> EXIT

DTR>:BOAT-REPORT
Enter LOW: 2000
Enter HIGH: 12000
Enter REPORT-NAME: "2000 - 12000 REPORT"
Enter OUTPUT DEVICE OR FILESPEC: TI:
```

ADT Sample

```
DTR> ADT
Do you want help? (YES or NO) : YES
ADT will help you create your DATATRIEVE domain and record
definitions. The DTR statements will be written to the  file
you specify.

All answers must be terminated by a carriage return.

If you need help for any question, type ? followed by a
carriage return.

If you would like to see what you have defined,
enter ! followed by a carriage return.
Do you want detailed questions? (YES or NO) : YES
What do you want to name this domain? : DTR-SAMPLE
What do you want to name the file where the data
for DTR-SAMPLE will be? : DTRSAMPLE.CMD
What do you want to name the first field in DTR-SAMPLE? : FIRST-NAME
What is the query abbreviation for FIRST-NAME? : FNAME
What's in FIRST-NAME --
        a DATE
        a PERCENT
        MONEY
        NUMBERS used in arithmetic
        or ANYTHING ELSE (CHARACTERS)?

Enter one of the above : CHAR
How many characters long is FIRST-NAME ? : 14
Are there any more fields in DTR-SAMPLE ? (YES or NO) : Y
What do you want to name the next field in DTR-SAMPLE? : LAST-NAME
What is the query abbreviation for LAST-NAME? : LNAME
What's in LAST-NAME --
        a DATE
        a PERCENT
        MONEY
        NUMBERS used in arithmetic
        or ANYTHING ELSE (CHARACTERS)?

 Enter one of the above : CHAR
How many characters long is LAST-NAME ? : 20
Are there any more fields in DTR-SAMPLE ? (YES or NO) : Y
What do you want to name the next field in DTR-SAMPLE? : INCOME
What's in INCOME --
        a DATE
        a PERCENT
        MONEY
        NUMBERS used in arithmetic
        or ANYTHING ELSE (CHARACTERS)?

Enter one of the above : MONEY
How many digits to the left of the decimal point? : 6
Are there any more fields in DTR-SAMPLE ? (YES or NO) : YES
What do you want to name the next field in DTR-SAMPLE? : BIRTH-DATE
What is the query abbreviation for BIRTH-DATE? : BDATE
```

ADT Sample

```
What's in BIRTH-DATE --
        a DATE
        a PERCENT
        MONEY
        NUMBERS used in arithmetic
        or ANYTHING ELSE (CHARACTERS)?

Enter one of the above : DATE
Four date formats are available:
        1       MM/DD/YY          6/29/79
        2       DD-MMM-YY        29-JUN-79
        3       DD-MMM-YYYY      29-JUN-1979
        4       DD.MM.YY         29.06.79
Enter format number 1, 2, 3, or 4 : 3
Are there any more fields in DTR-SAMPLE ? (YES or NO) : YES
What do you want to name the next field in DTR-SAMPLE? : KIDS
What's in KIDS --
        a DATE
        a PERCENT
        MONEY
        NUMBERS used in arithmetic
        or ANYTHING ELSE (CHARACTERS)?

Enter one of the above : NUMBER
How many digits to the left of the decimal point? : 2
How many digits to the right of the decimal point? : 0
Do you want zeros to the left to print as spaces? : Y
Are there any more fields in DTR-SAMPLE ? (YES or NO) : YES
What do you want to name the next field in DTR-SAMPLE? : BOYS
What's in BOYS --
        a DATE
        a PERCENT
        MONEY
        NUMBERS used in arithmetic
        or ANYTHING ELSE (CHARACTERS)?

Enter one of the above : NUMBER
How many digits to the left of the decimal point? : 2
How many digits to the right of the decimal point? : 0
Do you want zeros to the left to print as spaces? : Y
Are there any more fields in DTR-SAMPLE ? (YES or NO) : Y
What do you want to name the next field in DTR-SAMPLE? : GIRLS
What's in GIRLS --
        a DATE
        a PERCENT
        MONEY
        NUMBERS used in arithmetic
        or ANYTHING ELSE (CHARACTERS)?

Enter one of the above : NUMB
How many digits to the left of the decimal point? : 2
How many digits to the right of the decimal point? : 0
Do you want zeros to the left to print as spaces? : Y
Are there any more fields in DTR-SAMPLE ? (YES or NO) : NO
```

```
An indexed file can handle certain queries based on a key
field very quickly. A sequential file is not as fast and
does not allow records to be ERASEd.  BUT, an indexed file
does not allow you to change the primary key field's data.
Do you want your data file to be indexed? (YES or NO) : Y
What is the field name of the primary key? : LNAME
Do you want to allow the field which is the primary key
to have duplicates? (YES or NO) : YES
Do you want alternate keys? (YES or NO) : NO
What is the name of the file where the DATATRIEVE
domain and field definitions should go? : DEFINEIT.CMD
The DATATRIEVE definitions for your domain are
located in file SY:[147,105]DEFINEIT.CMD;1
The record length is 56 bytes.
Do you want to define another domain? (YES or NO) : NO
```

COMMAND FILE RESULTING FROM THE A.D.T. SESSION

```
DEFINE DOMAIN DTR-SAMPLE USING DTR-SAMPLE-REC
      ON DTRSAMPLE.CMD;
DEFINE RECORD DTR-SAMPLE-REC USING
01 DTR-SAMPLE-REC.
    15 FIRST-NAME          PIC IS X(14)
       QUERY-NAME IS FNAME.
    15 LAST-NAME PIC IS X(20)
       QUERY-NAME IS LNAME.
    15 INCOME     PIC IS  S9(6)V99
       EDIT-STRING IS $$$$,$$$.$$.
    15 BIRTH-DATE          USAGE IS DATE
       EDIT-STRING IS  DD-MMM-YYYY
       QUERY-NAME IS BDATE.
    15 KIDS       PIC IS S9(2)    EDIT-STRING IS -Z(2).
    15 BOYS       PIC IS S9(2)    EDIT-STRING IS -Z(2).
    15 GIRLS      PIC IS S9(2)    EDIT-STRING IS -Z(2).
;
DEFINE FILE FOR DTR-SAMPLE     KEY=LNAME (DUP);
```

MODIFIED COMMAND FILE

```
DEFINE DOMAIN DTR-SAMPLE USING DTR-SAMPLE-REC
      ON DTRSAMPLE.CMD;
DEFINE RECORD DTR-SAMPLE-REC USING
01 DTR-SAMPLE-REC.
 10 PARENT-NAME.
    15 FIRST-NAME          PIC IS X(14)
       QUERY-NAME IS FNAME.
    15 LAST-NAME PIC IS X(20)
       QUERY-NAME IS LNAME.
 10 PARENT-INF.
    15 INCOME     PIC IS  S9(6)V99
       EDIT-STRING IS $$$$,$$$.$$.
    15 BIRTH-DATE          USAGE IS DATE
       EDIT-STRING IS  DD-MMM-YYYY
       QUERY-NAME IS BDATE.
 10 KID-INF.
    15 KIDS       COMPUTED BY (BOYS + GIRLS) .
    15 BOYS       PIC IS S9(2)    EDIT-STRING IS -Z(2).
    15 GIRLS      PIC IS S9(2)    EDIT-STRING IS -Z(2).
;
DEFINE FILE FOR DTR-SAMPLE     KEY=LNAME (DUP);
```

SAMPLE SESSION USING THIS DEFINITION

```
DTR> @DEFINEIT
DEFINE DOMAIN DTR-SAMPLE USING DTR-SAMPLE-REC
     ON DTRSAMPLE.CMD;
DEFINE RECORD DTR-SAMPLE-REC USING
01 DTR-SAMPLE-REC.
 10 PARENT-NAME.
   15 FIRST-NAME          PIC IS X(14)
      QUERY-NAME IS FNAME.
   15 LAST-NAME PIC IS X(20)
      QUERY-NAME IS LNAME.
 10 PARENT-INF.
   15 INCOME     PIC IS  S9(6)V99
      EDIT-STRING IS $$$$,$$$.$$.
   15 BIRTH-DATE          USAGE IS DATE
      EDIT-STRING IS  DD-MMM-YYYY
      QUERY-NAME IS BDATE.
 10 KID-INF.
   15 KIDS       COMPUTED BY (BOYS + GIRLS) .
   15 BOYS       PIC IS S9(2)    EDIT-STRING IS -Z(2).
   15 GIRLS      PIC IS S9(2)    EDIT-STRING IS -Z(2).
;
[Record DTR-SAMPLE-REC is 54 bytes long]
DEFINE FILE FOR DTR-SAMPLE     KEY=LNAME (DUP);

DTR> READY DTR-SAMPLE WRITE
DTR> STORE DTR-SAMPLE
Enter FIRST-NAME: JIM
Enter LAST-NAME: SMITH
Enter INCOME: 1234.56
Enter BIRTH-DATE: 1-APR-49
Enter BOYS: 1
Enter GIRLS: 1
DTR> STORE DTR-SAMPLE
Enter FIRST-NAME: MARY
Enter LAST-NAME: JONES
Enter INCOME: 4567.89
Enter BIRTH-DATE: 25-DEC-52
Enter BOYS: 0
Enter GIRLS: 1
DTR> STORE DTR-SAMPLE
Enter FIRST-NAME: JOHN
Enter LAST-NAME: LONGFELLO
Enter INCOME: 5678.90
Enter BIRTH-DATE: 6-30-41
Enter BOYS: 3
Enter GIRLS: 0
```

ADT Sample

```
DTR> FIND ALL DTR-SAMPLE
[3 records found]
DTR> PRINT ALL

     FIRST                 LAST                                   BIRTH
     NAME                  NAME                INCOME             DATE       KIDS BOYS GIRLS

MARY               JONES                      $4,567.89 25-Dec-1952    1              1
JOHN               LONGFELLO                  $5,678.90 30-Jun-1941    3    3
JIM                SMITH                      $1,234.56  1-Apr-1949    2    1         1

DTR> PRINT TOTAL KIDS

  KIDS

       6

DTR> PRINT TOTAL BOYS, TOTAL GIRLS, TOTAL KIDS

 BOYS     GIRLS     KIDS

      4        2         6

DTR> PRINT AVERAGE INCOME

  INCOME

  $3,827.11
```

DATA SET MODIFICATION

All commands and statements to this point have been used to subset and print information. The following statements are used to store, modify and erase data.

* STORE -- Place a new record into a domain
* SELECT -- Make a record the current record
* MODIFY -- Change one or more fields in one or more existing records
* ERASE -- Remove one or more records from a domain

STORE

STORE domain [USING statement] [VERIFY USING statement]

The "domain" must be READY with WRITE or EXTEND access. If the "USING statement" clause is not supplied, DATATRIEVE will prompt for a value for each field in the record. If the USING clause is supplied, only the field or fields specified are assigned values.

If the VERIFY USING clause is supplied, then all conditions indicated in this clause must be met before the record is stored.

SELECT

SELECT (FIRST / NEXT / LAST / value-exp) [collection]

The specified record, first, last, etc, is made the current record of the specified collection or the CURRENT collection if no collection name is supplied.

If the "value-exp" form is used, the expression must result in a number from one to the number of records in the collection.

MODIFY

MODIFY [ALL] [USING stmnt] [VERIFY USING stmnt] [OF rse]

MODIFY [ALL] [field [,field]...] [VERIFY USING stmnt] [OF rse]

The modify statement changes the values of the fields in records of the current collection. If "ALL" is supplied then all records are changed, if not supplied, then only the selected record is changed.

If the "OF rse" clause is supplied, the processing of the "rse" is done first to generate the collection to be modified.

ERASE

ERASE [ALL [OF rse]]

The ERASE statement deletes one or more records from the current collection. If "ALL" is specified, then all records in the current collection are deleted. If "ALL" is not specified, then only the selected record is specified.

If the "OF rse" clause is supplied, the "rse" is processed to generate the record stream to be deleted.

FIND rse
PRINT ALL
SELECT
PRINT
ERASE

Do the exercises for Sections 5 thru 7

R E A D I N G A S S I G N M E N T

Chapters 5 thru 7 and 14 thru 16

OTHER USEFUL STATEMENTS

DATATRIEVE supports additional statements to allow the development of sophisticated data manipulation procedures.

FOR -- Processing to be performed for each record in a record stream

IF - THEN - ELSE -- Conditional statement processing

WHILE -- Processing which continues while some condition is true

ABORT -- A means of terminating the processing of a statement, procedure or a command file.

REPEAT -- Multiple executions of the same statement

DECLARE -- Define a local or global variable. Variables defined within a BEGIN-END block are local to that block.

ASSIGNMENT STATEMENTS

Assign a value to an elementary or group field or a variable.

- field = value-expression -- (This is used within STORE USING or MODIFY USING statements)

* - group-field1 = group-field2 (This is used within STORE USING or MODIFY USING statements)

- variable = value-expression

* For Yachts
Store BOATS USING SPECS = SPECS

Copies Yachts' specs into a domain boats

DECLARE

DECLARE variable-name variable-definition

DATATRIEVE will assign storage to hold the value of the variable and retain the definition for later use.

The definition must include at least a COMPUTED BY, PICTURE or USAGE clause.

DECLARE EXAMPLE

```
DECLARE NUMBER-RECORDS USAGE IS COMP PIC IS 9999.

DECLARE TOTAL-PAY PIC IS 9(6)V99 EDIT-STRING IS $$$$,$$$.99.

DECLARE WHEN-DONE USAGE IS DATE EDIT-STRING IS JJJ-YYYY.
```

FOR LOOP

FOR rse statement

The "rse" is processed to produce a record stream. For each record of the record stream, the "statement" supplied is executed. The statement can be supplied as a simple or a compound statement using the "BEGIN - END" or the "THEN" construction.

FOR LOOP EXAMPLE

```
FOR ALL YACHTS WITH PRICE = 0
MODIFY PRICE


FOR ALL YACHTS WITH PRICE = 0
BEGIN
PRINT BOAT
MODIFY PRICE VERIFY USING PRICE GT 0
END
```

IF - THEN - ELSE

IF boolean-exp THEN statement [ELSE statement]

If the boolean expression is true, the statement in the "THEN" clause is executed. If it is false, the "ELSE" statement is executed, if supplied.

ANY rse

allows use of multiple Domains

IF - THEN - ELSE EXAMPLES

```
IF PRICE EQ 0 THEN PRINT "NO PRICE" ELSE PRICE = PRICE * 1.1
```

```
FOR ALL YACHTS BEGIN
IF PRICE EQUAL 0 THEN BEGIN
PRINT "NO PRICE FOR THE FOLLOWING BOAT"
PRINT BOAT
END  ELSE BEGIN
PRICE = PRICE * 1.1
TOTAL = TOTAL + PRICE
END
END
```

Has a bug.
Does not always work!

WHILE

WHILE boolean-exp statement

(undocumented statement)

The statement supplied is executed repeatedly while the supplied boolean expression is true. If the expression is initially false, the statement is never executed.

WHILE EXAMPLES

```
DECLARE I USAGE IS COMP.
I=0
WHILE I LE 10 BEGIN PRINT I; I=I+1 ; END
```

The above results in a list of numbers zero (0) through ten (10) being printed.

```
FIND ALL YACHTS WITH PRICE = 0
SELECT FIRST
WHILE *.CONTINUE = "Y" BEGIN
PRINT
MODIFY PRICE VERIFY USING PRICE > 0
SELECT NEXT
END
```

The above sequence allows the user to continue or not, after modifying each record of the collection.

* WHILE *.CONTINUE = "Y","y" BEGIN
accepts Y or y

OR WHILE *.CONTINUE CONT "Y"
accepts any answer containing 'Y'

ABORT

ABORT value-exp

When DATATRIEVE proceses this statement the execution of the current statement, if it is part of a compound statement, procedure or command file is terminated. The supplied "value-exp" is output to the terminal.

If the command "SET ABORT" had been processed before the "ABORT" statement is encountered and the ABORT is within a procedure or command file, the processing of the procedure or command file is terminated. If the SET NO ABORT command had been specified, then only the current statement processing is aborted.

ABORT EXAMPLE

```
FIND ALL NO-PRICE IN YACHTS WITH PRICE = 0.0

MODIFY ALL PRICE VERIFY USING

IF PRICE LESS-EQUAL 0 THEN ABORT " ZERO NOT ALLOWED"
```

REPEAT

REPEAT value-exp statement

The value expression is evaluated. If the result is greater than zero, the supplied statement is executed the specified number of times.

A compound statement using the "BEGIN - END" or "THEN" construction can be used with the REPEAT statement

```
DEFINE PROCEDURE PRO
        PRINT "I LIKE WOMBATS"
        PRINT "DO YOU?"
END-PROCEDURE

REPEAT 5 :PROC

        I LIKE WOMBATS
        I LIKE WOMBATS
              "
              "
              "
        DO YOU?
```

To avoid this, BEGIN-END

REPEAT EXAMPLES

```
REPEAT 5 STORE YACHTS


REPEAT *."NUMBER OF RECORDS TO STORE" STORE YACHTS
```

DATATRIEVE WORKING STORAGE

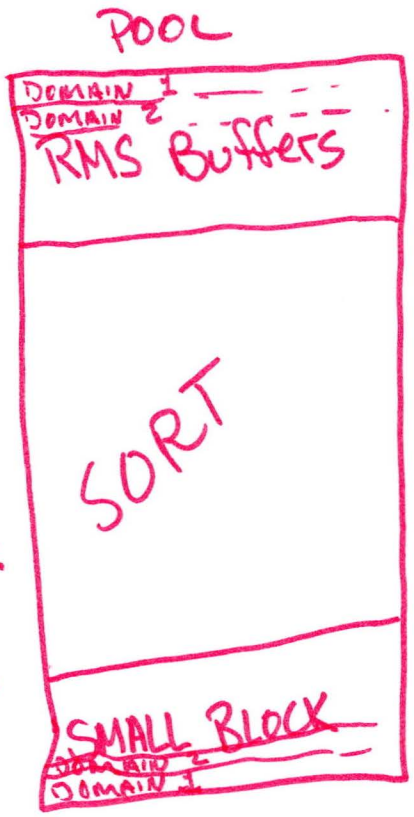
DATATRIEVE maintains information about domains, collections and other objects currently being used in a storage area called Pool Space. DATATRIEVE pool is local to the DATATRIEVE task.

WORKING STORAGE USE

The typical uses of DATATRIEVE Pool Space are:

* Buffers for access to RMS files for readied domains.
* Storage required for record definitions.
* Storage required for global and local variable definitions
* Storage required for currently used tables
* Storage required to define collections
* A work space used to sort collections and compile procedures when they are executed

SHOW SPACE



To save space:
Ready domains in 1 order & finish in opposite order.
Otherwise you get fragmented space that you cannot use.

RELEASE COMMAND

RELEASE object

The RELEASE command is used to free the workspace used by a collection, table or variable definition. A RELEASEd collection or variable is no longer usable, unless redefined. A RELEASEd table is still defined in the data dictionary, but is not loaded into DATATRIEVE workspace.

DEFINE DICTIONARY

DEFINE DICTIONARY file-spec

The DEFINE DICTIONARY command is used to create a private dictionary. When created the dictionary is empty. Domain, record and other definitions must be entered before anything can be done.

DICTIONARY OBJECT PROTECTION CONTROL

Each object in the Data Dictionary has a password table. This table is used to control user access and operations associated with the object. Each password table contains one or more entries of the following format:

SEQUENCE-NUMBER LOCK-TYPE KEY PRIVILEGE

PASSWORD TABLE ENTRY

SEQUENCE-NUMBER LOCK-TYPE KEY PRIVILEGE

* SEQUENCE-NUMBER -- the order used by DATATRIEVE when searching the password table to determine if the currently requested function can be performed by the user.

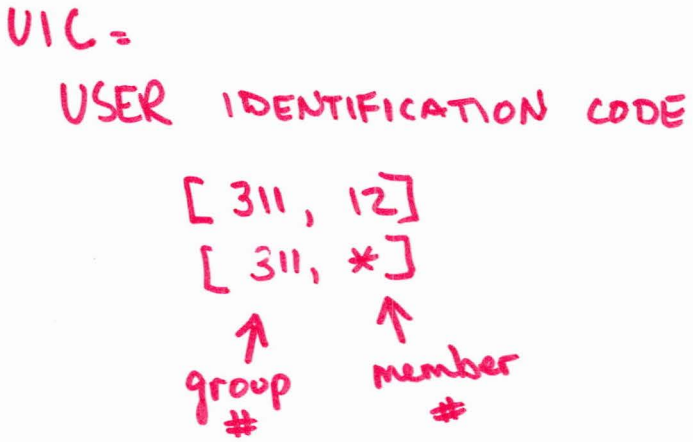
* LOCK-TYPE -- Specifies "password" or "UIC" type of access control.

* KEY -- The "password" or "UIC" required to satisfy this particular entry in the password table.

* PRIVILEGE -- Defines the operations a user is allowed to perform.

LOCK TYPE AND KEY

The two LOCK TYPEs allowed are "password" (PW) and "user identification code" (UIC). The type of key supplied is based on the lock type. If the type is a password, then a string is defined as the key. If the type is UIC, then a "uic" is defined as the key. A "uic" key may contain the "wild card" character (*) to allow any group/member to match.



ACCESS PRIVILEGE

* READ
* WRITE
* MODIFY
* EXTEND
* EXECUTE
* CONTROL

READ ACCESS

* SHOW or EXTRACT a definition from the data dictionary

* READY a domain for read and perform FIND, PRINT, SELECT, SORT and SUMmary operations on the domain

WRITE ACCESS

* All READ privilege operations plus READY for modify, write or extend

* Additional operations of MODIFY, STORE and ERASE can be performed

SLIDE 10.8

MODIFY ACCESS

* ALL READ privilege plus READY for modify and extend, --
  Additional operations of MODIFY and STORE are allowed.

EXTEND ACCESS

* READY for extend and STORE operations only.

EXECUTE ACCESS

* Procedure execution control

* Both TABLE and RECORD definitions which use the tables must be marked as EXECUTE privilege.

CONTROL ACCESS

* Allows the manipulation of object definition and the object password table, DEFINEP, DELETE, DELETEP, EDIT, SHOWP

COMMANDS USED TO CREATE AND MAINTAIN PASSWORD TABLES

* DEFINEP -- Define a password table entry

* DELETEP -- Delete a password table entry

* SHOWP -- Show a password table

DEFINEP

DEFINEP object [(password)] seq-no, PW, new-password, privilege

DEFINEP object [(password)] seq-no, UIC, [grp,mbr], privilege

* OBJECT is a domain, record, procedure or table name.
* PASSWORD is the password required to gain control access to the dictionary object, if required. If not supplied DATATRIEVE uses the current UIC to determine control access privilege
* SEQ-NO The sequence number to be assigned to the entry being defined.
* NEW-PASSWORD defines the password to be associated with the new entry.
* [GRP,MBR] defines the UIC to be associated with the new entry. Note, either the password or UIC form must be used.
* PRIVILEGE indicates the type of access to be allowed by this entry

See notes page 134

DELETEP

DELETEP object [(password)] seq-no

* OBJECT is a domain, record, procedure or table name.

* PASSWORD is the password required to gain control access to the dictionary object, if required. If not supplied, DATATRIEVE uses the current UIC to determine control access privilege

* SEQ-NO is the table entry sequence number to be deleted

SHOWP

SHOWP object [(password)]

* OBJECT is a domain, record, procedure or table name.

* PASSWORD is the password required to gain control access to the dictionary object, if required. If not supplied, DATATRIEVE uses the current UIC to determine control access privilege

order of priority ↓

Password Tables

Passwords must be listed 1st

1, PW, WOMBAT, RWMEC
2, UIC, [311, 4], RW
3, UIC, [311,*], RM
4, UIC, [*,*], R

ADVANCED TOPICS INTRODUCTION

* VIEW -- A view is a "domain" which consists of some or all fields in some or all records of one or more domains. This allows references other than the actual record definitions to be made without having to duplicate data in multiple files.

* HIERARCHIES -- A record definition where the fields have a tree-like structure showing a definite relationship.

* DBMS-11 ACCESS -- DATATRIEVE can retrieve records and sets in a DBMS-11 data base.

VIEW

```
DOMAIN KETCHES
 OF YACHTS BY
01 KETCH OCCURS FOR YACHTS WITH RIG EQ "KETCH".
   03 TYPE FROM YACHTS.
   03 LOA FROM YACHTS.
   03 PRICE FROM YACHTS.
```

> includes manufacturer & Model

This domain definition creates a "view" of the YACHTS data where only records where the rig is of type ketch are included.

See Sailboats Domain

HIERARCHIES

```
RECORD FAMILY-REC

01 FAMILY.

   03 PARENTS.

      06 FATHER PIC X(10).

      06 MOTHER PIC X(10).

   03 NUMBER-KIDS PIC 99 EDIT-STRING IS Z9.

   03 KIDS OCCURS 0 TO 10 TIMES DEPENDING ON NUMBER-KIDS.

      06 EACH-KID.

         09 KID-NAME PIC X(10) QUERY-NAME IS KID.

         09 AGE PIC 99 EDIT-STRING IS Z9.

;
```

list acts like a collection!

The OCCURS clause on the field "KIDS" creates a list where each occurrence contains information for one child.

FOR FAMILY
MODIFY KIDS

DBMS-11

DATATRIEVE can be used to access a DBMS-11 data base. The record and set definitions in the DBMS Data Dictionary are used by DATATRIEVE. There is no need to redefine records for DATATRIEVE.

DATATRIEVE Seminar Sections 1 Through 4

DEFINITIONS

Supply the definitions for the following terms:

* FILE related group of data
* DOMAIN group of records having the same record definition.
* RECORD group of related data items.
* FIELD each individual data item.
* COLLECTION a group of records from a domain created thru "FIND"
* COMMAND inputs which control & modify
* STATEMENT inputs which manipulate data.
* EXPRESSION a means of specifying
* VALUE EXPRESSION specifys numeric or string value
* BOOLEAN EXPRESSION true/false value
* RECORD SELECTION EXPRESSION specifys stream of records
* PRINT LIST

DATATRIEVE Seminar Sections 1 Through 4

* COMMAND MODE Data is manipulated, formatted, & printed.

* GUIDE MODE interactive aid for operations performed by User

* ADT MODE Aid for producing definitions

* EDIT MODE A line editor used for modification of definitions

* NAMES Symbolic identifiers

* COMPOUND STATEMENT Multiple statements between a BEGIN END statements.

* BOOLEAN OPERATORS NOT AND OR

* RELATIONAL OPERATORS =, >, <, BT, CONT, IN, ANY

* RECORD STREAM

COMMANDS AND STATEMENTS

Classify each of the following as a command or statement and give a brief description.

_ SHOW command

_ EDIT command

_ PRINT statement

_ READY command

_ BEGIN statement

_ ADT command

_ DECLARE statement

_ NEW-PRICE = PRICE * 1.1 statement

_ FINISH command

_ SUM statement

_ SORT statement

_ END statement

_ THEN statement

_ EXIT command

_ FIND statement

_ SET command

_ HELP command

DESCRIBE THE YACHT RECORD DEFINITION

Describe, in words, the definition of each field of the YACHT record. Indicate which fields are group fields and which are elementary.

```
01 BOAT.
   03 TYPE.
      06 MANUFACTURER     PIC X(10).
      06 MODEL PIC X(10).
   03 SPECIFICATIONS.
      06 RIG PIC X(6).
      06 LENGTH-OVER-ALL PIC XXX.
      06 DISPLACEMENT     PIC 99999.
      06 BEAM PIC 99.
      06 PRICE PIC 99999.
```

Group
ele.
ele.
Group
ele.
ele.
ele.
ele.
ele.

DATATRIEVE Seminar Sections 1 Through 4

DESK EXERCISE

Assume the following input lines are processed in a single DATATRIEVE session. Describe, in words, the operations performed and results of each of the following:

1 READY YACHTS

enables user to read the Yachts domain.

2 PRINT ALL YACHTS

displays all Yachts records

3 PRINT MODEL, RIG OF FIRST 20 YACHTS

prints Model + Rig of 1st 20 Yachts

4 FIND ALL YACHTS WITH PRICE = 0

creates a record-stream of yachts with price = 0

5 PRINT ALL

prints above record-stream.

6 PRINT ALL CURRENT SORTED BY BEAM

Prints above record-stream by asc beam.

7 SORT BY BEAM

SORTS YACHTS with Price = 0 by asc beam.

8 SHOW COLLECTIONS, CURRENT

CURRENT & info

9 PRINT FIRST 5 OF CURRENT

displays 1st 5 of Current

10 PRINT ALL OF MY-PRICE IN YACHTS WITH PRICE LESS-THAN 10000 AND PRICE GT 0 SORTED BY BEAM

Prints collection MY-PRICE with PRICE LT 10000 + GT 0 sorted by BEAM.

11 PRINT FIRST 5 OF MY-PRICE

No collection MY-PRICE has been made. Must have find. 5

12 FIND ALL BIG-YACHTS IN YACHTS WITH LOA GT 30 SORTED BY PRICE

Creates collection BIG-YACHTS

13 PRINT FIRST 5 OF BIG-YACHTS

Displays 1st 5 of BIG-YACHTS

14 PRINT FIRST 5 OF CURRENT SORTED BY PRICE

DISPLAYS 1st 5 of current sorted by PRICE

15 DECLARE NUM USAGE IS COMP.

Declares variable NUM

16 NUM = COUNT OF BIG-YACHTS

Assigns value to NUM

17 PRINT NUM

Displays NUM

What collections, if any, exist at this time? If there are any, what are their names and attributes (e.g., sorted, number of records, etc)?

BIG-YACHTS 58 records SORTED BY Price

Current 63 Records SORTED BY BEAM

DATATRIEVE Seminar Sections 1 Through 4

LAB WORK

1. Run DATATRIEVE and exit

2. Run DATATRIEVE and request help on some commands and statements which have been covered thus far in the seminar.

3. Request help and advanced help on the topic "value".

4. Show information from the data dictionary

5. Enter Guide Mode and perform the following operations:

    1. Print the contents of the YACHTS domain on your terminal

    2. Print only the displacements on your terminal

    3. Print all rig and beam information on your terminal

    4. Exit guide mode

6. Perform all of the Guide Mode Exercise operations in command mode.

7. Exit DATATRIEVE

8. Perform the DESK EXERCISE and check your descriptions.

9. Run DATATRIEVE and perform various print operations of your choice.

10. Create a collection which contains the first 20 records of YACHTS

11. Produce a listing of the collection so that the output is in order by price. (Do this two ways.)

12 Declare a local variable called "NUM-REC" and assign it a value which is the number of records in YACHTS which have a price of 0. (Do this in two ways.)

DEFINITIONS

Supply the definitions for the following terms:

* FIELD BREAK

* CONTROL GROUP

* DETAIL LINE In report-writer -- the output line containing stored data.

* COLUMN HEADER Heading of columns -- field name or query-heade

* SUMMARY LINE trailer line or summary function

* REPORT NAME name of report

* LEVEL NUMBER numbers in a record definition signifying subordinance.

* EDIT STRING format for output

* QUERY HEADER heading for report

* QUERY NAME abbreviation

* TABLE Converts a code to a longer form or validated data.

* PROCEDURE Commands & statements stored in the dictionary.

* CURRENT RECORD made Thru 'SELECT'

* KEYWORD Datatrieve word

* PROTECTION ATTRIBUTES

COMMANDS AND STATEMENTS

Classify each of the following as a command or statement and give a brief description.

_ DEFINE DOMAIN command
_ MODIFY statement
_ ERASE statement
_ REPORT command
_ DEFINE RECORD command
_ STORE statement
_ DEFINE PROCEDURE command
_ SELECT statement
_ EXTRACT command

DESCRIBE THE RECORD SELECTION EXPRESSION

1 Write the general form of a Record Selection Expression.

2 Explain each of its parts.

DESCRIBE A REPORT DEFINITION

Describe, in words, the following report definition.

```
DTR> REPORT ALL YACHTS WITH PRICE BETWEEN 1 AND
RW>  10000 SORTED BY BUILDER, PRICE
RW>  AT TOP OF BUILDER PRINT BUILDER, AVERAGE PRICE
RW>  SET REPORT-NAME = "BUILDER / PRICE REPORT"
RW>  SET COLUMNS-PAGE = 132
RW>  PRINT MODEL, SPECS
RW>  AT BOTTOM OF BUILDER PRINT AVERAGE PRICE
RW>  AT BOTTOM OF REPORT PRINT AVERAGE PRICE
RW>  END-REPORT
```

DESK EXERCISE

Assume the following input lines are processed in a single DATATRIEVE session. Describe, in words the operations performed and the results of each:

1 DEFINE DICTIONARY name.DIC (supply your initials or some other unique 3 to 9 character name)

creates a dictionary

NOTICE: If you get an error doing the above operation please ask for help before going on.

NOTICE: If you exit DATATRIEVE and rerun it then issue the following command to get back to your dictionary:

SET DICTIONARY name.DIC

2
```
DEFINE RECORD MY-REC USING
     01 CLASS.
        10 NAME.
          20 FIRST-NAME  PICTURE IS X(20).
          20 LAST-NAME PICTURE IS X(25)
             VALID IF LAST-NAME NE " ".
        10 AGE USAGE IS COMP PICTURE IS 99
           VALID IF AGE GT 0 AND AGE LT 80.
     ;
```

creates record

3 DEFINE DOMAIN PEOPLE USING MY-REC ON name.DAT; (supply your initials or some other unique 3 to 9 character name)

creates domain

4 DEFINE FILE FOR PEOPLE KEY = LAST-NAME (DUP) ;

creates file Indexes Last-Name. Allows duplicates.

5 READY PEOPLE WRITE

Readies domain for write

6 STORE PEOPLE (Perform this 5 or more times)

Adds new data

7 PRINT ALL PEOPLE

Prints all data

8 PRINT ALL PEOPLE SORTED BY LAST-NAME (Explain why this print and the previous print appear as they do.)

People has indexed field of LAST-NAME so it already sorted by that.

9 Define the following procedure:

```
DEFINE PROCEDURE NOT-SMITH

STORE PEOPLE VERIFY USING

IF LAST-NAME = "SMITH" THEN ABORT "SMITH NOT ALLOWED"

END-PROCEDURE
```

Stores people - not allowing "Smith"

10 :NOT-SMITH (Perform this 5 or more times and assign a last name of SMITH)

11 Enter the following report definition:

```
REPORT ALL PEOPLE SORTED BY AGE
SET REPORT-NAME="PEOPLE BY AGE"
AT TOP OF AGE PRINT AGE, AVERAGE AGE
PRINT NAME
AT BOTTOM OF AGE PRINT COUNT
AT BOTTOM OF REPORT PRINT " AVERAGE IS ",
SPACE 2, AVERAGE AGE
END-REPORT
```

LAB WORK

1 Request help on the record selection expression

2 Request help on report writer

3 Request help on record definitions

4 Show the YACHTS domain and YACHT record definition

5 Create a report definition to produce the following report for all records in the yachts domain.

- A control group of builder, within that a control group of rig type, within that a control group of beam.
- The detail lines should be sorted by price and not include builder, rig or beam information.
- At the end of each control group print the average price for the group
- At the end of the report print the average price of all yachts reported.

6 Define a procedure which contains the above report definition but change the report definition to work with a collection called MY-BOATS. (Make no assumptions about the order of records in MY-BOATS.)

7 Create several different collection of records from yachts

and use the above procedure to generate reports based on the collections.

12 Exit DATATRIEVE

13 Perform the Desk Exercise

DEFINITIONS

Supply the definitions for the following terms:

* VALIDATION

* WORKING STORAGE

* POOL SPACE

* RELEASE

* DATA DICTIONARY

* PASSWORD TABLE

* LOCK TYPE

* PRIVILEGE TYPES

* VIEW

* HIERARCHIES

COMMANDS AND STATEMENTS

Classify each of the following as a command or statement and give a brief description.

_ RELEASE

_ IF THEN ELSE

_ FOR

_ DEFINE DICTIONARY

_ DEFINEP

_ WHILE

_ ABORT

_ REPEAT

_ DELETE

_ DELETEP

_ SHOWP

DESK EXERCISE

Assume the following input lines are processed in a single DATATRIEVE session. Describe, in words, the operations performed and results of each.

1 SET DICTIONARY name.DIC (Use the dictionary defined in the previous desk exercise.)

2 READY PEOPLE

3 FOR ALL PEOPLE WITH AGE LT 25 PRINT NAME

4 FOR ALL PEOPLE IF AGE LT 25 THEN PRINT NAME

5 FIND ALL PEOPLE WITH AGE LT 25

6 PRINT ALL CURRENT

7 FINISH

8 READY PEOPLE WRITE

9 REPEAT 3 STORE PEOPLE

10 REPEAT 3 STORE PEOPLE USING

11 BEGIN

```
12 LAST-NAME = *."LAST NAME"

13 FIRST-NAME = *.FIRST

14 AGE=2

15 END

16 DECLARE TOT-AGE USAGE COMP PIC IS 9999.

17 PRINT ALL PEOPLE SORTED BY AGE

18 FOR ALL PEOPLE BEGIN

19 IF AGE LE 10 THEN PRINT "VERY YOUNG" , NAME ELSE

20 IF AGE GT 60 THEN PRINT " OLDER", NAME ELSE

21 PRINT " MIDDLE AGED", NAME

22 TOT-AGE=TOT-AGE + AGE

23 END

24 PRINT (TOT-AGE / COUNT OF PEOPLE), AVERAGE AGE OF PEOPLE
```

LAB WORK

1 READY the YACHTS domain for read

2 Declare the following variables, K-COUNT, MS-COUNT, S-COUNT, as COMP with a PICTURE clause of 9(4).

3 Enter the following input lines:

```
* FOR ALL YACHTS BEGIN

* IF RIG = "KETCH" THEN K-COUNT = K-COUNT + 1 ELSE

* IF RIG = "MS" THEN MS-COUNT = MS-COUNT + 1 ELSE

* IF RIG = "SLOOP" THEN S-COUNT = S-COUNT + 1 ELSE

* ABORT "RIG IS NOT OF PROPER TYPE"

* END

* PRINT K-COUNT, MS-COUNT, S-COUNT
```

What operation has been performed?

4 FIND ALL YACHTS

5 SUM 1 BY RIG

6 SHOW SPACE

7 FINISH YACHTS

8 SHOW SPACE

9 Perform the Desk Exercise