IBM System/34 Utilities Program Product
Program Number 5726-UT1

The IBM System/34 Utilities Program Product helps programmers and operators:

- Create and maintain System/34 display screen formats and menus
- Create, maintain, list, and sort System/34 files
- Create, and maintain source members and procedure members in System/34 libraries

The Utilities program product consists of five programs: screen design aid (SDA), work station utility (WSU), data file utility (DFU), source entry utility (SEU), and sort.

The system operator and the operator at each command display station can sign on any of the five programs that compose the Utilities program product. Each of the programs can be called by a procedure command.

More than one operator can run a particular WSU program at the same time, and different operators can run different WSU programs at the same time. Each operator can also sign on a copy of SDA, DFU, SEU, or sort even though other operators are running a copy of the same program.

Besides prompting for parameters necessary for sign-on, SDA, WSU, SEU, and portions of DFU run interactively. That is, SDA, WSU, and SEU prompt the calling operator for required information or data during all SDA, WSU, and SEU jobs. DFU prompts for information or data during most kinds of DFU jobs.

Throughout a Utilities job, the operator can use the keyboard function control keys and data keys as required. SDA, WSU, DFU, and SEU also assign command function keys to simplify operation.

Screen Design Aid

SDA is used to:

- Create, change, and delete display screen formats
- Create skeleton RPG II WORKSTN programs
- Create and change menus

SDA allows the user to design and change display screen formats interactively. Thus, the user can:

- Review the appearance and attributes of a new or changed display screen format before the format is generated
- Avoid coding display screen format specifications

To create or change a format with SDA, the user enters an image of the display that is to be created, or displays the format that is to be changed. The user then enters a field attribute code for each field in a new format; or, when changing an exisitng format, the user either alters the displayed image and enters new field attribute codes for each field or just enters new attributes for selected fields. The attribute codes identify such attributes as numeric field, protect field, field length, and so on. After all required attribute codes are entered, SDA converts the information into display screen format specifications that define the new or changed format.

A related option of SDA generates RPG II specifications from display screen format specifications created by SDA (or from equivalent display screen format specifications). The RPG II specifications are for an RPG II WORKSTN file, and are created to reflect display screen formats used by the RPG II program. The specifications that SDA creates are RPG II control (H), file description (F), input (I), and output (O) specifications. The generated specifications define the fields required by the RPG II WORKSTN file.

SDA can delete display screen formats. After the user names the format to be deleted, SDA scans a source member for the corresponding display screen format specifications and deletes the specifications from the source member.

After display screen format specifications are created, changed, or deleted by SDA, SDA calls, at the user's request, $SFGR (display screen format generator utility program). $SFGR then creates a format load member to reflect the formats that were added, changed, or deleted by SDA.

Besides helping to create and maintain display screen formats, SDA simplifies the creation and maintenance of System/34 menus. SDA helps a user create or change a menu by prompting for the information required by BLDMENU, which is the System/34 build menu procedure. After the user enters information in response to the prompts, SDA creates or modifies the source message members required by BLDMENU, then calls BLDMENU to create the new or modified menu. Because SDA prompts for all required information in a fixed format, SDA permits the user to create or change menus without concern for the requirements of BLDMENU.

SDA displays, on request, information to guide the user through each part of an SDA job.

Work Station Utility

WSU provides a way to code data entry and inquiry programs.

WSU is designed to generate a data entry program that creates a single file from data entered from one or more display stations. A WSU data entry program can be front-end entry for RPG II programs that do final editing, processing, updating, and printing (WSU does not provide printed output).

A WSU program can be used by as many as eight operators at once (the program is a multiple requestor terminal program). Each data entry program, using input from operators, from master files, and from results of processing within the program, creates or maintains one transaction file (a direct output file). Also, the program can update master files.

Two or more different WSU programs can be running at the same time. For example, payroll input, job costing input, and accounts payable input may be handled by three separate WSU programs that run at the same time. Two or more programs can share the same master files.

WSU programs can do:

- Simple data entry
- Data entry with edit
- Data entry with update
- Review of records in the transaction file
- Insertion of records into the transaction file

WSU offers more complex editing of data, processing of data, and formatting of displays than DFU. WSU simplifies the coding of interactive programs by providing easy-to-use ways to handle output to a transaction file and to allow review and correction of transaction file data. WSU also provides a structured way of coding and a cycle designed to simplify interactive programming.

Input from the programmer to WSU consists of WSU specifications, which provide the information needed to generate a program. These specifications indicate where WSU can find the RPG II specifications that describe the transaction file and master files used.

WSU specifications also describe the display screens and functions of a WSU application. A programmer can code the specifications on printed coding forms. An operator can then use SEU to enter the specifications. The programmer can also use SDA to design and define display screens for an application instead of defining them in WSU specifications, and then use SDA to enter the other WSU specifications.

Because the programmer defines the displays and the processing for those displays, the programmer controls the WSU display sequence and subsequent processing. WSU allows a programmer to specify processing for input data from each display, store input and results of processing on disk, and reshow a display for input.

WSU provides built-in functions that reduce the amount of coding required by programmers. For example, programmers can take advantage of an automatic sequence of displays, automatic recovery of the transaction file after system errors, special operations to access records in the transaction file and master files, and protection of one operator's entries from review and modification by other operators.

From the WSU specifications, WSU generation produces a program, a procedure that operators use to call and run the program, a display screen format for each display, and a listing of source code and diagnostic data.

Data File Utility

DFU has four functions:

- *Enter* is used to create indexed files.
- *Update* is used to change records in existing indexed files. Update is also used to add records to and delete records from existing indexed files.
- *Inquiry* is used to find a requested record in an indexed file, display the record, and, optionally, print the record on the allocated printer. While using inquiry, an operator can display any record whose key is in the sorted index area of the file. The operator can use record key fields to display records in random order, or can press the ROLL↑ or ROLL↓ function control key to display records in record key sequence.
- *List* is used to print records from indexed, sequential, and direct files. List creates reports in three formats: record, summary with detail, and summary without detail.
  - Record list: A record list contains one to three lines of column headings for each type of record printed.
  - Summary with detail: A summary list with detail contains one to three lines of headings that reflect all record types printed. The list contains detail lines.
  - Summary without detail: A summary list without detail contains one to three lines of headings to reflect all record types selected for the list, but the list does not contain detail lines: only control fields and accumulator fields are printed, and they are printed only when specified control fields change.
  All lists can use as many as 10 accumulator fields and as many as 5 control fields.

Features of list include:
- Related master file list. Data can be printed not only from the requested file, but also from a related indexed master file. This is accomplished by using a field from the list file as a key to find a record in the master file.
- Record selection. Records can be printed based on criteria specified during job setup. Record selection is determined by the relationship of one field to another, or by the relationship of a field to a constant. As many as 10 comparisons in AND/OR relationships can be specified as record selection criteria.
- Result field calculation. List can calculate result fields from information in either the list file or a related master file. List can also calculate result fields from constant data specified by the operator. A result field can be given a name and used as a factor in succeeding result fields for a record.

A sort can be requested with any list. If a sort is requested, the records in the file are printed in the sequence resulting from the sort, although the file itself is not rearranged. That is, if a sort is requested with a list, an addrout sort is performed. A description of sort follows the description of SEU.

DFU consists of two phases: job setup and job execution. Job setup is interactive. During job setup, DFU prompts for information required for the creation of data format descriptions. Job execution is interactive for the enter, update, and inquiry functions. Job execution is not interactive for the list function.

All DFU jobs can share files on System/34.

Source Entry Utility

SEU helps users create and maintain library source and procedure members. SEU can be used to:

- Enter new statements to create or add to a member
- Update statements in a member
- Delete statements from a member
- Move statements from one location in a member to another location in the same member
- Include in a member statements that already exist in a library
- Scan a member for a statement that contains a specified sequence of characters

To create or maintain a procedure member, SEU can enter or change OCL (operation control language) statements, utility control statements, and statements such as // IF and // ELSE that change procedure job streams. The statements can be entered or changed under control of the SEU free-form display screen format. To create or maintain source members, SEU can enter or change the following kinds of statements under control of SEU-provided display screen formats:

- RPG II specifications
- Auto report specifications
- Sort sequence specifications
- WSU specifications
- Assembler statements
- Specifications for the IBM 1255 Magnetic Character Reader
- Display screen format specifications
- FORTRAN IV statements

All other kinds of source statements, including macroinstructions, can be entered or changed under control of the SEU free-form display screen format, or under control of additional display screen formats created by a programmer. SEU can enter the additional display screen formats, which are defined in display screen format specifications. SEU can also change all display screen formats.

SEU can check the syntax of RPG II and auto report specifications entered or changed under control of the provided RPG II and auto report display screen formats. Unlike the RPG II compiler, which compares a number of statements at a time, SEU can check the syntax of only one statement at a time.

The statements that an operator enters or changes by using SEU can contain as many as 120 characters, including blanks. The operator can select or review exisitng statements randomly, by entering statement numbers, or sequentially, by using the ROLL↑ or ROLL↓ function control key.

SEU is interactive. SEU prompts the operator for information throughout each job.

Sort

Sort can sequence either records in a file or the relative record numbers of records in a file. Records and relative record numbers can be sorted into ascending seqeunce, descending sequence, or a different sequence defined by the user. Sort can select or omit records in an input file according to:

- The relationship of a field to a constant
- The relationship of a field to all or part of the program date
- The relationship of two fields within a record
- The existence of at least one condition specified in a series (OR)
- The existence of all conditions specified in a series (AND)
- A combination of the above

The sort input file can be sequential, indexed, or direct. Sort always reads the records in an input file sequentially. The input file can contain more than one record type. Sort control fields, that is, fields that are sorted on, do not need to be in the same position for different record types.

Output from sort is a sequential file in one of three formats:

- An addrout sort produces an output file of sequenced relative record numbers that can be used to access the input file in a specified sequence.
- A tagalong sort produces an output file of records that contain control fields only, control fields and data fields, or data fields only.
- A summary tagalong sort produces an output file of records that contain: control fields, data fields, or summary data fields; or, any combination of control fields, data fields, and summary data fields.

Sort requires a work file. The work file is allocated automatically if it is not specified. The work, input, and output files must all reside on the disk.

Sort is not interactive. Sort does not prompt for sequence specifications. If the SORT command is used to call sort, the sequence specifications must be stored in a source member.

If a job requires options that cannot be specified in the SORT command, the operator can use OCL statements to call sort. The OCL statements can be stored in a procedure or entered from the keyboard. If the OCL statements are stored in a procedure, the sequence specifications can be included in the procedure or stored in a source member. If the OCL statements are entered from the keyboard, the sequence specifications can also be entered from the keyboard, or they can be stored in a source member.

Specified Operating Environment

System Configuration

The System/34 Utilities Program Product runs on all models of System/34. Each copy of SDA, WSU, DFU, SEU, or sort requires a minimum of 14K (14,336) bytes of main storage. WSU, DFU, and sort take advantage of additional main storage if it is available.

Programming Systems

All System/34 program products are designed to operate in an environment that includes the System/34 System Support Program Product, Program Number 5726-SS1, or its equivalent.

The use of SDA to modify single statements existing in a source member requires that the SEU load members exist either in the active user library or in the system library.

The use of DFU to list a file in sorted order requires that the sort load members exist either in the active user library or in the system library.

Compatibility

- DFU: System/32 source members that contain RPG II file description specifications and RPG II input specifications for DFU, and System/32 source members that contain DFU specifications, can both be used as input to System/34 DFU to create the load and subroutine members required for the DFU execution phase.

  After the required load and subroutine members are created, DFU commands entered on System/32 to process files can be entered on System/34 to produce the same results. The filetype parameter in DFU commands for System/34 must be blank or D: System/34 DFU processes only files; System/34 SEU processes source and procedure members.

- SEU: System/34 SEU performs all the functions performed by System/32 SEU. Because SEU does not have a compilation or generation phase, source compatibility does not apply to SEU.

  SEU format descriptions created for System/32 by a user must be redefined as display screen formats for System/34 SEU. The System/34 display screen formats must be defined in display screen format specifications. SDA or SEU can be used to create the specifications.

- Sort: Given the same sequence specifications and input file, System/34 sort and System/32 sort produce output files that contain identical record sequences.

Warranty

The System/34 Utilities Program Product is
warranted to conform to its Licensed Program
Specifications when shipped to the customer if
properly used in the Specified Operating
Environment.

Licensed Program Specifications may be updated
from time to time, and such updates may
constitute a change in specifications.

Following the discontinuance of all program
services, this program will be distributed on an
"As Is" basis without warranty of any kind either
express or implied.

Any other documentation with respect to this licensed
program, including any documentation referenced herein,
is provided for information purposes only and does not
extend or modify these specifications.