

**SYSTEM/34 BASIC ASSEMBLER AND
MACRO PROCESSOR
5726-AS1****PURPOSE**

The Basic Assembler licensed program is a symbolic programming language used to write programs or subroutines for the IBM System/34. Source programs written in this language are processed by the Basic Assembler licensed program to produce relocatable object programs which are subsequently converted to executable format by the System/34 System Support Program Overlay Linkage Editor facility. The System/34 Libraries are used to store the source statements, relocatable object programs and executable 'load' programs.

The Basic Assembler may also be used for assembly of relocatable subroutines for use with System/34 RPG II and COBOL. The subroutines written in the Basic Assembler language are coded by the user and separately assembled. The process of program linking is accomplished during compilation of the RPG II and COBOL source programs.

HIGHLIGHTS

Some of the features provided by the Basic Assembler licensed program are:

- Mnemonic Operation Codes
- Symbolic Referencing of Storage Addresses
- Automatic Storage Assignment
- Address Displacement Calculation
- Convenient Data Representation
- Operand Field Expressions
- Source Identification - Sequence Fields
- Assembler Instructions
- Cross-Reference Listings
- Error Checking and Diagnostic Messages

DESCRIPTION

System/34 Macros: System/34 Macros provide support to the Assembler user through the Macro Processor for the following System Support Program facilities: Disk functions, printer operation, keyboard and display screen access, 1255 device control, binary synchronous communications, SNA/SDLC communications and other SSP services such as Timer, EOJ, Message Log, program load.

The macros are supplied to provide an interface to existing SSP support.

The BSC Macros provide communication with:

- Another System/34 (RPG II or Basic Assembler)
- System/32 (RPG II or Basic Assembler)
- System/3 (MLMP, CCP or RPG II)
- System/7 (MSP/7)
- System/360 (BTAM or TCAM/NCP)*
- System/370 (BTAM, TCAM/NCP, VTAM/NCP, CICS/VS or IMS/VS)*
- 3741 mdl 2 or 4
- 3747
- 5231 mdl 2 (Receive Mode only) - supported as 3741 mdl 2 or 4
- 5280 Distributed Data System
- Series/1 (supported as a System/3)
- * **Note:** The 3704/3705 Emulation Program (EP) or Partitioned Emulation Program (PEP) extension to 3704/3705 NCP can be used to emulate the 2701.

Additional macros and macro extensions will provide support for the Interactive Communications Feature (SSP-ICF) provided by the System/34 SSP. Specific support is for:

- System/370 IMS/VS (IRSS and SNA/SDLC), CICS/VS, and CICS/DOS/VS using BSC or SNA/SDLC protocols
- System/3 mdl 15 CCP using BSC protocols
- System/34, System/32, 5110, 3741, 5230 using BSC protocols (point-to-point only)

The assembler macros will support the loadable SORT interface from the System/34 Utilities Program and the SSP checkpoint/restart facility.

Additional System/34 macros provide interfaces to the scientific instruction set.

Additional macros may be written by the user using the macro definition language provide.

All macro instructions are expanded into Assembler source language statements by the Macro Processor that in turn can be processed by the Basic Assembler.

SPECIFIED OPERATING ENVIRONMENT

Support will be provided for this licensed program when it is operated in the following specified operating environment:

HARDWARE REQUIREMENTS

IBM System/34 Basic Assembler and Macro Processor licensed program runs on all models of the System/34 and supports all features.

SOFTWARE REQUIREMENTS

The current release of IBM System/34 Basic Assembler and Macro Processor licensed program operates under control of the current release of IBM System/34 System Support Licensed Program (5726-SS1).

Program Use During Customer Preinstallation Testing: The System/34 Basic Assembler and Macro Processor licensed program (5726-AS1) is available to customers for preinstallation testing on IBM Test Center systems in accordance with IBM's Program Testing Policy.

DOCUMENTATION
(available from Mechanicsburg)

System/34 Basic Assembler and Macro Processor Licensed Program Specifications (GC21-7677) ... System/34 Basic Assembler and Macro Processor Reference Manual (SC21-7705) ... System/34 Reference Summary (GX21-7674).

RQs ACCEPTED: No

TERMS and CONDITIONS: See PP Index

**SYSTEM/34 BASIC
5726-BA1**
PURPOSE

BASIC (Beginners All-purpose Symbolic Instruction Code) is a high-level interactive language for users who have commercial data processing requirements or who need to solve business, technical, and scientific problems. IBM System/34 BASIC is designed to be easy-to-learn, easy-to-use, and easy-to-remember, enabling the programmer or casual user to concentrate on the application aspects of the programming task. The System/34 BASIC implementation uses a design such that code not executed does not take up main storage, and program size is not limited to region size. System/34 BASIC has the ease-of-use characteristics of an interactive interpreter, and yet offers some of the performance advantages of a compiler.

System/34 BASIC is designed in accordance with the American National Standard Minimal BASIC (x3.60-1978) as understood and interpreted by IBM as of September 1979.

HIGHLIGHTS

System/34 BASIC offers the following functions and advantages to the user:

- Variable and function names can be up to 8 characters long.
- Longer variable and function names provide many unique names and improve the readability of BASIC programs.
- Program lines can be up to 4 display screen lines long. Read/write lists and other statements that extend for more than one line can be entered as one statement.
- A BASIC program line can contain multiple BASIC statements. Multiple statements on a line can shorten a program.
- BASIC program lines can be selectively renumbered. By renumbering program lines you may move lines within a program.
- The number of program statements is not limited by region size.
- Allows the user to stop program execution, examine or change variables, and then resume execution.
- The display may be formatted using the FIELDS parameter of the INPUT and PRINT statements. Most of the screen formatting capability of SFGR may be performed in BASIC.
- The screen may also be formatted using formats created by the screen format generator SSP Utility or by the Screen Design Aid (SDA) portion of the Utilities Program.
- Checks the syntax of each source statement. If a syntax error occurs, the operator can press the HELP key to automatically display the syntax and explanation of the BASIC statement used.
- BASIC program execution flow may be traced and displayed or printed. Simple commands control the start and stop of tracing.
- Provides a HELP function that displays descriptions of the BASIC commands, statements, and intrinsic functions. The HELP function also displays the syntax of each BASIC command and statement.
- BASIC program lines can contain a label. A line can be referenced with either a line number or a label. Labels can simplify programming.
- BASIC procedures may be created. BASIC procedures contain BASIC commands which are used to control the loading and running of BASIC programs. BASIC procedures may also contain BASIC statements, comments and data.
- BASIC supports input and update operations for user switches and local data areas.
- BASIC supports all System/34 file organizations and file access methods (see "Software Requirements").
- Fields of a disk file can be in zoned decimal, packed decimal, binary (1, 2, 3, and 4 bytes), or alphanumeric format. Files may be interchanged between BASIC, COBOL, and RPG.
- You can read and write library source members and OCL procedure members from a BASIC program.
- Logical (AND, OR, NOT) and Relational (for example, >, <, =, <=, >=, and <>) operators are provided.
- Input/Output may be formatted with the FORM or IMAGE statement or will assume default formats, if unformatted.
- Command keys provide forward and backward full screen paging through a program and the roll keys provide up and down line-at-a-time paging when the BASIC list command is being used.
- Supports the following matrix operations:
 - Addition
 - Subtraction
 - Multiplication by a scalar
 - Setting of all elements to a constant

– Creation of an array of index elements that specifies ascending or descending sequence of the data associated with each index element.

- Matrix multiplication, matrix inversion and determinant calculation suggested user-defined functions are provided in the BASIC reference manual.
- ADDROUT SORT files can be read by BASIC.
- A parameter (XREF) on the LIST command provides a cross-reference of a BASIC program.
- The BASIC OCL command procedure converts a BASIC source member into a BASIC member ready to be executed. All invalid statements are flagged and changed to comment statements. This procedure can simplify conversion of programs from another system.
- Support for Multiple Requestor (MRT) programs.
- Support for interactive communications (SSP-ICF).
- Support for timed wait in (SSP-ICF) as an intrinsic function.
- Cross-reference program listings provided.
- An error message may be written on the error line of a display.
- Enhanced support for multiple spooled printer files in one program.
- Support for additional error control on the file OPEN statement.
- Support for specifying, on the OPEN statement, a value for disk file extension when using extendable disk files.
- Additional TRACE support.
- Library name added to program listings.
- Support added to trap all run time syntax errors.
- Option added to BASICP, and BASICR to print HELP STATUS.

DESCRIPTION

BASIC Design Overview: System/34 BASIC is an interactive compiler; it provides the ease-of-use characteristics of an interactive interpreter. For example, some characteristics are: Syntax checking after each statement is entered; capability to run the program immediately; capability to stop program execution, examine or change variables, and then resume execution. After each statement is entered, it is changed to an internal source text. It is because the program is maintained in this internal source text that it can easily be changed, corrected, or executed by the programmer.

System/34 BASIC also provides some of the performance advantages of a compiler. The primary advantage of a compiler is improved execution performance over that of an interpreter. System/34 BASIC provides this advantage when there is sufficient region-size to contain all of the program during execution, because the source text is compiled only once for that execution of the program.

Support for Multiple Requestor (MRT) Programs: BASIC has added support to allow users to code MRT (multiple requestor) programs. This capability can provide improved performance in some situations. By recoding an SRT program as an MRT program, users can reduce the number of active copies of the program to 1. In the case of frequent swapping, performance may be improved by using more MRT programs. Caution must be exercised to ensure that MRT programs are not used in situations that could cause multiple users to wait for an excessive amount of time. To run a BASIC MRT program, a BASIC procedure must be written by the user.

Support for Interactive Communications (SSP-ICF): BASIC users may code programs that handle communications using SSP-ICF. No restrictions are placed on the BASIC programmer. All subsystems available to the RPG II and COBOL programmer are available to the BASIC programmer except that BASIC does not support the encryption routine for the Finance Subsystem.

Support for Timed Wait in SSP-ICF as an Intrinsic Function: BASIC users may use the SSP-ICF function of a timed wait. This capability is provided as an intrinsic function. The BASIC programmer need only place a timer interval of 'HHMMSS' in the intrinsic function and the timer wait is set. A 'WAITIO' operation is used to test the completion of the operation.

Cross-reference Program Listings Provided: BASIC supports an option in the LISTP command and the BASICS procedure to provide a sorted cross-reference listing used in the program as follows:

- line numbers
- labels
- variable names
- user-defined functions

The cross-reference listing has two sections - one section for variables, arrays, and user-defined functions, and a section for line numbers and

S/34 BASIC (cont'd)

labels. This assists users in documenting and debugging BASIC programs.

An Error Message may be Written on the Error Line of a Display: BASIC allows users to display a user-defined error message on the error line of a currently-attached display. This function places up to 78 characters on the last line of the display after saving the previous contents of the line and locking the keyboard. When the operator presses the Error Reset key, the previous contents of the line are redisplayed and the keyboard is unlocked. This function can be used to provide operator guidance during entry/edit applications.

Enhanced Support for Multiple Spooled Printer Files in One Program: Restrictions that were originally placed on the BASIC user when spooling printed output have been removed. Users are no longer restricted in the number of print files opened or the number of times they are opened and closed.

Support for Additional Error Control in the File OPEN Statement: BASIC allows users program control of additional file error conditions that were previously trapped by the system. The user is able to intercept errors such as:

- opening an indexed file for direct or consecutive update or output
- opening a direct file for consecutive output
- opening a consecutive file for direct output
- opening a direct or consecutive file for indexed access

Support for Specifying, in the OPEN Statement, a Value for Disk File Extension when Using Extendable Disk Files:

BASIC allows users to specify a file extend value on the disk file OPEN statement. Previously, this was defaulted to by BASIC and the user could not override it with the OCL. Users may also specify that a file is not extendable.

Additional TRACE Support: The TRACE function has been enhanced to allow STEP mode (in STEP mode one statement is executed each time the ENTER key is pressed). To start this function, the keyword STEP has been added to the TRACE statement. This enhancement provides greater flexibility when debugging complex programs.

Support Added to Trap All Run-Time Syntax Errors: Run-time syntax errors are intercepted as conversion errors. Also, the OPEN statement has been modified to permit users to explicitly specify NOSHR.

Option Added to BASICP and BASICR to Print HELP STATUS: An option has been added to BASICP and BASICR to allow the user to obtain a listing of the same information provided by HELP STATUS in BASIC mode. This information is useful to improve performance and/or storage utilization of programs that are initiated with BASICP or BASICR.

CUSTOMER RESPONSIBILITIES

IBM may provide marketing assistance, in accordance with the Marketing and Service Guidelines in the GI section, in the installation of IBM licensed programs. However, the responsibility for providing accurate ordering information, personnel selection and training, installation, and continued day-to-day operation lies solely with the customer.

Installation of System/34 licensed programs is a customer responsibility.

SPECIFIED OPERATING ENVIRONMENT

Support will be provided for this licensed program when it is operated in the following specified operating environment:

HARDWARE REQUIREMENTS

The IBM System/34 BASIC licensed program will run on models of the IBM System/34 having at least 48K bytes (mdl BXX) of main storage. The minimum region size is 24K bytes. Programs may require a larger region size. A larger region size than is required may improve performance.

IBM System/34 BASIC requires a print belt with a minimum of 64 characters to print all of the uppercase characters on the IBM 3262 or 5211 printer. A print belt with a minimum of 96 characters is required to print lower case characters.

When BASIC is installed with the Multinational Character Set feature, keyboards that do not contain the \$, # or < symbols are used, these characters must be entered as their two character hexadecimal equivalent.

SOFTWARE REQUIREMENTS

All IBM System/34 licensed programs are designed to operate in an environment that includes the System Support Program (5726-SS1) or its equivalent.

The BASICR Operation Control Language command provides the capability to evoke a BASIC program without using BASIC command mode. BASICR also supports the use of a procedure that could contain // FILE OCL to override parameters in a BASIC file OPEN statement.

The System Support Program (5726-SS1) or its equivalent must be configured for extended disk data management to use BASIC support for deleted records.

FORTRAN programs or programs using the Scientific Instruction Set may not be executed concurrently with BASIC command mode or program execution.

BASIC does not support logical processing of unformatted sequential access files created by the System/34 FORTRAN IV licensed program (5726-FO1).

Source Entry Utility (SEU as part of Utility Program, 5726-UT1) is available to help the data entry person enter BASIC source statements into a library source member. Previously entered source statements may also be changed with SEU. A BASIC program must be in a library source member in order to use SEU. The SEU scan feature may also be useful when changing a BASIC program.

The SORT program can be used to sort all BASIC disk data record files.

COMPATIBILITY

Differences do exist between 5100/5110 BASIC and System/34 BASIC. Conversion of most source programs will be required. An outline of these differences will appear in the *System/34 BASIC Reference Manual*.

Program Use During Customer Pre-installation Testing: The System/34 BASIC licensed program (5726-BA1) will be available to customers for pre-installation testing on IBM Test Center systems in accordance with IBM's Program Testing Policy.

DOCUMENTATION

(available from Mechanicsburg)

System/34 BASIC Licensed Program Specifications (GC21-7841) ... System/34 BASIC Reference Manual (SC21-7835).

TERMS and CONDITIONS: See PP Index

**SYSTEM/34 BASIC SUBSET
5726-BA2**

PURPOSE

This program is intended to support the Preconfigured IBM System/34 System Support Program Subset (5726-SS2).

BASIC (Beginner's All-purpose Symbolic Instruction Code) is a high-level interactive language for System/34 users who have commercial data processing requirements or who need to solve business, technical, and scientific problems. System/34 BASIC is designed to be easy-to-learn, easy-to-use, and easy-to-remember, enabling the programmer or casual user to concentrate on the application aspects of the programming task. The System/34 BASIC implementation uses a design such that code not executed is kept out of main storage, and program size is not limited to region size. System/34 BASIC has the ease-of-use characteristics of an interactive interpreter and yet offers some of the performance advantages of compiled code (see BASIC Design Overview).

System/34 BASIC is designed in accordance with the American National Standard Minimal BASIC (x3.60-1978) as understood and interpreted by IBM as of October 1979.

HIGHLIGHTS

System/34 BASIC offers the following advantages to the user:

- Variable and function names can be up to 8 characters in length. Longer variable and function names improve the readability of BASIC programs.
- A source statement can be up to four display screen lines in length. Thus, read/write lists and other statements that extend for more than one line can be entered on one statement.
- A BASIC program line can contain multiple BASIC statements. Multiple statements on a line shorten a BASIC program.
- BASIC program lines can be selectively renumbered. By renumbering program lines, you may also move lines within a program.
- The number of statements in a program is not limited by the region size.
- You can stop execution of a program or a BASIC procedure to examine or change variables and then resume execution.
- BASIC checks the syntax of each source statement. When a syntax error occurs, the cursor is positioned under the error.
- BASIC program lines can contain a label. You can reference a line with either a line number or a label. Labels improve program readability.
- BASIC has two entry modes: Program and data. When program mode is active, you can enter BASIC program lines and BASIC commands, which are syntax-checked as they are entered. When data mode is active, you can enter any data that you want to save in a library source member. The data is not syntax-checked.
- When data mode is active, you can create BASIC procedures which can be used to load and run BASIC programs. BASIC procedures can contain BASIC commands, BASIC statements, comments, and input data.
- BASIC supports input and update operations for user switches and the display station local data area.
- BASIC supports all System/34 file organizations and file access methods (see "Software Requirements").
- The fields of a disk file can be in zoned decimal, packed decimal, binary (1, 2, 3, and 4 bytes), or alphanumeric format; thus, you can create and update files in BASIC that can also be used by RPG II.
- You can read to and write from library source members and System/34 procedure members from a BASIC program.
- BASIC allows multiple print files.
- BASIC can use display screen formats created by the screen format generator SSP utility program (SSFGR).
- You can write to and read from the display screen using the PRINT FIELDS and INPUT FIELDS statements. The display screen is formatted by a character array in the PRINT FIELDS or INPUT FIELDS statement. A single field can be formatted by a character expression.
- After BASIC programs are entered, they can be saved in either library source or library subroutine members. For enhanced performance when loading a program, save it in a subroutine member.
- After BASIC procedures are entered, BASIC saves them in library source members.
- The procedure command, BASICP, allows you to execute BASIC procedures from System/34 command mode.

- The procedure command, BASICR, allows you to execute BASIC programs from System/34 command mode.
- The procedure command, BASICS, allows you to convert a source member containing a BASIC program into a subroutine member and to obtain a listing of all syntax errors (if any exist) in the program. The BASICS procedure command must be entered from System/34 command mode.
- BASIC stores numbers internally in a decimal, floating-point format. This format can prove the magnitude and accuracy required by the scientific user and the discrete penny accuracy required by the accountant and commercial user.
- BASIC supports logical (NOT, AND, OR) and relational (<, >, >=, <=, <>, =) operators.
- Input and output can be formatted with the FORM statement, and output can be formatted with the IMAGE statement. If unformatted, input and output will assume default formats.
- When the BASIC LIST command is entered, command keys provide forward or backward, full-screen paging through a BASIC program or a BASIC procedure, and the roll keys provide up and down, line-at-a-time paging.
- BASIC supports the following matrix operations:
 - Addition
 - Subtraction
 - Multiplication by a scalar
 - Setting of all elements to a constant
 - Creation of an array of index elements that specify the ascending or descending sequence of the data associated with each index element.

DESCRIPTION

BASIC Design Overview: System/34 BASIC subset is an interactive compiler; it provides the ease-of-use characteristics of an interactive interpreter. Some of these characteristics are: Syntax checking after each statement is entered (if program mode is active); the capability to run a BASIC program immediately; and the capability to stop program execution, examine or change variables, then resume execution. After each statement is entered, it is changed to an internal source text. Because the program is maintained in this internal source text, it can easily be changed or corrected by the programmer.

System/34 BASIC subset also provides some of the performance advantage of compiler code. The primary advantage of a compiler is improved performance over that of an interpreter. System/34 BASIC subset provides this advantage when there is sufficient region size to contain all of the program during execution, because the source text is compiled only once for that execution.

When sufficient region size is not available, the compiler fetches as much source text as storage permits, compiles it, executes it, and goes back for more source text. Code not executed is not compiled.

For example, if there is sufficient storage for the main loop of a program, the source text for the main loop might need to be compiled only the first time through the loop, and, if compiled, can be used throughout the execution of the loop.

Using the BASIC Licensed Program: BASIC is invoked by entering the procedure command, BASIC. Once BASIC is invoked, a program can be entered from the keyboard, loaded from a library subroutine member (SUBR or R) or loaded from a library source member (SOURCE or S). As each statement is entered from the keyboard or from a library source member, its syntax is checked. Execution of a program can be started at any time with the RUN command. BASIC can also be used to enter and update other library source members.

The following System/34 BASIC Subset (5726-BA1) function is *not* supported:

- BASIC HELP

CUSTOMER RESPONSIBILITIES

IBM may provide marketing assistance in accordance with the Marketing and Service Guidelines in the GI section, in the installation of IBM licensed programs. However, the responsibility for providing accurate ordering information, personnel selection and training, installation, and continued day-to-day operation lies solely with the customer.

Installation of System/34 licensed programs is a customer responsibility.

SPECIFIED OPERATING ENVIRONMENT

Support will be provided for this licensed program when it is operated in the following specified operating environment:

HARDWARE REQUIREMENTS

This IBM System/34 BASIC Subset (5726-BA2) runs on all models of IBM System/34 having at least 48K bytes of main storage. The



PROGRAM PRODUCTS

S/34 BASIC Subset (cont'd)

minimum region size is 24K bytes. Some programs might require a larger region size.

SOFTWARE REQUIREMENTS

This IBM System/34 BASIC Subset (5726-BA2) operates under the control of the IBM Preconfigured System/34 System Support Program Subset (5726-SS2), or Release 7 of 5726-SS1 while it is available, or its equivalent.

The System/34 BASIC Subset (5726-BA2) consists of parts of System/34 BASIC (5726-BA1) stabilized at Release 7. No release update or enhancements are planned.

The procedure commands, BASICR and BASCIP, allow you to invoke a BASIC program or a BASIC procedure, respectively, from System/34 command mode. The procedure command, BASICS, allows you to convert a library source member containing a BASIC program into a library subroutine member and to obtain a listing of all syntax errors (if any exist) in the program. The procedure commands, BASIC, BASICP, and BASICR, also support the use of a procedure that could contain a // FILE OCL statement which can be used to override parameters in a BASIC OPEN statement.

BASIC does not support the logical processing of unformatted sequential access files created by the System/34 FORTRAN IV licensed program (5726-FO1).

System/34 Licensed Utility Programs: The Source Entry Utility (SEU) portion of the Utilities Subset (5726-UT2) can be used to enter BASIC source statements into a library source member. The syntax of these statements must be checked later by BASIC. SEU can also be used to change programs that were previously entered with SEU or BASIC. Programs changed by SEU must be in library source members. The SEU scan function might also be useful for changing a BASIC program.

The Sort portion of the Utilities Subset (5726-UT2) can be used to sort BASIC disk record files.

COMPATIBILITY

Differences do exist between 5100/5110 BASIC and System/34 BASIC. Conversion of most source programs will be required. An outline of these differences appears in the *System/34 BASIC Reference Manual*.

Program Use During Customer Pre-installation Testing: The IBM System/34 BASIC Subset (5726-BA2) will be available to customers for pre-installation testing on IBM Test Center systems in accordance with IBM's Program Testing Policy.

DOCUMENTATION

(available from Mechanicsburg)

System/34 BASIC Subset Licensed Programming Specifications (GC21-9035) ... System/34 BASIC Reference Manual (GC21-7835) ... System/34 BASIC Command Reference Summary (GX21-7853).

TERMS and CONDITIONS: See PP Index



PROGRAM PRODUCTS

**SYSTEM/34 BUSINESS REPORT/APPLICATION
DEVELOPMENT SYSTEM (SYSTEM/34 BRADS)
5726-BR1****PURPOSE**

The IBM System/34 Business Report/Application Development System brings data base power to users of the IBM System/34. Using BRADS, users can productively develop and install system-justifying applications, often without becoming or hiring programmers.

Users can also expand the value of applications which run on their IBM System/34 by querying the data bases and by developing new reports.

HIGHLIGHTS

System/34 BRADS may be used to:

- Create, maintain and update data files.
- Create screen-driven data entry programs.
- Retrieve information from the files using a simple query.
- Create formatted reports using prompted report generation screens.
- Develop complete applications through use as a:
 - Highly productive development tool. The System/34 BRADS facilities can be used to create applications that execute under the control of System/34 BRADS.
 - Program generator for screens and reports. The screen and report programs generated by BRADS can be added to other BASIC programs to create applications that execute independently or in conjunction with System/34 BRADS.
- Create additional queries and reports for applications by creating BRADS file definitions.
- Provide design documentation maintained as a by-product of System/34 BRADS, which fulfills much of the user's documentation requirements.

Files may be shared for input among workstations while executing QUERY, REPORT, or COPY commands.

System/34 BRADS also contains a spread sheet generator facility which may be used to:

- Produce forecasts showing expected revenues, operating costs, capital expenditures, taxes, and other expenditures.
- Try a variety of what-if adjustments on the original spread sheet data to investigate alternative plans.
- Produce reports that examine the differences (variances) between plans or between plans and actual performance.
- Produce reports showing percentage relationships between rows or between columns (for example, growth from month-to-month).
- Consolidate or deconsolidate plans and evaluate performance of separate operating entities (for example, departments, companies, products).
- Combine historical and predictive data together.

The spread sheet generator facility provides the user flexibility in addressing applications such as:

- Balance Sheets
- Budget Planning and Forecasting
- Cash Requirements and Forecasting
- Commercial Loan Evaluation
- Common Sizing Analysis
- Comparative Analysis
- Consolidation and Deconsolidation
- Investment Analysis
- Material and Labor Requirements
- Manpower Projection
- Merger and Acquisition Analysis
- Product Planning
- Profit and Loss Statements
- Real Estate Investment

CUSTOMER RESPONSIBILITIES

IBM may provide normal marketing assistance and guidance. The responsibility of personnel selection and training, installation and continued day-to-day operation lies solely with the customer. The customer is responsible for error detection and analysis, and submission of APARS, but can obtain phone assistance from the Atlanta National Market Support Center.

The customer is responsible for applying any program fixes distributed by IBM Central Service.

SPECIFIED OPERATING ENVIRONMENT

Support will be provided for this licensed program when it is operated in the following specified operating environment:

HARDWARE REQUIREMENTS

The IBM System/34 Business Report/Application Development System (System/34 BRADS) is designed to operate on all models of the IBM System/34 having at least:

- 96K bytes of main storage
- One Printer
- One 1920-character display with keyboard

Since BRADS is an SRT requiring a 64K region, additional main storage will enhance performance when more than one workstation is operating concurrently. System/34 BASIC requires a minimum of 64 characters to print all of the BASIC characters. A printer with a minimum of 96 characters is required to print both upper and lower case characters.

SOFTWARE REQUIREMENTS

The IBM System/34 Business Report/Application Development System (System/34 BRADS) programs are written in IBM System/34 BASIC programming language, and are designed to execute under control of Release 7 or later of System/34 System Support Program (5726-SS1) and System/34 BASIC (5726-BA1), or Preconfigured System/34 System Support Program Subset (5726-SS2) and System/34 BASIC Subset (5726-BA2). System/34 Utilities (5726-UT1 or 5726-UT2), which includes SORT, is required for execution.

Customer Education: First time System/34 BRADS users should read self-study manuals: *System/34 BRADS Learning 1 and Learning 2*. A similar publication, *System/34 BRADS Learning 3*, covers the spread sheet generator facility.

DOCUMENTATION

(available from Mechanicsburg)

System/34 BRADS Reference (SB30-2550) ... *System/34 BRADS Reference - Spread* (SB30-2553) ... *System/34 BRADS Learning 1* (SB30-2547) ... *System/34 BRADS Learning 2* (SB30-2548) ... *System/34 BRADS Learning 3* (SB30-2552) ... *System/34 BRADS Messages* (SB30-2549) ... *System/34 BRADS Planning Guide* (GX60-0521) ... *BRADS Marketing Flyer* (G580-0390) ... *BRADS Features and Sample Reports* (G280-0237) ... *System/34 BRADS Licensed Program Specifications* (GB30-2554).

RPQs ACCEPTED: No

TERMS and CONDITIONS: See PP Index

**SYSTEM/34 COBOL COMPILER AND LIBRARY
5726-CB1**

PURPOSE

IBM System/34 1974-level COBOL is a licensed program that operates under control of the System/34 System Support Program (5726-SS1). The compiler and library are disk resident. The compiler requires as input a COBOL source language program and produces as output, by means of the system's Overlay Linkage Editor, a System/34 machine language object program cataloged in an object library. A source program listing, diagnostic messages, and main storage map can also be requested.

This compiler is designed according to the 1974 standard, which makes it more compatible with other COBOL compilers. The high level of function makes it more valuable to users who wish to do the major development of application programs centrally and then distribute the source code for final development and testing to a System/34.

Enhancements

- Language extensions to support workstations and interactive communications using SSP-ICF.
- The COBOL SORT/MERGE verbs are supported for up to eight input files. Multiple sorts are allowed in the same program.
- Nested IF statements are supported.
- ADD, SUBTRACT, and MOVE CORRESPONDING are now supported. This will aid users allowing a reduction in the number of instructions required to edit group items for printing or data conversion of group items.
- Support for abbreviated combined relations will allow users to code implied subjects and operands such that the following statement will be valid:
If A = B, OR C...
- Substring capability has been added so the user can now use the verbs STRING and UNSTRING to combine or take apart fields respectively. These powerful instructions are useful in text processing.
- Table processing has been enhanced to support the ASCENDING/DESCENDING options and the functions:
 - SEARCH
 - SEARCH ALL
- Variable length tables are also supported by the OCCURS DEPENDING ON option to allow the user to restrict table searches to valid data only and thus save processing time.
- The INSPECT verb replaces the 1968-level EXAMINE. The function has been enhanced to allow use to multiple characters.
- File processing support:
 - The record DELETE option is supported.
 - Add to sequential files is supported via the OPEN WITH EXTEND option.
 - The START verb will support NOT LESS THAN as well as EQUAL keys which will allow the user to do generic searches on indexed files.
 - Optional files are supported to allow the user to continue to run even if some of the files do not exist.
 - The DYNAMIC ACCESS option is supported so that a user can now process the same file both sequentially and randomly without having to doubly define the file.
 - The user can specify top and bottom margins for a printer file.
 - The FILE STATUS function is supported so that the user can interrogate the result of a file operation.
 - USE after STANDARD ERROR/EXCEPTION is supported to allow the user to combine error/exception logic in one section of the program.
 - RERUN is supported. This allows a user to checkpoint long running programs and restart them from the last checkpoint in case of a program failure. Multiple programs using RERUN can be executing at the same time.
- The value clause for level 88 supports multiple values. The THROUGH option also allows users to easily do range checking.
- Multiple result fields in arithmetic statements are supported.
- The REMAINDER option of the DIVIDE is supported.
- The RENAMES capability has been extended with:
 - Level 66 items
 - THROUGH option is supported
- The edit character of '/' for data edits is allowed.
- The COPY function supports the REPLACING option. This allows users to replace copied character strings, either entirely or partially, to fit the requirements of the source program.

- The 1974 DEBUG module is supported. This gives the user a special group item called DEBUG-ITEM which can be processed at desired debug points in the program. This support also includes both compile and execution time switches for suppression of the debug function.
- Additional debug support of EXHIBIT and TRACE.
- Additional compiler options include:
 - A cross-reference listing of data names and labels.
 - Flagging of all statements exceeding a specified FIPS (Federal Information Processing Standard) level.
 - Syntax-only compiles to allow users to check syntax prior to generating object code.
- Semi-interactive syntax checking is provided to allow users to compile and correct source programs without requiring a source listing printout.
- Enhanced support for multiple spooled printer files in one program.

Industry Standards: System/34 COBOL is designed according to the following industry standards as understood and interpreted by IBM as of September, 1978:

- American National Standards (ANS) COBOL, X3.23-1974 ANS COBOL is identical to ISO 1989-COBOL, approved in February, 1978 by the International Organization for Standardization. The following ANS processing modules are included:

```

2 NUC 1, 2
2 TBL 1, 2
2 SEQ 1, 2
2 REL 0, 2
1 INX 0, 2
2 SRT 0, 2
1 SEG 0, 2
2 LIB 0, 2
1 DEB 0, 2
1 IPC 0, 2
  
```

The first digit above represents the level of the modules included in the compiler; the second digit represents the lowest level specified for American National Standard COBOL (0 implies that the module may be completely missing from a standard compiler); the third digit represents the highest level specified in the standard.

- December 1975 Federal Information Processing Standard, (FIPS PUB 21-1), Low-Intermediate level. However, additional support is provided for many features of higher FIPS level.

The following exceptions apply to the above standards:

- The DELETE function is implemented by marking deleted records with a hexadecimal FF in position one of the record. When operating with DELETE mode files, the user is excluded from placing a hexadecimal FF in this position.
- No position in a key for indexed random READ or indexed START statements can be hexadecimal FF.

Additions: In addition to the standard language, the following additional features are provided:

- Extensions to the modules of American National Standard COBOL listed above include certain language elements which are defined in higher levels of the American National Standard COBOL than those listed.
- The following extensions are also supported:
 - Use of apostrophe instead of quotes.
 - Extended data types of computational-3 (packed) and computational-4 (binary).
 - Indexed file support for CORE-INDEX.
 - Additional debugging support with EXHIBIT and TRACE.
 - ACCEPT from console.
 - DISPLAY upon console.
 - File definition using the FILE CONTROL entries of SELECT and ASSIGN.
 - Standard error handling using FILE STATUS and the USE procedure in the DECLARATIVES SECTION.
 - Extensions to standard file processing verbs for:
 - OPEN/CLOSE
 - READ/WRITE
 - Support for display format indicators as boolean data types (0,1) and turning them on and off via the SET statement.
 - Acquire and release workstations and SSP-ICF sessions supported through ACQUIRE and DROP.
 - Support for UPSI switches.
 - ACCEPT/DISPLAY statements support reading and writing of the work station local data area (WSDA).

Additional Compiler Features:

S/34 COBOL Compiler and Library (cont'd)

System/34 COBOL offers additional compiler features which can be chosen by the programmer:

- **FIPS Flagger** - Issues messages identifying statements and clauses in a COBOL source program that exceed a user-specified FIPS level.
- **Symbol Cross-Reference** - Produces two alphabetic listings of user-specified names; one of names defined in the Data Division and one of names defined in the Procedure Division.
- **Semi-Interactive Debugging** - Builds a file that can be retrieved and displayed at a work station. The file that is created contains source statements, merged diagnostics and summary information. The file can be moved by an IBM-supplied procedure to a library member, which can then be reviewed and updated using SEU (Source Entry Utility). The source can then be reintroduced to the compiler. Inserted messages will be ignored by the compiler.
- **Syntax Checking Compilation** - Scans a source program for syntax errors. If errors are found, error messages are generated. No object code is produced.
- **Parameter Prompting** - Allows the user to request prompt screens for the specification of parameters needed for entering, updating, compiling, or executing COBOL programs.
- **Multiple Printer Files** - Allows the specification of up to 15 different printer files in the same program.
- **Standard Program Linkage** - Allows programs written in System/34 COBOL to call or be called by other programs written in System/34 COBOL, System/34 FORTRAN, or System/34 Assembler language.

Disk File Support: The access methods supported by System/34 COBOL, based on physical data organization, are as follows:

- **Sequential Organization**
 - Consecutive processing - including update in place and consecutive add (extend).
 - Random processing - by relative record number, including updating.
- **Indexed Organization**
 - Random processing - by key or relative record number.
 - Sequential processing - by key including file loading.
- **Direct Organization**
 - Random processing - by relative record number, including updating and file loading.
 - Consecutive processing.

Standard System/34 disk labels are mandatory for all disk files, nonstandard labels cannot be used except as data records within a file.

Record size can range from 1 byte to 4,096 bytes, and records may be processed as blocked or unblocked. The block size for a given file may be varied between programs up to a maximum block size of 9,999 bytes. Logical records may span physical disk sectors, blocks, tracks, or cylinders.

Offline multivolume files are supported. (System/34 allows these files only on the diskette magazine facility.)

Workstation Support: Low-volume, unformatted, line-at-a-time workstation support is provided with the ACCEPT and DISPLAY verbs. File processing has been extended to support a TRANSACTION organization type. Using this organization type, the user can define one file that supports single or multiple workstations, and single or multiple SSP-ICF sessions in any combination. Since the support is provided in a COBOL logic file, the user codes standard COBOL verbs, with extensions where necessary, to accomplish the job.

Enhanced Support for Multiple Spooled Printer Files in One Program: COBOL provides enhanced support for multiple spooled print files in a program. This enhancement removes a previous restriction of eight spooled print files in a program. Also, these printer files can be opened or closed at any time. Any spooled print files that are closed during the execution of a program will be marked as 'Ready to Print', and will be printed by the spool writer according to the print files position in the spool queue, regardless of whether or not the program has ended. Any COBOL programs compiled prior to Release 8 will have to be recompiled in order to utilize this function. The restriction of 25 total files in a COBOL program still applies.

Data Communications: The System/34 Interactive Communications Feature (SSP-ICF) is supported for the COBOL user via TRANSACTION organization type. Standard COBOL verbs, with extensions where necessary, may be used since this organization type provides a COBOL logical file support.

Operational Considerations: The System/34 COBOL compiler runs on all models of System/34. The compiler will execute on a minimum system of 32K bytes. The System/34 COBOL compiler requires an 18K-byte region for execution. Additional main storage may allow

faster compilation of a large source program. The Overlay Linkage Editor constructs overlays (if necessary and possible) to fit the object program into the available main storage. The region size required for an object program is a function of source program complexity and its ability to be overlaid.

The System/34 COBOL compiler accepts source statements from the source member on disk, from a procedure member on disk, or from a display station keyboard. Compiler output can consist of a source listing and diagnostic messages on the printer, messages on the display screen, an object module on disk, and a diagnosed source file.

During execution of the COBOL object program, input is accepted from the keyboard, from a library procedure member (if that procedure is defined as the system input device), or from data files on disk. Output from the executing COBOL program is to the printer, display screen, or to data files on disk.

CUSTOMER RESPONSIBILITIES

IBM may provide marketing assistance, in accordance with the Marketing and Service Guidelines in the GI section, in the installation of IBM licensed programs. However, the responsibility for providing accurate ordering information, personnel selection and training, installation, and continued day-to-day operation lies solely with the customer.

SPECIFIED OPERATING ENVIRONMENT

Support will be provided for this licensed program when it is operated in the following specified operating environment:

HARDWARE REQUIREMENTS

The IBM System/34 COBOL licensed program runs on all models of IBM System/34.

SOFTWARE REQUIREMENTS

The current version of the IBM System/34 COBOL licensed program operates under control of the current version of the IBM System/34 System Support Program (5726-SS1).

CONVERSION/COMPATIBILITY

There is a high degree of compatibility between the System/34 COBOL compiler and System/38 COBOL, the System/3 subset '68 COBOL, System/32 PRPQ COBOL, and System/34 PRPQ COBOL compilers. Differences do exist and some conversion effort will be required.

Installation of System/34 licensed programs is a customer responsibility.

Program Use During Customer Pre-installation Testing: The IBM System/34 COBOL (5726-CB1) will be available to customers for pre-installation testing on IBM Test Center systems in accordance with IBM's Program Testing Policy.

DOCUMENTATION

(available from Mechanicsburg)

System/34 COBOL Licensed Program Specifications (GC21-7745) ...
System/34 COBOL Reference Manual (SC21-7741).

TERMS and CONDITIONS: See PP Index

**CLIENT ACCOUNTING AND FINANCIAL REPORTING
SYSTEM FOR SYSTEM/34
(Single Program mode) (CAFRS)
5726-C21**

PURPOSE

The IBM System/34 Client Accounting and Financial Reporting System (CAFRS) offers the public accounting profession a comprehensive aid to solving the problems of client accounting. It assists the certified public accountant, public accountant, or bookkeeper in operating a more profitable and productive practice.

HIGHLIGHTS

CAFRS can be installed without in-house programming capability:

- File sizes may be changed, within limits, as needed, by the system tailoring procedure to allow additional clients to be serviced or to offer optional processing features to more clients
- File load and maintenance procedures provided
- System-controlled master and transaction file backup procedures
- Easy-to-use runbook
- Step-by-step installation activity plan and detail user's information supplied by application reference manual

CAFRS provides ease of use options to the user:

- Designed to fit industry requirements
- OCL procedures, sort specifications, and processing programs are packaged into logical work units which simplify system operation
- Monitoring of procedures, prevents execution of a program until preceding programs have been completely and successfully executed
- Compatible online/offline file maintenance and transaction data entry via the System/34 keyboard or diskettes created on the 3740 Data Entry System
- Dynamic backup and recovery system forces periodic backup of master files and edited transactions and keeps track of what procedures need to be rerun from the last backup point to recreate up-to-date master files
- Reprint options are possible because file updating is separated from report writing functions
- Selective printing options are available for many report functions

CAFRS uses recognized accounting techniques and terminology to provide a solid accounting system:

- Sample user-oriented forms for data preparation, file, creation, audit and control are provided
- Clear audit trails and control techniques are provided
- Standard types of accounting reports, such as journals, ledger, trial balance and financial statements plus special supporting analyses and lists, are provided

DESCRIPTION

The Client Accounting and Financial Reporting System is a ready-to-execute application for the small accounting firm.

It combines two data entry approaches; operator-oriented and batch-oriented. Support is provided for transaction entry through the System/34 keyboard or through a diskette created on a 3740 Data Entry System.

The application has certain records within a control file which contain questionnaire responses. These records allow the application to select file sizes and functions to suit each firm's needs. The questionnaire responses are keyed during initial installation and may be changed as needed. The system tailoring procedure allows these responses to be entered.

The system tailoring procedure utilizes the answers to a series of questions regarding the firm's requirements. It provides the following:

- Tailoring the application on-site at installation time.
- Allows the user to activate and deactivate provided functions as requirements change.
- All provided functions are included in the programs but only required functions are executed.
- File sizes may be expanded or contracted, as needed, by rerunning the system tailoring procedure.

An *Application Installation Guide* provides a step-by-step installation activity plan including sample numbering systems, sample input and maintenance data forms, file loading sequences, control forms with suggested procedures. The *Application Reference Manual* provides information on the day-to-day use of the application.

The runbook provides the operator with a detailed and easy-to-use set of instructions showing all the activities necessary to run the programs on a System/34. The *Procedure Reference Summary* is provided for the operator as a reminder of the major operational functions of each procedure. It is intended to be used once the operator is thoroughly trained in the particular application.

Instructional material in the form of a self-study course is provided for the operator for self-training in the use of the runbook (System/32 only).

An *Application Logic Manual* is provided for use by the self-sufficient customer and for systems engineering continuing support. It describes the architecture of programs, procedures, data base cross-references, data dictionary, and detailed descriptions of each program.

The System/34 licensed program makes available Client Accounting and Financial Reporting System on System/34 in single program mode. The System/34 licensed program supports one work station, no spooling, no multiprogramming and no file sharing.

It is designed to allow flexibility in the options included to meet an individual client's special needs:

- Up to 13 periods per fiscal year
- Automatically calculated journal entries based upon algorithms previously defined by the accountant
- Multiple special purpose journals with source code, related accounts, and headings specified by client
- Ability to correct prior periods
- Extensive chart of account flexibility to provide desired heading and account description information, up to 9 levels of subtotals for combining accounts, spacing and paging control
- Optional titles and formats for financial statements

Support is provided for the optional consolidation of multiple clients. Maintenance is provided for eliminating entries. Controls are included to force fiscal period alignment of clients being consolidated. The same processing capabilities are available for the consolidated client as for others.

Optional features and reports are available for any client, such as:

- Last year comparative data on financial statements
- Print suppression of zero-balance accounts on financial statements
- Balance sheet
- Income and expense statement
- Combined department income and expense reporting
- Income and expense comparison to budget
- Income and expense account balance comparison to a specified account balance, by department
- Income and expense account balance comparison to a client-specified base, such as number of rooms, square feet, or miles driven
- Supporting schedules
- Statement of changes in financial position with related worksheet and ability to process adjustments
- Reporting of financial ratios, defined by client, with comparison to industrial averages
- Employee payroll register
- Printing of 941-A and W-2 forms
- Accountant's transmittal letter
- Notes to the financial statements

CUSTOMER RESPONSIBILITIES

IBM may provide marketing assistance, in accordance with the Marketing and Service Guidelines in the GI section, in the installation of IBM licensed programs. However, the responsibility for providing accurate ordering information, personnel selection and training, installation, and continued day-to-day operation lies solely with the customer. For customers who have modified their installed System/32 IAPs and who choose to have IBM make the same modifications on the System/34 product, the reinstallation of the modifications on the new product will be at additional charge under SES. The customer is responsible for transferring data files from one system to the other. Installation of System/34 licensed programs is a customer responsibility.

SPECIFIED OPERATING ENVIRONMENT

Support will be provided for this licensed program when it is operated in the following specified operating environment:

HARDWARE REQUIREMENTS

This IBM System/34 licensed program will execute on all models of the System/34, in Single Program Mode. The programs are compiled assuming a 32K minimum system. Because of volumes and time



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PROGRAM PRODUCTS

CAFRS (cont'd)

constraints, there may be a requirement for providing offline keying on an IBM 3740 Data Entry System. If an IBM 3742 is to be used, it must have the 128-Character Record feature (#5455) and Feature Group A (#4004).

For presentation purposes on the reports, left and right parentheses have been included to indicate a credit or debit dollar amount opposite of an account's normal balance. The 64-character set feature is required for the System/34 to print the parentheses.

Many functions have been included to protect the integrity of the master files, programs, procedures, and libraries. Because of this, no other licensed program or user-written program may co-reside with this Application unless stringent coding requirements for these programs are met to insure compatibility with the Client Accounting and Financial Reporting System. The *Application Logic Manual* discusses in detail the coding conventions used for the development of CAFRS.

SOFTWARE REQUIREMENTS

The IBM System/34 licensed programs are written in IBM System/34 RPG II programming language and executed under control of the IBM System/34 System Support Program (5726-SS1). IBM System/34 Utilities licensed program (5726-UT1), which includes Sort, Data File Utility, Source Entry Utility, and Work Station Utility is required for execution of the programs. The System/34 RPG II Compiler (5726-RG1) is required if modifications to the source code are necessary.

DOCUMENTATION

(available from Mechanicsburg)

Installation Guide (SB30-0231) ... *Reference Manual* (SB30-0232) ...
Runbook (SB30-0233)

TERMS and CONDITIONS: See PP Index

PROGRAM PRODUCTS

**SYSTEM/34 CLIENT ACCOUNTING AND
FINANCIAL REPORTING SYSTEM (CAFRS II)
5726-C22****PURPOSE**

The IBM System/34 Client Accounting and Financial Reporting System (CAFRS II) offers the public accounting profession a comprehensive aid to solving the problems of client accounting. It helps the certified public accountant, public accountant, or bookkeeper to operate a more profitable and productive practice.

HIGHLIGHTS

- File sizes may be changed, within limits and as needed, by the system tailoring procedure to service additional clients or offer optional features to more clients.
- File load and file maintenance procedures are provided.
- System-controlled master and transaction file backup procedures are provided.
- Easy-to-use runbook and operator self-study courses are available.
- Step-by-step installation activity plan and detailed user's information are supplied in the application reference manuals.
- OCL procedures, sort specifications, and processing programs are packaged into logical work units which simplify system operation.
- Monitoring of procedures prevents execution of a program until preceding programs have been completely and successfully executed.
- Compatible online/offline file maintenance and transaction data entry.
- Dynamic backup and recovery system, optional at system tailoring, forces periodic backup of master files and edited transactions, and keeps track of what procedures need to be rerun from the last backup point to recreate up-to-date master files.
- Selective printing options are available for many report functions.
- Standard types of accounting reports, such as journals, ledgers, trial balances, and financial statements, plus special supporting analyses and lists, are provided.

DESCRIPTION

The Client Accounting and Financial Reporting System II is a ready-to-execute application.

It combines two data entry approaches: Operator-oriented and batch-oriented. Support is provided for transaction entry through a System/34 workstation or through a diskette created on a 3740 Data Entry System.

The application has certain records within a control file which contain questionnaire responses. These records allow the application to select file sizes and functions to suit each firm's needs. The questionnaire responses are typed in during initial installation and may be changed as needed. The system tailoring procedure allows these responses to be entered.

An *Application Reference Manual* provides a step-by-step installation activity plan, including sample numbering systems, sample input and maintenance data forms, file loading sequences, and control forms, with suggested procedures. The *Application Reference Manual* provides information on the day-to-day use of the application.

The *Runbook* provides the operator with a detailed and easy-to-use set of instructions showing all the activities necessary to run the programs on a System/34.

Instructional material in the form of a self-study course is provided for operator self-training in the use of the *Runbook*.

An *Application Logic Manual* is provided, as basic licensed material, for use by the self-sufficient customer and for continuing SE support. It describes the architecture of programs, procedures, data base cross-references, data dictionary, and detailed descriptions of each program.

The Client Accounting and Financial Reporting System II (CAFRS II) is designed to allow flexibility in the options included to meet an individual client's special needs:

- Up to 13 periods per fiscal year.
- Automatically calculated journal entries based on algorithms defined by the accountant.
- Multiple special purpose journals with source code, related accounts, and headings specified by client.
- Ability to correct prior periods.
- Extensive chart of account flexibility to provide desired heading and account description information, up to 9 levels of subtotals for combining accounts, and spacing and paging control.

- Optional titles and formats for financial statements.
- Consolidation is provided for clients with more than one business entity. Maintenance is provided for eliminating entries. Controls are included to force fiscal period alignment of clients being consolidated. The same processing capabilities are available for the consolidated client as for others.

Features

- Last year comparative data on financial statements
 - Print suppression of zero balance accounts on financial statements
 - Balance sheet
 - Income and expense statement
 - Combined departmental income and expense reporting
 - Income and expense comparison to budget
 - Income and expense account balance comparison to a specified account balance, by department, such as gross sales
 - Income and expense account balance comparison to a client-specified base, such as number of rooms, square feet, or miles driven
 - Supporting schedules
 - Statement of changes in financial position with related worksheet and ability to process adjustments
 - Reporting of financial ratios, defined by client, with comparison to industrial averages
 - Employee payroll register
 - Printing of presently formatted 941-A and W-2 forms
 - Notes to the financial statements
 - 8-1/2" x 11" general ledger or a full-size general ledger
 - Trial Balance with both current and year-to-date data, or year-to-date only
 - Cumulative general ledger
 - Automatic reversing entries
 - Budget amounts on budgeted income statements variable by period
 - Choice of four customer-entered footnote messages
 - Choice of four customer-entered disclaimer messages relating to auditability of reports
- The System/34 CAFRS II Application Program supports the following functions which take advantage of the System/34:
- Workstations are used for file maintenance, data entry, and inquiry.
 - All programs are online with the exception of the system tailoring procedure.
 - Spooling and priorities are used for printed output.
 - Operator selection of screens from a menu screen.
 - All files are 'shared.'
 - Multiple, interactive display stations may operate concurrently.
 - Multiple programs may operate concurrently.
 - Error messages and operator communications are displayed on the screen.

CUSTOMER RESPONSIBILITIES

IBM may provide marketing assistance, in accordance with the Marketing and Service Guidelines in the GI section, for installation of IBM licensed programs. However, the responsibility for providing accurate ordering information, personnel selection and training, installation, and continued day-to-day operation lies solely with the customer.

SPECIFIED OPERATING ENVIRONMENT

Support will be provided for this licensed program when operated in the following specified operating environment:

HARDWARE REQUIREMENTS

This licensed program will execute on all models of the IBM System/34 with a minimum of 48K bytes of main storage. Performance of application programs, as shipped, may be enhanced by increased print speeds and/or increased main storage. If an IBM 3742 is to be used, it must have the 128-character set feature (#5455) and feature group A (#4044). IBM 3741s must have feature group A (#4002).



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PROGRAM PRODUCTS

CAFRS II (cont'd)

For presentation purposes on the reports, left and right parentheses have been included to indicate a dollar amount opposite an account's normal balance. The 64-character set feature is required for the System/34 to print the parentheses.

Although nothing in CAFRS II prevents the use of the minimum system configuration, the system configuration for a particular customer must be able to accommodate the expected business volumes, data base size, and operating requirements.

SOFTWARE REQUIREMENTS

IBM Client Accounting and Financial Reporting System II is written in IBM System/34 RPG II programming language and executed under control of the IBM System/34 System Support licensed program (5726-SS1). It also requires the IBM System/34 Utilities licensed program (5726-UT1).

IBM Client Accounting and Financial Reporting System II is shipped with object code included (compiled for a 24K user area). Standard modifications use the system tailoring procedures and require no recompiling. Nonstandard modifications to the RPG II source programs require the IBM System/34 RPG II Compiler (5726-RG1).

DOCUMENTATION

(available from Mechanicsburg)

Licensed Program Specifications (GH30-0425) ... CAFRS II General Information Manual (GH30-0230) ... Customer/Prospect Self-Study (SV30-0100-SR30-0210) ... Reference Manual (SB30-0329) ... Runbook (SB30-0330) ... Installation Guide (SB30-0335) ... Logic Manual (LB30-0331).

TERMS and CONDITIONS: See PP Index

**SYSTEM/34 OVER-THE-COUNTER INVOICING AND
ACCOUNTS RECEIVABLE INQUIRY FOR DISTRIBUTORS
MANAGEMENT ACCOUNTING SYSTEM II (DMAS II)
5726-DM5****PURPOSE**

IBM System/34 DMAS II is designed to satisfy the data processing needs of a broad spectrum of distributors.

Some distributors have special needs relative to credit management and immediate invoice printing for over-the-counter order entry business.

With Over-the-Counter Invoicing and Accounts Receivable Inquiry (5726-DM5), a DMAS II user may inquire into accounts receivable information including detailed transaction activity and quickly print an invoice for a specific order.

HIGHLIGHTS

- Search for customer number based on customer name
- Obtain accounts receivable detail information for credit management purposes
- Know a customer's accounts receivable status prior to releasing goods
- Print an invoice for a single order, at the counter
- Allocate inventory required to satisfy the order
- Print invoices for a range of orders
- Print a duplicate copy of an invoice

DESCRIPTION

These capabilities are realized by using specialized routines easily called by the entry of short keywords which enable the user to quickly perform the operations without switching menus or answering multiple option prompts.

The licensed program enhancements have been specifically designed for quick turnaround, over-the-counter business, typical of some DMAS II users. The enhancements eliminate the necessity of manually producing invoices by enabling the user to quickly produce an invoice on the system. The time to prepare an invoice is significantly reduced as is the potential problem of costly incorrect pricing. The customer receives a timely, easily read, machine-prepared invoice which is accurate and complete. In addition, the DMAS II user is aided in the control of credit by being able to display complete account status including detailed transaction activity.

CUSTOMER RESPONSIBILITIES

IBM may provide marketing assistance, in accordance with the Marketing and Service Guidelines in the GI section, in the installation of IBM licensed programs. However, the responsibility for providing accurate ordering information, personnel selection, training, and continued day-to-day operation lies solely with the customer.

Installation of this System/34 licensed program is a customer responsibility.

Customer Installation Tasks

- Copy the installation procedure to disk
- Execute the installation procedure following displayed information
- Operating instructions will be printed during the installation process
- Read the operating instructions runbook carefully before executing the new operating procedure
- Following the operating instructions, execute the operating procedure

Modifications: The modification of this enhancement or the addition of new ones may be done by a programmer experienced in RPG II and the System/34.

SPECIFIED OPERATING ENVIRONMENT

Support will be provided for this licensed program when it is operated in the following specified operating environment:

HARDWARE REQUIREMENTS

The minimum system configuration requirements are an IBM System/34 with:

- 5340 System Unit with Diskette 1 Drive, 8.6 MB of disk storage and 48K (mdl B11) or 64K (mdl C11) bytes of main storage depending on the application
 - 64K for Billing, alone or in combination with any of the other DMAS II applications
 - 48K may be used in certain environments when neither Purchasing nor Billing is included

- A minimum of one IBM 5256 or 5211 or 3262 B1 Printer
 - A second printer (5256), dedicated to over-the-counter invoice printing, is recommended.

Although there is nothing inherent in the design of DMAS II to prevent the use of the minimum system configurations stated above, the system configuration for a particular customer must be able to accommodate the expected business volumes, data base size and operating requirements.

The standalone DMAS II File Size Procedures are unaffected by this enhancement. A particular customer's file size requirements may vary depending on individual use of the system and applications. While it is the customer's responsibility to determine the necessary file size, you may contact your IBM representative for guidance.

SOFTWARE REQUIREMENTS

These programs are written in IBM System/34 RPG II programming language and execute under control of the IBM System/34 System Support Program (5726-SS1). The IBM System/34 Utilities (5726-UT1) must be ordered for use with the system. The IBM System/34 RPG II (5726-RG1) must be available if modifications to the application programs are expected. These enhancement programs operate in conjunction with DMAS II, augmenting rather than replacing DMAS II. DMAS II Billing is prerequisite to the use of the DMAS II Over-the-Counter Invoicing function. DMAS II Accounts Receivable is required as a prerequisite to using the Accounts Receivable Inquiry function.

The Over-the-Counter and Accounts Receivable Inquiry licensed program will operate in conjunction with DMAS II FDPs such as 5798-NXY and/or 5798-NXZ; however, these FDPs are not required.

RPGs ACCEPTED: No

TERMS and CONDITIONS: See PP Index

**DISTRIBUTORS MANAGEMENT ACCOUNTING SYSTEM
(DMAS) FOR SYSTEM/34**

**BILLING ... 5726-D4A
ACCOUNTS RECEIVABLE ... 5726-D4B
INVENTORY CONTROL ... 5726-D4C
SALES ANALYSIS ... 5726-D4D**

PURPOSE

These modular licensed programs are available for either a 32K or 48K IBM System/34. The application function and data base are exactly the same as the IBM System/32 DMAS offering. These applications run in single program mode on the IBM System/34. Performance improvements in the larger memory size version come from the reduction of overlays, incorporation of larger blocking factors, and use of dual I/O areas. This is most beneficial for the customer who has no requirement for an interactive workstation system in the near future.

When all four programs are installed they constitute an interrelated application set with an integrated data base. These applications have the industry-oriented function and marketing support that will capture the interest of your distribution prospect. They can help the users manage their two largest business assets, accounts receivable and inventory, and give them profit performance data on their products, customers, and salespersons. These programs can also help the user increase operational efficiency and customer service.

The open order file, warehouse sequenced picking lists and automated pricing and discounting methods can help improve order processing speed and accuracy. The inventory control system provides information to the buyers that will help them optimize inventory investment by identifying the obsolete, slow moving, and unprofitable items and help increase inventory turns and service levels. Automatic credit limit checking, variable credit terms, late charges on open item and balance forward accounts, delinquency notices, and aged receivables reports provide tools for reducing bad debt losses and increasing cash flow. Daily, monthly, and on demand sales reports help monitor the attainment of the distributor's sales objectives.

The Payroll, Accounts Payable, and General Ledger programs of the Distribution Financial Accounting System (DFAS) can co-reside with DMAS. With DMAS and DFAS, you can address the major data processing requirements of the Distribution customers and can select the applications that best meet their needs.

DESCRIPTION

BILLING (5726-D4A)

A postbilling system with data entry from the System/34 display station and/or from diskettes keyed on a 3740 Data Entry System, with editing, invoicing, invoice register, and a salesperson's recap. Features include:

- Open orders file with listing by customer and/or item that provides for printing order acknowledgements or picking lists.
- Ship-to address file
- Variable price selection methods
 - Contract pricing
 - Unit price or extended price entered by operator
- Variable item discount or markup flexibility
 - Operator override of discount/markup percent
 - Quantity discount for up to 5 quantity break ranges
 - Combination of customer class (8) and item class (99) selects discount/markup percent. Markups can be greater than 100%.
 - Choice between discounting or marking up is controlled by code in customer record
- Variable trade discount on invoice total
 - Selection of one of 5 discount percents, based on code in customer record
 - Selection of one of 5 discount percents, based upon invoice amount
- Variable payment terms and cash discounts
 - One of 9 cash discount percents
 - One of 10 term descriptions (for example, 2% 10, net 30)
 - Terms and discount percents based on customer code
- Broken case pricing with surcharge
- Pricing unit conversion - when inventory unit differs from selling unit
- Container charges automatically applied
- Price list
- Optional invoice format with or without a tearstrip (profit stub)
- Daily backorder slips
- Federal Excise tax calculated

- State sales tax (standard) plus two local sales taxes
- Monthly tax totals report

ACCOUNTS RECEIVABLE (5726-D4B)

A combined balance forward and open item method, with data editing, monthly statements, and delinquency notices. Features include:

- Balance forward or open item selectable by account
- Late charges for both open item and balance forward accounts
- Future dating
- Credit limit checked during order edit if Billing is installed
- Monthly statements and delinquency notices
- Aged trial balance monthly or on demand - summary or detail
- Statements by job or branch location
- Aging of customer invoices with three past due periods

SALES ANALYSIS (5726-D4D)

Sales and profitability figures by salesperson, customer, item, and item class. Availability of the information in the following reports is dependent upon the applications selected and their installation sequence.

- Daily sales recap by salesperson (data from Billing or Accounts Receivable)
 - Sales dollars
 - Cost
 - Gross profit
 - Gross profit percent
- Monthly salesperson sales analysis - current and year-to-date (data from Billing or Accounts Receivable)
 - Sales dollars
 - Cost
 - Gross profit
 - Gross profit percent
 - Number of orders
- Monthly customer sales analysis - current and year-to-date (data from Billing or Accounts Receivable)
 - Sales dollars
 - Gross profit
 - Gross profit percent
 - Drop ship sales - year-to-date only
 - Gross profit amount
- Monthly salesperson/customer sales analysis - current and year-to-date (data from Billing or Accounts Receivable)
 - Date of last sale
 - Sales dollars
 - Gross profit
 - Gross profit percent
 - Number of orders
- Monthly salesperson/customer/item class sales analysis - current and year-to-date (data from Billing)
 - Sales dollars
 - Gross profit
 - Gross profit percent
 - Number of orders
 - Totals by customer and salesperson
- Monthly item and item within item class sales analysis - current and year-to-date (data from Billing or Inventory)
 - Quantity
 - Sales dollars
 - Gross profit
 - Gross profit percent
 - Number of orders
 - Up to 99 item classes

If Sales Analysis is the first or only DMAS program installed, the customer must provide data entry and edit programs.

INVENTORY CONTROL (5726-D4C)

A system which allows management to obtain the information needed for purchasing and profitability analysis, including a perpetual inventory system and a physical inventory system. Features include:

- Stock Status Review - on demand, selectable for
 - All items, items within limits, active items only
 - Sequence by vendor, item class, or item
 - Exceptions only: Below minimum, cost deviation, *backordered*, or quantity zero

PROGRAM PRODUCTS

DMAS for S/34 (cont'd)

- Current stock position: On hand, on order, *backordered*, on reserve
- Sales and cost information: This month and year-to-date
- Stock Status Report - monthly
 - Year-to-date drop shipped quantities
- Inventory Analysis Report - on demand in sequence by
 - Item number
 - Date of last sale
 - Gross profit year-to-date
 - Profit % year-to-date
 - Months' supply on hand
 - Extended cost on hand
 - Vendor number
 - Item class
 - Vendor/item class
 - Alternate cost on hand
 - Sales year-to-date
- Basic Unit Cost - average cost method
- Alternate Cost - last cost method
- Multiple Warehouses

FUNCTIONS

- Integrated data base which simplifies file maintenance and provides for more efficient disk utilization.
- User-maintained constants file is used in most programs which allows operator to modify data subject to change, such as late charge rate, tax rates, terms, or aging dates, without the need to change and recompile programs.
- Specific load and maintenance programs are included for each master file.
- Easy-to-use printed runbook for each application
- Contains additional space in item and customer master records for customer use.
- OCL procedures, sort specifications, and processing programs are cataloged into logical work units which optimize system utilization.
- Automatic monitoring of execution sequence prevents execution of a program until preceding required programs have been completely and successfully executed.
- Offline 3741 data entry diskette formats.
- Dynamic file space checking capability of transaction edit programs tells the operator in advance when a file is approaching its maximum size so that action may be taken in time to prevent an interruption in processing.
- Dynamic backup and recovery system provides for periodic backup of master files and edited transactions, and keeps track of what procedures need to be rerun from the last backup point to recreate up-to-date master files.
- Reprint options are possible because file updating is separated from report printing functions. Reports or parts of reports can be reprinted to provide extra copies, or some report printing can be deferred to a more convenient time.
- Selective printing allows the operator to control the printing mode for reports by entering a keyboard response to prompts on the CRT. In this way, for example, reports may be printed for a range of customers or items, or only for accounts with balances or past due amounts.
- Inquiry programs, with data retrieval options selectable at program run-time, provide current information from the customer and item master files.

File Size and Application Function Tailoring Capability: All necessary programs and procedures for file allocation are included with DMAS. The customer can allocate file space during installation and change file space allocations as business volumes change, and may control the operation of some application functions by file maintenance and by operator-controlled run time options.

CUSTOMER RESPONSIBILITIES

IBM may provide marketing assistance, in accordance with the Marketing and Service Guidelines in the GI section, in the installation of IBM licensed programs. However, the responsibility for providing accurate ordering information, personnel selection and training, installation, and continued day-to-day operation lies solely with the customer.

Installation of System/34 licensed programs is a customer responsibility. For customers who have modified their installed System/32 IAPs and who choose to have IBM make the same modifications on the System/34 product, the reinstallation of the modifications on the new

product will be billable under SES. It is the customer's responsibility to transfer data files from one system to the other.

SPECIFIED OPERATING ENVIRONMENT

Support will be provided for these licensed programs when they are operated in the following specified operating environment:

HARDWARE REQUIREMENTS

The minimum system configuration requirement is an IBM System/34 with:

- 32K or 48K bytes of main storage
- 8.6 megabytes of disk storage
- 40 characters per second matrix printer
- IBM 5251 mdl 11 Information Display Station

SOFTWARE REQUIREMENTS

- IBMSystem/34 System Support licensed program Version 1 (5726-SS1)
- IBM System/34 Utilities licensed program (5726-UT1)

Instructional Materials

Operator Introduction and Exercises: These materials, consisting of a Student Guide, audio cassettes, and System/32 diskettes, will help the operator learn and practice IAP operation without using the customer data files. One copy will be provided at no charge to the customer.

One copy of the following material is supplied via SLSS when program number and initial library are specified.

Audio Cassettes (2)	SV30-0002
System/32 Diskettes (3)	SV30-0003
Student Guide	SR30-0171
Advisor Guide	SR30-0169
Runbook	SR30-0170

DOCUMENTATION

(available from Mechanicsburg)

Licensed Program Specifications(GH30-0521) ... *Installation Considerations for Single Program Mode Applications* (GH30-0514) ... *Runbooks: System Operations* (SH30-0515) ... *Billing* (SH30-0516) ... *Accounts Receivable* (SH30-0517) ... *Inventory Control* (SH30-0518) ... *Sales Analysis* (SH30-0519).

Since application functions and data base are identical to System/32 versions of these programs, the following available System/32 publications provide appropriate information.

Executive Guide (G580-0112) ... *General Information Manual* (GH30-0093) ... *Application Logic Manual* (SH30-0140) ... *Application Reference Manual* (SH30-0141).

TERMS and CONDITIONS: See PP Index



PROGRAM PRODUCTS

LUMBER DEALERS MANAGEMENT ACCOUNTING SYSTEM (LDMAS) FOR SYSTEM/34 (Single Program Mode)

- BILLING ... 5726-D4E
ACCOUNTS RECEIVABLE ... 5726-D4F
INVENTORY CONTROL ... 5726-D4G
SALES ANALYSIS ... 5726-D4H

PURPOSE

These modular programs are available for either a 32K or 48K IBM System/34. The function and data base are exactly the same as the System/32 LDMAS offering.

When all four programs are installed, they constitute an interrelated application set with an integrated data base. They can help the users manage their two largest business assets, accounts receivable and inventory, and give them profit performance data on their products, customers, and salespersons.

The Payroll, Accounts Payable, and General Ledger programs of the Distribution Financial Accounting System (DFAS) can co-reside with Lumber Dealers Management Accounting System application programs.

HIGHLIGHTS

- An automated estimate preparation procedure provides the capability to bid on more jobs for increased business.
Lien expiration notification helps dealers avoid losing their rights to file a lien when they have not been paid for the delivered material.
The complexities and error potential of pricing by different units of measure such as board foot, square foot, and linear foot, should be reduced because applicable conversions are automatically applied.

For example, one 8-foot length of 2x4 is converted to the correct number of board feet. A roll of roofing paper is converted to its pricing unit, square feet. A length of molding, priced by the linear foot, is not converted.

- A unique billing and inventory technique can handle a large number of items with a reduced number of item records. For lumber items, which are sold in different lengths but accounted for in board feet, one item record can be used for one size and grade such as 2' x 4' Redwood Common.

DESCRIPTION

BILLING (5726-D4E)

A postbilling system with data entry from the System/34 display station and/or diskettes keyed on a 3740 Data Entry System. Editing, invoice printing, invoice register, and sales summary. Features include:

- Ship-to address file
Variable price selection methods
Price conversion, with computations for square foot, linear foot, and board foot items.
Estimate preparation
Price list printing - six prices in addition to list price
State sales tax and one local sales tax
Customer code selects 1 of 6 payment terms

ACCOUNTS RECEIVABLE (5726-D4F)

A combined balance forward and open item method, with data editing, monthly statements, and delinquency notices. Features include:

- Balance forward or open item selectable by account
Lien expiration date checking
Late charge capability for both open item and balance forward accounts
Credit limit checked during order edit if Billing is installed
Variable statement format - two options
Aged trial balance monthly or on demand

- Statement by job for contractors or by branch for multilocation wholesalers

INVENTORY CONTROL (5726-D4G)

A system which allows management to obtain the information needed for purchasing and profitability analysis, including reports to assist in taking inventory. Features include:

- Stock Status Review - on demand, selectable for
Stock Status Report - monthly
Inventory Analysis Report - on demand in sequence by
Basic Unit Cost - Standard cost method
Alternate Cost - average cost
Multiple Warehouses

SALES ANALYSIS (5726-D4H)

Sales and profitability figures by salesperson, customer, item, and item class. Availability of the information in the following reports is dependent upon the applications selected and their installation sequence.

- Daily sales recap by salesperson (Data from Billing or Accounts Receivable)
Monthly salesperson sales analysis (Data from Billing or Accounts Receivable)
Monthly customer within salesperson sales analysis (Data from Billing or Accounts Receivable)
Monthly customer sales analysis (Data from Billing or Accounts Receivable)
Monthly item and item within item class sales analysis (Data from Billing or Inventory)
Monthly item class within customer sales analysis (Data from Billing)
The ability to report sales information for groups of items which do not have inventory records on file
If Sales Analysis is the first or only Lumber Dealers Application Program installed, the customer must provide data entry and edit programs.

FUNCTIONS

- Integrated data base which simplifies file maintenance and provides for more efficient disk utilization
User-maintained constants file is used in most programs which allows operator to modify data subject to change, such as late charges rate, tax rates, terms, or aging dates, without the need to change and recompile programs.
Specific file load and maintenance programs are included for each master file
Easy-to-use printed runbook for each application
Contains additional space in item and customer master records for customer use
OCL procedures, sort specifications, and processing programs are cataloged into logical work units which optimize system utilization
Automatic monitoring of execution sequence prevents execution of a program until preceding required programs have been completely and successfully executed
Dynamic file space checking capability of transaction edit programs tells the operator in advance when a file is approaching its

LDMAS for S/34 (cont'd)

- maximum size so that action may be taken in time to prevent an interruption in processing
- Dynamic backup and recovery system provides for periodic backup of master files and edited transactions, and keeps track of what procedures need to be rerun from the last backup point to recreate up-to-date master files
 - Reprint options are possible because file updating is separated from report printing functions. Reports or parts of reports can be reprinted to provide extra copies, or some report printing can be deferred to a more convenient time
 - Selective printing allows the operator to control the printing mode for reports by entering a keyboard response to prompts on the CRT. In this way, for example, reports may be printed for a range of customers or items, or only for accounts with balances or past due amounts.
 - Inquiry programs, with data retrieval options selectable at program run time, provide current information from the customer and item master files
 - Offline 3741 data entry diskette formats

Executive Guide (G580-0121) ... General Information Manual (GH30-0166) ... Application Logic Manual (LH30-0169) ... Application Reference Manual (SH30-0168)

TERMS and CONDITIONS: See PP Index

File Size and Application Function Tailoring Capability: All necessary programs and procedures for file allocation are included with the application programs. The customer can allocate file space during installation and change file space allocations as business volumes change, and may control the operation of some application functions by file maintenance and by operator-controlled run time options.

CUSTOMER RESPONSIBILITIES

IBM may provide marketing assistance, in accordance with the Marketing and Service Guidelines in the GI section, in the installation of IBM licensed programs. However, the responsibility for providing accurate ordering information, personnel selection and training, installation, and continued day-to-day operation lies solely with the customer.

Installation of System/34 licensed programs is a customer responsibility. For customers who have modified their installed System/32 IAPs and who choose to have IBM make the same modifications on the System/34 product, the reinstallation of the modifications on the new product will be billable under SES. It is the customer's responsibility to transfer data files from one system to the other.

SPECIFIED OPERATING ENVIRONMENT

Support will be provided for these licensed programs when they are operated in the following specified operating environment:

HARDWARE REQUIREMENTS

The minimum system configuration requirement is an IBM System/34 with:

- 32K or 48K bytes of main storage
- 8.6 megabytes of disk storage
- 40 characters-per-second matrix printer
- IBM 5251 mdl 11 Information Display Station

SOFTWARE REQUIREMENTS

- System/34 System Support licensed program Version 1 (5726-SS1)
- System/34 Utilities licensed program (5726-UT1)

Instructional Materials

Operator Introduction and Exercises: These materials, consisting of a *Student Guide*, audio cassettes, and System/32 diskettes, will help the operator learn and practice IAP operation without using the customer data files. One copy will be provided at no charge to the customer.

One copy of the following material is supplied via SLSS when program number and initial library are specified. Additional copies may be obtained by ordering them individually from Mechanicsburg.

Audio Cassettes (2) (SV30-0002) ... System/32 Diskettes (3) (SV30-0003) ... *Student Guide* (SR30-0171) ... *Advisor Guide* (SR30-0169) ... *Runbook* (SR30-0170) ... *Binder* (SV30-0024)

DOCUMENTATION

(available from Mechanicsburg)

Licensed Program Specifications (GH30-0538) ... *Installation Considerations For Single Program Mode Applications* (SH30-0514) ... *Runbooks: System Operations* (SH30-0533) ... *Billing* (SH30-0534) ... *Accounts Receivable* (SH30-0535) ... *Inventory Control* (SH30-0536) ... *Sales Analysis* (SH30-0537).

Since application functions and data base are identical to System/32 versions of these programs, the following available System/32 publications provide appropriate information.

SYSTEM/34 DISTRIBUTORS MANAGEMENT ACCOUNTING SYSTEM II (DMAS II)

BILLING ... 5726-D41
 ACCOUNTS RECEIVABLE ... 5726-D42
 INVENTORY CONTROL ... 5726-D43
 SALES ANALYSIS ... 5726-D44
 PURCHASING ... 5726-D46

PURPOSE

IBM System/34 DMAS II is a workstation application system that puts data processing in the hands of the using departments. Customer orders can be entered from the order desk, cash posted to customer accounts by the Accounts Receivable clerk, purchase orders created online by a buyer, and stock receipts entered by either warehouse or receiving department personnel. This can result in stock balances that reflect realtime data, lead to improved customer service, fewer lost sales, and optimum inventory investment; at the same time, greater control can be provided over the entire purchasing process and the cash commitment it involves.

HIGHLIGHTS

- Interactive data entry is designed for simplicity and operator efficiency. Using this method, an operator gets a maximum amount of system-provided information in response to entering a minimum amount of data. Screen displays guide the operator through the data entry operation in a logical sequence. Data entry errors are signalled and descriptive data from master files is displayed to aid in visual verification. Errors are corrected interactively.
- The additional processing capability of the System/34 allows System/32 DMAS customers to convert to System/34 DMAS II using diskette entry and batch processing. This DMAS capability has been retained to facilitate the transition of customers using batch processing and diskette entry to that of interactive online processing. Concurrent with batch operations, the customer can use the Workstation Operator Instruction Course. This capability provides for the processing of existing daily work, the training of operators and the ability to put new applications 'online' at a controlled pace.
- Multiple, interactive display stations may operate on one job or concurrently on different jobs. Several workstations can be used for customer order entry, while others may be used for posting payments, creating purchase orders, or entering inventory receipts. While this is occurring, a batch job may be running in the background. These capabilities dramatically increase the efficiency of entering data from the various centers of activity in a distribution business.
- The alpha search feature allows inquiry about customers and items when the workstation operator does not have the customer or item number available. By keying a portion of either the customer's name, or city, or both, the system will locate and display all customers meeting that criterion. Similarly item name, item class, or both can be used to display items. An optional search field can be used when the customer or item is to be found by other than the first portion of the customer or item name.
- Comprehensive inquiry offers current data on demand. Displays show key information such as customer accounts receivable summaries, aged receivables status, customer sales and billing summaries, realtime item inventory balances, item sales summaries, item price and cost data, vendor purchasing data, and active purchase orders for any item. In addition, a credit check which includes a summary of all A/R, all in transit to A/R, and all orders in process for a customer can be obtained. Alpha search can be used to locate desired customer and item inquiry data.
- Order status inquiries show the current status of customer or purchase orders in process or on file in the system. The user may choose to display all orders or only those meeting selection criteria.
- Comparative sales analysis provides inquiry displays which show historical comparisons and ratios. Quantitative figures and graphical comparisons are displayed for both item and customer data. Latest-month data can be compared to the preceding month, to the same month in the preceding year, and to the latest 12-month average. Also, the current year-to-date data can be compared to the same period-to-date data in the previous year. The latest 13-month figures for any customer or item can be displayed in bar graph form. The various comparative sales analyses can show dollar sales, dollar profit, and quantity sold (items) or number of orders (customer) data, as selected by the user.
- Interactive file maintenance permits easy and accurate additions and corrections to master files from any workstation. Field descriptions, field lengths, and explanations of coded data are provided, while entered data is edited for reasonableness. A special feature allows rapid review and/or change of any or all item list prices. New prices are edited for reasonableness, as a protection against gross keying errors.

- All application procedures may be executed from a menu screen. Menu screens simplify the operators' duties by displaying a list of job numbers, with descriptions, that can be run. This reduces operator keying time and errors.
- Application options may be selected, depending on the type, at install time, run time, or by overriding standard data during data entry. Files may be resized as necessary to accommodate growth. Warning messages signal when files are approaching their capacity.
- Diskette magazine support for master file backup and recovery for all five DMAS II application programs.
- Enhanced auditability and control.
 - Order Reconciliation list.
 - System balancing to optional operator-entered control totals and the notation of any forced control totals.
 - Transaction registers.
 - Backing up of transaction files and master files.
 - System-produced notations of price-related operator overrides in the Billing application.
 - Financial data (receivables amounts and stock on hand) cannot be altered through file maintenance operations.
 - Sales statistics from deleted records are stored in summary form through year end, so that year-to-date sales and cost amounts balance to controls.
 - All pages of transaction registers (Invoice Register, Inventory Transaction Register, Receivables Transaction Register, Items Ordered/Received Register) are numbered with a perpetual serial page count to prevent valid report copies from being inadvertently destroyed or lost unnoticed.
- Prompting to override default options.
- No customer programming capability is required. An education program is provided that is intended to help the customer attain operational self-sufficiency.
- Each application may be installed separately or in conjunction with the others. However, when Billing is installed, its output automatically serves as input to the Accounts Receivable, Inventory Control, and Sales Analysis; output from Purchasing updates related data in the inventory records, if Inventory Control is also installed.
- Reserved user space in master records.
- Basic screen functions across applications.
 - Ability to change mode between entry and review.
 - Cancel function may be performed.
 - Ability to add or insert new lines.
 - 1 to 8 lines may be entered and edited per body screen.
 - Ability to delete transactions.
 - Screens displayed in logical sequence.
 - Ability to unlock keyboard to make changes during review or entry.
- Flexible backup/recovery/restart to minimize the recovery process.

DESCRIPTION

BILLING (5726-D41)

- Dynamic stock on-hand balance maintained and quantity available may be allocated to orders as they are entered. This allocate feature is optional with postbilling and standard in prebilling.
- Post- or prebilling methods available. Users may select either method, and change their choice at a later time.
- Credit limit checking (if A/R is installed) warns when customers' posted balance exceeds 90% of their credit limit.
- Extended credit check option displays total due currently posted in A/R, plus future and in-transit to A/R charges, plus total of all orders in process. Comparison to credit limit and orders on credit hold are shown.
- Price check during order entry option will display complete order pricing data prior to picking list printing.
- Back orders are automatically reentered for customer and items that qualify.
- The printing of picking lists and invoices may be initiated following entry of an order. After an order has been entered, any operator may initiate the printing of a picking list on a printer located in the warehouse. The operator can also expedite delivery by calling for the printing of particular invoices to that warehouse.
- Alpha search on customer and item.
- Diskette and online workstation data entry.
- Multiprogramming allows for other batch and/or workstation jobs to operate concurrently.
- Multiple order entry workstation.

PROGRAM PRODUCTS

S/34 DMAS II (cont'd)

- Orders may be entered for new customers and for new items not on file. No file maintenance required prior to entering orders.
- Flexible pricing, including: Discount from list or markup from cost, item quantity discounts, contract prices, or manually entered overrides.
- Operator override allows the operator to override defaults and information contained in master file data records.
- Orders may be cancelled, corrected, released to invoicing or retained in the file for later processing.
- Invoices/credit memos may be entered directly and changed, cancelled or remain in file for later processing.
- Picking documents and invoices printing flexibility:
 - For a particular warehouse or all warehouses
 - Within order number or invoice number limits
 - Based on 'all ready to be printed' or up to a specified number (for example, first 20).
 - Can be directed to different printer
 - The standard picking list printing sequence (list organization and content) can be overridden.
- An on-reserve warning is displayed when the quantity available of an item is less than the quantity on reserve.
- Interactive File Maintenance permits easy, accurate customer master file maintenance from any workstation.

ACCOUNTS RECEIVABLE (5726-D42)

- Cash application is simplified. The operator can select invoices for payment from a display of all of a customer's open items and selectively apply payments.
- Balance forward or open item. Either method is selectable for each account. The individual accounts can be changed from one method to the other at the end of an accounting period.
- Multiple cash entry workstations.
- Diskette and online work station data entry.
- Statements with past and future aging, late charges, and optional remittance tear strips are prepared monthly.
- Aged Trial Balance and a Customer Account Status Report are available on demand. An option allows the Aged Trial Balance to be sequenced by customer within salesperson.
- Delinquency notices are available.
- Multiprogramming allows for other batch and/or workstation jobs to operate concurrently.
- Deferred statement printing is provided for. Data is saved on diskettes for the printing of statements at a more convenient time.
- A zero-balance statement option permits the printing or bypassing of statements for customers with zero amount due, but who had transactions during the latest month.
- Print paid open item proof, and paid item list.

INVENTORY (5726-D43)

- Dynamic stock-on-hand balances maintained. Sales, receipts and adjustment are immediately reflected in the quantities available.
- Alpha search on item.
 - Item price, cost, and quantity sold inquiry capability.
- Multiprogramming allows for other batch and/or workstation jobs to operate concurrently.
- A stock status report, stock status review and a variety of other analytical reports can provide stock movement data to assist in the buying process, optimize inventory investment, and provide a high level of customer service.
- Broken case quantities maintained.
- Accounting for warehouse and drop shipments.
- Multiple warehouse activity supported. Inventory balances can be maintained separately for multiple warehouses. Inventory Analysis reports can show either the items in all warehouses, or only those in a specific warehouse.
- Two costing methods are supported: Average cost, for calculation of profit, and last cost, which usually represents your current replacement cost. Both costs can be displayed during item balance inquiry.
- Backorder release lists, one in item sequence and one in order number sequence, show customer orders being held pending receipt of backordered items.
- Physical inventory lists assist when taking inventory.

- Diskette and online work station data entry.
- Quantity on reserve and on backorder.
- Interactive File Maintenance permits easy, accurate item master file maintenance, including item price changes by item class, from any work station.

SALES ANALYSIS (5726-D44)

- Sales analysis reports assist in answering questions like:
 - What is selling and what is not selling?
 - Which profitable items should be promoted and which unprofitable ones should be dropped?
 - Which customers are profitable?
 - Which salespersons are effective and profitable?
- Depending on other licensed programs installed, reports are sequenced:
 - By item.
 - By item within item class.
 - By item class within customer within salesperson
 - By customer
 - By customer within salesperson
 - By salesperson.
 - Within limits
- Deferred printing of reports.
- Comparative Sales Analysis displays show historical data about items and customers at any workstation.
 - Data displayed is dollar sales, dollar profit, and quantity sold (items) or number of orders (customers).
 - Analyses for a sales territory or an item class show four comparisons of latest period data to previous time periods. Quantitative data and the ratio between periods is shown.
 - Analyses for a single customer or item show four comparisons of latest period data to previous time periods. These analyses show quantitative data and ratios for sales, profits, and orders for that item or customer.
 - Trend charts, showing up to 13 months of sales, profit, or order history for a single customer or item are displayed in bar graph form.
 - Comparative Sales Analysis data is collected and retained on file as the result of month-end DMAS II processing.

PURCHASING (5726-D46)

- Build order by scan through vendor's line, identifying desired items and accepting or overriding normal order quantity - as alternative to key entry of individual items. Scan can be confined to items with below minimum availability status.*
 - Item inventory status can be displayed.*
 - Quantity/price break points can be displayed. Program assigns vendor price appropriate to quantity ordered.
 - Cumulative order weight and cost displayed and updated as order is modified during entry.
- Handles items that are ordered from more than one vendor.
- Orders can be entered for items that are not on the file.
- Orders can be entered for vendors who are not on the file.
- A standard general ledger account number is assigned to the order, but the operator can assign a different number to the order or to any item(s) on it.
- Messages can be entered to be associated with an order or a particular item on the order, and to appear only on the screens and reports destined for specific operating areas (for example, on the purchase order for the vendor, or on receiving reports and displays for the warehouse).
- Total order weight and cost is displayed after order entry, and updated if the order is modified at entry time.
- Orders can be held for later approval and/or can be printed individually or in batches at any time.
- Purchase orders can be printed on the system printer, or on a workstation printer (for example, at the buyer's desk), as predetermined by the user.
- When the purchase order has been entered, it updates Quantity on Order in the item records.*
- Multiple-warehouse activity is supported.
- Daily purchase order reconciliation report
 - Log of all orders
 - Transaction and status record for each order
 - Summary reconciliation of status changes and activities for all orders

* If the DMAS II Inventory Control application is installed.

S/34 DMAS II (cont'd)

- Summary of open order dollar value by order status and buyer
- Report of shipments expected, by due date
 - For expediting
 - For warehouse labor scheduling
- Receiving lists and reports, to aid in
 - Warehouse operations and space planning
 - Checking receipts with minimum clerical effort
 - Determining stocking locations for incoming merchandise
 - Maintaining audit trail
- Extensive order status reports and displays - with multiple selection criteria.
- Item purchase order search, and display of status
- Interactive application of receipts to open orders
 - Updates purchase order quantities
 - Dynamically updates quantities available to fill customer orders*
 - Updates quantity on order and quantity on hand in item records*
 - Updates open order cash commitments
- Accounts Payable input
 - Interactive reconciliation of vendor invoice quantities and amounts to purchase order and receiving data.
 - Closing report for quantities approved for payment, with cost by assigned General Ledger account numbers.
 - Interactive input of vendor invoice Accounts Payable data, for transfer via diskette to the DFAS II Accounts Payable application.
- Operator can override defaults and information obtained from master file data records.
- Multiprogramming allows for other workstation and/or batch jobs to operate concurrently.
- Multiple workstations can enter purchase orders concurrently.

AUTOMATED INSTALLATION AID

DMAS II Self-Install, an interactive installation method consisting of a workbook and diskette, enables customers to install any of the existing DMAS II applications with little or no SE assistance. These applications include Billing, Accounts Receivable, Inventory Control, Sales Analysis, and Purchasing. They may be installed in any sequence. DMAS II Self-Install is designed for the novice who is installing an application for the first time. It is also intended for the experienced DMAS II user who wishes to add a new DMAS II application.

DMAS II Self-Install consists of:

- An installation workbook that guides the user step-by-step through the planning and installation of a DMAS II application. File sizing and run time options are explained and then entered by the user in the workbook. The workbook should be ordered so the customer can use it prior to installation.
- Data forms for all application master files are included along with lists of descriptions for the information fields in all the forms.
- A set of programs, invoked by one command, that prompts for workbook responses, calculates disk/diskette requirements, initializes required diskettes, loads programs to DMAS II libraries, and backs up all files and libraries. The programs are included with the application code shipped from PID.

PTF APPLICATION SERVICE AID

This new service aid will provide an improved method of support and control for application of PTFs, as well as an automated audit trail of the activity. This service aid has been designed so that customers can increase their self-sufficiency by being able to apply their own PTFs and refreshes.

This aid provides the following features:

- The total or partially automatic replacement of corrected modules in a refresh.
- Built-in safeguards to prevent inadvertent replacement of modified modules.
- Source code image PTFs additionally provided with refresh diskettes to facilitate manual application to modified modules.
- Cross-reference listings of PTFs contained in refresh.
- Audit trail listing of PTFs applied during refresh session.
- Automatic logging of PTF numbers into the library log.

Customer Education

Distribution Customer Executive Seminar: A half-day seminar to introduce distribution executives to the concepts, features, and advantages of System/34 and DMAS II.

Distribution Industries End-User Orientation: A half-day seminar for department heads, covering the concepts, features, and advantages of System/34 and DMAS II.

Buyer Orientation: A class for purchasing agents and buyers, covering the concepts, features, and advantages of INVEN/34. The capabilities and benefits of DMAS II-Purchasing are also discussed.

Instructional Materials

DMAS II Workstation Operator Instruction: This Workstation Operator Instruction Course will provide hands-on experience to the workstation operator in the daily operations of DMAS II Billing, Inventory Control, Accounts Receivable, Comparative Sales Analysis, Purchasing, Inquiry, and Interactive File Maintenance. It will co-reside with DMAS II. A major advantage of this feature allows the customer to train operators on new applications and new operators on existing applications, while also operating DMAS II.

The self-study course consists of an Advisor Guide, Study Guide, Audio Cassettes and System/34 Diskettes. One set will be provided, at no charge to the customer, when the initial DMAS II order is first placed.

Additional components may be obtained by ordering them individually. An additional complete set of this material can be supplied via SLSS when ordered under bill-of-forms number SBOF-4031. Material and form numbers are as follows:

Advisor Guide	SR30-0256
Study Guide	SR30-0257
Audio Cassettes	SV30-0504
Diskettes	SV30-0505
Binder	SV30-0156

Note: A copy of the *DMAS II System Operator Instruction Study Guide* (SR30-0254) is also provided when ordering SBOF-4031.

Recommended Prerequisites: *System/34 Operating Concepts* (T2020) ... *System/34 Work Station Users Guide* (SR30-0240).

DMAS II System Operator Instruction: A self-study course to provide hands-on experience to the System/34 operator in the daily, weekly, and monthly operations of DMAS II. One copy of this guide, provided at no charge to the customer, is supplied via SLSS when ordering the *DMAS II Workstation Operator* course (SBOF-4031).

Note: The DMAS II System Operator Instruction requires the diskettes (SV30-0505) used in the DMAS II Workstation Operator Instruction Course.

Recommended Prerequisites: *System/34 Operating Concepts* (T2020) ... *System/34 Work Station Users Guide* (SR30-0240) ... *System/34 System Operations* (D2050).

Data Base Conversion Programs: These programs are available for customers converting from System/32 DMAS to System/34 DMAS II Release 2.

Responsibility for conversion rests with the customer, although assistance via SES may be available. To help the customer convert DMAS to DMAS II Release 2 data files, data base conversion programs will be included at no extra charge in the licensed machine-readable material ordered with DMAS II Release 2. They are supplied to all new users of DMAS II, along with the publication *Data File Conversion Instructions* (SH30-0195).

The feature #7041 diskettes contain programs and pertinent OCL for converting the ten permanent data files. The conversion is performed on the System/34. The programs assume that no changes were made in the DMAS Application Program data base.

CUSTOMER RESPONSIBILITIES

Installation of System/34 licensed programs is a customer responsibility. IBM may provide marketing assistance, in accordance with the Marketing and Service Guidelines in the GI section, in the installation of IBM licensed programs. However, the responsibility for providing accurate ordering information, personnel selection and training, installation, and continued day-to-day operation lies solely with the customer. The customer has responsibility for providing data base conversion programs when either the conversion is from a system other than that described above, or the conversion is from a System/32 DMAS installation in which the licensed program data base has been changed.

SPECIFIED OPERATING ENVIRONMENT

Support will be provided for these licensed programs when they are operated in the following specified operating environment:

HARDWARE REQUIREMENTS

The minimum system configuration requirements are an IBM System/34 with:

- 5340 System Unit with Diskette 1 Drive, 8.6 MB of disk storage and 48K (mdl B11) or 64K (mdl C11) bytes of main storage depending on the application (see below)
- One IBM 5256, 5211 or 3262 Printer

S/34 DMAS II (cont'd)

- One IBM 5251 Display Station mdl 11
- 64K for Billing or Purchasing, alone or in combination with any of the other DMAS II applications
- 48K may be used in certain environments when neither Billing nor Purchasing is included.

Although there is nothing inherent in the design of DMAS II to prevent the use of the minimum system configurations stated above, the system configuration for a particular customer must be able to accommodate the expected business volumes, data base size and operating requirements.

The amount of disk storage required is influenced by:

- The number of applications installed
- The volume of daily transactions
- The number of customer, item and ship-to records
- The number of open customer orders and unpaid invoices
- The number of purchase orders on file
- The number of contract items and items with quantity discounts
- The number of vendor and vendor/item records
- The number of Accounts Payable entry records stored

Additionally, a main storage capacity greater than the stated minimum required will often provide improved performance. For example, performance is affected by:

- The number of DMAS II application tasks operating concurrently.
- The number of workstations operating concurrently on the same or different applications, and
- Any other applications operating concurrently.

SOFTWARE REQUIREMENTS

The programs are written in IBM System/34 RPG II programming language and executed under control of the IBM System/34 System Support Program (5726-SS1), Release 5, or later. The IBM System/34 Utilities (5726-UT1) must be ordered for use with the system. IBM System/34 RPG II (5726-RG1) must be available if modifications to the programs are expected.

DOCUMENTATION

(available from Mechanicsburg)

Executive Brochure (BICARSA) (G580-0234) ... Executive Brochure (Purchasing) (G580-0255) ... Business Information For the Executive (GH30-0593) ... Reports and Displays (G280-0079) ... Application General Information Manual (GH30-0185) ... Licensed Program Specifications (GH30-0501) ... An Auditor's Perspective (GH30-0543) ... System Reference Manual (SH30-0193) ... Billing Reference Manual (SH30-0510) ... Inventory Control Reference Manual (SH30-0507) ... Accounts Receivable Reference Manual (SH30-0508) ... Sales Analysis Reference Manual (SH30-0509) ... Purchasing Reference Manual (SH30-0601) ... Self-Installation Workbook (SH30-0610) ... System Logic Manual (LH30-0191) ... Billing Logic Manual (LH30-0552) ... Inventory Control Logic Manual (LH30-0553) ... Accounts Receivable Logic Manual (LH30-0554) ... Sales Analysis Logic Manual (LH30-0555) ... Purchasing Logic Manual (LH30-0603) ... System Runbook (SH30-0506) ... Billing Runbook (SH30-0502) ... Inventory Control Runbook (SH30-0503) ... Accounts Receivable Runbook (SH30-0504) ... Sales Analysis Runbook (SH30-0505) ... Purchasing Runbook (SH30-0602) ... Interactive File Maintenance Runbook (SH30-0591) ... Data File Conversion: DMAS to DMAS II (SH30-0195).

RPQs ACCEPTED: No

**DISTRIBUTION FINANCIAL ACCOUNTING SYSTEM
(DFAS)
FOR SYSTEM/34 (Single Program Mode)**

**GENERAL LEDGER ... 5726-D6A
ACCOUNTS PAYABLE ... 5726-D6B
PAYROLL ... 5726-D6C**

PURPOSE

These three IBM System/34 applications provide the distributor with an aid for managing the business.

HIGHLIGHTS

- Independent or Interrelated applications approach:
 - Modular design facilitates sequential application installation
 - Single data entry results in multiple application updates
 - Modular design allows users to choose the applications that address their problem areas
- Wide variety of reports and report options included:
 - Management reporting is a byproduct of normal data entry
 - The 941-As and W-2s are saved on diskette and may be printed later
 - Detail or summary listings within a range of keys is supported in many reports
- Uses recognized accounting techniques and terminology to provide a solid accounting system:
 - Clear audit trails and control techniques are provided
 - Sample user-oriented forms for data preparation, file creation, audit, and control are provided
 - Security code deters unauthorized execution of key programs in each application
 - A journal reference numbering system supplies an audit trail for any application that generates transactions into the General Ledger
- The System/34 application program may co-reside, but not interact, with the Motor Freight Accounting System (5726-T21) and with certain Distribution IAPs which have System/34 application programs (DMAS, FDMAS, LDMAS) or that were converted using conversion guidance from Menlo Park.
- Can be installed without customer programming capability:
 - System tailoring procedure facilitates account growth by allowing on-site changes to file sizes and determination of functions used
 - File maintenance and audit procedures provided
 - Easy-to-use runbook
 - Step-by-step installation activity plan provided by the *Application Installation Guide*
 - User's information supplied to the supervisor by the application reference manuals

DESCRIPTION

These three applications are independent yet interrelated, ready-to-execute applications for the small distributor:

- General Ledger
- Accounts Payable
- Payroll

The system combines two data entry approaches: Operator-oriented and batch-oriented. Support is provided for transaction entry through the System/34 keyboard or through a diskette keyed offline on a 3740 Data Entry System. The three easy-to-operate applications can be installed in separate stages at different times and still be an interrelated system.

Each application has certain requirements records within a cross-application Constants File which contain questionnaire responses. These records allow the application to select certain fields for editing, file sizes, and functions to suit each customer's needs. The questionnaire responses are keyed during initial installation and may be changed as needed. The System Tailoring Procedure allows these responses to be entered.

The System Tailoring Procedure utilizes the answers to a series of questions regarding a distributor's requirements. It provides the following:

- Tailoring the application on-site at installation time
- Allows the user to change selection of provided functions as business changes.
- All provided functions are included in the programs but only required functions are executed.
- File sizes may be expanded or contracted as needed by rerunning the System Tailoring Procedure.

An application installation guide provides a step-by-step installation activity plan including sample numbering systems, sample input and maintenance data forms, file loading sequences, and control forms with

suggested procedures. The application reference manual provides information on the day-to-day use of the application.

The runbook provides the operator with a detailed and easy-to-use set of instructions showing all the activities necessary to run the programs on a System/34. The procedure reference summary card is provided for the operator as a reminder of the major operational functions of each procedure. It is intended to be used once the operator is thoroughly trained in the particular application.

An application logic manual is provided for use by the self-sufficient customer and for systems engineering continuing support. It describes the architecture of programs, procedures, data base cross-references, data dictionary, and detailed descriptions of each program.

The System/34 application program makes available the Distribution Financial Accounting System on a System/34 in single program mode. The System/34 application program supports one workstation, no spooling, no multiprogramming, and no file sharing.

Applications Description - The three applications are ready-to-execute applications. Each includes source code, object code, execution procedures, and the application logic manual.

These are some general features which all three applications have:

- Designed to fit industry requirements
- Security codes to deter unauthorized use of master files
- In-house inclusion/exclusion of functions to be executed
- OCL procedures, Sort Specifications, and processing programs are packaged into logical work units which simplify system operation
- Monitoring of execution sequence prevents execution of a program until preceding required programs have been completely and successfully executed
- Compatible online/offline file maintenance and transaction data entry via the System/34 keyboard or diskettes created on the 3740 Data Entry System
- Dynamic Backup and Recovery System forces periodic backup of master files and edited transactions and keeps track of what procedures need to be rerun from the last backup point to recreate up-to-date master files
- Reprint options are possible because file updating is separated from report writing functions
- Some report printing can be deferred to a more convenient time
- Selective printing options are available for many report functions

GENERAL LEDGER (5726-D6A)

This application combines all the transactions affecting the financial status of the company during the period. They may be entered directly as a General Journal Entry or may have been previously entered through interface with Accounts Payable or Payroll. Support is provided for either a 13-period or 12-month fiscal year. At period-end closing time, audit listings and the Financial Statement Worksheet are provided to help verify that the user is still in balance before proceeding into the actual closing. The reports will also aid in generation of any necessary closing entries.

An Income Statement and Balance Sheet are standard report outputs. The user can design the format of these reports with an easy-to-use format description procedure. The financial reports can illustrate current financial data as compared to historical information, also to budget information on the Income Statement. The capability is provided to format Income Statements by subdivisions of a company, such as department. Several companies' financial information may be combined into one Balance Sheet and Income Statement. A Statement of Changes in Financial Position Worksheet is provided.

Users may define their own Chart of Accounts or use a suggested account structure provided with the application. The fiscal year start period or month is user-defined. Multiple company support for up to ten companies is included. Any transactions passed from Payroll are applied to company number one only.

ACCOUNTS PAYABLE (5726-D6B)

The Accounts Payable application provides an Open Payables and Cash Disbursements function on either an accrual or cash basis. Invoices and credit memos entered may be multi-lined and distributed by General Ledger account number. Entries may be for standard or one-time vendors and may be open or prepaid. Credit memos may be entered manually or initiated automatically by referencing a prior entered invoice. Invoice payments may be assigned to a vendor other than the original vendor. Invoices may be controlled through the application based upon a voucher number entered with the invoice.

A Purchase Journal provides the audit trail for cost transactions entering into the General Ledger system and into the Open Payables

S/34 DFAS (cont'd)

File. An Open Payables Report is provided in due date or vendor sequence. This turnaround document provides a way to select for payment by date, vendor, or invoice, including partial payments, for Cash Disbursements. Invoices may be entered or placed in hold status to prevent inadvertent payment. A Cash Requirements Report is used to assist in insuring sufficient funds are available and proper invoice selection was made before the checkwriting procedure begins. The Cash Disbursements Journal provides an audit trail for its transactions entering the General Ledger application and acts as the Check Register. Checkwriting and reconciliation are also provided.

A Vendor Analysis Report indicates key business volumes and discounts lost and taken for previous year and current year. An additional analysis report by business volume per vendor is also provided. Multiple company support for up to 10 companies is provided.

PAYROLL (5726-D6C)

This hourly salary executive payroll provides for regular, overtime, premium, vacation, and sick pay. It may be run weekly, biweekly, semimonthly, monthly. Hours may be entered daily or by pay period. Exception hours provide time and one-half, double time, and one-half, and triple time capabilities. Rates may be selected from the Employee Master Record or keyed in as an override. Shift differential capabilities are provided for second and third shift. The differential may be defined as a percentage of the rate or cents to be added to the rate.

Vacation/Holiday pay may be part of a regular pay check or on a separate check. A bonus payment is paid on a separate check with a flat percentage of income tax deducted. Sick pay may be fully nontaxable or only liable for income tax. Wages subject to Federal Unemployment Insurance (FUI) and State Unemployment Insurance (SU) are determined.

The ability to handle taxable or nontaxable adjustments, pay advances, and employer-paid union benefits (taxable and nontaxable) is also provided. Once the gross earnings is calculated, deductions will be taken to reach net pay. In addition to calculating present Federal and FICA taxes, a standard tax algorithm is provided to calculate most present state taxes based upon customer-provided data. Local taxes may also fit the standard tax algorithm provided. The state disability insurance deductions also use a standard algorithm based upon customer-provided data. Miscellaneous deductions may be taken by percent, fixed amount, hourly rate, upper limit, or cyclic within a user-specified frequency. Union deductions may be taken by percent, hourly rate, or fixed amount within a user-specified frequency.

Handwritten paychecks and paychecks never cashed (reversals) are also supported by the application. Once the payroll register and checks are printed, many analysis reports are produced: Labor Distribution, Miscellaneous Deductions, Union Deductions, YTD/QTQ Earnings, Workmen's Compensation Worksheet, and Payroll Journal. W-2 and 941-A reports are also provided.

The capability is provided to pass transactions to the General Ledger application, if installed. These transactions will be applied towards company one only. Payroll may be on either a cash or accrual basis. If the cash basis is selected, no transactions are passed to the General Ledger.

CUSTOMER RESPONSIBILITIES

IBM may provide marketing assistance, in accordance with the Marketing and Service Guidelines in the GI section, in the installation of IBM licensed programs. However, the responsibility for providing accurate ordering information, personnel selection and training, installation, and continued day-to-day operation lies solely with the customer.

Installation of System/34 licensed programs is a customer responsibility.

SPECIFIED OPERATING ENVIRONMENT

Support will be provided for these licensed programs when they are operated in the following specified operating environment:

HARDWARE REQUIREMENTS

Each of these licensed programs will execute on all models of the IBM System/34 in Single Program Mode. The programs are compiled assuming a 32K minimum system on IBM System/34. Because of volume and time constraints, there may be a requirement for providing offline keying on an IBM 3740 Data Entry System. If an IBM 3742 is to be used, it must have the 128-character record features [128-character (#5455) and feature group A (#4004)].

The three applications are intended to be independent yet interrelated. Many functions have been included to protect the integrity of the master files, programs, procedures, and libraries.

Each application may co-reside, but will not interact with the Distribution IAPs and may also operate as stand-alone applications.

The Distribution IAP must have a Constants File with a record length of 64 characters. The original shipments of the Food and Paper IAPs for 24K machines had 59-character records. The customers that received

these original shipments will have to update their IAPs to the larger record size before they will co-reside with DFAS.

SOFTWARE REQUIREMENTS

The IBM System/34 Application Programs are written in IBM System/34 RPG II programming language and executed under control of the IBM System/34 System Support Program (5726-SS1 Version 1). IBM System/34 Utilities licensed program (5726-UT1), which includes Sort, Data File Utility, Source Entry Utility, and Work Station Utility is required for execution of the programs. The IBM System/34 RPG II Compiler (5726-RG1) is required if modifications to the source code are necessary.

Instructional Materials

DFAS Operator Instructions (SBOF-3584)

One copy is supplied via SLSS when program number and initial library are specified. Additional copies can be obtained by specifying SBOF-3584 which includes the following:

Binder (SR30-0324) ... Study Guide (SR30-0117) ... Sample Run Book (SR30-0118) ... Advisor Guide (SR30-0119) ... Cassette (SV30-0073) ... Diskette (SV30-0074) ... Plastic Insert (S580-0116).

DOCUMENTATION
(available from Mechanicsburg)

General Ledger: Installation Guide (SB30-0189) ... Reference Manual (SB30-0190) ... Runbook (SB30-0191) ... Accounts Payable: Installation Guide (SB30-0193) ... Reference Manual (SB30-0265) ... Runbook (SB30-0194) ... Payroll: Installation Guide (SB30-0196) ... Reference Manual (SB30-0197) ... Runbook (SB30-0198) ... General Ledger Logic Manual (LB30-0192) ... Accounts Payable Logic Manual (LB30-0195) ... Payroll Logic Manual (LB30-0199).

TERMS and CONDITIONS: See PP Index

**FOOD DISTRIBUTORS MANAGEMENT
ACCOUNTING SYSTEM (FDMAS)
FOR SYSTEM/34 (Single Program Mode)**

**BILLING ... 5726-D65
ACCOUNTS RECEIVABLE ... 5726-D66
INVENTORY CONTROL ... 5726-D67
SALES ANALYSIS ... 5726-D68**

PURPOSE

These licensed programs are for either a 32K or 48K IBM System/34. The application function and data base are exactly the same as the System/32 Food Distributors Management Accounting System (FDMAS) offering. These applications run in single program mode on the System/34. Performance improvements in the larger memory size version come from the reduction of overlays, incorporation of larger blocking factors, and use of dual I/O areas.

When all four application programs are installed, they constitute an interrelated application set with an integrated data base. They can help users to manage their two largest business assets, accounts receivable and inventory, and give profit performance data on products, customers, and salespersons. These application programs can also help the user increase operational efficiency and customer service.

The open order file, slot-sequenced picking lists and automated pricing and discounting methods can help improve order processing speed and accuracy. The inventory control system provides information to the buyer that will help optimize inventory investment by identifying the obsolete, slow moving, and unprofitable items, and help increase inventory turns and service levels. Automatic credit limit checking, variable credit terms, late charges on open item and balance forward accounts, delinquency notices, and aged receivables reports provide tools for reducing bad debt losses and increase cash flow. Daily, monthly, and on-demand sales reports help monitor the attainment of the distributor's sales objectives.

The Payroll, Accounts Payable, and General Ledger licensed programs of the Distribution Financial Accounting System (DFAS) can co-reside with Food Distributors Management Accounting System Application Programs. With FDMAS and DFAS, the major data processing requirements of the food distribution customer can be addressed, and the applications that best meet the customer's needs may be selected. If Billing is used in the prebilling mode, a compatible Inventory Control System must be installed before or with the Billing licensed program.

DESCRIPTION

BILLING (5726-D65)

A prebilling system (when used with a compatible inventory control system) with postbilling capability, with data entry from the System/34 display station and/or from diskettes keyed on a 3740 Data Entry System, with editing, invoicing, invoice register, and a salesperson's recap. Features include:

- Open orders file with listing by customer and/or item that allows either case labels or picking list in warehouse (slot) sequence
- Ship-to address file
- Variable pricing methods, including:
 - Contract pricing
 - Customer class pricing (six classes)
 - Cost plus pricing
 - Catchweight pricing
 - Broken case pricing and surcharge
 - Special charges and allowances
 - Case label charges
 - Cash and trade discounts
- Sales and tobacco tax
- Credit limit checking
- Automatic invoice numbering
- Special deals
- Automatic substitution
- Suggested retail price on invoice and case labels

ACCOUNTS RECEIVABLE (5726-D66)

Accounts Receivable provides for the recording, controlling, and reporting of money owed for merchandise sold or services rendered. Recognizing that a major portion of a wholesale food distributor's assets may be tied up in accounts receivable, the application procedures are designed to provide timely information that helps your customer.

- Maximize profit and return on investment through tight control over all accounts due
- Minimize losses from bad debts through appropriate attention to slow paying accounts
- Maintain customer goodwill through prompt, accurate record keeping

The major features of Accounts Receivable include:

- Balance forward or open item selectable by account
- Late charges for both open item and balance forward accounts on monthly statements
- Credit limit checked during order edit if Billing installed
- Monthly or weekly statements and delinquency notices
- Aged trial balance monthly or on demand - summary or detail
- Aging into four aging periods

INVENTORY CONTROL (5726-D67)

Inventory control involves the recording of items received, sold, and on-hand, the updating of item costs and the recording of activity dates.

Inventory Control can provide accurate, periodic reviews of the status of each item, while identifying any exception conditions, to assist management in deciding what to buy, how much to buy and how often to buy.

Inventory Control provides information that helps:

- Maintain records of all items physically in stock as well as on-order, providing control and auditing for this major investment
- Arrange for timely, economical ordering of stock
- Minimize investment required to meet a specific service level, by highlighting overstocked or slow moving items.

The major features of Inventory Control include:

- Data entry and edit
- Two cost figures - last cost and burdened cost
- Maintenance of broken case quantities
- Warehouse location (slot)
- Physical inventory aids
- An array of reports to assist in:
 - Buyer ordering
 - Inventory management
 - Transaction recording and control
 - Inventory accounting

SALES ANALYSIS (5726-D68)

Sales Analysis offers sales and profitability figures by salespersons, customer, item, and item class. Availability of the information in the reports is dependent upon the applications selected and their installation sequence. Major Sales Analysis Reports include:

- Daily sales recap by salesperson (data from Billing or Accounts Receivable).
- Monthly salesperson sales analysis - current and year-to-date (data from Billing or Accounts Receivable).
- Monthly customer sales analysis - current and year-to-date (data from Billing or Accounts Receivable).
- Monthly customer sales analysis - current and year-to-date (data from Billing or Accounts Receivable).
- Monthly item and item within item class sales analysis - current and year-to-date (data from Billing or Inventory).
- Monthly item class, within customer, within salesperson sales analysis - current and year-to-date (data from billing).

If Sales Analysis is the first or only application program installed, the customer must provide data entry and edit programs.

FUNCTIONS

- Integrated data base which simplifies file maintenance and provides for more efficient disk utilization.
- User-maintained constants file is used in most programs which allows operator to modify data subject to change, such as late charge rate, tax rates, terms, or aging dates, without the need to change and recompile programs.
- Specific file load and maintenance programs are included for each master file.
- Easy-to-use printed runbook for each application.
- Contains additional space in item and customer master records for customer use.
- OCL procedures, sort specifications, and processing programs are cataloged into logical work units which optimize system utilization.

FDMAS (cont'd)

- Automatic monitoring of execution sequence prevents execution of a program until preceding required programs have been completely and successfully executed.
- Dynamic file space checking capability of transaction edit programs tells the operator in advance when a file is approaching its maximum size so that action may be taken in time to prevent an interruption in processing.
- Dynamic backup and recovery system provides for periodic backup of master files and edited transactions, and keeps track of what procedures need to be rerun from the last backup point to recreate up-to-date master files.
- Reprint options are possible because file updating is separated from report printing functions. Reports or parts of reports can be reprinted to provide extra copies, or some report printing can be deferred to a more convenient time.
- Selective printing allows the operator to control the printing mode for reports by entering a keyboard response to prompts on the CRT. In this way, for example, reports may be printed for a range of customers or items, or only for accounts with balances or past due amounts.
- Inquiry programs, with data retrieval options selectable at program run-time, provide current information from the customer and item master files.
- Offline 3741 data entry diskette formats.

Executive Guide (G580-0120) ... General Information Manual (GH30-0156) ... Application Logic Manual (LH30-0159) ... Application Reference Manual (SH30-0158).

TERMS and CONDITIONS: See PP Index

File Size and Application Function Tailoring Capability: All necessary programs and procedures for file allocation are included with the application programs. The customer can allocate file space during installation, change file space allocations as business volumes change, and may control the operation of some application functions by file maintenance and by operator-controlled runtime options.

CUSTOMER RESPONSIBILITIES

IBM may provide marketing assistance, in accordance with the Marketing and Service Guidelines, in the installation of IBM licensed programs. However, the responsibility for providing accurate ordering information, personnel selection and training, installation, and continued day-to-day operation lies solely with the customer.

Installation of System/34 licensed programs is a customer responsibility.

SPECIFIED OPERATING ENVIRONMENT

Support will be provided for these licensed programs when they are operated in the following specified operating environment:

HARDWARE REQUIREMENTS

The minimum system configuration requirement is an IBM System/34 with:

- 32K or 48K bytes of main storage
- 8.6 megabytes of disk storage
- 40 characters-per-second matrix printer
- IBM 5251 mdl 11 Display Station

SOFTWARE REQUIREMENTS

IBM System/34 System Support licensed program (5726-SS1 Version 1), and System/34 Utilities licensed program (5726-UT1).

Instructional Materials

Operator Introduction and Exercises: These materials, consisting of a *Student Guide*, audio cassettes, and System/32 diskettes, will help the operator learn and practice IAP operation without using the customer data files. One copy will be provided at no charge to the customer.

One copy of the following material is supplied via SLSS when program number and initial library are specified. Additional copies may be obtained by ordering them individually from Mechanicsburg.

Audio Cassettes (2) (SV30-0002) ... System/32 Diskettes (3) (SV30-0003) ... *Student Guide* (SR30-0171) ... *Advisor Guide* (SR30-0169) ... *Runbook* (SR30-0170)

DOCUMENTATION

(available from Mechanicsburg)

Licensed Program Specifications (GH30-0531) *Installation Considerations for Single Program Mode Applications* (SH30-0514) ... *Runbooks: System Operations* (SH30-0526) ... *Billing* (SH30-0527) ... *Accounts Receivable* (SH30-0528) ... *Inventory Control* (SH30-0529) ... *Sales Analysis* (SH30-0530)

Since application functions and data base are identical to System/32 versions of these application programs, the following available System/32 publications provide appropriate information.

SYSTEM/34 3270 DEVICE EMULATION 5726-EM1

PURPOSE

The IBM 3270 Device Emulation licensed program allows the IBM System/34 and locally attached IBM 5250 Information Display System devices to appear as an IBM 3270 Control Unit and devices to a host system.

HIGHLIGHTS

- System/34 appears to a host system as a 3271 under Binary Synchronous Communications (BSC) or as a 3274 under System Network Architecture/Synchronous Data Link Control (SNA/SDLC).
- A locally attached 5251 mdl 11 appears to a host system as a 3277 mdl 2 Display Station.
- A 5256, 5211, and 3262 printer locally attached to a System/34 will appear to the host system as a 3288 mdl 2 printer.
- Up to 16 device addresses are supported under BSC and up to 16 logical units under SNA/SDLC.
- The licensed program operates under System Support Program (5726-SS1) and the Interactive Communications Feature (SSP-ICF), #6000 or #6001).
- The Work Station Control Expansion A or B feature (#4900 or #4901) is required on the 5340 System Unit.
- Auto-call support is available with SNA/SDLC
- Numeric lock support

DESCRIPTION

The 3270 Device Emulation licensed program is a utility program that supports both BSC and SNA/SDLC 3270 line protocols through SSP-ICF. No user code is required.

The 3270 Device Emulation program will allow the System/34 to appear to a host system as a 3271 mdl 2 (BSC) or a 3274 mdl 1C (SNA/SDLC) Control Unit. It will also allow the 5251 mdl 11 Display Station locally attached to a System/34 to appear to a host system as a 3277 mdl 2 Display Station. Keyboard Numeric Lock (#4690) on 3277 displays is optionally supported. The 5256 printers locally attached to a System/34 and the 5211 or 3262 printer on the System/34 will appear to the host system as a 3288 mdl 2 printer. The 3284 mdl 2 and 3286 mdl 2 printers are emulated as the 3288 mdl 2. Output to be printed can also be spooled.

Only the EBCDIC typewriter keyboards and EBCDIC transmission code are supported. Certain keys are in different locations on the 3277 and the 5231. Function keys on the 3277 will be mapped onto the 5251 keyboard to provide the same functions; that is, Field Mark, Erase Input, PA and PF keys. The copy command is not supported. However, the 5250 Print key can provide an equivalent function in many cases. The light pen and magnetic stripe reader are not supported.

Emulation of the 3270 devices allows the System/34 to reside on a multipoint communications link that supports a 3270. Since this program translates the data stream, host application programs will, generally, require no changes to support the System/34 when running under this device emulation. 'Screen wrap' is not supported. If the last position (24,80) on the screen is a field attribute character, it will be repeated in the first position (1,1).

Many users have large investments in 3270 application programs; and many host systems, especially under BSC, only support a single device type on a given communications line. The 3270 Device Emulation program will provide the System/34 user with an easy means of introducing an intelligent system into such a network. The end user at the System/34 will be able to execute the same host applications as with the 3270. At the same time, other applications can be developed on the System/34.

Host systems that support 3271 mdl 2 or 3274 mdl 1C control units on a multipoint network can have the System/34 with the 3270 Device Emulation program co-resident on that network. Such host system communication subsystems include: System/370 IMS/VS, CICS/VS, TSO, and System/3 mdls 15A, 15B, 15C and 15D CCP.

With Release 8, the 3270 Device Emulation Program has been modified to emulate the 3270 keyboard numeric lock feature. This change provides the capability of locking out all characters in a numeric field except 0-9, decimal sign, minus sign, plus sign, comma, space and DUP.

BSC Considerations: For BSC, the 3270 Device Emulation program emulates the 3271 mdl 2 control unit, the 1920-character 3277 mdl 2 display station, and the 3288 mdl 2 printer. The 3284 and 3286 printers are also emulated, but as a 3288.

The System/34 with the 3270 Device Emulation program acts as the 3271 mdl 2 control unit. The 5251 mdl 11 Display Station serves as the 3277; and the 5256, 5211, and 3262 printers serve as the 3288.

No auto-call support is available in BSC.

Only one line is supported.

The maximum receive buffer size supported will be 4096 bytes. This will include all line control characters.

The 3270 Device Emulation Program may generate BSC error status to the host under somewhat different conditions than the 3271. Customer host programs dependent on such specific link level 3270 BSC error status may require modification. The reference manual will detail these conditions.

SNA/SDLC Considerations: For SNA/SDLC, the 3270 Device Emulation program emulates the 3274 mdl 1C control unit, the 1920-character 3277 mdl 2 display station, and the 3288 mdl 2 printer. The 3284 and 3286 printers are also emulated but as a 3288.

The System/34 with the 3270 Device Emulation program acts as the 3274 control unit on a multipoint (nonswitched) or point-to-point (switched or nonswitched) line. The 5251 mdl 11 display station serves as the 3277; and the 5256, 5211, and 3262 printers serve as the 3288 (or 3287 in SCS mode only). Up to 16 devices (logical units) are supported using SNA/SDLC protocols.

Multiple lines can be used concurrently.

CUSTOMER RESPONSIBILITIES

IBM may provide marketing assistance, in accordance with the Marketing and Service Guidelines in the GI section, in the installation of IBM licensed programs. However, the responsibility for providing accurate ordering information, personnel selection and training, installation, and continued day-to-day operation lies solely with the customer.

Installation of System/34 licensed programs is a customer responsibility.

SPECIFIED OPERATING ENVIRONMENT

Support will be provided for this licensed program when it is operated in the following specified operating environment:

HARDWARE REQUIREMENTS

The IBM System/34 3270 Device Emulation licensed program runs on all models of the System/34 with a minimum of 64K bytes of main storage. Communications to a host system requires a communications adapter on the System/34 (#2500, #3500, or #4500). Work Station Control Expansion A or B (#4900 or #4901) is also required.

SOFTWARE REQUIREMENTS

The IBM System/34 3270 Device Emulation licensed program will operate under control of the current release of the IBM System/34 System Support Program (5726-SS1) and the Interactive Communications Feature SSP-ICF, (#6000 or #6001).

SYSTEM/34 COMMUNICATION SUPPORT COMPATIBILITY

The 3270 Device Emulation licensed program can coexist in a System/34 with other communication support (that is, programs using remote 5250s, batch BSC, MRJE, SRJE, SSP-ICF, or System/34 Assembler macros). However, 3270 Device Emulation communications support can only share a communications line concurrently with SSP-ICF.

Program Use During Customer Preinstallation Testing: The System/34 3270 Device Emulation (5726-EM1) licensed program will be available to customers for preinstallation testing on IBM Test Center systems in accordance with IBM's Program Testing Policy.

DOCUMENTATION

(available from Mechanicsburg)

System/34 3270 Device Emulation Licensed Program Design Objectives (GC21-7749) ... System/34 3270 Device Emulation Licensed Program Specifications (GC21-7807) ... System/34 3270 Device Emulation Licensed Program User's Guide (SC21-7868).

TERMS and CONDITIONS: See PP Index

STUDENT ADMINISTRATION SYSTEM FOR SYSTEM/34 (Single Program Mode)

STUDENT RECORDS ... 5726-E31
 STUDENT ACCOUNTING ... 5726-E32
 STUDENT SCHEDULING ... 5726-E33

PURPOSE

The IBM Student Records licensed program, which provides the data base and file maintenance functions, is a prerequisite for either or both of the other packages.

These three applications provide the school with a powerful aid in managing its student recordkeeping functions.

The system design of these packages incorporates many significant features:

- General - System tailoring to the school's unique requirements for number of periods in a school day, number of terms (or semesters) in a year, state reporting cycles, etc. All input specifications are described in terms familiar to school administrators and require no detailed knowledge of data processing techniques. Data files are shared among applications.
- Student Records - Provides common data base and file maintenance functions for the other applications. Basic record keeping and reporting functions essential for secondary schools are also included.
- Student Accounting - Consists of an Attendance Accounting Application and a Mark Reporting Application.
- Student Scheduling - Supports both machine scheduling and 'arena' scheduling of students to classes. Provides many reports to assist the principal and counselor in the scheduling process.

HIGHLIGHTS

- Interrelated applications approach:
 - Modular design allows users to choose the applications that address their problem areas.
 - Modular design facilitates sequential application installation
 - Single data entry results in multiple application updates
- Wide variety of reports and report options included:
 - Management reporting is a byproduct of normal data entry
 - Optional sequences and selection within a range is supported in many reports
- Uses recognized accounting techniques and terminology to provide a solid student accounting system:
 - Clear audit trails and control techniques are provided
 - Sample user-oriented forms for data preparation, file creation, audit and control are provided
 - Security codes deter unauthorized execution of key programs in each application
- Can be installed without customer programming capability:
 - Designed to fit industry requirements
 - System tailoring procedure facilitates account growth by allowing on-site changes to file sizes and determination of functions used
 - File maintenance auditability provided
 - Easy-to-use runbook
 - Step-by-step installation activity plan and detailed user information provided by the *Application Reference Manual*

DESCRIPTION

These three applications are an interrelated and ready-to-execute set of applications for the small school district or large secondary schools:

- Student Records
 - Data Base and Maintenance
- Student Accounting
 - Attendance Accounting and Mark Reporting
- Student Scheduling
 - Assignment of students to classes

The system combines two data entry approaches: Operator-oriented and batch-oriented. Support is provided for transaction entry through the System/34 keyboard or through a diskette keyed offline on a 3740 Data Entry System. Student Records is a prerequisite to the other applications which can be installed at different times.

Each application has certain requirements records within a cross-application Constants File which contain questionnaire responses. These records allow the application to select certain fields for editing, file sizes, and functions to suit each customer's needs. The questionnaire responses are keyed during initial installation and may be changed as needed. The System Tailoring Procedure allows these responses to be entered and maintained.

The System Tailoring Procedure utilizes the answers to a series of questions regarding a school's requirements. It provides the following:

- Tailoring of the application at installation time.
- Allows users to change their selections of provided functions as the environment changes.
- All provided functions are included in the programs but only required functions are executed.
- Files may be resized as needed by rerunning the System Tailoring Procedure.

The *Application Installation Guide* provides a step-by-step installation activity plan including sample input and maintenance data forms and file loading sequences. There is only one *Application Installation Guide* which is delivered with the Student Records application. It contains information pertinent to all three applications. Each *Application Reference Manual* provides information on the day-to-day use of the application.

The runbook provides the operator with a detailed and easy-to-use set of instructions showing all the activities necessary to run the programs on a System/34. The *Procedure Reference Summary* is provided for the operator as a reminder of the major operational functions of each procedure. It is intended to be used as a quick reference once the operator is thoroughly trained in the particular application.

An application logic manual is provided for use by the self-sufficient customer and for systems engineering continuing support. It describes the architecture of programs, procedures, data base cross-references, data dictionary, and detailed descriptions of each program.

The System/34 licensed program makes available the Student Administrative System on System/34 in single program mode. It supports only one workstation, no spooling, no multiprogramming and no file sharing.

APPLICATIONS DESCRIPTION

The three applications are ready-to-execute. Each includes source code, object code, execution procedures, and the application logic manual.

These are some general features which all three applications have:

- Designed to fit industry requirements
- Security codes to deter unauthorized use of master files
- In-house inclusion/exclusion of functions to be executed
- OCL procedures, Sort Specifications, and processing programs are packaged into logical work units which simplify system operation
- Monitoring of execution sequence prevents execution of a program until preceding required programs have been completely and successfully executed.
- Compatible online/offline file maintenance and transaction data entry via the System/34 keyboard or diskettes created on a 3740 Data Entry System
- Dynamic Backup and Recovery System forces periodic backup of master files and edited transactions and keeps track of what procedures need to be rerun from the last backup point to recreate up-to-date master files
- Reprint options are possible because file updating is separated from report writing
- Selective printing options are available for many reports

STUDENT RECORDS (5726-E31)

The Student Records area represents a systems solution to the problem of recording, retrieving, manipulating, and reporting student data. The student record is the key to the school's student accounting system. It is a vital source of information necessary to the implementation of the other applications. In addition to providing data to and collecting data from the scheduling, mark reporting, and attendance accounting applications, it contains student personal data for counseling. This data includes the student's name, school code, year of graduation, current grade level, sex, birth date, address, and a number of other data elements. It also contains student attendance information, the student's current schedule and mark reporting information, and the school's curriculum for the current school year. From these files, many reports can be provided for the school administration, teacher, counselors and parents.

As the Student Records system is designed to be an ongoing system, it is not necessary to recreate all of the basic files at the beginning of each school year. Programs are provided to accomplish a year-to-year transition by indicating the promotion of qualified students to the next grade level, and their new school, if that is indicated at promotion time. An important aspect of the student records application is the file maintenance functions. Programs are provided to update information in each of the files in the student records application as well as performing the year end transition functions (student transfers between schools, promotions of students from one grade level to the next, etc.)

S/34 Student Administration System (cont'd)

The integrity of the data in the files is maintained through the use of extensive editing of the data when it is entered into the system and through complete backup and recovery procedures which are an integral part of the package.

Output reports include:

- Student Listings
- Name and Address Labels
- Ethnic Distribution Report
- Student Profiles
- Student Schedules
- Room Schedules
- Instructor Schedules
- Class Rosters

STUDENT ACCOUNTING (5726-E32)

The Student Accounting package consists of two applications, Attendance Accounting and Mark Reporting.

The Student Records Package, which provides the data base and file maintenance functions, is a prerequisite to this package.

• Attendance Application

The maintenance of attendance records is an important aspect of Student Accounting. In many states the amount of state aid for public education is based on average student attendance. Under manual methods, a considerable amount of time is expended by teachers and staff personnel in keeping records and accumulating data for state reports. The Attendance Accounting application simplifies such tasks by collecting original data at the source through the use of attendance data gathering documents, enabling reports to be prepared accurately and rapidly, and reducing clerical transcriptions.

Output reports include:

- Daily Absence Phone List
- Daily Absence Report
- Unresolved Absence Report
- Student Attendance Register
- Student Category Register
- School Category Register

• Mark Reporting Application

The Mark Reporting application provides a means of recording student progress data for reports to parents and to school personnel. The prime data processed by this application are the student marks, which may be either numeric marks or alphabetic marks with optional plus or minus signs. In addition, up to two comments may be selected from a list of 99 user-defined comments and associated with each student's graded course. The Mark Reporting application is designed to fit the needs of many schools by providing a selection of reports and processing methods from which to choose. Output reports include:

- Report Card
- Labels for Permanent Records
- GPA Listings
- Mark Analysis
- Exception Reports

STUDENT SCHEDULING (5726-E33)

The Student Scheduling licensed program [Student Records (5726-E31) is a prerequisite] processes student course requests against a manually prepared master schedule of classes to produce a schedule of classes for each student. To assist the school administrator in preparing this master schedule of classes, the following reports are produced from the student course requests: Student Verification Report, Course Verification Report, Course Request Tally Report, and Potential Conflict Matrix. Once the master schedule of classes has been prepared, student requests are processed by the Main Scheduler programs, or, schools may wish to use the arena scheduling option. Whether the class assignments are accomplished through machine scheduling or arena scheduling, the results are the same: A data base reflecting each student's class assignments. For those students who could not be completely scheduled because of a conflict in their course requests, a Student Conflict report can be printed to assist the school administrator in resolving that student's conflict. Once a final scheduling run has been processed, the school may optionally run the student hall scheduler which will assign the student to study halls during any unassigned time in the school day.

Output reports include:

- Student Request Verification
- Course Request Verification
- Course Request Tally Report
- Potential Conflict Matrix
- Student Conflict Report
- Student Schedules

Programs are provided to pass basic student identifying information from Student Records to the Scheduling program. Once scheduling is completed and the scheduled term is about to begin, the student data records will be updated to reflect the student's current schedule of classes. One of the primary objectives of the Student Scheduling Package is to provide for the variety of scheduling philosophies present in today's secondary school environment. This flexibility is accomplished by offering a number of basic scheduling features and options which include:

- Scheduling of up to 4 terms, or semesters
- Up to 24 periods in a school day
- Up to 20 requests per student
- Flexibility in course requests - section requests, instructor requests, term requests, free time requests, and alternates
- Add-on scheduling
- Study hall scheduling option
- Arena scheduling option

Student scheduling is far more than a clerical chore. The basic educational philosophy of an institution is reflected in the manner in which students are assigned to a class section. For example, many school systems permit varying degrees of student-elected alternates and teacher preferences. This illustrates the need for flexibility in a student scheduling system in order to accommodate a wide spectrum of educational policies. The student scheduling package provides administrators with a variety of optional system features which can be used to tailor the scheduling system to coincide with the school's policies.

CUSTOMER RESPONSIBILITIES

IBM may provide marketing assistance, in accordance with the Marketing and Service Guidelines, in the installation of IBM licensed programs. However, the responsibility for providing accurate ordering information, personnel selection and training, installation, and continued day-to-day operation lies solely with the customer.

Installation of System/34 licensed programs is a customer responsibility.

SPECIFIED OPERATING ENVIRONMENT

Support will be provided for these licensed programs when they are operated in the following specified operating environment:

HARDWARE REQUIREMENTS

The minimum system configuration requirements are an IBM System/34 with

- 48K bytes of main storage
- 8.6 megabytes of disk storage
- Character or line print capability with 132 print positions and the 48-character set
- IBM 5251 mdl 11 Display Station

The licensed programs are designed to process data recorded on the IBM System/34 keyboard or on a diskette created by the IBM 3740 Data Entry System. Because of volume and time constraints, there may be a requirement for providing offline key entry on an IBM 3740 Data Entry System. If an IBM 3742 is to be used, it must have the 128-Character Record feature (#5455) and Feature Group A (#4004).

The marketing representative must be careful when determining the printing, disk space, and key entry requirements. Some installations can use the character printer, but others may require greater print capability, and a larger disk file to handle the number of students and the printing volumes associated with them.

The three applications are interrelated. Many functions have been included to protect the integrity of the master files, programs, procedures, and libraries. Because of this, no other licensed program or user-written programs may co-reside unless stringent coding requirements for these programs are met to insure compatibility with the Student Administration System. The *Application Logic Manual* discusses in detail the coding conventions used for the development of the Student Administration System.



PROGRAM PRODUCTS

S/34 Student Administration System (cont'd)

Because of the printing volumes and timing constraints involved in the Mark Reporting applications, an 80-cps printer is recommended as a practical minimum.

SOFTWARE REQUIREMENTS

The IBM System/34 licensed programs are written in IBM System/34 RPG II programming language and executed under control of the System/34 System Support licensed program (5726-SS1). IBM System/34 Utilities licensed program (5726-UT1), which includes Sort, Data File Utility, Source Entry Utility, and Work Station Utility is required for execution of the programs. The IBM System/34 RPG II Compiler (5726-RG1) is required if modifications to the source code are necessary.

DOCUMENTATION

(available from Mechanicsburg)

Student Records Reference Manual (SB30-0252) ... Student Records Runbook (SB30-0253) ... Student Accounting Reference Manual (SB30-0255) ... Student Accounting Runbook (SB30-0256) ... Student Scheduling Reference Manual (SB30-0258) ... Student Scheduling Runbook (SB30-0259) ... Student Records Logic Manual (LB30-0254) ... Student Accounting Logic Manual (LB30-0257) ... Student Scheduling Logic Manual (LB30-0260)

TERMS and CONDITIONS: See PP Index

**SYSTEM/34 FORTRAN IV
5726-FO1****PURPOSE**

IBM System/34 FORTRAN IV processes programs written in the IBM System/34 FORTRAN IV language, producing output suitable for execution with the IBM System/34 System Support Program (5726-SS1).

The System/34 FORTRAN IV language contains those features defined in American National Standard Basic FORTRAN, X3.10.1966; language extensions supported by IBM 1130, IBM System/3 and IBM System/32 Basic FORTRAN, and additional features and capabilities previously available only with certain Full FORTRAN compilers. These features include:

- Correction or modification of a program in a semi-interactive mode at the workstation by displaying a source program file into which the compiler has interspersed diagnostic messages. The compile turnaround time can be reduced because the programmer can start to correct or modify the program without waiting for a listing.
- Logical data, logical expressions, and logical IF are supported.
- Logical elements (constants, variables, and arrays) contain true or false values.
- Operation symbols are used in logical expressions:

.NOT. (negation)	.LT. (less than)
.AND. (conjunction)	.LE. (less or equal to)
.OR. (union)	.EQ. (equal)
	.GT. (greater than)
	.NE. (not equal)
	.GE. (greater or equal to)
- Logical expressions evaluate elements to obtain true or false values.
- Logical assignment statements define a relationship - placing the value of a logical expression in a variable or array element.

The System/34 FORTRAN IV library contains mathematical and service subprograms required during execution to perform arithmetic operations, input and output constant conversions and input/output control.

System/34 FORTRAN IV is supplemented by a commercial subroutine package which is equivalent in function to the System/32 Package insofar as is meaningful in terms of System/34 devices and data management.

SPECIFIED OPERATING ENVIRONMENT

Support will be provided for this licensed program when it is operated in the following specified operating environment:

HARDWARE REQUIREMENTS

The IBM System/34 FORTRAN IV licensed program runs on all models of the System/34. FORTRAN graphics on the IBM 5211 Printer are provided by any 64-character or 96-character print belt or by the 48-character FORTRAN print belt. The IBM 5256 Printer automatically provides FORTRAN graphics.

SOFTWARE REQUIREMENTS

The current release of the IBM System/34 FORTRAN IV licensed program operates under control of the current release of IBM System/34 System Support licensed program (5726-SS1).

Program Use During Customer Pre-installation Testing: The IBM System/34 FORTRAN IV licensed program (5726-FO1) is available to customers for pre-installation testing on IBM Test Center systems in accordance with IBM's Program Testing Policy.

DOCUMENTATION

(available from Mechanicsburg)

System/34 FORTRAN IV Licensed Program Specifications (GC21-7685) ... System/34 FORTRAN IV Reference Manual (SC21-7706).

TERMS and CONDITIONS: See PP Index

SYSTEM/34 FINANCIAL INSTITUTIONS CUSTOMER ACCOUNTING SYSTEM

CUSTOMER INFORMATION FILE ... 5726-F11
DEMAND DEPOSIT ACCOUNTING ... 5726-F12
SAVINGS ACCOUNTING ... 5726-F13
INSTALLMENT LOAN ACCOUNTING ... 5726-F14

PURPOSE

These four IBM applications provide broad application support for the small commercial bank. The Customer Information File licensed program (CIF) includes the data base, application conversion procedures, and file maintenance procedures for the system. It is a prerequisite for the Demand Deposit Accounting, Savings Accounting and Installment Loan Accounting licensed programs, which may be installed independently of each other.

The Customer Information File licensed program enables the bank to associate all of a customer's checking, savings, and installment loan accounts with a single record that contains common information about customers and their relationship to the bank. This enables the bank to make decisions based on a broader knowledge of the status of the customer's accounts. Account and customer information is accessed by account number for daily transaction processing, and by customer name for management reports, inquiries, etc. The Demand Deposit Accounting, Savings Accounting and Installment Loan Accounting licensed programs support the three most important data processing applications in a commercial bank. Each of these licensed programs contains a variety of functional options, enabling the bank to tailor the application to its own requirements.

HIGHLIGHTS

- Can be installed without customer programming capability:
 - Step-by-step installation activity plan and detailed user guidance is provided in the application installation guide.
 - System Tailoring Procedure accommodates account growth by allowing on-site changes to file sizes and functions used.
 - Application conversion procedures are provided.
 - Conversion aids are provided to assist in consolidating the master data from a customer's account records into a single CIF record.
 - Strict DP controls are enforced during conversion.
 - File maintenance is provided.
- Accounting and Control Techniques
 - Two levels of security codes help deter unauthorized access to programs and data.
 - Sample audit trail and control techniques are documented.
 - Sample user-oriented forms for data preparation, file creation, audit and control are provided.
- Interrelated Application Design
 - Data base design reduces file space requirements.
 - Common procedures add new accounts and provide file maintenance for all installed applications.
 - Access to all application accounts through the CIF Master Record.

DESCRIPTION

These four applications are an interrelated and ready-to-execute set of applications for the small commercial bank:

- Customer Information File
 - Data base, file maintenance, application conversion and customer-oriented reports.
- Demand Deposit Accounting
 - Processing of checking accounts with optional functions of overdraft banking, automatic funds transfer, and combined statements.
- Savings Accounting
 - Processing of savings accounts, both regular savings accounts and time deposit open accounts.
- Installment Loan Accounting
 - Processing of installment loan accounts, including simple interest, add-on, and discount loans.

The system provides transaction and file maintenance data entry through the System/34 keyboard or through a diskette keyed offline on a 3740 Data Entry System. The bank may optionally elect to use the 1255 Magnetic Character Reader (MCR) to capture transactions for Demand Deposit Accounting, Savings Accounting, and Installment Loan Accounting. An installation questionnaire and data capture programs are provided to support the 1255 MCR.

At installation time, the options provided in the system are selected through a System Tailoring Procedure which allows the user to:

- Tailor the application to use only the functions wanted.
- Change the functions to be executed as the environment changes.

- Resize files as the bank's business expands, or if the bank wishes to revise its original estimates.

There is an application installation guide provided with the Financial Institutions Customer Accounting System. It is shipped with CIF and provides instructions for installing and converting all of the Financial Institutions Customer Accounting System licensed programs. It contains guidance on installation planning, data gathering, and the use of the installation and conversion procedures. Samples of all required input data and control forms are included. An application reference manual is provided for each of the four licensed programs. These manuals contain information on the daily operations of the applications. Included is information on procedure scheduling, the operation of each procedure and the implementation of sound operational controls.

An application runbook and a procedure reference summary is provided for each application. The application runbook provides the operator with an easy-to-use set of instructions showing all the activities necessary to run the procedures on a System/34. The procedure reference summary is provided for the operator as a reminder of the functions and use of each procedure. It is intended to be used as a quick reference once the operator is thoroughly trained in the particular application.

An operator instruction manual with exercises is provided for operator training in the use of the runbook. The course is not oriented specifically to financial applications. Therefore, only one copy of the course is needed per customer regardless of which of the IAPs are installed. The course is System/34 only.

An application logic manual is provided for each application as basic licensed material. It is mainly useful for the self-sufficient customer and for systems engineering support. The manual describes the architecture of the Financial Institutions Customer Accounting System, and the logic of the programs and procedures. Data base cross-references and a data dictionary are also included.

The System/34 Financial Institutions Customer Accounting System executes on System/34 in single program mode. The System/34 licensed programs support one workstation, no spooling, no multiprogramming and no file sharing.

The four licensed programs are ready-to-execute applications. Each includes source code, object code, execution procedures and the application logic manual. These are some general features common to all four applications:

- Two levels of security codes help deter unauthorized access to programs and data.
- Application processing is tailored by the customer by including or excluding functions to be executed.
- OCL procedures, Sort specifications, and processing programs are packaged into logical work units which simplify system operation.
- Monitoring of execution sequence prevents execution of a program until the required preceding programs have been successfully executed.
- File maintenance and monetary transactions may be entered via the System/34 keyboard or diskettes created on a 3740 Data Entry System.
- Monetary transactions may be entered via the 1255 Magnetic Character Reader.
- A single set of Customer Information File (CIF) procedures enters and edits application conversion data for all applications and creates the master files.
- A single set of CIF procedures establishes new accounts and performs master file maintenance for the four applications.
- The backup and recovery design forces periodic backup of master files and transactions. This provides for tracking of what procedures need to be rerun in recovery to recreate the master files. Three generations of backup diskettes can be maintained, each containing a complete set of master files and transactions.
- Reprint options permit printing multiple copies of reports.

CUSTOMER INFORMATION FILE (5726-F11)

The Customer Information File licensed program supports three general functions of the System/34 Financial Institutions Customer Accounting System:

- Application Conversion
- Master File Maintenance
- Cross-Application Reports

CIF is a prerequisite for Demand Deposit Accounting, Savings Accounting, and Installment Loan Accounting and is installed in conjunction with the installation and conversion of each of those licensed programs. The conversion process creates a CIF Master File

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(which contains customer-related data for each of the bank's customers) and separate Account Master Files for DDA, Savings and Installment Loans. The Account Master Files contain account-related data for each account in the three applications. The system maintains linkage from each customer's CIF record to the account master record for checking, savings, and installment loan accounts. In addition, a cross-reference file provides an access path from each account master record to all of the customers associated with the account, based on the account number.

Application Conversion: Separate programs are provided to enter and edit the customer and account data and to build the data base during application conversion. A two-phase conversion procedure is established for each application. During the first phase the data that is less subject to change (such as customer name and address, account type, etc.) is entered. The master data from each customer's account records is consolidated into a single CIF record. A unique access key is developed for each customer and all master records are created. At this stage the records can be maintained, but monetary transactions cannot be processed. This phase may take place over several weeks or months.

During the second phase the remaining data, such as account balances, are entered, edited and loaded into the master records created in the first phase. The records are placed in active status and the application is ready for daily processing.

Strict batch controls are implemented for both phases of conversion. The controls will not permit either phase to proceed if edit errors exist in any records or if the monetary controls do not balance.

File Maintenance: All maintenance of inter-application master files is performed by CIF programs. A single operator procedure is provided to add new customers or new accounts to any converted application. Another procedure is used to change the data in these master files - including such actions as changing an address, placing an account in dormant status, etc. Monetary data can only be changed through application transaction processing. A separate procedure is provided to change the operator and supervisor security codes.

Cross-Application Reports: A basic set of cross-application reports is provided. The advanced customer may wish to extend the use of the CIF data base through additional user-written report programs. (If these programs are to co-reside with the Financial Institutions Customer Accounting System, they must meet stringent coding requirements to insure complete compatibility.)

The following items are provided:

- A Customer Services Report, summarizing the number of customers using installed applications or combinations of applications.
- Mailing Labels, to assist the bank in selective marketing of its services, may be printed according to customer selection criteria established by the execution of the Customer Services Report.
- A Customer Profile showing information for an individual customer and the customer's account status.
- A Customer Inquiry, displayed on the console workstation, and containing a subset of the information printed for a Customer Profile. Inquiry may be by full or partial customer name, customer key, or an account number.
- A Spread Report showing the distribution of accounts and the total deposits for up to five user-supplied ranges of DDA and Savings account balances.
- A Master File List, in customer key sequence, to assist in the maintenance of customer and account data.

DEMAND DEPOSIT ACCOUNTING (5726-F12)

The Demand Deposit Accounting licensed program provides daily transaction processing and reporting for checking accounts for a commercial bank. The licensed program includes broad support for the standard processing functions and for two major optional functions - Overdraft Banking and Automatic Funds Transfer (AFT).

The customer Information File (5726-F11), which provides the data base and file maintenance functions, is a prerequisite for this product.

Standard DDA Functions: Transactions can be entered from the System/34 keyboard, a diskette created on a 3740 Data Entry System, or a 1255 Magnetic Character Reader.

Transactions can be posted against the current, available or collected balance in the account. The bank must select one of these options at installation time to apply to all DDA accounts.

Either one or two classes of float may be used for deposits to calculate the collected balance for accounts. The bank specifies the number of days it requires to collect each class.

The bank must assign one of the supported service charge options to each DDA account. In addition, if Savings Accounting (5726-F13) is installed, the service charge may be waived based on either a minimum

or average balance maintained in the customer's savings account. The supported service charge options are:

- Free Checking
 - No service charge.
- Single Plan
 - A fixed monthly service charge.
- Special or Thrift
 - A fixed monthly charge plus an extra charge for each item designated by the bank as 'service chargeable'.
- Minimum Balance & Charge Per Item
 - The same as the Special or Thrift Option except that provision is made for a charge for each item in a deposit. The service charge is zero if a bank-specified minimum or average current balance is maintained in the account during the statement period.
- Three-Two-One
 - The service charge for the account will be one of three fixed monthly charges, or will be zero, depending on the relationship of the minimum current balance for the period to three ascending balance levels designated by the bank. The account will be charged amount 1 if the minimum current balance is below level 1, amount 2 if it is between level 1 and level 2, amount 3 if it is between level 2 and level 3, and no charge if it is above level 3.
- Volume Earnings
 - The service charge is determined by calculating the cost of servicing the account, subtracting from this amount a credit for the amount the bank earned on the average collected balance, and charging the account the difference. The bank may include a fixed monthly cost, a cost per service-chargeable item, and a cost per item deposited in the cost computation. The earnings credit is a specified percentage of the average collected balance for the statement period. If the earnings credit exceeds the cost, the service charged is zero.

Stop payment actions may be ordered against a check, based on check amount or serial number. In addition a 'stop all' action may be initiated to prevent the posting of any checks to the account.

A hold for a specific amount may be specified against an account, or the account may be frozen - in which case all transactions against it are rejected.

The bank may specify a short list factor which applies to all accounts. When the daily number of checks for an account reaches the specified level, the checks are added together to form a single item for account posting and statement printing. A list of the checks that were combined to produce this single item is printed for filing in the customer's account folder. The short list factor may be overridden to always short list or never short list an account regardless of the number of checks.

The bank must select one of two procedures for determining how to handle an account when there are not sufficient funds to post all checks that are presented. They may choose to post each item individually until the balance is insufficient and then reject those items that cannot be posted; or, add all checks together and either post them or reject them.

Overdraft Banking: The overdraft banking function may be invoked for any specific account. If a check would normally cause the posting balance to fall below zero, a loan sufficient to cover the check is automatically advanced. Loans are always advanced in user-defined increments, with a credit limit specified for each account. The loan balance is maintained separate from the checking account balance, and deposits do not reduce the loan balance. Finance charges are accrued daily and added to the loan balance when the monthly statement is printed. A user-defined minimum payment is also calculated at statement time and automatically deducted from the DDA account balance. The overdraft banking format of the standard statement shows the running balance of the overdraft loan, its associated transactions, and the loan status.

Automatic Funds Transfer (AFT): The AFT function provides periodic transfers of funds from a checking account to another account - such as a savings or installment loan account. If Savings Accounting (5726-F13) or Installment Loan Accounting (5726-F14) is installed, the deposit or payment is also automatically credited. If the credit is to some other account, it is listed on a report and must be credited offline. The account holder may designate a frequency of weekly, biweekly, monthly or quarterly for the transfer. A number of transfers may be established against a single account.

Customer-Oriented Reports: These reports are all produced on preprinted forms. The sample forms shown in the documentation may be ordered through SSD.

Account statements are printed monthly. One of the five service charge options or free checking must be assigned to each account. The bank

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may offer each customer either the standard statement or a 'combined' statement. The combined statement includes the status of selected customer savings or installment loan accounts, if they exist on an installed Savings Accounting Program (5726-F13) or Installment Loan Accounting Program (5726-F14).

The NSF Notice is a combination form which is used to notify the customer either of checks drawn on insufficient funds, or of an overdraft loan advance:

Auditor Confirmation Notices are generated on request, based on a multiple start point systematic sample technique. The random start points can be selected by the auditor.

Internal Reports: The reports produced for use within the bank include:

- Transaction Entry and Edit Reports
- Trial Balance and Activity Journal
- Unposted Items Report
- Service Charge Journal
- Overdrawn and Drawing Against Uncollected Funds Report
- Significant Balance Change Report
- Inactive and Dormant Accounts List
- Inactive and Dormant Account Activity Report
- Account Status Change Report
- Stopped Items List
- Closed and Zero Balance Accounts List
- Short Lists
- Overdraft Banking Trial Balance Report
- AFT Debits List and AFT Credits List
- AFT Journal
- Stop/Hold Journal

SAVINGS ACCOUNTING (5726-F13)

The Savings Accounting licensed program provides daily transaction processing and reporting for regular savings accounts and time deposit open accounts.

The Customer Information File (5726-F11), which provides the data base and file maintenance functions, is a prerequisite for this licensed program.

Standard Functions: Transactions may be entered from the operator console, a diskette created on a 3740 Data Entry System or a 1255 Magnetic Character Reader. If Demand Deposit Accounting (5726-F12) is installed, Automatic Funds Transfers (AFT) to savings accounts will be merged by the system into the daily transactions and automatically credited to the designated accounts.

A hold for any amount may be specified against an account, all withdrawals may be stopped, or the account may be frozen - in which case all transactions against it will be rejected.

Up to eight different account plans, based on combinations of the interest calculation techniques, and the compounding and crediting options discussed below, may be offered at one time.

Interest Calculation Techniques: The licensed program supports both regular savings deposits and time deposit open accounts. The Low Reference Balance and the Day of Deposit to Day of Withdrawal (DOD-DOW) interest calculation techniques may be selected for savings deposit account plans. Time deposit open account plans may be based on either, (1) a requirement that the funds be on deposit for at least one complete interest period, or, (2) a requirement that they be on deposit for at least ninety consecutive calendar days.

For Low Reference Balance accounts, interest is calculated and compounded either quarterly or semiannually. Grace periods at the beginning of each month and end of the period may be defined, and either the LIFO or FIFO posting option must be selected for each plan.

For all except Low Reference Balance accounts, interest is accrued daily, and the bank may elect to compound interest continuously, daily, quarterly or semi-annually.

The bank may elect to credit interest to the account (add it to the account balance) either quarterly or semiannually.

Customer-Oriented Reports: For both regular savings deposit and time deposit open accounts, the bank may choose to provide pass-books, periodic statements, or may do both. The system records and reports 'no-book' transactions against a passbook account.

Interest earned during the preceding year may be reported to the customer each January on 1099 forms.

Auditor Confirmation Notices are generated on request, based on a multiple start point systematic sample technique. The random start points can be selected by the auditor.

Internal Reports: The reports produced for internal use within the bank include:

- Transaction Entry and Edit Reports
- Trial Balance
- Activity Journal
- Unposted Items Report
- Special Activity Report
- Earnings Journal
- Inactive and Dormant Accounts
- Closed Accounts
- No Book Transactions List
- Transaction History Report
- Accrual Report
- Account Status Change Report
- Stop/Hold Journal

INSTALLMENT LOAN ACCOUNTING (5726-F14)

The Installment Loan Accounting licensed program provides daily transaction processing for installment loan accounts for a commercial bank. The application includes broad support for the handling of the common interest calculation types, accrual and refund methods, and provides a variety of other features.

The Customer Information File (5726-F11), which provides the data base and file maintenance functions, is a prerequisite for this licensed program.

Standard Functions: Transactions may be entered from the operator console, a diskette created on a 3740 Data Entry System, or a 1255 Magnetic Character Reader. If Demand Deposit Accounting (5726-F12) is installed, AFT payments to installment loan accounts will be merged by the system into the daily transactions and automatically applied to the designated accounts.

For simple interest loans, interest is accrued daily. For precomputed (add-on and discount) loans, interest is accrued monthly on the loan's anniversary day (the day of the month on which payment is scheduled), by either the rule of 78s or straight-line accrual methods, or on a cash basis. Payment schedules are monthly or quarterly.

Early payoff calculations for precomputed loans use either the rule of 78s or straight-line method. They are performed monthly on, or up to 15 days after, the anniversary day. These calculations are performed monthly for all loans including those on a quarterly payment schedule. A loan paid off prior to the first regular monthly accrual will earn either one full month's interest or interest computed at a daily rate for the number of days outstanding.

Credit life and accident and health insurance are supported. Earnings and collections on each type of insurance are maintained and reported separately. Early payoff calculations include insurance earnings.

Dealers can be associated with a loan and earn a portion of the interest. Dealers will earn by the same schedule and method that the bank earns. Bank earnings and dealer earnings are reported separately on a daily and monthly basis. The bank's recourse to dealer is identified.

The bank may choose to print reminder notices and late notices and to assess late charges for accounts missing a payment. A percentage of the payment may be allowed to fulfill the payment obligation and prevent late charges from being assessed.

Payments may be applied first to either past due amounts or to the current payment, based on a bank-selected option. Late charges are assessed only if the current payment has not been paid. The bank has the option to permit automatic deduction of late charges from a payment. The late charges will only be deducted after the current month's payment obligation is fulfilled, past due amount is satisfied, and full payments are applied to the loan balance. A separate late charge payment is also accepted.

Loan extensions may be granted, thereby deferring payments for some number of months. The bank may require a fee for extensions.

Notices of Interest can be produced on request for all or selected accounts. These notices are also produced automatically at the end of each month for accounts closed during the month.

Payment notices can be printed for simple interest loans, advising customers of payments due.

Auditor confirmation notices are generated on request based on a multiple start point systematic sample technique. The random start points can be selected by the auditor.

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Internal Reports: The reports produced for use within the bank include:

- Transaction Entry and Edit Reports
- Trial Balance
- Update Totals
- Earnings Update Summary
- Transaction Journal
- Unposted Items Report
- Suspected Closed Report
- Special Activity Report
- Exception Report
- New Loans Report
- Late Charge Assessments Report
- Collection Report
- History Merge
- Monthly Earnings Report
- Dealers Monthly Earnings Report
- Monthly Insurance Company Report
- Closed Loans Report
- Transaction History Report
- Aged Delinquency Report
- Dealers Trial Balance
- Loan Class Report
- Loan Plan Report
- Collateral Insurance Expiration Report

CUSTOMER RESPONSIBILITIES

IBM may provide marketing assistance, in accordance with the Marketing and Service Guidelines in the GI section, in the installation of IBM licensed programs. However, the responsibility for providing accurate ordering information, personnel selection and training, installation, and continued day-to-day operation lies solely with the customer.

Installation of System/34 licensed programs is a customer responsibility.

SPECIFIED OPERATING ENVIRONMENT

Support will be provided for these licensed programs when they are operated in the following specified operating environment:

HARDWARE REQUIREMENTS

Each of these IBM System/34 licensed programs is compiled assuming a minimum 48K system and will execute on all models of the IBM System/34 in single program mode equipped with a minimum of 48K of memory. Because of volume and time constraints, there may be a requirement for offline keying on an IBM 3740 Data Entry System and/or transaction entry through the IBM 1255 Magnetic Character Reader. If an IBM 3741 is to be used, it must have Feature Group A (#4002). If an IBM 3742 is to be used, it must have 128-character feature (#5455) and Feature Group A (#4004). In addition, the Proof Keyboard Feature (#5901 or #5902) is desirable, but is not required.

All models of the IBM 1255 Magnetic Character Reader (MCR) that can be attached to the IBM System/34 are supported by these licensed programs. The Dash Symbol Transmission Feature (#3215) cannot, however, be installed if the customer wishes to use the MCR data capture programs supplied with the programs. Consult the sales manual for ordering instructions and any restrictions that pertain to attachment of the 1255 MCR to the System/34.

The four applications are closely interrelated. Many functions have been included to protect the integrity of the master files, programs, procedures, and libraries. Because of this, no other licensed program or user-written programs may co-reside unless stringent coding requirements for these programs are met to insure compatibility with the Financial Institutions Customer Accounting System. The application logic manual discusses in detail the coding conventions that are used.

SOFTWARE REQUIREMENTS

The IBM System/34 feature licensed programs are compiled in System/34 RPG II programming language and executed under control of the IBM System/34 System Support Program (5726-SS1). IBM System/34 Utilities licensed program (5726-UT1), which includes Sort, Data File Utility, Source Entry Utility and Work Station Utility is required. Only the Sort Utility, however, is required for execution of the programs. The IBM System/34 RPG II Compiler (5726-RG1) is required if modifications to the source code are necessary. The

Customer Information File (5726-F11) is a prerequisite for Demand Deposit Accounting (5726-F12), Savings Accounting (5726-F13), and Installment Loan Accounting (5726-F14).

DOCUMENTATION
(available from Mechanicsburg)

Customer Information File: Installation Guide (SB30-0238) ... Reference Manual (SB30-0239) ... Runbook (SB30-0240) ... Demand Deposit Accounting Reference Manual (SB30-0242) ... Runbook (SB30-0243) ... Savings Accounting: Reference Manual (SB30-0245) ... Runbook (SB30-0246) ... Installment Loan Accounting Reference Manual (SB30-0248) ... Runbook (SB30-0249) ... Customer Information File Logic Manual (LB30-0241) ... Demand Deposit Accounting Logic Manual (LB30-0244) ... Savings Accounting Logic Manual (LB30-0247) ... Installment Loan Accounting Logic Manual (LB30-0250)

TERMS and CONDITIONS: See PP Index

PROGRAM PRODUCTS

**SYSTEM/34 MANAGEMENT SYSTEM FOR LAW FIRMS
5726-F52**

[No longer available, effective June, 1983.]

PURPOSE

The IBM System/34 Management System for Law Firms licensed application program offers the partners in a law firm a practical, convenient means of capturing time and disbursement data, and organizing that data into meaningful working documents and management reports.

The application program is designed for the small to medium sized law firm. It is a complete set of programs designed to assist the law firm in time and disbursement accounting, billing and accounts receivable. These programs capture and store data which is then organized into reports to aid law partners in effectively controlling and managing the firm's business functions. In addition, it can be utilized with the MMAS General Ledger System licensed application program (5726-M37) to provide traditional general ledger functions such as balance sheet, income statement and other reports describing the financial status of the firm.

The System/34 Management System for Law Firms includes the components necessary for a controlled flow of daily time entries, disbursement entries (made on behalf of a client) and billing information, from data capture to final reports. Other entries, such as time or disbursements transfers, cash receipts, accounts receivable journal entries, file maintenance, and accounts receivable writeoffs, are supported. A series of comprehensive reports, with frequency of many of the reports being user-determined, is provided to the law firm.

HIGHLIGHTS

- Provides Missing Time Report which flags individuals who have reported less time than the firm standard
- Provides a turnaround document for billing information on demand or periodically with all of the necessary information to make billing decisions and update computer stored records.
- Provides disbursement-only billing information memos on demand or periodically
- Prints client bills in a variety of formats
- Calculates the variance between the firm investment of time for a bill and the actual amount received on the bill
- Provides aged accounts receivable reports
- Prepares aged reports of unbilled time and disbursements
- Analyzes billed and unbilled time
- Provides a file sizing program to create file sizes based on individual user needs
- Provides system tailoring procedures for user to select functions
- Designed to be used with the General Ledger licensed program.
- Provides initial file loading, record addition, and data entry capabilities through keyboard entry or 3740 Data Entry System.
- Provides data entry for daily transactions through keyboard or 3740 Data Entry System
- Provides file maintenance on existing master file records which use DFU (keyboard only)

DESCRIPTION**TIME and DISBURSEMENT ACCOUNTING**

The Time and Disbursement Accounting application controls recorded unbilled time and disbursement entries made by the firm on behalf of a client, and provides a broad range of management reports. The major Time and Disbursement Accounting features are:

- Additional time recording steps are not required of the professional staff.
- Aged unbilled time and disbursement reporting triggers billing activity and should help improve cash flow.
- Time and disbursement information is maintained in detail with totals accumulated at the matter and client levels.
- One of two billing rates can be selected per individual.
- Time and client disbursement description codes are user-defined.
- Narrative can be included or omitted as required.
- References to an individual can be suppressed on selected reports.
- A single disbursement journal handles both firm and client disbursements.
- All or selected time or client disbursement records can be transferred from client-to-client, matter-to-matter, attorney-to-attorney, or date-to-date.

- All information is automatically adjusted and all transfers are listed for control and auditing purposes.
- Nonbillable time can be tracked for management analysis.
- Billing Proofs can be used to verify billing attorney instructions.
- A broad range of time and disbursements reports is provided:
 - Weekly Time Report
 - Missing Time Report
 - Individual Time Summary
 - Individual Unbilled Time Summary
 - Disbursements Journal
 - Billing Journal
 - Unbilled Time and Disbursements

The billing information function of the application processes time and client disbursement records to provide billing information to assist in the billing process. Features of the billing information function are:

- Produces Billing Information Memos on demand showing all reported activity performed by the firm for a client. This report is used by the billing attorney as a turnaround document to record decisions on actual amounts billed and/or written off.
- Enables the billing attorney to bill without relieving time entries (payment on account), by relieving time and client disbursement entries, or by relieving client disbursements only.
- Prints client bills in a variety of formats
- Produces Matter Billing Summary reports showing billing analysis for the billing attorney, the matter, or the client.
- Shows billing variance (the dollar difference between time value and fees billed) and billing realization (the ratio, expressed as a percentage, between fees billed and the value of the individual's reported and billed time).
- Prepares retainer lists showing billable retainer amounts.

ACCOUNTS RECEIVABLE

The Accounts Receivable application offers a systematic procedure of recording and reporting client fee and disbursement bills, receipts and write-offs as well as the firm's cash receipts. Features of the Accounts Receivable application are:

- Aging of client accounts
- Allocation of fees and write-off amounts
- Summary or detail printing of the Aged Receivables Report
- Advance payments for fees and disbursements
- Allows entry of billing information into Accounts Receivable without any supporting time or client disbursement entries
- Cash Receipts/Write-off Journal
- Paid Open Bill and Write-off Report
- Inactive Client/Matter List

Features: Included as part of this application program are several features designed to enhance day-to-day operation.

File maintenance is a part of every application within the program. Maintenance may be performed on descriptive data in all major files but not on auditable totals and dollar amounts.

Checking procedures guide the correct sequence of operations to maintain data integrity. When an operation is not successfully completed due to missing or incorrect information, or due to an attempt to perform an operation out of sequence, the operator is notified that corrective action must be taken. The operator can then correct problems before running subsequent tasks, which are dependent upon the accuracy of prior input for proper reporting.

Backup and recovery routines maintain a dynamic tracking history which records previously executed tasks. If recovery is necessary, the recovery routines guide the user in recovering required data developed since the last data back-up point.

Reprint options are available for most reports. Reports can be reprinted to provide extra copies. If recovery is needed to recreate data files, report printing is bypassed, thus saving time.

Selective printing allows the operator to specify various options to control the content and level of detail contained in reports.

Printing options include:

- Range printing. For example, the operator may specify client identifiers as limits so that information is printed only for the group of clients whose identifiers fall between those specified.
- Selection of specific data. For example, the operator may select to print only matters whose unbilled disbursement totals exceed a specified amount.

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- Selection of detail level. For example, the operator may optionally request a detailed report or a summary report.
Users may modify information that is subject to change, such as report selection criteria and aging periods.
- Individual security codes for time and disbursement accounting, accounts receivable and maintenance are user-assigned at installation time. These codes may be periodically changed as authorization changes dictate.
- File sizes, which are determined at installation time, may be resized in the future to accommodate the firm's growth.

CUSTOMER RESPONSIBILITIES

IBM may provide marketing assistance, in accordance with the Marketing and Service Guidelines in the GI section, in the installation of IBM licensed programs. However, the responsibility for providing accurate ordering information, personnel selection and training, installation, and continued day-to-day operation lies solely with the customer.

Installation of System/34 application programs is a customer responsibility.

SPECIFIED OPERATING ENVIRONMENT

Support will be provided for this licensed program when it is operated in the following specified operating environment:

HARDWARE REQUIREMENTS

The minimum system configuration requirement is an IBM System/34 with:

- 32K bytes of main storage
- 8.6 megabytes of disk storage
- 40 characters per second matrix printer
- IBM 5251 mdl 11 Information Display Station

Because of volume and time constraints, there may be a requirement for providing offline keying on an IBM 3740 Data Entry System. If an IBM 3742 is to be used, it must have the 128-character record features 128-character (#5455) and feature group A (#4004).

SOFTWARE REQUIREMENTS

IBM System/34 System Support licensed program (5725-SS1 Version 1), and System/34 Utilities licensed program (5726-UT1).

TERMS and CONDITIONS: See PP Index

**SYSTEM/34 PUBLIC BUDGETING AND ACCOUNTING SYSTEM (PBA)
5726-G21**

PURPOSE

The IBM System/34 Public Budgeting and Accounting System (PBA) provides a workstation-oriented financial control, planning and accounting system for public institutions. It assists users in meeting financial reporting requirements, preparing budgets through online budget preparation and tracking, and controlling expenditures through management reports. The system also provides periodic reporting of expenditure and revenue accounts, and preparation of Balance Sheet and General Ledger as well as year-end closing statements.

HIGHLIGHTS

- The System/34 hardware and software functions (spooling, inquiry, multiprogramming) are integral parts of the PBA application design.
- Workstation data entry is designed for simplicity and ease of use. Screen displays provide guidance for entering data. Error messages are displayed. The incorrect data can then be corrected by the operator.
- Interactive data entry, concurrent edit, and correction from multiple workstations with batch programs operating from the job queue.
- Data entered into the multiple workstations is immediately edited for errors.
- Journal entry, cash receipt, purchase order, voucher, cash disbursement, and labor distribution transactions are posted to revenue, expenditure, labor distribution, and general journals.
- Audit trails for transactions from entry to period-end closing are provided by a journal reference numbering system.
- Accounting year is established by choice of first fiscal month or period. Yearly cycle can be 12 months or 13 periods.
- As an option, encumbrance accounting is performed. Liquidation occurs through the processing of an outstanding encumbered purchase order file.
- Labor and material costs can be accumulated by project.
- Budget reports are printed containing the previous two years' actuals and present projected amounts.
- Percent of budget spent is tracked both for current month and for year-to-date.
- A trial balance for balance sheet, revenue, and expenditure accounts by fund is produced to ensure fund integrity prior to printing final reports.
- Reports can be produced periodically or on demand.
- Single fund general ledger as well as fund trial balance are produced.
- Accounts payable checks are produced on demand.
- An expenditure approval listing is produced identifying expenditures by item.
- Multiple payments to a vendor are accumulated, totaled, and printed on a single check.
- Current chart of accounts is printed.
- Outstanding payable checks are tracked and reports of outstanding checks are printed after check reconciliation.
- Inquiry into master files concurrent with data entry and batch programs.
- System tailoring procedure permits the user to select optional functions and determine the size of files used by the application. Functions and file sizes may be modified as the environment changes by re-executing the tailoring procedure.
- Source code, ready-to-execute procedures, and object code provided. No additional systems design, programming, or compiling is required.
- File load programs for all master files are provided. Data can be entered from diskette during file load.
- Online file maintenance of master files with direct file updating and printed registers for control and auditing.
- Master file backup to diskettes and optional transaction file backup to diskettes.
- Password security helps deter authorized use of application functions.
- Documentation for PBA includes an application installation guide, an application reference manual, runbooks, and an application logic manual.

- Self-study instructional materials are also available for operator education.

DESCRIPTION

Special functions and features of the PBA application are:

- Budget preparation and tracking
 - Online direct entry and edit
 - Direct file updating through workstations
 - Printed worksheet with previous year's figures
 - Estimated expenditure and revenue reports
 - Final budget report for publication
- Revenue and expenditure accounting
 - Online data entry and edit
 - Inquiry provides up-to-date account balance information
 - Journals that provide complete audit trails for transaction processing
- General Ledger
 - Required month and year-end reports
 - Complete audit trail
- Purchase order encumbering/Accounts Payable
 - Encumbrance accounting as an option
- Purchase Orders are checked against account balance
 - Check approval listing, check registers, and check writing are provided
 - Complete audit trail is provided
 - Inquiry provides review of outstanding purchase orders

PBA is a set of ready-to-execute application programs for public institutions and schools. The application has certain required records within an application control file which contain questionnaire responses. File sizes and functions can be selected to suit the user's needs. The questionnaire responses are entered during initial installation and may be changed as needed.

The System Tailoring Procedure allows these responses to be entered or modified. It provides the following:

- Tailors the application and Operator Control Language (OCL) on-site at installation time
- Allows the user to activate and deactivate provided functions as the user's business changes
- All functions are included in the application programs, but only required functions are executed
- Allows changes to file sizes as needed by rerunning the System Tailoring Procedure.

The application installation guide for PBA provides detailed step-by-step instructions for use in preinstallation, installation and postinstallation activities in order to achieve productive operation. These instructions include sample account numbering structure, sample input and maintenance data forms, file loading sequences, and control forms with suggested procedures.

The application reference manual is provided to enable the user to understand the application from a functional and operational standpoint. It contains information for the installation manager to supervise the system console operator, and to run the application from a total systems viewpoint. It also provides the user department manager with information needed to supervise the workstation operator and to understand the application at a detailed level.

Runbooks are provided for the systems console operator and for the workstation operator. These runbooks contain detailed instructions for the application procedures, an overview of the system and application flow, system consideration, hints for troubleshooting, and all of the error messages that can be generated.

An application logic manual is provided, as licensed material, for use by the self-sufficient customer and the systems engineer for maintaining and modifying PBA. Information on architecture, naming conventions, controls, program functions and specifications, relationships among files, and other information applicable to the application is presented.

Instructional support is provided to facilitate installation and operation. The Installation Planning self-study material provides guidance in the use of the application installation guide and the application reference manual. Instructional material for self-study is provided for the systems console operator and the application workstation operator to instruct them in the use of the runbook.

CUSTOMER RESPONSIBILITIES

IBM may provide marketing assistance, in accordance with the Marketing and Service Guidelines in the GI Section, in the installation of



PROGRAM PRODUCTS

S/34 PBA (cont'd)

IBM licensed programs. However, the responsibility for providing accurate ordering information, personnel selection and training, installation, and continued day-to-day operation lies solely with the customer. Installation of the System/34 is also a customer responsibility.

SPECIFIED OPERATING ENVIRONMENT

Support will be provided for this licensed program when it is operated in the following specified operating environment:

HARDWARE REQUIREMENTS

This licensed program will execute on all models of the IBM System/34 with a minimum of 48K bytes of main storage. The PBA Survey Guide provides the necessary information and questions for determining the prospect's qualification and application fit. Areas covered are function, storage capacity, and justification.

Many functions have been included to protect the integrity of the master files, programs, procedures, and libraries. Design features have been incorporated into the PBA application to allow for co-residency of other applications and/or user-written programs with minimum restrictions. Consult the PBA application logic manual for further explanation of these restrictions.

SOFTWARE REQUIREMENTS

The IBM System/34 application programs are written in IBM System/34 RPG II programming language and executed under control of the IBM System/34 System Support licensed program, 5726-SS1. The IBM System/34 Utilities licensed program, 5726-UT1, which includes Sort and Work Station Utility, is required for execution of the programs. The IBM System/34 RPG II licensed program, 5726-RG1 is required if modifications to the source code are desired.

DOCUMENTATION

(available from Mechanicsburg)

Licensed Program Specifications (GH30-0435) ... Reference Manual (SB30-0323) ... Runbook (SB30-0324) ... Installation Guide (SB30-0332) ... Logic Manual (LB30-0325).

TERMS and CONDITIONS: See PP Index

HOSPITAL FINANCIAL MANAGEMENT SYSTEM (HFMS) FOR SYSTEM/34 (Single Program Mode)

PATIENT BILLING ... 5726-H11
ACCOUNTS RECEIVABLE ... 5726-H12
PAYROLL ... 5726-H13
GENERAL LEDGER/ACCOUNTS PAYABLE ... 5726-H14

PURPOSE

The IBM Hospital Financial Management System offers the small hospital a disk data-based system comprised of a series of programs and procedures that perform the accounting, management reporting and statistical functions for patient billing, accounts receivable, payroll and general ledger/accounts payable.

Presentation of timely information enables management to observe trends and deviations from the hospital's planned financial position. This enables Hospital Management to quickly spot problems and initiate corrective action. More important, it provides a basis upon which to institute plans to improve the financial position. The accuracy of the accounting information is mandatory because of reporting requirements placed upon the hospital by regulatory agencies.

Completeness of hospital operating information provides the basis for review, analysis, and cause and effect relation studies of such things as rate setting, reimbursement analysis, patient mix, and services performed. A comprehensive information base provides the justification for decisions regarding future operations and services.

Five applications are supported by HFMS. They are patient billing, accounts receivable, payroll, and general ledger/accounts payable. General ledger and accounts payable are marketed together as one offering. Each of the other applications is a separate offering. Each application may be installed and operated independently or as an integrated system.

HIGHLIGHTS

- An integrated series of offerings that can be installed in any sequence for standalone or integrated operation
- The HFMS offering consists of:
 - Source Code and Object Code
 - Ready-to-Execute Procedures
 - Predefined File Sizes
 - Installation Guides
 - Operator Runbooks
 - Installation Supervision Self-Study Instructions
 - Operator Self-Study Courses With Machine Exercises (System/32 only)
 - Hospital Application-Oriented Specifications for Data Entry and Control Forms
 - Technical Documentation for problem determination
- Simplicity of operation characterized by application-oriented commands, prompting, responses, and messages
- Complete hospital disk data base
- Complete file load and maintenance programs
- Backup/recovery procedures imbedded in the application flow
- Comprehensive data entry editing with errors explained to facilitate correction
- Inquiry facility for Patient Billing and Accounts Receivable
- Optional entry of batch transaction input through diskettes prepared on the 3740 Data Entry System
- Comprehensive accounting controls through a defined audit trail
- User-defined system control file entries for adapting HFMS to customer requirements

The System/34 programs make available the Hospital Financial Management System in single program mode. They support one workstation, no spooling, no multiprogramming, and no file sharing.

DESCRIPTION

PATIENT BILLING (5726-H11)

The system provides for accurate and timely posting of inpatient and outpatient charges to produce patient bills and provides the basis for the revenue statistics needed for third-party reporting, cost reimbursement, internal rate setting, and revenue analysis.

The offering has five logical subsystems: Census, posting, billing, revenue usage, and statistics.

The census subsystem tracks the location of inpatients and processes all outpatient activity. Census reports are produced in various sequences which serve the needs of different users in the hospital. The census reports and the daily recap are used to verify the accuracy of the reported day's activity. The generation of the final census triggers the automatic generation of room charges to the posting subsystem.

The posting subsystem enters all routine and ancillary charges including room charges from the census subsystem into the inpatient and outpatient billing files. Charges can be automatically priced by the system or overridden by keyboard entry. It produces reports necessary to verify the accuracy of the information, automatically prepares the daily revenue entries for the General Ledger (5726-H14) and updates the detail revenue file records.

All detail posted charges are saved by the system on an accumulated charges file, which is used by the billing subsystem to prepare detail patient bills. Accounts Receivable (5726-H12) will post payments against accounts not yet final billed into the accumulated charges file.

The billing subsystem uses the information in the inpatient and outpatient billing files and the accumulated charges file to print patient bills. The detail bills for both inpatients and outpatients include a complete chronological detail of charges and a 'summary of charges' at the end of the bill. Inpatients' final detail bills are automatically produced after discharge. Outpatient emergency (one-time visit) detail final bills are automatically produced after the patient visit, while recurring outpatient final detail bills are produced when requested by the hospital. After the detail final bill is produced, the billing record is deleted. Prior to this deletion, it is transferred to the accounts receivable file if Accounts Receivable (5726-H12) is installed.

Detail cycle bills can also be requested for any current inpatient account. This bill shows the balance as of the last cycle bill and a detailed summary of current charges. Requesting cycle bills does not alter the processing or format of the detail final bill which will eventually be produced.

Summary bills can be printed on demand (inquiry) for any inpatient or outpatient account not yet final billed. The bill is in summary format containing all charges as of the last posting period.

The revenue usage subsystem is driven by the inpatient and outpatient charges from the posting subsystem. Daily and monthly revenue reports are produced in detail or in summary by departments, showing usage of individual services within the current period and year-to-date. The statistics subsystem maintains and reports patient statistics by medical service and patient category for both inpatients and outpatients, ancillary utilization statistics by department for all inpatients and for five outpatient categories, and departmental revenues by six financial classes.

ACCOUNTS RECEIVABLE (5726-H12)

Managing the hospital's Accounts Receivable has become an increasingly complex task. Required interaction with patients and many third parties (including private and public insurance companies and various governmental agencies) has created an explosion in clerical tasks. This has resulted in a difficult control problem in the hospital business office. The offering has three logical subsystems to aid in the collection of accounts receivable and in controlling the large volume of data involved. They are daily posting, statement writing, and reporting.

The posting subsystem creates receivable accounts either through keyboard entry or by accepting transferred inpatient and outpatient accounts which have been final billed from the Patient Billing offering (5726-H11). The subsystem accepts a full range of transactions such as payments, adjustments, late charges, and bad debt recoveries. If Patient Billing (5726-H11) is installed, payments can be accepted against active billing accounts and posted as credit charges. Controls, procedures, edit and audit reports assist the accounts receivable department in making sure transactions are posted to the correct accounts. This automated posting procedure eliminates many clerical tasks and frees business office personnel to concentrate the majority of their time analyzing and pursuing collection of open accounts.

The posting subsystem maintains a separate account for each patient for each hospital visit. However, the ability to assign a guarantor number (family number) is provided. The facility enables the system to group all accounts for one family together for statement writing and accounts receivable reporting. The system has further facilities to handle both active and bad debt accounts with separate controls, to transfer from patient to insurance and from insurance to patient, and to generate entries for the General Ledger (5726-H14).

The Statement Writing Subsystem generates balance-forward statements and includes a number of options that allow users to operate the system to meet their unique requirements. Statements can be written on a weekly, biweekly, or monthly cycle to smooth the business office workload. Statements can be written for all financial classes or only selected financial classes (financial class denotes primary method of payment, such as self-pay, Medicare, Blue Cross, Welfare, etc.). Finance charges can be assessed at the option of the user. Statements can be either family statements or individual account statements.

The Reporting Subsystem provides the user with a flexible information system to be used in handling the unique patient and third-party collection problems encountered in a hospital receivables system. Aged receivables reports can be produced in varying sequences or as various exception reports to help hospital personnel zero-in on specific

S/34 HFMS (cont'd)

collection problems or to satisfy specific information needs. The age of accounts can be calculated based on discharge date, date of last payment, or date insurance was filed. Reports can be produced for all open accounts or selected accounts based on financial class, range of dollar balances, and age since discharge date, last payment date, or date insurance was filed. If patient number is assigned to all accounts, the aging reports can be printed for all accounts for a patient alphabetically by patient name.

A selective Detail Status Report facility is provided in the system for the user to retrieve reports showing all detail transactions for any specific account or group of accounts, based on financial class or patient number.

The system handles the processing for both Active and Bad Debt Accounts. A report showing all accounts that have been transferred to bad debt can be run at any time.

An Account Balance Inquiry can be requested at any time to be displayed on the System/34 or printed or both. This allows the business office to retrieve the most current information regarding any account when it is required.

The Patient Account record and all Detail Transactions for an account are maintained in the system until a user-specified number of days after the account zero balances or until the account is deleted from the system as an uncollectable bad debt. At the time an account is deleted from the system, a one page report is printed showing all the detailed information for the account. This report is then filed for reference purposes.

PAYROLL (5726-H13)

Within the hospital, personnel represents the most valuable and the most expensive resource. While an efficient mechanism for prompt employee payment and bookkeeping is essential, the emphasis today is necessarily on astute management - planning, scheduling, and monitoring - to ensure the most productive use of this valuable and costly personnel resource. The offering addresses these needs through four logical subsystems: Payroll Processing, Labor Distribution, Benefits Analysis, and Personnel Reporting.

The biweekly Payroll Processing subsystem calculates hourly and salaried employee earnings, calculates statutory and voluntary deductions, accrues vacation and sick leave, accumulates quarter and year-to-date totals needed for 941-A and W-2 reports, and prints the employee's check. It also provides necessary reports to show a complete audit trail of each payroll run and to perform check reconciliation. The system calculates and deducts tax-sheltered annuities, federal withholding taxes, and Federal Insurance Compensation Act (FICA) withholding. Rates are supplied to the programs from a system control file to avoid program recompilation as rates change. The data fields needed to calculate existing state, county, or city withholding taxes are included in the date base and an exit point is provided in the program for the inclusion of a user-written subroutine to calculate these taxes. However, the earnings statement and reports have provisions to print only one non-federal withholding tax.

The ability to process voided checks as a separate run is provided. Batches are created of the checks to be voided and the data is entered in a manner similar to normal time card entry. The void check run follows the same sequence of events as normal payroll run except that checks are not written.

Vacation and sick leave hours are accrued based on actual hours worked and a hospital-defined accrual rate that can vary by employee.

The system will handle up to 10 types of voluntary deductions that can vary among employees regarding the frequency and method of calculation. These hospital-defined voluntary deductions are calculated, deducted, and reported each pay period on both a current period and year-to-date basis.

The labor distribution subsystem produces current and year-to-date reports each pay period by using the extended employee time records and budgeted and year-to-date balances from the position control file. These reports show hours and dollars (actual, budget, and variance) categorized by productive and non-productive time. This subsystem produces the departmental expense entries for the General Ledger application (5726-H14).

The benefits analysis subsystem produces reports for both included and contributory benefits each pay period. Included benefits are generally those that are completely paid by the hospital, such as vacation, sick leave and holidays. Contributory benefits are generally those that are partly paid by the hospital and partly by the employee, such as life insurance and health insurance.

The Included Benefits Report shows vacation and sick leave hours carried over, accrued, taken and remaining for each employee and department. Holidays taken are also noted on this report. The Contributory Benefits Report provides an analysis of the amount paid by the hospital for life and health insurance on a total cost basis and cost-per-hour basis for each employee, position classification, and department.

The personnel reporting subsystem provides reports to assist the personnel department in effectively using the people resource of the hospital.

An up-to-date Employee Status Report for each employee in the hospital is produced by the system whenever a change is made on an employee's record. All additions, changes, or deletions of employee information are thoroughly edited by the system and printed on Maintenance Reports. An Employee Personnel Profile is produced for employee verification of pertinent data. It serves as a turnaround document for entering changes into the system.

Employee listings by name and number are printed for reference purposes. An Annual Employee Benefits Report is produced for each employee showing total earnings, included benefits and contributory benefits. The Turnover Report provides an analysis of employee terminations by department showing the reason for each termination. Union Listings by employee within union can be produced when required.

GENERAL LEDGER/ACCOUNTS PAYABLE (5726-H14)**GENERAL LEDGER**

In order to provide increased patient care, hospitals must work from a sound financial base. In order to develop that base, the hospital executive must have detailed hospital operating information that is accurate, timely, and complete. The hospital must establish a plan, and since they are controlled to cost-dependent prices, they must work within that plan. The general ledger application provides the information that is key to more effective management through three logical subsystems: Daily processing, accounting period-end updating, and accounting period-end financial reporting.

The daily processing subsystem produces a journal of the day's valid transactions and adds them to the accumulated transaction file. Transaction validity is established through the use of the batch proof report. All transactions can be entered as miscellaneous journal entries. However, other offerings of the Hospital Financial Management System automatically provide journal entries from Patient Billing (5726-H11), Accounts Receivable (5726-H12), Payroll (5726-H13) and General Ledger/Accounts Payable (5726-H14) which will substantially reduce keying time. All transactions from whatever source are thoroughly edited by the system.

The accounting period-end updating subsystem provides the detail and summary trail balances. They are produced at the close of each accounting period. The system is designed to handle either 12 or 13 accounting periods per fiscal year. The trial balances can be run as many times as necessary to insure that all closing and correcting entries for that accounting period have been processed and the ledger is in balance. The system then updates the General Ledger Accounts file by extracting all entries for the accounting period (from the Accumulated Transaction File and summing these entries with the balance as the end of the last accounting period) to obtain the new year-to-date balance of each account in the General Ledger Accounts File. The updated General Ledger Accounts File is then used to produce the Financial and Management reports by the accounting period-end reporting subsystem.

Comparative schedules of Patient Revenue, Miscellaneous Revenue, Deductions from Revenue, and Expenses are produced showing variances on a current month and year-to-date basis for either this year versus last year or this year versus budget or both.

The format of the Balance Sheet, Income Statement, Pre-Cost Allocation Schedule, Per Diem Revenue Report, and Per Diem Expense Report can be tailored to the user's requirements through the use of the Report Description Master file. This file contains a record for each physical line that appears on each of the reports. By adding, changing or deleting records in this file, characteristics of the reports such as the number of lines, levels of total, and line and total descriptions, can be changed to meet the needs of the user. This feature, along with the ability to define the chart of accounts desired, provides a flexible financial information system that can be defined by the user to produce financial reports to assist in creating and maintaining financial stability for the hospital.

ACCOUNTS PAYABLE

Inflation has caused a rapid increase in the cost of supplies in all departments of the hospital. An accurate, efficient Accounts Payable system has become a requirement. It is one of the basic tools needed by hospital management to assist in reducing and controlling the cost of providing health care because most of the hospital's supplies expense originates through Accounts Payable. Approved vendor invoices must be accurately recorded, efficiently analyzed, and accurately distributed to affected cost centers.

The key element of expense control can only be obtained if the proper departments are given the information they need. For example, purchasing agents require information regarding standard vendor terms and business volume. The financial officer needs timely information regarding open Accounts Payable to analyze cash requirements. Available cash must be used effectively to take advantage of all discounts through prompt payment. The business office needs an

PROGRAM PRODUCTS

S/34 HFMS (cont'd)

efficient method of recording items, reporting to management, and accurately distributing supplies expense to appropriate cost centers.

The Accounts Payable application meets these objectives and satisfies these needs through four logical subsystems: Transaction entry, check writing, expense distribution, and reporting.

The transaction entry subsystem performs an extensive edit on all approved invoices and credit memos. The required information is keyed into the system and a Proof Report is printed to balance to controls. Any errors are corrected prior to further processing. These transactions are accumulated with any prior unpaid items and a Cash Requirements Report is printed to provide a current listing of all unpaid items listed by invoice within vendor. The items to be paid are noted on the Cash Requirements report and control totals are developed. Items to be paid can be selected in either of two ways: All invoices for a vendor or only certain invoices within a vendor can be selected. The computer operator uses this report to enter a notification of items to be paid into the system. A Payment Journal is printed by the system showing all transactions selected to be paid. This report is used to balance to the control totals, and any keying errors are corrected prior to the writing of checks.

Further flexibility is provided by the system because a check for any items may be typed at any time and entered into the system with a different code to designate a demand check. The transactions for these demand checks flow through to the expense distribution, but no computer checks are prepared. This facility provides the hospital maximum flexibility for taking advantage of discounts and creating of special checks such as travel advances.

The checkwriting subsystem produces the Check Registers, Checks, and Remittance Advices for those items checked on the cash requirements report. The system allows for multiple check writing runs during the month which, in conjunction with the ability to handle demand checks, provides the flexibility needed to control the payment of outstanding accounts payable items. Check reconciliation reports are included to allow the user to control the reconciling of checks and produce an Aged Outstanding Check Register.

Once each accounting period, the Accumulated Transaction file is sorted by General Ledger number and the expense distribution subsystem is run. An Accounts Payable Distribution Report is produced and summary expense entries are created for entry into the General Ledger system.

The reporting subsystem provides analysis of year-to-date purchases and discounts taken based on information in the Vendor Master file. This file contains one record for each permanent or temporary vendor used by the system to obtain vendor name, address, and discount terms information. The amount of purchases, credit memos and discounts for each vendor are also maintained in this file and Vendor Analysis Reports can be printed whenever desired.

CUSTOMER RESPONSIBILITIES

IBM may provide marketing assistance, in accordance with the Marketing and Service Guidelines in the GI section, in the installation of IBM licensed programs. However, the responsibility for providing accurate ordering information, personnel selection and training, installation, and continued day-to-day operation lies solely with the customer.

Installation of System/34 licensed programs is a customer responsibility.

SPECIFIED OPERATING ENVIRONMENT

Support will be provided for these licensed programs when they are operated in the following specified operating environment:

HARDWARE REQUIREMENTS

These IBM System/34 programs will execute on all models of the IBM System/34 in single program mode.

Information regarding disk allocation and usage (master and transaction files) and recommended backup levels and diskettes requirements are available in the *HFMS Installation Guides*.

The OCL and file sizes, as distributed, will be fixed at the maximum capacity assuming all five applications are to be installed on a 8.6 megabyte file.

Any changes to file sizes other than those shown above should be carefully reviewed by the customer and IBM Systems Engineering to determine the necessity for more storage, estimate time required to convert OCL procedures, and estimate throughput performance.

SOFTWARE REQUIREMENTS

The IBM System/34 Application Programs are written in IBM System/34 RPG II programming language and executed under control of the IBM System/34 System Support Program (5726-SS1 Version 1). IBM System/34 Utilities licensed program (5726-UT1), which includes Sort, Data File Utility, Source Entry Utility, and Workstation Utility is required for execution of the programs. The IBM System/34 RPG II Compiler (5726-RG1) is required if modifications to the source code are necessary.

DOCUMENTATION
(available from Mechanicsburg)

Patient Billing Installation Guide (SB30-0212) ... *Patient Billing Runbook* (SB30-0213) ... *Accounts Receivable Installation Guide* (SB30-0215) ... *Accounts Receivable Runbook* (SB30-0216) ... *Payroll Installation Guide* (SB30-0218) ... *Payroll Runbook* (SB30-0219) ... *General Ledger Installation Guide* (SB30-0221) ... *General Ledger Runbook* (SB30-0222) ... *Accounts Payable Installation Guide* (SB30-0224) ... *Accounts Payable Runbook* (SB30-0225) ... *Patient Billing Logic Manual* (LB30-0214) ... *Accounts Receivable Logic Manual* (LB30-0217) ... *Payroll Logic Manual* (LB30-0220) ... *General Ledger Logic Manual* (LB30-0223) ... *Accounts Payable Logic Manual* (LB30-0226).

TERMS and CONDITIONS: See PP Index

**MEDICAL GROUP MANAGEMENT SYSTEM
5726-H15 (Single Program Mode)**

PURPOSE

The IBM Medical Group Management System is primarily intended for a group of up to 99 doctors using a single accounting system.

HIGHLIGHTS

- Wide variety of reports and report options included:
 - Management reporting is a byproduct of normal data entry
 - Detail or summary listings within a range of options is supported in many reports
- User recognized accounting techniques and terminology to provide a solid accounting system:
 - Clear audit trails and control techniques are provided
 - Sample user oriented forms for data preparation, file creation, audit and control are provided.
 - Security code deters unauthorized execution of all programs in the application
 - A Reference Number may be used to supply an audit trail for any transaction entered into the system
- Designed to be installed without customer programming capability:
 - System tailoring procedure facilitates account growth by allowing on-site changes to file sizes and determination of functions used
 - File maintenance and audit procedures
 - Easy-to-use runbook
 - Step-by-step installation activity plan provided by the *Application Installation Guide*
 - User's installation and daily operating information supplied to the supervisor by the application reference manual

DESCRIPTION

The system combines two data entry approaches: Operator-oriented and batch-oriented. Support is provided for transaction entry through the System/34 keyboard or through diskette created on a 3740 Data Entry System.

The application has requirements records which contain Questionnaire responses stored in a Constants File. These records allow the system to select certain fields for editing, report formats, file sizes, and functions to suit each customer's needs. The Questionnaire responses are keyed in during initial installation and may be changed as needed. The System Tailoring Procedure allows these responses to be entered.

The System Tailoring Procedure uses the answers to a series of questions regarding a medical group's requirements to build the system. It provides the following:

- Tailoring the application and Operation Control Language (OCL) on-site at installation time.
- All provided functions are included in the programs but only required functions are executed.
- Allows the user to activate and deactivate provided functions as the user's business changes.
- File sizes may be increased or decreased as needed by rerunning the System Tailoring Procedure.

An application installation guide provides a step-by-step installation activity plan including sample numbering systems, sample input and maintenance data forms, file loading sequences, and control forms with suggested procedures. The application reference manual provides information on the day-to-day use of the application.

The runbook provides the operator with a detailed and easy-to-use set of instructions stating all the activities necessary to run the programs on a System/34. The procedure reference summary is provided for the operator as a reminder of the major operational instructions for each procedure. It is intended to be used once the operator is thoroughly trained in the application.

An application logic manual is provided for use by the self-sufficient customer and for systems engineering continuing support. It describes the architecture of programs, procedures, data base cross-references, data dictionary, and detailed descriptions of each program.

The System/34 licensed program makes available the Medical Group Management System on System/34 in single program mode. The System/34 supports one workstation, no spooling, no multiprogramming and no file sharing.

The application is ready-to-execute. It includes source code, object code, execution procedures, and the application logic manual as basic material.

Features

- Designed to fit business requirements
- Security codes to deter unauthorized use of master files
- In-house inclusion/exclusion of functions to be executed

- OCL procedures, Sort specifications, and processing programs are packaged into logical work units which simplify system operation
- Monitoring of execution sequence prevents execution of a program until preceding required programs have been completely and successfully executed
- Compatible online/offline data entry through the System/34 keyboard or by means of diskettes created on a 3740 Data Entry System.
- Dynamic Backup and Recovery System forces periodic backup of master files and edited transactions and keeps track of what procedures need to be rerun from the last backup point to recreate up-to-date master files
- Reprint options are possible because file updating is separated from report writing functions
- Some report printing can be deferred to a more convenient time
- Selective printing options are available for many report functions
- Cash accounting by doctor
- History transactions kept on the disk for the number of months specified

The Medical Group Management System licensed program is intended to provide a balance forward accounts receivable system for a group of up to 99 doctors using a single accounting system.

The licensed program provides the ability to bill patients on a monthly basis. Third parties (insurance companies) can be billed as required. It provides accounts receivable information including status reports and aged trial balances in order to control accounts receivable.

An optional Daily Charge Slip system is provided to print an appointment list showing patient appointment information and patient charge slips for recording patient charges, diagnoses and procedures. The charge slips can then be used as turnaround documents for input into A/R.

A practice analysis system is also optional and provides statistical reports for each doctor on a calendar year basis.

Inquiry is provided allowing the user to locate a guarantor record by keying either the guarantor's last name and first initial or the guarantor's account number.

CUSTOMER RESPONSIBILITIES

IBM may provide marketing assistance, in accordance with the Marketing and Service Guidelines in the GI section, in the installation of IBM licensed programs. However, the responsibility for providing accurate information, personnel selection and training, installation, and continued day-to-day operation lies solely with the customer.

Installation of System/34 licensed programs is a customer responsibility.

SPECIFIED OPERATING ENVIRONMENT

Support will be provided for this licensed program when it is operated in the following specified operating environment:

HARDWARE REQUIREMENTS

This licensed program will execute on all models of the IBM System/34. The programs are compiled assuming a 32K minimum system. Because of volume and time constraints, there may be a requirement for providing offline key entry on an IBM 3740 Data Entry System. If an IBM 3742 is to be used, it must have the 128-Character Record feature (#5455) and Feature Group A (#4004).

Many functions have been included to protect the integrity of the master files, programs, procedures and libraries. Because of this, no other licensed program or user-written programs may co-reside unless stringent coding requirements for these programs are met to insure compatibility with the Medical Group Management System. The *Application Logic Manual* discusses in detail the coding conventions used for the development of the Medical Group Management System.

SOFTWARE REQUIREMENTS

The IBM System/34 licensed programs are written in IBM System/34 RPG II programming language and executed under control of the IBM System/34 System Support licensed program (5726-SS1). IBM System/34 Utilities licensed program (5726-UT1), which includes Sort, Data File Utility, Source Entry Utility, and Workstation Utility, is required for execution of the program. The IBM System/34 RPG II Compiler (5726-RG1) is required if modifications to the source code are necessary.

DOCUMENTATION

(available from Mechanicsburg)

Installation Guide (SB30-0227) ... *Reference Manual* (SB30-0228) ... *Runbook* (SB30-0229) ... *Logic Manual* (LB30-0230).

TERMS and CONDITIONS: See PP Index

**SYSTEM/34 MEDICAL GROUP MANAGEMENT SYSTEM II
5726-H16****PURPOSE**

The IBM System/34 Medical Group Management System II is designed to provide an accounts receivable and third-party claims system for doctors, groups of doctors, or clinics. The basic system is derived from the System/32 Medical Group Management System IAP. For System/32 users, programs are provided to convert master files from the System/32 to the System/34 format.

HIGHLIGHTS

- The System/34 hardware and software functions - spooling, inquiry, and multiprogramming - are integral parts of the application design.
- Workstation data entry is designed for simplicity and ease-of-use. Screen displays provide guidance for entering data.
- Data entry for multiple work stations with batch programs operating from the job queue.
- Inquiry into master files concurrent with data entry and batch programs.
- System tailoring procedure permits the user to select optional functions and determine the size of files used by the application. Functions and file sizes may be modified as the environment changes by reexecuting the tailoring procedure.
- Source code, ready-to-execute procedures, and object code provided. No additional systems design, programming, or compiling is required.
- File load programs for all master files are provided. Data can be entered from the workstation or diskette.
- File maintenance of master files and printed registers for control and auditing.
- Optional master file backup to diskettes and transaction file backup to diskettes.
- Password security to deter unauthorized use of application procedures.
- Documentation for the Medical Group Management System II includes an application installation guide, an application reference manual, a runbook, and an application logic manual. Self-study instructional materials are also available for operator education.
- Extensive control features and documents are included to assist in establishing audit trails.

DESCRIPTION

The Medical Group Management System II is a set of ready-to-execute application programs for groups of doctors. The application has certain required records within an application control file which contain questionnaire responses. Users can select file sizes and functions to suit their needs. The questionnaire responses are entered during initial installation and may be changed as needed. The System Tailoring Procedure allows these responses to be entered or modified. It provides the following:

- Tailors the application and Operator Control Language (OCL) on-site at installation time.
- Allows the user to activate and deactivate provided functions as the user's business changes.
- All functions are included in the application programs, but only required functions are executed.
- Allows changes to file sizes as needed by rerunning the System Tailoring Procedure.

The application installation guide for the Medical Group Management System II provides detailed step-by-step instructions for use in preinstallation, installation and postinstallation activities in order to achieve productive operation. These instructions include sample numbering systems, sample input and maintenance data forms, file loading sequences, and control forms with suggested procedures.

The application reference manual is provided to enable the user to understand the application from a functional and operational standpoint. It contains information for the installation manager to supervise the system console operator, and to run the application from a total systems viewpoint. It also provides the user department manager with information needed to supervise the workstation operator, and to understand the application at a detailed level.

A runbook is provided for the systems console operator and for the workstation operator. This runbook contains detailed instructions for the application procedures, an overview of the system and application flow, system considerations, hints for troubleshooting, and all of the error messages that can be generated.

An application logic manual is provided, as licensed material, for use by the self-sufficient customer and the systems engineer for maintaining and modifying the Medical Group Management System II. Information on architecture, naming conventions, controls, program functions and

specifications, relationships among files, and other information applicable to the application is presented.

Instructional support is provided to facilitate installation and operation. The Installation Planning Self-Study material provides guidance in the use of the installation guide and the application reference manual. Instructional material for self-study is provided for the systems console operator and the application workstation operator to instruct them in the use of the runbook.

Functions and Features

- Support designed as 'family' billing system
- User-defined fiscal year-ending month
- Preprinted charge slips
- Sequential charge slip reference numbers
- Charge slip reconciliation
- Supplemental statements used by patients to file major medical claims or for income tax purposes
- Supplemental claims used for rebilling insurance
- Third-party claims printed at any time during the month
- Four different claim formats
- Superbill statements
- Reference number optional on all accounting entries for ease of auditing
- Selective aging reports
- Selective printing of collection messages on patient statements
- Finance charge applied to selected accounts
- Revenue report by doctor comparing current year to past
- Analysis for each doctor of procedures and diagnoses on a calendar year basis
- Cash accounting by doctor
- History transactions kept on disk for the number of months specified

CUSTOMER RESPONSIBILITIES

IBM may provide marketing assistance, in accordance with the Marketing and Service Guidelines in the GI section, in the installation of IBM licensed programs. However, the responsibility for providing accurate ordering information, personnel selection and training, installation, and continued day-to-day operation lies solely with the customer.

SPECIFIED OPERATING ENVIRONMENT

Support will be provided for this licensed program when it is operated in the following specified environment:

HARDWARE REQUIREMENTS

This IBM licensed program will execute on all models of the IBM System/34 with a minimum of 48K bytes of main storage.

Many functions have been included to protect the integrity of the master files, programs, procedures, and libraries. Design features have been incorporated into the application to allow for co-residency of other applications and/or user-written programs with minimum restrictions. Consult the application logic manual for further explanation of these restrictions.

SOFTWARE REQUIREMENTS

The IBM System/34 licensed programs are written in IBM System/34 RPG II programming language and executed under control of the IBM System/34 System Support licensed program (5726-SS1). The IBM System/34 Utilities licensed program (5726-UT1), which includes Sort, Data File Utility, Source Entry Utility, and Workstation Utility, is required for execution of the programs. The IBM System/34 RPG II Compiler (5726-RG1) is required if modifications to the source code are desired.

DOCUMENTATION

(available from Mechanicsburg)

Application General Information Manual (GH30-0228) ... Licensed Program Specifications (GH30-0426) ... Reference Manual (SB30-0326) ... Runbook (SB30-0327) ... Installation Guide (SB30-0334) ... Logic Manual (LB30-0328).

TERMS and CONDITIONS: See PP Index



PROGRAM PRODUCTS

**SYSTEM/34 IDEOGRAPHIC GENERATOR/SORT
5726-IG1****PURPOSE**

This IBM System/34 program consists of two utilities that provide users with the capability of designing ideographic characters and of arranging ideographic records according to various sequences.

DESCRIPTION**IDEOGRAPHIC SORT**

The Ideographic Sort utility arranges records in an output file according to the user's specifications and the data in each record of the original file.

Sort selects records from the original file and places them in an output file in the order you have defined (ascending, descending, or special sequence). The sorted output file can contain all or some of the records from the original file. The sorted file can also contain all or some of the fields from each record of the original file.

The user has the ability to select between five types of control fields for sorting the ideographic fields in the records.

1. Stroke/Radical/Tie-Breaker
2. Radical/Stroke/Tie-Breaker
3. Single Pronunciation/Stroke/Radical/Tie-Breaker
4. Single Pronunciation/Radical/Stroke/Tie-Breaker
5. Character Type

Sort tables are provided, addressed by an ideographic hexadecimal value, which contain as entries the 2-byte sequence numbers for each of the five types of control fields. One or more of the five tables are utilized to sort the fields by one of the above five rules. Sei-on or alphameric pronunciation control fields may optionally be selected by the user.

This method allows the user to define his own sorting sequence, and with equal ease, support the more common sequences like:

- Single Pronunciation
- Japanese Word Dictionary
- Telephone Book
- Word Index Type (A) and (B)
- Kanji Dictionary Type (A) and (B)

The customer may optionally include additional field(s) in the record which gives the pronunciation(s) of the field being sorted.

The fields in the original file can be all ideographic fields, all alphameric fields, or a combination of ideographic and alphameric fields. One can select and sort on any type of field.

The Ideographic Sort program can be used with DFU to generate a file of the locations (addresses) of the records in the original file so you can process and print the records in a different sequence without changing their order on disk and without creating another file with the same data.

The Ideographic Sort program also provides the following functions contained in the regular System/34 sort:

- Multiple record types
- Record selection based on field contents
- ADDROUT (tag) sort
- Tagalong sort
- Summary tagalong sort
- Automatically allocated work file
- Ascending, descending, or user-defined sequence
- Dynamically adjusts to region size available
- Reformatting of records in a file

IDEOGRAPHIC CHARACTER GENERATOR

The Ideographic Character Generator utility can be used by System/34 operators and programmers to graphically create, change, and delete user-defined characters. Up to 4,370 user-generated ideographic characters can be added and maintained in addition to the 7,190 characters in the preprogrammed character set.

The ideographic character generator allows the interactive creation and change of characters. Thus, the user can review the appearance of a new or changed character before writing it into the user-defined character file. A printout of the new character in a large format as well as the actual size can be requested to update a user directory of characters.

The character generator also allows the entry of sort information to update the sort master table for characters created, changed and deleted in the user-created character file. In addition, the single

pronunciation files for a portion of the preprogrammed characters in the sort master table can be changed.

This utility also prints all or portions of the user-defined, user-generated characters in convenient formats for documentation.

SPECIFIED OPERATING ENVIRONMENT**HARDWARE REQUIREMENTS**

The IBM System/34 Ideographic Generator/Sort licensed program runs on all models of the System/34 equipped with Work Station Control Expansion C (#4902).

SOFTWARE REQUIREMENTS

The current version of the IBM System/34 Ideographic Generator/Sort licensed program (5726-IG1, #9143 or #9149) operates under control of the current version of the IBM System/34 System Support Program (5726-SS1, #9143 or #9149).

Educational Allowance: The IBM System/34 Ideographic Generator/Sort licensed program qualifies for the IBM Educational Allowance Plan. See Announcement Letter GS79-110.

Program Use During Customer Preinstallation Testing: The IBM System/34 Ideographic Generator/Sort licensed program (5726-IG1, #9143 or #9149) is available to customers for preinstallation testing on IBM Test Center systems in accordance with the IBM Program Testing Policy.

RPOs ACCEPTED: No

Ordering Information: Contact IBM.



PROGRAM PRODUCTS

**SYSTEM/34 IDEOGRAPHIC CHARACTER GENERATOR
SUBSET (5726-IG2)**

PURPOSE

This IBM System/34 program consists of a utility that provides users with the capacity of designing additional ideographic characters.

DESCRIPTION

The Ideographic Character Generator utility can be used by System/34 operators and programmers to graphically create, list, change, and delete user-defined characters. Up to 4,370 user-generated ideographic characters can be added and maintained in addition to the 7,190 characters in the preprogrammed character set.

The Ideographic Character Generator utility allows an interactive graphic creation and change of a new or changed character before writing it into the user-defined character file. A printout of the new character in a large format, as well as the actual size, can be requested to update a user directory of characters.

This utility also prints all or some of the user-defined characters in convenient formats for documentation.

SPECIFIED OPERATING ENVIRONMENT

HARDWARE REQUIREMENTS

The IBM System/34 Ideographic Character Generator Subset runs on all models of the System/34 equipped with Work Station Control Expansion C (#4902).

SOFTWARE REQUIREMENTS

The current version of the IBM System/34 Ideographic Character Generator Subset (5726-IG2) operates under control of the current version of the IBM System/34 System Support Program (5726-SS2).

Program Use During Customer Preinstallation Testing: The IBM System/34 Ideographic Character Generator Subset (5726-IG2) is available to customers for preinstallation testing on IBM Test Center systems in accordance with the IBM Program Testing Policy.

Educational Allowance: The IBM System/34 Ideographic Character Generator Subset (5726-IG2) qualifies for the IBM Educational Allowance Plan. See Announcement Letter GS79-122, dated October 25, 1979.

MEMBERSHIP AND MAILING LIST SYSTEM FOR SYSTEM/34 (Single Program Mode) 5726-K11

PURPOSE

Associations are constituted to serve their memberships. Their prime functions are information retrieval and dissemination, establishment of standards and ethics, research, and representing their members to external agencies. Items of general interest are disseminated through association publications sent through the postal service. However, the need often exists to make specialized mailings to selected members with specific characteristics. Information exchange also takes place at events sponsored by associations. Associations, then, have data processing needs characterized by large data bases which must be processed in total but with the ability to process individual records or groups of records on a selective or exception basis.

HIGHLIGHTS

The Membership and Mailing List System provides an economical approach for the needs of business and professional associations. It addresses the following areas:

Data Base Management

- Interrelates up to 10 master files into a single data base
- Nonredundant data base (duplicate records eliminated)
- Can be installed as: Single file system (members are individuals); dual-file system (members are companies with mailing sent to and events attended by individuals). Usage of other master files is optional as needed.
- Full maintenance procedures.

Cash Accounting

- Invoices generated for dues and publications
- Balance forward accounts maintained for dues
- Cash application through file maintenance runs

Mailing Labels

- One-up or four-up
- Names and addresses vertically and horizontally aligned
- Produced from the data base on user-defined selection criteria
- Zip code changes noted and count shown

Membership and Association Services

- Membership cards
- 3" x 5" information cards
- Membership rosters, dynamic listings, and profiles
- Data file inquiry

Analyze Procedure

- Provides a means to select and sequence subsets from the data base
- Used for: Statistical profiles; input to all of the above runs; input to a preformatted dynamic listing program - for management review and analysis.
- Installation through a system control file which allows implementation of user options and printed descriptions without recompilation
- Inquiry capability to display or print individual member's records
- Comprehensive transaction editing prior to update
- Member identification codes can be chosen by the association (11 characters or less) - A suggested format is included.

DESCRIPTION

The Membership and Mailing List System organizes the vital records of an association into a comprehensive data base. The data base is modular in design so that only those portions which are required for user-desired functions need to be implemented. For example, if the association does not maintain its membership in a chapter structure, the chapter file is not used. Similarly, if it has no interest in knowing who sponsored a member for membership, the sponsor file is not used. The basic decision to be reached regarding the optionality of files, however, concerns the manner in which the association structures its membership and what dues functions are required. A typical difference between business associations and professional organizations is that business associations tend to have companies as members, while professional organizations tend to have individuals as members. The Membership and Mailing List System accounts for this difference by separating the dues function from the mail function. Data required to implement these two functions is separated into two discrete files: The dues file and the mail file.

If your customer has company members with individuals within the company receiving mail, both files would be used (dual file system). If, however, the members of the association are individuals, either the dues file or the mail file, or both, may be used. If partial payments are to be accepted and the association has only one publication that it distributes, the dues file should be implemented. If the association has multiple publications with different payment rates and accepts full payment only, the mail file should be implemented. However, whichever file is implemented, the basic cash accounting and mailing functions are provided. The optional nature of the data base files is implemented through a Systems Control File without need for recompilation. Consult the *Membership and Mailing List System Installation Guide* for further information.

The following sections describe system highlights in three important functional areas: Accounting, mailing, and service.

Accounting Functions

Invoicing: Invoices are generated for both dues and publications. The dues invoice shows the balance brought forward, the current dues amount, and a new total owed. An optional special charge amount (such as an initiation fee) can also be included. First dues billing for new members can be prorated. Publication invoices can handle amounts for two separate publications (mail file). Both types of invoices as well as follow-up notices are prepared on user-defined billing cycles and frequencies.

Cash Application: Cash can be applied to dues on a partial payment basis (dues file only) or on a full payment required basis. Payments for publication subscription can be applied in even increments of the base subscription rate with automatic calculation of the 'paid to' date. Cash receipts can also be applied for registration fees for association-sponsored events.

Mailing Functions

Mailing Labels: Mailing labels are prepared for user-defined subsets of the data base. The selection is dynamic. User defined parameters for inclusion/exclusion and sequencing are keyed prior to the label run. The labels can be printed one-up or four-up with names and addresses horizontally and vertically aligned. Changes in zip code (if the labels are sequenced by zip code) can be highlighted to facilitate mailing bundling. Mailing type is noted, that is sample publications.

Circulation Reports: This report recaps totals by state, zip code, or type of mailing for each mailing. It can be used for advertising ratesetting by showing circulation demographics.

Membership/Association Service Functions

Membership Cards: Membership identification cards can be prepared showing member's name and current membership period.

3" x 5" Information Cards: These cards can be prepared with user-defined inclusion/exclusion and sequencing criteria. They are useful for such functions as convention registration, direct sales follow-up, etc.

Rosters: Periodic alphabetic listings of the membership, mailing lists, or event participation can be prepared for reference.

Membership Profile: Profiles of all information regarding members can be printed and sent for review and correction. Therefore, it can serve as a turnaround document to maintain the accuracy of the data base.

Additional Features: The Membership and Mailing List System is designed to meet the needs of associations by producing standard printouts of selected input. Input inclusion/exclusion and sequencing criteria are entered through a simple ANALYZE command. This feature provides great flexibility to your customer. For example, the system does not arbitrarily send follow-up notices for dues or publication invoices after a fixed period. Your customer can implement a 30 or 60 day follow-up policy by simply entering the appropriate 30 or 60 day parameter into the ANALYZE command prior to running the follow-up procedure. Analysis report formats have been established for each major file. The use of the ANALYZE command in conjunction with these report programs gives the user a dynamic listing capability to answer needs as they occur. The ANALYZE command can also be used without a subsequent report to develop statistical profiles (demographic analysis) of the membership.

The optional files are implemented and descriptions are supplied to the programs by answering a questionnaire. The responses are then entered into a systems control file. Other options addressed on the questionnaire include such policy matters as invoicing frequency and dues proration for new members.

An inquiry capability is provided through the Data File Utilities (DFU) to indicate individual records on the System/34 display screen or to print the records.

The System/34 licensed program makes available the Membership and Mailing List System on System/34 in single program mode. The System/34 supports one workstation, no spooling, no multiprogramming and no file sharing.



PROGRAM PRODUCTS

S/34 Membership and Mailing List System (cont'd)

CUSTOMER RESPONSIBILITIES

IBM may provide marketing assistance, in accordance with the Marketing and Service Guidelines in the GI section, in the installation of IBM licensed programs. However, the responsibility for providing accurate ordering information, personnel selection and training, installation, and continued day-to-day operation lies solely with the customer.

Installation of System/34 licensed programs is a customer responsibility.

SPECIFIED OPERATING ENVIRONMENT

Support will be provided for this licensed program when it is operated in the following specified operating environment:

HARDWARE REQUIREMENTS

This licensed program will execute on all models of the IBM System/34.

Information regarding disk allocation and usage (master and transaction files) and recommended backup levels and diskette requirements will be available in the *Installation Guide* (LB30-0235).

The OCL and file sizes, as distributed, will be fixed at the maximum capacity and normal distribution for utilizing 5 megabytes of disk.

Any changes to file sizes should be carefully reviewed by the customer and IBM Systems Engineering to determine the necessity for more storage, estimate the time required to convert OCL procedures, and estimate throughput performance.

SOFTWARE REQUIREMENTS

The Membership and Mailing List System programs for the IBM System/34 are written in IBM System/32 RPG II and operate under control of IBM System/34 System Support Program (5726-SS1). In addition, the IBM System/34 Utilities licensed program (5726-UT1) must be available for sorting of data (Sort), entering transactions with the Data File Utilities (DFU) and for making source program corrections with Source Entry Utility (SEU). If compilation of the RPG II Source Programs is required, the IBM System/34 RPG II Compiler (5726-RG1) and Source Entry Utility (SEU), for making RPG II program corrections, must be available.

CONVERSION

The Membership and Mailing List System requires loading of a large volume of data. This may make use of the System/34 keyboard inadvisable for conversion input. Programs are supplied to load the files from diskettes produced by the IBM 3740 Data Entry System. Discussing conversion approaches and schedules with your customer or prospect will be a key element in your installation planning process.

DOCUMENTATION

(available from Mechanicsburg)

Installation Guide (SB30-0235) ... *Runbook* (SB30-0236) ... *Reference Manual* (LB30-0237)

TERMS and CONDITIONS: See PP Index

5230 DATA COLLECTION SYSTEM SUPPORT FOR SYSTEM/34 (5726-M3A)

PURPOSE

The IBM 5230 Data Collection System Support for System/34 provides the manufacturer with a convenient, practical means of preparing shop floor data for processing by the Manufacturing Management Accounting System (MMAS) application programs. Data collected by the IBM 5230 Data Collection System is edited, consolidated, and formatted for processing by the MMAS Payroll, Inventory Management, and Production Status and Costing IAPs, or for user-written manufacturing management systems (with appropriate changes to the output modules).

HIGHLIGHTS

- Interrelated to MMAS applications:
 - Elapsed time calculation for Payroll
 - Material receipt and issue data for Inventory Management
 - Job time for Production Status and Costing
- Management reports generated as a byproduct of data entry
 - Option to print or not print all reports except error reports and audit summaries
 - Labor report by foreman for checking
 - Attendance and absentee reports
- Provides internal cross-checking and editing
 - Jobs started checked against jobs stopped
 - Employee time on jobs checked against time and attendance record
 - Transaction records checked for complete and accurate entry
- Provides automatic generation of machine-readable editing
 - Reduces transcription errors
 - Eliminates time keeper calculation of elapsed time
 - Supports up to 40 different shifts to provide added flexibility for special starting times, lunch and other break times, and unique weekend schedules
- Can be installed without customer programming capability
 - System tailoring procedure facilitates account growth by allowing on-site changes to file sizes and determination of functions used
 - File maintenance and audit procedures
 - Easy-to-use runbook
 - Step-by-step installation activity plan provided by the *Application Reference Manual*
 - User's information supplied to the supervisor by the *Application Reference Manual*

DESCRIPTION

The 5230 Data Collection System Support for System/34 licensed program provides two phases of operations: 5230 personalization phase and a data conversion phase.

The 5230 personalization provides a menu of actions from which users select those that best fit their operation. Using the menu selections and loop definitions for up to three 5231 Controllers with up to four loops each, this phase creates the personalization records required to personalize the 5230 Data Collection System.

The data conversion phase prepares the data received from the 5230 Data Collections System for processing by the MMAS applications. The data can be accepted through the data communications facilities, or the diskette offered as output options by the 5230 Data Collection System.

Both material transactions and labor transactions are prepared by the application program. The material transactions are edited, listed, formatted, and stored for later use by the Inventory Management and Production Status and Costing applications. Labor transactions are expanded, edited, checked for accuracy, and adjusted for break and lunch times. They are also adjusted for lunch and shift start-stop time variances. The elapsed time for time and attendance and job time is calculated, and job time applied to overlapping jobs is apportioned to the jobs. Time and attendance totals are checked against job time totals with warning messages printed for differences that exceed user-prescribed limits. A correction procedure is included to allow for changing incorrect labor transactions. The results of the labor transaction processing are stored for later use by the Payroll and Production Status and Costing applications.

Reports are printed, at the user's option, for material transactions and for labor transactions. The material transactions report is a single listing. Labor transaction reports provide labor-related information suitable for management review, and checking by foremen for correctness. Attendance and absentee reports are also printed.

This program augments the MMAS cross-application Constants File with its own questionnaire responses. These records allow the application to select certain options for the procedures to be used. The questionnaire responses are keyed during initial installation and may be changed as needed.

An application reference manual provides a step-by-step installation activity plan including sample input and maintenance data forms, file loading sequences, and control forms with suggested procedures. This manual also provides information on the day-to-day use of the application.

The runbook provides the operator with a detailed and easy-to-use set of instructions showing all the activities.

An application logic manual is provided for use by the self-sufficient customer and for systems engineering continuing support. It describes the architecture of programs, procedures, data base cross-references, data dictionary, and detailed descriptions of the program.

Data Collection System Support for System/34 executes on System/34 in single program mode. The System/34 feature supports one workstation, no spooling, no multiprogramming and no file sharing.

Applications Description - The 5230 Data Collection System Support for System/34 is a ready-to-execute program. The application program includes source code, object code, execution procedures, and the application logic manual.

CUSTOMER RESPONSIBILITIES

IBM may provide marketing assistance, in accordance with the Marketing and Service Guidelines in the GI section, in the installation of IBM licensed programs. However, the responsibility for providing accurate ordering information, personnel selection and training, installation, and continued day-to-day operation lies solely with the customer.

Installation of System/34 licensed programs is a customer responsibility.

SPECIFIED OPERATING ENVIRONMENT

Support will be provided for this licensed program when it is operated in the following specified operating environment:

HARDWARE REQUIREMENTS

The IBM 5230 Data Collection Support for System/34 will execute on all models of the IBM System/34 with a minimum of 48K of main storage with a 64-character print set (specify codes #9496 or #9498). The programs are compiled assuming a 48K system and operate in single program mode. If data communications features are to be used, the Binary Synchronous Communications Adapter feature (#2074) must be installed in the IBM 5230 System Unit.

SOFTWARE REQUIREMENTS

The IBM System/34 feature application programs are written in System/34 RPG II programming language and executed under control of the IBM System/34 System Support Program (5726-SS1). IBM System/34 Utilities licensed program (5726-UT1), which includes Sort, Data File Utility, Source Entry Utility, and Workstation Utility is required for execution of the programs. The IBM System/34 RPG II Compiler (5726-RG1) is required if modifications to the source code are necessary.

DOCUMENTATION

(available from Mechanicsburg)

Reference Manual (SB30-0186) ... *Runbook* (SB30-0187) ... *Logic Manual* (LB30-018).

TERMS and CONDITIONS: See PP Index

MANUFACTURING MANAGEMENT ACCOUNTING SYSTEM (MMAS) FOR SYSTEM/34

- PRODUCTION STATUS AND COSTING ... 5726-M31
- PAYROLL ... 5726-M32
- ACCOUNTS PAYABLE ... 5726-M33
- ACCOUNTS RECEIVABLE ... 5726-M34
- INVENTORY MANAGEMENT ... 5726-M35
- PRODUCT DEFINITION AND COSTING ... 5726-M36
- GENERAL LEDGER ... 5726-M37
- SALES ANALYSIS ... 5726-M38
- ORDER ENTRY AND INVOICING ... 5728-M39

PURPOSE

The IBM Manufacturing Management Accounting System (MMAS) provides the manufacturer with a powerful aid in managing the business.

MMAS offers flexible applications specifically designed for the manufacturing industry. MMAS provides key reports to help management direct and control their business effectively.

HIGHLIGHTS

- Independent or interrelated applications approach:
 - Modular design facilitates sequential application installation
 - Single data entry results in multiple application updates
 - Modular design allows users to choose the applications that address problem areas
- Wide variety of reports and report options included:
 - Management reporting is a byproduct of normal data entry
 - Certain reports (Statements, 941-As, and W-2s) can be saved on diskette for later printing
 - Detail or summary listings within a range of keys is supported in many reports
- Uses recognized accounting techniques and terminology to provide a solid accounting system:
 - Clear audit trails and control techniques are provided
 - Sample user-oriented forms for data preparation, file creation, audit and control are provided
 - Security code deters unauthorized inquiry or execution of key programs in each application
 - A Journal Reference Numbering System supplies audit trail for any application that automatically generates transactions into the General Ledger
- Provides manufacturers with an easy-to-use method for organizing and using manufacturing information such as bills-of-material, product cost, and shop order or job cost.
- MMAS can be installed without customer programming capability:
 - System tailoring procedure facilitates account growth by allowing on-site changes to file sizes and determination of functions used
 - File maintenance and audit procedures
 - Easy-to-use runbook
 - Step-by-step installation activity plan provided by the *Application Installation Guide*
 - User's information supplied to the supervisor by the application reference manuals

DESCRIPTION

The Manufacturing Management Accounting System consists of nine full-function, ready-to-execute applications. MMAS includes source code, object code, execution procedures, and application logic manual.

There are some general features which all applications have:

- Designed to fit industry requirements
- Security codes to deter unauthorized use of master files
- In-house inclusion/exclusion of functions to be executed
- OCL procedures, Sort specifications, and processing programs are packaged into logical work units which simplify system operation
- Monitoring of execution sequence prevents execution of a program until preceding programs have been completely and successfully executed
- Compatible online/offline data entry through the system console or by means of diskettes created on a 3740 Data Entry System
- Dynamic Backup and Recovery System forces periodic backup of master files and edited transactions, and keeps track of what procedures need to be rerun from the last backup point to recreate up-to-date master files
- Reprint options are possible because file updating is separated from report writing functions
- Some report printing can be deferred to a more convenient time
- Selective printing options are available for many report functions

PRODUCTION STATUS AND COSTING (5726-M31)

This application provides management information on Jobs or Shop Orders from the point of release to the shop floor through the closing process. Also, it provides a means to build and maintain a job select file for retaining and releasing repetitive or standard jobs. This file contains information at an operation and material level.

Jobs or Shop Orders may be released from the job select file and/or manually based on individual requirements. During the release function, the shop data base is created to provide for editing of feedback from the shop floor and for management reports. In addition to the creation of a shop data base, the release function creates a job worksheet to move with the work, and a group of labor tickets for labor reporting.

The report function provides a variety of production and accounting reports such as Job Status, Work List, and exception reporting for quantity variance or cost variance. These reports reflect variance from projection on both production and accounting information and may be obtained in summary or detailed format.

The updating function records information from the shop floor to the shop data base at the operation and material detail level. Updates to the shop data base occur via labor, move, material issue, miscellaneous, outside operations and material receipts transactions. These transactions reflect the activity (hours and cost) and movement (quantity) of Jobs or Shop Orders as they progress through the manufacturing facility. Transactions may be entered either manually or from other applications (Payroll, Inventory Management, and Accounts Payable) via the application interface.

Upon completion of a job, the closeout function produces closeout reports in both production and accounting formats to allow the analysis of labor and cost projections against actual. After producing these reports, the closed Jobs or Shop Orders are removed from the shop data base.

PAYROLL (5726-M32)

This hourly/salary/executive payroll provides for regular, overtime, premium, vacation, and sick pay. It may be run weekly, biweekly, semimonthly, monthly. Hours may be entered daily or by pay period; if selected, balancing time worked to attendance may be accomplished daily or weekly. Exception hours provide time and one-half, double time, and triple time capabilities. Rates may be selected from the Employee Master Record or keyed in as an override. Shift differential capabilities are provided for second and third shift. The differential may be defined as a percentage of the rate or cents to be added to the rate.

Vacation/Holiday pay may be part of a regular pay check or on a separate check. A bonus payment is paid on a separate check with a flat percentage of income tax deducted. Sick pay may be fully nontaxable or only liable for income tax. Wages subject to Federal Unemployment Insurance (FUI) and State Unemployment Insurance (SUI) are determined.

The ability to handle taxable or nontaxable adjustments, pay advances, and employer-paid union benefits (taxable and nontaxable) is also provided. Once the gross earnings is calculated, deductions will be taken to reach net pay. In addition to calculating present Federal and FICA taxes, a standard tax algorithm is provided to calculate most present state taxes based upon customer-provided data. Local taxes may also fit the standard tax algorithm provided. The state disability insurance deductions also use a standard algorithm based upon customer-provided data. Miscellaneous deductions may be taken by percent, fixed amount, hourly rate, upper limit, or cyclic within a user-specified frequency. Union deductions may be taken by percent, hourly rate, or fixed amount within a user-specified frequency.

Handwritten paychecks and paychecks never cashed (reversals) are also supported by the application. Once the payroll register and checks are printed, many analysis reports are produced: Labor Distribution, Job Distribution, Miscellaneous Deductions, Union Deductions, YTD/QTD Earnings, Workmen's Compensation Worksheet, and Payroll Journal. W-2 and 941-A reports are also provided.

The capability is provided to pass transactions to the General Ledger application, if installed. These transactions will be applied towards company one only. Payroll may be on either a cash or accrual basis. If the cash basis is selected, no transactions are passed to the General Ledger.

ACCOUNTS PAYABLE (5726-M33)

The Accounts Payable application provides an open payables and cash disbursements function on either an accrual or cash basis. Invoices and credit memos entered may be multi-lined and distributed by job, item number, cost type and General Ledger account number. Entries may be for standard or one-time vendors and may be open or prepaid. Credit memos may be entered manually or initiated automatically based upon a previously entered open invoice.

A Purchase Journal provides the audit trail for cost transactions entering into the General Ledger system and into the open payables file. An Open Payables Report is provided in due date or vendor sequence. This turnaround document provides a mechanism to indicate payment

MMAS for S/34 (cont'd)

by date, vendor, or invoice, including partial payments, for Cash Disbursements. Invoices may be entered or placed in hold status to prevent inadvertent payment of invoices in question.

A Cash Requirements Report is used to assist the controller in insuring sufficient funds are available and proper invoice selection was made before the checkwriting procedure begins. The Cash Disbursements Journal provides an audit trail for its transactions entering the General Ledger application, and acts as the Check Register. Checkwriting and reconciliation are also provided.

A Vendor Analysis Report indicates key business volumes and discounts lost and taken for previous year and current year.

ACCOUNTS RECEIVABLE (5726-M34)

The Accounts Receivable application supports a combination of both open-item and balance-forward customers. Billing transactions are directly keyed, or accepted from Open Entry and Invoicing, if that application is installed.

All transactions (that is, invoices, cash receipts, adjustments, and credit memos) are retained in an Open-Item File. This file may be purged daily or monthly at the user's request. An Aged Trial Balance with current plus four past periods is provided. It has multiple printing options (summary, detail, selected line, within limits). Delinquency Notices may also be printed. Late charges can be calculated for balance forward customers.

Two optional formats are provided for the customer statements which are printed at month end. The capability is provided to delay the printing of the statements until a more convenient time without affecting the closing of the books. An account status inquiry feature is also provided.

INVENTORY MANAGEMENT (5726-M35)

The Inventory application maintains a perpetual inventory and on-order status for each item. It calculates and prints on demand numerous management figures including: Economic order quantity, dollar profit and percent of profit, average monthly usage, turnover rate and reorder point. Management reports are also provided: ABC Analysis Report, two types of Stock Status, Inventory Analysis Report, Physical Inventory Checklist, On-order Status Reports, Inventory Valuation and Variance Report, and Inventory Reorder Report. It can also interface with Order Entry and Invoicing, Sales Analysis, Product Definition and Costing, and Production Status and Costing.

PRODUCT DEFINITION AND COSTING (5726-M36)

Product Definition and Costing provides manufacturers with an easy-to-use method of organizing bills-of-material and item information, and calculating product costs using bills-of-material. Costs are built from raw material up to the finished end-item. Assembly costs may be recalculated when there is a change in the bill-of-material or in the assembly labor or material costs or burden. The user can simulate the effect of proposed cost changes in end-item costs due to changes in labor, material or burden cost.

For all product costs the total cost of purchased parts is maintained separately as material cost. These costs are calculated and maintained level by level, and make it possible for the user to identify the added value (labor, burden) for products and assemblies for tax purposes.

Management reports can be produced when required since the cost information is stored in the Product Definition and Costing data base. These reports include costed bills-of-material, cost reports reflecting either real or potential cost changes and variances (simulations), and special vendor where-used and final assembly where-used lists. The basic formats used for parts lists and where-used lists are single level, indented and summarized.

GENERAL LEDGER (5726-M37)

This application combines all the transactions affecting the financial status of the company during the month. They may be entered directly as a General Journal Entry or may have been previously entered through interface with Accounts Payable or Payroll. At month-end closing time, Audit Registers and the Financial Statement Worksheet are provided to help verify that the user is still in balance before proceeding into the actual closing. The reports will also aid in generation of any necessary closing entries.

An Income Statement and Balance Sheet are standard report outputs. The user can define these reports with an easy-to-use format description procedure. The financial reports can illustrate current financial data as compared to budget or historical information.

Users may define their own Chart of Accounts or use a suggested account structure provided with the application.

The fiscal year start month is user-defined. Multiple company support for up to ten companies is included. Any transactions passed from Payroll or Accounts Payable are applied to the first company only.

SALES ANALYSIS (5726-M38)

Sales Analysis reports summarize the activity and highlight the performance of items, customers, and/or salespersons. Selected

reports may be printed in detail or summary, depending on the option selected at printing time. Since all data used in Sales Analysis can be entered through Order Entry and Invoicing, it should be installed to obtain full benefit of the Sales Analysis application. If Sales Analysis is installed with Accounts Receivable alone, only Salesperson and Customer Sales Analysis can be obtained; or with Inventory Management alone, only Item Sales Analysis can be obtained.

ORDER ENTRY AND INVOICING (5726-M39)

This postbilling application includes order entry and edit, invoicing, and preparation of an Invoice Register and Price Lists. The Order Acknowledgement will show warehouse location, while the Picking List is printed in warehouse sequence. Pricing options include selection of the actual selling price, a discount percent from a list price, operator-entered price, or a contract price by customer. Up to six user-assigned discount percentages by item and up to three tax percentages are provided. Quantity break prices can be established optionally by item.

Order status and backorder status is provided by item, customer, or due date. Support is also provided for partial shipments and back ordering or cancellation of the balance of the order. This application provides data for input into Inventory Management, Accounts Receivable, and Sales Analysis.

Two invoice formats are available. Picking List is optional and can be run either at order entry time or just prior to billing. Order Acknowledgements are optional and may optionally be printed with prices.

CUSTOMER RESPONSIBILITIES

IBM may provide marketing assistance, in accordance with the Marketing and Service Guidelines in the GI section, in the installation of IBM licensed programs. However, the responsibility for providing accurate ordering information, personnel selection and training, installation, and continuing day-to-day operation lies solely with the customer.

Installation of System/34 licensed programs is a customer responsibility.

SPECIFIED OPERATING ENVIRONMENT

Support will be provided for these licensed programs when they are operated in the following specified operating environment:

HARDWARE REQUIREMENTS

Each of these licensed programs will execute on all models of the IBM System/34 with a minimum of 48K of main storage. The programs are compiled assuming a 48K minimum system. It is not intended that any one customer install all nine applications on one IBM System/34. Because of volumes and time constraints, there may be a requirement for providing offline keying on an IBM 3740 Data Entry System. If an IBM 3742 is to be used, it must have the 128-character record features [128-character (#5455) and feature group A (#4004)].

The Manufacturing Management Accounting System is intended to be an independent yet interrelated set of applications. Many functions have been included to protect the integrity of the master files, programs, procedures, and libraries. Because of this, no other application program or user-written program may co-reside with any MMAS application unless stringent coding requirements for these programs are met to insure compatibility with the MMAS applications.

SOFTWARE REQUIREMENTS

The IBM System/34 application programs are written in System/32 RPG II programming language and executed under control of the IBM System/34 System Support Program (5726-SS1 Version 1). IBM System/34 Utilities licensed program (5726-UT1), which includes Sort, Data File Utility, Source Entry Utility, and Workstation Utility is required for execution of the programs. The IBM System/34 RPG II Compiler (5726-RG1) is required if modifications to the source code are necessary.

DOCUMENTATION

(available from Mechanicsburg)

Product Status and Costing: Installation Guide (SB30-0150) ... Reference Manual (SB30-0151) ... Runbook (SB30-0152) ... Payroll: Installation Guide (SB30-0154) ... Reference Manual (SB30-0155) ... Runbook (SB30-0156) ... Accounts Payable: Installation Guide (SB30-0158) ... Reference Manual (SB30-0159) ... Runbook (SB30-0160) ... Accounts Receivable: Installation Guide (SB30-0162) ... Reference Manual (SB30-0163) ... Runbook (SB30-0164) ... Inventory Management: Installation Guide (SB30-0166) ... Reference Manual (SB30-0167) ... Runbook (SB30-0168) ... Product Definition and Costing: Installation Guide (SB30-0170) ... Reference Manual (SB30-0171) ... Runbook (SB30-0172) ... General Ledger: Installation Guide (SB30-0174) ... Reference Manual (SB30-0175) ... Runbook (SB30-0176) ... Sales Analysis: Installation Guide (SB30-0178) ... Reference Manual (SB30-0179) ... Runbook (SB30-0180) ... Order Entry and Invoicing: Installation Guide (SB30-0182) ... Reference Manual (SB30-0183) ... Runbook (SB30-0184) ... Product Status and Costing Logic Manual (LB30-0153) ... Payroll Logic Manual (LB30-0157) ... Accounts Payable Logic Manual (LB30-0161) ... Accounts



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Major Revision

PROGRAM PRODUCTS

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Receivable Logic Manual (LB30-0165) ... Inventory Management Logic Manual (LB30-0169) ... Product Definition and Costing Logic Manual (LB30-0173) ... General Ledger Logic Manual (LB30-0177) ... Sales Analysis Logic Manual (LB30-0181) ... Order Entry and Invoicing Logic Manual (LB30-0388)

TERMS and CONDITIONS: See PP Index

PROGRAM PRODUCTS

**SYSTEM/34 MANUFACTURING ACCOUNTING AND
PRODUCTION INFORMATION CONTROL SYSTEM
MAPICS**

PRODUCTION CONTROL AND COSTING ... 5726-M41
 PAYROLL ... 5726-M42
 ACCOUNTS PAYABLE ... 5726-M43
 ACCOUNTS RECEIVABLE ... 5726-M44
 INVENTORY MANAGEMENT ... 5726-M45
 PRODUCT DATA MANAGEMENT ... 5726-M46
 GENERAL LEDGER ... 5726-M47
 SALES ANALYSIS ... 5726-M48
 ORDER ENTRY AND INVOICING ... 5726-M49
 DATA COLLECTION SYSTEM SUPPORT ... 5726-M4A
 MATERIAL REQUIREMENTS PLANNING ... 5726-M4B
 CAPACITY REQUIREMENTS PLANNING ... 5726-M4G

- General Ledger
- Accounts Payable
- Payroll
- Manufacturing Applications
 - Product Data Management
 - Material Requirements Planning
 - Production Control and Costing
 - Capacity Requirements Planning
- Data Collection
 - Data Collection System Support

PURPOSE

The IBM System/34 Manufacturing Accounting and Production Information Control System (MAPICS) provides an integrated and comprehensive workstation-oriented accounting, financial, and manufacturing control system for the small-to-medium manufacturer and some of the like process industries. The Accounts Payable, General Ledger, and Payroll applications are designed to meet the needs of both the manufacturer and the distributor. These three applications are included in the twelve applications of MAPICS, and are also marketed as Distribution Financial Accounting System II (DFAS II) to the distribution industries.

HIGHLIGHTS

- The System/34 hardware and system software functions - spooling, inquiry, multiprogramming - are integral parts of the MAPICS application design.
- Workstation data entry is designed for simplicity and ease-of-use. Screen displays provide guidance for mandatory input and for fields that may be overridden. Error messages signal errors which can then be corrected interactively by the operator.
- Interactive data entry, concurrent edit and correction for multiple applications through multiple workstations while batch programs operate in the background.
- Inquiry into master files concurrent with data entry.
- System tailoring procedures permit the user to select optional functions and reports, and to determine the sizes of all files used by the applications. Functions and file sizing may be modified as the customer environment changes by reexecuting the tailoring procedures.
- Source code ready-to-execute procedures, and object code are provided. Although no additional systems design, programming, or compiling is required, the system design incorporates features to assist the user in the modification of source code.
- File load programs for master files are provided, as well as file conversion programs for System/32 MMAS and DFAS files, System/34 MMAS and DFAS files, and System/3 and System/32 DCSS files to the System/34 format.
- Online file maintenance of most master files with optional file maintenance reports.
- Optional system procedures for master file backup and restart.
- Password security helps deter unauthorized use of applications and functions within applications. A higher level of security helps protect selected master file data.
- Documentation for each application includes a reference manual, a runbook, and a logic manual. From an overall MAPICS system perspective, an installation guide, a reference manual, a runbook, and a logic manual are provided. Self-study instructional materials are also available for operator education.
- Sample documents are provided for both data collection and data entry.
- Control features and documents are included to assist in establishing audit trails.

DESCRIPTION

MAPICS is a set of twelve independent, but interrelated, ready-to-execute applications for the small to medium-sized manufacturer:

- Order Processing and Accounting Applications
 - Order Entry and Invoicing
 - Inventory Management
 - Accounts Receivable
 - Sales Analysis
- Financial Applications

These applications are designed for marketing in any combination and installing in any sequence, with the following exceptions:

- Sales Analysis requires at least one of the other Order Processing and Accounting applications.
- Material Requirements Planning requires both Inventory Management and Product Data Management.
- Production Control and Costing requires the Inventory Management application. (Although Product Data Management is not an absolute requirement, its use is highly recommended.)
- Capacity Requirements Planning always requires the Inventory Management application and either Product Data Management or Production Control and Costing.

Each application has certain required records within a cross-application control file which contain questionnaire responses. These records allow the users to select report formats, file sizes, and functions to suit their needs. The questionnaire responses are entered during initial installation and may be changed as needed. The System Tailoring Procedures allow these responses to be entered or modified. It provides the following:

- All functions are included in the application programs but only required functions are actually executed.
- Allows the user to activate and deactivate provided functions as the user's business changes
- Tailors the Operator Control Language (OCL) on-site at installation time
- File sizes may be expanded or contracted as needed by rerunning the system tailoring procedure

The *MAPICS Installation Guide* provides instructions for planning the installation of one or more MAPICS applications. One installation guide is provided for the twelve MAPICS applications.

Reference manuals provide an explanation of the system to enable the user to understand the applications from a functional and operational standpoint. Manuals are provided at two levels. A reference manual for MAPICS operations gives guidance to the installation supervisor on managing and running the applications from a total-system viewpoint. One management operations manual is provided for MAPICS operations covering all twelve applications.

Individual reference manuals for each application instruct the workstation manager on how to conduct day-to-day operations of the application.

Similarly, one runbook is provided for the system console operator and individual application runbooks for the workstation operators. The console operations runbook contains detailed step-by-step instructions for operating MAPICS at the console. Included are an overview of the system and application flow, system considerations, hints on troubleshooting, and all of the error messages that can be generated by any of the applications in the offering.

The individual application runbooks provide a summary of the application and workstation operations, application and screen flow, application messages, and a detailed description of how to run each procedure in the application.

The MAPICS system logic manual is provided as licensed material for use by the self-sufficient customer, and for the systems engineer in maintaining and modifying MAPICS. Information on system architecture, naming conventions, system controls, system program functions, and specifications, relationship among system files, and other information applicable to all applications is presented in this system manual.

In addition, logic manuals for maintaining and modifying each application are available. Information relevant only to the subject application, such as program descriptions, cross-reference lists, and data dictionary, is presented.

Instructional support is provided to facilitate installation and operation. The Installation Planning Self-Study material provides guidance in the use of the installation guide and the reference manual. Other self-study

S/34 MAPICS (cont'd)

instructional material is provided for the systems console operator and for the application workstation operator to train them in the use of the runbooks. Only one copy of each manual is needed per customer no matter how many applications are to be installed.

Modular Application and Systems Training (MAST) is available to help identify and quantify benefits for top executives. MAST aids the customer in planning an effective implementation and includes techniques to assure top priority and the commitment of all the necessary resources. To assist in determining Management function and fit, there is a MAPICS features course for all MAPICS applications. In addition, for Inventory Management, Product Data Management, Production Control and Costing, and Material Requirements Planning, there are concepts, implementation, and using-the-system courses to make the customer more self-sufficient and reduce the effort and time required to install these applications.

PRODUCTION CONTROL AND COSTING (5726-M41)

The Production Control and Costing application provides for shop packet creation and for the tracking and costing of an ordered item as it is manufactured; it also measures work center utilization and efficiency plus queue analysis and control functions, similar to the IPICS FDPs. The application also creates, maintains, and updates the operation and miscellaneous charge information associated with jobs within the user's shop. It requires the installation of Inventory Management and has optional interfaces with Accounts Payable, Payroll, and Product Data Management as well as accepting data from Data Collection System Support (Product Data Management is highly recommended). Open operation information may also be passed on to Capacity Requirements Planning.

This application uses information which Inventory Management creates and maintains in conjunction with its own information to produce all necessary reports to track and cost an order. In addition, it produces a prioritized worklist by work center to assist production control in moving work through the shop in the most efficient manner.

The capability of accepting transactions via the workstation and/or diskette is provided in order to support Data Collection System Support diskette output. The transactions passed via the Data Collection System Support interface are labor, (operations) moves, and machine times. The labor transaction depends on the user's request of a Payroll interface. If the Payroll interface has been requested, the labor transactions are passed through Payroll to Production Control and Costing.

Additional functions include inquiry of order status, item status, and work center status, as well as report printing of order status and open order exceptions.

IBM System/34 MAPICS Production Control and Costing requires the use of the MAPICS Inventory Management (5726-M45) application.

PAYROLL (5726-M42)

The Payroll application starts with the basic employee time record as input and handles the calculation of wages, taxes, deductions, checkwriting, and file updating for both salaried and hourly pay plans. Employee time data may be entered from a workstation or can be passed from the Data Collection System Support application. Payroll can interface with both the General Ledger and Production Control and Costing applications. Transactions may be passed to General Ledger on either a cash or accrual basis during printing of the payroll distribution journal. Relative to MMAS, the accrued procedures have been modified to precisely relate pay periods to accounting periods. Job-related data for both hourly and salaried employees can be passed to the Production Control and Costing application.

Current payroll data is entered from time cards or job reports either daily or weekly, and is edited to validate employee and job information. A user with an incentive payroll must manually calculate gross pay and then enter it into the system. In addition to calculating present Federal and FICA taxes, a standard tax algorithm is provided to calculate most present state taxes based upon customer-provided data. Local taxes may also fit the standard tax algorithm provided. The state disability insurance deduction also uses a standard algorithm based upon customer-provided data. Wages subject to Federal Unemployment Insurance (FUI) and State Unemployment Insurance (SUI) are determined. Deduction programs compute voluntary deductions for a specific pay period as well as one-time and union deductions. All necessary reports are furnished including payroll register, deduction reports, checks, Federal 941-A reports, and W-2 reports.

Support for up to 20 companies, a manual payroll check procedure, and the ability to handle an employee working in multiple states, counties, cities, unions, jobs, or shifts on the same day are provided to give the user wide flexibility. Labor distribution of payroll hours and dollars is done in the same detail as the basic employee time record, that is, department, work center, job number, operation.

Several other reports are printed:

- Vacation, holiday, and sick pay register
- Year-to-date and quarter-to-date earnings register

- State and local tax register
- Check reconciliation register
- Workmen's compensation worksheet
- Union deduction register
- Paychecks (with option to print employee address)
- Governmental reports Federal 941-A, W-2 (and associated registers)

ACCOUNTS PAYABLE (5726-M43)

The Accounts Payable application keeps accurate and detailed records of vendor invoices and credit memos from the time they are entered into the system until they are paid and the check reconciled. Although Accounts Payable can be installed on a standalone basis, it is frequently used with the General Ledger application to which it can distribute the dollar amounts spent against the proper account numbers. There also exists an interface to Production Control and Costing by which Accounts Payable can pass job-related purchase information.

Transaction auditing is aided by a journal referencing scheme which causes every transaction affecting General Ledger to refer to a particular journal and line number within that journal. A double-entry bookkeeping method keeps transactions in balance.

Procedures for handling manual checks, petty cash, and check reversals are provided, as well as online selection of invoices for payment selection including partial payments, selection by date, and selection by vendor and invoice. Credit memos can be automatically generated, allowing the user to reverse a previously entered invoice without having to rekey all the invoice's indicative information and distribution.

Support is provided for up to 20 companies. Key reports include a new aged payables report, two vendor analysis reports, plus normal accounts payable audit trails such as purchase journal, cash requirements reports, and cash disbursements journal. When checks are printed, options are available to make the checks payable to 'assignees' (due to factoring by the vendor) and to print remittance advice 'overflow' data on a separate remittance advice form.

ACCOUNTS RECEIVABLE (5726-M44)

The Accounts Receivable application keeps detailed records of customer charges, cash payments, credit and debit memos, and other adjusting entries from the time they are entered into the system until they are paid or otherwise applied. The application allows for a combination of open item and balance-forward handling of individual customer accounts. Interfaces with Order Entry and Invoicing, Sales Analysis, and General Ledger are provided.

Invoices and credit memos can be entered directly and/or received from the Order Entry and Invoicing application. Cash receipts and adjustments are entered into the system directly, update the accounts receivable immediately, and can generate General Ledger transactions via an interface. The application provides optional late charges by customer for both open-item and balance forward accounting and support for up to 20 companies.

As required, the user can generate account status reports for a single customer or a group of customers as well as an aged trial balance in any of the following forms:

- Summary or detail
- Past-due accounts only
- Delinquent accounts only
- Minimum balance
- Aging based on current status
- Aging based on date of next statement
- Future aging of invoices

Additionally, statements and delinquency notices can be printed at user-determined frequency. The following features are provided:

- Option to age unapplied cash/adjustment
- Ability to identify credit memo by a unique number, but still relate the credit memo back to a specific invoice number
- Ability to apply cash, without knowing specific invoice numbers

INVENTORY MANAGEMENT (5726-M45)

The Inventory Management application processes all transactions affecting the status of the inventory balances. It is a central application which can interface with Order Entry and Invoicing, Sales Analysis, Product Data Management, and Data Collection System Support applications. Inventory Management is a prerequisite for installing either Material Requirements Planning, Production Control and Costing, or Capacity Requirements Planning.

The basic functions of this application provide the 'in's and out's' of inventory accounting plus the ability to cycle count the physical

S/34 MAPICS (cont'd)

inventory. The reporting functions include calculating current inventory investment and the annual inventory turns, as well as valuation techniques for tax reporting. Finally, you have the ability to release purchase and manufacturing orders and track their progress until each order is closed out.

The application provides for inventory valuation based on average, last, or standard costs as well as LIFO and FIFO options. Physical inventory checklists can be generated for multiple or selected warehouses, with or without cycle count options. In addition to printing a stock transaction register for audit control, a stock status report can be printed for all items or on an exception basis, and a stock status review can be had by item or by item within vendor.

A component 'availability check' is performed during the release phase, and items and orders with shortages are identified on special exception reports. At order release time, component allocation for manufacturing orders can be done to ensure that component inventory needs are accounted for between order release time and the actual withdrawal from stock.

Transactions can be entered from diskette or workstation. Transactions entered from diskette go through batch edit and batch update; transactions entered through a workstation are edited immediately and can update balances either immediately or later, in accordance with a System Tailoring option. In either case, an audit trail of all transactions is produced.

PRODUCT DATA MANAGEMENT (5726-M46)

The Product Data Management application maintains bills of material, product options, routing, and work center data bases and provides for costed retrievals and cost simulation. In interfacing with Inventory Management, Material Requirements Planning, Production Control and Costing, and Capacity Requirements Planning, this application is an information point for bills of material and routings. Order Entry and Invoicing also require Product Data Management in order to enter end items with standard options.

The ability to perform inquiry into the product structure and routing files is provided. Application highlights include the capability for multiple screen displays, mass replace, mass delete, and 'same-as-except' functions which facilitate maintenance to the product structure file. In addition to option handling techniques, use of engineering effectivity date simplifies engineering change control procedures. Labor and overhead rate tables can be used for costing in lieu of routing and work center files.

Several reports can be printed:

- Listings of item master, feature/option table and work center master
- Retrievals of product structures and routings
- Cost reports including management cost summary and cost variations

GENERAL LEDGER (5726-M47)

The General Ledger application is the terminal point of all accounting entries; it integrates completely with Accounts Payable and Payroll and accepts cash receipts and adjustment entries from Accounts Receivable. Though it can be installed apart from the other applications, a large number of ledger entries result from the distribution of expenses incurred through Accounts Payable. Therefore, most General Ledger users will likely install Accounts Payable and/or Payroll.

Each transaction entered is assigned a journal number and a unique line number within that journal. This journal reference number is kept with the transaction until it is posted to the master record during period-end closing. Transactions coming from other interfacing applications also use this reference numbering scheme. This makes auditability easier throughout the application. Thorough editing of all data at entry time, plus the fact that a double-entry bookkeeping system is used ensures that all credit entries are offset by an equal value of debit entries, and provides for smooth period closings. Diskettes can be used for processing recurring entries. The application gives the user support for up to 20 companies and choice of either a 12-month or 13-period fiscal year. The general ledger listing displays (by account number) transaction original journal reference numbers, to provide a clear and easily used audit trail of all transactions.

The balance sheet and income statement can be formatted to the user's particular requirements by use of a format file which permits special spacing, user-specified columnar printing, user-specified totaling, and up to 73 accounts to be totaled and printed with one line of description. By exploiting the capabilities of the format file, the user can produce departmentalized and/or combined (not consolidated) statements for multiple companies. Both the balance sheet and income statement can be comparative to last year and the income statement can also be comparative to budget figures.

SALES ANALYSIS (5726-M48)

The Sales Analysis application consolidates all sales and credit memo transactions affecting customers, salespersons, and items that have

been entered into the system. Input can come from Order Entry and Invoicing, Inventory Management, or Accounts Receivable; at least one of these applications must be installed as a prerequisite.

Data is passed to Sales Analysis via interface files as shown:

Customer-related data can come from	Salesperson-related data can come from	Item-related data can come from
OE&I A/R	OE&I A/R	OE&I IM

Either 12-month or 13-period reporting may be selected by the user. These transactions are posted to summary files which provide a historical data base for management reports. Summary files may also be corrected by file maintenance with an entry list providing an audit control.

Provision has been made for multicompany support for up to 20 companies for customer summary analysis, for flagging specific items for inclusion in sales analysis, and for inquiry into the summary files from the workstation. The reports included in the application are sales by customer, salesperson, and item with the option to display comparative data as well.

The System/34 MAPICS Sales Analysis application requires the use of at least one of the following MAPICS applications:

- Order Entry and Invoicing (5726-M49)
- Accounts Receivable (5726-M44)
- Inventory Management (5726-M45)

ORDER ENTRY AND INVOICING (5726-M49)

The order entry function is a key starting point for activity in a manufacturing organization. For make-to-order products, this function describes the item to be manufactured and when the item is required. For products to be shipped from inventory, it streamlines the order processing so items can be shipped promptly. It interfaces with Inventory Management by directly updating quantity on hand data, with Accounts Receivable by providing invoice summary information, and with Sales Analysis by providing item, customer and salesperson data. The data stored in the open order files can also be analyzed by Material Requirements Planning. Customer open orders can be passed to Capacity Requirements Planning.

As orders are entered, customer data is validated and, if accounts receivable is installed, a credit check is performed. Initial ship dates may be established on the basis of inventory availability or manufacturing orders, and item pricing data is checked for validity and completeness. The term 'orders' includes regular and blanket orders. A blanket order specifies a single item with multiple ship dates and specific quantities. Both order types may be entered in a similar manner. Invoicing may be accomplished by either direct entry or from orders previously entered into the system. Invoicing encompasses the computation of prices, taxes, and invoice totals. Pricing can be based on established contract prices, quantity breaks, markup from cost, or discounting from list price. Order acknowledgments, picking lists, invoices, and bills of lading can be printed.

If Product Data Management is installed, orders can be entered for end items which have standard options associated with them. Since these options may be required, they are checked at entry time to make sure the data is sufficient.

As soon as the Open Order files have been updated, the user has immediate access to current information such as:

- All orders for a particular item
- All orders for a particular customer
- Details for a particular order
- Blanket order status
- Customer status

The application also handles credit memo printing and the posting of back orders to the open order files. Support for up to 20 companies is provided as well as the generation of worksheets for general ledger input, commission accounting, and taxing body reporting.

DATA COLLECTION SYSTEM SUPPORT (5726-M4A)

The Data Collection System Support application provides an interface between a 5230 Data Collection System and the Payroll, Inventory Management, and Production Control and Costing applications. Inventory and labor transactions can be entered at conveniently located terminals, so information can be entered as it occurs, thereby eliminating many manual steps before this data can be processed on the System/34. Therefore, it provides a link between shop floor reporting and the MAPICS applications, and is designed as an integrated labor-reporting, payroll, and production control system.

The Data Collection System Support Application allows customers to define unique shop floor actions which are suited to their requirements.

S/34 MAPICS (cont'd)

The output from this definition phase is used by the 5231 Controller. Programs are provided so that data from the shop floor can be transmitted to the System/34, or the diskette can be carried to the System/34. Elapsed time is then calculated (based on user options regarding shift start/stop times, lunch breaks, and other paid/unpaid breaks) and prepared for payroll processing as attendance records or job records. The application will also apportion the time of an employee who works on overlapping jobs.

The application produces attendance, absentee, and labor reports, which provide a complete audit trail. Labor transactions may also be entered on the 5251 Display Station, as well as 5230 stations, to utilize the elapsed time calculations for payroll processing prior to installing a 5230 system.

MATERIAL REQUIREMENTS PLANNING (5726-M4B)

The Material Requirements Planning application is divided into three parts: Master Production Scheduling Planning (MPSP), Material Requirements Planning (MRP), and Order Release Planning (ORP). This application interfaces with and requires installation of Inventory Management and Product Data Management. It also interfaces with Order Entry and Invoicing to the extent that it can compare a master production schedule against customer orders. Firm planned and planned orders can be passed to Capacity Requirements Planning. MPSP determines the production schedule for master-level items (designated by a code in the item master record). Master-level requirements can be compared to forecast and/or customer orders to evaluate the manufacturing plan. Typically, planning requirements for master-level items is an interactive process. This process is simplified by various reports and workstation inquiries. The Material Requirements Planning reports include requirements planning, purchase planning, order recommendation, and cash analysis reports. A shortage report can be generated in the order release cycle if the user chooses to do an availability check. In addition, order release/review and requirements by item inquiries are supported.

Material Requirements Planning will take the approved output of MPSP and generate a total material plan to meet this schedule. This new plan can either be rebuilt (generation) or it can consist of differences from a previous plan (net change). Order recommendations produced from MRP become input to order release. The planner can review changes and approve orders scheduled for release.

IBM System/34 MAPICS Material Requirements Planning requires the use of both the MAPICS Inventory Management (5726-M45) and MAPICS Product Data Management (5726-M46) applications.

CAPACITY REQUIREMENTS PLANNING (5726-M4G)

The Capacity Requirements Planning Application is designed to analyze a company's production plan in terms of its plant capacity. This is a very useful tool for a company that wishes to identify those work centers and time periods when overload or underload conditions may be expected to develop. The application allows the production manager to meet the short term overload or underload condition by entering a temporary increase or decrease in work center capacity for a specified time period in the future.

Medium term analysis using the capacity planning run can help a company distinguish between scheduling problems and capacity problems that require changes to the base capacity of a work center.

The production plan used by the application is based on capacity requirements from several sources: Open orders, firm planned orders, planned orders, and under some restrictions, customer orders. Accurate start dates and operation durations are imperative for each manufacturing operation whether these operations come from Production Control and Costing or from Product Data Management's standard routings.

When the production plan and plant capacity have both been defined, capacity planning is ready to schedule and accumulate the workload by user-defined time period. This process will produce analysis files for workstation inquiry or report printing, and may be repeated to help users tune their plant capacity to the current production plan.

Capacity Requirements Planning is a dependent application. It requires orders (customer, open, firm planned and/or planned) and specifications (routing and/or open operations). The minimum support for Capacity Requirements Planning is:

Inventory Management (5726-M45) and Product Data Management (5726-M46)

or

Inventory Management (5726-M45) and Production Control and Costing (5726-M41).

CUSTOMER RESPONSIBILITIES

IBM may provide marketing assistance, in accordance with the Marketing and Service Guidelines in the GI section, in the installation of IBM licensed programs. However, the responsibility for providing accurate ordering information, personnel selection and training,

installation, and continued day-to-day operation lies solely with the customer.

Installation of System/34 licensed programs is a customer responsibility.

SPECIFIED OPERATING ENVIRONMENT

Support will be provided for these licensed programs when they are operated in the following specified operating environment:

HARDWARE REQUIREMENTS

Each of these licensed programs will execute on all models of the IBM System/34 with a minimum of 48K of main memory - with the exception of the Manufacturing applications, which require 64K of main memory. A user area of 28K is required for all applications except the Manufacturing applications (Product Data Management, Material Requirements Planning, Capacity Requirements Planning, Production Control & Costing), which require a minimum user area of 42K.

MAPICS is intended to be an independent yet interrelated set of applications. Many functions have been included to protect the integrity of the master files, programs, procedures, and libraries. Design features have been incorporated into the MAPICS applications to allow for co-residency of other applications and/or user-written programs with minimum restrictions. (Consult the MAPICS logic manual for a fuller explanation of these restrictions.)

SOFTWARE REQUIREMENTS

The IBM System/34 MAPICS application programs are written in IBM System/34 RPG II programming language and execute under control of the IBM System/34 System Support Program (5726-SS1). The IBM System/34 Utilities licensed program (5726-UT1), which includes Sort, Data File Utility, Source Entry Utility, and Work Station Utility, is required for execution of the programs. The IBM System/34 RPG II Compiler (5726-RG1) is required if modifications to the source code are desired. All programs must be release 6 or later.

The IBM System/34 MAPICS Material Requirements Planning, Capacity Requirements Planning, Production Control and Costing, and Sales Analysis applications require the use of other MAPICS applications as prerequisites. Refer to the descriptions of these four MAPICS applications for the specific requirements.

DOCUMENTATION

(available from Mechanicsburg)

Unlicensed Publications

Data Collection System Support Reference Manual (SB30-0311) ...
Data Collection System Support Runbook (SB30-0312) ...
Material Requirements Planning Reference Manual (SB30-0314) ...
Material Requirements Planning Runbook (SB30-0315) ...
Production Control and Costing Reference Manual (SB30-0317) ...
Production Control and Costing Runbook (SB30-0318) ...
Payroll Reference Manual (SB30-0302) ...
Payroll Runbook (SB30-0303) ...
Accounts Payable Reference Manual (SB30-0305) ...
Accounts Payable Runbook (SB30-0306) ...
Accounts Receivable Reference Manual (SB30-0296) ...
Accounts Receivable Runbook (SB30-0297) ...
Inventory Management Reference Manual (SB30-0293) ...
Inventory Management Runbook (SB30-0294) ...
Product Data Management Reference Manual (SB30-0320) ...
Product Data Management Runbook (SB30-0321) ...
General Ledger Reference Manual (SB30-0308) ...
General Ledger Runbook (SB30-0309) ...
Sales Analysis Reference Manual (SB30-0299) ...
Sales Analysis Runbook (SB30-0300) ...
Order Entry and Invoicing Reference Manual (SB30-0290) ...
Order Entry and Invoicing Runbook (SB30-0291)

Licensed Publications

Data Collection System Support Logic Manual (LB30-0313) ...
Material Requirements Planning Logic Manual (LB30-0316) ...
Production Control and Costing Logic Manual (LB30-0319) ...
Payroll Logic Manual (LB30-0304) ...
Accounts Payable Logic Manual (LB30-0307) ...
Accounts Receivable Logic Manual (LB30-0298) ...
Inventory Management Logic Manual (LB30-0295) ...
Product Data Management Logic Manual (LB30-0322) ...
General Ledger Logic Manual (LB30-0310) ...
Sales Analysis Logic Manual (LB30-0301) ...
Order Entry and Invoicing Logic Manual (LB30-0292).

TERMS and CONDITIONS: See PP Index

**SYSTEM/34 DISTRIBUTION FINANCIAL
ACCOUNTING SYSTEM II (DFAS II)****PAYROLL ... 5726-M42
ACCOUNTS PAYABLE ... 5726-M43
GENERAL LEDGER ... 5726-M47****PURPOSE**

The IBM System/34 Distribution Financial Accounting System II (DFAS II) provides an integrated and comprehensive workstation-oriented financial control system for the small to medium-sized distributor. The Accounts Payable, General Ledger, and Payroll applications are designed to meet the needs of both the manufacturer and the distributor. These three applications are also included in the twelve applications of the IBM System/34 Manufacturing Accounting and Production Information Control System (MAPICS) and are also marketed collectively as DFAS II to the distribution industries.

HIGHLIGHTS

- The System/34 hardware and software functions - spooling, inquiry, multiprogramming - are integral parts of the DFAS II application design.
- Workstation data entry is designed for simplicity and ease-of-use. Screen displays provide guidance for mandatory input and for fields that may be overridden. Error messages signal errors which are then corrected interactively by the operator.
- Interactive data entry, concurrent edit, and correction for multiple applications, through multiple workstations while batch programs operate in the job queue.
- Inquiry into master files concurrent with data entry.
- Online file maintenance of all master files with optional file maintenance reports.
- Each application may be installed independently or in combination with other applications.
- System tailoring procedures permit the user to select optional functions and reports, and to determine the sizes of all files used by the applications. Functions and file sizing may be modified as the customer environment changes by reexecuting the tailoring procedures.
- Source code, ready-to-execute procedures, and object code are provided. Although no additional system design, programming, or compiling is required, the system design incorporates features to assist the user in the modification of source code.
- File load programs for master files are provided, as well as file conversion programs for System/32 DFAS files and System/34 Single Program Mode DFAS files to the System/34 DFAS II format.
- Password security helps deter unauthorized use of applications and functions within applications. A higher level of security helps protect selected master file data.
- Optional system procedures for master file save and restore.
- Documentation for each application includes a reference manual, a runbook, and a logic manual. From an overall DFAS II system perspective, an installation guide, a reference manual, a runbook, and a logic manual are provided. Self-study instructional materials are also available for operator education.
- Sample documents are provided for both data collection and data entry.
- Control features and documents are included to assist in establishing audit trails.
- DFAS II can co-reside with DMAS II.

DESCRIPTION

The Distribution Financial Accounting System II (DFAS II) is a set of three independent, yet interrelated, ready-to-execute applications for the small to medium-sized distributor.

These applications are designed for marketing in any combination and installing in any sequence.

Each application has certain required records within a cross-application control file which contain questionnaire responses. These records allow the user to select report formats, file sizes, and functions to suit each customer's needs. The questionnaire responses are keyed during initial installation and may be changed as needed. The System Tailoring Procedure allows these responses to be entered or modified. It provides the following:

- Tailors the application and Operator Control Language (OCL) on site at installation time
- All functions are included in the application programs, but only required functions are executed

- Allows changes to file sizes as needed by rerunning the System Tailoring Procedure

The installation guide for DFAS provides instruction for planning the installation of one or more DFAS II applications. One installation guide is provided for all three applications of DFAS II.

Reference manuals are provided to enable the user to understand the applications from a functional and operational standpoint. Manuals are provided at two levels. A reference manual for DFAS II operations contains information for the installation manager to supervise the system console operator, and to run the applications from a total systems viewpoint. One such manual for DFAS II operations covers all three applications. Individual reference manuals for each of the three applications provide the user department manager with information needed to supervise the workstation operator and to understand the application at a detailed level.

Separate runbooks are provided for the systems console operator and for the workstation operator. The DFAS II system runbook for console operation contains detailed instructions for the application procedures, an overview of the system and application flow, system considerations, hints for troubleshooting, and all of the error messages that can be generated by any of the applications in the offering. One systems runbook is provided for DFAS II.

Runbooks for the workstation operator are provided for each application and include a summary of the application and workstation operations, application and screen flow, application messages, and a detailed description of how to run each procedure associated with the application.

Logic manuals are provided, as licensed material, for use by the self-sufficient customer and for the systems engineer. An application logic manual, for maintaining and modifying DFAS II, presents information on system architecture, naming conventions, system controls, system program functions and specifications, relationship among system files, and other information applicable to all applications.

In addition, logic manuals for maintaining and modifying each application are available. Information relevant only to the application, such as program descriptions, cross-reference lists, data dictionary, etc., is presented.

Instructional support is provided to facilitate installation and operation. The Installation Planning Self-Study material provides guidance in the use of the installation guide and the reference manual. Instructional material for self-study is provided for the systems console operator and for the application workstation operator to instruct them in the use of the runbooks. Only one copy of each is needed per customer no matter how many applications are to be installed.

PAYROLL (5726-M42)

The Payroll application starts with the basic employee time record as input and handles the calculation of wages, taxes, deductions, checkwriting, and file updating for both salaried and hourly pay plans. Payroll can interface with the General Ledger application. Transactions may be passed to General Ledger on either a cash or accrual basis during the printing of the payroll distribution journal.

Current payroll data is entered from time cards or job reports either daily or weekly, and is edited to validate employee and job information. A user with an incentive payroll must manually calculate gross pay and then enter it into the system. In addition to calculating present Federal and FICA taxes, a standard tax algorithm is provided to calculate most present state taxes based upon customer-provided data. Local taxes may also fit the standard tax algorithm provided. The state disability insurance deduction also uses a standard algorithm based upon customer-provided data. Wages subject to Federal Unemployment Insurance (FUI) and State Unemployment Insurance (SUI) are determined. Deduction programs compute voluntary deductions for a specific pay period as well as one-time and union deductions. All necessary reports are furnished including payroll register, deduction reports, checks, 941-A reports, and W-2 reports.

Support for up to 20 companies, a manual payroll check procedure, and the ability to handle an employee working in multiple states, counties, cities, unions, jobs, or shifts on the same day are provided to give the user wide flexibility. Labor distribution of payroll hours and dollars is done in the same detail as the basic employee time record; that is, department, work center, job number, operation.

Several other reports are printed:

- Vacation, holiday and sick pay register
- Year-to-date and quarter-to-date earnings register
- State, county and local tax register
- Check reconciliation register
- Workmen's compensation worksheets
- Union deduction register
- Paychecks (with option to print employee address)
- Government reports 941-A, W-2 (and associated registers)

ACCOUNTS PAYABLE (5726-M43)

S/34 DFAS II (cont'd)

The Accounts Payable application keeps accurate and detailed records of vendor invoices and credit memos from the time they are entered into the system until they are paid and the check reconciled. Although it can be installed on a standalone basis, it is frequently used with General Ledger to which it can distribute the dollar amounts spent against the proper account numbers while printing the purchase journal and the cash disbursements journal.

Transaction auditing is aided by a journal referencing scheme which causes every transaction affecting General Ledger to refer to a particular journal and line number within that journal. A double-entry bookkeeping method keeps transactions in balance.

Procedures for handling manual checks, petty cash, and check reversals are provided as well as online invoice entry and payment selection which includes partial payments, selection by date, and selection by vendor and invoice. Credit memos can be automatically generated, allowing the user to reverse a previously entered invoice without having to rekey all the invoice's indicative information and distribution.

Support is provided for up to 20 companies. Key reports include a new aged payables report, two vendor analysis reports, plus normal accounts payable audit trails such as purchase journal, cash requirements reports, and a cash disbursements journal. When checks are printed, options are available to make the checks payable to 'assignees' (due to factoring by the vendor) and to print remittance advice 'overflow' data on a separate remittance advice form.

GENERAL LEDGER (5726-M47)

The General Ledger application is the terminal point of all accounting entries integrated completely with Accounts Payable and Payroll. Though integrated, it can be installed apart from the other applications. Since a larger number of ledger entries result from the distribution of expenses incurred through Accounts Payable, a majority of General Ledger users will likely install Accounts Payable.

Each transaction entered is assigned a journal number and a line number within that journal. This journal reference number is kept with the transaction until it is posted to the master record during period-end closing. Transactions coming from other interfacing applications also use this reference numbering scheme. This makes auditability easier throughout the application. Thorough editing of all data at entry time plus the fact that a double-entry bookkeeping system is used ensures that all credit entries are offset by an equal value of debit entries, and provides for smooth period closings. Diskettes can be used for processing recurring entries. The application gives the user support for up to 20 companies and a choice of either a 12-month or 13-period fiscal year. The general ledger listing displays the transaction original journal reference number, providing a clear and easily used audit trail of all transactions.

The balance sheet and income statement can be formatted to the user's particular requirements by use of a format file which permits special spacing, user-specified columnar printing, user-specified totaling, and up to 73 accounts to be totaled and printed with one line of description. Through the capabilities of the format file, the user can produce departmentalized and/or combined (not consolidated) statements for multiple companies. Both the balance sheet and income statement can be comparative to last year and the income statement can also be comparative to budget figures.

AUTOMATED INSTALLATION AID

Available at no additional charge, the DFAS II Self-Install feature (#7443) should be ordered with the first DFAS II application. It is an interactive installation method consisting of a workbook and diskette, enabling customers to install any of the existing DFAS II applications with little or no SE assistance. These applications include Payroll, Accounts Payable, General Ledger. They may be installed in any sequence. DFAS II Self-Install is designed for the novice who is installing an application for the first time. It is also intended for the experienced DFAS II user who wishes to add a new DFAS II application. DFAS II Self-Install consists of:

- An installation workbook that guides the user step-by-step through the planning and installation of a DFAS II application. File sizing and run time options are explained and then entered by the user in the workbook. The workbook should be ordered through Mechanicsburg so the customer can use it prior to installing the application.
- Data forms for all application master files are included along with lists of descriptions for the information fields in all the forms.
- A set of programs, invoked by one command, that prompts for workbook responses, calculates disk/diskette requirements, initializes required diskettes, loads programs to DFAS II libraries, and backs up all files and libraries. These programs are included with the application code shipped from PID when feature #7443 is specified.

The *DFAS II Self-Install Installation Workbook* (SH30-0653) should be ordered by form number from Mechanicsburg when feature #7443 is ordered.

CUSTOMER RESPONSIBILITIES

IBM may provide marketing assistance, in accordance with the Marketing and Service Guidelines in the GI section, in the installation of IBM licensed programs. However, the responsibility for providing accurate ordering information, personnel selection and training, and continued day-to-day operation lies solely with the customer. Installation of System/34 licensed programs is a customer responsibility.

SPECIFIED OPERATING ENVIRONMENT

Support will be provided for these licensed programs when they are operated in the following specified operating environment:

HARDWARE REQUIREMENTS

Each of these licensed programs will execute on all models of the IBM System/34 with a minimum of 48K of main memory.

DFAS II is intended to be an independent yet interrelated set of applications. Many functions have been included to protect the integrity of the master files, programs, procedures, and libraries. Design features have been incorporated into the DFAS II applications to allow for co-residency of other applications and/or user-written programs with minimum restrictions. Consult the DFAS II logic manual for further explanation of these restrictions.

Although nothing inherent in the design of the DFAS II applications prevents the use of the minimum system configurations stated above, the system configuration for a particular customer must be able to accommodate the expected business volumes, data base size, and operating requirements.

SOFTWARE REQUIREMENTS

The IBM System/34 application programs are written in IBM System/34 RPG II programming language and executed under control of the IBM System/34 System Support Program (5726-SS1). The IBM System/34 Utilities licensed program (5726-UT1), which includes Sort, Data File Utility, Source Entry Utility, and Work Station Utility, is required for execution of the programs. The IBM System/34 RPG II Compiler (5726-RG1) is required if modifications to the source code are desired. Release 2 or any later release of these licensed programs is required.

DOCUMENTATION

(available from Mechanicsburg)

Unlicensed Application Publications

Payroll Reference Manual (SB30-0302) ... *Payroll Runbook* (SB30-0303) ... *Accounts Payable Reference Manual* (SB30-0305) ... *Accounts Payable Runbook* (SB30-0306) ... *General Ledger Reference Manual* (SB30-0308) ... *General Ledger Runbook* (SB30-0309).

Licensed Application Publications

Payroll Logic Manual (LB30-0304) ... *Accounts Payable Logic Manual* (LB30-0307) ... *General Ledger Logic Manual* (LB30-0310).

TERMS and CONDITIONS: See PP Index



PROGRAM PRODUCTS

**CONSTRUCTION MANAGEMENT and
ACCOUNTING SYSTEM for the SYSTEM/34
CMAS/34**

JOB COSTING ... 5726-M66
GENERAL LEDGER ... 5726-M67
ACCOUNTS PAYABLE ... 5726-M68
PAYROLL AND LABOR COSTING ... 5726-M69
REVENUE ACCOUNTING ... 5726-M6A

PURPOSE

The IBM Construction Management and Accounting System for the System/34 (CMAS/34) provides an integrated and comprehensive workstation-oriented accounting and financial control system for the small-to-medium size construction firm and related project-oriented business. The Payroll and Labor Costing, Accounts Payable, Job Costing, Revenue Accounting, and General Ledger applications are designed to meet the needs of the construction industry.

HIGHLIGHTS

- The System/34 hardware and system software functions - spooling, inquiry, multiprogramming - are integral parts of the CMAS/34 application design.
- Workstation data entry is designed for simplicity and ease-of-use. Screen displays provide guidance for mandatory input and for fields that may be overridden. Messages signal errors which can be corrected interactively by the operator.
- Interactive data entry allows concurrent edit and correction for multiple applications and multiple workstations while batch programs operate in the background.
- Offline input of transactions from diskettes prepared on a 3740 Data Entry System is supported except for the Revenue Accounting application and the Committed Cost/Cost History feature. Diskette support does *not* include file loading and maintenance transactions to any master files.
- Special inquiries are provided for the job cost, labor cost, open payable, subcontract status, contract status, and open receivables files.
- System tailoring procedures permit the user to select optional functions and reports and to determine the sizes of all files used by the applications. Functions and file sizing may be modified as the customer environment changes by re-executing the tailoring procedures.
- All object programs and procedures are resident with the exception of System/32 CMAS file conversion programs, system tailoring programs, security file change programs, and file sizing programs.
- Source code, ready-to-execute procedures, and object code are provided. Although no additional systems design, programming, or compiling is required, the application design incorporates features to assist the user in the modification of source code. These features include user interface branches in procedures, reserved user space in master file records, and detailed program documentation.
- Provides the file maintenance of all master files with audit reports.
- Procedure documentation reflects restart/no-restart capability of each of the main line procedures.
- Password security helps deter unauthorized use of workstations, applications, and functions within applications.
- Sample input forms are provided for data entry.
- Control features and sample control documents are included to assist in establishing audit trails.
- Multiple company support for up to 99 companies.

DESCRIPTION

CMAS/34 is a set of five interrelated, ready-to-execute applications for small-to-medium size contractors. Four of the applications (Payroll and Labor Costing, Accounts Payable, Job Costing, and General Ledger) are independent and can be marketed in any combination and installed in any sequence.

Revenue Accounting is a dependent application. The Job Costing application *must* be installed prior to installing Revenue Accounting.

JOB COSTING (5726-M66)

Costing journal entries with cost distribution may be entered with distribution by company, job, pay item, cost code, and cost type. Job Costing passes transactions to the General Ledger, if installed. General Ledger is then updated on a monthly basis. Job Costing is automatically updated by the Accounts Payable and Revenue Accounting applications if installed. Payroll and Revenue Accounting reports, when used with the Job Cost reports provide a total perspective of job status.

Job Cost management reports are provided with unit costs, budget comparison, and projected profit or loss based on field reporting of percent complete or quantity 'put-in-place.' Income reporting with

distribution provides the basis for cash flow reports by company and by job. If the Committed Cost/Cost History feature (#6021) of the Accounts Payable application (5726-M68) is installed, Job Cost Management reports are available which optionally can include committed cost. Also, a cost history report is available which optionally can include all detail cost and income records for a project. You can select which projects to accumulate cost history when you establish a record in the Job Name file. Special inquiry into the job cost and labor cost (if available) files provides immediate access to job cost information.

Special emphasis is given to providing a complete audit of transactions affecting the job costing file and general ledger. A job cost detail transaction register (optional) highlights items posted to the general ledger by cost distribution for the accounting month close.

Jobs indicated as Time-and-Material jobs (jobs without estimates) will be processed without cost projections. Without this feature, these jobs would always project cost overages equal to actual costs incurred, which is inaccurate. Change orders and revised estimates can be accounted for via an optional change order file which is processed against the original estimates. Up to 99 change orders per cost distribution record may be maintained. The costing reports will show change order detail or optionally net the change orders against the original estimate and print a revised estimate summary line per cost item.

A standard master job costing file enables users to store frequently used cost items which can be duplicated into the job cost file when those cost items are used on a new job. This is especially useful to a home builder for storing the cost descriptions and estimates for a standard house plan and copying that plan to the costing file without having to retype all the details.

GENERAL LEDGER (5726-M67)

The General Ledger application is the terminal point of all accounting entries; it interfaces with Payroll and Labor Costing, Revenue Accounting, and Accounts Payable, and accepts journal entries from Job Costing. Though it can be installed apart from the other applications, a large number of ledger entries result from the distribution of expenses incurred through Accounts Payable and Payroll and Labor Costing. Therefore, a majority of General Ledger users will likely install Accounts Payable and/or Payroll and Labor Costing.

Each transaction entered is assigned a journal number and a unique line number within that journal. This journal reference number is kept with the transaction until it is posted to the master record during period-end closing. Transactions coming from other interfacing applications also use this reference numbering scheme. This makes auditability easier throughout the application. Thorough editing of all data at entry time plus the fact that a double-entry bookkeeping system is used, ensures that all credit entries are offset by an equal value of debit entries and provides for smooth month-end closing. The application gives the user support for up to 99 companies and supports a 12-month fiscal year. The general ledger listing displays (by account number) transaction original journal reference numbers, providing a clear and easily used audit trail of all transactions.

The balance sheet and income statement can be formatted to the user's particular requirements by use of a format file which permits special spacing, user-specified columnar printing, user-specified totaling, and up to 118 accounts to be totaled and printed with one line of description. By exploiting the capabilities of the format file, the user can produce combined statements for multiple companies. Both the balance sheet and income statement can be comparative to last year and both can also be comparative to budget figures.

ACCOUNTS PAYABLE (5726-M68)

The Accounts Payable application keeps accurate and detailed records of vendor invoices and credit memos from the time they are entered into the system until they are paid and the check reconciled. Although Accounts Payable can be installed on a standalone basis, it is frequently used with the General Ledger application to which it can distribute the dollar amounts spent against the proper account numbers. There also exists an interface to Job Costing by which Accounts Payable can pass subcontract or material purchase costs to specific jobs. In addition, equipment repair parts or services processed through Accounts Payable can be distributed to the equipment cost file in the Payroll and Labor Costing application, if installed. Job expenses, disbursements, and subcontract retention are passed to Revenue Accounting, if installed.

Transaction auditing is aided by a journal referencing scheme which causes every transaction affecting General Ledger to refer to a particular journal and line number within that journal. A double-entry bookkeeping method keeps transactions in balance.

Procedures for handling manual checks (partial as well as fully prepaid), petty cash, and check reversals are provided. Selection of invoices for payment includes partial payments, selection by date, and selection by vendor and invoice. Credit memos can be automatically generated,

CMAS/34 (cont'd)

allowing the user to reverse a previously entered open invoice without having to retype all the invoice's indicative information and distribution.

Support is provided for up to 99 companies. Key reports include an aged payables report, vendor analysis report, plus normal accounts payable audit trails such as purchase journal, cash requirements report, and cash disbursements journal. When checks are printed, options are available for reconciliation and to print remittance advice 'overflow' data on a separate remittance advice form.

Subcontract accounting is a subsystem within the Accounts Payable application. It provides for automatic movement and accountability of retainage and taxes. Subcontracts can be maintained on either a balance forward or open item basis. Subcontract status reports by job and by vendor specify the contract amounts, change orders and/or revisions, billed amounts to date (by date, if open item), payment amount to date (by date, if open item), retention and taxes. Controls help insure that the subcontract status file remains in balance with the job costing file if the Job Costing application is installed.

Committed Cost/Cost History Feature (#6021)

The optional Committed Cost/Cost History feature to Accounts Payable adds the capability to enter and track purchase order activity and pass the information to the Accounts Payable data entry function when the invoice is received. It provides an analysis of future cash requirements for committed purchase orders. Inquiries can be made into the Open Purchase Order file to check the status of any purchase order line item. Reports can be run in Purchase Order, Vendor, or Job sequence. Committed Costs can be optionally included on applicable Job Costing reports if the Job Costing application (5726-M66) is installed. This feature does not support data entry.

PAYROLL AND LABOR COSTING (5726-M69)

The Payroll application starts with the basic employee time record as input and handles the calculation of wages, taxes, direct burden, deductions, checkwriting, and file updating for both salaried and hourly pay plans. Employee time data may be entered from a workstation or can be entered via diskettes on a 3740 Data Entry System. Payroll can interface with both the CMAS/34 General Ledger, Job Costing, and Revenue Accounting applications. Transactions may be passed on to General Ledger during printing of the payroll distribution journal. Job-related data for both hourly and salaried employees can be passed to the Job Costing application. Labor costs are used by the Revenue Accounting application.

Current payroll data is entered from time cards or job reports either daily or weekly, and is edited to validate employee and job information.

In addition to calculating present federal income and FICA taxes, a standard tax algorithm is provided to calculate most present state income taxes based upon customer-provided data. Local income taxes may also fit the standard tax algorithm provided.

The state disability insurance deductions also use a standard algorithm based upon customer-provided data. Wages subject to Federal Unemployment Tax Act (FUTA) and State Unemployment Tax Act (SUTA) are also determined.

Deduction programs compute voluntary deductions for a specific pay period as well as one-time and union deductions. Included at customer option are employer-paid union fringes, workmen's compensation, Federal Unemployment Tax Act (FUTA), and State Unemployment Tax Act (SUTA). Employer-paid direct burden (FICA, FUTA, SUTA, workmen's compensation, and union benefits) is calculated automatically and optionally costed to jobs based on several methods which are tailored at install. The calculated burden may be distributed to a standard cost code selected by the contractor or distributed to each individual labor cost record. The appropriate accounts in the General Ledger are also updated if the General Ledger application is installed. Any additional burden required for local codes can be calculated by a user-written program and interfaced to the system via procedure interface and an 'other burden' field in the current hours record.

Support for up to 99 companies, a manual payoff check procedure, and the ability to handle an employee working in multiple states, localities, unions, jobs, at different rates on the same day are provided to give the user wide flexibility. Labor distribution of payroll hours and dollars is done in the same detail as the basic employee time record; that is, job number, pay item, cost code, cost type, and job class by company.

Reports furnished include payroll register, deduction reports, monthly union reports, certified payroll register, checks, 941-A reports, and W-2 reports.

Several other reports are printed:

- Year-to-date and quarter-to-date earnings register
- State and local tax register
- Check reconciliation register
- Workmen's compensation earnings worksheet
- Workmen's compensation premium worksheet
- Workmen's compensation and insurance report

- Union calculation register
- Union stamp report
- Paycheck formats are provided in the original System/32 CMAS format and a new CMAS/34 format. This new CMAS/34 format provides options to print employee address and the amount of the check printed in words. It also provides a free form check stub which shows deduction detail and hours worked at each rate of pay.

REVENUE ACCOUNTING (5726-M6A)

The Revenue Accounting application performs normal accounts receivable functions such as entry of invoice and cash receipts information, posting to open receivables and Temporary General Ledger Work File (TEMGEN), printing statements and delinquency notices, printing management reports, calculating late charges, and allowing discounts for prompt payment. Job Costing (5726-M66) is a prerequisite application.

In addition, Revenue Accounting has added functions specifically addressing the requirements of the construction industry. These functions are:

- Entry of detail line items for job invoices so that Job Costing income records are updated.
- Defining eight invoice types (Job, Retention, Work Order, Equipment, Employee, Material, Standard, and Cash), each one with associated General Ledger account numbers, to reduce coding requirements for source documents.
- Cash can be applied by customer, job, or invoice, so manual coding of cash receipts is minimized.
- The ability to process statements 'as of' a certain date so that priority work can proceed without interruption; for example, payroll processing.
- The ability to request Open Receivables Analysis reports by customer, job, or non-job to aid in managing receivables.
- Capturing retention information in invoice processing to aid in managing retention accounts receivable.
- Printing of a Retention Due listing to aid in tracking and billing of retention.
- A Progress Billing subsystem that includes interactive review and change as an aid to determining billable amounts for completed work.
- Conforming to all CMAS/34 conventions with one exception - diskette data entry is not supported.
- Interfacing with Job Costing, Accounts Payable, Payroll and Labor Costing, and General Ledger, if these applications are installed.

A significant feature of this application is Progress Billing. Progress Billing assists the contractor in preparing monthly invoices. It accumulates costs from the Job Cost file and calculates the preliminary billable amount based on job progress. The contractor can adjust the billable amounts at the workstation before printing a final report. The format of the final report is similar to that of the American Institute of Architect's (AIA) billing form.

The functions of the interfaces are:

Revenue Accounting requires job billing and cost information from the Job Costing file for the Progress Billing subsystem, and for verification of job billings. Job billing detail from invoicing updates Job Costing via the TEMGEN file.

While Job Costing is the only prerequisite application, Revenue Accounting also interfaces with the other CMAS/34 applications.

Without Accounts Payable, data must be manually entered and maintained for job expenses incurred, disbursements made, and subcontract retention, if the financial position report is used.

Without Payroll and Labor Costing, labor costs must be kept in Job Costing, if the financial position report is used.

Without General Ledger, accounting entries produced by Revenue Accounting Invoice, Cash Receipt, and Late Charge journals must be manually posted. Therefore, it is recommended that all five CMAS/34 applications be installed.

CUSTOMER RESPONSIBILITIES

IBM may provide marketing assistance, in accordance with the Marketing and Service Guidelines in the GI section, in the installation of IBM licensed programs. However, the responsibility for providing accurate ordering information, personnel selection and training, installation, and continued day-to-day operation lies solely with the customer.

Installation of System/34 licensed programs is a customer responsibility.



PROGRAM PRODUCTS

CMAS/34 (cont'd)**SPECIFIED OPERATING ENVIRONMENT**

Support will be provided for these licensed programs when they are operated in the following specified operating environment:

HARDWARE REQUIREMENTS

The minimum system configuration for any *single* CMAS/34 application is an IBM System/34 with:

- IBM 5340 System Unit with Diskette 1 Drive, 8.6 Mb of disk storage and 48K (Mdl B11).
- One system printer, either line printing at 160 lines per minute, or serial printing at 40 characters per second.
- One application per IBM 5251 Display Station (mdl 11)

Although there is nothing inherent in the design of the CMAS/34 applications which prevents the use of the minimum system configuration stated above, the system configuration for a particular customer must be able to accommodate the expected business volumes, data base size, and operating requirements.

The amount of disk storage required is influenced by the:

- Number of workstations attached
- Library sizes (number of applications installed - all programs resident)
- Number of records in the required master files
- System tailoring options taken
- Volume of daily transactions

Installation of more than one CMAS/34 application concurrently will require more disk capacity than the minimum disk configuration of 8.6 megabytes.

Disk File Requirement: CMAS/34 requires substantially more library and file space than CMAS on System/32. Failure to use the CMAS/34 File Sizer to determine disk space requirements could result in a system configuration that is insufficient to meet customer requirements.

Remote Data Entry Performance: If data entry programs are to be used with remote workstations, consideration should be given to the impact on performance (time between pressing the enter key and the return of the next display) caused by the much slower data transfer rates inherent with teleprocessing communication facilities. Customers should be made aware of the performance differences between locally attached workstations (1,000,000 bps) and remote workstations communicating at rates of 1200, 2400, 4800, or 9600 bps. Refer to the *IBM System/34 Concepts and Design Guide* (SC21-7742) for additional performance considerations.

SOFTWARE REQUIREMENTS

CMAS/34 application programs are written in IBM System/34 RPG II and System/34 Work Station Utility (WSU) and execute under control of the System/34 System Support Program (5726-SS1), Release 7 or later, and System/34 Utilities (5726-UT1), Release 7 or later, which includes Sort, Data File Utility, Source Entry Utility, and Work Station Utility. Sort and WSU are required for execution of the programs. The System/34 RPG II Compiler (5726-RG1) is required if modifications to the source code are desired.

The CMAS/34 Job Costing application (5726-M66) is a prerequisite application to installing CMAS/34 Revenue Accounting (5726-M6A).

The CMAS/34 Accounts Payable application (5726-M68) is a prerequisite application to installing the Committed Cost/Cost History feature (#6021). In addition, if the following licensed programs are installed, they must be at or above the specified modification level and PTF level before installing the Committed Cost/Cost History feature:

- Job Costing (5726-M66) V1, Mod. 3
- General Ledger (5726-M67) V1, Mod. 2, PTF #0038
- Accounts Payable (5726-M68) V1, Mod. 4
- Payroll and Labor Costing (5726-M69) V1, Mod 9, PTF #0294
- Revenue Accounting (5726-M6A) V1, Mod. 0, PTF #0001
- Cross Application (#7043) V1, Mod. 4

Educational Allowance: The standard education allowance applies.

DOCUMENTATION

(available from Mechanicsburg)

Licensed Program Specifications:

Payroll and Labor Costing (GH30-0441) ... *Accounts Payable* (GH30-0440) ... *Job Costing* (GH30-0439) ... *General Ledger* (GH30-0442) ... *Revenue Accounting* (GH30-0457).

Application General Information Manual (GH30-0707) ... *Construction Industry Flyer* (G580-0186) ... *Reports Brochure* (G280-0085).

Education Courses

CMAS/34 Customer Education ... *CMAS/34 System Console Operator Instructions Self-Study* (SBOF-4061) ... *CMAS/34 Installation Planning Self-Study* (SBOF-4060) ... *CMAS/34 Work Station Operator Instructions Self-Study* (SBOF-4062).

TERMS and CONDITIONS: See PP Index

Ordering Information: Contact IBM

PROGRAM PRODUCTS

**CONSTRUCTION MANAGEMENT ACCOUNTING SYSTEM
(CMAS) FOR SYSTEM/34 (SINGLE PROGRAM MODE)**

JOB COSTING ... 5726-M61
ACCOUNTS PAYABLE ... 5726-M62
PAYROLL ... 5726-M63
GENERAL LEDGER ... 5726-M64

PURPOSE

The IBM Construction Management Accounting System (CMAS) provides the construction industry with a complete, yet flexible, method for managing their Payroll, Accounts Payable, Job Costing, and General Ledger.

CMAS offers flexible applications specifically designed for the construction industry. CMAS key reports help construction management effectively direct and control their business.

HIGHLIGHTS

Independent or interrelated applications approach

- Modular design facilitates sequential application installation
- A journal reference numbering system ties the four applications together when multiple CMAS applications are installed
- Single data entry results in multiple application update

wide variety of reports and report options included

- Management reporting is a byproduct of normal data entry
- All applications provide for multicompany entries and reports
- Field reporting allows for projecting profit and loss by job

Uses recognized accounting techniques and terminology to provide a solid accounting system

- Clear audit trails and control techniques are provided
- Sample user-oriented forms for data preparation, file creation, and audit and control are provided
- Security code deters unauthorized inquiry or execution of key programs in each application

CMAS can be installed without customer programming capability

- System tailoring procedure on-site to facilitate account growth changes
- Display screen input prompting and output report formats are tailored to meet specific customer requirements
- Complete, system-controlled, operator-oriented input prompting
- Complete file maintenance and audit programs and procedures
- File sizing procedure to assist in relocating master and work files

DESCRIPTION

The Construction Management Accounting System is a set of four independent, interrelated, ready-to-execute applications for the small to medium-sized contractor/subcontractor. The system combines two approaches: Operator-oriented and batch reporting. This approach and programming system provides a sound accounting base by doing Payroll with Labor Distribution, Accounts Payable with Subcontract Accounting, Job Costing with Management Reporting and General Ledger with Financial Statements.

The four easy-to-operate applications may be installed in separate stages at different times and still be a totally interrelated system; that is, payroll data may be passed by the system directly to general ledger and job costing, etc.

Each application contains a requirements file with user questionnaire responses which allows the application to select input formats, report formats, and functions to suit each customer's needs. These responses are keyed in during initial installation and may be changed as customer needs change.

The systems tailoring procedure controls the prompting of input records and fields to be entered, the types of reports and fields on reports, and data files used for output.

Systems tailoring procedure is a procedure requesting the answers to a series of questions regarding a contractor's company requirements. Systems tailoring provides the following:

- Tailoring the system on-site at installation time
- Application reprogramming is not required as business changes because system tailoring parameters can be changed by the customer
- The programs contain all the announced functions, but only required functions are performed by the system
- Applications may be installed in any sequence

- System tailoring options include the following: Multiple companies or single; multiple status or single; multiple unions or no unions; custom formatting of Balance Sheets and Income Statements

An installation guide provides a step-by-step installation activity plan including suggested numbering systems, sample input and maintenance user data forms, control forms with suggested procedures, and other activities necessary for a successful installation.

The runbook provides the operator with activities necessary to effectively operate CMAS as an accounting system to provide accurate and timely management reports.

Two self-study guides lead the user through the installation guide, runbook, and associated materials to assist the self-sufficient customer.

These application programs make the Construction Management Accounting System available on a System/34 operating in single program mode. The programs support one workstation, no spooling, no multiprocessing and no file sharing.

Application Description: The Construction Management Accounting System consists of four full-function, ready-to-execute applications. CMAS includes source code, object code and execution procedures. The four applications have the following functions:

JOB COSTING (5726-M61)

General Journal entries with cost distribution may be entered with distribution by company, job, pay item, cost code, and cost type.

Job Costing automatically updates the General Ledger component, if available. General Ledger is then updated on a monthly basis.

Job Costing is automatically updated by the Accounts Payable application if installed. Payroll reports, when used with the Job Cost reports provide a total perspective of job status.

Job Cost management reports are provided with unit costs, budget comparison, and projected profit or loss based on field reporting of percent complete or quantity put in place. Income reporting with distribution provides the basis for cash flow reports by company and by job.

ACCOUNTS PAYABLE (5726-M62)

Invoices and credit memos entered may be multiline and distributed by company, job, pay item, cost code, and cost type. The entries may consist of vendor, miscellaneous, estimated or subcontract invoices. Prepaid invoices are permitted on all of the invoice types. Credit memos may be entered manually or initiated automatically based on a prior enter invoice. Partial payment is not supported.

Subcontract accounting provides for automatic movement and accountability of retainage and change orders. Subcontracts are maintained on either a balance forward or open item basis. Subcontract status reports by job and by vendor denote the contract amount, change orders, billed amount and date, payment amount and date, retention, and taxes.

An accrued accounting system provides for timely job cost information while a cash flow handling capability indicates job cash position through the general ledger.

The Accounts Payable application provides an Open Payable and Cash Disbursements function. An Open Payable report is provided in due date or vendor sequence. This turnaround document provides a mechanism to indicate payment by date, job, vendor, or invoice, including partial payments for Cash Disbursements.

Invoices may be entered or placed on hold status to prevent inadvertent payment of invoices in question.

A Cash Requirements report is used to assist the controller in ensuring funds are available and proper invoice selection was made before the check writing procedure begins.

Check writing and reconciliation are provided. The check format provided includes a user-indicated check stub length to adapt the size of the remittance advice. Stub overflow initiates a separate supplementary stub.

An Accounts Payable trial balance is available in job or vendor sequence.

A Vendor Analysis Report indicates key business volumes by quarter and year.

Diskette input for Accounts Payable invoices is provided.

PAYROLL (5726-M63)

This hourly/salary distributed payroll provides for regular, overtime, premium, vacation, sick, and travel pay. It may be run weekly, biweekly, semimonthly, or monthly. Exception hours provide time and one-half, double time, double time and one-half, and triple time capabilities. Rate selection may be standard, selected by craft, or keyed in as an exception overtime or premium rate.

PROGRAM PRODUCTS

CMAS for S/34 (cont'd)

Clear audit and accounting procedures aid in maintaining a Payroll system in balance.

Hand-written checks (payoffs, special, etc.) are easily handled.

Standard union deductions are used to prepare two standard union deduction reports. Multiple union reporting is supported.

Workmen's compensation calculations and a workmen's compensation worksheet report provide a mechanism for weekly tracking of insurance premiums.

A standard tax algorithm calculates Federal, FICA, and many state income taxes on the basis on customer-provided data. Local taxes may fit the standard tax algorithm provided.

Deductions by percent, fixed amount, upper limit, and miscellaneous deductions.

Taxable or non-taxable adjustments.

State Disability Insurance is calculated and reported.

Federal Unemployment Insurance and State Unemployment Insurance is calculated and reported.

Check writing and reconciliation are provided.

A payroll journal provides a clear audit trail of entries to the CMAS General Ledger application.

Labor cost management reports are provided with unit cost, budget comparison, and projected profit or loss based on field reporting of percent complete or quantity put in place. The reports are available with distribution by company, job, pay item, cost code, cost type, and job class.

941-A, W-2, and Certified Payroll reports are provided. Diskette input for payroll hours is supported.

GENERAL LEDGER (5726-M64)

General Journal entries may be entered for end-of-month closings or for out-of-balance conditions.

Journal entries identified by journal names and numbers are indicated on the Financial Statement Worksheet and Trial Balance Listing. These entries are automatically accepted from the Payroll, Accounts Payable, and Job Costing applications.

On an out-of-balance condition, a procedure is provided to rearrange the entries into journal reference number sequence and print out a selective audit listing. This listing can be compared with the monthly journals to quickly identify the out-of-balance entry.

An Income Statement and Balance Sheet are standard report outputs which provide the user with the flexibility of defining these reports with an easy-to-use format description procedure. This definition may be changed as needs vary. The user may carry over account transactions from one month to the next without performing a monthly close.

Financial reports can illustrate current financial data as compared to budget or historical information.

Users may define their own chart of accounts or use a suggested account structure provided with the application. The fiscal year start date is user-defined.

CUSTOMER RESPONSIBILITIES

IBM may provide marketing assistance, in accordance with the Marketing and Service Guidelines in the GI section, in the installation of IBM licensed programs. However, the responsibility for providing accurate ordering information, personnel selection and training, installation, and continued day-to-day operation lies solely with the customer.

Installation of System/34 licensed programs is a customer responsibility. For customers who have modified their installed System/32 IAPs and who choose to have IBM make the same modifications on the new System/34 product, the reinstallation of the modifications on the new product will be at an additional charge under SES. It is the customer's responsibility to transfer their data files from one system to the other.

SPECIFIED OPERATING ENVIRONMENT

Support will be provided for these licensed programs when they are operated in the following specified operating environment:

HARDWARE REQUIREMENTS

Each of these licensed programs will execute on all models of the IBM System/34 with a minimum of 48K of main storage in single program mode. The programs are compiled assuming a 48K minimum system.

Information regarding disk allocation and usage (master and transaction files) and recommended backup levels and diskette requirements is available in the CMAS logic manuals and installation guides.

The OCL and file sizes, as distributed, are fixed at the maximum capacity assuming all four applications are to be installed utilizing five megabytes of the file.

Note: When a customer's volumes require additional disk capacity, file allocations can be modified to meet requirements by utilizing the CMASFILE procedure. (See the information under "Distributed System for System/32" below.)

SOFTWARE REQUIREMENTS

The IBM System/34 licensed programs are written in IBM System/34 RPG II programming language and executed under control of the IBM System/34 System Support Program (5726-SS1 Version 1). The IBM System/34 Utilities licensed program (5726-UT1), which includes Sort, Data File Utility, Source Entry Utility, and Work Station Utility is required for execution of the programs. The System/34 RPG II Compiler (5726-RG1) is required if modifications to the source code are necessary.

Distributed System for System/32:
5 Megabyte file (1968 Blocks)

Files	Number or Blocks*
System Control Programming	239
SORT Executable Code	34
CMAS Executable Work Units	98

* These block figures are for the System/32 feature only.

Application Files (online all the time)

Payroll system - 250 Active Employees design 476

- Payroll System File - 3 Records
- Employee Master - 250 inactive, 250 active employees
- Current Hours - 1400 Distributions/Pay Period
- Employee Deductions - 2000 Deductions for active or inactive
- Check Reconciliations - 1250 Outstanding Checks (250 checks x 5 weeks)
- Job Classifications - 65 Job Classes
- Distribution - 160 P/R Distribution Codes
- Active Labor Cost Distributions - 700 Weekly Distributions
- Union Master Deductions - 80 Union Deductions 10 Unions + (10 Unions x 7 deductions/union)
- Monthly Union Deductions - 3000 deductions
- Tax Tables Federal/State/Local - 30 tax brackets (Federal, single, weekly, 10 \$ Brackets)
- Employee State and Local Taxes - 2000 Deductions with additional withholding (2 states x 2 locals x 500 active/inactive employees)
- Insurance File - 155 Insurance company masters
- Insurance Summary - 1200 Employee Workmen's Compensation

Accounts Payable - 1200 Checks design 401

- Payables System File - 3 records
- Active Vendor Master - 900 name and address
- Checks Written - 1200 checks/month
- Open Payables Distribution - 1000 Outstanding Invoices with three distributions per invoice (3000 records)
- Active Subcontracts - 1000 Subcontracts
- Payables Work File - 1400 Invoices and distributions

Job Costing - 100 Job Vouchers/Month Design 117

- Job Costing Systems File - 3 records
- Job Work File - 400 Job Vouchers/Batch
- Job Name Master - 240 Active Jobs
- Job Cost Detail - 2100 Costing Entries (Active J/C Distributions + Income Distributions)

General Ledger - 200 Journal Entries/Month 389

- General Ledger Systems File - 3 records
- General Ledger Work File - 200 General Journal Entries



PROGRAM PRODUCTS

CMAS for S/34 (cont'd)

- General Ledger Chart of Accounts - 800 accounts
- Temporary General Ledger Account Transactions - 9200 entries
- General Ledger Format - 400 formatting records

Application Work Files Area (loaded by application)	208
Paidfor CMAS User	6
*Total Blocks	1968

* The total blocks number is for the System/32 IAP only.

The OCL and file sizes, as distributed, have been fixed at the maximum capacity with normal distribution for the 5 megabyte file.

Any changes to file sizes, other than those shown above, should be carefully reviewed by the customer and the IBM Systems Engineer to: Determine the necessity for more storage, estimate the time required to convert OCL procedures, and evaluate throughput performance.

System Backup: The System/32 and System/34 disk is backed up by dumping the disk to multiple diskettes. IBM-supplied system programs are initially provided to the user on diskettes which should be retained by the user for backup. User-created application data files must also be backed up on diskette. The user is required to provide backup diskettes for CMAS procedures, programs, and data files.

Number of User-Supplied Diskettes Required for Backing Up the System/32 Distributed System and Data Files

	System/32 Back Up*	
	Single Level	Double Level
Payroll	18	36
Accounts Payable	12	24
Job Costing	8	16
General Ledger	13	26
All 4 Applications	38	76

* Includes Backing Up: Daily Transactions; CMAS Machine-Readable Object Programs; Disk Resident Application files. It does not include System Control Program (5725-SC1), Utilities (5725-UT1), RPG II (5725-RG1) machine-readable materials or any other programs, procedures, data files, and spare diskettes to replace damaged or worn diskettes.

The System/32 user requires either the sum of the backup diskettes for each application installed or 38 diskettes, whichever is less.

DOCUMENTATION
(available from Mechanicsburg)

Job Costing Installation Guide (SB30-0200) ... Job Costing Runbook (SB30-0201) ... Accounts Payable Installation Guide (SB30-0203) ... Accounts Payable Runbook (SB30-0204) ... Payroll Installation Guide (SB30-0206) ... Payroll Runbook (SB30-0207) ... General Ledger Installation Guide (SB30-0209) ... General Ledger Runbook (SB30-0210) ... Job Costing Logic Manual (LB30-0202) ... Accounts Payable Logic Manual (LB30-0205) ... Payroll Logic Manual (LB30-0208) ... General Ledger Logic Manual (LB30-0211).

TERMS and CONDITIONS: See PP Index

PROGRAM PRODUCTS

**PERSONAL TEACHING AID/34 for the SYSTEM/34
5726-PT1****PURPOSE**

The IBM System/34 Personal Teaching Aid/34 licensed program provides an author with an easy-to-use tool to write educational materials in the form of courses for presentation to a student on the System/34. The author using the System/34 presents text, asks questions, evaluates and responds to answers and, in general, guides the student through a learning experience. Also, the product can collect data on the student's answers and courses completed. When analyzed, this data can assist the user in determining the progress being made by the student.

HIGHLIGHTS

- Completely menu and prompt-driven for ease of operation by students, authors, and the supervisor.
- Supports multiple students on the same or different courses concurrently.
- Supports multiple authors on different courses concurrently.
- Written in BASIC and requires the BASIC program product (5726-BA1) for execution. Nevertheless, the user does not need to learn BASIC or know how to program.
- Operates concurrently with other System/34 programs and languages except FORTRAN (5726-F01) programs and programs using the Scientific Instruction Set (5726-SS1).
- The basic license (5726-PT1) may be ordered with an optional feature (#6025):
 - Basic license allows a student to take a course written by an author on a System/34 different from the one used by the student.
 - Feature allows an author to build a course on a System/34 for use by students on that system as well as other System/34 units.
- Provides answer matching so that appropriate text can be displayed for correct, incorrect, and unexpected answers.
- Provides for multiple correct and/or incorrect answer processing ('OR' logic).
- Course material sectioned for easy arrangement of concepts covered in course.
- Provides scoring capability with weighted question values.
- Provides capability for course to be taken by student in scoring mode or practice mode.
- Provides 'JUMP TO' function both unconditionally and conditionally on score or count of correct answers.
- Ability to chain to user-written BASIC programs for inclusion as course material.
- Ability to include external screens (\$\$FGR members) as course material.
- Permits author maintenance functions for existing courses.
- Includes security features to inhibit unauthorized access to course material, student answers, and student scores. This is in addition to the System/34 integrated security.

DESCRIPTION

The offering is a course writing *tool* which the course developer or author uses in preparing course material for students. Students can take courses at their own rate of speed and capabilities.

The product is used by the supervisor to register courses and students, and to maintain the application. The author uses the application to develop and maintain a course, while the student uses it to take a course.

The IBM Personal Teaching Aid/34 is made up of two parts. The feature (#6025) to the application is a *tool* which uses a set of BASIC programs for developing and maintaining courses. The basic license (5726-PT1) consists of a set of BASIC Programs which retrieve course material from disk and interact with the student. The supervisor maintains the application files and is responsible for allowing students to take the proper courses and authors to modify only their own courses. The supervisor also is responsible for printing student responses and scores when this data is needed.

The *Application Installation Guide/Reference Manual/Runbook* (User's Guide) provides the user with all the information necessary to install the product. This document also provides step-by-step instructions for operating the application as a student, an author, or the supervisor.

The *Application Installation Guide/Reference Manual/Runbook* provides execution instructions for the sample course shipped to the user of the basic license (5726-PT1) by PID as part of the machine-readable materials on diskette. This document provides course and

student registration instructions for the supervisor as well as execution instructions for the student.

The *Application Installation Guide/Reference Manual/Runbook* provides build instructions for creating a sample course. Following the instructions in this document, the user of the feature (#6025) builds a course which can be executed upon completion. Also, authors of courses are given a discussion of tips and techniques to help develop courses which are easy to change and maintain.

The basic license (5726-PT1) and the feature (#6025) each have a separate *Application Logic Manual*. These documents are provided as licensed documentation for use by the self-sufficient user in maintaining and modifying the product. Information on naming conventions, application program functions and specifications, file record layouts, and other information pertaining to the application is presented in these manuals.

CUSTOMER RESPONSIBILITIES

IBM may provide marketing assistance, in accordance with the Marketing and Service Guidelines in the installation of IBM licensed programs. However, the responsibility for providing accurate ordering information, personnel selection and training, installation, and continued day-to-day operation lies solely with the customer.

Installation of this System/34 licensed program is also a customer responsibility.

The customer must:

- Install the licensed program by following the instructions in the *User's Guide* (SB30-0473).
- Read the *User's Guide* carefully before executing the new licensed program menu options.
- Follow the *User's Guide* to execute the licensed program menu options.

SPECIFIED OPERATING ENVIRONMENT

Support, as described under Programming Services, will be provided for this licensed program when it is operated in the following specified operating environment:

HARDWARE REQUIREMENTS

The minimum system configuration for this product is an IBM System/34 with:

- IBM 5340 System Unit mdl D11 (8.6 megabytes of disk storage and 96K bytes of main storage).
- One system printer, either a serial printer or a line printer with a 96-character print belt.
- One IBM 5251 Display Station (mdl 11 or mdl 12).

SOFTWARE REQUIREMENTS

Release 7 or later of the following licensed programs are required:

- System Support licensed program (5726-SS1)
- BASIC licensed program (5726-BA1)

DOCUMENTATION
(available from Mechanicsburg)

Promotional Flyer (G580-0534)

RPQs ACCEPTED: No

TERMS and CONDITIONS: See PP Index



PROGRAM PRODUCTS

**SYSTEM/34 RPG II
5726-RG1****PURPOSE**

IBM System/34 RPG II provides the following capabilities:

- RPG II Language Level
- System/34 Device Support including WORKSTN (work station) device and Interactive Communications Feature (SSP-ICF)
- Auto-Report
- Binary Synchronous Communications (BSC)

HIGHLIGHTS

- The RPG II device names are DISK, PRINTER, CRT, CONSOLE, SPECIAL, KEYBOARD, BSCA and WORKSTN.
- The support for SSP-ICF using the WORKSTN file support.
- The user indicators (U1-U8) may be tested and turned on and off in the RPG II program. The status of these indicators may then be tested by OCL. The indicators can also be set on or off using OCL.
- The user program may access a work station local data area which provides program-to-program or program-to-OCL data interchange.
- Header specification entries have been added to specify the number of display formats associated with a WORKSTN file.
- Data Structures may be defined for the work station local data areas or to redefine other fields without allocating additional storage.
- A program using a WORKSTN file may support multiple work stations or communication sessions with specified unique data fields and indicators saved and restored automatically by work station or communication sessions.
- The TIME operation may be used to obtain time-of-day and date from the system.
- Field end position may be omitted and the compiler will calculate the end position within an output record.
- The user may control spacing and skipping of the compiler listing.
- OCL option to avoid halting for terminal errors found during compilation.
- Subroutine to retrieve message text from a message member.

DESCRIPTION**SYSTEM/34 DEVICE SUPPORT**

All the devices available on the System/34 are supported by System/34 RPG II, except the diskette drive. Through the use of System/34 OCL, the diskette drive is supported as a transaction or master file and librarian Save/Restore device. The shared input/output access methods are also supported. The following expanded device support is provided:

- **WORKSTN File Support** - Language entries support one or more 5251 Display Stations and 5252 Dual Display Stations or SSP-ICF communication sessions as a primary or demand file. The 5252 represents two work stations. The WORKSTN device support allows the programmer to treat the display station or communication session as a sequential update file using the normal RPG II logic. Multiple display stations and/or multiple communications sessions may be attached to the WORKSTN file. The programmer need only be concerned with the single user (display station or communications session) logic. Data fields and indicators that are unique to each user are so indicated by the programmer and RPG II saves and restores those fields and indicators automatically. Display formats for use with the WORKSTN file must be created using the SSP Screen Format Generator Routine (SFGR). Printer output coding for work station printers is the same as that for the system printer and, furthermore, is reassignable at execution time using OCL.
- **CONSOLE File Support** - Through the use of normally coded File Description and Input Specifications, the CONSOLE File (5251 or 5252) is supported in a buffered interactive mode. The operator is prompted record-by-record with display formats generated by the compiler. Keying of one record is buffered and overlapped with processing of the previous record. The program is coded to process records as from any other sequential input device. The user must specify display size to be used.
- **KEYBOARD and CRT File Support** - The display formats used for these files will use six lines of forty characters each or twenty-four lines (twelve lines for the 960-character display) of seventy-nine characters each depending on the maximum record length specified in the program for the file. The KEYBOARD support includes support of 24 command functions.
- **PRINTER File Support** - Multiple printer files may be specified in a single program. The System/34 OCL is used to assign an RPG II

printer file to the system printer or a work station printer at execution.

- The SSP Data Management routines are not included in the generated object program since those routines are a sharable part of the SSP.

AUTO-REPORT

Auto-Report is included with the System/34 RPG II compiler and includes the following features:

Copy - Specifications may be cataloged in a library and included in any RPG II program via the COPY statement. It is especially useful for cataloging the File Description and Input Specifications for which overrides may be coded to specify such things as control levels. By using the COPY statement, only one description of the file need be cataloged and changed for all programs using the file.

Page Headings - Page headings can easily be specified on Output Specifications without the need for Output Indicators or end positions. The heading is centered over the report complete with page numbers and date.

Simplified Report Specifications - A report may be produced by listing on Output Specifications the fields desired in the order desired. On one Output Specification, the field, column heading, and an indication for column totals may be entered. The column headings, fields, and column totals are automatically generated.

Auto-Report Function Modified to Prevent Program Name Duplication - The Auto-Report function has been modified so that the program name in columns 75-80 of the Header Specification will no longer be propagated through the source program. This change prevents overlaying portions of comment records and retains existing data from the original program.

BINARY SYNCHRONOUS COMMUNICATIONS (BSC)

The Telecommunications Specification is supported in System/34 RPG II. Support of Binary Synchronous Communications will be provided by System/34 to communicate with:

- Another System/34 with RPG II or Basic Assembler
- System/32 with RPG II or Basic Assembler
- System/3 with ML/MP, CCP or RPG II
- System/7 with MSP/7
- System/360 with either of the following:

BTAM*
TCAM/NCP*

- System/370 with any of the following:

BTAM*
TCAM/NCP*
VTAM/NCP*
CICS/VS*
IMS/VS*

- 3741 mdl 2 or 4
- 3747
- 5231 mdl 2 (supported as 3741 mdl 2 or 4 in transmit mode only)
- 5280 Distributed Data System
- Series/1 (Supported as a System/3)
- 5110 (as a 3741)
- POWER/VS (as a 2780)

* **Note:** The 3704/3705 Emulation Program (EP) or the Partitioned Emulation Program (PEP) extension to 3704/3705 NCP can be used to emulate the 2701.

Limited programming support is provided by System/34 RPG II Telecommunications Specifications for the following devices: (an approved RPQ (S40186) is required.)

- 6640 Document Writer
- Office Systems 6 Information Processor
- 6240 Magnetic Card Typewriter - Communicating
- 6670 Information Distributor
- Displaywriter System

The BSC host support for System/34 is generated on the host system as System/3 BSC.

S/34 RPG II (cont'd)**SPECIFIED OPERATING ENVIRONMENT**

Support will be provided for this licensed program when it is operated in the following specified operating environment:

HARDWARE REQUIREMENTS

The IBM System/34 RPG II licensed program runs on all models of System/34 and supports the Communications Adapters (#2500, #3500) in BSC mode.

SOFTWARE REQUIREMENTS

The current release of the IBM System/34 RPG II licensed program operates under control of the current release of the IBM System/34 System Support licensed program (5726-SS1).

COMPATIBILITY

System/32 RPG II Considerations: The RPG II language is supported as on the System/32. Overlays are automatically generated when necessary. Differences do exist due to different devices and SSP function. System/32 RPG II programs must be recompiled on System/34 with the following considerations.

- Object program size will differ due to the SSP Data Management and control block changes. The size may be larger or smaller depending on the particular logical files used in the user program and the overlay structure generated by the compiler.
- RPG II CONSOLE, KEYBOARD, and CRT files will display information differently because of the larger display screen. Keying will also be slightly different.
- If any subroutines are called via EXIT or SPECIAL files, those Basic Assembler subroutines must be reviewed and modified as required to execute correctly on System/34. IBM-written System/34 Basic Assembler subroutines SUBR01 and SUBR95 are supplied with the RPG II program product to support conversion of System/32 RPG II programs that include SUBR01 or SUBR95.

Program Use During Customer Pre-Installation Testing: The IBM System/34 RPG II Licensed Program (5726-RG1) is available to customers for pre-installation testing on IBM Test Center systems in accordance with IBM's Program Testing Policy.

DOCUMENTATION

(available from Mechanicsburg)

*System/34 RPG II Licensed Program Specifications (GC21-7669) ...
System/34 RPG II Reference Manual (SC21-7667).*

TERMS and CONDITIONS: See PP Index

Ordering Information: Contact IBM.

SYSTEM/34 RPG II SUBSET 5726-RG2

PURPOSE

This program is intended to support the Preconfigured System/34 System Support Program Subset (5726-SS2).

RPG II is a symbolic programming language that is commercially-oriented and specifically designed for writing application programs that meet common business data processing requirements. The System/34 RPG II Subset compiler translates programs written in RPG II subset into object programs that are executed under the Preconfigured System/34 System Support Program Subset.

HIGHLIGHTS

- Display station support which allows an RPG II program to communicate with display stations by using the WORKSTN file facility. WORKSTN file support allows concurrent interaction of multiple display stations with the same program. Four calculation operation codes support the WORKSTN file:
 - ACQ acquires a display station for a program.
 - REL releases a display station from a program.
 - NEXT forces the next input to the RPG II program to come from a specified display station.
 - POST provides for the retrieval of status information for a specified display station attached to a WORKSTN file.
- Subroutines are provided to support multiple display stations in a WORKSTN file:
 - SUBR20 reads and updates the external indicators (U1-U8) for a specified display station.
 - SUBR21 reads and updates the display station local data area for a specified display station.
 - SUBR22 allows an RPG II program to read records from a transaction file that has been created by the Work Station Utility program.
- User exception/error handling capability for the WORKSTN file allows the user to control the program logic flow if exception/error conditions occur on an operation to a WORKSTN file.
- Data structures which allow the user to redefine the same data area multiple times using different data formats. Data structures enable a user to:
 - Specify subfields of a file (thereby reducing the number of MOVE and MOVEL operations needed)
 - Perform an operation on a portion of a field by referencing a subfield
 - Use the same internal storage area for multiple record types
- Expanded CONSOLE support which allows complete record prompting through use of screen formats. The RPG II format generator generates screen formats for the CONSOLE file from the RPG II input specifications (either 960- or 1920-character screens).
- Subroutine SUBR01 which allows data to follow a // RUN statement either in a procedure or from the keyboard.
- Subroutine SUBR23 which retrieves messages from a user message member.
- Calculation operation codes:
 - TIME gives the time-of-day and, optionally, the system date.
 - SHTDN tests whether the system operator has requested shutdown.
- Multiple printer support which allows up to eight printer files in a program.
- The specification of a primary file is optional. If there is no primary file, the RPG II programmer must set on the LR indicator to go to end of job.
- The cross-reference support which provides the ability to include a cross-reference listing of symbols used in an RPG program in the compiler listing.
- Delete-capable file support which allows records to be deleted from delete-capable files through the use of DEL on the output specifications.
- Addition of records to delete-capable files processed randomly by relative record number.
- The job queue support which allows the capability of placing RPG II compilation requests on the input job queue.
- NOSTOP/REPLACE procedure options which eliminate halts for terminal errors and duplicate library members.
- The storage index entry is allowed for files processed sequentially within limits.
- The SORTA operation code which allows the records in an array to be sorted into ascending or descending sequence.

- The figurative constants *BLANK, *BLANKS, *ZERO, and *ZEROS supported for the calculation specifications.
- The /TITLE statement which provides heading information at the top of each page of the compiler listing.
- Currency symbol support which allows you to specify a symbol other than the dollar sign (\$) as the currency symbol.
- Extended printer support which allows record lengths of up to 198 characters to be specified for the 5225 printer.
- Short form calculations

The following features of System/34 RPG (5726-RG1) are *not* supported:

- Auto-Report
- Telecommunications

DESCRIPTION

RPG II SOURCE LANGUAGE SPECIFICATIONS

To use System/34 RPG II Subset, the programmer defines a program by coding combinations of the following source language specifications:

- Control specification which provides information about the program to be compiled and describes the system being used
- File description specifications which describe all of the program files
- Extension specifications which describe all tables, arrays, and record address files
- Line counter specifications which indicate the length of the forms used in the printer and specify the overflow line
- Input specifications which describe the records and fields in the input files and also describe data structures
- Calculation specifications which describe the calculations to be performed on data
- Output specifications which describe the records and fields in the output files and also specify the display screen format names for WORKSTN files

The RPG II SUBSET COMPILER

The RPG II Subset compiler is a program that translates an RPG II subset source language program into an executable object program. The RPG II Subset compiler produces:

- A source program listing
- Diagnostic messages
- A main storage map
- An object program stored in a library
- A cross-reference listing of symbols (on request)

SPECIFIED OPERATING ENVIRONMENT

Support will be provided for this licensed program when it is operated in the following specified operating environment:

HARDWARE REQUIREMENTS

This IBM System/34 RPG II Subset (5726-RG2) runs on all models of System/34.

SOFTWARE REQUIREMENTS

This IBM System/34 RPG II Subset (5726-RG2) operates under the control of the IBM Preconfigured System/34 System Support Program Subset (5726-SS2), or Release 7 of 5726-SS1 while it is available, or its equivalent.

The IBM System/34 RPG II Subset (5726-RG2) consists of parts of System/34 RPG II (5726-RG1) stabilized at Release 7. No release update or enhancements are planned.

COMPATIBILITY

System/34 RPG II Subset is highly source-compatible with System/32 RPG II (5725-RG1). System/32 RPG II programs can be recompiled using System/34 RPG II Subset with the following considerations:

- Object program size will differ due to System/34 System Support licensed program data management and control block changes.
- CONSOLE files will prompt for a record at a time rather than field by field.
- Any Assembler language subroutines called via EXIT or SPECIAL files should be reviewed and modified to execute on System/34.
- RPG II subset does not support Telecommunication Specifications or Auto-Report.



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PROGRAM PRODUCTS

S/34 RPG II Subset (cont'd)

Program Use During Customer Pre-installation Testing: The System/34 RPG II Subset (5726-RG2) is available to customers for pre-installation testing on IBM Test Center systems in accordance with IBM's Program Testing Policy.

DOCUMENTATION
(available from Mechanicsburg)

System/34 RPG II Subset Licensed Program Specifications (GC21-9034) ... System/34 RPG II Reference Manual (SC21-7667).

TERMS and CONDITIONS: See PP Index

Ordering Information: Contact IBM.

PROGRAM PRODUCTS

**SYSTEM/34 SYSTEM SUPPORT PROGRAM
5726-SS1**

HIGHLIGHTS

IBM System/34 System Support Program (SSP) provides the following control program capabilities:

- Single Program/Multiple Program Modes
- Input Job Queue
- Main Storage Management
- Disk File Sharing
- Operation Control Language
- System Utilities
- Data Management
- System History Area
- Print Spooling
- User Access to Spool
- Interrupt/Resume
- Overlay Linkage Editor
- Synchronous Data Link Control (SDLC) as a part of Systems Network Architecture (SNA)
- SNA Remote Job Entry Utility Programs (SRJE and SRJE WITH MLU)
- Binary Synchronous Communications (BSC)
- Support for the Auto-Call Feature of the Multiline Communications Adapter (MLCA)
- MULTI-LEAVING Remote Job Entry System Utility Program (MRJE)
- Multiple User Library Support
- Operator ID and Password Security to the file/library level
- Support for the 1255 Magnetic Character Reader
- Control Program Support for Compilers and Utilities
- Support for directly attached and remote workstations (display stations and printers)
- Support for both 1,920- and 960-character displays
- Support for up to four communications lines
- System HELP Facility
- System Measurement Facility
- Interactive Communications Feature Support
- Support for 5250 Magnetic Stripe Reader
- Support for the Multinational Character Set
- Support for 5211, 5262 Translation Capability
- Expanded VTOC allows up to 2,008 user library/file entries
- Spool function
- Support for work station History File scroll capability
- ASSIGN/FREE support for systems using near maximum nucleus size
- ASSIGN/FREE allocation and use for temporary storage of a user's Local Data Area
- RELOAD/Release update support
- Support in Batch BSC for Assembler language users to receive variable length records
- Auto-Response Facility

DESCRIPTION

Single Program/Multiple Program Modes: The System/34 may be used in the single program mode which is very similar to the operation of a System/32. When the SSP is configured in the single program mode, one operator enters commands and OCL. The programs invoked by the OCL execute one at a time, in sequence, in a single region.

The Display Stations attached to a System/34 are designated at SSP configurations as either command- or data-capable. A command-capable station can be used to invoke procedures, control commands and OCL as well as being used for data input/output in user programs. A data-capable station may be used only for user-programmed data input/output and must be acquired by a user RPG II or Basic Assembler program which has been invoked from a command station. A command-capable station must be located near the System Unit for

use as the system console. In single program mode, there can be only one command-capable station.

The SSP can be configured to allow the System/34 to operate in the multiple program (multiprogramming) mode. Operators at multiple command-capable stations may concurrently invoke control commands, OCL and procedures. Multiple programs can execute concurrently.

Input Job Queue: Multiple program mode of the SSP provides an Input Job Queue facility. The input job queue contains a list of jobs that are to be executed in sequence concurrently with other batch or operator-interactive jobs. The jobs in the queue can be placed there by any command-capable station or OCL procedure. The station that places the job on the queue is released from that job and, therefore, becomes available for other work. Job queue priorities can be specified to control a job's position in the job queue.

Main Storage Management: The System/34 manages main storage as a pool of noncontiguous 2,048-byte segments and 'swaps' entire programs to and from disk as required to fit an active program into main storage (a program that is inactive might, for example, be waiting for data input or a message response from a display station).

System/34 main storage management allows the total main storage required by all active tasks to exceed actual user main storage. Performance considerations will dictate to what extent user main storage may be overcommitted.

The System/34 SSP occupies a minimum of 14K bytes of main storage. This value may be increased in 2K-byte increments to include printer Spool support, increase number of active tasks, or to optimize system performance. This resident nucleus area contains SSP functions such as data management for disk, printer and workstations; buffers for workstation I/O and printer spooling; and an SSP work area used for task control. When remote workstations are active, an additional area of main storage is reserved for line buffers and SDLC data management.

Disk File Sharing: Disk data files on System/34 may be accessed concurrently by multiple programs for input, update, or add operations. Protection of data against concurrent update by two programs is provided by locking the disk sector(s) until released by the accessing program. An OCL parameter is provided to allow or prevent the file sharing of a specified file.

Operation Control Language (OCL): System/34 OCL is compatible with System/3 OCL with the following exceptions:

- A command statement which has the capability to pass parameters to the indicated procedure is used in place of the System/3 CALL.
- Capability for specifying default values for missing OCL parameters.
- Logical IF statement provides for condition checking within procedures. It is possible to execute different steps based on tests performed in OCL.
- Other differences brought about by devices and system function.

System/34 OCL is compatible with System/32 OCL with exceptions such as the following:

- Additional commands, statements, and parameters have been incorporated into System/34 OCL.
- Some operator-entered commands do not invoke OCL procedures or utility programs on System/34. Therefore, a System/32 procedure using those commands will require change.
- Some utility functions such as COMPRESS must run dedicated, that is, cannot run in multiprogramming mode with other programs. Therefore, System/32 procedures using those commands must be changed.
- System/34 in multiprogramming mode, or either mode with printer spool, will not honor the System Log statement. Logging to the System History Area is still performed and messages are displayed to the operator's display screen but will not be printed as they are displayed in this mode.
- System/34 does not support offline multivolume diskette files except on the Diskette Magazine Drive.
- The disk file rebuild of the System/32 Utilities has been replaced by an automatic disk file integrity check at IPL (optional).

OCL procedure commands and control commands are provided to support the SSP facilities and the management of a multiprogramming system. Key functions in addition to those above include print spool queue and input job queue management, disk file sharing control, display station and printer assignment at execution time, region size, OCL-to-program communications (in a 256-byte local data area accessible and modifiable through OCL and user programs), reserve disk space for a job, add job names to the input queue, select communication line, branch to a specific point in a procedure, specify

S/34 System Support Program (cont'd)

the next menu to be shown to the operator, display user formats for input data prompting and display station-to-system console station communications.

Systems Utilities: System/34 SSP also provides enhanced function for those utilities and new utility programs to allocate files, rename files, build display formats, build job menus and other common functions.

Data Management: This SSP provides data management support for the disk, the display, the keyboard and printers. The support for disk also allows the user to optionally specify space for more than 200 disk files, up to a maximum of 920 on mdls XX1 to XX3 and 984 for mdls XX4 and XX5. The display station data management supports multiple direct and remote units of the 5250 Information Display System, for both 1,920- and 960-character displays. This display station data management manages all input and output to the display stations including the retrieval of display formats from a disk library and merging program data prior to displaying the format on the display.

Diskette - The System/34 SSP includes utility programs to fully support the diskette unit and the Diskette Magazine drive as a Save/Restore device. The Diskette 1 in 128- or 512-byte sector formats are supported. In addition, the Diskette 2D (2-sided Double-density) is supported in 256 or 1,024-byte sector formats.

The Diskette Magazine support allows input/output operations to begin on any one of 23 specified diskettes and overflow automatically to the next diskette in the magazine, to the next magazine, or from one individual slot to the next.

System History Area: System/34 provides a history area on disk which contains all recently executed OCL statements and all messages issued to the log device. The messages and data may be retrieved and redisplayed on the display station or printed. Either all the OCL statements or only those originally displayed may be printed as a hard copy log of the activity of the system. Individual display station operators will only be able to display or print entries created from that display station.

Entries are time stamped and include the job identification generated by the SSP to assist in determining the sequence of activity on the system. A configuration option allows the user to prevent History File from being overwritten. This option, which can be overridden at IPL, allows the system to save the History File.

Print Spooling

Print spooling is supported by the SSP as an option in either single program or multiple program mode. When spooling is configured in the SSP and indicated at execution time, printer output requests are intercepted and stored on disk. Spool writers are used to retrieve the print records from disk for printing. A print queue is maintained of job names whose printer data is yet to be printed, or specified as 'Retained after Printing'. System console commands are provided to start/stop, restart (at a page number), cancel, hold/release, change priority of and display jobs in the print queue. Print spooling is supported for any and all printers attached to the system simultaneously. In addition, multiple logical print files, up to 8, from a single RPG II program may be directed to one printer or separate printers.

A specified display station can be configured to be the controlling station for a spooled workstation printer. The spool control commands and spool-issued messages are available to the display station operator to control the output directed to the printers associated with that display station.

The size of the primary spool disk file is specified when the SSP is configured. The spool intercept routine will allocate up to five additional extents if necessary. These extents will be freed up by the spool writer as they become empty.

User Access to Spool: A utility permits spooled data to be copied to a data file which may be saved on diskettes, restored for later use, and viewed on a display station. While viewing the output, the user can elect to print a copy of the information. The entire report or selected pages can be printed without re-executing the job.

Interrupt/Resume: The operator may interrupt a processing program, execute another job, such as inquiry into a file, and return to the processing program. Processing of the interrupted program will resume when the operator indicates the completion of interrupting activity.

Overlay Linkage Editor: The Overlay Linkage Editor facility converts relocatable object modules, produced by FORTRAN and the Basic Assembler program, to executable programs. Overlay structures may be created automatically or as designated by the user.

This facility is not required for Basic Assembler subroutines to be included in RPG II programs.

A System/34 SRJE (SNA Remote Job Entry) utility program is included with the SSP to provide data communications capability to the following System/370 remote job entry programs:

DOS/VSE/POWER/VS
Remote Entry Services (RES)
Job Entry Subsystem 2 (JES2)
Job Entry Subsystem 3 (JES3)

Synchronous Data Link Control (SDLC) as a Part of Systems Network Architecture (SNA): The System/34 SSP provides an interface to support data communications with a host System/370 (4300, S/370 mdls 115 through 168, 303X, 308X) operating under DOS/VSE, OS/VS1, MVS, or any of these operating systems when running under VM/370. Attachment is through a 3704 or 3705 operating under NCP/VS.

System/34 SNA Remote Job Entry (SRJE) has been enhanced to support Multiple Logical Units (SRJE with MLU). This support is an incremental improvement to the current System/34 SRJE in the SSP. SRJE supports a single logical punch unit which may be a READER, a WRITER, or a PUNCH. The CONSOLE requires the current active device to pause to allow console messages. SRJE with MLU supports multiple logical units, up to 10, which may be three READERS, three PUNCHES, and a CONSOLE all active concurrently.

The following host subsystems are supported:

RES
JES2
JES3
DOS/VSE/POWER/VSE

The attachment and operation has been tested to each of the above subsystems. These host subsystems currently support MLU on the 3770/3790. The host subsystems are not required to make any coding changes to support this attachment.

The following changes must be made by the IBM customer to use this support. On the host subsystem, the definition of the System/34 must be changed from a Single Logical Unit to MLU. On the System/34, the SRJE procedure has a new parameter - the number of sessions desired. SRJE with MLU does require an additional 2K of nonswappable memory in the System/34.

If a customer does not want to use SRJE with MLU, but just SRJE, then no changes should be made. There is no impact on memory and no changes to the SRJE procedure or to the host subsystems. The original SRJE support still exists.

This utility provides capabilities similar to the batch workstation utility program for RES, JES2 and POWER/VS that is available with the IBM System/32. This support includes the ability for SRJE to be initiated from a procedure from any workstation without operator intervention. When the auto-call feature of the MLCA is used, the initiation of SRJE will call a predetermined phone number without requiring operator intervention to place the call.

Support for the Auto-Call Feature of the Multiline Communications Adapter (MLCA): The support for the System/34 Auto-Call feature (of MLCA) allows the user to have the system automatically attempt phone calls on a switched line to another device or system. This support is provided external to the user programs in such a way that no changes to user source code are necessary. Phone numbers are referenced through new OCL parameters.

Highlights

- Ability to call multiple locations from a single batch BSC step (through an OCL loop) and retrieve/send data from/to each location without operator intervention
- Ability to define phone numbers or lists of phone numbers that can be referenced in OCL for communication on any line that is an auto-call line.
- Ability to specify a time interval to wait after the call has been placed before considering it incomplete.
- Automatic retry of incomplete calls a specified number of times before considering call a failure and logging an error message.
- Support for phone numbers of up to 22 characters to facilitate international calls.
- Support for a separator (SEP) character option to allow the system to wait for an additional dial tone when dialing through to another network.
- Support for an End of Number (EON) character option to allow users to signal their hardware when short numbers are used.
- Support for MRJE and SRJE to be executed and call a predetermined number, without operator intervention for placing the call.
- Auto-call support is provided when using batch (RPG or Assembler) MRJE, SRJE, SNA 3270 Device Emulation, and the following subsystems of SSP-ICF: BSCCL, CICS, CCP, SNA Upline Facility, SNA Peer.

Binary Synchronous Communications: The SSP provides Binary Synchronous Communications (BSC) data management for System/34

S/34 System Support Program (cont'd)

RPG II and Basic Assembler and Macro Processor programs. For the devices supported, this BSC data management appears the same as the program support provided by the System/32 RPG II data communications support (an additional BSC capability on System/34 permits transmission of multiple data files to or from 3741 diskettes). A system utility is also provided to select certain communications characteristics at program execution time such as: Line type, terminal address, line speed, error retry count, etc. The Basic Assembler program product includes BSC macro support.

MULTI-LEAVING Remote Job Entry System Utility Program (MRJE): The MRJE System Utility program permits a System/34 to function as a remote job entry (RJE) workstation for submission of jobs to a central System/370. The central OS processing is performed under control of one of the following: HASP II, ASP, RES or JES2, JES3. The System/34 MRJE will also operate with VM/370 Remote Spooling Communications Subsystem (RSCS) as a HASP workstation. MRJE operates under control of the System/34 SSP and communicates with the central system over a point-to-point (switched or nonswitched) communication line via the Communications Adapter in BSC mode. Host System RJE programming support should be generated specifying System/3 as the supported terminal.

Highlights of the MRJE program are:

- Full MULTI-LEAVING support permits concurrent System/34 device operation.
- Card I/O operation is simulated by disk storage.
- Compression and expansion of blanks and duplicate characters may be performed for increased line utilization.
- At the user's option, the MRJE automatically selects a default for any MRJE message requiring an operator response.
- Disk storage is supported for jobstream input and output and for individual data set output.
- A print utility program is provided for printing 'punch' and printer data streams which were directed to disk storage during the RJE session.
- MRJE Utility control statements may be entered through the keyboard or a limited set may be entered from a file on disk storage.
- MRJE can be initiated from a procedure from any workstation.
- When the auto-call feature of the MLCA is used, the initiation MRJE will call a predetermined phone number without operator intervention.
- The initiating workstation functions as a console for operator communication.
- All MRJE Utility control statements and central system commands and all messages are logged in the System/34 History File.

Note: The diskette drive is not supported by the MRJE Utility.

Multiple User Library Support: The System/34 SSP provides for multiple user libraries. Parameters and OCL statements allow the user to specify a library name. If the library is not specified, the default is to the system library (#LIBRARY).

Operator ID and Password Security to the File/Library Level: Each operator who signs on to a System/34 display station is prompted for an identification and optionally a password. This data is then checked by the SSP before allowing the operator any further access to the system.

Also, files and program libraries can be restricted to authorized users. These users can be further classified by type of use. An additional option allows the creation of audit entries in the system history area for each use of a secured file/library.

Security permits the optional additional check of operator badge identification at sign-on, if the workstation has an attached 5250 Magnetic Stripe Reader.

IBM 1255 Support: The System/34 SSP includes subroutines (SUBR08 or SUBR25) which can be linked into a user-written RPG II, COBOL or Basic Assembler program to interface the program to the 1255 Attachment feature. SUBR08 and SUBR25 provide for the reading of data from documents (checks) and returning that data to the program when requested by program logic. It can also return to the program the stacker selection that was made, and indicators that tell field validity and document type.

Control Program Support for Compilers and Utilities: The SSP provides the control program services for RPG II, COBOL, FORTRAN, Basic Assembler and the Utility licensed programs. Included are disk data management, printer and spool support, program library maintenance, OCL and procedure support, and main storage allocation and management.

The language compilers and utilities function like user batch programs. In a multiprogramming environment, multiple copies of a compiler or utility may operate concurrently if necessary resources are available.

Support for Directly Attached and Remote Display Stations and Printers: The System/34 may be configured to support the 5251, 5252, 5291 and 5292 display stations and the 5219 D01 and D02, 5224, 5225, and 5256 printers attached to the System/34, and communicate with 5251 mdls 2 and 12 on one to four communication lines. Remote workstations may be used to perform most of the same functions as the directly attached stations.

Switched network backup and speed select modem features are not supported under program control when communicating with 5251 mdls 2 or 12.

Application programs and IBM program products which support directly-attached 5219 D01 and D02, 5224, 5225, 5251, 5252, 5256, 5291 and 5292 devices will also support the remotely-attached devices without change. However, the system console function may not be assigned to a remote display station.

Support for Both 1,920- and 960-Character Displays: The System/34 may be configured to support 1,920- and 960-character display stations. All SSP display formats will be supported on either display size. Some formats (such as message displays) will present fewer lines when output is directed to a 960-character display. Either size display can be assigned as the system console.

Support for Up to Four Communication Lines: The System/34 may be configured to support four communication lines, each in either BSC or SDLC protocol. Each can be either switched, leased, or leased with Switched Network Backup.

They are accessed via OCL (with the default being line 1). No user programming is required.

Switched network backup and speed select modem features are not supported under program control when communicating with 5251 mdls 2 or 12.

HELP Facility: The SSP includes a HELP facility to aid users in executing many of the functions of the System/34. HELP provides the user with the capability of displaying prompts which contain the syntax, default parameters, keywords, and general descriptions of procedure commands.

System Measurement Facility: System/34 includes System Measurement Facility (SMF) routines which, in conjunction with control storage routines, may be invoked to monitor system activity, system device, and SSP work area utilization, and record this data in a disk file. A report program is provided so that the file may be listed to provide information useful in analysis of system performance with the current application work load or in anticipation of added application work load.

Expanded VTOC Allows up to 2,008 User Library/File Entries: The disk Volume Table of Contents (VTOC) has been increased to allow entries for up to 2,008 user files and libraries resident on the system in addition to the system files. The previous maximum number of entries was 984.

Spool Function: The spool support treats each print file separately and allows any number of print files in a user program. This allows independence between print files created in the same program so that spool file space can be freed as each print file completes printing.

The maximum spool file size is 76,800 blocks. In addition, the maximum page number that can be supported in a RESTART command is 65,535.

A number of commands and the information they display to aid the operator in controlling spool files are:

STATUS PRT Command

- An indication of print files being copied by the User Access to the Spool File Utility
- The page number currently being intercepted
- The page number currently being printed by the writer

STATUS WRITER Command (new)

- The ID of the printer
- The ID of the subconsole that controls the printer
- An indication of whether the writer is stopped or started
- The spool ID and procedure name of the print file that the writer is currently printing
- The forms number that the writer is currently printing
- An indication of whether a spool writer message is pending
- Number of separator pages
- Residency and priority indications

S/34 System Support Program (cont'd)
CHANGE Command

- A parameter allows the operator to change the DEFER attribute (YES/NO) of a currently intercepted print file
- Parameters allow the operator to change the residency, priority, and separator page attributes of the writer for any individual printer

Support for Work Station History File Scroll Capability: A procedure, HISTCRT, facilitates problem determination by allowing the operator to easily view history file entries on the display. When the HISTCRT procedure is executed, the first screen shows the most current history entries. While viewing the entries, the user can:

- Use the Roll Up and Roll Down keys to scroll through the entries
- Use a command key to view the oldest or newest entry, or change the number of lines to be scrolled
- Use HELP to obtain an explanation of the command keys
- Enter scan characters to locate a specific entry
- Use command keys to choose selection criteria for the entries or parts of entries that are to be viewed

The use of scan characters assists the user in locating information. When an entry is found that contains the specified scan characters, the entry is displayed and the scan characters are highlighted and underlined. The operator can continue scanning, forward or backward, for more entries with the same characters, or scanning can be stopped by removing the scan characters. Up to 20 scan characters can be specified during each scan operation.

ASSIGN/FREE Support for Systems Using Near Maximum Nucleus Size: The ASSIGN/FREE support issues a message and performs STOP JOB,ALL and STOP SESSION control commands when the last 2K of storage is allocated to ASSIGN/FREE space. This action will be taken even if the system is configured with the maximum nucleus size. This causes the system to stop, allowing the operator to take appropriate action to reduce the load on the system by selectively restarting jobs. As ASSIGN/FREE space becomes available, the remaining jobs can be restarted by the operator.

ASSIGN/FREE Allocation and Use for Temporary Storage of a User's Local Data Area: The allocation of ASSIGN/FREE space provides more efficient usage. The allocation algorithm looks for space on a 'best fit' basis, which reduces fragmentation and improves utilization.

The users' Local Data Area (LDA) is placed in the system ASSIGN/FREE space during a job step initiation. Each LDA requires 256 bytes. The system allocates 256 bytes of ASSIGN/FREE space the first time a LOCAL OCL statement or LOCAL procedure control expression substitution is encountered in a job step. This space is freed when a // RUN statement is encountered. If the job step does not reference the LDA, no additional ASSIGN/FREE space is used. This may improve performance in job steps that have multiple OCL references to the LDA. This support does not affect statements placed after the // RUN statement.

RELOAD/Release Update Support: RELOAD preserves certain system names and parameters across the installation of a new release. The names and parameters that will not be reset are:

- Workstation Parameter Member Name
- Print Belt Image Name
- Startup Procedure Name
- Line Printer Translate Table Name
- SNA/SDLC Parameters

Batch BSC Support for Assembler Language Users to Receive Variable Length Records: Assembler language users have support in Batch BSC to receive variable length records. The data can be blocked or unblocked. The user must specify a parameter RECFMT=F (fixed) or RECFMT=V (variable) for this support. The record length is returned in the DTF field \$BSRCL. The maximum expected record length must be specified when the file is opened. Transparency, blank truncation, compression, and ITB mode cannot be used.

Auto-Response Facility: The System/34 Auto-Response Facility allows users to specify response options to be taken automatically when error messages are displayed at the system console. Normally, processing stops until the system console operator responds to a message with an option value. Auto-response allows a user to select messages to which the system will respond with an option value and then continue processing. The use of this facility is particularly valuable when a system must run without an operator in attendance.

Only messages sent to the system console can be answered by auto-response. The selected option value must be a value that is allowed for the message. Messages issued by the SSP, communications components, program products, and user-created programs can be responded to automatically.

The RESPONSE procedure allows users to specify the source member that contains the option values to be applied to the messages, and the name of the library that contains the source member. The RESPONSE procedure calls the \$ARSP utility, which reads the auto-response values and applies them to the appropriate messages.

Once the utility has been run, the system will respond automatically to all messages for which auto-response values exist. If the system is not to respond automatically to a message, the utility must be run again to remove the default values.

Interactive Communications Feature Support: The interactive communications feature includes support for program-to-program communications to other systems or devices using BSC and SNA/SDLC as well as communications between programs within the same system. The feature also allows programs on other systems to initiate System/34 procedures and allows System/34 programs to initiate programs or procedures on other systems without remote system operator intervention. To facilitate incoming procedure requests, the interactive communications support can maintain a connection on a communications line when no System/34 application program is active.

Support for 5250 Magnetic Stripe Reader: Provides the capability of reading numeric encoded information from a magnetic stripe on a wide range of credit cards, identification cards and documents. The magnetic stripe may be encoded with up to 128 ABA characters, including control characters. This feature enhances system data security by providing the ability to read an operator identification card without being displayed.

Support for the Multinational Character Set: Provides the capability of displaying the 188-character Multinational Character Set to facilitate the interchange of information between systems with different language groups. The keyboards do not include the additional characters of the Multinational Character Set. All characters may be entered via a single or multiple key sequence.

Support for 5211 Translation Capability: For users with translation capability, the IMAGE statement permits the specification of a translation table for each display station or job on the input job stream. This provides for character substitution when using a print belt on the 5211 which does not contain all the characters in the printer data stream.

Configuration of the SSP: Configuration of the SSP involves an interactive process of responding to displayed prompts to select options and specify buffer sizes and work area sizes. Configuration is typically performed immediately following initial installation of the SSP on the user's system but may be repeated later to change specified options or sizes.

The SSP provides default values for all variables and will adjust these defaults dynamically depending on the user system configuration. The values may also be altered at IPL to temporarily select or omit function or alter performance characteristics of the system.

SPECIFIED OPERATING ENVIRONMENT

Support will be provided for this licensed program when it is operated in the following specified operating environment:

HARDWARE REQUIREMENTS

The IBM System/34 System Support Program runs on all models of System/34 and supports all features. The system configuration required to support the Communications Adapters (#2500,#3500) in SDLC mode via System/34 SSP (5726-SS1), requires a minimum of 48K bytes of main storage.

SOFTWARE REQUIREMENTS

All IBM licensed programs for System/34 are designed to operate in an environment that includes the System/34 System Support licensed program (5726-SS1) or its equivalent. The SSP order should be entered via AAS at the same time as the system order. IBM's ability to provide concurrent hardware maintenance is dependent upon functions provided by the SSP or its equivalent.

Program Use During Customer Pre-Installation Testing: The IBM System/34 System Support Program (5726-SS1) is available to customers for pre-installation testing on IBM Test Center systems in accordance with IBM's Program Testing Policy.

DOCUMENTATION

(available from Mechanicsburg)

System/34 System Support Licensed Program Specifications (GC21-7702) ... System/34 Introduction (GC21-5153) ... System/34 Planning Guide (GC21-5154) ... System/34 System Support Reference Manual (SC21-5155) ... System/34 Installation and Modification Reference Manual (SC21-7689) ... System/34 Overlay Linkage Editor Reference Manual (SC21-7707) ... System/34 Data Communications Reference Manual (SC21-7703) ... System/34 1255 Magnetic Character Reader Reference Manual (SC21-7740).

TERMS and CONDITIONS: See PP Index



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PROGRAM PRODUCTS

S/34 System Support Program (cont'd)

Ordering Information: Contact IBM.

PROGRAM PRODUCTS

**SYSTEM/34 SYSTEM SUPPORT PROGRAM (SSP)
INTERACTIVE COMMUNICATIONS FEATURE (SSP-ICF)
FEATURE #6000, #6001**

PURPOSE

Support is offered as a feature of the IBM System/34 System Support Program (SSP) (5726-SS1) and provides for Interactive Communication (BSC and SNA/SDLC), Remote Procedure Initiation on the System/34, and Communications Line Monitoring on a multipoint line (System/34 as a tributary station).

DESCRIPTION

System/34 SSP Interactive Communications feature (SSP-ICF) provides support for:

- Interactive communications between application programs
- Multiple concurrent communication sessions over the same data link
- Multiple concurrent user application programs which use communications
- An application program interface which is substantially independent of link protocol (BSC or SDLC)

Interactive communications differs conceptually from batch communication in that the sequence of messages is not necessarily predetermined. Either party in the communications session can logically start, alter or terminate the conversation. The logical communication path connecting two programs which are exchanging messages is called a session. SSP-ICF allows for multiple concurrent sessions to be used by one or more application programs in the System/34.

The application program access to SSP-ICF is available at two levels. Both are a logical extension of the System/34 workstation interface. The first is through special predefined screen format names that serve as operation codes to control evoking programs, sending data, and issuing special commands to SSP-ICF. The second is through assembler programming and supports all of the functions in the first level plus the added flexibility of supporting situations that may occur when communicating to systems which are not part of the standard SSP-ICF support.

This application program interface allows the user program to be shielded from most of the uniqueness of the communications protocols (BSC or SNA/SDLC) and the communications support for the remote systems (e.g., IMS/VS, CICS/VS, or CCP). For example, with proper design, users can develop programs for their current BSC network and then easily move to an SNA network without significant change to the communications interface within existing application programs.

With Release 8 modifications, evoked SRT programs perform output as the first operation. This removes a restriction that an evoked SRT program must perform input as the first operation. An SRT program initiated by EVOKE may perform input or output as the first operation. This capability applies only to SRT programs; the system restrictions for MRT processing still apply.

Included with SSP-ICF is support for languages, devices, and communications systems as listed below:

Note: System/34 link connections are either point-to-point or multipoint tributary only (except for connection to 5250 devices or another System/34 using SDLC).

- **BSC**
 - System/3 mdl 15 with CCP
 - System/370 with IMS/VS (version 1.1.4) via IRSS
 - System/370 with CICS/VS (version 1.3.0), OS/VS or DOS/VS with BTAM (System/34 as a System/3)
 - System/34 with SSP-ICF, RPG II, COBOL, or Basic Assembler*
 - 5110 (as a 3741, point-to-point only)*
 - System/7 with MSP/7 (System/7 as a System/3)*
 - System/3 with RPG II T/P or ML/MP*
 - System/32 with RPG II or Basic Assembler*
 - 3741 mdl 2 and mdl 4 (no multiple file support, point to point only)*
 - 3747 (point-to-point only)*
 - 5231 mdl 2 (as a 3741)*
 - 5280 Distributed Data System
 - Series/1 (as a System/3)*
 - System/370 with: (System/34 as a System/3)
 - OS/VS, DOS/VS BTAM*
 - OS/VS TCAM*
- These devices are only supported for single communication sessions over a data link.
- **SNA/SDLC**
 - SDLC to System/34 using SSP-ICF
 - System/34 with SSP-ICF
 - SNA/SDLC to System/370 using NCP/VS and TCAM Direct (TCAM 10) or VTAM, or ACF/NCP/VS and ACF/TCAM or ACF/VTAM

- System/370 IMS/VS (version 1.1.4) using SLU Type P protocols
- System/370 CICS/VS (version 1.3.0) OS/VS (System/34 as a 3790)
- System/370 CICS/VS (version 1.3.0) DOS/VS (System/34 as a 3790)
- System/370 with user-written communications support using SNA protocol profiles TSP 3 or 4 and FMP 3 or 4.

REMOTE PROCEDURE INITIATION

The remote procedure initiation facility is available to help support distributed processing applications. With this enhancement, programs in another system can send a message to the System/34 which will cause a procedure to be evoked. The evoked procedure may use any of the procedure capabilities of the System/34. The program(s) within the procedure may or may not use SSP-ICF. Using this capability, an application program can communicate interactively with a program in the evoking system. If the evoked procedure is an executing MRT procedure, the session from the evoking program will be attached to the MRT program.

DATA COMMUNICATIONS LINE MONITORING

During the configuration procedure, interactive communications can be included in the system. If it is, specific questions will be asked to determine which communication subsystem types to include (for example, CICS or IMS/IRSS). Multiple subsystems may be configured, identified with a logical name, and associated with a specific data communications line connection. The configured subsystems may be activated (ENABLED) during the IPL procedure (auto-enable) or by the system operator after IPL. Once the connection is made, the System/34 SSP-ICF will maintain the connection to the communications link (until disabled), even though no user application program is active.

Note: This facility is a function of SSP-ICF and not available to other System/34 communication support (such as batch BSC, MRJE, or SRJE).

CUSTOMER RESPONSIBILITIES

IBM may provide marketing assistance, in accordance with the Marketing and Service Guidelines in the GI section of these pages, in the installation of IBM licensed programs. However, the responsibility for providing accurate ordering information, personnel selection and training, installation, and continued day-to-day operation lies solely with the customer.

Installation of System/34 licensed programs is a customer responsibility.

SPECIFIED OPERATING ENVIRONMENT

Support will be provided for this licensed program when it is operated in the following specified operating environment:

HARDWARE REQUIREMENTS

The IBM System/34 Interactive Communication Feature (SSP-ICF) runs on all mdls of the System/34 with a minimum of 64K bytes of main storage. SSP-ICF support for communications between programs residing in the same System/34 does not require a communications adapter. Communication to another system or device requires a communications adapter on the System/34 (#2500 or #3500).

SOFTWARE REQUIREMENTS

The IBM System/34 Interactive Communications Feature (SSP-ICF) will operate under control of the current release of the System/34 System Support Program (5726-SS1).

SYSTEM/34 COMMUNICATIONS SUPPORT COMPATIBILITY

SSP-ICF communications support does not replace previously announced System/34 communication support. SSP-ICF communications support can coexist in a System/34 with other communications support (that is, programs using remote 5250s, batch BSC, MRJE, SRJE, or previously announced System/34 SNA Assembler macros). However, SSP-ICF communications support and other communications support cannot share a communications adapter concurrently.

DOCUMENTATION

(available from Mechanicsburg)

IBM System/34 Data Communications Manual (SC21-7703) ... IBM System/34 Interactive Communications Feature Reference Manual (SC21-7751).

TERMS and CONDITIONS: See PP Index

Ordering Information: Contact IBM.

PROGRAM PRODUCTS

**SYSTEM/34 SYSTEM SUPPORT PROGRAM - SSP
FINANCE SUBSYSTEM (Feature #6010, #6011)****PURPOSE**

The IBM System/34 System Support Program Finance Subsystem, operating with the Interactive Communications Feature (ICF), can communicate with the IBM 3601 Finance Communication Controller, 4701 Finance Communication Controller, and 3694 Document Processor.

DESCRIPTION

3694 Document Processor: Communications with the 3694 is in batch mode via SDLC. The Check Processing Executive (CHX/3694) licensed program (5748-F53) must be used in the 3694. User applications must be written for the System/34 to receive the Allitems File from the 3694 and to transmit the User Edit Routines, Statement Sort Tables and Cycle Sort Tables to the 3694. See the CHX/3694 page for a list of the manuals that will be necessary to write the System/34 application program to communicate to CHX/3694.

3601/4701 Finance Communication Controller: The Finance Subsystem allows a System/34 to communicate with 3601s and/or 4701s via SDLC. A controller application program (none provided as part of this subsystem) can send procedure start requests to the System/34. Once a program is loaded in the System/34, the Finance Subsystem allows program-to-program communication between the controller and the System/34. The 3601 or 4701 will provide control for the devices attached to it and they will appear as command-capable work stations to the System/34. See the M36XX and M47XX pages for the devices that are supported by these controllers.

The Finance Subsystem uses the workstation interface which ICF supports. This interface shields the user application from the System/34 and 3601/4701 communication protocol requirements. RPG II, COBOL, and Assembler languages can be used with the Finance Subsystem.

Diskette Transfer Utility: The Finance Subsystem includes a diskette transfer utility which is used to support 3601 installations. Application programs that reside in a 3601 will be generated on a System/370, 303X, or 4300 which has been configured to support the 3600 Finance Communication System. A set of service programs (included in the System/370, 303X, or 4300 support) will produce a file which can be loaded into the System/34 through existing utilities. The file can then be communicated to the 3601 through the diskette transfer utility. The 3601 uses the data to create an operational diskette for use when the 3601 is IPLed.

DES Subroutine: Data encryption/decryption capability is provided in the DES subroutine which can be used in an RPG II, COBOL, or Assembler program. The DES subroutine complies with the United States Federal Information Processing Data Encryption Standard (DES) algorithm. The DES subroutine is used in conjunction with an application program (such as 5798-RDP) to generate Personal Identification Numbers (PINs) for use with the 3624 Consumer Transaction Facility.

CUSTOMER RESPONSIBILITIES

The customer is responsible for installation and use of this licensed program and for providing the application program which resides in the 3601, 3694, or 4701.

SPECIFIED OPERATING ENVIRONMENT

Support will be provided for this licensed program when it is operated in the following specified operating environment:

HARDWARE REQUIREMENTS

The IBM System/34 Finance Subsystem requires a minimum main storage size of 96K bytes. A communications adapter (#2500, #3500, or #4500) is required on the System/34.

Note: The IBM System/34 Finance Subsystem provides support for only a subset of the total IBM 3601/4701 communication protocols. The application program in the IBM 3601/4701 must conform to this subset.

The IBM 3601s, 3694s, and 4701s can be multidropped on the same communications line (16 devices maximum) and they may co-reside with remote IBM 5251 Display Stations and/or IBM System/34s that are configured as secondary SDLC devices.

SOFTWARE REQUIREMENTS

The IBM System/34 Finance Subsystem is an optional feature of the System/34 SSP. Prerequisite: SSP-ICF (#6000, or #6001) must also be installed for the Finance Subsystem to operate.

Support Programs: The following programs have been developed to support installations of the Finance Subsystem:

- IBM 3600 Online Terminal Support for System/34 FDP (5798-RAA).
- IBM 4700 Online Terminal Support for System/34 PRPQ (5799-BGB).

- IBM System/34 Application Support for the IBM 3624 Consumer Transaction Facility FDP (5798-RDP).
- IBM 3694 Check Processing Executive/General Support
 - Document Control Section Edit FDP (5798-RFL)
 - Table Preparation Facility FDP (5798-RFK)
 - Allitems File Translation Facility FDP (5798-RJF)

DOCUMENTATION
(available from Mechanicsburg)

IBM System/34 Interactive Communications Feature Reference Manual (SC21-7751).

TERMS and CONDITIONS: See PP Index

Ordering Information: Contact IBM.

**PRECONFIGURED SYSTEM/34
SYSTEM SUPPORT PROGRAM SUBSET
5726-SS2**

PURPOSE

The Preconfigured IBM System/34 System Support Program Subset (SSP) provides the following Release 7 subset of the 5726-SS1 control program capabilities:

- Single Program/Multiple Program Modes
- Input Job Queue
- Main Storage Management
- Disk File Sharing for Input, Update, and Add
- Operation Control Language
- System Utilities
- Data Management
- System History Area
- Print Spooling
- User Access to Spool File
- Interrupt/Resume
- Multiple User Library Support
- Operator ID and Password Security to the File/Library Level
- Control Program Support for Compilers and Utilities
- Support for Directly Attached Display Stations and Printers (one to four displays and one or two 5256 Printers and one or two 5225 or 5224 Printers)
- Support for either 1920- or 960-Character Displays. These cannot be intermixed.

DESCRIPTION

Single Program/Multiple Program Modes: The System/34 may be used in the single program mode which is very similar to the operation of a System/32. When the SSP is in the single program mode, only one operator enters commands and OCL. The programs invoked by the OCL execute one at a time, in sequence, in a single region.

In order to use single program mode, the user must select this option during/at each Initial Program Load (IPL). When in single program mode, the user still has support for functions such as printer spooling, job menus, user libraries, and interrupt/resume.

The display stations attached to a System/34 are designated as command-capable. A command-capable station can be used to invoke procedures, control commands and OCL, as well as being used for data input/output in user programs. The mode of a command-display station can be changed to data mode.

A data-capable station may be used only for user-programmed data input/output, and must be acquired by a user RPG II program that has been invoked from a command station. In single program mode, there can be only one command display station.

This SSP is preconfigured to allow the System/34 to operate in the multiple program (multiprogramming) mode. Operators at multiple command-capable stations may concurrently invoke control commands, OCL, and procedures. Multiple programs can execute concurrently.

Input Job Queue: Multiple program mode of the SSP provides an input job queue facility. The input job queue contains a list of jobs that are to be executed in sequence concurrently with other batch or operator interactive jobs. The jobs in the queue can be placed there by any command-capable station operator or OCL procedure. The station that places the job on the queue is released from that job and, therefore, becomes available for other work.

Main Storage Management: The System/34 manages main storage as a pool of noncontiguous 2048-byte segments and 'swaps' programs to and from disk as required to fit an active program into main storage (a program that is inactive might, for example, be waiting for data input or a message response from a display station).

System/34 main storage management allows the total main storage required by all active tasks to exceed actual user main storage. Performance considerations will dictate to what extent user main storage may be overcommitted.

The preconfigured System/34 occupies 18K bytes of main storage. This value may be increased or decreased in 2K-byte increments by excluding spool support or changing the size of the system work area and buffers. (This system work area will automatically expand and contract to its specified size based on the system workload without user intervention.) This resident nucleus area contains SSP functions such as data management for disk, printer, and work stations; buffers for workstation I/O and printer spooling; and an SSP work area used for task control.

Disk File Sharing: Disk data files on System/34 may be accessed concurrently by multiple programs for input, update, or add operations. Protection of data against concurrent update by two programs is provided by locking the disk sector(s) until released by the first accessing program. An OCL parameter is provided to allow or prevent the file sharing of a specified file.

Operation Control Language (OCL): System/34 OCL is compatible with System/3 OCL with the following exceptions:

- A command statement which has the capability to pass parameters to the indicated procedure is used in place of the System/3 CALL.
- Capability for specifying default values for missing OCL parameters.
- Logical IF statement provides for intelligence within procedures. It is possible to execute different steps based on tests performed in OCL.
- Other differences brought about by devices and system function.

System/34 OCL is compatible with System/32 OCL with exceptions such as the following:

- Additional commands, statements, and parameters have been incorporated into System/34 OCL.
- Some operator-entered commands do not invoke OCL procedures or utility programs on System/34. Therefore, a System/32 procedure using those commands will require change.
- Some utility functions such as COMPRESS must run dedicated (that is, cannot run in multiprogramming mode with other programs). Therefore, System/32 procedures using those commands must be changed.
- System/34 in multiprogramming mode or either mode with printer spool, will not honor the System Log statement. Logging to the system history area is still performed, and messages are displayed to the operator's display screen but will not be printed as they are displayed in this mode.
- System/34 does not support offline, multivolume diskette files except on the diskette magazine drive.
- The disk file rebuild of the System/32 utilities has been replaced by an automatic disk file integrity check at IPL (optional).

OCL procedure commands and control commands are provided to support the SSP facilities and the management of a multiprogramming system. Key functions, in addition to those above, include print spool queue and input job queue management, disk file sharing control, display station and printer assignment at execution time, region size, OCL-to-program communications (in a 256-byte local data area, accessible and modifiable through OCL and user programs), reserve disk space for a job, add job names to the input queue, branch to a specific point in a procedure, specify the next menu to be shown to the operator, display user formats for input data prompting and display station to system console station communications.

Systems Utilities: System/34 SSP provides functions for utility programs that allocate files, rename files, generate load modules from user-created display formats, build job menus, and other common functions.

Data Management: This SSP provides data management support for the disk, the display, the keyboard, and printers. The support for disk also allows the user to optionally specify space for more than 200 disk files, up to a maximum of 920 on mdls XX1 to XX3 and 984 for mdls XX4 and XX5. This display station data management manages all input and output to the display stations, including the retrieval of display formats from a disk library, and merging program data prior to displaying the format on the display.

SSP utility programs fully support the diskette unit and the diskette magazine as a save/restore device. The Diskette 1 in 128- or 512-byte sector formats is supported. The Diskette 2D (2-sided double density) is supported in 256- or 1024-byte sector formats.

The diskette magazine support allows input/output operations to begin on any one of 23 specified diskettes and overflow automatically to the next diskette in the magazine, to the next magazine, or from one individual slot to the next.

System History Area: System/34 provides a history area on disk which contains all recently executed OCL statements and all messages issued to the log device. The messages and data may be retrieved and redisplayed on the display station or printed. Either all the OCL statements or only those originally displayed may be printed as a hard copy log of the activity of the system. Individual display station operators can display or print history file entries created only at their own display station.

Entries are time-stamped and include the job identification generated by the SSP to assist in determining the sequence of activity on the

Preconfigured S/34 System Support Program (cont'd)

system. The user can prevent the history file from being overwritten during an Initial Program Load (IPL).

Print Spooling: Print spooling is supported by the SSP in either single program or multiple program mode. When spooling is active, printer output requests are intercepted and stored on disk. Spool writers are used to retrieve the print records from disk for printing. A print queue is maintained of job names whose printer data is yet to be printed, or specified as 'Retained after Printing'. System console commands are provided to start/stop, restart (at a page number), cancel, hold/release, change priority, and display jobs in the print queue. Print spooling is supported for any and all printers attached to the system simultaneously. In addition, multiple logical print files, up to 8, from a single RPG II program may be directed to one printer or separate printers.

The size of the primary spool disk file is 48 blocks. The spool intercept routine will allocate up to five additional extents if necessary. These extents will be freed up by the spool writer as they become empty.

The print spooling function can be turned off at IPL. The print spool file size can be changed at IPL.

An OCL statement is provided for use in passing parameters from the user job to print spool, such as forms alignment (yes/no), special form required, number of copies, priority, and deferred printing.

User Access to Spool: A utility permits spooled data to be copied to a data file which may be saved on diskettes restored for later use, and viewed on a display station.

While viewing the output, the user can elect to print a copy of the information. The entire report or selected pages can be printed without re-executing the job.

Interrupt/Resume: The operator may interrupt a processing program, execute another job such as inquiry into a file, and return to the processing program. Processing of the interrupted program will resume when the operator indicates the completion of interrupting activity.

Multiple User Library Support: The System/34 SSP provides for multiple user libraries. Parameters and OCL statements allow the user to specify a library name. If the library name is not specified, the default is to the system library (#LIBRARY).

Operator ID and Password Security to the File/Library Level: Each operator who signs on to a System/34 display station is prompted for an identification and, optionally, a password. This data is then checked by the SSP before allowing the operator any further access to the system.

Also, files and program libraries can be restricted to authorized users. These users can be further classified by type of use. An option allows the creation of audit entries in the system history area for each use of a secured file/library.

Control Program Support for Compilers and Utilities: This SSP provides control program services for RPG II Subset (5726-RG2), BASIC Subset (5726-BA2), and Utilities Program Product Subset (5726-UT2). Included are disk data management, printer and spooling support, program library maintenance, OCL and procedure support and main storage allocation and management.

The language compilers and utilities function like user batch programs. In a multiprogramming environment, multiple copies of a compiler or utility may operate concurrently if necessary resources are available.

Support for Directly Attached Display Stations and Printers: This SSP allows the System/34 to support a maximum of four 5251 mdl 1 or mdl 11 displays or two 5252 displays and up to two 5256 printers and up to two 5225 (or 5224) printers as locally attached devices. Remote device support is not provided.

Support for Either 1920- or 960-Character Displays: When using this system support, the System/34 supports up to four, either 1920- (5251 mdl 11) or 960- (5252 or 5251 mdl 1) character display stations, but not a mixture. All SSP display formats will be supported on either display size. Some formats (such as message displays) will present fewer lines when output is directed to 960-character display.

Configuration of the SSP: The software automatically configures itself during the first IPL after the system has been copied to the system disk. Workstation IDs and addresses are fixed. No other configuration capability is supported.

Some preconfigured values and options may be altered at IPL to temporarily select or omit functions or alter performance characteristics of the system.

The following System/34 hardware features are *not* supported by the preconfigured SSP (5726-SS2):

- All Communications Adapters
- 5211 and 3262 Line Printers
- 5250 Magnetic Stripe Reader
- 5251 mdl 2 and 12 Displays

- 1255 Magnetic Character Reader
- Multinational Character Set Feature
- Additional Work Station Adapter for 9 to 16 Local CRTs

The following optional System/34 SSP software (5726-SS1) functions are *not* supported by the Preconfigured SSP Subset (5726-SS2):

- BSC
- MRJE
- SRJE
- SNA/SDLC
- ICF Subsystem
- MICR SUBR08
- MICR SUBR25
- SMF
- Subconsole
- Checkpoint/Restart
- Remote Work Station Support
- HELP
- Extended Index Data Management
- Multinational Conversion Utility
- I-exchange (Extended 5280 Support)
- MLCA
- Auto-Call
- FORTRAN and COBOL execution
- Overlay Linkage Editor
- SSP-ICF

In addition, the system configuration function (CNFIGSSP) is not supported.

Program Use During Customer Preinstallation Testing: The Preconfigured System/34 System Support Program Subset (5726-SS2) is available to customers for preinstallation testing on IBM Test Center systems in accordance with IBM's Program Testing Policy.

SPECIFIED OPERATING ENVIRONMENT

Support will be provided for this licensed program when it is operated in the following specified operating environment:

HARDWARE REQUIREMENTS

The Preconfigured IBM System/34 System Support Program Subset runs on all models of the System/34 containing Microcode feature #9850.

The IBM System/34 Subset licensed programs are designed to operate in an environment that includes the Preconfigured IBM System/34 System Support Program Subset (5726-SS2), or Release 7 of 5726-SS1 while it is available, or its equivalent. The SSP order should be entered via AAS at the same time as the system order.

The Preconfigured System/34 System Support Program Subset (5726-SS2) consists of parts of System/34 SSP (5726-SS1) stabilized at Release 7. No release update or enhancements are planned.

SOFTWARE REQUIREMENTS

There are no programming requirements for operation of the Preconfigured IBM System/34 System Support Program Subset on System/34.

DOCUMENTATION (available from Mechanicsburg)

Preconfigured System/34 Planning and Installation Guide (GA21-9799) ... Preconfigured System/34 System Support Program Subset Licensed Program Specifications (GC21-9032) ... System/34 Installation Manual - Physical Planning (GA21-9242) ... System/34 Introduction (GC21-5153) ... System/34 Planning Guide (GC21-5154) ... System/34 Command and OCL Statements Reference Summary (GX21-7690) ... System/34 System Support Reference Manual (SC21-5155) ... System/34 Operator's Guide (SC21-5158) ... System/34 Displayed Messages Guide (SC21-5159) ... System/34 Installation and Modification Reference Manual (SC21-7689) ... System/34 Master Index (SC21-7739) ... System/34 Concepts and Design Guide (SC21-7742).

RPOs ACCEPTED: No

TERMS and CONDITIONS: See PP Index

**SYSTEM/34 MOTOR FREIGHT ACCOUNTING SYSTEM
MFAS (Single Program Mode)
5726-T21**

PURPOSE

Revenue Accounting: This application provides small to medium size general commodity or specialty motor freight carriers with a powerful aid in managing their business.

The IBM System/34 MFAS Revenue Accounting licensed program offers conventional revenue accounting functions to the small and medium size general commodity and specialty carrier in the motor freight industry. These functions are divided into the five categories of (1) Freight Bill Entry and Daily Reports, (2) Accounts Receivable, (3) Interline Payables, (4) Shipment Analysis, and (5) Owner/Operator Accounting.

The application is designed to help the general freight and specialty carrier manage revenue accounting requirements and report prime motor freight sales and operational data.

The entry of data from a coded copy of the freight bill establishes records for daily statistical reporting, accounts receivable, interline payables, shipper/consignee and interline statistics and shipment analysis.

The entry of the owner/operator accounting data produces records of owner/operator freight bill revenue, expenses, charges, advances, and settlement amounts. Owner/operator accounting will also produce settlement sheets detailing those items used in settling with the owner/operator. Owner/operator accounting is by owner and/or driver or unit.

HIGHLIGHTS

- Wide variety of reports and report options included:
 - Management and operational data reporting is a byproduct of normal data entry.
 - Detail or summary listings within a range of keys is supported in many reports
 - Statements for freight bill accounts receivable optionally printed on stock paper or preprinted forms with or without tear off portion for turnaround document.
- The Motor Freight Accounting System can co-reside in the System/34 with the Distribution Financial Accounting System and all application areas with the exception of owner/operator accounting can supply data to general ledger.
- Uses recognized accounting techniques and terminology to provide a solid accounting system:
 - Clear audit trails and control techniques are provided
 - Sample user-oriented forms for data preparation, file creation, audit and control are provided
 - Security code deters unauthorized execution of programs
 - A journal reference numbering system supplies an audit trail for any area that generates transactions for the DFAS General Ledger
- Can be installed without customer programming capability:
 - System tailoring procedure facilitates account growth by allowing on-site changes to file sizes and determination of functions used
 - File maintenance and audit procedures provided
 - Detailed Runbook
 - Step-by-step installation activity plan provided by the *Application Installation Guide*
 - User's information supplied to the supervisor by the *Application Reference Manual*

DESCRIPTION

The Motor Freight Accounting System is a ready-to-execute application for the small to medium size motor carrier.

The system uses the Data File Utility as its data entry approach. Support is provided for transaction entry through the System/34 keyboard or through a diskette keyed offline on a 3740 Data Entry System. The Motor Freight Accounting System Revenue Accounting licensed program can be installed with the Distribution Financial Accounting System General Ledger, Accounts Payable, and Payroll Application Program in separate steps, at different times and be an interrelated system.

The System Tailoring Procedure utilizes the answers to a series of questions regarding a carrier's requirements. It provides the following:

- Tailoring the application on-site at installation time
- Allows the user to change the selection of provided functions as business changes
- All provided functions are included in the programs but only required functions are executed
- File sizes may be expanded or contracted as needed by rerunning the System Tailoring Procedure

The *Application Installation Guide* provides a step-by-step installation activity plan including sample input and maintenance data forms, file loading sequences, and control forms with suggested procedures. The *Application Reference Manual* provides information on the day-to-day use of the application.

The Runbook provides the operator with a detailed set of instructions showing all the activities necessary to run the procedures on a System/34. The *Procedure Reference Summary* is provided for the operator as a reminder of the major operational functions of each procedure. It is intended to be used once the operator is thoroughly familiar with the particular procedure.

The System/34 Motor Freight Accounting System runs in single program mode. The System/34 licensed program supports only one work station, no spooling, no multiprogramming and no file sharing.

Application Description: The Motor Freight Accounting System is a full function, ready-to-execute application. Included are the *Application Reference Manuals*, *Installation Guide*, a Runbook, Source Code, Object Code, execution procedures, and the *Application Logic Manual*.

These are some general features which the Motor Freight Accounting System has:

- Designed to fit industry requirements
- Security codes to deter unauthorized use of master files
- In-house inclusion/exclusion of functions to be executed
- OCL procedures, Sort Specifications, and processing programs are packaged into logical work units which simplify system operation
- Monitoring of execution sequence prevents execution of a program until preceding required programs have been completely and successfully executed
- Compatible online/offline data entry through the System/34 Keyboard console or by means of diskettes keyed offline on a 3740 Data Entry System.
- Dynamic Backup and Recovery System forces periodic backup of master files and edited transactions and keeps track of what procedures need to be rerun from the last backup point to recreate up-to-date master files.
- Reprint options are possible because file updating is separated from report writing functions
- Selective printing options are available for many report functions

CUSTOMER RESPONSIBILITIES

IBM may provide marketing assistance, in accordance with the Marketing and Service Guidelines in the GI section, in the installation of IBM licensed programs. However, the responsibility for providing accurate ordering information, personnel selection and training, installation, and continued day-to-day operation lies solely with the customer.

Installation of System/34 licensed programs is a customer responsibility.

SPECIFIED OPERATING ENVIRONMENT

Support will be provided for this licensed program when it is operated in the following specified operating environment:

HARDWARE REQUIREMENTS

The IBM System/34 licensed program will execute in single program mode on all models of the System/34 which have 48K bytes of main storage. The programs are compiled assuming a 48K system. Because of volume and time constraints, there may be a requirement for providing offline keying on an IBM 3740 Data Entry System. If an IBM 3742 is to be used, it must have the 128-Character Record feature (#5455) and Feature Group A (#4004).

The Motor Freight Accounting System is designed to co-reside with the Distribution Financial Accounting System. No other licensed programs or user-written programs may co-reside with these applications unless stringent coding requirements for the programs and procedures are met. The *Application Logic Manual* discusses these coding conventions.

SOFTWARE REQUIREMENTS

The IBM System/34 licensed programs are compiled in System/34 RPG II programming language and executed under control of the System/34 System Support Program (5726-SS1). System/34 Utilities licensed program (5726-UT1), which includes Sort, Data File Utility, Source Entry Utility and Work Station Utility, is required for execution of the programs. The System/34 RPG II Compiler (5726-RG1) is required if modifications to the source code are necessary.

TERMS and CONDITIONS: See PP Index

**SYSTEM/34 UTILITIES
5726-UT1**

PURPOSE

The following utilities are provided with the IBM System/34 Utilities licensed program:

- Data File Utility (DFU)
- Sort
- Source Entry Utility (SEU)
- Workstation Utility (WSU)
- Screen Design Aid (SDA)

Each display station using DFU, Sort, WSU Generator, SEU, and SDA has its own copy of the utility (multiple copies can be executing at one time). Only one copy of a specific WSU-created module can be executing at one time; however, one WSU module services multiple display stations. All models of the IBM 5251/5252 Display Stations are supported by these utilities.

DESCRIPTION

DATA FILE UTILITY (DFU)

The following disk data file management functions are provided as part of DFU:

- Data File Creation and Maintenance (Indexed Files, Sequential Files, or Direct Files)
- Data File Inquiry (Indexed Files, Sequential Files, or Direct Files)
- Data File List (Indexed, Sequential or Direct Files)

All functions of the above utility take advantage of cataloged RPG II File Description and Input Specifications. To use any of the functions, the user need only know the name of the file, a name to be assigned to the job description, and the name of the cataloged RPG II specifications. The functions will prompt for all the other information necessary to tailor the job to the user's task. Field names are included with the prompts to aid the user in selecting the data fields to be used.

Previously, DFU copied the entire field from the previous record when the DUP key was pressed in ENTER, UPDATE, or INQUIRY mode. If non-DUP characters were inserted into the field, DFU stopped copying from the previous record. In Release 8, DFU was modified to allow the operator to override 'DUP' characters in a field as required. This support enables an operator to key over a portion or all of the 'DUP' characters in a field and, upon pressing the ENTER key, have only the portions of the field containing 'DUP' characters duplicated. The remaining characters in the field will be recorded as keyed.

Data File Creation and Maintenance: This function provides the necessary capabilities to create and maintain Indexed or Direct data files on disk. You can only change records in an existing sequential data file. Maximum use is made of the display to prompt the operator by field name for the data to be entered. For update, the data currently in the record is displayed. Highlights include:

- Formatted Report for an Audit Trail
- Auto Duplication of Fields
- Control Totals
- Generated Keys
- Modulus 10 and 11 Self-Check Digit
- Record sequencing

Data File Inquiry: This function provides the necessary capability to allow inquiry into any indexed file, sequential file, or direct file. The records are displayed showing the current status of the information in the file. Highlights include:

- Retrieval by record key for indexed files and relative record number for direct files and sequential files
- The ability to roll forward or backward through the file by key sequence for indexed files, and by relative record number for direct files and sequential files
- The ability to print selected records with the 'PRINT REC' command key
- All displayed fields include column headings for easy identification

Data File List: This function provides the capability to list and summarize selected information from any indexed, direct or sequential file on disk. The function is very useful for obtaining one-time reports and for creating recurring management reports. Highlights include:

- Page headings including date and page number
- Column headings
- Edited data fields
- Column totals - both final and subtotals

- Selection based on record codes and/or field values
- Sort, ascending or descending, on up to five fields
- Summary list with totals only
- Retrieve and print data from a related index master file
- Calculate and print additional result fields

The System/34 DFU capabilities include the data file management capabilities of System/32 DFU. In addition, DFU and RPG II source specifications created and saved on System/32 may be loaded to a System/34 library and used to execute a comparable job on System/34.

SORT

The System/34 Sort utility provides the function and capability of the proven System/32 Sort. Highlights include:

- Multiple record types
- Record selection based on field contents, including by comparison to system date
- Support of all data fields except binary
- ADDROUT (Address out) Sort
- Tag Along Sort
- Summary Tag Along Sort
- Automatically allocated work file
- Sort into ascending, descending or user-defined sequence
- Reformatting of records in a file
- Dynamically adjusts to region size available

System/34 extensions include:

- Multiple input files
- Equal control field ordering
- ALTSEQ by field
- Loadable SORT interface

The Sort Control Specifications used by System/32 may be used on System/34 and will result in the same data file output.

SOURCE ENTRY UTILITY (SEU)

SEU can be used to create and maintain OCL procedures, display format specifications, 1255 control specifications, RPG II, Auto Report, WSU, Display Formats, FORTRAN, Assembler and source statements. Highlights include:

- Display Formats are provided for the fixed-format statements (for example, RPG II, WSU) to aid in key entry of fields.
- Free-form display format for any statements to be entered.
- User-defined display formats may be used.
- Optional RPG II and Auto-Report syntax checking.
- Optional resequencing of statements in library.
- The ability to move statements in a member.
- The ability to include statements from any source or procedure library member in the system or user library.
- The ability to delete statements.
- Statement insertion.
- Rolling forward or backward through cataloged statements.
- Optional listing of statements.
- Use of display to show statement being entered or updated.
- Scan capability controlled by a character mask.
- Global replace option

With Release 8 modifications, SEU has been changed to default the number of lines per statement and the roll factor to 16 for 1920-character displays, and to 4 for 960-character displays. Previously, the default values were 8 and 2, respectively. This change allows viewing of a larger segment of the displayed source at one time.

WORKSTATION UTILITY (WSU)

WSU provides an easy-to-use set of specifications for defining interactive data entry programs which support one or more display stations. Specifications describe the following program variables:

- Job (name, number of workstations, region size)

S/34 Utilities (cont'd)

- Optional Transaction File (a special direct organization disk file created and managed by WSU to contain key entered records)
- Master Files (up to 20 disk files accessed or updated by the program)
- Display Formats (formats to be displayed on the 5251 Display Stations to prompt for data entry and/or display error messages)
- Calculations (the arithmetic, logical edit or I/O operations to be performed in conjunction with the entry of data in response to a display format)
- RPG II File Description and Input specifications are referenced for a description of the transaction and master files.

The WSU specifications are processed by the WSU Generator and the SSP Screen Format Generator Routine (\$SFGR utility) to produce:

- An object definition module to be executed by WSU when the job is invoked.
- Display Formats
- System/34 OCL procedures to control execution of the job when invoked.

Highlights

- Logical combination of display format description and calculation specifications.
- Automatic management of the transaction file with each workstation's records logically separate.
- Operator review, correction and insertion of transactions.
- Each operator may sign-on, sign-off, and resume entry independently.
- Recovery of the transaction file after system failure is provided.
- Different WSU-generated programs may be executing concurrently.
- WSU programs execute as MRT (multiple requester terminal) programs to optimize performance.
- WSU programs will dynamically adjust to larger region size to reduce overlay fetches from disk or to smaller execution region size if memory needs to be constrained.
- The number of active workstations can vary and is transparent to programmer-supplied logic.
- WSU allows the user to specify display formats using a variable starting line number.
- Masking of Command and Function Keys.
- Capability to access the originating workstation ID for a transaction.
- Options at generation to replace existing programs, control portions of the output listing, and suppress OCL generation.
- Random additions to indexed master files
- Online debugging via DEBUG operation code
- WSU transaction file update capability (SUBR22)
- WSU edit date fields greater than 6 characters
- WSU optional 'SR' in subroutines

SCREEN DESIGN AID (SDA)

SDA provides an interactive approach to designing, creating and maintaining display formats and job menus. Increased productivity can result by eliminating the amount of clerical work associated with coding specification sheets, transcribing source code, and correcting transcription or coding errors.

Highlights

- Create a new WSU/SFGR source specification member.
- Add new WSU/SFGR source specifications to an existing member.
- Update entire formats in an existing WSU/SFGR source member.
- Delete entire formats from a source member.
- Update, insert and delete individual source specifications via SEU.
- Display formats in an SFGR LOAD member.
- Create and update MENUs and their associated source members.
- Create from an SFGR source member an RPG II skeleton program to use the formats.
- Help function which displays text describing the use of SDA.
- Generation of WSU programs for master file inquiry, maintenance, or transaction file creation.

- Field level syntax checking.
- Random format update.
- Optional source specification sequencing.

Program Use During Customer Pre-Installation Testing: The System/34 Utilities licensed program (5726-UT1) is available to customers for pre-installation testing on IBM Test Center systems in accordance with IBM's Program Testing Policy.

SPECIFIED OPERATING ENVIRONMENT

Support will be provided for this licensed program when it is operated in the following specified operating environment:

HARDWARE REQUIREMENTS

The IBM System/34 Utilities licensed program runs on all models of the System/34. Each of the five programs in the Utilities licensed program requires a minimum of 14K (14,336) bytes of main storage. Sort, DFU and WSU will take advantage of additional main storage if it is available.

SOFTWARE REQUIREMENTS

The current release of the IBM System/34 Utilities licensed program operates under control of the current release of IBM System/34 System Support licensed program (5726-SS1).

DOCUMENTATION

(available from Mechanicsburg)

System/34 Utilities Program Product Licensed Program Specifications (GC21-7659) ... System/34 Workstation Utility Reference Manual (SC21-7663) ... System/34 Data File Utility Reference Manual (SC21-7656) ... System/34 Source Entry Utility Reference Manual (SC21-7657) ... System/34 Sort Reference Manual (SC21-7658) ... Workstation Utility Debugging Template (GX21-7697) ... System/34 Screen Design Aid Programmer's Guide and Reference Manual (SC21-7716)

RPQs ACCEPTED: No

TERMS and CONDITIONS: See PP Index

SYSTEM/34 UTILITIES SUBSET 5726-UT2

PURPOSE

This program is intended to support the Preconfigured IBM System/34 System Support Program Subset (5726-SS2).

The following utilities are provided with this Utilities Program Subset:

- Workstation Utility (WSU) Execution Support
- Data File Utility (DFU)
- Sort
- Source Entry Utility (SEU)

Each display station using DFU, Sort, and SEU has its own copy of the utility (multiple copies of the same utility can be executing at one time). Only one copy of a specific WSU-created module can be executing at one time; however, one WSU module can service multiple display stations.

WORKSTATION UTILITY (WSU) EXECUTION SUPPORT

Data entry, update, and inquiry programs written in WSU can be executed using this support. Generation support for WSU is provided with Release 7, 5726-UT1 and 5726-SS1.

Highlights

- Each operator may sign-on, sign-off, and resume entry independently.
- Recovery of the transaction file is provided after a system failure.
- Different WSU programs may be executing concurrently.
- WSU programs execute as multiple requester terminal (MRT) programs to optimize performance.
- WSU programs will automatically adjust to a larger execution region size to reduce overlay fetches from disk or to a smaller execution region size if memory needs to be constrained.
- The number of active workstations can vary and be transparent to the programmer-supplied logic.

Utilities to support:

- Copy a file, changing the record length
- Extract specific records from a file
- Rebuild a WSU transaction file

DATA FILE UTILITY (DFU)

The following disk data file management functions are provided as part of DFU:

- Data file creation and maintenance (indexed files, direct files)
- Data file inquiry (indexed files, sequential, or direct files)
- Data file list (indexed, sequential or direct files)

All functions of the above utility take advantage of cataloged RPG II File Description and Input Specifications. To use any of the functions, the user need only know the name of the file, a name to be assigned to the job description, and the name of the cataloged RPG II specifications. The functions will prompt for all the other information necessary to tailor the job to the user's task. Field names are included with the prompts to aid the user in selecting the data fields to be used.

Data File Creation and Maintenance: This function provides the necessary capabilities to create and maintain indexed or direct data files on disk. Maximum use is made of the display to prompt the operator by field name for the data to be entered. For update, the data currently in the field is displayed. Highlights include:

- Formatted report for an audit trail
- Auto duplication of fields
- Control totals
- Generated keys
- Modulus 10 and 11 self-check digit
- Record sequencing

Data File Inquiry: This function provides the necessary capability to allow inquiry into any indexed file, sequential file or direct file. The records are displayed showing the current status of the information in the file. Highlights include:

- Retrieval by record key for indexed files and relative record number for direct files and sequential files
- The ability to roll forward or backward in key sequence for indexed files and by relative record number for direct files and sequential files
- The ability to print selected records with the 'PRINT REC' command key

- All displayed fields include field headings for easy identification

Data File List: This function lists and summarizes selected information from any indexed, direct, or sequential file on disk. The function is very useful for obtaining one-time reports and for creating recurring management reports. Highlights include:

- Page headings including date and page number
- Column headings
- Edited data fields
- Column totals - both final and subtotals
- Selection based on record codes
- Selection based on field content
- Sort, ascending or descending, on up to five fields
- Summary list with totals only
- Calculation on record fields to obtain result fields
- Retrieve and print data from a related index master file
- Calculate and print additional result fields

The System/34 DFU capabilities include the data file management capabilities of System/32 DFU. In addition, DFU and RPG II specifications created and saved on System/32 may be loaded to a System/34 library and used to generate and execute a comparable job on System/34.

SORT

System/34 Sort provides the function and capability of the System/32 Sort. Highlights include:

- Multiple record types
- Record selection based on field contents, including by comparison to system date
- Support of all data fields except binary
- ADDRROUT (tag) sort
- Tagalong sort
- Summary tagalong sort
- Automatically allocated work file
- Ascending, descending, or user-defined sequence
- Dynamically adjusts to region size available
- Reformatting of records in a file

System/34 extensions include:

- Multiple input files
- Equal control field ordering (file merge)
- ALTSEQ by field

The Sort Sequence Specifications used by System/32 can be used on System/34 and will result in the same data file output.

SOURCE ENTRY UTILITY (SEU)

SEU can be used to create and maintain OCL procedures, RPG II, display screen formats, and sort source statements. Highlights include:

- Display Formats for the fixed-format statements (for example, RPG II) to aid in key entry of fields.
- Free form display format for any statements to be entered.
- User-defined display formats may be used.
- Optional RPG II syntax checking.
- Optional sequencing of statements in a member.
- The ability to move statements in a member.
- The ability to include statements from another source or procedure library member in the system or user library.
- The ability to delete statements.
- Statement insertion.
- Rolling forward or backward through cataloged statements.
- Optional listing of statements.
- Use of display to show statement being entered or updated.
- Scan capability controlled by a character mask.
- Global replace option



PROGRAM PRODUCTS

S/34 Utilities Subset (cont'd)

The following System/34 Utilities (5726-UT1) functions are *not* supported:

- WSU compilation
- SDA Screen Design Aid

Program Use During Customer Pre-installation Testing: The IBM System/34 Utilities Subset (5726-UT2) is available to customers for pre-installation testing on IBM Test Center systems in accordance with IBM's Program Testing Policy.

SPECIFIED OPERATING ENVIRONMENT

Support will be provided for this licensed program when it is operated in the following specified operating environment:

HARDWARE REQUIREMENTS

This IBM System/34 Utilities Subset runs on all models of the System/34 supported by 5726-SS2. Sort, DFU, and SEU require a minimum of 14K (14,336) bytes of main storage. Sort and DFU will take advantage of additional main storage if it is available. WSU programs may require more memory than is available on a minimum system.

SOFTWARE REQUIREMENTS

This IBM System/34 Utilities Subset (5726-UT2) operates under control of the IBM Preconfigured System/34 System Support Program Subset (5726-SS2), or Release 7 of 5726-SS1 while it is available, or its equivalent.

The System/34 Utilities Subset (5726-UT2) consists of parts of System/34 Utilities (5726-UT1) stabilized at Release 7. No release update or enhancements are planned for System/34 Utilities Subset (5726-UT2).

DOCUMENTATION

(available from Mechanicsburg)

System/34 Utilities Subset Licensed Program Specifications (GC21-9033) ... System/34 Data File Utility Reference Manual (SC21-7656) ... System/34 Source Entry Utility Reference Manual (SC21-7657) ... System/34 SORT Reference Manual (SC21-7658) ... Workstation Utilities Reference Manual (SC21-7663).

RPOs ACCEPTED: No

TERMS and CONDITIONS: See PP Index



PROGRAM PRODUCTS

**IBM SYSTEM/34 BUSINESS MANAGEMENT
ACCOUNTING SYSTEM**

General Ledger	5726-XBB
Accounts Payable	5726-XBC
Accounts Receivable	5726-XBA
Payroll	5726-XBD
Inventory Accounting	5726-XB9
Billing	5726-XB8

PURPOSE

These multi-industry licensed programs are written in System/34 BASIC programming language and are an extension of the Business Management Accounting System programs with accounting functions that are identical to those available for Datamaster. The IBM System/34 Business Management Accounting System licensed programs provide the user with powerful tools to perform business accounting while providing additional management information. The programs contain functions applicable to a wide range of industry classifications.

The program design provides an accounting base of information and incorporates a flow of information in terms that are familiar to the user. This base of information is then available to improve productivity through the managerial reporting provided by the programs. The fundamentals of accounting provided by the applications give the entry level user the benefits of an automated accounting system without the expense or requirement of a programming staff.

HIGHLIGHTS

- Master Menu displays all applications installed.
- Programs and procedures required to run the applications will reside in the application library on disk. Master files, interface files, data entry files and work files will also be disk resident.
- Built-in auditability and control characteristics through the use of familiar five-column journals, sequential journal numbering and inter-application data integrity.
- Program documentation is designed to promote customer self-sufficiency during installation and operation.
- The Atlanta National Market Support Center (formerly the ACSC) provides a direct customer toll free number for questions related to installation and operation of these applications.
- Ease-of-use is enhanced through:
 - Menu driven task selection
 - Consistent data entry programs and procedures for all applications
 - Common file maintenance techniques including user-defined field defaults
 - Use of generally accepted accounting terminology
- Installation-time tailoring options allow the user to select key functions and perform file sizing.
- A program update (PTF) procedure is provided to aid the operator in applying program updates provided by the Atlanta National Market Support Center (ANMSC) or the Program Information Department (PID).
- System/34 BRADS file definitions are provided with the applications for selected master files.
- Optional security code by application for each company.
- Multi-company support.
- File sharing capability supporting concurrent operations for any workstations signed on to that company.
- Full screen file load is provided to support loading of the customer master, item master and item balance files.

DESCRIPTION**IBM SYSTEM/34 GENERAL LEDGER (5726-XBB)**

The IBM System/34 General Ledger application is a multi-industry application designed to accomplish the basic accounting functions of posting journal entries to the General Ledger, generating financial statements, and producing special journals. The programs are based on double entry accounting principles in accordance with generally accepted accounting practices. Transactions may be directly entered as general journal entries and also received as summary entries from the IBM System/34 Billing, Accounts Receivable, Payroll and Accounts Payable applications, if installed.

Functions and Features

- Calendar-driven 1 to 13 period support
- User-defined fiscal year
- Optionally combined financial statements for multiple companies
- User-defined statement formatting

- Special journal capabilities which allow the user to tailor journal formats
- Previous year history maintained for comparative statements
- Budget and encumbrance support
- Annual ledger capability
- Page width option allowing statements on 8-1/2 x 11 paper
- Future fiscal year posting
- Automatic year-end closing.

IBM SYSTEM/34 ACCOUNTS PAYABLE (5726-XBC)

The IBM System/34 Accounts Payable application is a multi-industry offering designed to assist the user in controlling the outflow of cash and maintaining accurate records of liabilities to trade and other vendors. Payable items are handled on an accrual basis and vendor analysis reporting allows the user to determine key purchase volumes and discounts taken or lost for the current and previous year. Summarized journal information can be passed to the IBM System/34 General Ledger application, if installed.

Feature and Functions

- Allows one-time vendor checks
- Cash discount by percent or amount on invoice total or line items
- Supports multiple General Ledger distributions per invoice
- Payment selection by due date and/or by vendor/invoice
- Partial payment support
- User-defined excessive check amount warning
- Debit memos available
- Vendor open-item inquiry
- Manual checks
- User-tailorable five-column Purchase and Cash Disbursement Journals
- Default General Ledger distribution by vendor
- Default vendor cash discount percent
- Check reversals

IBM SYSTEM/34 ACCOUNTS RECEIVABLE (5726-XBA)

The IBM System/34 Accounts Receivable application is designed to assist the user in managing one of the most important assets of a business--the money owed by its customers. This multi-industry offering provides timely information to help improve cash flow, and reduce bad debt losses through control of accounts receivable. Invoice transactions can be entered directly into the Accounts Receivable application and also received from the IBM System/34 Billing Application. Cash Receipts and Adjustment transactions are entered through the Accounts Receivable data entry menu option. Accounts Receivable can also pass summarized accounting information to the IBM System/34 General Ledger Application, if installed.

Functions and Features

- Supports entry of non-Accounts Receivable cash such as vending machine receipts
- Open Item or Balance Forward account type selection by customer
- Cash and COD sales support
- Partial and over payment of invoices
- Statement selection by customer
- Supports invoices with future due dates
- Current plus four past due periods
- Optional late charges by customer
- Consolidated statements for multi-branch companies
- Interactive cash entry for open item customers
- User-tailorable five-column Sales and Cash Receipts and Adjustment Journals
- Full screen file load is provided to support loading a large volume Customer Master file.

PROGRAM PRODUCTS

S/34 Business Management Accounting System (cont'd)

IBM SYSTEM/34 PAYROLL (5726-XBD)

The IBM System/34 Payroll application is a multi-industry solution that performs basic payroll computations and produces payroll checks with earnings statements and supporting reports. Both hourly and salaried payroll processing is supported. Individual earnings may be taxed for up to three taxing jurisdictions per time and adjustment transaction. Summarized accounting information can be transferred to the IBM System/34 General Ledger application, if installed.

Features and Functions

- Weekly, bi-weekly, semi-monthly and monthly pay frequency
- Shift differentials as a percent of employees hourly rate or a fixed dollar amount
- Hourly, exempt and non-exempt salaried employees
- Payroll calculations provided for:
 - Gross Pay
 - Federal Income Tax (FIT)
 - Federal Insurance Contributions Act (FICA)
 - State and Local Taxes
 - State Disability Insurance (SDI)
 - Federal Unemployment Tax Act (FUTA)
 - Earned Income Credit (EIC)
 - Net Pay
- Taxable and non-taxable adjustments
- Automatic deduction based on:
 - Percent of taxable gross
 - Rate per hour worked
 - Flat dollar amount per pay period
- Resetting deductions (i.e., bonds)
- Automatic benefits (with optional maximums) can be calculated using the same algorithms used for automatic deductions
- Separate checks available for vacation and bonus payments
- Tip accounting with optional minimum hourly guarantee
- Workmen's compensation worksheet
- Detailed earnings and deductions shown on earnings statement

IBM SYSTEM/34 INVENTORY ACCOUNTING (5726-XB9)

The IBM System/34 Inventory Accounting Application offers management reports which help the user to optimize inventory levels. Up-to-date reports reflecting stock movement, on-hand positions, sales and cost information enhance purchasing decisions. The Inventory Accounting application can receive summarized sales information from the IBM System/34 Billing application.

Features and Functions

- Support for up to three warehouses per item
- Broken-case handling
- Pricing conversion
- Both returns and allowances supported
- Maintains both average and last cost for an item
- Both stock movement and financial information maintained
- Suggested reorder quantities based on user supplied:
 - minimum balance
 - maximum balance
 - lead time
 - pack size
 - vendor minimum
- Item inquiry including both item master and item balance information
- Inventory analysis based on sales, cost and profit amounts
- Full screen file load is provided to support loading large volume Item Master and Item Balance files.

IBM SYSTEM/34 BILLING (5726-XB8)

The IBM System/34 Billing Application is a multi-industry billing application providing the user with the ability to create invoices for customer orders already picked and shipped. Customer and item names, prices and tax information are automatically retrieved from the Billing Application master files during invoice entry. Summarized data is optionally available to the IBM System/34 Accounts Receivable, General Ledger and Inventory Accounting Applications, if installed.

Features and Functions

- Post billing

- Selective printing of invoices
- Five standard prices
- Pricing conversion
- Broken-case pricing
- Flexible terms and invoice discounts
- Federal excise tax
- Special charges and comments
- Credit memo support with returns and allowances
- Billing on non-inventory items
- Cash and COD sales
- Invoices for one-time customers
- Up to three sales taxes per invoice, maximum of 50 taxing bodies
- Optional profit tear strip on invoices
- User-tailorable five-column Sales Journal
- Data entry overrides of master file data
- Full screen file load is provided to support loading large volume Customer Master and Item Master files.

PROGRAM DOCUMENTATION

The documentation provided for each application is designed to help the user understand, install and operate the application. The materials are consistent in size and format with the IBM System/23 Datamaster publications and:

- Introduce new application users to automating typical business tasks in a way that invites use, reinforces efforts to learn and use, and builds confidence and willingness to reuse after learning
- Are written in "friendly", user-oriented language
- Are visually attractive with multi-color printing
- Are small in size to be usable in a space-limited work area
- Are presented in a step-by-step task fashion that guides the user through installation and operation
- Are designed to assist in communication with the Atlanta National Market Support Center (ANMSC)
- Provide tables of contents along with master indexes (one per application) that pinpoint information

The following materials are available for each application.

Introducing

This book is intended for all users of the application. The owner/executive, installer, operator, user department, programmer and consultant can use this book as their first source of information about the application. The book is designed to be a general introduction to how the application fits within the user's business.

Learning

This learning package consists of a book, cassettes, and a sample data files diskette. The learning consists of separate exercises which guide the operator through aspects of daily operations in a very step-by-step fashion. The learning package refers the operator to specific sections of the Running book so that, in addition to application training, the operator becomes familiar with the format of the Running book.

Installing

This book details the steps to follow in installing and tailoring the application, collecting and recording the data, entering it, and scheduling operator training.

Running

This book contains information the operator needs in order to run the application.

Using

This package contains a book and a forms pack. The book is intended primarily for user department personnel who are not System/34 operators. It has the information required by the user to:

- Prepare input for submission to the operator
- Analyze reports
- Submit changes to files
- Aid in using the reports to help manage the business
- Understand alternative uses of the reports

The forms pack contains reproducible camera ready copies of all input forms, preprinted IBM forms, and any control logs peculiar to that application that are required to install and run the application. Instructions for using the forms are printed on the back of each form. The



PROGRAM PRODUCTS

S/34 Business Management Accounting System (cont'd)

forms in the forms pack are on 8-1/2" x 11" paper. The customer can order additional forms from a printer or IBM's System Supplies Division. Preprinted forms will be documented in actual size for the user to provide to his printer.

Messages

Messages for each application are printed as separate pages which are delivered with each application library.

Application Program Manual

A separate application program manual is available as optional material. It contains record formats, logic flows, and other technical information to be used primarily by the experienced BASIC programmer interested in understanding the detail design of the application.

CUSTOMER RESPONSIBILITIES

IBM may provide normal marketing assistance and guidance. The responsibility for personnel selection and training, installation and continued day-to-day operation lies solely with the customer.

The customer is responsible for error detection and analysis, and submission of APARs.

IBM Central Service is responsible for the development and distribution of program fixes, but the customer has the responsibility to apply fixes to the program.

Note: Where changes in Law or Industry Standard (local or national) change program function requirements on delivered programs, IBM may furnish program changes, but it is not obligated to make these changes available. References to tax reports and calculations for the System/34 Disk Business Management Accounting System applications reflect the 1982 version of the tax law.

SPECIFIED OPERATING ENVIRONMENT

HARDWARE REQUIREMENTS

The IBM System/34 Business Management Accounting System Programs (General Ledger, Accounts Payable, Accounts Receivable, Payroll, Inventory Accounting, and Billing) are written in BASIC and operate on an IBM System/34 with the following minimum configuration:

- 1 - 5340 System Unit Model D21 (8.6 megabytes of disk storage, 2D diskette and 96K bytes of main storage)
- 1 - System printer, either a serial printer or a line printer with a 96-character belt
- 1 - 5251 Display Unit (Model 11 or Model 12)

SOFTWARE REQUIREMENTS

The System/34 Business Management Accounting System Programs are written in System/34 BASIC programming language, and execute under control of:

- System/34 System Support Program - (5726-SS1 Release 7 or later)
- System/34 BASIC - (5726-BA1)
- System/34 Utilities - (5726-UT1)

or

- Preconfigured System/34 System Support Program Subset - (5726-SS2)
- System/34 BASIC Subset - (5726-BA2)
- System/34 Utilities Subset - (5726-UT2)

System/34 Utilities (5726-UT1 or 5726-UT2), which include SORT, are required for execution.

RPQs ACCEPTED: No

TERMS and CONDITIONS: See PP Index

PROGRAM PRODUCTS

**SYSTEM/34 JOB ANALYSIS SYSTEM
JAS/34 (5726-XP1)****PURPOSE**

The IBM System/34 Job Analysis System (JAS/34) is a powerful aid to management for planning, scheduling, supervising, and controlling project-oriented work through the use of the critical path method. Designed to be easily used by non-technical personnel, the JAS/34 functions consist of an interactive data entry processor, network processor, and a report processor.

HIGHLIGHTS

- Front-to-back interfacing of up to 10 subnets to form a network with up to 14,720 activities.
- Accommodates up to 10 subnets per master file.
- Allows interactive creation of JAS/34 input records.
- Handles interactive correction of JAS/34 input records.
- Provides for interactive insertion of additional JAS/34 input records.
- Supports up to eight workstations by the interactive data entry processor.
- Handles up to 32 calendars.
- Has four types of time relationships between work items.
- Offers multiple starts and ends.
- Modifies reports easily modifiable.
- Progress reporting specifying actual start date and/or remaining duration.
- Provides levels of milestones.

DESCRIPTION

Interaction between the user and the interactive data entry processor will be provided by a series of workstation display screens to which the user responds by entering the data requested on the screen. When appropriate, flow from screen to screen will be automatic, or under user control. Data entry may also be accomplished by using batch input records entered via the Source Entry Utility (SEU) or entered via an IBM 3741 from a diskette created offline.

JAS/34 can handle up to 1,472 activities or work items and relationships per subnet, depending on region size. To get maximum flexibility, control records are used. JAS/34 is written in the System/34 Assembler language.

CUSTOMER RESPONSIBILITIES

All users should know the various features of this system before attempting to use it for actual project control. Users will need to know the fundamentals of the critical path technique before they can prepare input.

The customer must describe the activities which form the project network. This data may be recorded on diskettes for entry into the System/34 using a 3740, or it can be entered directly from the keyboard using the Source Entry Utility, or it can be entered with guidance from the system by using the interactive data entry processor.

The customer should provide for safekeeping of the diskette to ensure his continued operation (back-up). A *User's Guide* will also be provided. Procedure for installation will be furnished.

SPECIFIED OPERATING ENVIRONMENT

Support will be provided for this licensed program when it is operated in the following specified operating environment:

HARDWARE REQUIREMENTS

The interactive data entry processor requires a minimum of 24K bytes of main storage and, therefore, requires an IBM System/34 with at least 48K bytes of main storage. All other modules of JAS/34 require a minimum of 14K bytes of main storage and, therefore, will run on any model of the IBM System/34 which has a 14K region available. JAS/34 will take advantage of additional main storage if it available.

SOFTWARE REQUIREMENTS

JAS/34 must be used under control of the IBM System/34 System Support Program (5726-SS1). The IBM System/34 Utilities (5726-UT1) are required.

If assembly of the source machine-readable material is desired, the IBM System/34 Basic Assembler and Macro Processor (5726-AS1) is required.

DOCUMENTATION

(available from Mechanicsburg)

IBM System/34 Job Analysis System (JAS/34) Proposal insert (G280-0040) ... Promotional Brochure - For the project managers: A tool from IBM to help with planning, estimating and scheduling (G580-0134) ... IBM System/34 Job Analysis System (JAS/34) General Information Manual (GH30-0511).

RPQs ACCEPTED: No

TERMS and CONDITIONS: See PP Index

**WORK STATION SEARCH FACILITY/34
FOR THE SYSTEM/34 (WSF/34)
5726-XR1****PURPOSE**

The Workstation Search Facility/34 provides System/34 Workstation users with a powerful tool to search disk files rapidly for records meeting terminal user-selected search criteria. This facility is designed to be used as a means of selecting records for further processing by user-written inquiry, file maintenance, order entry, and other programs. This offering will allow the user to define the searches required that will best aid the organization.

WSF/34 is applicable to any industry classification. Manufacturers and distributors can use the facility for customer and item searches; hospitals for patient or guarantor; schools for student lookups, etc.

HIGHLIGHTS

- Reduces the need for alphabetically sorted master file listings.
- Ease-of-operation allows non-DP personnel within the organization to search their files for information.
- Keyword in Context (KWIC) technique for searching alphabetic fields without requiring data base changes by the user. Blanks and special characters (if preceeded or followed by a blank position) are considered delimiters.
- User-defined literals are excluded during the index creation process (for example, THE, AND, CO, INC, etc.)
- Use of up to eight-character search argument with null characters within the argument. This facility may be used in those cases where the exact spelling of the search criteria is unknown.
- Use any combination of six logical search operators (equal, less than, less than or equal, greater than, greater than or equal, or not equal).
- AND/OR logic to define the relationship between the primary, secondary and tertiary searches.
- Both 960- and 1920-character screens are supported and are workstation independent.
- Indices may be created without knowing the data processing file structure, and all standard System/34 data file organizations are supported.
- Optional user-defined security passwords to prevent unauthorized use of searches
- Creation of up to 13 cross-reference indices per tailoring session for fast searching of high use data fields.
- Supports all data field formats with the exception of binary fields.
- Displays up to 20 matches at a time.
- Allows forward and backward paging, termination of a search or start of a new search at any time.
- Second level display on a selected line provides additional data from the selected master record. This screen displays unformatted data directly from the record.
- User-oriented tailoring procedure that will allow the user to easily define the required searches and then will generate the required RPG II source programs and required OCL and invoke the required compiles and execution of the index creation program.

DESCRIPTION

WSF/34 (5726-XR1) is an application product designed to process System/34 disk records. It is a cross-industry offering and will execute in conjunction with licensed program and non-licensed program users.

The operator will define through an interactive workstation session the search required, up to 76 characters of information to be displayed on matching master records. Additionally, information such as the name of the file, record size and approximate number of records will be required. The Application Reference/Runbook will provide the operator with an explanation of the required and optional fields to be entered during this session. Each response will be edited as the information is entered.

The offering can reduce the need for referencing voluminous printed reports by displaying up to 20 records at a time that meet search criteria. If more than 20 records meet the criteria, the screen display can be paged forward or backward to allow a review of all matched records. Also, when the desired record is displayed, you can select to have the entire contents of the record, as it appears on disk, to be further displayed.

The WSF/34 application consists of four programs: An interactive entry/edit program, a tailoring program, and two skeletal programs which, when copied and modified by the tailoring program, provide user unique Index-build and Search programs.

The first segment consists of two programs. The first is an interactive entry/edit program in which unique tailoring answers to three or more displays are supplied. The second is a tailoring program that uses these

answers to modify the two skeleton source programs of the other two segments, and also creates operational procedures that are self-initiating. The first and second segments will be run sequentially as one session if the user does not want to modify the source prior to compilation. The sequential operations of this session would be:

1. Answers to displays are temporarily stored on disk.
2. Answers are used to tailor two skeleton source programs and create tailored procedures.
 - a. Index-build program
 - b. Search program
 - c. Procedures to run the Index-build and Search programs
 - d. Procedures to compile the Index-build and Search programs
3. Compilation of Index-build and Search programs.
4. Run the Index-build program which:
 - a. Creates unique search pointer files
 - b. Creates procedure and utility statements for a sort
5. Sorts pointer files into alpha order.

If the user wants to modify the source code before compilation, only sequential operation steps 1 and 2 will be performed. The users will need to be familiar with the source entry utility (SEU) to be able to modify either the Build-pointers or Search program source code. They will also need to know how to compile the source programs because the compile procedures of step 3 will not be created.

The second segment consists of the tailored Build-search-pointers program. This program determines which data fields of a particular master file are to have pointer files created, as specified by the answers created during the running of the interactive entry/edit program. The build pointers program then creates one or more pointer records per master record for each search. If the user chose not to modify the build-pointers program before compiling, it will run automatically when both the interactive and tailoring programs are finished.

The build-pointers program can also be run as a standalone program. The pointer files should be recreated after records are added or changed in the master file. The build-pointer program can be run any time.

The third segment of the WSF/34 application consists of the tailored search program. A workstation user initiates a particular search program by entering the name that was assigned during the running of the interactive entry/edit tailoring session. The search program returns a display allowing the user to key in the search request parameters. Records that match the search criteria are then displayed to the workstation user.

During the tailoring process, control logs are filled out that will aid the user in maintaining the search and index data base. Copies of these control logs, along with data entry forms, are provided to facilitate the actual entry during the tailoring process.

The WSF/34 Application Reference/Runbook provides the user with the information necessary to install WSF/34, execute tailoring of searches, and defines how the user would approach special situations. This document provides step-by-step instructions for operating the application.

The *WSF/34 Application Logic Manual* is provided as licensed documentation for use by the self-sufficient user if modifying, and for the systems engineer when maintaining WSF/34. Information on naming conventions, application program functions and specifications and other information pertaining to the application is presented in this manual.

Instructional information regarding the execution of the sample problem is provided in the WSF/34 Application Reference/Runbook. The sample program will include a master file and tailoring instructions so that a user becomes self-educated on the tailoring and search programs and procedures.

CUSTOMER RESPONSIBILITIES

IBM may provide marketing assistance, in accordance with the Marketing and Service Guidelines in the GI section, in the installation of IBM licensed programs. However, the responsibility for providing accurate ordering information, personnel selection and training, installation, and continued day-to-day operation lies solely with the customer.

SPECIFIED OPERATING ENVIRONMENT

Support will be provided for this licensed program when it is operated in the following specified operating environment:

HARDWARE REQUIREMENTS

The minimum system configuration for WSF/34 application is an IBM System/34 with:



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PROGRAM PRODUCTS

WSF/34 (cont'd)

- IBM 5340 System Unit with Diskette 1 drive, 8.6 megabytes of disk storage and 48K (mdl B11).
- One system printer, either line printing at 160 lines-per-minute, or serial printing at 40 characters-per-second.
- One IBM 5251 Display Station (mdl 11)

SOFTWARE REQUIREMENTS

The WSF/34 application programs are written in IBM System/34 RPG II programming language and execute under control of the IBM System/34 System Support Program (5726-SS1, Release 2, Release 3 required for 960-character display support). IBM System/34 Utilities Program Product (5726-UT1), which includes Sort, Data File Utility, Source Entry Utility, and Workstation Utility, is required for execution of the programs. The IBM System/34 RPG II Compiler (5726-RG1) is also required.

DOCUMENTATION

(available from Mechanicsburg)

Executive Brochure (G580-0212) .

RPOs ACCEPTED: No

TERMS and CONDITIONS: See PP Index