

AN ACCESS LANGUAGE RETRIEVAL CLASS FOR END USERS AT CONOCO

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CONOCO Research Services Division has implemented three large SYSTEM 2000 (S2K) data bases and is developing a fourth data base. The data bases were developed for our Research and Development Department. A Personnel data base, Project data base, and an Authorization for Expenditure (AFE) data base have been implemented. An Overhead and Operating (O&O) cost data base is being developed. CONOCO is using Release 11.0 of Single User S2K on IBM 308x mainframes under MVS/XA and TSO.

The data bases are updated both in batch and on-line. Each division in R&D is responsible for loading and updating their records in the data bases. On-line updates are made by one person in each division using PL/I PLEX Dialog Manager (full screen) programs. Batch updates are submitted by one person in each division. Standardized reports are generated regularly using S2K Report Writer and PL/I PLEX programs.

No sooner were the first standardized reports generated than supervisors and managers at all levels in R&D began to request different kinds of reports and the same reports with different formats or different sort keys. The demand was so great and varied that the Research Services Division data base support staff was inundated. The only timely solution to satisfy the requests was to retrieve as much of the information as possible using S2K ACCESS Language retrieval commands and develop S2K Report Writer and PL/I PLEX programs for the remaining requests.

This meant training data clerks and secretarial staff in each division in R&D in S2K ACCESS Language retrieval commands. Most of these employees had no experience with terminals or computers or software application packages. These were going to be "end-users" with the emphasis on "the end"!

The Computer and Telecommunications Services Department (C&TSD) in CONOCO had established a User Training program in the summer of 1982. A course in System Productivity Facility (SPF) - an IBM System Product with full screen Edit, Browse and other capabilities which runs under TSO - was one of the first classes developed and offered. More than three hundred fifty end-users from all departments in CONOCO and more than seventy end-users from R&D have taken the course in the last two years. An on-line Computer Based Training (CBT) course was installed in 1984 and over two hundred end-users have taken the CBT course.

The R&D data clerks and secretarial staff were sent to the SPF lecture class and/or required to take the CBT SPF course. In addition, Research Services Division conducted a one day seminar for these employees which was designed to give them a general overview of what was in the three data bases and what they might be expected to retrieve for their supervisors and managers.

Since no on-line ACCESS Language updates are permitted, the training of the R&D employees was to consist of ACCESS Language concepts and retrieval commands only.

A two day class, S2K ACCESS, was developed by the C&TSD Education Center. It consists of one day of Concepts and Terminology using Part 2 of Volume 1 of the Access and Queue Language Specification Manual, a half day on Syntax using Part 4 of Volume 2 of the Access and Queue Language Specification Manual, and a half day devoted to applications from the data bases the students will be using back on the job. All references to update commands are carefully avoided.

In the section on Concepts and Terminology the following topics are introduced:

- (1) A Data Base.
- (2) Data Entries.
- (3) Data Records.
- (4) Data Items.
- (5) Hierarchies.
- (6) Data Trees.
- (7) Schemas.
- (8) Schema Records.
- (9) Schema Items.
- (10) Schema Trees.
- (11) Similar Records.
- (12) Schema Components.
- (13) Component Numbers.
- (14) Component Names.
- (15) Relationships - Parent, Ancestor, Child, Descendant, Sibling, Level, Path, Family.
- (16) Subtree.
- (17) Related and Disjoint Schema Records.
- (18) Null Items, Null Records.
- (19) Control Records, Control Nodes.
- (20) Item Types - Integer, Decimal, Money, Date, Character, Text.
- (21) Strings and Functions.
- (22) Displaying and Interpreting a Data Base Definition.
- (23) Creating a Schema Diagram From DESCRIBE Output.
- (24) Brief Overview of S2K Physical Storage Structure.
- (25) The Index.
- (26) The Extended Field Table.
- (27) The Hierarchical Table.
- (28) The Multiple Occurrence Table.
- (29) The Data Table.
- (30) Logical Order.
- (31) Physical Order.

All of these topics are introduced using the Employee demonstration data base. The data base schema and the diagrams of some of the entries are used throughout.

All of the employees who have attended the class so far have been able to handle these concepts. They are introduced with many examples and questions are encouraged at all times.

A large screen monitor is available at the front of the classroom so that on-screen examples of the commands can be shown. The TSO command to access the Employee demonstration data base, the data base password and the DESCRIBE output of the data base definition can be displayed on the screen.

The retrieval commands are introduced next. Topics covered include the following:

- (1) Action-clause.
- (2) Where-clause.
- (3) Conditions.
- (4) Operators - Unary, Binary, Ternary, and Text Search.
- (5) Unary Operators - EXISTS, FAILS.
- (6) Binary Operators - EQ, NE, GE, GT, LE, LT.
- (7) Qualified Records.
- (8) Expressions.
- (9) Logical Expressions - And, Or, Not.
- (10) The AT Operator.
- (11) The HAS Operator.
- (12) Normalization - Implicit, Explicit.
- (13) Focal Records.
- (14) Parentheses.
- (15) Placement of Conditions.
- (16) TALLY.
- (17) PRINT.
- (18) LIST.
- (19) Format of Retrieval Commands.
- (20) ORDER BY.
- (21) BY PHRASES.
- (22) DITTO.
- (23) SAME.
- (24) System Functions - COUNT, SUM, MAX, MIN, AVG.

- (25) Ad Hoc Functions.
- (26) The TSO Allocate Command.
- (27) Command Files.
- (28) Report Files.

These concepts are also introduced with the use of a large screen monitor and hands-on exercises for the students as the concepts are discussed. They can see the exercises in the materials, the commands to perform the retrievals and the output. The monitor displays the same information. If a student has difficulties, the instructor or an experienced employee who is designated by the Research Services Division to accompany each group can come to their terminal and help them get the desired results.

One common problem for these end-users is grasping the notion that S2K and SPF are two different application tools which are both running in the TSO environment. It is not uncommon for them to issue SPF commands while in S2K or to issue S2K commands while in SPF.

The last activity on the first day is to solve the following problems concerning the Employee data base:

- (1) Find the maximum and minimum hourly pay rate.
- (2) Find the maximum and minimum monthly pay rate.
- (3) Find the name, sex and age of the persons with the maximum and minimum hourly pay rate.
- (4) Find the name, sex and age of the persons with the maximum and minimum monthly pay rate.
- (5) Find the minimum, maximum and average age of the employees in the data base.
- (6) Find the average hourly pay rate for males and females.
- (7) Find the average monthly pay rate for males and females.
- (8) Find the average age for male and female employees.
- (9) Create a list of all employees by department, by last name, by sex and list their last name, forename, age, department and sex.
- (10) Find the number of employees whose first job was in the Marketing Department.

On the second day, the SYNTAX of ACCESS commands is introduced. This introduction is intended to make Part 4 of Volume 2 available to the students as a reference guide. It has not been possible to cover this material in depth. At the end of this session they should know where to look if a SYNTAX error occurs in one of their retrieval commands. The topics covered include:

- (1) Considerations for All S2K Commands.
- (2) General Format of ACCESS Language Retrieval Commands.
- (3) DATE FORMAT.
- (4) DESCRIBE.
- (5) Keywords and Abbreviations.

LIST	LI
NUMBER	NUM, NUMB
ORDERED BY	OB
PRINT	PR
SUPPRESS	SUP
UNLOAD	UN
WHERE	WH
- (6) Options

INDENT	BLOCK
NULL SUPPRESS	NULL
NUMBER	NAME
REPEAT	REPEAT SUPPRESS
SINGLE SPACE	DOUBLE SPACE
STUB	STUB SUPPRESS
TREE	RECORD
ZERO SUPPRESS	ZERO
- (7) WHERE CLAUSE.
- (8) CONTAINS.
- (9) NON-KEY.
- (10) HAS, AT, BY.
- (11) Derived Information.
- (12) TALLY.
- (13) System Functions.
- (14) LIMIT.

The last half day is devoted to applications the students have brought concerning the data bases which they will use on the job. One of the first things they discover is that it is easy to formulate a LIST command asking for disjoint records. Now they know that this is a request they will have to forward to their data base support analyst. In the meantime they can produce two listings - perhaps with a key field in the same order on both listings.

Forty-three persons from R&D have taken the SYSTEM 2000 ACCESS class and their evaluations have been positive. The class is currently being updated to include the COLLECT file concepts and to have more than one data base open for ACCESS Language queries.

In summary, a definite need existed for data clerks and secretarial staff in R&D to become proficient in ACCESS Language retrieval commands. The ACCESS and QUEUE Language Specification Manual content and organization in Part 2, Volume 1 and Part 4, Volume 2 are an excellent basis for a two day class for "end"-users. The large screen monitor is an invaluable tool in teaching classes involving interactive applications. I would hate to attempt this class without this equipment. The teaching assistant from the Research Services Division also helps a great deal. The students do not hesitate to ask them any question, even those they think are "stupid". I try to assure them that the only "stupid" questions are the ones they don't ask. In addition to the initial training effort, S2K ACCESS classes are regularly scheduled every other quarter.

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