



PROGRAMMING RPQ

**IBM EMULATOR FOR RCA 301
On S/370 Using DOS and DOS/VS
5799-ADR (PRPQ P810002)**

PURPOSE

This program provides emulation of RCA 301 systems on the S/370 mdls 135 and 145. CPU operations are provided for, or assisted by, microprogramming. I/O operations are simulated with DOS. This program is available under VM/370. For additional information, consult *IBM Emulator for RCA 301 on System/370 Using DOS and DOS/VS* (GA24-3605).

PREREQUISITES

One of the following no-charge RPQs must be selected:

For the 3135:

S00118 - Emulate RCA 301. Control Storage Requirement -- 4,400 bytes.

For the 3145:

S00119 - Emulate RCA 301. Control Storage Requirement -- 6,000 bytes.

LICENSE

The *License Agreement for IBM Program Products* does not provide the customer with a license to emulate programs in which third parties have or may have copyright or other proprietary interests.

Customers should be advised that programs they have obtained from third parties may require a license from the third party for use on the IBM system.

PROGRAMMING RPQ

**VANCOUVER DATA LANGUAGE-ONE
VANDL-1 (5799-AEY)**

PURPOSE

VANDL-1 is an entry data base management system for the DOS user. A compatible subset of DL/I DOS/VS and IMS - DL/I (except for RPG-II programs), VANDL-1 has been designed to provide both a batch data base processing capability as well as operate within the teleprocessing environment of CICS DOS-Entry and CICS DOS-Standard. The DOS user can now begin data base and application program development with VANDL-1 in preparation for installing DL/I DOS/VS.

HIGHLIGHTS

- VANDL-1 runs in a user program partition under the Disk Operating System (DOS or DOS/VS).
- VANDL-1, operating under DOS/VS, allows smooth migration to DL/I DOS/VS.
- Application programs are upward compatible to DL/I DOS/VS and IMS DL/I (except for RPQ-II).
- Online applications may access VANDL-1 data bases through an interface to the Customer Information Control System (CICS DOS-Entry or DOS-Standard).
- VANDL-1 includes three data file organizations: HSAM, HIDAM and HISAM.
- VANDL-1 supports hierarchical file structures of up to eight levels.
- VANDL-1 requires a minimum of additional core in the user partition (8-10K for two data files for batch, 8K for online).
- User programs may be written in Assembler, COBOL, PL/I or RPG-II.
- VANDL-1 supports files on tape, and on direct access storage devices, such as 2319, 3330 and 3340.
- VANDL-1 application programs are data- and device-independent.
- Data base maintenance is performed by the VANDL-1 utility program.
- Application program access to data is controlled externally to the application.
- Data bases are opened and closed automatically by VANDL-1.

DESCRIPTION

PROGRAM STRUCTURE

The following kinds of program modules are combined in a VANDL-1 application program:

- Application Program: Contains DL/I calls to the VANDL-1 modules.
- Program Specification Block (PSB): Identifies each VANDL-1 data base used by application program, and describes how each can be processed by this program.
- Data Base Definition (DBD): Describes the physical data base structure, the file organization and the device on which the data base resides.
- VANDL-1 Processing Modules.

These modules are stored in a relocatable library and are combined by the linkage editor, along with appropriate DOS IOCS modules, into an executable application program.

DATA AND DEVICE INDEPENDENCE

The separation of the application program from data base control logic allows both data- and device-independence.

Data-independence means:

- Adding new types of data to existing data bases with no application program recompile.
- Optimizing system performance by varying record size, blocking factor, space allocation and access method with no application program recompile.
- Every program refers to the same data by the same name.
- Reduced programming maintenance due to changes in existing data format.

Device-independence means:

- Data bases can be moved from tape to disk access methods with no application program recompile.
- Device changes from 2400 to DASD devices, such as 2319, 3330 and 3340 for any combination of these, can be made with no application program recompile.
- Simplified testing - e.g., testing tape programs using DASD eliminating tape mounting, with no application program recompile after testing is done.

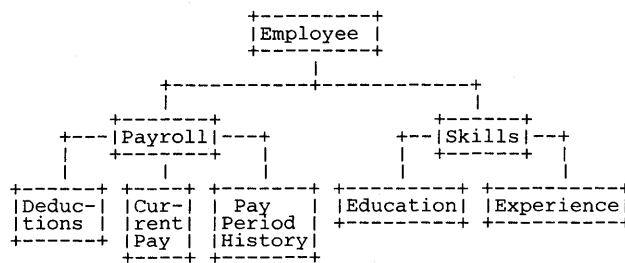
PROGRAM EXECUTION

VANDL-1 acts as an interface between the application program and the DOS data management routines. It is actually the main program in the DOS partition; the user-written COBOL, PL/I, RPG-II or Assembler program is treated as a subroutine.

The application program communicates with VANDL-1 via the Data Language/I (DL/I) interface. Program requests provide for reading, deleting, adding and changing segments in the data base. (A segment consists of one or more logically associated data fields, and is of fixed length.) Feedback information is provided by VANDL-1 after every call indicating successful or unsuccessful completion, plus complete identification of the data base segment retrieved or processed.

HIERARCHICAL STRUCTURES

Hierarchical structures are a way of representing the dependencies within segments associated by a single identifying piece of information, for example, employee number. Dependent segments for an employee might include such information as age, dependents, current pay and pay history, and skills inventory, as shown.



Hierarchical data structures allow variable length data base records by supporting zero to n occurrences of segment types, such as pay period history records, or deductions.

DATA BASE ORGANIZATION

VANDL-1 provides three data base organizations for application data, all based on a hierarchical structure of data segments.

- Sequential (SEQ): Data base segments are stored in physical sequence in undefined length records. This organization may be used for both tape and disk files which are processed sequentially in the batch environment.
- Indexed Sequential (ISAM): Data base segments are end-to-end in fixed length records in a DOS ISAM file. This organization is for disk files which are processed sequentially and randomly in both the batch and the online environment.
- Indexed Direct (DAM): The data base root segments are stored in a DOS ISAM file. The remainder of the segments are stored in one or more blocks in a DAM file. This organization is for disk files which are processed randomly in both the batch and the online environment.

UTILITY PROGRAMS

An easy-to-use facility is provided to generate utility programs which dump, restore, copy and reorganize VANDL-1 data bases. Like application programs, each utility program generated is used for a specific data base. At the end of each run, statistics on the data base are printed.

ONLINE ENVIRONMENT

The CICS interface module provided with VANDL-1 allows VANDL-1 ISAM and IDAM data bases to be processed by CICS application programs written in COBOL, Assembler or PL/I. The CICS application program issues DL/I calls to the VANDL-1 module to process VANDL-1 data base records. All functions available in a batch environment are provided in the online version except for the loading of data bases, the insertion and deletion of segments in a data base, and the use of RPG-II application programs. To preserve the integrity of the data base, simplify the support program required to maintain the online data base, and minimize online core storage requirements, these functions are not allowed in the online environment.

Record insertion and deletion may be done by accumulating the affected records or segments in a *change* file and inserting and deleting these segments in the data base at a later time using batch update mode. The online update capability may also be used to *insert* data into existing records in a data base by sorting data in *empty* segments which were created during the data base load. Segments may be *deleted* by use of a user-implemented convention.

CICS controls access by multiple message processing programs to the same data, so that a single data base can *concurrently* be updated by any number of message processing programs.

PROGRAMMING RPQ

VANDL-1 (cont'd)**CUSTOMER RESPONSIBILITIES**

The user of VANDL-1 has two primary responsibilities:

- The development of the data processing application that uses VANDL-1. This includes application programs, as well as creating backup and recovery programs using the utility function.
- The structuring of the data processing environment: Data bases ... processing programs ... CICS as the teleprocessing support for message processing programs.

SPECIFIED OPERATING ENVIRONMENT**HARDWARE REQUIREMENTS**

The minimum partition for VANDL-1 batch operation under DOS is 14K. A typical partition size for batch operation is about 30K.

The configuration must include sufficient I/O devices to support the DOS requirements for system console, system input, system output, system residence and system data sets. Sufficient direct access storage must be provided to hold the VANDL-1 macros, relocatable modules, and user data. This storage may consist of 2311 Disk Storage Drives, 2314 Direct Access Storage Facilities and/or 3330 Direct Access Storage Facilities and/or 3340 Direct Access Storage Facilities. Tape drives are used only as required for user data (9-track drives or 7-track drives with Data Conversion Feature).

Distribution and service of the VANDL-1 system requires the availability of one 9-track or one 7-track (with Data Conversion Feature) tape drive.

The minimum partition required for teleprocessing access to VANDL-1 data bases is the same as the CICS minimum configuration, assuming adequate space in the *remaining storage* area for the VANDL-1 interface module of 8K, plus additional dynamic storage for each message processing program.

SOFTWARE REQUIREMENTS

VANDL-1 operates under the control of the IBM Disk Operating System (DOS), or DOS/VS, where it can run either V=R or V=V. The following components of DOS are required for batch operation:

Resident Supervisor:

(2311/2314/3330/3340) 370N-SV-495
(2311) 360N-SV-474
(2314) 360N-SV-468

System Control and Basic IOCS, 360N-CL-453 or 370N-CL-453
Assembler, 360N-AS-465 (14K variant) or 370N-AS-465, or

Assembler F, 360N-AS-466

Utilities Group 1, 360N-UT-461, or System Utilities, 370N-UT-491 for 3330

Utilities Group 2, 360N-UT-462

Consecutive Tape IOCS, 360N-IO-456 or 370N-IO-456 (if tape on system)

Consecutive Disk IOCS, 360N-IO-455 or 370N-IO-455

Index Sequential Disk, 360N-IO-457 or 370N-IO-457

Direct Access Disk, 360N-IO-454 or 370N-IO-454 (for IDAM files only)

The Disk Operating System/Virtual Storage (DOS/VS), 5745-010, may be used instead of the DOS components listed above.

Application programming may use Assembler, COBOL, RPG-II or PL/I (Optimizing Compiler).

In addition to the above DOS components, the user may require one or more of the following:

ANS COBOL (360N-CB-482)

COBOL (360N-CB-452)

ANS COBOL Compiler (DOS) (5736-CB2)

ANS COBOL Library (DOS) (5736-LM2)

ANS COBOL Subset Compiler (DOS) (5736-CB1)

PL/I Optimizing Compiler (DOS) (5736-PL1)

PL/I Resident Library (DOS) (5736-LM4)

PL/I Transient Library (DOS) (5736-LM5)

RPG-II (5736-RG1)

VANDL-1 operates within the teleprocessing environment of the Customer Information Control System (CICS) Version 1.1 or subsequent versions: CICS DOS-Entry (5736-XX6), or CICS DOS-Standard (5736-XX7).

All programming systems required for batch operation of VANDL-1 apply to teleprocessing, except RPG-II. RPG-II users planning to migrate from VANDL-1 to DL/I DOS/VS or CICS/DOS/VS should be informed that only COBOL, PL/I and Assembler programs are upward compatible. See the CICS reference manuals for specific requirements of CICS.

FILE INTEGRITY AND RECOVERY

VANDL-1 uses the integrity and recovery services provided by DOS. Since VANDL-1 runs in the same partition as the user application

program and CICS, it is vulnerable to errors in these programs. Abnormal batch user program terminations are intercepted by VANDL-1, to ensure that data base files are closed properly. CICS intercepts program abnormal terminations during online operation.

Control of multiple updates of the same data is provided by CICS for the online environment. Proper scheduling of update programs is required in the batch environment.

APARS: Send APARS to:

IBM Germany
Program Product Center
APAR Processing
7032 Sindelfingen
Schwertstr, 5860 Germany@SS@

PROGRAMMING RPQs

**TERMINAL QUERY FACILITY for SYSTEM/3 (TQF/3)
5799-AJR, 5799-AQZ, and 5799-AJT**

PURPOSE

The System/3 Terminal Query Facility is a customized program (RPQ P84004) that offers a terminal-oriented query facility to users of System/3 mdl 10 (5799-AJR), mdl 12 (5799-AQZ), and mdls 15A, 15B, and 15C (5799-AJT).

DESCRIPTION

The TQF/3 program (written in RPG II) enables the user to formulate and enter his information request directly into his System/3 via a 3270 Information Display Station. This information request is a complex inquiry and is characterized by the examination of a standard System/3 disk data file instead of a data record. Interactive, fill-in-the-blanks prompting is provided to facilitate the entering of correct query parameters. The query is then processed against the appropriate file and the results written to disk. Facilities are provided to print the results on the system printer and/or to send the formatted output back to the requesting executive via the 3270 Information Display System for review by the requesting executive.

TQF/3 is executed in three phases. The first phase requires the information requester to call, under control of the Communications Control Program (CCP), the program which formats and edits the query parameters. The second phase is a batch processing of these parameters against the appropriate file. This second phase will normally be executed whenever other batch jobs are run on the System/3. If DPF is installed on the System/3 model 10 or 12 or if there is a batch partition on the System/3 model 15, the second phase can be executed while CCP is in operation. Normally, on the System/3 model 10, the batch processing will occur when CCP is not up, either at night or at specified intervals during the day. If the information user has elected to have his output directed to the terminals, the third phase is another task which, under CCP, will display the query results at the requester's 3270 Information Display System.

HIGHLIGHTS

- The user is prompted by TQF/3 to enter his query using a fill-in-the-blanks approach. Each entry is validated to assure that the query can be executed.
- The user may select information based on the logical relationships of equal (EQ), not equal (NE), less than (LT), greater than (GT), less than or equal to (LE), and greater than or equal to (GE). The comparisons can be between different data fields in a record or between a data field and a constant. Multiple comparisons, up to nine relationships, may be made through the use of 'and/or' logic.
- A related disk data file may be designated at installation time. Information from this file is available to be printed and may be used in arithmetic computations. This function is intended for users who have split their files, resulting in critical data being stored in two data files (e.g., a balance file and a name and address file). This physical separation of data is transparent to the user while entering a query using TQF/3.
- The user may specify an arithmetic operation on any two numeric data fields in a record. Addition, subtraction, multiplication, and division are supported.
- The user may request that totals be accumulated for designated fields. He may also request subtotals of these fields based on a change of the first data field to be printed/displayed.
- The user may specify the sequence in which he wishes his output. Up to 12 field names may be designated with the first one being the most significant for sequencing. Either ascending or descending sequence may be chosen for each of the fields independently.
- During the interactive entry of a query, the user may choose to have his output directed to the line printer, back to the terminal, or both. If he should elect terminal output or later (during output) change his mind, he can then request output to the line printer. If he has a terminal printer attached to his 3270 System, he may copy any or all screens (at his choice) during the terminal output phase.
- Report output is automatically formatted to present the individual data fields in the order in which the user requests them and with identifying column headings.
- A count of the number of records selected by the user's query is automatically provided.
- The user may page forward or backward to review all output display screens as often as he wishes during the output phase.
- The user is required to enter a unique title which will be printed/displayed at the beginning of his report.
- Only authorized personnel can retrieve information from confidential files. Confidential fields within a file can be made secure with encrypted names.

Use: TQF/3 can be used in a wide variety of applications requiring analysis of System/3 disk data files not answered in standard computer reports.

Every industry and customer where management has a requirement for current information reflecting changing relationships dictated by day-to-day needs are potential users of TQF/3.

CUSTOMER RESPONSIBILITIES

The customer must make CCP assignment runs ... choose the files into which the user will query ... create the Data Element Dictionary, in accordance with the *Program Description/Operations Manual*, describing the elements (fields) in the records of the chosen files ... establish passwords for any secured files ... compile the programs and create the required files ... conduct demonstration/training sessions for information requesters.

The *Program Description/Operations Manual* has details on installation and operation.

SPECIFIED OPERATING ENVIRONMENT

HARDWARE REQUIREMENTS

Note that a card I/O device is required.

The minimum configuration for the IBM System/3 model 10 (dedicated CCP System) is IBM 5410 Processing Unit (48K bytes) ... IBM 5444 Disk Storage Drive model 2 ... IBM 5203 Printer or 1403 Printer (with 5421 Printer Control Unit) ... IBM 5471 Printer-Keyboard ... IBM 5424 MFCU or IBM 1442 Card Read Punch ... Local Communications Adapter (LCA) or Binary Synchronous Communications Adapter (BSCA) ... IBM 3270 Information Display System (see below).

The minimum configuration for the IBM System/3 model 12 is IBM 5412 Processing Unit (64K bytes) ... IBM 3340 Direct Access Storage Facility ... IBM 5203 Printer or 1403 Printer (with 5421 Printer Control Unit) ... IBM 5471 Printer-Keyboard ... IBM 5424 MFCU or 1442 Card Read Punch ... Integrated Communications Adapter (ICA) or Binary Synchronous Communications Adapter (BSCA) or Local Display Adapter ... IBM 3270 Information Display System (see below).

The minimum configuration for the IBM System/3 model 15A (dedicated CCP system) is IBM 5415 Processing Unit (64K bytes) ... IBM 5444 Disk Storage Drive model A2 ... IBM 1403 Printer (with 5421 Printer Control Unit) ... IBM 3277 Display Station (system console) ... IBM 5424 MFCU or 2560 MFCM or 1442 Card Read Punch ... Local Communications Adapter (LCA) or Binary Synchronous Communications Adapter (BSCA) or Display Adapter ... IBM 3270 Information Display System (see below).

The minimum configuration for the System/3 model 15B is the same as for model 15A, except that an IBM 3340 Direct Access Storage Facility is used instead of a 5444 Disk Storage Drive.

The minimum configuration for the IBM System/3 model 15C is the same as for model 15B, except that the minimum IBM 5415 Processing Unit is 160K bytes.

3270 Requirements: In each System/3 configuration, at least one display station of a 3270 Information Display System is required. Program function keys 1-5 are required on 3275/3277 Display Stations (available on keyboards 4631, 4632, 4633, 4635, and 4636).

All terminals in a system using TQF/3 must be the same model (model 1 or model 2); they can be 3277 Display Stations and/or 3275 Display Stations. In addition, 3284, 3286, and 3288 Printers are supported for printing display screens.

TQF/3 allows only one terminal at a time to enter queries; as soon as one terminal is finished with a query request, another terminal can load and use the Query Entry Program.

Additional Devices Supported: Additional devices supported include IBM 5445 Disk Storage (models 10 and 15A), IBM 5448 Disk Storage Drive (model 10), and multiple terminals (including printers) on the 3270 Information Display System.

Main Storage Requirements: If the user chooses to run programs in a dedicated operating environment, a 48K System/3 model 10, or a 64K System/3 model 12 or 15 is required. A multiprogramming environment requires: (1) a 64K System/3 model 10 (RPQ), (2) at least a 64K System/3 model 12, or (3) at least a 96K System/3 model 15.

Each TQF/3 task run under CCP requires 16K with overlays on the model 10 or 12, and 18K with overlays on the model 15. Additional requirements in the CCP user program area are for Display Format Facility (DFF) and its related areas (approximately 6K). The programs TQFB01 and TQFB02 operate in an 18K partition (or program level) using overlays.

SOFTWARE REQUIREMENTS

The TQF/3 programs are written in RPG II. To use TQF/3, SCP, RPG II compiler, disk sort program, and CCP (using the Display Format Facility, DFF) are required, as shown below. In addition, 5799-AJR requires the BSCA Multiline/Multipoint Features of the SCP.



PROGRAMMING RPOs

TQF/3 (cont'd)

	Model 10	Model 12	Model 15 A, B, C
TQF/3	5799-AJR	5799-AQZ	5799-AJT
RPG II	5702-RG1	5705-RG1	5704-RG1
Disk Sort	5702-SM1	5705-SM1	5704-SM1
5445 feature*	#6012/14	N/A	N/A
SCP	5702-SC1	5705-SC1	5704-SC1
CCP feature	#6033	6070/71	6033/70/71
ML/MP feature	#6030/31	N/A	N/A
5445 feature*	#6022/23	N/A	N/A
5448 feature*	#6074	N/A	N/A

* Optional

DOCUMENTATION
(available from Mechanicsburg)

*Program Description/Operations Manual (SC21-5107) ... System/3
Bibliography (GC20-8080).*

PROGRAMMING RPQ

**PRINTTEXT/370
5799-ALR (PRPQ EF3414)**

PURPOSE

PRINTTEXT/370 provides high quality type composition, hyphenation, correction, and text data base management for newspapers, commercial printers, book and periodical publishers, as well as in-house publishers. An output device module generator is provided to aid the user in supporting a wide variety of photocomposers and linecasters for a flexible, yet cost effective solution to complex output requirements. PRINTTEXT/370 runs on a S/370 with 256K memory or larger supported by DOS/VS Release 31 and subsequent releases. Text input/output support is provided for magnetic tape, disk, diskette, card reader, card punch, and printers. The specific I/O devices are those supported by the DOS/VS PL/I Compiler and Libraries (5736-PL3). The 1017 and 1018 Paper Tape Reader and Punch are also supported. Support for CX* paper tape readers and BRPE* paper tape punches is provided via a channel attached System/7.

* Trademark of Teletype, Inc.

HIGHLIGHTS

- Management facilities required to maintain a large text data base system are provided. These facilities allow the input, correction, storage, and maintenance for a variety of text units in a complex production environment. A query facility for text header records permits the user to access and route copy as required. Complete backup procedures allow restoration of the data base in case of termination.
- Operational flexibility is provided by allowing users to uniquely specify how their jobs are to be processed. Multiple types of keyboards, text processing procedures, priorities, typographical values, and output devices can be requested for an individual job to optimize a user's total production requirement. In addition, PRINTTEXT/370 allows multiple input devices, multiple output devices, and composition processing to run concurrently.
- New techniques for increased operator productivity have been incorporated. Single key commands for text, Pi characters, formats, and commands reduce keyboarding requirements. Text composition and control commands can now be automatically executed based on the context of a job in process. Non-PRINTTEXT/370 data sets can be entered, composed, and typeset with little operator keyboarding required.
- High quality typesetting is achieved through an improved hyphenation (English language) module, user control of line justification values, kerning, and hanging punctuation functions. Vertical and horizontal justification calculations are made in the actual units of measure of each output device to ensure that typographic precision is limited only by the capabilities of the typesetting device.
- Correction facilities allow the user to add, change, or delete text and formats stored in the data base. Corrections are processed against groups of lines, individual lines, or words within a line. The Find and Replace command allows one character string to be substituted for another in the copy. Multiple proofing options are available to allow the user to specify the most expedient form for the type of copy processed. The interface of user-developed systems for online entry and correction of text is possible with PRINTTEXT/370.
- PRINTTEXT/370 is a table-driven system written in modular form under control of DOS/VS. This design provides great operational flexibility to the user and simplifies programming support.
- PRINTTEXT/370 with PRINTTEXT/370-Classified (5799-ALQ) can compose, update, sequence dump, and produce the necessary management reports for the classified advertising section of a large metropolitan newspaper. These operations can be executed concurrently with both news and display advertising processing.

DESCRIPTION

PRINTTEXT/370 provides input support from 1017 Paper Tape Reader, magnetic tape, disks, diskettes, and card reader; and can be provided from CX* paper tape readers on a channel-attached S/7. The keyboards used to create the input do not require the same layout and keyboard tables can be changed within the input text.

Output support is provided for 1018 Paper Tape Punch, magnetic tape, and line printer; and can be provided to BRPE paper tape punches on a channel-attached S/7. Input and output proof listings are available for corrections of the text and commands.

PRINTTEXT/370 provides disk storage buffering (spooling) of input and output to allow composition to proceed without always having to wait for a slower device. This function allows multiple input devices, multiple output devices, and composition to run concurrently.

Features: PRINTTEXT/370 is designed to provide the user with a comprehensive, yet flexible production system. Full use of the S/370 Advanced Functions permits users to tailor the system to their particular operating environment to enhance the use of system resources. Some of these features are:

- Multi-tasking of PRINTTEXT/370 application program modules (processors) permits concurrent execution of multiple jobs allowing the user to service varied text-processing requests in a timely fashion.
- System Generation procedures permit the user to allocate resources to multiple users - individuals, departments, or enterprises - with each retaining full utilization of the system. New output scheduling and allotting techniques allow PRINTTEXT/370 to optimize output based on job priority, scheduled machine workload, physical device characteristics, and user requests. An output hold queue is maintained for work requests that cannot execute due to unavailable devices.
- Security provisions are provided to allow the user to protect key text records as well as designated system functions. Logging of key functions provides an audit trail of the respective users.
- Data sets from a non-PRINTTEXT/370 system can be input through any DOS/VS device supported by PL/I. String processing character commands are now available that allow the user to read, manipulate, and format data into typeset output.
- Query facilities allow the user to extract header and control information from each user-defined segment of in-process copy regardless of its source. Requests for information can be searched based on the following values:
 - equal
 - not equal
 - less than
 - less than or equal to
 - greater than
 - greater than or equal to
 - OR, AND, NOT and exclusive OR

These values can be applied to text header and control information such as entry date, status, column measure, composed depth, number of lines, source, destination, and kind of copy. Once the appropriate text records are found, they can be listed on a systems printer, or automatically routed to another PRINTTEXT/370 process.

A Device Module Generator that permits the user to develop the operating code for various typesetting devices. By specifying the unique operating characteristics of an output device, the Device Module Generator creates a source deck for an individual device. User modification may be required to tailor the code to the specifics of this device. This feature allows the user to use existing equipment and to install newer, more advanced typesetting devices without extensive programming expense.

Of equal importance is the capability to control typographic quality and improve productivity through the use of text commands.

Keying Commands

- Multiple user-defined keyboard layouts allow for optimum use of existing entry equipment as well as introduction of new devices with no reprogramming required.
- A wide range of single-key commands specified by the user allow for decreased command keying requirements - single keys can be defined for commands, formats, commands with data, and commands for data.
- Data values can be of a variety of types, and intermixed on one system; picas, points, ems, inches, units, ciceros, and millimeters can be specified.
- Arithmetic operations can be performed on command data and variables to permit the user to control text composition based on the results of an arithmetic operation. Add, subtract, multiply, divide, larger, smaller, reverse subtract, and divide are the operands that can be used during text input.
- Increased use of variables and system data items simplify both mark-up and keyboarding requirements. Users can define the number of variables that they require - private as well as "public". Indirect referencing of variables provides a new dimension to solving complex mark-up requirements.

Justification: The system can use three different methods to justify a line:

- Expansion of interword space. If expansion is within the appropriate user-specified value, then this is the only technique used.
- Hyphenation is attempted when the interword space is excessive and the user-specified requirements for hyphenation can be met.
- Letterspacing, the last method tried, is attempted if interword space exceeds a user-specified value.

Justification calculations are always performed in the exact units of the output device eliminating loss of typographic precision in the typeset line.

PRINTTEXT/370 (cont'd)

Interword Space: As part of a font description, several interword space widths can be specified, such as:

- **PREFERRED WIDTHS.** Various widths may be designated for automatic use in different types of lines - for example, quadded, ragged, last line of paragraph.
- **TIGHT WIDTH.** This space width is the minimum width for justified lines. If a quadded line cannot fit using the normal space, then the system will switch to this smaller width and attempt to fit the entire line.
- **VERY TIGHT WIDTH.** On short lines, the system will switch to this space width in an attempt to place at least two words on a line.

Hyphenation: The user specifies when hyphenation is to be attempted based on:

- Maximum interword space
- Number of letters in a word
- The minimum number of letters on each line
- Number of letters before/after a text-supplied hyphen
- The maximum number of consecutively hyphenated lines
- Punctuation placement in a numeric word.

The last word of a paragraph will not be hyphenated if interword space does not exceed a user-specified value. The language has commands to ensure proper hyphenation of homographs and to allow and disallow any hyphenation attempts.

Hyphenation can handle words up to 50 characters in length. The hyphenation program uses suffix analysis, probability analysis, and an exception-word dictionary. The user can add his own words to the supplied dictionary during normal operations. Access to user-supplied hyphenation modules and/or dictionaries is provided. The size of the dictionary is changeable by the user.

Letterspacing: The user may specify:

- Letterspacing entire lines
- Entire line or partial line
- Letterspace for emphasis
- No letterspacing.

The user may also specify:

- When to attempt letterspacing
- The width of a letterspace
- The maximum number of repetitions of letterspacing widths in a line.
- The balance between interletter and interword space.

Also, the user can force letterspacing to be applied to a quadded line.

A ligature on a line will prevent letterspacing.

Ligatures: Ligatures are combined automatically if the font has ligatures and the user has not canceled ligature processing.

The ligatures may be on a different face from the one which caused the invoking of the ligature.

Even though a word is hyphenated, any eligible ligatures will be combined on both halves of the word.

A line with ligatures will not be letterspaced.

Automatic Pi Characters: Characters on a Pi device or on a normal face arrangement, but treated as Pi, can be specified with one keystroke. The system will automatically perform any necessary changes away from and back to the current font.

Multiple-Character Sequences: Some graphics may require several characters to be set. Some examples are fractions and superior numbers which are not directly on a font. The required sequence of output codes can be produced from a single keystroke.

Quadded Lines: Lines can be quadded left, right or center. The interword space in quadded lines will be nearly equal to the space used on justified lines. The user can force letterspacing to be used in quadded lines.

Another feature of the system is its ability to select the largest point size which will fit a quadded line into the given column measure. It is also possible to let the system select the column measure for a given point size. When the width of a quadded line is very close to the width of the measure, the system can change the quadded line into a justified line.

Ragged Copy: Copy can be set with one or both margins ragged.

The degree of raggedness can be varied widely by the user.

Ragged center lines can be offset from center.

A separate value is specified by the user to control any hyphenation attempts on ragged copy.

Extra Lead: Extra lead - either forward or reverse - can be specified at any time although the results will differ depending on the capabilities of the output device.

The system will allow the user to specify more leading than the device can perform in one motion in which case the system will generate multiple motions.

Extra leading can also be automatically inserted between paragraphs.

Fixed Space: Fixed space characters can be inserted with a single keystroke whether or not the font has a quad of that width.

Fixed space can also be specified in a command in terms of printer's measure, device units, variables, or as determined by the width of text.

Face/Font: The system has several ways to specify face selection on an output device:

- By face number - user-specified face numbers for each family of devices.
- By normal or alternate commands - these are similar to on and off the rail on a linecaster but apply to all devices.
- By assembly number - an assembly is one or more faces. It can be a disk, a grid, a magazine, or a row on a disk, for example. An assembly change can be specified with a single key.
- The system can automatically change fonts depending on point size.
- The system distinguishes between the widths of a set of characters and the concept of face or font. The system thus permits the user to specify different fonts which share the same width but differ in justification characteristics.

Logical Font: Users may define a font as any set of characters that are accessible on their typesetting device. Once defined, they may refer to them without regard to their physical location.

Paragraph Control

Indentions: There are left and right indentions available for the first line, hang lines, and all lines of the paragraph.

Extra Leading. Automatic extra lead can be specified for placement between paragraphs.

Hyphenation: The last word of a paragraph will not be hyphenated if interword space will fit within user-specified widow limits.

One-Line Fit: The language features a command to set a quadded line using the maximum point size that will fit in the measure. The system-selected point size is available for use in later lines as a fixed point size to ensure uniform copy.

Format Control and Definition: The format capability of PRINTTEXT/370 lets the user store repetitively used commands and text for later retrieval with one or more keystrokes.

The system has storable formats with merge copy capabilities. The user specifies how many formats will be on the system and how many of them will be protected from being changed.

The system allows two levels of formats - a format can call another format. When the second-level format is complete, it returns control to the first level format at the point of original call.

When a format is called, the user can also specify values for variable data. Without this feature, one might need ten formats which differed only in point size. With this feature, one format is required in which the point size would be variable.

The language has a command to force end-of-format. This feature provides good copy even when keying errors would otherwise cause complete loss of synchronization with the controlling format. This is very important in key-boarding tabular and other repetitive types of copy.

Formats can be called automatically when certain events occur, such as:

- Beginning-of-character, word, line, paragraph, short
- At a specified depth
- At end-of-character, word, short.

Text for a format can be stored at execution time. This allows copy to be output in a sequence different from the keying sequence. Large initial characters become simple to set with this feature.

A format can be called with a single keystroke or with a shorthand notation that eliminates the requirement for the UF mnemonic.

Leading: Some devices apply leading only after a line is set while others apply leading before a line is set. Often this affects the way in which copy is marked up. With PRINTTEXT/370, however, the user can specify that mark-up leading will be applied before or after the line regardless of how the output device works.

Another feature of the language causes the system to automatically calculate leading. This calculation is performed, for example, by taking one third of the largest point size of the previous line, adding two thirds of the largest point size of the current line, and finally adding a user-specified clearance to determine the leading.

PROGRAMMING RPQ

PRINTTEXT/370 (cont'd)

When in automatic mode the user can temporarily override the feature by specifying the desired amount of leading.

Skews: The system provides skewed indents on either or both margins.

Up to five patterns of skewing can be defined in one command. These definitions can be in terms of the width of text or any other variables.

Indents: There are several forms of indentation, all of which can be used alone or together. These indents are:

- First line of a paragraph
- Hang
- Paragraph
- Take
- Controlled by depth
- Set by position of text
- Indent step for outline reports

Any indentation can be set for a width determined by the width of text. Any indentation can be specified with a variable.

Insertion of Leaders and White Space: A single keystroke can be used to place leaders or white space in a line quadded from the middle.

It is possible to place leaders and/or white space at more than one place in a line.

Tabbing: The system has a complete set of tabbing features for a variety of output devices.

Tab stops can be set at known locations, at proportional locations, at locations determined by the width of text, or at variable locations. Different lines can use a different set of tab stops.

Text can be tabbed left, right, or center of tab stops, or between two tab stops. Unused tab stops can be jumped by a single command.

The space between tabbed text can be filled with white space or leaders.

SPECIFIED OPERATING ENVIRONMENT**HARDWARE REQUIREMENTS**

PRINTTEXT/370 is designed to operate in one partition of a DOS/VS system. The tasks of this partition - input, composition, output, etc. - can operate concurrently within the partition. This concurrent operation, combined with the virtual storage facility of S/370, can provide efficient utilization of the S/370 resources. Thus, the user's copy volumes and peak composition throughput will govern the amount of computer resources including real storage needed to operate PRINTTEXT/370.

The minimum requirements are a DOS/VS partition with access to at least 176K bytes of real storage in the page pool. In addition, sufficient real storage must be provided for (a) DOS/VS supervisor with multi-tasking and VSAM options, and (b) Virtual Storage Access Method.

- A virtual storage S/370 with 256K memory operating under DOS/VS.
- One 3330 or 3340 Direct Access Storage Facility over that required by the DOS/VS system.
- 5213 Console and Console Attachment.
- Any card reader supported by DOS/VS under PL/I.
- 3203 Printer and Printer Attachment (used for system generation, maintenance, and PRINTTEXT/370 messages and text listings), or any line printer supported by DOS/VS under PL/I.

PRINTTEXT/370 was designed to support the following input/output devices:

Input:

- IBM 1017 paper tape readers
- IBM magnetic tape
- IBM magnetic disks, diskettes
- IBM card reader
- CX paper tape readers via channel attached S/7*

Output

- IBM 1018 paper tape punches
- IBM magnetic tape
- IBM magnetic disks, diskettes
- IBM printer (A T/N print chain with upper and lower case characters and the UCS feature are recommended but not required.) BRPE paper tape punches via channel attached S/7.*

* Use of CX readers and BRPE punches require a S/7 mdl A8 or larger with the Channel Attach RPQ D08112 and the CX/BRPE RPQs D08009, D08031, D08032, PSH RPQ 5799-WBW, and PSH RPQ 5799-WCB.

The specific model of magnetic tape, disks, card equipment, and printer are those mdls supported by PL/I under DOS/VS.

SOFTWARE REQUIREMENTS

PRINTTEXT/370 is designed to operate under the control of the Disk Operating System with Virtual Storage (DOS/VS) beginning with Release 31. PRINTTEXT/370 is written in PL/I and Assembler language. The Virtual Storage Access Method (VSAM) is the file management system. Installation requires the DOS/VS PL/I Compiler and Libraries (5736-PL3). The S/7 application support is written using the S/7 Host Program Preparation Facilities II (5747-AF1). The XC/BRPE reader/punch support is provided by PSH RPQ 5799-WBW and the S/7 channel attach support is provided by PSH RPQ 5799-WCB.

DISK REQUIREMENTS: To estimate disk space, assume that 400 stories, 1,825 characters in average length, will require approximately one million bytes of disk storage. Specific user requirements will depend on the type of disk storage selected.

INSTALLATION TASKS: PRINTTEXT/370 requires that the user specify operating values to the system. These values are recorded on worksheets supplied with the system. Such data as fonts and widths, printer graphics, and output codes must be specified by the user on these worksheets.

The specifications for the photocomposition equipment must be obtained. These specifications identify the codes required for various fonts, characters, spacing, leading, point sizes, and other special functions unique to the device. These specifications will then be input to the Device Module Generator. The generator accesses a library of routines that provide program source code to translate from PRINTTEXT/370 output to the unique codes required for an output device. Some additional programming may be required to support an individual device.

System Engineering Services are available at a charge to assist the customer with customizing the system to his particular needs. The amount of assistance required will depend on individual requirements.

MODIFICATIONS: PRINTTEXT/370 has been designed to be individually customized to the user requirements by using the worksheets provided. It is recommended, however, that users become thoroughly familiar with the PRINTTEXT/370 before attempting modifications.

COMPATIBILITY

PRINTTEXT/370 is an extension of and is upward compatible from the 1130 Copy Composition (FDP 5798-ADF). The 1130 Copy Composition System formats and customizing tables can be used with little modification.

DATA SECURITY and AUDITABILITY

Security provisions are provided to allow the user to protect key text records as well as designated system functions. Logging of key functions provides an audit trail for the respective users.

PROGRAMMING RPQ

**GENERALIZED INFORMATION SYSTEM
DOS/VIRTUAL STORAGE (GIS DOS/VS)
5799-ALX (PRPQ 8T0139)**

PURPOSE

GIS DOS/VS is designed to enable both non-programmers and programmers to extract information on a timely basis from a company's data base. This is possible through the use of a generalized high-level language which is easy to learn yet powerful enough to handle complex multi-file data requests with extensive logic and computational requirements. In conjunction with DL/I DOS/VS (5746-XX1) or DL/I-Entry (5746-XX7), GIS DOS/VS provides an integrated information system with full use of the flexibility and power inherent in these data base systems. Non-technical users often can formulate their own data requests and enter them directly into the computer on a batch basis. Programmers can produce printed reports, required in production applications with a minimum number of statements. As a result, programmer work load and associated costs can be substantially reduced, and total turnaround time normally required for development, testing and execution of inquiry and reporting programs can be drastically reduced.

DESCRIPTION

Implementing a particular application ordinarily entails coding multiple programs and the JCL to run them. During program development, program specifications often change, requiring modification of program logic. Once implemented, system requirements usually prove unstable. Additional programs are required to extend capabilities: Revised coding is necessary to produce reports not anticipated when the application was initially defined. This changing operational environment imposes significant demands on programmers to update existing programs. To implement GIS DOS/VS, the data base administrators initially describe the fields in their data bases much as they describe their data base to DL/I. These descriptions expand the information about the data base required by DL/I to include such things as standard field headings to be used on reports and edit masks to be used when printing fields. The descriptions are processed by a program component of GIS DOS/VS, enabling the users to address the contents of their data bases by symbolic names. No longer must the user repeat, in every procedure, the size of each field, its unit, relative location and other data management parameters. When the users employ GIS to query their data bases, another GIS DOS/VS program component will first list and diagnose their procedures for validity, and then compile the procedure. The compiled procedure code may then be executed, using the JCL generated by GIS, to access data bases. The procedure source statements may be stored and, later, retrieved for reuse from the DOS/VS Source Statement Library by the facilities of POWER/VS.

A design provision enables a GIS DOS/VS installation to invoke restrictions on the accessibility of sensitive data (see the sections on Data Security and Branch Office Responsibilities).

In summary, GIS DOS/VS is a data base information retrieval system designed for use in cross-industry applications. The system's design provides for a dynamic operational environment.

GIS DOS/VS justifies a S/370 - 3330/3340 upgrade and can help to sell either DL/I DOS/VS or DL/I-Entry DOS/VS.

HIGHLIGHTS

GIS DOS/VS offers the following facilities:

Basic Query: Permits the user to formulate queries on a batch basis for processing against DL/I data bases. The user has the ability to temporarily hold, re-sequence, and list data in a report format. Symbolic arithmetic functions may be performed within a program.

Formal Report: Supports the generation of report programs within a GIS DOS/VS procedure. This feature enhances the LIST capability by permitting the specifications of a title page, page headers and trailers, summary lines conditioned on end-of-data and/or control field breaks and detailed lines, all with the flexibility to control the horizontal and vertical spacing of the printed output.

Control Statements: Permit scanning of data fields, generation of procedure-testable switches, and additional comparison operators for detecting increase or decrease of a field and absent or empty state of a field.

Arithmetic Statements: Providing arithmetic verbs: INCREASE, DECREASE, MULTIPLY, DIVIDE.

Processing Statements: Provide totaling, counting, averaging and count of unique occurrences of data with both automatic and user-controlled output.

USE: The users must generate their DBDs, and PSBs, and build their data bases. They then describe their data bases to GIS DOS/VS as they appear to DL/I, a process which need not be repeated unless the data bases change. These descriptions become permanent reference tables in secondary storage. Now, they may query their data bases by a series of procedure statements, entering them with or without transaction data to select, retrieve and manipulate data residing in the data bases.

DL/I data bases are only described to GIS DOS/VS once; thereafter, the contents of these data bases are addressed by the user-assigned names given in this description. The user need not restate such parameters of the data base as field lengths and units, location within segment, field output patterns, and data management parameters. Entire data bases also have symbolic names.

In addition to DL/I data bases, sequential files and VSAM Key Sequenced Data Sets may be processed after they have been defined to DL/I or SHSAM or SHISAM data bases (these must follow DL/I DOS/VS and DL/I-Entry DOS/VS blocking and byte-count rules). A user may access up to eight data bases in a single GIS procedure, and store data fields in sixteen different GIS work files to be sorted and displayed.

The GIS DOS/VS Queries run as Batch application programs. Thus, data bases not in use by other partitions, for example, an online partition, may be queried with the feature. The users may query multiple DL/I data bases in a single query.

They may also specify the format of their output reports, build an object library of GIS DOS/VS procedures, use arithmetic or logic capabilities, and present his output in a specified sequence.

GIS DOS/VS can substantially reduce the time, effort and cost required to design, program and debug a batch inquiry into a DL/I data base. This should effectively increase the scope of tasks which may be performed in a given period of time. Therefore, the implementation of complex, one-time information requirements becomes much more economically feasible.

CUSTOMER RESPONSIBILITIES

Customers planning to use GIS DOS/VS must have installed DOS/VS Release 30 or later, POWER/VS and either DL/I DOS/VS Version 1.1 (5746-XX1) with Command Code F ICR feature #5001, #5002 or #5003 or DL/I-Entry (5746-XX7) on their DOS/VS system.

Considerable attention should be given to pre-installation systems design and analysis. The choice of data organization and data base system will affect processing speed. The GIS DOS/VS PRPQ uses the data base functions provided by DL/I-Entry including secondary indexes. The GIS DOS/VS PRPQ takes advantage of the additional functions offered by DL/I DOS/VS to give expanded data base retrieval capability. (DL/I DOS/VS also supports the GIS language unary operators MAX, MIN, SUM, CNT and PRD.)

Customer systems programmers or data base administrators responsible for describing data bases to GIS DOS/VS require an in-depth knowledge of VSAM and sequential file organizations, DL/I data management organizations, and the data description language employed by GIS DOS/VS.

A PL/I or COBOL programmer who will use GIS for report-producing programs needs a working knowledge of the GIS language, and the way it interfaces to the installation's conventions for job execution.

Users within the customer organization who are not programmers should be provided with guidance on the use of GIS by the data processing department. A formal, in-house training program is recommended for these users.

GIS DOS/VS provides for data base level access controls and also gives a measure of field level access control where properly used (consult the *System Programmer's Reference Manual*).

SPECIFIED OPERATING ENVIRONMENT

HARDWARE REQUIREMENTS

Main storage in addition to that specified below is necessary for the VSAM and SAM access methods.

For Query compilation under DOS/VS, the normal working set is 60K bytes. 500K bytes of virtual storage (V=V) are required.

While the above dynamic main storage allocation does include space for all the necessary parameter tables to support multi-file operation, it does not guarantee successful compilation of a multi-file procedure. In addition to the parameter tables, sufficient memory must be available to concurrently hold the key Data Description Table (DDT) information for each file. A reserved area is included for this purpose. The actual space requirement for multi-file compilation is highly dependent on file complexity. The most significant factors to be considered are the number of files involved (including the number of unique field and segment names), the actual number of fields and segments, and the quantity of decode specifications, field redefinitions, and field security specifications.

Query execution generally requires an additional 90K bytes of virtual storage (V=V) in the partition in which it runs, over the storage requirements of DL/I DOS/VS or DL/I-Entry. The normal working set of GIS DOS/VS logic is 60K bytes.

Minimum essential I/O devices for GIS DOS/VS PRPQ system generation and operation include a system input unit, one tape unit, one



PROGRAMMING RQP

GIS DOS/VS (cont'd)

disk unit and a system output unit. For more efficient operation, an additional IBM 3330/3340 is recommended. These devices are in addition to DOS/VS secondary storage requirements and do not require dedication to GIS DOS/VS. Total secondary storage requirements depend on the size and number of user data bases.

SOFTWARE REQUIREMENTS

GIS DOS/VS programs are written in the DOS/VS Assembler language and require no further coding by the system user. GIS DOS/VS requires the components and options of the DOS/VS Operating System as required by DL/I DOS/VS or DL/I-Entry plus DOS/VS Release 30 or later, and POWER/VS.

PERFORMANCE CONSIDERATIONS

For special performance requirements, attention must be given to ensuring that adequate real resources (main storage, CPU computing capability, channels, DISC file arms, and so on) are available. To verify specific performance, benchmarking may be appropriate.

GIS DOS/VS operates under VM/370 under control of DOS/VS. This environment is intended for use in program development and testing, and other uses where performance is not critical. Operation under VM/370 Release 2, even with the Virtual Assist feature, may add significant additional CPU overhead. If your customer has specific throughput requirements under VM/370, you should plan to benchmark under VM/370 to ensure that any proposed configuration will meet the customer's performance needs.

PROGRAMMING RPQ

**APL SHARED VARIABLES (APLSV)
5799-AQC**

PURPOSE

APL Shared Variables (APLSV Version 3.0) is an interactive system designed to give rapid response to terminal users. APLSV Version 3.0 includes numerous enhancements to the APL language, supports OS/VS1 and VS2, and provides access to files and to the operating system via a general interface to processors outside APL.

HIGHLIGHTS

A "Shared Variable" Communication Facility: Providing, under program control, exchange of data between concurrent APL users or between an APL user and "auxiliary processors" outside APL.

Operating System File Access: An auxiliary processor called TSIO (included as part of the APLSV Version 3.0 package) gives the terminal user the ability to allocate new data sets or to read and write files, either sequentially or by direct access, in a variety of formats, or as APL arrays.

Support of 3270 Information Display System with the Data Analysis-APL Feature: 3277 Display Stations without the Data Analysis-APL feature may be used for applications which require only alphameric input and output:

- The 3270 screen is divided into two areas: One for input and one for output and logging.
- The user enters each line in the input area. When he presses the 'enter' key, his input is copied to the first free position in the output area. When the output area fills up, the user is given the opportunity to view and/or obtain a hard copy printout of the output area before proceeding.
- Attention is handled by use of the program attention keys.
- APL statements may only contain characters in the APL character set. Other characters may be used as data through character input and output.
- Line and frame recall facilities are provided.

OTHER HIGHLIGHTS

Modifications have been made to make APLSV Version 3 conform to the *APL Language Manual (GC26-3847)*.*

3350 and 3344 support is provided.

SMF accounting facilities are provided.

A new command CMD permits issuing of operating system commands from the terminal for system level programmers using TSIO.

Format and execute functions: Permit efficient conversion between character and numeric data, facilitating the reading of files and the preparation of formatted reports. APL statements generated as character arrays may be executed permitting "use by name" in function calls, or the use of conditional expressions without unnecessary execution.

Function representation and fixing: The definition of an APL function may be treated as a character array, or a character array may be "fixed" to create a new function. These facilities permit APL functions to create new functions, or to analyze, display or edit existing ones. A list of names used within a workspace, and classification of the use they serve is available, making possible functions for the automatic documentation or analysis of workspaces.

System Variables: Special variables, shared with the APL interpreter, are introduced to manage such parameters as index origin, tab settings, printing width, time-of-day, or accounting information. These are syntactically like other variables and, in particular, may be localized so that specific values apply only during execution of the function that sets them.

A latent expression is automatically executed when a workspace is loaded, and may be reset by an APL function, or localized. This permits instructions to be given, or work initiated or resumed, automatically without user intervention.

The scan operator provides an efficient way to state and to execute algorithms involving cumulative application of a function without iteration.

Extensions to certain system commands are provided, and certain aspects of system behavior (such as the handling of open quotes) are improved since APL/360. The syntax analyzer has been replaced by one using a table-driven algorithm, reducing interpretive overhead.

A simplified system interface reduces overhead and makes the system simpler to maintain and more efficient to run. The support of swapping devices has been extended so that more than one device can be used, and device types can be mixed.

* These changes do not affect APL programs, but serve to standardize commands and error messages. See *APLSV Version 3.0 Specifications (GH20-9102)* for details.

DESCRIPTION

APLSV Version 3.0 consists of four main parts:

- An APL Interpreter
- A Shared Variable Processor
- A Time-sharing Supervisor
- 3270 Display System Driver

Several service routines are provided:

- An auxiliary processor, TSIO, providing a shared-variable interface to the operating system, and permitting the reading and writing of files.
- A startup and initialization routine.
- The APLSV Version 3.0 utility, for library maintenance.

In addition, APLSV Version 3.0 workspaces are provided to illustrate the use of the language extensions, and to facilitate use of the TSIO auxiliary processor.

SPECIFIED OPERATING ENVIRONMENT

HARDWARE REQUIREMENTS

The System/370 must be configured subject to the considerations below.

Selector Channel Devices: For swapping and library storage, APLSV Version 3.0 supports 2314, 2319, 3330, 3330 model 11, 3340, 3344, 3350 and 2305 models 1 and 2.

An arbitrary number of devices may be used for swapping; these need not be of the same type. A maximum of 32 library data sets, each of which may be an entire module, is supported; library devices must be of the same type. A minimum of one swap data set and one library data set are required.

Storage Required: The recommended minimum region (or partition) for a ten-port APLSV system is 280K bytes if no 3270 terminals are defined and 330K bytes if all ten terminals are 3270s. This includes space for ten terminal control and buffer areas of approximately 600 bytes each, the minimum of two workspace slots at the APL/360 standard size of 36,000 bytes, and a 10K byte shared variable storage. A separate partition or region of 128K bytes is required for TSIO. The recommended minimum amount of real storage which should be available when APLSV is operating is 100K, assuming ten or fewer terminals are attached.

SYSGEN Considerations: Each teleprocessing line used in APLSV Version 3.0 must be included in the generation of the operating system with the IODEVICE macro. APLSV makes continuous use of one RQE for each terminal line. One user Type 1 SVC (with local and cross memory locks for MVS) must be available for use by APLSV. BTAM must be included in the generation of the host system. For full installation details, see the *APLSV Operations Guide (SH20-9088)*.

Transmission Control Unit and Terminal Requirements: One line position on a 2702, 2703, 3704 or 3705 in emulate mode only is required for each start-stop terminal. Start-stop terminals supported by APLSV are: 1050, 2740 model 1, 2741 or equivalent. A 3767 may be used in 2741 Compatibility Mode only and only on a 3704 or 3705.

The 1050, 2740, and 2741 terminals require the APL type element (#987 for correspondence coded terminals, #988 for BCD coded terminals); other elements may be used for applications such as text processing or plotting. The 3767 terminal system requires the APL character set.

One line position on a 2701, 2703, 3704 or 3705 in emulate mode only is required for each remotely attached 3270 Information Display System to be used with APLSV. Locally attached 3270 Information Display Systems do not require use of a transmission control unit, but do require one control unit position on a System/370 channel. If the 3270 is to be used for APL programming, the Data Analysis-APL feature must be ordered.

The following components of the 3270 Information Display System are supported: 3271-2 or 3272-2 Control Unit, 3284-2 or 3286-2 Printer, or 3287-1,-2 Printer with 3271/3272 Attachment (#8330) and 1920 character print operation (#9522), 3277-2 Display, and 3277-2 Keyboard. For each of these, #1066 provides the Data Analysis-APL Feature, if desired. The 3277-2 Keyboard may be provided with either the 66-key (#4637) or 78-key (#4638) set of keys.

The 3271-11 and -12 Control Units are not supported by APLSV.

A minimum of one terminal is required, either a 3270 or start-stop type. If it is a start-stop terminal, it must have the interrupt feature.

Tape Drive: A minimum of one tape drive is required for installation and library maintenance.

PROGRAMMING RPQ

APL/SV (cont'd)

SOFTWARE REQUIREMENTS

APLSV Version 3.0 supports OS/VS1 and OS/VS2.

Version 2.1 of APLSV will continue to be supported.

APLSV Version 3.0 is written entirely in the Assembler language.

The following programs are required for installation: Assembler, Linkage Editor, Utilities.

APLSV Version 3.0 manages data as follows: Start/Stop Terminals - EXCP ... 3270 Information Display Station - BTAM ... Swapping and library access - EXCP.

TSIO manages data as follows: APLSV Version 3.0 user I/O - BSAM, BDAM (blocked sequential data sets are supported) ... Logging data set - QSAM.

COMPATIBILITY WITH APL/360

APL/360 programs operate correctly in APLSV except for changes in literal input and output and minor changes in residue and decode.

CONVERSION from APL/360

When APLSV is installed to replace APL/360, the APL/360 libraries must be converted by dumping them to tape with the APL/360 Utility, reallocating the library data sets, and then using the APLSV Version 3.0 Utility to create APLSV Version 3.0 libraries from the APL/360 dump tape.

The APLSV Version 3.0 Utility program provides conversion of APL/360 workspaces to the APLSV Version 3.0 workspace format. During the conversion, workspaces are checked for validity, and data damaged as a result of APL/360 errors are removed. APLSV Version 3.0 workspaces may be converted to the APL/360 format, but statements which contain advanced language features such as Execute, Format, or Scan, and systems functions and variables, will not be executed in APL/360.

DOCUMENTATION

APLSV Version 3.0 Specifications (GH20-9102)

... APL Language (GC26-3847) ... APLSV User's Guide (SH20-9087) ... APLSV Operations Guide (SH20-9088).

APPLICATION PACKAGES: Certain application packages may also be ordered for use with APLSV Version 3.0 (but may require changes for use from a 3270):

Program Product

MINIPERT	5734-XP3
<i>Specifications</i>	GH20-4432
<i>Program Description Manual</i>	SH20-0995

Installed User Programs

APL Econometric Planning Language	5796-PDW
<i>Availability Notice</i>	G320-5535
<i>Program Description Manual</i>	SH20-1620

APL Text Editor and Composer	5796-PAC
<i>Availability Notice</i>	G320-1516
<i>Program Description Manual</i>	SH20-1089

APL Program Development Tracking System	5796-PAD
<i>Availability Notice</i>	G320-1517
<i>Program Description Manual</i>	SH20-1092

A Department Report System	5796-PFF
<i>Availability Notice</i>	G320-5665
<i>User's Guide</i>	SH20-1808
<i>User's Reference Card</i>	GX20-1980

APL Forecasting and Time Series Analysis	5796-PFX
<i>Availability Notice</i>	G320-5664
<i>Program Description Manual</i>	SH20-1806

Field Developed Programs

APL Financial Planning System	5798-BDE
<i>Availability Notice</i>	GB21-1339
<i>Program Description Manual</i>	SB21-1340

APL Coordinate Geometry System	5798-AGF
<i>Availability Notice</i>	GB21-1339
<i>Program Description Manual</i>	SB21-0400

APL Graphpak	5798-AGK
<i>Availability Notice</i>	GB21-0411
<i>Program Description Manual</i>	SB21-0412

Graphs and Histograms in APL	5798-AGL
<i>Availability Notice</i>	GB21-0414
<i>Program Description Manual</i>	SB21-0415

Zeros and Integrals in APL	5798-AGJ
<i>Availability Notice</i>	GB21-0408
<i>Program Description Manual</i>	SB21-0409

Interactive Business Game Simulation	5798-AGM
<i>Availability Notice</i>	GB21-0393
<i>Program Description Manual</i>	SB21-0394

APL Data Language	5798-CHR
<i>Availability Notice</i>	GB21-1804
<i>Program Description Manual</i>	SB21-1805

APL PRINT TRAIN RPQs

Two 1416 print trains containing APL characters are available for the 1403-N1 printer on an RPQ basis:

APL FAST (RPQ S00232) - Complete APL character set, positioned to be compatible with utilities supporting the PN print train.

APL FULL (RPQ S00233) - Complete upper and lower case Roman typefont, and complete APL character set.

Two print trains containing APL characters are available for the 3211 Printer, on a no-charge RPQ basis:

APL FAST (RPQ S00202) - Complete APL character set with an expected speed of 1,500 lpm.

APL FULL (RPQ S00203) - Complete upper and lower case Roman typefont and complete APL character set, with an expected speed of 1,100 lpm.

PROGRAMMING RPQ

**STAIRS/VS THESAURUS and LINGUISTIC
INTEGRATED SYSTEM (STAIRS/VS-TLS)**

**STAIRS/VS-TLS RETRIEVAL - 5799-AQK (PRPQ P71044)
STAIRS/VS-TLS GENERATOR - 5799-AQL (PRPQ P71045)**

PURPOSE

The Storage and Information Retrieval System with Virtual Storage (STAIRS/VS) is a natural language text storage and retrieval system.

SPECIAL SALES INFORMATION

Until now, STAIRS/VS users may have had an idea of what they wanted, but did not know how to express it, or they may have needed to use the terminology of a discipline with which they were not familiar. STAIRS/VS-TLS helps them by providing a new dimension of capabilities to STAIRS/VS by improving recall and precision in retrieval of textual information.

For example, in today's STAIRS/VS environment, users may have searched with the query words *tooth decay*, but the terminology in the data base is *teeth care* or *dental hygiene* or *orthodontics*. TLS can automatically expand the query to include the other terms. Another example might be that of a search with the query word *benzylidone*; TLS could automatically expand it to *methylaminobenzylidone*.

Other users may want to search with special categories, translate queries into other expressions, use a light-pen, or display a list of STAIRS/VS data bases. TLS can do all of these things.

TLS helps STAIRS/VS users to make more thorough inquiries and is another step to give our customers an even better information retrieval capability.

HIGHLIGHTS of STAIRS/VS-TLS RETRIEVAL

The STAIRS/VS-TLS Retrieval PRPQ extends the online retrieval functions of STAIRS/VS as follows:

- Automatic generation of inflected forms of the query words.
- Online retrieval of thesaurus for formulating queries.
- Additional user functions.

Inflected Form Retrieval: Inflection is the change of word form to indicate case, gender, tense, plurals, etc. For example, *went* is a tense of *go* and *teeth* is the plural of *tooth*. In non-English languages it can be more complex because of gender, compound words, change of letter depending on its position in a word, and so on.

A major component of the STAIRS/VS-TLS Retrieval PRPQ is the Inflection Form Program. This program automatically generates the inflected forms of words in a query before the data base search. Furthermore, inflected forms not present in the data base are not included. Retrieval results include all valid spellings in the data base. This program contains algorithms for English, French and German.

Thesaurus Retrieval: Another major component of the STAIRS/VS-TLS Retrieval PRPQ is Thesaurus Retrieval. This component enables a STAIRS/VS user to select a thesaurus, independently of STAIRS/VS data base selection, and access the thesaurus online. The user can have:

- Interactive dialog with the thesaurus.
- Qualified retrieval, i.e., retrieving by categories. Up to 13,000 paragraphs in a STAIRS/VS document can now be addressed separately by user-defined names (i.e., author, title, date, abstract, etc.).
- Compound word retrieval. For example, *Law* retrieves Constitutional Law and *Amino* retrieves *Methylaminobenzylidone*.
- Translate retrieval. For example, *mass media* could result in the STAIRS/VS query words *radio* or *television* or *newspaper*.
- Subfunctions of STAIRS/VS Search command that allow construction of a STAIRS/VS query while browsing in a thesaurus.
- Inflected form processing of queries constructed from a thesaurus.
- Statistics on the use of search terms.
- Thesauri relations and descriptors of access control with up to 255 priority levels.

Additional User Functions: These functions are modifications to the STAIRS/VS retrieval dialog to simplify the use of the retrieval system:

- Light-pen to improve user dialog.
- Data base selection list.
- STAIRS/VS commands (search, browse, set, select, etc.) selection list.
- STAIRS/VS SET command selection list.
- Additional security with TLS signon (i.e., non-displayable password).

Preprocessor: A preprocessor compatible with the STAIRS/VS conventions enables a TLS user to use all the facilities of STAIRS/VS including standard user exits.

HIGHLIGHTS of STAIRS/VS-TLS THESAURUS GENERATOR

The STAIRS/VS-TLS Thesaurus Generator PRPQ is a set of batch programs which create and update a thesaurus. The user defines the words and the semantic properties and relationships which will be in the thesaurus; then the programs use this definition to build, delete, replace, and check word relationships. This thesaurus exists independently of the STAIRS/VS dictionary; an association exists only insofar as the thesaurus words occur in the STAIRS/VS documents and, thus, in the STAIRS/VS dictionary.

The output of the Thesaurus Generator can be used as an online thesaurus for use by the STAIRS/VS-TLS Retrieval PRPQ.

The Thesaurus Generator includes a print program which provides printouts in alphabetic sequence or in word relationship sequence.

If users have an existing thesaurus and their own thesaurus build program, they can use the Load Utility of the STAIRS/VS-TLS Retrieval PRPQ, and continue using their own thesaurus package.

CUSTOMER RESPONSIBILITIES

An individual who is thoroughly trained in STAIRS/VS is required to install STAIRS/VS-TLS.

SPECIFIED OPERATING ENVIRONMENT

HARDWARE REQUIREMENTS

The TLS PRPQs use the same software and hardware systems as STAIRS/VS.

All the prerequisites for a successful STAIRS/VS installation, and only those prerequisites, are required for installation of the TLS Retrieval PRPQ.

Installation Requirements: STAIRS/VS, PL/I Optimizing Compiler and the System/370 OS/VS Assembler are prerequisites for both Online Retrieval and the Thesaurus Generator.

External Space Requirements: Only the thesaurus data sets that are additional to the STAIRS/VS data sets in online retrieval are described. Full details for space calculation are given in the *STAIRS/VS-TLS Thesaurus Generator, Program Description and Operations Manual* and the *STAIRS/VS-TLS Online Retrieval, Program Description and Operations Manual*. Each thesaurus consists of three BDAM data sets:

1. Letter-Pair-Pointer Table (LPPT). Size: 15,120 Bytes.
2. Descriptor File (DESF). The size of the descriptor file depends on the number and length of the descriptors in the thesaurus. For example, 3,000 descriptors having an average of 32 characters require 165,000 bytes.
3. Pointer File. The size of the pointer file depends on the average number of relations per semantic field, the average number of descriptors per semantic field, and the number of semantic fields. For example, 230,000 bytes are needed for a file with the following requirements:

Number of Semantic Fields	2,500
Descriptors/Semantic Field	20
Relations/Semantic Field	4

Minimum Virtual Storage Requirements: The following paragraphs list the minimum storage requirements for TLS Online Retrieval and TLS Thesaurus Generator:

TLS Online Retrieval

Under CICS/VS: In addition to the main storage allocation of the STAIRS/VS and CICS/OS/VS installation, the TLS Retrieval System requires an additional address space of 40K bytes plus 10K bytes per user. For example:

	Bytes
STAIRS/VS	100K
TLS (Two Users)	60K
	160K

Under IMS/VS: In addition to the main storage allocation of the IMS/VS system and the TLS batch message processing region, the TLS Retrieval System requires an address space of 50K bytes plus 10K bytes per user. For example:

	Bytes
STAIRS/VS	200K
TLS (Two Users)	70K
	270K

Batch Programs: The TLS batch message data set creation program requires an address space of 128K bytes.

The TLS Thesaurus load utility program requires an address space of 324K bytes.



PROGRAMMING RPQ

STAIRS/VS-TLS (cont'd)

TLS Thesaurus Generator

The programs run in batch mode. They require an address space of about 512K bytes.

SOFTWARE REQUIREMENTS

STAIRS/VS-TLS operates in the same environment as STAIRS/VS (5740-XR1) on System/370 configurations in virtual mode under OS/VS1 or OS/VS2. STAIRS/VS operates under the control of CICS/OS/VS Version 1 (5740-XX1) Release 1.0 and subsequent releases unless otherwise identified, or under the control of IMS/VS Version 1 (5740-XX2) Release 0.1 and subsequent releases unless otherwise identified. For operating system support, see CICS/OS/VS or IMS/VS programming system support in the appropriate CICS/OS/VS or IMS/VS documentation.

Most program modules are written in PL/I and the remainder are written in System/370 Assembler language.

All modules are distributed in both source and load module form.

The then most current release of the STAIRS/VS program product is a prerequisite for the use of the TLS Online Retrieval component. The prerequisite program products for using STAIRS/VS are defined in the *STAIRS/VS General Information Manual* (GH12-5114).

DATA SECURITY

Up to 255 access control priority levels for thesauri relations and descriptors are possible. In addition, TLS signon provides non-displayable entry of user password.

DOCUMENTATION: (order from Mechanicsburg)

General Information Manual (GH20-1908).

PROGRAMMING RPQ**FINANCIAL SERVICES TERMINALS SUPPORT
for the IBM 3606 and 3608
5799-ARE (OS/VS1) (PRPQ P09005)
5799-ARD Release 2 (DOS/VS) (PRPQ P09004)****PURPOSE**

Financial Services Terminals Support for the 3606 and 3608 is designed to assist users in their installation of these terminals.

DESCRIPTION

The Programming RPQs (PRPQs) consist of two components:

- A 3600 Finance Communication Controller (FCC) application program which is designed to provide a flexible level of onhost and offhost message processing support to the financial services terminal user. The 3600 application program supports the following customer transactions: Check guarantee, check verification, bank card authorization and customer account inquiry. In addition, the program performs such functions as: System initialization, error handling, file load and file maintenance, and offhost message logging for later transmission. The PRPQs provide the framework for adding user-written application routines. The 3600 FCC program provides processing routines for the above-specified transactions. A user may use the provided application routines or make modifications.
- S/370 host programs for the batch creation of a negative file, the onhost transmission of the negative file to the 3600 FCC and a sample application onhost test program. The OS/VS1 onhost programs operate under the control of CICS/OS/VS Version 1 (5740-XX1) Release 1.2 and subsequent CICS/OS/VS releases unless otherwise identified. The DOS/VS onhost programs operate under the control of CICS/DOS/VS Version 1 (5746-XX3) Release 1.2 and subsequent CICS/DOS/VS releases unless otherwise identified. For operating system support, refer to CICS/VS programming systems support in the appropriate CICS/VS documentation. The DOS/VS onhost programs execute with VTAM or CICS Extended Telecommunications Modules (EXTM) Version 3 (5746-XXB).

HIGHLIGHTS

The application program residing in the 3600 Finance Communication Controller will provide the functions described below:

- Support for multiple 3606/3608 terminal groups per workstation.
- Support of concurrent transaction processing for terminals associated with a workstation (multithreading).
- Support of a negative file to be maintained on either the 3602 disk or the 3600 FCC one- or two-sided removable diskettes.
- Support the IBM PIN PAD (RPQ 8K0578) for attachment to the 3606 (RPQ 8K0626).
- Accept transaction inputs from the 3604, 3606 and 3608 terminals.
- Analyze transaction codes keyed by terminal operators.
- Edit and format the transaction data for transmission to the host.
- Format and display messages returned from the host to the 3606/3608 terminals and turn indicator lights on or off as required by transaction status.
- Log offhost-processed transactions on the 3600 Controller diskette.
- Maintain a negative file for offhost operations.
- Access the negative file during offhost operations.
- Support offhost transaction processing.
- Provide transaction control to and from the host.
- Forward offhost logged transactions to the host.
- Relieve the host application of formatting data for the 3606/3608.

The following areas require user programming:

- Customization of the 3600 message processing routines and application tables.
- Host message processing program(s).
- Analysis of the discretionary area of the magnetic stripe.
- Analysis of the PIN data.
- Encryption and decryption of the PIN data.
- Implementation of appropriate programming methods to provide terminal security and to prevent unauthorized access to financial institution records.
- Network Control Program/VS generation.

Terminal security is not included in these PRPQs. Therefore, unattended terminals will not be secure from unauthorized access. The user will

want to consider implementing appropriate security procedures through additional programming and physical control methods.

Remote terminals must have programming and procedural safeguards built into the system to prevent unauthorized access to the financial institution records. These safeguards may be imposed on a terminal or across the whole system. This area of security must be planned and implemented carefully to maintain data base security.

CUSTOMER RESPONSIBILITIES

For installation of the IBM 3600 Finance Communication System through use of these Programming RPQs, the user must:

- Understand the IBM 3600 Finance Communication System and its components, including the relationships of loops, devices, terminal groups and workstations.
- Analyze the user environment to determine how the 3600 system workstations will be configured and used to satisfy transaction requirements.
- Study and understand the functions and architecture of the application programs.
- Develop any required terminal and merchant control information.
- Prepare input for the host negative file creation program.
- Develop the S/370 host application program.
- Educate terminal users and provide operational guides.
- Test programs onhost with host application.
- Test programs for proper offhost operation.
- Make necessary modifications to the transaction code/message processing tables in the 3600 FCC application program.
- Modify any application processing routines, if required.
- Implement any balance and control techniques which are to be used in connection with the terminal and merchant records.
- Implement appropriate programming and physical control methods to provide terminal security and to prevent unauthorized access to financial institution records.

SPECIFIED OPERATING ENVIRONMENT**HARDWARE REQUIREMENTS**

Financial Services Terminals Support for the IBM 3606/3608 requires the following system configuration:

- System/370 computer with a minimum of 256K real storage (DOS/VS) or a minimum of 512K real storage (OS/VS1).
- 3704 or 3705 Communications Controller.
- Any direct access device supported device supported by DOS/VS or OS/VS1.
- Any card read/punch and printer supported by DOS/VS or OS/VS1.
- One magnetic tape drive if required for the installation of the product.
- 3601 or 3602 Finance Communication Controller with a minimum of 40K user-programmable storage.

The minimum Finance Communication System consists of one IBM 3601 or 3602 Finance Communication Controller and one IBM 3604 Keyboard Display (any model). The 3600 FCC application program is designed to support ten 3606/3608 workstations in 40K of controller user storage. The program will support multiple terminal groups per controller workstation.

SOFTWARE REQUIREMENTS

Financial Services Terminals Support for the IBM 3606 and 3608 OS/VS1 and DOS/VS operates under the control of CICS/OS/VS Version 1 (5740-XX1) and CICS/DOS/VS Version 1 (5746-XX3) Release 1.2 and subsequent CICS/VS releases unless otherwise identified. For operating system support, refer to CICS/VS programming systems support in the appropriate CICS/VS documentation.

With Financial Services Terminals Support for the IBM 3606 and 3608 OS/VS1, the user should have:

OS/VS1 Assembler	5741-SC1-03
or	
Assembler H	5734-AS1
Virtual Storage Access Method (VSAM)	5741-SC1-DE
Access Method Services	5741-SC1-DK



PROGRAMMING RPQ

Financial Services Terminals Support for 3606/3608 (cont'd)

3704/3705 Network Control Program/VS (NCP/VS)	5744-BA2
System Support Services (SSS)	5741-SC1-SS
Host Support for IBM 3600 Finance Communication System OS/VS1	5744-CA3
Customer Information Control System (CICS/OS/VS)	5740-XX1
COBOL OS/VS1 Compiler and Library	5740-CB1
With Financial Services Terminals Support for the IBM 3606 and 3608 DOS/VS Release 2, the user should have:	
DOS/VS	5745-010
DOS/VS Assembler	5745-SC-ASM
Virtual Telecommunications Access Method (VTAM)	5745-SC-VTM
or	
Extended Telecommunications Methods Version 3 (EXTM) feature of CICS/DOS/VS	5746-XXB
Virtual Storage Access Method (VSAM)	5745-XC-AMS
3704/3705 Network Control Program/VS (NCP/VS)	5747-AJ2
System Support Services (SSS)	5745-SC-SSS
Host Support for IBM 3600 Finance Communication System DOS/VS	5744-BR1
Customer Information Control System (CICS/DOS/VS)	5746-XX3
COBOL DOS/VS Compiler and Library	5746-CB1

PROGRAMMING RPQ

**3350/3330 MDL 11 SUPPORT for OS/MVT
5799-ARG****PURPOSE**

The 3350/3330 mdl 11 MVT PRPQ will provide the ability to operate the following devices on OS/MVT Release 21.8 for attachment to S/370 mdls 145, 148 (operating in IMPL 3145 CPU mode), 155II, 158, 165II, and 168, and with the S/370 mdls 155, 165 and 195 with no-charge RPQs S20582 and S20560 for 3350 and 3330 attachment respectively: 3350 Direct Access Storage in native mode ... 3330 mdl 11 Direct Access Storage ... 3350 Direct Access Storage when operating in 3330 mdl 1 Direct Access Storage compatibility mode ... 3350 Direct Access Storage when operating in 3330 mdl 11 Direct Access Storage compatibility mode. Additionally, IMS/360 (5734-XX6), CICS/OS-Standard (5734-XX7) Version 2 Release 3, Sort/Merge (5740-SM1), and HASP II (360D-05.1.014) Version 3.1 will operate with the 3350 and the 3330 mdl 11 under OS/MVT Release 21.8.

HIGHLIGHTS

The PRPQ will provide the ability to operate the 3350 Direct Access Storage and the 3330 Mdl 11 Direct Access Storage:

- As system residence devices
- As RPS devices
- For user data sets
- With ISAM, SAM, PAM and DAM
- In a shared DASD environment
- With AP-1 (3350 only)

This PRPQ will allow OS/MVT Release 21.8 to utilize the 3350 and 3330 mdl 11. At system generation, users may specify these devices in their system configuration, and at job step time the devices can be allocated. Programs that utilize unmodified versions of ISAM, PAM, SAM or DAM and that do not require specification of device characteristics will operate on the 3350 and 3330 mdl 11. For programs which are time-dependent or which are optimized to the characteristics of another direct access storage device, the user may want to consider changes to take full advantage of the characteristics of these devices. A starter system for 3350 or 3330 mdl 11 will not be available. The use of the 3350 in native mode or 3330 mdl 11 as a system residence device requires an additional system generation operation.

The user should evaluate the following physical characteristics of the 3350 in planning volume assignment, system configuration, and data set usage:

- The number of logical devices on one physical device when operating in compatibility mode.
- The availability of the fixed head models.
- The fact that one-to-one mapping of physical cylinders is not preserved when operating in compatibility mode.

Appropriate action (for example, PRESRES) should be taken to avoid MOUNT/DEMOUNT requests for the 3350 which is a permanently mounted media.

Storage Requirements: The main storage requirement for individual functional components will be available in the program directory for the PRPQ.

SPECIFIED OPERATING ENVIRONMENT**HARDWARE REQUIREMENTS**

This PRPQ will be applicable to OS/MVT Release 21.8 operating on the System/370 Models 145, 148 (operating in IMPL 3145 CPU mode), 155, 155II, 158, 165, 165II, 168 and 195.

The no-charge RPQs S20582 and S20560, for 3350 and 3330 attachment respectively, are required with the System/370 Models 155, 165 and 195. These RPQs are permission to attach RPQs and do not contain hardware.

Minimum System Configuration: The minimum configuration consists of System/370 Model 145, 148 (operating in IMPL 3145 CPU mode), 155, 155II, 158, 165, 165II, 168 or 195 with at least 384K bytes of main storage for operation with MVT for batch processing. DASD space is required for library storage. The exact requirements must be established by the installation.

SOFTWARE REQUIREMENTS

The 3350 in native mode or in compatibility mode is permanently mounted. This PRPQ does not provide 3340 or 3344 support, which is only available on DOS/VS, OS/VS1 and OS/VS2.

This PRPQ will operate with OS/MVT Release 21.8 running under VM/370.

The use of TSO will be restricted, since the 3350 in native or Model 11 mode and the 3330 Model 11 may be used for data but not as swapping devices.

BTAM (360S-CQ-513) for OS/MVT Release 21.8 will operate with this PRPQ.

TCAM, with PTF US07000, will operate with the 3330 Model 11 and 3350.

CRJE system data sets and the SYS1.DUMP data set may not be placed on the 3350 in native or Model 11 mode or on the 3330 Model 11.

Program Product Utilization of the 3350 or 3330 Model 11: Program products which are storage device-independent and which operate under OS/MVT Release 21.8 (for example, language compilers will operate on the 3350 and 3330 Model 11 under OS/MVT Release 21.8.

IMS/360 (5734-XX6) will operate with the 3350 and 3330 Model 11 under OS/MVT Release 21.8. This will be available in IMS/360 Version 2.4.1.

CICS/OS-Standard (5734-XX7) Version 2 Release 3 for OS/MVT Release 21.8 will operate with the 3350 and 3330 Model 11.

Sort/Merge (5740-SM1) which can utilize 3350 and 3330 Model 11 will operate under OS/MVT Release 21.8.

Other Programs: HASP II (360D-05.1.014) Version 3.1 will operate with the 3350 and 3330 Model 11. ASP (360A-CX-15X) Version 3.2 on OS/MVT Release 21.8 does not support 3330 Model 1 and 3350.

CONVERSION

Installing this PRPQ will remove support for the following devices:

- 2301 Drum Storage
- 2302 Drum Storage
- 2303 Drum Storage
- 2311 Disk Storage Drive
- 2321 Data Cell Drive

SYSTEM PERFORMANCE

Performance of an OS/MVT Release 21.8 system is dependent on several factors, such as system configuration, job scheduling, data organization, and application requirements. Therefore, no specific statement of general performance can be made either for native or compatibility operation. The user should evaluate the placement of data sets, volume assignment, and system configuration to take advantage of the 3350 and 3330 mdl 11 machine characteristics, capacity, and fixed head models (of the 3350 only).

PROGRAMMING RPQ

**VM/370 RESOURCE MANAGEMENT
5799-ARQ (PRPQ P09006)****PURPOSE**

The VM/370 Resource Management PRPQ consists of a series of modifications to the VM/370 SCP. Their objective is to improve VM/370 resource management for the larger VM user (mdl 155II and above with one megabyte or more of storage). Based on the workload and options selected by the installation, problem state throughput and terminal response time for interactive transactions can be expected to improve. It is also expected that the system will be able to drive a larger number of interactive terminals.

SPECIAL SALES INFORMATION: An RPQ must be submitted and approved prior to bidding or proposing the VM/370 Resource Management PRPQ. This does not preclude the normal DP/FE systems assurance and installation planning functions. These activities must take place on the local level.

HIGHLIGHTS: Enhancements are made to VM/370 in these areas:

- *Scheduling Algorithm* - A "fair share" approach to distribute the resources of the system equally among the users with the appearance of improved trivial interactive performance.
- *Reset Pages & Time Stamp Segments* - The working set algorithm improves page selection while time stamping facilitates page migration and swappable migration.
- *Working Set Estimate* - Dynamically adjusted multiprogramming levels are achieved by periodic evaluation of total system performance based upon feedback control.
- *Page Migration* - Designation of preferred paging areas on DASD with migration to other devices based on how long the pages are unused.
- *Swappable Migration* - Seldom used segment tables are swapped to DASD, thereby freeing up main storage.
- *Fast Redispach Extension* - The number of cases where fast redispach implementation is used after privileged instruction simulation and I/O interruptions is increased.
- *Enable Window* - Increase the extent to which VM runs enabled and thus can accept I/O and external interruptions.
- *Set Favored Extension* -- Specification of multiple users with "d" percent option.
- *Indicate Command Extension* - Additional performance status data available to systems performance evaluation routine.
- *Selective Path Length Reductions*

DOCUMENTATION: Consists of updates to the user's guide, a programmer and system logic guide, and an installation guide contained on the distribution tape as CMS Disk Dump print files. A memo will be provided with each tape, containing a description of its contents, and instructions for its use.

MARKETING INFORMATION: The VM/370 Resource Management PRPQ is designed to a base of VM/370 Release 3. Program update services will be available with every third VM/370 PLC from the date of initial PRPQ release in the form of a total replacement tape.

The VM/370 Resource Management PRPQ is written in Assembler Language. All VM/370 Resource Management PRPQ releases will use CMS for installation and update support.

No further enhancements to this PRPQ will be accepted at this time.

PROGRAMMING RPQ

**CREDIT MANAGEMENT/VIRTUAL STORAGE
5799-ARY (PRPQ MH4661)**

PURPOSE

Credit Management/VS is a flexible, application-oriented system that extends the facilities of the Display Management System/VS (DMS/OS/VS) to provide for the specific needs of the credit card issuing and consumer service industries. It provides a powerful array of services tailored to address the unique aspects of this application area without limiting the user's approach to managing credit. It helps simplify the task of implementing an interactive system for credit card and receivables management. Prerequisites for Credit Management/VS are DMS/OS/VS (5740-XC2) Version 1 and subsequent DMS/OS/VS releases unless otherwise identified, and the Customer Information Control System (CICS/OS/VS) Version 1 (5740-XX1) Release 1.1 and subsequent CICS/OS/VS releases unless otherwise identified. For operating system support, refer to CICS/OS/VS programming systems support in the appropriate CICS/OS/VS documentation.

HIGHLIGHTS

- VSAM support for 3330, 3340 and 3350 storage devices.
- An update-in-place capability is supported for VSAM files.
- A new option for online interface between user exit coding and packed records to facilitate the editing of packed data for online display.
- Advanced file handling and data compaction techniques that permit economical online storage and rapid access to millions of customer account records.
- Creation and maintenance of alpha cross-reference files with alpha search and file access capabilities.
- Online transaction capture for subsequent offline posting and limited online update capability. An audit trail of all activity affecting customer account records is created.
- Use of selection criteria, specified on Credit Management/VS forms, to initiate the preparation of documents such as customer statements, letters, and past-due notices.
- Work list files, as designated by management, can be created for account situations requiring special attention.
- The table driven approach used by Credit Management/VS allows credit management personnel to adapt more readily to changing system requirements, such as changes in credit policies or changes resulting from legislation in the consumer credit area.
- File conversion utilities are provided for the creation of customer account and alpha cross-reference files from sequential user account files. This simplifies the task of implementing large online credit management systems.

DESCRIPTION

The Programming RPQ consists of an online control system and an offline control system. The online system, through the facilities available under DMS/OS/VS, provides online display of customer account information using 3270 Display Stations. DMS/OS/VS operates under the control of CICS/OS/VS. The offline control system runs under OS/VS1 or OS/VS2 and is used to maintain the customer account file, and to process and produce user-defined credit management information such as delinquency reports, customer statements, etc. Input to the offline control system consists of transaction data including payments, charges, adjustments, and other data entered from the online system. Customer-unique application processing routines in both the online and offline systems are written by the user.

The customer account file is an OS/VS VSAM or ISAM variable length segmented file that is created and maintained by the Credit Management/VS offline control system. Unique features of the Credit Management/VS file structure and its use are as follows:

- The user specifies the content and format of the records on Credit Management/VS File Description Form. Flexibility is provided to enable users to design the file to meet their specific requirements. Additional segments or fields in existing segments can be added without affecting current user programs.
- A customer account record is logically segmented according to the characteristics of the data. Four types of data segments are available:
 - Packed data segments
 - Unpacked data segments
 - Packed repetitive data segments
 - Unpacked repetitive data segments

Packed data segments have zeros and blanks removed prior to writing the segment to disk and re-inserted when reading from disk. This compaction technique reduces the amount of disk storage required. The use of unpacked data segments eliminates the processing time required for packing and unpacking the data. These two factors should be taken into consideration in structuring

the customer account file. Repetitive data segments allow a data group, such as a date and amount, to be repeated a variable number of times in a segment. These features allow the user to design a file format that minimizes the physical file space required and allows operating efficiency requirements to be taken into consideration.

- A single logical file can be divided into multiple physical files. This facility improves online performance and enhances file rebuild and recovery capabilities in the event of an I/O error. It also provides flexibility in offline processing.
- A file can be accessed online for inquiry and display through DMS/OS/VS. A record may be retrieved by account number, partial account number, name and address information, or a combination of both. This facility allows the user to respond to customer inquiries in a matter of seconds. Updates can be made to the first segment in each record to accommodate special conditions that may arise. The first segment in a record is fixed length.
- Credit Management/VS provides a new option for online interface between user exit coding and a packed record. This facilitates editing of packed record information for online display. This option allows display of current account status, including transaction data not yet added to the customer account file by a batch update run.
- A Credit Management/VS file is updated by means of an offline control system program that incorporates user-written routines to process transactions. It is the user's responsibility to write subroutines to perform all transaction processing. The Credit Management/VS offline control program operates as an I/O supervisor controlling all I/O operations and linking to the user subroutines as appropriate. This program is designed to handle a high volume of daily transactions and provides the following functions:
 - Reading and unpacking customer account records, as required
 - Retrieving inactive customer account records having new activity
 - Merging multiple input transaction files
 - Controlling the execution of user routines written in Assembler, PL/I or COBOL
 - Execution of customer-defined selection criteria (specified on Credit Management/VS forms) to initiate the creation of exception files (such as delinquent account files) or other customer-specified processing.
 - Updating of work list and alpha cross-reference files
 - Packing and writing the customer account file and creating a sequential backup copy
 - An option to update the current VSAM customer account file instead of writing a new VSAM output file.
- Additional functions are added to the DMS/OS/VS online programs to provide for writing and accessing online transaction files. While performing routine operations against Credit Management/VS files, display station operators may encounter the need to initiate update actions against customer records. Since the customer account file is not updated online (except for the first segment), these functions allow the operator to create a transaction record and put it into an online transaction file. These files are used in the batch update run when the customer account file update takes place. The display station operator can also access and display records written to the online transaction files if it is necessary to see if any activity has occurred for an account since the last batch update run.
- Assembler language macros are provided for reading, writing, packing and unpacking data segments to allow user programs to process the data in unpacked format, in cases where the offline control system does not meet their requirements.

CUSTOMER RESPONSIBILITIES

See the *Credit Management/VS General Information Manual*.

SPECIFIED OPERATING ENVIRONMENT

HARDWARE REQUIREMENTS

The system configuration for the Credit Management/VS Programming RPQ is the same as that for the IBM Display Management system/OS/VS. The minimum processing unit is a System/370 with sufficient real memory for the operating system and the dependent Program Products. Since the Credit Management/VS customer account file, alpha cross-reference file, transaction files, and work list files are direct access files, the user must include sufficient 3330, 3340, 3350 or equivalent direct access devices to accommodate the size of files to be used. Additional I/O device requirements are identified in the *Display Management System/OS/VS General Information Manual*.

To estimate storage requirements for online operations, an additional 15,000 bytes must be added to the DMS/OS/VS loadable modules.



PROGRAMMING RPQ

Credit Management/VS (cont'd)

the DMS/OS/VS storage requirements shown for each terminal should be adequate for typical Credit Management/VS users.

The Credit Management/VS offline control system operates directly under OS/VS1 or OS/VS2.

SOFTWARE REQUIREMENTS

The Credit Management/VS Programming RPQ is written in System/370 Assembler language. The system is supported under OS/VS1 (5741-VS1) or OS/VS2 (5742-VS2 or 5752-VS2).

In addition, the online processing of Credit Management/VS requires the following program products and their identified system requirements:

DMS/OS/VS (5740-XC2) - see the *Display Management System/VS General Information Manual* (GH20-1863).

CICS/OS/VS (5740-XX1) - see the *CICS/VS General Information Manual* (GC33-0052).

OS VSAM or ISAM must be included for processing.

COMPATIBILITY

A user of the Credit Management System II Programming RPQ (5799-AHJ) should be able to convert to the Credit Management/VS Programming RPQ with no user programming changes. User exit programs in use under Credit Management System II must be recompiled for use with Credit Management/VS. Compatibility is maintained in format with the customer account file, alpha cross-reference file, transaction files, and work list files.

CONVERSION

A procedure is provided to read a user-defined fixed length sequential customer file or an existing sequential packed master file, and create a VSAM or ISAM Credit Management/VS customer file and an alpha cross-reference file.

SECURITY

Security facilities to assist in preventing unauthorized access to data are provided by CICS/OS/VS.

PROGRAMMING RPQ

**VM/370 NETWORKING
5799-ATA (PRPQ P09007)****PURPOSE**

Functional modifications have been made to the RSCS Component of VM/370 to provide for the communication of jobs for execution and print and punch formatted data streams to Network Job Entry for JES2 (NJE) systems, and HASP, ASP and other VM/370 systems when running with their respective Network Job Interface (NJI) support. Modifications have been provided to perform the actual networking functions between NJE and NJI systems. These modifications also provide compatibility with existing installations, and extend the networking functions to existing Remote Job Entry workstations.

HIGHLIGHTS

- Compatible Network Protocol allows one system to transfer jobs and card or printer formatted data streams to another without requiring either system to assume a subordinate role.
- Store and Forward facility provides that a complete file be transmitted from one node to another before any further action is taken on that file. As a result, the integrity and recovery procedures of the sending system spool file facility for intermediate storage provides for the integrity and recovery of that file in the event of a network or system failure.
- Routing, by means of destination tables is provided automatically by each node on the network. Until the node to which a file is directed is reached, each intervening node will enqueue the file for the link to the next node for proper routing to the specified destination. When the final destination is reached, the file is released to that system for processing.
- Operator Commands allow the network operator to reconfigure the network without interrupting normal networking operations.
- NJE for JES2 Compatibility - the network protocol in this PRPQ is compatible with that of the NJE for JES2 program product (binary synchronous and channel-to-channel).
- Communication to and from NJE for JES2 and HASP, ASP and VM/370 NJI Systems over binary synchronous facilities and channel-to-channel adapter attachment is provided. These data streams can be jobs to be executed by the receiving system, print files (including 3800) and punch files to be processed on the receiving system real peripheral devices or, in the case of a VM/370 system, data files to be directed to a user-specified CMS virtual machine for interactive processing on that system.
- The networking function to existing RJE workstations is extended. These modifications also provide compatibility for existing RSCS operations.
- In addition to the terminals supported by the RSCS Package, the PRPQ supports inter-CPU communications between NJE for JES2 and HASP, ASP and VM/370 systems with NJI capability.
- A CMS EXEC-like facility to aid the network operator in executing repeated sequences of commands is provided.
- VM/370 accounting records for each file received or transmitted are maintained. These records contain information that pertains to the origin, destination and record count of the file.
- Concurrent operation of the RSCS in the same VM/370 system as the VM/370 Networking PRPQ version is possible.
- Multi-leaving is the common transmission protocol.

CUSTOMER RESPONSIBILITIES

In addition to installing the base system, the user is responsible to assure that local modifications to the IBM base system do not conflict with the changes provided by this package of program code.

The product is supported under VM/370 Release 3, PLC 3 and above and relies on the SPOOL file system and other virtual machine facilities provided by the SCP.

SPECIFIED OPERATING ENVIRONMENT**HARDWARE REQUIREMENTS**

This support requires a standard VM/370 virtual machine with telecommunications facilities attached to that virtual machine. Adequate CMS user disk must be provided to contain the line driver object modules and any user-generated network EXEC files. One cylinder is adequate for the former. While an operator's console is required at generation time, normal operation can be conducted without operator intervention and, as with the standard RSCS, the PRPQ can be run disconnected.

Approximately 30 cylinders of space of an IBM 3330 type DASD is needed to maintain the source code. 384K of virtual storage is required for execution (512K for generation).

SOFTWARE REQUIREMENTS

The VM/370 Networking PRPQ is coded entirely in Assembler language. CMS is the installation and support mechanism for this product.

LICENSING REQUIREMENTS and SERVICE: Each CPU which is to run the PRPQ must be licensed for the PRPQ.

The VM/370 Networking PRPQ is licensed under the License Agreement for IBM Program Products.

No requests for further enhancements to this PRPQ will be accepted at this time.

EDUCATION: Education will be made available as required on an RPQ basis.

DOCUMENTATION: (available from Mechanicsburg)

NJI General Information (GH20-1941).

PROGRAMMING RPQ

**ASP NETWORKING
5799-ATB (PRPQ P09008)****PURPOSE**

A series of functional modifications have been made to ASP to provide for the communication of jobs for execution and print and punch formatted data streams to Network Job Entry for JES2 (NJE) systems, and HASP, VM/370 and other ASP Systems, when running with their respective Network Job Interface (NJI) support. The necessary modifications have been provided to perform the actual networking functions between NJE and NJI systems.

HIGHLIGHTS

- Compatible Network Protocol allows one system to transfer jobs and card or printer formatted data streams to another without requiring either system to assume a subordinate role.
- Store and Forward facility provides that a complete file be transmitted from one node to another before any further action is taken on that job. As a result, the integrity and recovery procedures of the sending system spool file facility for intermediate storage provides for the integrity and recovery of that job in the event of a network or system failure.
- Routing, by means of destination tables which are established at system initialization, is provided automatically by each node on the network. Until the node to which a job is directed is reached, each intervening node will enqueue the file for the link to the next node for proper routing to the specified destination. When the final destination is reached, the job is released to that system for processing.
- Operator Commands allow the network operator to reconfigure the network without interrupting normal networking operations.
- NJE FOR JES2 Compatibility - the network protocol in this PRPQ is compatible with that of the NJE for JES2 program product (binary synchronous).
- Communication to and from NJE for JES2 and HASP, ASP and VM/370 NJE systems over binary synchronous facilities and channel-to-channel adapter attachment is provided. These data streams can be jobs to be executed by the receiving system real peripheral devices.
- OS utilities to support transmission of bulk data together with JCL to process the data at the receiving end are provided.
- ASP accounting records for each job received or transmitted are maintained. These records contain information that pertains to the origin, destination and record count of the job.
- Multi-Leaving is the common transmission protocol.

CUSTOMER RESPONSIBILITIES

In addition to installing the base systems, the user is responsible to assure that local modifications to the IBM base system do not conflict with the changes provided by the package of program code.

This product is supported under ASP Version 3.2.1.

SPECIFIED OPERATING ENVIRONMENT**HARDWARE REQUIREMENTS**

This support requires a standard ASP configuration with telecommunications facilities attached capable of operating in the transparent mode. Consideration should be given to provide adequate SPOOL file capacity as a function of anticipated traffic. ASP Networking will add approximately 25,000 bytes to ASP, and each network line will require approximately 3,000 bytes.

SOFTWARE REQUIREMENTS

The ASP Networking PRPQ is coded entirely in Assembler Language.

EDUCATION: Education will be made available as required on an RPQ basis.

INSTALLATION CONSIDERATIONS

The ASP Networking PRPQ is applied as modification to the base ASP program, so modules in ASP are affected to varying degrees. Users who have applied local modifications should evaluate this PRPQ for possible conflicts prior to application.

No requests for further enhancements to this PRPQ will be accepted at this time.

LICENSING REQUIREMENTS AND SERVICE: Each CPU which is to run the PRPQ must be licensed for the PRPQ.

The ASP Networking PRPQ is licensed under the Amendment for Specially Developed IBM Programs - Extended Support (To License for IBM Program Products), Z120-2681, and its supplements, which must be signed by the customer and accepted by IBM.

For the ASP Networking PRPQ, *Programming Services Apply* is defined in the Amendment for Specially Developed IBM Programs - Extended Support (To License Agreement for IBM Program Products),

Z120-2681, and its supplements. The customers may submit documentation to the designated IBM location when a problem is encountered which the user diagnosis indicates is caused by this licensed product. This programming service may be discontinued upon three months' notice except as noted in the agreement. Any on-site programming services or assistance will be provided at a charge.

DOCUMENTATION: [available from Mechanicsburg]

NJI General Information (GH20-1941).

PROGRAMMING RPQ

**HASP NETWORKING
5799-ATC (PRPQ P09009)****PURPOSE**

Functional modifications have been made to HASP II, Version 4.0 to provide for the communication of jobs for execution, print and punch formatted data streams to Network Job Entry for JES2 (NJE) systems, and HASP, ASP and other VM/370 Systems when running with their respective Network Job Interface (NJI) support. Modifications have been provided to perform the actual networking functions between NJE and NJI systems. These modifications also provide compatibility with existing installations, and extend the networking functions to existing Remote Job Entry workstations. These modifications include changes to the standard HASP modules and the addition of two new modules, one to handle job transmission and the other to handle the receipt of SYSOUT data streams.

HIGHLIGHTS

- Compatible Network Protocol allows one system to transfer jobs and card or printer formatted data streams to another without requiring either system to assume a subordinate role.
- Store and Forward facility provides that a complete job be transmitted from one node to another before any further action is taken on that job. As a result, the integrity and recovery procedures of the sending system spool file facility for intermediate storage provides for the integrity and recovery of that job in the event of a network or system failure.
- Routing, by means of destination tables which are established at system generation time, is provided automatically by each node on the network. Until the node to which a job is directed is reached, each intervening node will enqueue the job for the link to the next node for proper routing to the specified destination. When the final destination is reached, the job is released to that system for processing.
- Operator Commands allow the network operator to reconfigure the network without interrupting normal networking operations.
- NJE for JES2 Compatibility - the network protocol in this PRPQ is compatible with that of the NJE for JES2 program product (binary synchronous).
- Communication to and from NJE for JES2 and HASP, ASP and VM/370 NJI Systems over binary synchronous facilities and channel-to-channel adapter attachment is provided. These data streams can be jobs to be executed by the receiving system, or print or punch files to be processed on the receiving system real peripheral devices.
- HASP accounting records for each job received or transmitted are maintained. These records contain information that pertains to the origin, destination and record count of the job.
- Multi-Leaving is the common transmission protocol.

CUSTOMER RESPONSIBILITIES

In addition to installing the base systems, the user is responsible to assure that local modifications to the IBM base system do not conflict with the changes provided by this package of program code.

Since this PRPQ represents a substantial modification to the HASP system, it is recommended that customers first apply this PRPQ to the standard HASP system, and then apply local modifications to the HASP system thus developed.

SPECIFIED OPERATING ENVIRONMENT**HARDWARE REQUIREMENTS**

This support requires a standard System/370 machine with telecommunications facilities and/or the channel-to-channel feature.

The telecommunications facilities supported are the same as those supported by the standard HASP RJE, except that the network requires leased lines.

The HASP SPOOL space must be reevaluated by the customer to allow for the store and forward capability of the network.

Assembly of the modified HASP modules requires the H level Assembler.

HASP Networking will add approximately 16,000 bytes to HASP.

SOFTWARE REQUIREMENTS

The HASP II Version 4.0 Network PRPQ is coded entirely in Assembler language.

This product is supported under OS/VS2, Release 1.7 with HASP II Version 4.0 as shipped from PID.

This PRPQ does not support HASP II Version 4.1.

COMPATIBILITY

The networking PRPQ modifications to the Remote Terminal Access Method (RTAM) are a logical extension of the multi-leaving capability of the HASP/RJE system, and are compatible with standard RJE support.

The HASP Networking PRPQ is licensed under the License Agreement for IBM Program Products.

EDUCATION

Education will be made available as required on an RPQ basis.

INSTALLATION CONSIDERATIONS

The HASP Networking PRPQ is applied as a modification to the base HASP program. Most modules in HASP are affected to varying degrees. Users who have applied local modifications should evaluate this PRPQ for possible conflicts prior to application.

No requests for further enhancements to this PRPQ will be accepted.

DOCUMENTATION: [available from Mechanicsburg]

NJI General Information (GH20-1941).



PROGRAMMING RPQs

**SYSTEM/3 CP/DISK SORT PROGRAM
5799-ATF, 5799-ATG, 5799-ATH (P84016)**

PURPOSE

The System/3 CCP/Disk Sort programs are used to sort files into ascending or descending sequence on System/3 model 8, 10, 12, 15A, 15B, or 15C. With the CCP/Disk Sort, the user can generate an object module which can be executed as a task under control of the Communication Control Program (CCP), or as a program under control of the SCP in a non-CCP environment.

DESCRIPTION

Each of the System/3 CCP/Disk Sort programs is functionally compatible with its Disk Sort program counterpart, with exceptions or requirements as noted below. Output can be tags, tag-along records, or summary tag-along records.

- Only disk input can be specified.
- Deferred mount of the output file is not supported.
- Automatic work file allocation is not supported.
- Work record lengths cannot be less than three bytes.

Use: Two steps are necessary:

1. **Generation:** Using information from OCL FILE statements (for input, work, and output files) and sort specifications, this program generates an object module which is cataloged into the object library. Generation is done in a non-CCP program level or partition.
2. **Execution:** The CCP system or terminal operator calls the generated object program by entering the name of the program, similar to calling any other program under CCP control. A generation program can be loaded in a batch partition by the system operator.

5799-ATF (MODELS 8 AND 10)

This program is functionally compatible with program product 5702-SM1, except as noted.

Object program generation is under control of SCP 5702-SC1. The Overlay Linkage Editor (5702-SC1, feature #6026/#6027) is required. A generated object program can be executed under control of the SCP or under control of CCP (5702-SC1, feature #6033). Neither generation nor execution requires a dedicated system.

One input file may be specified, and it may be on a 5444 or 5448 Disk Storage Drive (model 8 or 10) or on 5445 Disk Storage (model 10). The work file and the output file are also on these devices.

This program requires 12K bytes of main storage, exclusive of supervisor requirements, for both generation and execution. Additional storage is not used, even if it is available.

5799-ATG (MODEL 12)

This program is functionally compatible with program product 5705-SM1, except as noted.

Object program generation is under control of SCP 5705-SC1. A generated object program can be executed under control of the SCP or under control of CCP (5705-SC1, feature #6070). Neither generation nor execution requires a dedicated system.

Only one input file may be specified, and it must be on the 3340 Direct Access Storage Facility. The work file and the output file are also on the 3340.

This program requires 12K bytes of main storage, exclusive of supervisor requirements, for both generation and execution. Additional storage is not used, even if it is available.

5799-ATH (MODEL 15A, 15B, 15C)

This program is functionally compatible with program product 5704-SM1, except as noted.

Object program generation is under control of SCP 5704-SC1. A generated object program can be executed under control of CCP (5704-SC1, feature #6033/#6070). Neither generation nor execution requires a dedicated system.

One to eight input files may be specified, and they may be on a 5444 Disk Storage Drive or 5445 Disk Storage (model 15A) or on a 3340 Direct Access Storage Facility (model 15B or 15C). The work file and the output file are also on these devices.

The output file cannot be written over the input file. Task chaining, supported only on the model 15D, is not supported in this PRPQ.

This program requires 12K bytes of main storage, exclusive of supervisor requirements, for generation. For the size of the generated program, 12K to 48K can be specified. However, CCP does not allow a program greater than 32K.

SPECIFIED OPERATING ENVIRONMENT

HARDWARE REQUIREMENTS

Minimum System Requirements: Same as for the SCP, except as noted above. See SCP pages.

13.1/

CCP/Disk Sort	S/3 Models	SCP
5799-ATF	8, 10	5702-SC1
5799-ATG	12	5705-SC1
5799-ATH	15A, B, C	5704-SC1

SOFTWARE REQUIREMENTS

See program descriptions above.

DOCUMENTATION

(available from Mechanicsburg)

System/3 Disk Sort Reference Manual (SC21-7522) ... S/3 Bibliography (GC20-8080).

For further information, refer to the RPQ Description and Price Transmittal Number P84016.

PROGRAMMING RPQ

**HASP/MVT/3800
5799-ATQ (PRPQ MJ0792)****PURPOSE**

Functional modifications have been made to HASP II Version 4.0 to provide 3800 Printing Subsystem support for the OS/MVT Release 21.8 user. The 3800 support uses the HASP output writer.

HIGHLIGHTS

- The HASP II Version 4.0 code, which is supported only on OS/VS2 Release 1.7 (SVS) has been modified to execute on OS/MVT Release 21.8 (MVT).
- Most functions available to the HASP II Version 4.0 (SVS) user are now available to the HASP/MVT/3800 user. However, all functions withdrawn with HASP II Version 4.0 (SVS) will not be available to the MVT user that installs HASP/MVT/3800. See *HASP NEWSLETTER*, Issue Number 16, dated March 30, 1973 for details.
- New and revised operating system modules and system utilities provide support for 3800 Printing Subsystem.
- The following 3800 Printing Subsystem capabilities are supported:
 - The use of pre-printed forms, or forms generated by the 3800 itself, through either forms overlay or formatting techniques.
 - Vertical spacing at six, eight or twelve lines per inch, or a mixture of the three on the same page.
 - Horizontal printing at 10, 12 or 15 characters to the inch. The different sizes can be intermixed on the same line.
 - The ability, using the copy modification function, to add information such as legends or names and addresses, or to delete information, on the pages of any specific copy of a report.
 - Job separation by perforation marking with the mark form function.
 - In addition, a system utility, IEBIMAGE is provided for defining or modifying FCB modules, copy modification modules, and character arrangement tables.
- 3800 Compatibility Notes
 - No changes to users programs written in higherlevel languages are needed.
 - Names of existing chain/train arrangements (e.g., AN, TN, etc.) for impact printers can be used with SYSOUT DD statements processed by HASP/MVT/3800 for compatible results. All standard arrangements for the 1403 mdl N1 and 3211 printer are recognized, except ALA. Non-standard chain/train character arrangements require user modification of character arrangement tables, and/or graphic character modification records.
- Additional Compatibility Considerations
 - The forms control buffer format is unique to the 3800.
 - Overprinting, to produce special composite characters or to print diacritical marks over existing graphics, is not possible except for underscoring. Underscoring is implemented in two ways in the 3800 Printing Sub-system. A standard hardware feature operates as an equivalent to the similar function in line printers requiring two lines to be transmitted for each line that contains underscored characters. The other method employs an underscored character set only requiring one line to be transmitted.
 - Commands that cause folding or unfolding are not recognized by the 3800 Printing Subsystem. These functions are achieved through the use of appropriate character arrangement tables.
 - No printing is permitted in the top and bottom half inch (12.7mm) of a page.
 - Interactive Training System (ITS) (5734-XXC) cannot support the 3800 due to the extensive use of overstriking incorporated into reports generated for the user.

CUSTOMER RESPONSIBILITIES

HASP/MVT/3800 is applied through the HASP generation procedure. Installation remains the responsibility of the user. Because HASP/MVT/3800 represents change from HASP II Version 3, users should be aware that their own modifications, if any, must be removed, reapplied, or redesigned. System utility programs and system modules are applied with the System Modification Program (SMP). When using the S/3 Starter Deck Program, it is recommended that all workstation programs be regenerated to ensure acceptance of 4-digit job numbers, failure to do so will cause unpredictable results when a 4-digit job number is submitted.

SPECIFIED OPERATING ENVIRONMENT**HARDWARE REQUIREMENTS**

The system utilities and system modules included in this product are applicable to OS/MVT Release 21.8 on the IBM System/370 models 145, 148, 155, 155II, 158, 158-3, 165, 165II, 168, and 168-3, increasing main storage requirements approximately 2K bytes.

Due to the variations which result from user-selected options available at HASP generation, no generalized statement of main storage requirements is included here.

Additional auxiliary storage is required to accommodate a larger SYS1.IMAGELIB data set, and library storage. The exact requirements must be established by the user.

SOFTWARE REQUIREMENTS

The HASP/MVT/3800 HASP modules are coded in Assembler language. The HASP generation process requires assembly of all HASP modules using either the Program Product OS Assembler H (5734-AS1) or OS/VS Assembler F executing under control of its respective operating system:

Assembler F Order No.	Operating System
5741-SC-103	VS1
5742-SC-103	OS/VS2 Release 1 (SVS)
5749-SC-103	VM/370
5752-SC-103	OS/VS2 Release 3 (MVS)

HASP/MVT/3800 is supported under OS/MVT Release 21.8 with the System Modification Program (SMP) installed. The SYS1.IMAGELIB system data set is required.

Note: Effective November 30, 1977, programming support for OS/MVT Release 21.8 and HASP II Version 3.0 were discontinued.

PROGRAMMING RPQs

**SYSTEM/32 SUBSET ANS/68 COBOL
5799-AWQ (P84018)****PURPOSE**

The System/32 Subset ANS/68 COBOL programming RPQ operates under control of the System/32 System Control Program (5725-SC1). The compiler and library are disk resident on the fixed disk. The compiler requires as input a COBOL source language program written in American National Standard COBOL (X3.23-1968) and produces as output, by means of the system's Overlay Linkage Editor, a System/32 machine language object module which is cataloged into an object library. A source program listing, diagnostic messages, and main storage map can be requested.

HIGHLIGHTS**COBOL Language Level**

The following functional processing modules of the ANS standard are included in the System/32 compiler:

1 Nucleus	1, 2
1 Sequential Access	1, 2
1 Random Access	0, 2
1 Library	0, 2
2 Table Handling	1, 3
1 Segmentation	0, 2

The first digit above represents the level of the models included in the compiler; the second digit represents the lowest level in the American National Standard (0 implies that a module does not have to be present); the third digit represents the highest level in the ANS standard.

The international standard for COBOL is ISO (International Organization for Standardization) Recommendation Number 1989, which was approved by ISO in 1972. The ISO and ANS standards are identical in technical content.

Extensions

- Certain language elements which are defined in higher levels of the ANS COBOL than those listed.
- Certain language elements, defined by CODASYL, not included in the X3.23-1968 standard, but are now included in the 1974 standard.
- IBM-developed extensions consistent with those supported by the S/360 and S/370 OS and DOS ANS COBOL compilers and 1130 ANS COBOL compiler.

SPECIFIED OPERATING ENVIRONMENT**HARDWARE REQUIREMENTS**

All models of the IBM System/32 are supported.

SOFTWARE REQUIREMENTS

The current release of the IBM System/32 System Control Program (5725-SC1) is required.

DOCUMENTATION

(available from Mechanicsburg)

System/32 COBOL Supplement PRPQ Information Manual (GC21-7753).

PROGRAMMING RPQ

**SYSTEM/34 SUBSET ANS/68 COBOL
5799-AWR (P84019)****PURPOSE**

The System/34 Subset ANS/68 COBOL Programming RPQ operates under control of System/34 System Support (5726-SS1). The compiler and library are disk resident on the fixed disk. The compiler requires as input a COBOL source language program written in American National Standard COBOL (X3.23-1968) and produces as output, by means of the system's Overlay Linkage Editor, a System/34 machine language object module which is cataloged into an object library. A source program listing, diagnostic messages, and main storage map can be requested.

DESCRIPTION

COBOL Language Level: The following functional processing modules of the ANS standard are included in the System/34 compiler:

1 Nucleus	1,2
1 Sequential Access	1,2
1 Random Access	0,2
1 Library	0,2
2 Table Handling	
1 Segmentation	0,2

The first digit above represents the level of the modules included in the compiler; the second digit represents the lowest level in the American National Standard (0 implies that a module does not have to be present); the third digit represents the highest level in the ANS standard.

Extensions Include:

- Certain language elements which are defined in higher levels of the ANS COBOL than those listed.
- Certain language elements, defined by CODASYL, not included in the X3.23-1968 standard, but are now included in the 1974 standard.
- IBM-developed extensions consistent with those supported by the System/360 and System/370 OS and DOS ANS COBOL compilers and 1130 ANS COBOL compiler.
- The interval timer is supported for time-of-day functions by invocation of a supplied subroutine via a call 'CFTOD' statement.
- Workstation support is via call and includes the capability to READ/WRITE, OPEN/CLOSE, ACQUIRE/RELEASE workstation files. Multiple requesting terminals and multiple data entry terminals are possible; however, the user must keep track of data associated with each terminal.
- Users must generate their own screen formats via screen format generation.
- The local area and UPSI byte of a workstation may be read and written.
- Full support of System/34 functions of multiprogramming and spooling (including multiple printer files).

SPECIFIED OPERATING ENVIRONMENT

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

HARDWARE REQUIREMENTS

All models of the IBM System/34 are supported.

SOFTWARE REQUIREMENTS

The current release of the IBM System/34 System Support licensed program (5726-SS1) is required.

DOCUMENTATION

(available from Mechanicsburg)

*System/3 Subset ANS COBOL Reference Manual (GC28-6452) ...
System/34 COBOL Supplement PRPQ General Information Manual (GC21-7752) ... System/34 Subset 1968 ANS COBOL Compiler and Library PRPQ Licensed Program Specification (GC21-7784).*



PROGRAMMING RPQs

**INTELLIGENT REMOTE STATION SUPPORT (IRSS)
5799-AXL**

PURPOSE

This program allows the System/3 mdl 15D to communicate with IMS/VS IRSS on a S/370.

DESCRIPTION

Intelligent Remote Station Support (IRSS) is an IMS/VS Binary Synchronous Communications (BSC) protocol for support of remote systems.

A user program in a remote model 15D can inquire into, or update, an IMS/VS data base through a user application program on S/370.

IMS/VS must be Version 1, Release 1.1.4 (or later). System/3 model 15D SCP must be Release 3 (or later). The IRSS facility for the System/3 model 15D consists of 3 functional areas:

1. IRSS interface support
2. Disk queue formatting queue
3. User interface support

RPG II is the only language supported. IMS/VS data communications feature is required on the System/370. (CICS/VS as a 'front end' to IMS is not supported.) IRSS protocol cannot run on the same line as 3270 protocol. Only nonswitched multipoint lines are supported by the IRSS protocol.

SPECIFIED OPERATING ENVIRONMENT

HARDWARE REQUIREMENTS

An IBM System/3 processing unit of at least 128K bytes of main storage is required. Either BSCA line 1 or line 2 can be used; BSCC is not supported.

SOFTWARE REQUIREMENTS

This PRPQ operates under control of CCP and requires the 15D SCP, 5704-SC2. The IRSS interface is a MRT/NEP task under CCP, and the user interface consists of a task chain to the IRSS program.

DOCUMENTATION

(available from Mechanicsburg)

IBM System/3 and IBM System/34 IMS/VS IRSS Facility PRPQ Program Reference Manual (SC21-7747).

Also refer to the RPQ Description and Price Transmittal Number P84024, (5799-AXL).

PROGRAMMING RPQ

**3277 APL GRAPHICS ATTACHMENT SUPPORT
5799-AXW****PURPOSE**

The 3277 APL Graphics Attachment Support package is a set of APL functions which provides interactive graphics support for the 3277 Graphics Attachment (RPQ 7H0284). This package contains a variety of APL functions designed to provide capabilities ranging from fundamental graphics support through high-level graphics applications. The functions are members of the following major components: Fundamental graphics support ... curve plotting ... curve fitting ... contour plotting ... 3-dimensional geometry.

HIGHLIGHTS

- Adds a visual dimension to interactive computing.
- An effective way to view data generated using APL.
- Easy to learn and use.
- Fundamental and applications-oriented components makes it easy to implement additional applications.
- Supports the capabilities of the 3277 Graphics Attachment.
- Maintains the orderly and highly usable syntax of functions encouraged by APL.
- Provides compatibility with the 5100 APL GRAPHPAK FDP (5798-NFX).

OVERVIEW

The fundamental graphics support component of this package includes functions for drawing straight line segments in any direction and writing characters. All of the applications-oriented components utilize the fundamental graphics support component.

The curve plotting component enables the user to plot defined data on either linear or logarithmic coordinate axes and to label those axes. Scaling, symbol plotting, labeling, and titling can be done automatically or through user specification. In addition, functions are provided for plotting bar charts and histograms. The curve plotting component is also used by the curve fitting and contour plotting components.

The curve fitting component permits quick, least-squares analyses of potential functional relationships between variables. Fits are provided for polynomials (which include the straight line, quadratic, cubic, etc. exponential or power functions in linear or logarithmic spaces. Data points may be removed conveniently from consideration for recomputation of fits. In addition, spline-like functions can be fit to provide smooth curves that go through all data points.

The contour plotting component permits drawing level curves for functions of two variables defined on a rectangular grid. This permits mapping in many application areas including surveying and field plotting.

The three-dimensional geometry component is designed to facilitate the visualization of three-dimensional objects. Representations of objects may be scaled to fit in a convenient space, magnified, and translated along and rotated about X, Y and Z axes. The resulting objects may then be sketched using any of several projection techniques including orthographic, isometric, oblique, perspective and stereo.

These components can be used effectively as the basis for user-customized higher-level applications because the system design is based on a sound technical base in computer graphics techniques including scaling transformations based on virtual and real spaces, scissoring on arbitrary convex polygon boundaries, utilization of homogeneous coordinates, and other techniques representative of the state of the graphics art.

CUSTOMER RESPONSIBILITIES

The customer must have an adequate processor with at least one 3277 mdl 2 with the 3277 Graphics Feature installed (RPQ 7H0284) and a suitable storage display device. All IBM hardware must be at the latest engineering change (EC) level. Additionally, VSAPL must be installed (Release 3.0) under the appropriate operating system (see Programming pages). Minimum system configuration required is the same as that for VSAPL.

SPECIFIED OPERATING ENVIRONMENT**SOFTWARE REQUIREMENTS**

The PRPQ is implemented in the APL language and is designed for use with the following languages:

- VSAPL (Release 3.0) under (VM/370)
- VSAPL (Release 3.0) under (IUP 5796-ALB)
(MVS Release 3.7)
- VSAPL (Release 3.0) under VSPC Release 2.0 for OS/VS1
and OS/VS2.

All auxiliary processors are included in the program which provide mechanisms for communication between the APL workspace and the 3277 I/O management programs in the TSO and CMS environments.

DOCUMENTATION: (available from Mechanicsburg)

Licensed Program Specifications (G20-5275) ... General Information Manual (GH20-2147) ... Program Reference/Operations Manual (SH20-2444) ... Logic Manual (LY20-2138).

MVS INTEGRITY

IBM will accept APARs describing any situation where the installation of the IBM 3277 APL Adapter Graphics Support PRPQ causes an exposure to the integrity of MVS. However, the 3277 APL Graphics Attachment Support PRPQ is not intended to run in an authorized state at any time and should not represent a threat to the systems integrity of MVS.

PROGRAMMING RPQ

**3277 GRAPHICS ATTACHMENT SUPPORT
5799-AXX****PURPOSE**

3277 Graphics Attachment Support is a comprehensive collection of FORTRAN and Assembler routines which provides the user with three levels of graphic support. The first level, basic device support, allows the user to generate commands for drawing lines, placing characters, changing graphic characteristics (line types, character sizes, etc.), and reading X-Y coordinates. These routines also provide an exit to allow command generation directly and for converting between numeric and character formats. The second level of support provides user coordinate functions and basic operations such as clipping, shading, thick line, and dot generation. The third level provides two applications, a line art program (flowcharts, foils, and simple drawings), and a graph generation program. All routines are callable from FORTRAN, PL/I and COBOL.

HIGHLIGHTS

- Device support routines
- Number to character and character to number conversion
- X-Y input
- Clipping
- Transformations (magnification, rotation, translation)
- User coordinates
- Shading
- Thick lines and dots
- Geometric structures
- Three dimensions
- Curve fitting
- Contouring
- Line art application
- Graphic application.

SPECIFIED OPERATING ENVIRONMENT**HARDWARE REQUIREMENTS**

In addition to the hardware components needed to support OS/VS (MVS) with TSO or VM/370 CMS, one 3277 mdl 2, the 3277 Graphics Attachment (RPQ 7H0284), and a suitable storage display device are also required.

SOFTWARE REQUIREMENTS

This program is designed to operate under OS/VS2 (MVS) with TSO or VM/370 CMS. FORTRAN IV G or H and Assembler F or H are required operating system components. The basic device support requires 10 to 15K; the basic application support requires about 50K, and each application requires 50K of virtual storage. The total package requires about 150K of virtual storage.

PLANNED AVAILABILITY: Will be available with first customer shipment of the 3277 Graphics Attachment (RPQ 7H0284).

DOCUMENTATION (available from Mechanicsburg)

Design Objectives (GH20-4499).

**INTERACTIVE GEO-FACILITIES GRAPHIC SUPPORT
IGGS (5799-AYB) (PRPQ P09016)****PURPOSE**

Interactive Geo-Facilities Graphic Support is a set of high-level interactive programs written in FORTRAN IV and OS/VS Assembler. These programs will provide a fast and efficient means of creating and maintaining graphic documents such as maps with a minimum of user programming. This will allow implementation of a wide variety of customer-coded applications. A principal application is the entry, editing and display of data used to create and update geographically oriented-facilities data bases.

DESCRIPTION

Four areas of program support are provided:

- Define and specify user interaction with the system via menu keys, data entry keyboard and picture components.
- Specify, externally, the structural relationships and graphic representations of user data items to be manipulated in the IGGS workspace.
- A comprehensive and extendable set of preprogrammed library functions which are invoked via user defined menu keys.
- A workspace information manager that is able to maintain multiple relationships for each data segment that is stored in the workspace.

HIGHLIGHTS

- **Workstation Control:** A comprehensive set of functions providing user controls for registering paper documents on a tablet, windowing and zooming picture data within the viewport of the display, selecting picture scales and points of interest and controlling cursor operations. See "System Configuration" below for a description of a workstation.
- **Graphic Data Entry and Editing:** A powerful set of interactive functions for constructing and modifying two-dimensional pictures in a workspace. Included in this set are user specified procedures for dynamically adding, deleting and moving facilities in picture displays; constructing arcs and parallel or perpendicular lines; attaching, connecting and offsetting lines; various forms of graphic annotation, etc.
- **Attribute Data Entry and Modification:** A set of programs supporting user data entry directly from menu keys and the keyboard into facility data fields. Included in this set are various formatting and data conversion options for internal storage of user data.
- **Symbol Generation:** The generation of symbols and characters from a user-specified symbol table. The installation has significant flexibility in the interactive design of its symbol character set. Symbol definitions also make it possible to easily support the generation of symbols of various sizes and orientations desired in the display.
- **Graphic Workspace Data Transformation To and From Interface Format:** IGGS not only manages picture data, but also maintains complex relationships between picture data and the associated data of the application. Data may be created outside of the IGGS system. In order to transform this external data into the IGGS format, a device and system *Independent Interface Format* (SH20-2196) has been designed as a common method for interfacing. IGGS will transform data from the Interface Format into the internal workspace structure, and from workspace structure into the Interface Format.
- **Flexible Menu Layout and Function Definition:** Menu layouts are designed by the user. Each menu area can correspond to one or more keys and sub-keys. Each key corresponds to one menu function. Each sub-key defines a set of data passed to the function. Therefore, a single pointing to the menu may invoke one or more functions with different data input. Functions invoked via the menu may include both preprogrammed library functions and user application programs.

CUSTOMER RESPONSIBILITIES

To install IGGS, the customer is required to:

- Define symbol tables
- Develop appropriate facilities MENU layouts
- Modify and/or add to action/response process for MENU functions
- Write validation edit routines.

Customers installing IGGS to interface to other application systems will be required to program the interface modules. These include data base (DL/I) detail layout, creation and maintenance module, facility retrieval module, transform modules (to/from), IGGS and special conversion programs.

SPECIFIED OPERATING ENVIRONMENT**HARDWARE REQUIREMENTS**

In both the OS/VS2 (MVS) and VM/370-CMS environments, IGGS requires 1.5 megabytes of virtual storage for each workstation supported. In addition, disk storage is required to store workspaces when they are saved. The user should consider an average of 200,000 bytes for each saved workspace.

In addition to the hardware components needed to support OS/VS2 (MVS) with TSO or VM/370 - CMS, applications using the programming RPQ will require a minimum of one workstation.

The only workstation supported by IGGS is the IBM 3277 Graphics Attachment (RPQ 7H0284) using a customer-supplied storage tube, digitizing tablet and optional plotter. Device support will be provided for one variety of RS-232-C connected digitizing tablet and plotter. The user may choose other varieties of storage tubes, digitizers and plotters but may have to make minor modifications to the device support.

SOFTWARE REQUIREMENTS

The Interactive Geo-Facilities Graphics Support Programming RPQ is written in FORTRAN IV and OS/VS Assembler Language. The programming RPQ is released to run under current releases of OS/VS2 (5752-VS2) with TSO or under VM/370-CMS (5749-010).

A remote system with VM/370-CMS RSCS or VNET and the IGGS programming RPQ will communicate with user written library services in a central computer.

FORTRAN IV G1 (5734-FO2) or H Extended (5734-FO3) compilers and OS/VS Assembler (5734-AS1) are required for installation.

DOCUMENTATION: (available from Mechanicsburg)

General Information Manual (GH20-2152), *Interface Format Definition* (GH20-2196), *Program Reference and Operation Manual*, *Logic Manual*, *Licensed Program Specifications*.

PROGRAMMING RPQ

**SYSTEM/34 WORKSTATION SUPPORT SUBROUTINES
for COBOL and BASIC ASSEMBLER
5799-AYW (P84034)****PURPOSE**

The System/34 provides workstation support subroutines as a Programming RPQ of preassembled subroutines that operate under the System/34 SSP (5726-SS1). These subroutines provide the COBOL and Basic Assembler user with access to the workstation formatting capabilities of SFGR (Screen Format Generation Routine) and WSDM (Workstation Data Management). The subroutines provide the user with support for single or multiple requestor programs (SRT/MRT), never ending programs (NEP), and single or multiple acquired terminals. Support is provided for reading and updating the Workstation Local Data Area (WSDA) and UPSI switches. Support is provided for the Interactive Communications feature (SSP-ICF) for COBOL and Basic Assembler.

HIGHLIGHTS

- Support for access to the facilities of the (SSP-ICF) (Interactive Communications Feature) from COBOL and Basic Assembler.
- Support for reading and writing data under control of SFGR formats.
- Support for acquire and release of selected workstations and (SSP-ICF) sessions.
- Support for reading and writing a specific workstation's local data area.
- Support for reading and writing a specific workstation's UPSI switches.
- Write a format after rolling a specific section of the screen up or down.
- Write a message to the error line of the workstation.
- Read/Write to the system console.
- Read workstation attributes.
- Test for status of operation-ended invites.
- Stop a pending invite.

DESCRIPTION

The user is given access to these capabilities through a standard call interface (as defined by System/34 COBOL). This interface consists of the following elements:

- Callable subroutines
- Parameter lists
- Record areas
- Optional screen format indicator areas
- Return codes

To use this interface for workstation support, the user need only:

- Load the workstation support subroutines to the desired library.
- Code the definition of the parameter lists and record areas in the using source program.
- Set the contents of the parameter lists as required.
- Call the subroutines that perform the desired function.
- Compile and link-edit the using source program.
- Prior to execution, the screen formats must have been coded and generated into the appropriate library using Screen Format Generator Routine (SFGR) of the System/34 System Support licensed program.

To use the interface with SSP-ICF, in addition to the items specified under workstation support, the user needs to:

- Supply the predefined format name that corresponds to the SSP-ICF output function desired.
- Supply any SSP-ICF parameters required to perform the output functions (that is, transaction ID, password, etc.).
- Supply the data.
- Perform the input/output operation.
- Test the SSP-ICF return code.

Acquire, release, and read are done with the same subroutines for both a display station and SSP-ICF session.

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 Use During Customer Pre-installation Testing: Jcc This PRPQ is available 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 Workstation Support Subroutines PRPQ runs on all models of the IBM System/34, when included in an appropriately coded, compiled, and link-edited user program written in IBM System/34 COBOL or Basic Assembler language.

SOFTWARE REQUIREMENTS

The IBM System/34 Workstation Support Subroutines PRPQ will operate under control of the current release of the IBM System/34 System Support licensed program (5726-SS1), when included in an appropriately coded, compiled, and link-edited user program written in IBM System/34 COBOL or Basic Assembler language. The SSP-ICF feature (#6000, #6001) is required to perform interactive communications with a session under control of the IBM System/34 Work Station control Subroutines PRPQ.

DOCUMENTATION

(available from Mechanicsburg)

System/34 Work Station Support Subroutines PRPQ Reference Manual (SC21-7810).

PROGRAMMING RPO

**8100 INFORMATION SYSTEM
DISTRIBUTED PROCESSING DEVELOPMENT SYSTEM
DPDS (5799-AZL) (PRPQ P88016)**

PURPOSE

DPDS is a PRPQ that runs on a S/370 or 4300. It provides systems programmers with a high-level language in which to code systems programs, and a simulator of the 8100 Information System processor, with interactive facilities for debugging on the S/370 or 4300 before execution on the 8100.

DESCRIPTION

DPDS is a set of facilities designed primarily to enhance productivity of systems programming at a S/370 or 4300 site. It is intended to be used by systems programmers who wish to develop applications or new modules that extend the capabilities of Distributed Processing Programming Executive (DPPX) licensed programs for the 8100 Information System. DPDS is not intended to facilitate the alteration of IBM licensed programs, but does provide the alternative of supporting the extension and substitution of program modules within DPPX licensed programs. DPDS facilities run as problem programs on a S/370 or 4300 with OS/VS1 or OS/VS2 MVS. DPDS provides a high level language, Programming Language for Distributed Systems (PL/DS), which is similar to PL/I but is specially adapted to 8100 system programming needs. DPDS is comprised of a compiler with a macro library, a linkage editor, and a simulator of the 8100 Information System processor with interactive facilities for debugging. With these facilities, the 8100 systems programmer can compile and debug 8100 programs on a S/370 or 4300.

HIGHLIGHTS

The typical users of DPDS are the central site programming staff for host connected 8100/DPPX systems. The typical application areas for DPDS are:

- Program development of extensions to DPPX/BASE. For example, the programmer may wish to add a function to the interactive debug portion of DPPX/BASE to automatically store the test parameters for a particular program at the end of a debug session.
- Program development of new system applications intended for operation in the DPPX environment. Such an application may be the addition of a text processor to the interactive editor portion of DPPX/BASE.
- Program development of special I/O support (not supported by DPPX/BASE). This might include a unique device such as a specialized optical reader.

The use of DPDS for these purposes rather than programming entirely at the DPPX assembler language level may provide the following advantages:

- Reduced development cost through greater productivity
- Simplified program debugging
- Reduced length of development schedules
- Reduced cost and effort in updating and enhancing user systems code
- Structured program documentation
- Reduced dependency on 8100 hardware for systems program development.

DPDS has the following facilities:

1. PL/DS, a high-level systems-programming language and its associated compiler. PL/DS permits intermixing of high-level, macro, and machine level statements. A macro library is also included to provide access from PL/DS to the services of DPPX. Output options prepare the object modules for further DPDS processing or prepare a data set which, when moved to an 8100 by a user-defined process, is suitable for input to the DPPX/BASE linkage editor.
2. A special linkage editor which combines the outputs of compiler runs into input for the program simulator.
3. The program development simulator is composed of an 8100 processor model program and command facilities that are used interactively to debug the program produced by the compiler. It is designed to be used as an interactive tool under TSO but can also be run in batch mode. The simulation environment can be extended with user-prepared hardware or system models which define missing functions, DPPX licensed program interactions, and/or non-processor hardware devices. This is accomplished with the aid of a set of macro modeling functions that are a part of the program development simulator. These macros provide a simplified method of performing such functions as starting and terminating the simulator model and providing input and output.

The three facilities are invoked and executed independently by the user.

CUSTOMER RESPONSIBILITIES

- The customer must provide appropriate facilities to move completed object modules prepared on the S/370 or 4300 to the 8100. The alternatives are physical transfer via diskette or tape media or via communication lines.

For movement via compatible diskette or tape media the customer is responsible for preparing the necessary procedures or programming. This may be accomplished partly by the use of system utility functions available with OS/VS1 or OS/VS2 MVS and DPPX/BASE.

Movement via communication attachment can be done if the customer has the Distributed Systems Executive (DSX) licensed program, Release 2.0 or later, installed on his system and the user has defined specific DSX procedures for this purpose. Otherwise, customer developed programs will be necessary.

- The customer is responsible for developing all simulator models for programs and hardware other than the 8100 processor model that is part of the program development simulator. The processor model does not include DPPX licensed programs.

SPECIFIED OPERATING ENVIRONMENT

HARDWARE REQUIREMENTS

DPDS will operate on a S/370 or 4300 with sufficient real storage to satisfy the combined requirements of DPDS, OS/VS1 and OS/VS2 respectively, and other customer-required programs. The PL/DS compiler requires a minimum of 768K bytes of virtual storage. The linkage editor requires 512K bytes plus the main storage size required by the resulting load modules, and the simulator requires 256K bytes plus the simulated 8100 storage size plus the size of any user model that has been added to the simulated environment. The storage requirements for the compiler, linkage editor, and simulator facilities of DPDS are not cumulative, since each component is run independently.

The configuration must include sufficient I/O - devices to support the requirements for system output, system residence, and system data sets. Sufficient direct access storage must be available to satisfy the user information storage requirements and may consist of any direct access facility supported by OS/VS1 or OS/VS2 MVS, respectively. Residence on 3330 mdl 11 requires ten cylinders for the PL/DS macro library, one cylinder for the simulator modeling macro library, and eight cylinders for the load library.

SOFTWARE REQUIREMENTS

DPDS works with OS/VS1 Release 7 and OS/VS2 (MVS) Releases 3.7 and 3.8 and subsequent releases and modification levels unless otherwise specified. It operates either in batch mode or under TSO. Since DPDS operates as an application, it is capable of coexisting with other applications in the system, provided sufficient storage is available. No other programs are required for executing DPDS, but a System/370 assembler is required if the user wishes to build his own models.

COMPATIBILITY

The output record format for object modules produced under the option for export of text (object modules produced on the S/370 or 4300 for link editing and execution on an 8100) is compatible with the input data format for the DPPX/BASE linkage editor. The PL/DS compiler provides for the optional selection of linkage conventions to be included in the object code. Options include the DPPX supported linkage, a compiler-defined general linkage, and a user-defined linkage.

DATA SECURITY

DPDS runs under OS/VS1 or OS/VS2 and is subject to the controls those systems provide. User management is responsible for the selection, application, adequacy and implementation of the security features, and for the appropriate application controls.

PERFORMANCE CONSIDERATIONS

Compiler options are provided to assist in the management of performance. Options permit the control of major compiling phases and the selection of a variety of documentation outputs. The compiler performs extensive optimization analysis using both global and local techniques which result in more efficient object code construction.

DOCUMENTATION: (available from Mechanicsburg)

DPDS Licensed Program Specification (GC27-0517) ... DPDS General Information (GC27-0505) ... DPDS Programming Language for Distributed Systems (PL/DS) User's Guide (SC27-0478) ... DPDS Program Development Simulator User's Guide (SC27-0479) ... DPDS Programming Language for Distributed Systems (PL/DS) Reference (SC27-0446) ... DPDS PL/DS Macros for DPPX/BASE Reference (SC27-0447).



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PROGRAMMING RPQ

DPDS (cont'd)

MVS SYSTEM INTEGRITY

IBM will accept APARs describing any situation where the installation of the Distributed Processing Development System (5799-AZL) causes an exposure to the system integrity of MVS. This program is not intended to run in an authorized state at any time and should, therefore, represent no threat to the system integrity of MVS.

PROGRAMMING RPO

**3624/3614 CONSUMER TERMINAL ACCESS METHOD
THOD
5799-AZN**

PURPOSE

The Consumer Terminal Access Method for 3624 and DES Version 3614 Consumer Transaction Facilities (CTF) is designed to assist users in their installation of these terminals when attached to a 3600 Finance Communication Controller (FCC).

DESCRIPTION

This PRPQ provides CTF device-dependent functions as part of an 3600 FCC application program. The user is responsible for writing the transaction processing application program. Using this PRPQ relieves the user programmer of CTF device-dependent concerns and allows his attention to be focused on the application-dependent function to be performed. The device-dependent support functions will handle exceptional or error events associated with the CTF, presenting a logically error-free source of transactions to the user programmer. This PRPQ is written in 3600 Assembler language and does not require any 3600 FCC microcode changes.

The modules provided by this PRPQ are designed to be generated in a S/370 with the resulting program executed in the 3600 FCC. This PRPQ, as delivered, will participate in three 3600 FCC programs that are assembled separately and then combined and transmitted to the FCC in a single controller image. These programs are:

- User's application program that includes device-dependent modules and macros. The user's application program is directly responsible for transaction authorization and transaction completion processing. Interaction across the interface between the user's application program and the CTF device-dependent modules is via macros provided in this PRPQ.
- Services program, which performs CTF device-dependent functions that do not require interface with the user's application program. This service program provides support for:
 - Service request macros.
 - Activation of a 3600 FCC polling workstation to monitor availability of the CTF network.
 - Logging and hardware error analysis on behalf of a restarting CTF workstation.
 - Retrieval of customization load images from SSS and management of these images between CTF and FCC.
- 3604 control operator program, which supports an interface to a 240-character display 3604. This module is designed for debugging or pilot operations, but may be used in an operational system if it fits the user's requirements. The user may utilize the facilities within this module to provide his own operator support through a 3604 or via some other suitable method of communication such as an attached host processor.

HIGHLIGHTS

- High degree of CTF device-independence, allowing the user to develop transaction processing application programs independent from CTF operational dependencies.
- Provides standard interface for communication between user's application and Consumer Terminal Access Method program.
- Provides for generation and operation of user's program with Consumer Terminal Access Method through a set of high-level macros.
- Formats transaction reply data for transmission to CTF.
- Computes number of bills to be disbursed for both single- and dual-denomination machines.
- Provides special entry points to Consumer Terminal Access Method services and operator control programs to allow user participation, where desired, in error recovery and restart.
- Option to route CTF-related, attention-required messages to host system and/or subhost system components for CTF and network operator control.
- Provides a range of 3624/3614 network operator commands to:
 - Open and close CTF.
 - Change communication encryption keys.
 - Load master encryption key.
 - Initiate recovery and restart sequence.
 - Replace display messages.
 - Request and change customized option data.
 - Print transaction statement documents to be retained in CTF.
 - Request normal and maintenance status of CTFs.
 - Place CTF in test mode for offline testing.
 - Immediate stop and closure of CTF.
 - Start CTF with option to open automatically or to remain closed until further command.
 - Set and obtain date and time-of-day.

- 3624/3614 load image management:
 - Maintain load images on 3600 FCC permanent file.
 - Provision for up to eight image load areas can be defined for 3600 FCC diskette permanent file.
 - Assign given load images on permanent file to specific CTFs.
 - Options are available to establish SSS session with host processor, activate a user-written application program, or notify a control operator whenever a load image is required that is not available in permanent file.
- CTF system options that are specifiable by Consumer Terminal Access Method generation macros include:
 - Support track-2, track-3, or both tracks.
 - Dynamic or static I/O buffering.
 - Dynamic or static diskette file allocation.
 - 3604 control operator routines.
 - Modification of 3604 display message content and/or format.
 - Auto restart following control operator assignment and control operator entry of date and time.
 - Dynamically determine CTF workstation IDs at startup.
 - Auto restart following service door closing.
 - Specify CTF commands available to control operator.
 - Automatic activation of:
 - Polling workstation to monitor availability of 3624/3614 network.
 - Transaction activity logging.
 - Checkpoint facility.
 - Auto reconfiguration to continue CTF operation in the event of:
 - One hopper out of currency in dual-denomination machine.
 - Depository full or non-functioning.
 - Printer out of forms, stacker full, or nonfunctioning.
 - Degree of overlay processing allowed.

CUSTOMER RESPONSIBILITIES

For installation of the 3600 Finance Communication System through the use of this Programming RPO, the user must:

- Understand the 3600 Finance Communication System and its components including the relationship of loops, devices, workstations.
- Study and understand the functions and architecture of the application programs and macros provided in this PRPQ.
- Develop user-written application transaction processing routines.
- Develop, if desired, user-written application programs to replace 3604 central operator support and 3624/3614 load image management routines supplied, and/or to supplement 3624/3614 start/restart processes.
- Originate all system encryption keys and furnish Consumer Terminal Access Method, where desired, with CTF master key and communication keys.
- Test programs for proper offhost and onhost operation.
- Implement any balance and control techniques which are to be used in connection with the terminals and user records.
- Implement appropriate security procedures through programming and physical control methods.

SPECIFIED OPERATING ENVIRONMENT

HARDWARE REQUIREMENTS

Consumer Terminal Access Method for the IBM 3624/3614 requires the following minimum system configuration:

Host System for generation of 3600 FCC Consumer Terminal Access Method supported programs and for support of CTF load images through SSS:

- Any System/370 with at least 256K bytes of real storage.
- Any direct access storage device supported by DOS/VS or OS/VS.
- Any card read/punch and printer supported by DOS/VS or OS/VS.
- One magnetic tape drive unit for installation of this product.
- 3704 or 3705 Communications Controller with storage and features capable of supporting NCP/VS.

Finance Communication System

- 3601 or 3602 Finance Communication Controller utilizing Instruction Enhancements and DES features. Due to the variations which result from user selected options available at Consumer Terminal Access Method generation, no specific statement of storage requirements is included here.



PROGRAMMING RPQ

3624/3614 Consumer Terminal Access Method (cont'd)

- 3604 Keyboard Display (any model with a 240-character or greater display) when using the control operator program supplied by this PRPQ.
- 3624 or 3614 model 1, 2, 11 or 12 Consumer Transaction Facility. (Requires DES (#9001) Encryption Technique on 3614.)

SOFTWARE REQUIREMENTS

The Consumer Terminal Access Method is designed to work with the programming systems specified below. To generate the 3600 FCC application program using Consumer Terminal Access Method and to support the transmission of the application program and 3624/3614 customization load images between host and 3600 FCC, the user must have: Disk Operating System (DOS/VS) Release 34, or Operating System (OS/VS1) Release 6.0, or (OS/VS2 MVS) Release 3.7, in a virtual System/370. Consumer Terminal Access Method supported programs operate under 3600 FCC Host Support, Independent Release 4 or later. This licensed program is released to work with above releases and all subsequent releases, and modification levels unless otherwise stated.

DOS/VS

Assembler 5745-SC-ASM
Host Support for IBM 3600 Finance Communications
System (DOS/VS) (IR4 or later) 5747-BR1
Subsystem Support Services (SSS) 5747-CC6
and SSS prerequisites: (VSAM; NCP/VS or
ACF/NCP/VS; VTAM or ACF/VTAM; TCAM or ACF/TCAM)

OS/VS

Assembler XF 5741-SC1-03
Host Support for IBM 3600 Finance Communications
System (OS/VS) (IR4 or later) 5744-CA3
Subsystem Support Services (SSS) 5741-VS1
or
and SSS prerequisites: (VSAM; NCP/VS or
ACF/NCP/VS; VTAM or ACF/VTAM; TCAM or ACF/TCAM)

DOCUMENTATION: (available from Mechanicsburg)

Licensed Program Specifications (GC66-0013) ... Systems Guide (SC66-0014) ... Advanced Function Guide (SC66-0014) ... Reference and Operations Manual (SC66-0016).

SECURITY

Responsibility for security of the CTF system rests with the user. Data security between a CTF and Consumer Terminal Access Method is as provided by the normal 3624/3614 message encryption protocol, utilizing the Data Encryption Standard (DES) algorithm. Consumer Terminal Access Method provides the encryption and decryption required between CTF and 3600 FCC, utilizing encryption keys furnished by the user. Additional security measures to help prevent unauthorized access to control operators workstations should be placed in the user application programs as desired.

PROGRAMMING RPQ

**NETWORK EXTENSION FACILITY
5799-AZP**

PURPOSE

Network Extension Facility enhances the 3705 ACF/NCP/VS Control Program to allow NCP management of Airlines Line Control (ALC) networks. Running in concert with the Airline Control Program/Transaction Processing Facility (ACP/TPF) program and the Airline Control Program/Advanced Communication Function (ACP/ACF) feature, the facility intercepts ALC traffic to perform ALC-dependent processing. From the ACP/TPF-ACF host viewpoint, the ALC network interchanges appear as SNA cluster controllers. User applications and current ALC terminals will require no change as a result of installing the Network Extension Facility PRPQ.

DESCRIPTION

The Network Extension Facility is an extension to the Advanced Communication Function/Network Control Program/Virtual Storage Release 2 (ACF/NCP/VS). As an integral NCP component, the facility polls ALC terminal interchanges, translates 6-bit ALC data to EBCDIC on inbound (from the ALC terminal to the 3705) and EBCDIC to 6-bit ALC on outbound, edits and deblocks ALC messages, and directs ALC transactions to multiple ACP hosts.

Host Interface: On receipt of an inbound terminal transaction, the facility places the terminal interchange network address in the Destination Address Field (DAF) of the SNA header. When received by the host, the network address in the DAF is used to retrieve the pseudo LNIA (Line and Interchange Address) of the interchange from the Resource Vector Table (RVT). The LNIA is then combined with the Terminal Address (TA), which is the first character of the message text, to create the LNIATA for application processing. On outbound transactions, the above process is reversed using the Origin Address Field (OAF) of the SNA header. The following SNA commands are supported by the Network Extension Facility:

ACTLINK/DACTLINK	ACTLU/DACTLU
CONTACT/DISCONTACT	BIND/UNBIND
CONTACTED	CLEAR
ACTPU/DACTPU	SDT

HIGHLIGHTS

Host CPU Offloading: Host performance improvements are accomplished by moving polling, transmission code translation, message editing and, deblocking from the ACP host into the 3705/NCP; thus, the CPU is available for other application processing during data transmission. Additionally, I/O interruptions are minimized by the blocking of messages across the channel.

Block Multiplexer Channel Support: In addition to supporting the 3705 with NCP on the byte multiplexer channel, ACP/TPF-ACF will support the 3705 with NCP on the block multiplexer channel. With Network Extension Facility, ALC networks may now exist on the block multiplexer and the byte multiplexer channels. As a result, the 126 full duplex ALC line limitation of ACP has been removed.

Multi - ACP - System Networking Support: When the facility is used in conjunction with the networking support in ACP/ACF and ACF/NCP/VS Release 2, ALC messages can be delivered to multiple ACP hosts via 3705/NCP multiple tail attachments or SDLC link connections. In either case, the user must provide a transaction router program through an exit provided by the facility.

Expanded Communications Environment: The ACP/TPF Licensed Program and ACP/ACF feature along with the Network Extension Facility PRPQ expands the ACP communications environment. Specifically, the host will now be able to communicate concurrently with both 3705 EP ALC lines and 3705 NCP ALC lines. Additionally, the 3705 is able to run in a full PEP configuration (Start/Stop, Binary Synchronous, Airlines Line Control) along with SDLC and ALC in the NCP portion of the communications controller.

CUSTOMER RESPONSIBILITIES

To install the Network Extension Facility PRPQ, the user must:

- Understand the NCP generation procedure for user-written line control.
- Generate the control blocks necessary to describe the terminal system to the facility.
- Be able to write a 3705 transaction analysis routine if routing is needed.
- Be familiar with SNA protocol, because the host will see an SNA interface for the ALC terminals.

SPECIFIED OPERATING ENVIRONMENT

HARDWARE REQUIREMENTS

An IBM 3705 II Communications Controller equipped with a minimum of 128K of storage, a Type 3 line scanner, and a Type 4 channel adapter. Operation of ALC lines on a 3705 requires RPQ 858911 plus one RPQ 858912 for each scanner. Each full duplex ALC line must have a Type 1H line set.

SOFTWARE REQUIREMENTS

ACF/NCP/VS Release 2 ... ACP/TPF-ACF host support.

DATA SECURITY AND PRIVACY

The Network Extension Facility PRPQ data security and privacy is dependent on its host system ACP/TPF-ACF. ACP/ACF contains new facilities built on the existing ACP/TPF Licensed Program and, as such, will maintain existing ACP data security and auditability features.

WARRANTY

The ACP/Network Extension Facility PRPQ is warranted to conform to its licensed program specifications when shipped to the customer if properly used in the specified operating environment.

Device Support

Terminal Interchange/Control Units

2946-4	Terminal Control Subsystem
2948	Display Terminal Interface
S/7 (RMX/7)	Remote Multiplexer
7411	Terminal Control Unit

Terminals

1977-1	Terminal Unit
1980-21/24	Terminal Printer
2740-2	Communication Terminal (via a System/7)
2915-3	Display Terminal
3767	Communication Terminal (2740 Emulation)
4505	Video Display

DOCUMENTATION: (available from Mechanicsburg)

Network Extension Facility PRPQ Design Objectives ... Network Extension Facility Program Reference and Operations Manual.

PROGRAMMING RPQ

**JES3 NETWORKING
5799-AZT (PRPQ P09022)****PURPOSE**

A series of functional modifications have been made and routines added to JES3, Release 3 to provide for the communication of jobs for execution and print and punch formatted data streams to other JES3, JES2/NJE systems, and HASP, VM/370, ASP systems when running with their respective Network Job Interface (NJI) support. The necessary modifications have been made to perform the actual networking functions between NJE and NJI systems.

HIGHLIGHTS

Compatible Network Protocol allows one system to transfer jobs and card or print formatted data streams to another without requiring either system to assume a subordinate role.

Store and forward facility provides that a complete job be transmitted from one node to another before any further action is taken on that job. As a result, the integrity and recovery procedures of the sending system spool file facility for intermediate storage provides for the integrity and recovery of that job in the event of a network or system failure.

Routing, by means of destination tables which are established at system initialization is provided automatically by each node on the network. Until the node to which a job is directed is reached, each intervening node will enqueue the job for the link to the next node for proper routing to the specified destination. When the final destination is reached, the job is released to that system for processing.

Operator commands allow the network operator to reconfigure the network without interrupting normal networking operations.

NJE for JES 2 Compatibility - The network protocol in this PRPQ is compatible with that of NJE for JES2.

Communication to and from NJI for HASP, ASP and VM/370 and VM/370 Remote Spooling Communications Subsystem (RSCS) Networking over binary synchronous facilities and channel-to-channel adapter attachment is provided. These data streams can be jobs to be executed on the receiving system, or SYSOUT data streams to be processed on real peripheral devices.

JES3 accounting records for each job received or transmitted are maintained. These records contain information that pertains to the origin, destination and buffer count of the job.

Multi-leaving is the common transmission protocol.

Bulk Data transfer - JES3 Networking is compatible with the Bulk Data Transfer IUP, 5796-PKK.

CUSTOMER RESPONSIBILITIES

In addition to installing the base systems, the user is responsible to ensure that local modifications to the IBM base system do not conflict with the changes provided by the package of program code.

SPECIFIED OPERATING ENVIRONMENT**HARDWARE REQUIREMENTS**

This support requires a standard JES3 configuration with telecommunications facilities attached capable of operating in the transparent mode. Consideration should be given to provide adequate SPOOL file capability as a function of anticipated traffic. JES3 Networking will add approximately 20,000 bytes to JES3 and each network line will require approximately 8,000 bytes of virtual storage.

SOFTWARE REQUIREMENTS

The JES3 Networking PRPQ is coded entirely in Assembler language.

This product is supported under JES3, Release 3 (SU26) and MVS 3.7, MVS 3.8 and subsequent releases of MVS.

PROGRAMMING RPQ

**LOOP ADAPTER CICS/VS EXTENSIONS
for 3640 TERMINALS RELEASE 1
5799-BEH (PRPQ X99909)**

PURPOSE

The PRPQ Loop Adapter CICS/VS Extensions for 3640 Terminals is a series of CICS/VS application programs and exit routines that enhance the support of the 3641, 3642, 3644, 3646 and 3647 when attached to the 4331 Processor by the Loop Adapter feature. The functions provided are not applicable to the 3643 and 3645 terminals; and, therefore, the CICS/VS support for these terminals is not enhanced by the PRPQ.

DOCUMENTATION: (available from Mechanicsburg)

GC33-6137 *Program Summary*
GC31-0501 *Licensed Program Specifications*
SC31-0500 *4331 Loop Adapter Programming Guide*

RPQs ACCEPTED: No.

HIGHLIGHTS

Four functions are addressed by the PRPQ Loop Adapter CICS/VS Extensions for IBM 3640 Terminals:

Terminal Initialization: When a session is to be started between a terminal and CICS/VS, a user-written application program is invoked to initialize the 3640 terminal prior to the terminal becoming available to the terminal operator. This function provides the mechanism for invoking this application. A sample application program will be shown in the *4331 Loop Adapter Programming Guide*.

Terminal Re-initialization: For the 3641, 3644, 3646 and 3647 terminals, following an error situation, a user-written application program is invoked to notify the operator and then re-initialize the terminal for further operation. This function provides the mechanism for invoking this transaction. A sample application program will be shown in the *4331 Loop Adapter Programming Guide*.

3642 Encode Check Handling: After an encode check has occurred, this function provides an indication for the application program to allow for corrective actions.

Transaction Selection: For the 3641, 3644, 3646 and 3647 terminals, this function provides a mechanism whereby input from the terminal that is not yet connected to a transaction, can be used to build a transaction identification code (transid) and thus allow the CICS/VS Task Control Program to select the appropriate transaction to be attached.

A new control table, defined and generated by the user, provides the information to support these functions. The table will be loaded immediately after CICS/VS initialization. It will be accessed:

- For terminal initialization, from a module that gets control on establishment of a session between the terminal and CICS/VS.
- For terminal re-initialization, after error situations, from a PRPQ-supplied Node Error Program.
- For transaction selection, from a PRPQ-supplied exit program of the CICS/VS Terminal Control Program
- for 3642 Encode Check condition, from a PRPQ-supplied Node Error Program.

Terminals Supported: The PRPQ Loop Adapter CICS/VS Extensions for IBM 3640 Terminals is a usability aid for the following terminals:

- 3641 Reporting Terminal
- 3644 Automatic Data Unit
- 3646 Scanner Control Unit
- 3647 Time and Attendance Terminal

These terminals are supported as LUTYPE1 and defined to CICS/VS as Interactive Logical Units (INTLU).

- 3642 Encoder Printer

This terminal is also supported as LUTYPE1 but is defined to CICS/VS as an SNA-Character-String Printer (SCSPRT).

SPECIFIED OPERATING ENVIRONMENT

HARDWARE REQUIREMENTS

The PRPQ runs on an IBM 4331 Processor equipped with the Loop Adapter.

SOFTWARE REQUIREMENTS

The PRPQ is designed to operate in the VSE and in the OS/VS1 environment.

VSE Environment:

- VSE/Advanced Functions (5746-XE8) Release 3
- CICS/DOS/VS (5746-XX3) Release 1.5
- ACF/VTAM (5746-RC3) Release 3 or ACF/VTAME (5746-RC7)

Note: The 3644 requires ACF/VTAME in the VSE environment.

OS/VS1 Environment:

- OS/VS1 Release 7
- CICS/OS/VS (5740-XX1) Release 1.5
- ACF/VTAM (5735-RC2) Release 3

**5799-BEJ - ACS HOST SUPPORT
5799-BEW - ACS SERIES/1 SUPPORT
ADVANCED CONTROL SYSTEM
HOST and SERIES/1 SUPPORT**

PURPOSE

The Advanced Control System PRPQs provide a framework for implementation of medium to large scale process control applications.

DESCRIPTION

The Advanced Control System is designed to provide the user with a framework for defining: Process variables, control strategies which utilize those variables, cyclically updated process schematics, operational reports, plots of variables, bar graphs and statistical displays. The user may also define reports in order to implement a real time monitoring or control system covering the entire range of engineering and data processing applications found in modern process industry plants.

The Advanced Control System is designed to utilize computer systems from the 4331 Model Group 2 through the IBM 3000 Series. The OS/VS1 operating system is utilized in conjunction with the Special Realtime Operating System (SRTOS). With the Advanced Control System, the computer system is channelconnected to the Series/1 to permit the interconnection to process instruments or instrument systems.

The Advanced Control System will be available in December 1981, in the following forms:

1. The Host Support PRPQ in load module form suitable for use as an evaluation and testing vehicle.
2. The Series/1 Support PRPQ in source module form.

The Host Support PRPQ can be used separately to meet the following objectives:

1. Allow the customer to fully evaluate the function provided in the Advanced Control System, particularly the functions provided for The Process Engineer, and the operator interface.
2. Allow the customer to begin the training of the Process Engineering and operations staff who are to use the Advance Control System.
3. Allow the customer to begin defining the process variables, control strategies and reports as early as possible.

In keeping with these objectives the Host Support PRPQ will be delivered only in load module form. It contains all of the function of the full system with the exception of the ability to interface with the Series/1 input/output processor. Among these functions is a test mode which simulates signals from the Series/1 to provide effective evaluation, training and testing. The Host Support PRPQ will include a typical application control strategy implemented with named variables, display and sample reports. This example is valuable in training both Process Engineers and operators and will provide examples to the customer of the many functions to the Advanced Control System.

HIGHLIGHTS

The Advanced Control System provides:

• **Interactive Man-Machine Communication**

The system utilizes the IBM 3270 family of displays to provide monochromatic and/or color graphic display of process variable information, operating targets, performance or response graphs and process schematics.

• **Flexible Expandable Interface to Process Signals**

Process signals are interfaced utilizing the S/1 Support PRPQ through from 1 to 15 Series/1 systems. Each of the Series/1s can be optionally backed up by a standby.

• **Optional Enhanced Availability**

The host system processor can be duplexed. The backup system can be of smaller capacity than the prime. Load shedding facilities are provided in the event a smaller processor is used.

• **Control Strategy Flexibility**

Addition, deletion or modification of control definitions and strategies can be accomplished online while maintaining control integrity.

• **Communications with other Systems**

Because the Advanced Control System operates under the standard IBM OS/VS1 operating system in conjunction with SRTOS, all of the functions supported by OS/VS1 are available to the user. Hence, communications with other systems using standard telecommunications packages can be easily implemented.

• **Real Time Data Base**

References to the data base are by symbolic name with identifying data element. The user is not concerned with such details as the location of the data or the internal format of the data. Data are returned to the user in the most appropriate form; for example, engineering units for measurements, percent full scale for outputs or in the engineer-defined units.

The data in the data base are updated cyclically or as modified and checkpoints of the entire data base are taken every six minutes.

• **Historical Information**

Several types of historical information are maintained. The current value of all analog type variables is saved in the history data base every six minutes. From these values, hourly averages, shift averages and daily averages are maintained.

Rate type signals may optionally be integrated historically to provide shift and daily accumulations for production reporting.

Equipment run times can be maintained in the history data base by shift, day, week and total-to-date. This information can be used as part of the input required for a preventive maintenance system.

Every process and interface alarm condition that occurs is time-stamped and logged for later retrieval.

All operator and engineer console change activity is also time-stamped and logged, along with the originating console number, the type of change or action and the old and new values entered.

• **Host Support PRPQ**

This PRPQ can be installed prior to connection to signals to the process and can provide:

- Early preparation for implementation by defining process variables, control strategies and displays.
- Effective training of process operators and engineers through the simulation capabilities.
- Lower cost evaluation of functional capabilities.

• **High-Level Language Interface**

Standard IBM language processors such as FORTRAN and PL/1 can be used to augment the standard facilities of the Advanced Control System. High-level language interfaces have been provided for these languages (and Assembler) to permit full access to the current and historical data bases, as well as numerous other Advanced Control System facilities. This allows the user to integrate and blend strategy or plantwide optimization program with the data and control facilities of the Advanced Control System.

CUSTOMER RESPONSIBILITIES

Understanding the process and the desired control strategy.

Selecting and preparing an appropriate equipment site.

Selection of Series/1 and main processor options and parameters to tailor the system to the user's environment.

Providing and entering the data necessary to describe his process variables and control strategies.

Ordering and installing required system control programs, program products and PRPQs.

Initiating orders for required computer and terminal equipment needed in the system.

Installing all required instrumentation and common carrier facilities to meet minimum equipment requirements.

Designing and implementation of any specialized application programs and displays formats required.

Training of user personnel.

Ensuring accuracy of initial data, network and realtime sensor data input definitions.

Reviewing Advanced Control System restart facilities to select those appropriate for the protection of the process.

Design and implementation of the specialized Series/1 program modules to provide for connecting his instruments.

Implementing and exercising appropriate controls to protect the Advanced Control System code from outside interference or contamination of the computer process or its data.

PROGRAMMING RPQ

Advanced Control System Support (cont'd)**SPECIFIED OPERATING ENVIRONMENT****HARDWARE REQUIREMENTS**

The Advanced Control System PRPQs were designed to operate with the following IBM machines. Minimum central processing unit is a dedicated IBM 4341 Group 2, 4361 or 4381 (with two megabytes of storage), including one byte-multiplexer channel, two block-multiplexer channels and floating-point feature.

The configuration must include sufficient input and output devices to support the requirements for system output, system residence and system data sets. Sufficient direct access storage must be provided to satisfy user information storage requirements. Direct access devices may be chosen from an IBM 3330 Disk Storage Facility, an IBM 3333 Disk Storage and Control (Integrated), an IBM 3350 or an IBM 3375 Direct Access Storage Facility (or combination). A typical configuration will contain four drives of DASD.

The minimum system also contains a Series/1 processor with 64,000 words of storage, a diskette and an IBM 3101 Terminal or equivalent to interface with the process input/output and the field equipment. This system must be attached to the host system via the IBM 4993 Channel Attachment.

Also required in the minimum configuration is a 1920 character size display. For monochrome operation, a 3278 mdl 2 and for color operation, a 3279 mdl 2A, each with keyboard attachment, and attachable to a 3274 mdl 1D control unit, is required. A typical system, with graphics capability, would contain 3279 mdl 3B color displays with keyboard, including programmed symbol features, attachable to a 3274 control unit with Configuration Support C.

RPQs on the 3279 mdl 3B display to provide capabilities for Process Operator Console use will be accepted immediately for analysis and be responded to within 120 days.

SOFTWARE REQUIREMENTS

Special Real Time Operating System (5799-AHE) is a prerequisite to the installation of the Advanced Control System, which runs in an OS/VS1 environment. OS/VS1 (Release 7.0) must, therefore, already be installed or ordered with the product.

Use of the Series/1 under the Advanced Control System requires the following:

IBM Series/1 Event Driven Executive Basic Supervisor and Emulator (5719-XS3).

IBM Series/1 Event Driven Executive Utilities (5719-UT5).

IBM Series/1 Event Driven Executive Macro Library/Host (5750-LM4).

IBM Series/1 Event Driven Executive System/370 Channel Attach (5719-CX1).

System/370 Program Preparation Facility for Series/1 (5798-NNQ).

Distribution and maintenance of the Advanced Control System and the Evaluation and Training System require the availability of one 9-track tape drive.

DOCUMENTATION
(available from Mechanicsburg)

General Information Manual (GH19-0071).

PROGRAMMING RPQ

**SYSTEM/38 LOG RECOVERY
5799-BEP (PRPQ P84042)****PURPOSE**

System/38 Log Recovery is a series of programs designed to enhance and expand the recovery capability available with Release 2 of CPF. Log Recovery uses the log file created by the Data Base Logging function of CPF and allows the user to recover damaged data base files and to ensure data base file integrity following an abnormal system termination.

DESCRIPTION

Through a series of menus and prompts, Log Recovery will help the user to restore the backup of a damaged or missing file, and then reapply logged records to bring the file to the current level

Log Recovery will also recover data base transactions which might have been lost in volatile storage as a result of a power loss or other abnormal system terminations. This provides an alternative to using a high force write ratio on user files to avoid the loss of data in volatile storage.

HIGHLIGHTS

- System Recovery
 - Restore backup and reapply logged records (if required)
 - Ensure data base integrity by reapplying necessary logged records
- Single File Recovery
 - Restore backup and reapply logged records
 - Restore files to a previous status (such as beginning of a batch that job incorrectly executed)
- Audit Trail
 - Reports produced from the log file of data base activity in time, user or file sequence
- Reduces frequency of user file backup required
 - Log file 'segments' created frequently (that is, daily)
 - User file backed up infrequently (that is, weekly)
 - Log recovery recovers files by reapplying logged records from the point of last user file backup
- Ease-of-Use
 - Extensive use of menus and prompts
 - Default values provided where practical
 - HELP text extensively used
 - Log file saves are prompted, and unique naming convention automatically applied for control purposes
 - Restores are prompted (user files and log file segments) and audited to ensure that the proper file and level is restored

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/38 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 PRPQ runs on all models of IBM System/38.

SOFTWARE REQUIREMENTS

This PRPQ is designed to operate with the IBM System/38 CPF (5714-SS1), Release 2 or later. Log Recovery requires the Data Base Logging function which is available in Release 2.

DOCUMENTATION

(available from Mechanicsburg)

System/38 Log Recovery User Reference Manual (SC21-7889).

PROGRAMMING RPQs

**MVS 3.8 3380/3375 PRPQ
5799-BFF****PURPOSE**

MVS 3.8 3380/3375 PRPQ allows installation of Data Facility Device Support Release 1 Modification Level 4 (5740-AM7) on MVS Release 3.8 without the installation of MVS/System Extensions (5740-XE1), MVS/System Product-JES2 Release 1 (5740-XYS) or MVS/System Product-JES3 Release 1 (5840-XYN). Additionally, MVS 3.8 3380/3375 PRPQ does not require the S/370 Extended feature (#7730) or the S/370 Extended Additional feature (#7731), for installation on S/370 mdls 158 or 168. Previously, Data Facility Device Support Release 1 required the installation of MVS/SP-JES2 (5740-XYS) or MVS/SP-JES3 (5740-XYN).

DESCRIPTION

MVS 3.8 3380/3375 PRPQ consists of the following:

- Support for the 3380 Direct Access Storage with the 3880 Storage Control mdls 2 and 3 using either:
 - Data Streaming feature (#4850) on the 3031, 3032 and 3033 processors.
 - 3880 Speed Matching Buffer for 3380 feature (#6550) with the 3031, 3032, 3033 and S/370 mdls 158 and 168.

Note: The 3380 and 3375 Direct Access Storage devices are supported at a level equivalent to a 3350 with a string switch feature (#8150) attached to a 3830, with the additional capability of being able to access two drives on the string simultaneously.
- Support for the 3375 Direct Access Storage and the 3880 Storage Control mdls 1 and 2 using the Data Streaming feature (#4850) on the 3031, 3032 and 3033 processors.

Note: The 3380 and 3375 Direct Access Storage devices are supported as system residence devices, as system paging devices, and for user and system data sets, except for JES 2 and JES3 spool and checkpoint data sets.

SPECIFIED OPERATING ENVIRONMENT**HARDWARE REQUIREMENTS**

MVS 3.8 3380/3375 PRPQ is designed to operate on the following IBM processors:

IBM S/370 mdl 158 (3380)**
IBM S/370 mdl 158-3 (3380)**
IBM S/370 mdl 168 (3380)**
IBM S/370 mdl 168-3 (3380)**
IBM 3031 Processor (3380)* (3375)***
IBM 3032 Processor (3380)* (3375)***
IBM 3033 Processor (3380)* (3375)***
IBM 3033 Processor Model Group S
IBM 3033 Processor Model Group N

- * Requires Data Streaming feature or 3880 Speed Matching Buffer feature.
- ** Requires 3880 Speed Matching Buffer feature.
- *** Requires Data Streaming feature.

SOFTWARE REQUIREMENTS

MVS 3.8 3380/3375 PRPQ requires the functions provided by the OS/VS2 MVS Data Facility Device Support Release 1 Modification Level 4 licensed program (5740-AM7) and OS/VS2 MVS 3.8 with Processor Support 2 feature (5752-864). Resource Measurement Facility (RMF) users must install RMF Version 2 Release 2 Modification Level 1 (5740-XY4).

IBM program products which currently operate on MVS 3.8 with the Processor Support 2 feature installed, and use published I/O services only, should continue to operate with the MVS 3.8 3380/3375 PRPQ installed. IBM program products which require MVS/SP for 3375/3380 device support only, should operate on MVS 3.8 with the Processor Support 2 feature and with the MVS 3.8 3380/3375 PRPQ installed. APARs will be accepted against the PRPQ for program products which meet these criteria and fail to operate.

The MVS 3.8 3380/3375 PRPQ cannot be installed on a system which has any of the following products installed: MVS/System Extensions Releases 1 and 2, MVS/SP-JES2 Release 1 (5740-XYS), MVS/SP-JES3 Release 1 (5740-XYN), and any subsequent releases of MVS/SP.

RPQs ACCEPTED: No

MVS SYSTEM INTEGRITY APPLIES: Yes

PROGRAMMING RPQ

**SYSTEM/34 TEXT EDITOR
5799-BFP (P84046)****PURPOSE**

The System/34 Text Editor gives the user a library of programs that provide document creation, maintenance, storage, inquiry, and print functions. Data processing and document processing can be performed concurrently using the multiprogramming capabilities of the System/34. These functions are performed through a 1,920-character, multipurpose 5251 Display Station. The same display station can alternately be used for data processing and document processing.

DESCRIPTION

With the implementation of System/34 security support, users can control access to documents containing sensitive information on a document library basis.

The System/34 Text Editor is designed for ease-of-installation and use. After the library is copied to the system, it is ready for execution. A user who is familiar with the System/34 and the IBM 5251 Display Station should be able to use the Text Editor application program immediately without referring to any documentation other than the online prompts, help text, and tutorial.

All Text Editor functions are executed from menus. The application prompts the operator for information when required. Where appropriate, defaults to these prompts are indicated for ease-of-use.

All data entry screens contain descriptive information to guide the user through operation of the package. HELP screens are provided. Pressing the HELP key within programs will cause summarized information about the currently active program to be displayed.

Online tutorial is provided to aid the new user or to provide a quick review of a function.

Documents are kept in a document library for each user ID. This provides a more efficient use of disk storage and allows duplicate document names by different users. Various document library functions are provided such as document identification and document review on the display screen.

Up to 14 lines of information can be keyed at a time. Various text functions are available to manipulate the document through the use of command keys. Additional functions such as tabbing, scrolling, duplicating, and inserting are available.

The System/34 Text Editor application utilizes features available in the IBM System/34 System Support Program. These features include multiple user library support, multiprogramming, local and remote transparency of display stations, print spooling and security.

HIGHLIGHTS

The following functions are provided:

- Online User Document Library Inquiry provides a means to:
 - Show document names or document titles
 - Specify starting character(s) of the document names to be shown
 - Document processing options to browse, delete, change or maintain, create a new document, and print a document
 - Select a different document library
- Document Creation/Maintenance Functions include:
 - Specify, recall and modify document control information such as description, headings, and footings.
 - Enter multiple lines
 - Delete lines
 - Add blank lines
 - Move or Copy one or more lines within a document
 - Include lines from another document stored in the same or a different document library
 - Insert characters or words within a line
 - Adjust a document by rewriting words into specified positions
 - Adjust line contents by moving words up a line or down a line
 - Tabs can be set any time and used on any line
 - Center characters on one or more lines
 - Spread characters by placing an extra space between each character for one or more lines
 - Fill all or part of one or more lines with a specified character
 - Blank all or part of one or more lines
 - Find a character string (letter, word, or phrase)
 - Replace a character string with another
 - Dynamic document size (size is adjusted automatically)
 - End options to restart, save and/or print the document with or without line change indicators
 - Page backwards through the document
 - Skip to any line number
 - Roll forward a line at a time
- Document Printing Options
 - Print one or more documents at one time
 - Notation control of changed lines
 - Printer device selection
 - Special spacing and skipping for 5224/5225 printers

- Standard headings/footings per page as an option
- Floating date and page numbers in headings and/or footings
- Special or standard page numbering
- Draft and/or final copy printing
- Specification of number of copies
- Print on the 5219 Printwheel printer, providing selection of fonts, paper drawer selection, and ribbon saver feature under program control
- Print on Quality Printers (OS/6, 6640, 6670, or Displaywriter) provided communications is installed on both systems
- Print with data merge
- Print text line numbers for editing
- Variable left margin setting
- Print Table of Contents
- Standard or special forms can be specified
- Recoverability
 - Integral part of the System/34 Text Editor Application Program design
 - Recovery prompt screen will be presented if work files exist at startup
- Online Tutorial
 - Online descriptions for all major functions
 - Topics selected from a Table of Contents
 - Descriptions displayed automatically
 - Tutorial can be accessed whenever necessary

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 with

- 64K memory
- 1 printer (IBM 5211, 5256, 3262, 5224 or 5225)
- 1 IBM 5251 mdl 11 Display Station

The IBM System/34 Text Editor application library requires 1,000 blocks of disk space. For each user-ID, a minimum document library of 50 blocks will be reserved. The user document library can be increased or decreased 50 blocks at a time using menu options. In addition to permanent disk space, a minimum 10 blocks of temporary work space will be used for each user of the Text Editor Program. If file expansion is necessary, the work files will automatically expand approximately 10 blocks at a time. The maximum number of lines that can be kept under one document name is 9,999.

The option of sending to a quality printer (such as the IBM OS/6, 6670, 6640, or Displaywriter) requires appropriate communications features.

SOFTWARE REQUIREMENTS

IBM System/34 System Support Program (5726-SS1), Release 7 or later, must be installed with the optional Extended Disk Data Management Support. The largest program requires 44K of user memory to execute Access to Spool and RPG BSC communications. This support is not required to use any other function.

**DOCUMENTATION
(available from Mechanicsburg)**

*IBM System/34 Text Editor Application Program
Description/Operations Guide (SC21-7921).*

PROGRAMMING RPQ

**SYSTEM/38 TEXT MANAGEMENT
5799-BFZ (P84047)**

PURPOSE

System/38 Text Management provides the capability for users to create, store, retrieve, revise, and print documents. The user can access the System/38 data base for the Text Management program. This provides the capability to selectively merge data base information within a text document.

SPECIAL SALES INFORMATION

The functions of the Text Management are utilized interactively through the 5251 Display Stations Models 11 and 12 concurrent with data processing operations. The text program was designed with the same ease of installations and use as the other System/38 utilities. After installation, it is ready for use. Any user who has experience with the 5251 Display Station on the System/38 should be able to perform the basic functions of the program with minimum learning time. Prompts and HELP text are available during program execution to assist the user, and examples of the basic functions will be available in the program user's guide.

Documents are stored as members in files, allowing maximum flexibility for organization of documents. For example, a file can represent a folder in which all documents pertaining to a subject or job can be stored. In addition, each user can have one or more libraries for storage of document files.

Up to 21 lines of the display can be used to enter or revise text. Line commands, similar to the System/38 Source Entry Utility (SEU), as well as command keys, are used to invoke the function of the Text Management program.

All the System/38 functions of the Control Program Facility (CPF) are available to the Text Management user.

Note: This product is not intended for usage in an office systems administrative environment or any other environment which requires a letter quality printer. It is designed for a user's internal requirements, such as data processing documentation, where the output from System/38 printers (IBM 5211, 3262, 3203, 5256, 5254, or 5225) is acceptable.

HIGHLIGHTS

- Create text
 - File by user-provided document name
 - Key new text
 - Copy in from a stored document
- Revise text
 - Retrieve document by:
 - Keying document name
 - Selecting from a list of documents in a file
 - Searching document titles for character string
 - Searching for creation (from/to)
 - Searching for document name (including partial name)
 - Any combination of searches
 - Line commands to:
 - Move
 - Copy
 - Insert
 - Delete
 - Shift
 - Text string manipulation by command key and cursor to:
 - Insert text in a paragraph
 - Move text strings
 - Copy text strings
 - Delete text strings
 - Move columns
 - Reformat paragraph
 - Copy in from a stored document
 - Scan for character string
 - Replace character string
- Print Documents with Formatting Options For:
 - Headers/footers per page
 - Number of copies
 - Length of printer form
 - Line spacing
 - Printing review copy with line numbers
 - Printing part of document (from/to page number)
 - Flagging changes
- Data base access
 - Form letters with data base field insertion at print time
 - Copy data base directly into document, interactively
 - Simple conditional selection by field
- Create, store, retrieve forms
- Table of Contents

- Totals for Numeric Data

DESCRIPTION

The user invokes the text program by entering the command or by selection from a user-created menu.

Text Management functions are selected from menus. For example, on the initial program menu, the user chooses to either create or revise, browse, print, or fill in a form. The user can key the document, file, and library name, or key only the library name and select the file and document from displayed lists. From a document list, the user can select a document to revise, to copy a new document, or to remove a document from the file. In the case of large document files, subsets of the document list can be presented as a result of user specified searches of the list by document name or title (including partial title), and creation date (including from/to ranges).

To create a new document, the user can key one line at a time or present a block of blank lines in which to key. During document creation or revision, the user can manipulate text by keying simple line commands. These line commands allow the user to:

- Insert one or more blank lines
- Copy one or more lines anywhere in the document
- Move one or more lines anywhere in the document
- Delete one or more lines
- Shift text right or left on a line

The user can manipulate text strings, such as sentences, by cursor placement (to frame the text string) and command keys to execute the function. There are command key functions for:

- Inserting text string in the document
- Moving a text string in the document
- Copying a text string in the document
- Deleting a text string
- Moving columns of text

For example, to insert text in the middle of a paragraph, the user would position the cursor at the point where the new text is to be inserted. Pressing the insert text command key would present a series of blank lines in which to key. The user would key the new text and, when finished, press the ENTER key. The paragraph would "close up" adjusting line endings. While inserting text, the user can also specify a new paragraph.

Text from another stored document can be copied into the document being created or revised. The document to be copied can be reviewed on the lower part of a split display while the document being edited remains displayed on the upper part of the screen.

The text program user can scan through a document to search for a specified character string and can also specify replacement of the character string.

The user can store print format instructions with each document. Page header and footer information can be specified. Format options for: 1) line spacing, 2) positions to left of margin, and 3) printing line numbers for review copies can be specified. The user can further indicate first and last print line, form length, number of copies, and partial document printing (from/to page number). Specification of character(s) to flag changes when to print the flag, and whether or not to print the date of last modification can also be made.

Forms can be created and stored in the system for later use. In forms mode, the user can define fields, to be filled in later, anywhere in the document. There are options to define characteristics of fields defined in forms. The user can specify:

- Initial values
- Data base fields
- Numeric only (with system edit codes)
- Highlighting
- Underlining
- Centering
- Right adjust (with zero or blank fill)
- Decimal alignment

To fill in a form, the user simply retrieves it from storage and can then key into defined fields in the form. Pressing the field advance keys after keying into a form field will advance the cursor to the next field.

Text Management users can access the system data base in multiple ways. During editing of a document, the user can "copy in" data base information in the same way that information is copied from other

PROGRAMMING RPQ

S/38 Text Management (cont'd)

documents. The user can identify a data base file (with options for field selection and ordering) that can be displayed on the lower portion of a split screen. Then, the data can be copied to the document being edited that is displayed in the top portion of the screen.

Multiple copies of documents that require insertion of data base variables can be produced. Examples of these are: "past due" accounts receivable reminders to customers, order acknowledgements, and advertising to customers or categories of customers. The user creates a document and specifies the name of the data base field in the document at the location the variable is to print. Field and record selection options are supported to specify the total number of documents printed. Once the document is set up, normal print procedures are used.

A Table of Contents can be created for any document. The user specifies section headings and subheadings. As an option, the program will sequentially number the headings and subheadings, and identify the page numbers. The Table of Contents can be printed anywhere in the document.

CUSTOMER RESPONSIBILITIES

IBM may provide marketing assistance in accordance with Marketing Service and Guidelines in the GI section. 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/38 licensed programs is a customer responsibility.

SPECIFIED OPERATING ENVIRONMENT

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

HARDWARE REQUIREMENTS

The minimum system configuration for this program is an IBM System/38 with:

- IBM 5381 System Unit
- One IBM 5251 Display Station Model 11 or 12

SOFTWARE REQUIREMENTS

The IBM System/38 Text Management program operates under the control of the IBM System/38 Control Program Facility (CPF) (5714-SS1) licensed program.

Program Use During Customer Preinstallation Testing: For new users, the program is available for preinstallation testing on IBM Test Center systems in accordance with IBM's Program Testing Policy.

DOCUMENTATION
(available from Mechanicsburg)

Text Management User's Guide and Reference Manual ... Text Management Licensed Program Design Objectives (GC21-7925).

RPQs ACCEPTED: No

PROGRAMMING RPQ

**4700 FINANCE COMMUNICATION SYSTEM
ONLINE TERMINAL SUPPORT
5799-BGB (P90002)****PURPOSE**

The System/34 has the capability of supporting 4700 Finance Communication System terminals via this PRPQ. Designed to operate in the 4701 Finance Communication Controller, this PRPQ provides the capability to attach the 4704 Display, 4710 Printer, 3610, 3611 and 3616 Printers and 3624 Consumer Transaction Facility (multiline display only) to the 4701 Finance Communication Controller for online operations to a host System/34.

HIGHLIGHTS

- Cash dispensing, account status inquiry, deposits, loan payments, fund transfers, and bill payment on 3624 Consumer Transaction Facility (multiline display only)
- Can support a mixture of teller and CTF devices with a single 4701 Finance Communication Controller
- Provides data transmission and error recovery for the controller-attached terminals
- 4700 devices designated as command-capable workstations when using the Finance Subsystem of Interactive Communication Feature under control of the System/34 System Support Program (SSP-ICF)
- User-defined message content and destination as the host application dictates
- Provides formatted screens for tellers
- Provides editing of teller input
- System/34 user application programs may be written in RPG II, COBOL, or Assembler languages

DESCRIPTION

This PRPQ provides the following functions:

- Monitors the host for unsolicited messages
- Monitors the loops and 4700 terminals for activity
- Provides a fixed formatted message to the host
- Receives formatted messages from the CPU

In order to use this PRPQ, the customer must:

- Choose one of the predefined configurations supplied as part of the PRPQ
- Define and build a 4700 operational diskette using Local Configuration Facility (LCF)
- Install the PRPQ on an operational diskette via LCF
- Define unique installation parameters to the PRPQ; for example, passbook formats
- Write, or provide, System/34 applications written to the PRPQ interface, to manage the 4700 terminals

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 configuration for the PRPQ includes an IBM 4701 Finance Communication Controller with 192K storage. In addition, a local loop with an IBM 4704 Display with a keyboard is required.

The IBM Online Terminal Support for IBM System/34 PRPQ does not use encryption on the communications link between the IBM 4701 Finance Controller and the System/34. Security can be maintained on the link by locating the 4701 in the same room as the System/34 and connecting the two machines via a modem or modem eliminator. If the 4701 will be installed in a remote location and a secured line is desired, an encryption device such as the IBM 3845 or IBM 3846 may be used.

SOFTWARE REQUIREMENTS

The IBM 4700 Online Terminal Support for IBM System/34 was written using IBM 4700 Assembler language. A user who wishes to modify this PRPQ must have access to a virtual storage system (IBM System/370, 4300, 3031, 3032, etc.), VSAM, VTAM, VTAM-E. Additional requirements are an IBM 3704 or 3705 with the Network

Control Program (NCP), or a 4331 CA, a VS Assembler and the IBM 4700 Finance Communication System Host Support licensed program.

The PRPQ must be used in conjunction with the Finance Subsystem of System/34 SSP-ICF and the Local Configuration Facility (LCF) of 4700 Finance Communication System Controller data support.

DOCUMENTATION

(available from Mechanicsburg)

Program Description/Operation Manual.



PROGRAMMING RPQ

**SYSTEM/38 OFFICE/38 - BAR CHART
5799-BHQ (PRPQ P84050)**

PURPOSE

System/38 Office/38 - Bar Chart allows easy creation of business charts. With this program, the user can display, modify and print bar charts using data obtained from a standard data base file or entered directly from the keyboard.

DESCRIPTION

This program can be used interactively from a workstation, or from a batch job, or from another application such as the IBM System/38 OFFICE/38 - Text Management Program (5714-WP2), to produce printed charts and chart legends.

On a color workstation, charts of up to seven colors can be created. On a monochrome display, two shades are used (High and Low Intensity), but different effects can be achieved by the selection of several attributes at chart creation time.

HIGHLIGHTS

- The System/38 OFFICE/38 - Bar Chart PRPQ is an interactive utility which requires no user programming
- Either color or monochrome workstations can be used. Reports created on one can run unmodified on the other
- Comprehensive online Help Text provides tutorial and reference information

CUSTOMER RESPONSIBILITIES

IBM may provide marketing assistance in accordance with the Marketing and Service Guidelines in the GI section. 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/38 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 minimum system configuration for this PRPQ is:

- An IBM 5381 System Unit (any model)
- One of the following:
 - IBM 5251 mdl 11, 12, or 999 Display Station
 - IBM 5291 Display Station
 - IBM 5292 Color Display Station

Optionally, a workstation printer or line printer can be utilized.

SOFTWARE REQUIREMENTS

This PRPQ is designed to operate with the IBM System/38 CPF (5714-SS1), Release 4.1 or later.

DOCUMENTATION

(available from Mechanicsburg)

IBM System/38 OFFICE/38 - Bar Chart PRPQ Licensed Program Specification Specification (GC21-7953).

No other documentation is provided. However, the HELP key may be pressed at any time to invoke a help facility designed to free the user from the requirement of having reference manuals. The help facility provides tutorial and reference information. The material may be reviewed in 'browse' mode by users just as they would use a document. Alternately, when the HELP key is used, specific information needed at that level is displayed with an appropriate example.

PROGRAMMING RPQ

**DISPLAYWRITER - 3277 DEVICE EMULATION
DW-3277DE 5799-BHT (PRPQ P10034)****PURPOSE**

Displaywriter - 3277 Device Emulation performs 3277 Display Station emulation in a Textpack 4 and Textpack 6 software environment. The program provides end-user functions including interrupt services, display support, and keystroke handling. DW-3277DE is packed on one single-sided feature diskette.

HIGHLIGHTS

- Emulates a 3277 model 2 display station.
- Provides a 'Hot Key' technique to change between Displaywriter and 3277 mode of operation.
- Provides screen change notification.
- Operates with Textpack 4 and Textpack 6 with alternate foreground task support.
- Suspend/resume capability maintains text and 3277 task integrity during mode changes via 'Hot Key'.

DESCRIPTION**3277 Display Station Emulation**

- Processes keystrokes to emulate the operation of a 3277 Display Station.
- Sends out Attention Identifier (AID) codes to the controller for keystrokes requiring host intervention.
- Displays data sent from the host and/or keyed from the keyboard.

Interrupt Services Process: Handles interrupts generated by the 3277DE hardware adapter. It determines whether the interrupt is caused by a control word from the controller or direct memory access (DMA) transfer completion.

Display Support: Provides an audible tone, validates attributes on the screen, rewrites the screen, and updates status indicators.

Keystroke Handling: Displays keyboard input, keeps track of cursor position and ensures protected fields and attributes are respected when handling the cursor.

CUSTOMER RESPONSIBILITIES

- The customer is responsible for the installation and use of Displaywriter licensed programs, as well as certain problem determination activities.

SPECIFIED OPERATING ENVIRONMENT**HARDWARE REQUIREMENTS**

- The IBM Displaywriter must be equipped with the 3277 Device Emulator adapter, RPQ 8D0098.
- Memory requirements for concurrent 3277DE and text operation:
Textpack 4 - 320K bytes
Textpack 6 - 384K bytes

Note: For non-concurrent operation, Textpack 4 or Textpack 6 memory requirements apply.

SOFTWARE REQUIREMENTS

- Displaywriter software required is Textpack 4 or Textpack 6, which will be upgraded through a maintenance release to provide alternate foreground tasks support prior to shipment of DW-3277DE.
- No other Displaywriter communications licensed program can be active while the DW-3277DE program is active.

DOCUMENTATION

(available from Mechanicsburg)

Displaywriter-3277 Device Emulation Custom Feature Description (GA09-1679) ... Displaywriter-3277 Device Emulation Operator's Reference Package (SA09-1680).

**5799-BHW - SYSTEM/34 PRODUCTIVITY AID
SYSTEM/34 PROGRAMMER and OPERATOR
PRODUCTIVITY AID (P84051)**

PURPOSE

The System/34 Programmer and Operator Productivity Aid is an integrated set of four utilities that provide a new high-level, easy-to-use, menu-driven, interactive interface to functions commonly performed by application programmers and lead operators on disk and diskette files, libraries, and library members. The support helps eliminate the need to use system commands or operation control language. In addition, a full-screen editor is provided for editing System/34 source and procedure statements.

HIGHLIGHTS

The File, Library, and Diskette Utilities allow the user to:

- Display the names (up to 64 at one time) of
 - All files or libraries on the system
 - Members within a selected library
 - All files in a diskette magazine
 - All files on a diskette volume
 - All members within a library files on diskette.
- Perform operations (such as copy, print, delete, etc.) on individual files, libraries, or library members by using command keys and simple operation codes.
- Display the data (a full screen at one time) within data file or library member resident on disk or diskette.
- Browse through the records within a data file or library member by using simple commands and the command function keys.
- Perform character string searches on records within data files or library members.
- Generate test data files.
- Request assistance on utility functions through the online help and tutorial facility.

The Edit Utility allows the user to:

- Create a new, or update an existing, source or procedure member in full-screen mode (22 display lines) or under format control in single-line mode (similar to SEU).
- Select the desired source or procedure member to be edited by:
 - Specifying the appropriate library and member name, or
 - Specifying a library and displaying, for selection, the names of the source and procedure members in that library. In addition, the records within a source or procedure member can then be displayed.
- Delete, insert, duplicate, and rearrange lines of data.
- Perform operations on either a single line of data or a group of data lines.
- Perform character-string searches including optional replacement with another character string.
- Copy lines of data from a member in the same or a different library into the member being edited.
- Print a source or procedure member including formatted printing for a text member.
- Request online help for the edit commands, command and function control keys, and format selection (single-line mode) via the HELP key.

DESCRIPTION

This PRPQ is intended for programmers and operators who have the responsibility for maintaining files and libraries and for assisting programmers in writing and maintaining applications (programs and procedures). Additionally, the Edit Utility supports a basic document entry with formatted printing facility.

The System/34 Programmer and Operator Productivity Aid is designed for ease of installation and use. After the utility library members are copied from the distribution diskette to a library on the system, the utility functions are available for immediate use. The utility functions can be executed from the menu provided with the utility or from procedure commands.

The System/34 Programmer and Operator Productivity Aid operates within the System/34 security facilities. Access to files, libraries, and members within a library can be controlled by using the resource security functions provided on System/34.

File, Library, and Diskette Utilities: The File, Library, and Diskette Utilities provide the facilities to display from the system disk or a diskette:

- The names of all libraries
- The names of all members within a library

- The names of all files
- The data within a file
- The data within a library member.

Up to 64 files names, library names, or library member names are shown at one time. The displays also contain descriptive information to guide the user in using the utility functions. Online tutorial is provided to aid the new user or provide others with a quick review of the functions.

When displaying the data within a data file or library member, a full screen of data is provided. Function keys and simple commands are used to assist in viewing and moving through the data. While viewing the data, information on the use of the commands and function keys is available by pressing the HELP key.

When displaying the names of libraries, library members, or files, operation codes are provided for requesting various operations to be performed on a specific file, library, or library member. If operation codes require additional information to perform the function requested, prompts for this information are provided.

Command keys: These utilities support the use of the command keys for requesting additional information about the files, libraries, or library members being displayed, for selective control of the information to be displayed, for changing the order (sorted sequence) of the information to be displayed, and for requesting system functions.

User modification: Support is provided for users to define their own operation codes and use of command keys to perform functions that are unique to their installation. Additional operation codes can be defined or operation codes, defined by the utility, can be changed. Unused command keys can be defined. Screen headings, HELP menus, and the tutorial information can also be changed to correspond with the user modifications.

Command line: A command line is provided on the file, library, and library member display screens to allow the user to enter system or application commands. Any statement allowed in a procedure may be entered. Following execution of the command, control is returned to the display screen. This command line can also be used to scroll to a specific file, library, or library member name.

Test File Generation: The File Utility allows a user, via a prompted interface, to generate test data files. This facility provides support for file definition (sequential, direct, or indexed), field definition (character, zoned, packed, or binary), and field initialization (ascending, descending, random, constant, or keyed value). Optionally, RPG II or COBOL source specifications that define the file can be generated.

Edit Utility: The Edit Utility simplifies the creation and changing of source or procedure members by:

- Maintaining a profile record for each user signon.
- Prompting the user for job information.
- Setting default initialization values for use during data entry and as replacement options at end of job.
- Allowing the display of the names of all source and procedure members in a selected library.
- Allowing the display of individual members within the selected library.
- Allowing 22 lines of the display for use in entering and editing lines of data.
- Supporting job and screen-level functions by command keys, function control keys, and simple commands.
- Providing the option to display and edit lines of data in single-line mode under format control (similar to the System/34 Source Entry Utility).
- Providing both single-line and multiple-line commands for use in deleting, inserting, duplicating, and rearranging lines of data.
- Providing a search facility for locating occurrences of a specified character string and, if desired, to change those occurrences to another character string.
- Allowing statements from a member in the same or a different library to be copied into the member being edited.
- Prompting the user, when editing has been completed, for verification of the control information prior to placing the member back into the library. The request for printing of the source or procedure member is also allowed at this time.
- Allowing the user to request the printing only (no editing) of a source or procedure member.

All prompt screens contain descriptive information to guide the user when using the utility functions. Where appropriate, the prompt screens include default information (which can be overridden). Tutorial

PROGRAMMING RPOs

System/34 Programmer/Operator Productivity Aid (cont'd)

displays are also provided where needed to assist the user in entering the requested information. Access to these tutorial displays is obtained by pressing the HELP key.

While editing a library member, pressing the HELP key provides information on the Edit commands, the command and function control keys supported, and the format selection options allowed when editing is to be performed in a single statement mode.

SPECIFIED OPERATING ENVIRONMENT**HARDWARE REQUIREMENTS**

This PRPQ is designed to operate on an IBM CPU with a minimum storage of 64K, a printer, and a 5251 mdl 11 or mdl 12 (1,920-character screen) Display Station.

SOFTWARE REQUIREMENTS

This PRPQ is designed to operate with the IBM System/34 System Support Program (5726-SS1), Release 8 or later. The optional Extended Disk Data Management Support is not required but will be utilized if installed. The largest program requires 34K of user memory to execute.

SYSTEM REQUIREMENTS

The System/34 Programmer and Operator Productivity Aid requires 325 blocks of disk library space. The Edit Utility requires a minimum of 40 blocks of disk file space. An additional 30 blocks (minimum) of file space is required for each additional (other than the first) Edit session. The files will be extended automatically when necessary if Extended Disk Data Management Support is also installed. The Diskette Utility requires 39 blocks of disk file space when processing diskette magazines.

DOCUMENTATION

(available from Mechanicsburg)

IBM System/34 Programmer and Operator Productivity Aid Description/Operations Guide (SC21-7954) ... IBM System/34 Programmer and Operator Productivity Aid Licensed Program Specifications (GC21-7955).

RPOs ACCEPTED: No

PROGRAMMING RPQ

**IMAGE DISTRIBUTION SYSTEM - CICS/DOS/VS
5799-BJA****PURPOSE**

Image Distribution System - CICS/DOS/VS allows the users of Scanmaster I to send and receive noncoded (image) documents via the public switched telephone network and nonswitched voice facilities. Drawings, charts, letters and diagrams may be distributed during regular working hours, or deferred to a time when telephone line rates are lower.

DESCRIPTION

The program uses a simple cover sheet to control routing and disposition of image input documents. The cover sheet has preformatted positions for marks indicating recipients addresses. A cover sheet is placed in front of the document to which it applies and is placed in the automatic document feed of the Scanmaster I. Documents for different locations may be stacked together in the automatic document feed since each has its own addressing cover sheet.

A depression of the 'Send' button causes documents to be read into the system where the images of the documents are stored on DASD. If no errors are detected, a confirmation of acceptance (COA) of the document is optionally returned by the system to the originating Scanmaster I.

The Image Distribution System program then distributes the document to each addressed Scanmaster I in the system. The program will also send a confirmation of delivery (COD) back to the originating Scanmaster I.

The Image Distribution System program, an IBM Program Offering on CICS, provides the following key functions for the Scanmaster I:

- Image Document Distribution.
- Stored Distribution List.
- Timed Delivery.
- Confirmation of Acceptance.
- Confirmation of Delivery.
- Control of Document Retention Period.

A. Distribution

This system provides image document distribution functions under CICS, using cover sheet to control routing and disposition of the documents.

Cover Sheet: The capability to read and recognize a specially formatted document distribution cover sheet is provided for the Scanmaster I. An optical mark reading technique is used to recognize marks made by the sender of the document on the cover sheet.

- (1) Users may elect to use the IBM-defined cover sheet format. (Customized printing of locations and addresses for document distribution can be made by the customer on the IBM-defined cover sheet.) The system validates only the IBM-defined cover sheet.
- (2) Users may define their own cover sheet format. Processing of a user-defined cover sheet is the user's responsibility through a program user interface.
- (3) The sender specifies document destination mail points by marks and specific recipients by handwritten notes. The cover sheets with destination marks and recipients names/addresses will be sent with a document to the destination mail points. The user can specify multiple recipients at one mail point.
- (4) The system-generated separatot sheet is used as a vehicle for destination messages.

Directory: The system uses the directory to correlate mail points to Scanmaster I's IDs. The directory is built at the Image Distribution System installation time, but can be altered later by a system utility. When additional Scanmaster Is are installed in the network, the user may need to re-assemble CICS Control Tables and to examine the cover sheet verification routine.

Multiple Scanmaster Is on One Mail Point: Users can treat multiple Scanmaster Is as though they were one mail point.

B. Confirmation of Acceptance

Users can receive notification from the system of successful receipt of the document for subsequent distribution, if this option is selected with a mark on the cover sheet.

C. Timed Delivery

The system supplies the option via a cover sheet to specify that documents should be delivered at a pre-set time or as soon as system resources permit. A single delivery time is established for the entire Image Distribution System but can be altered at start-up time each day, if necessary.

D. Confirmation of Delivery

A user can receive confirmation of delivery, if this option is selected with a mark on the cover sheet.

E. Control of Document Retention Period

Documents are purged after all mail points have received the document, or when system operator requests the deletion of undelivered documents and, as the result, COD is returned.

F. Stored Distribution List

In order to facilitate broadcasting and routing mailing in an enterprise, a stored distribution list capability is supported through the Image Distribution System utility function. Lists are numbered from 0000 through 9999 and can contain up to 60 entries per list. The Image Distribution System provides the flexibility to allocate distribution lists, both public and private, according to the needs of the particular installation. The Image Distribution System-defined cover sheet has a specific marking position for reference to the stored distribution list.

G. Interchange of Cover Sheet

Cover sheets will be used by the receiving operator to identify recipients. When a recipient's name appears on a continuation cover sheet, the system changes the sequence of cover sheets so that the continuation cover sheet with the recipient name is the first page of the document.

In addition to the above, the following capabilities are provided for user flexibility:

Message File: A message file is designed so that countries can substitute native language support. The system provides English and Katakana message files. Only one message file will be supported within one system.

User Interface: The system provides a program user interface tailorable at the following points:

- (1) Sign-on: To change the sign-on procedure.
- (2) Cover Sheet Handling exit: To permit the use of user-designed cover sheet.
- (3) Document Processing exits (Inbound beginning/end time): To provide access to the document file and save it in the user's own file for later printing or modification. The Image Distribution System does not provide tools or processing modules for manipulating the contents of the document file.
- (4) Document Output entry: To print the user-manipulated documents on Scanmaster I.
- (5) Outbound Completion exit: To finish the user process on any required action.

User interface routines may be written in Assembler, COBOL or PL/I, but must observe the CICS command level programming conventions.

SPECIFIED OPERATING ENVIRONMENT**HARDWARE REQUIREMENTS**

The IBM Image Distribution System - CICS/DOS/VS is designed to operate with a single IBM 4300, S/370, 303X or 308X processor supported by DOS/VS.

For the execution of the program, a minimum of 128K bytes of real storage is required.

One IBM 3270 display terminal is required for the system control functions.

DASD space is required for document file.

SOFTWARE REQUIREMENTS

The IBM Image Distribution System program runs as an application program under the then most current release of CICS/DOS/VS on 6/83.

A current release of VSE/VSAM which supports the above operating system release, is required for Image Distribution System generation and execution.

ACF/VTAM Version 2 with ACF/NCP/VS Release 1.3 or Release 2.1 is required.

The Image Distribution System requires the DOS PL/I Transient Library (5736-LM5) for its execution.

DOCUMENTATION

(available from Mechanicsburg)

IBM Image Distribution System - CICS Program Description and Operation Manual (SH18-0058 - English) ... IBM Image Distribution System - CICS System and Logic Manual (LY18-1139 - English).

RPQs ACCEPTED: No

PROGRAMMING RPQ

**IMAGE DISTRIBUTION SYSTEM - CICS/OS/VS
5799-BJB****PURPOSE**

Image Distribution System - CICS/OS/VS allows the users of Scanmaster I to send and receive noncoded (image) documents via the public switched telephone network and nonswitched voice facilities. Drawings, charts, letters and diagrams may be distributed during regular working hours, or deferred to a time when telephone line rates are lower.

DESCRIPTION

The program uses a simple cover sheet to control routing and disposition of image input documents. The cover sheet has preformatted positions for marks indicating recipients addresses. A cover sheet is placed in front of the document to which it applies and is placed in the automatic document feed of the Scanmaster I. Documents for different locations may be stacked together in the automatic document feed since each has its own addressing cover sheet.

A depression of the 'Send' button causes documents to be read into the system where the images of the documents are stored on DASD. If no errors are detected, a confirmation of acceptance (COA) of the document is optionally returned by the system to the originating Scanmaster I.

The Image Distribution System program then distributes the document to each addressed Scanmaster I in the system. The program will also send a confirmation of delivery (COD) back to the originating Scanmaster I.

The Image Distribution System program, an IBM Program Offering on CICS, provides the following key functions for the Scanmaster I:

- Image Document Distribution.
- Stored Distribution List.
- Timed Delivery.
- Confirmation of Acceptance.
- Confirmation of Delivery.
- Control of Document Retention Period.

A. Distribution

This system provides image document distribution functions under CICS/OS/VS V1 R6, using cover sheet to control routing and disposition of the documents.

Cover Sheet: The capability to read and recognize a specially formatted document distribution cover sheet is provided for the Scanmaster I. An optical mark reading technique is used to recognize marks made by the sender of the document on the cover sheet.

- (1) Users may elect to use the IBM-defined cover sheet format. (Customized printing of locations and addresses for document distribution can be made by the customer on the IBM-defined cover sheet.) The system validates only the IBM-defined cover sheet.
- (2) Users may define their own cover sheet format. Processing of a user-defined cover sheet is the user's responsibility through a program user interface.
- (3) The sender specifies document destination mail points by marks and specific recipients by handwritten notes. The cover sheets with destination marks and recipients names/addresses will be sent with a document to the destination mail points. The user can specify multiple recipients at one mail point.
- (4) The system-generated separator sheet is used as a vehicle for destination messages.

Directory: The system uses the directory to correlate mail points to Scanmaster I's IDs. The directory is built at the Image Distribution System installation time, but can be altered later by a system utility. When additional Scanmaster I's are installed in the network, the user may need to re-assemble CICS Control Tables and to examine the cover sheet verification routine.

Multiple Scanmaster I's on One Mail Point: Users can treat multiple Scanmaster I's as though they were one mail point.

B. Confirmation of Acceptance

Users can receive notification from the system of successful receipt of the document for subsequent distribution, if this option is selected with a mark on the cover sheet.

C. Timed Delivery

The system supplies the option via a cover sheet to specify that documents should be delivered at a pre-set time or as soon as system resources permit. A single delivery time is established for the entire Image Distribution System but can be altered at start-up time each day, if necessary.

D. Confirmation of Delivery

A user can receive confirmation of delivery, if this option is selected with a mark on the cover sheet.

E. Control of Document Retention Period

Documents are purged after all mail points have received the document, or when system operator requests the deletion of undelivered documents and, as a result, COD is returned.

F. Stored Distribution List

In order to facilitate broadcasting and routing mailing in an enterprise, a stored distribution list capability is supported through the Image Distribution System utility function. Lists are numbered from 0000 through 9999 and can contain up to 60 entries per list. The Image Distribution System provides the flexibility to allocate distribution lists, both public or private, according to the needs of the particular installation. The Image Distribution System-defined cover sheet has a specific marking position for reference to the stored distribution list.

G. Interchange of Cover Sheet

Cover sheets will be used by the receiving operator to identify recipients. When a recipient's name appears on a continuation cover sheet, the system changes the sequence of cover sheets to that the continuation cover sheet with the recipient name is the first page of the document.

In addition to the above, the following capabilities are provided for user flexibility:

Message File: A message file is designed so that countries can substitute native language support. The system provides English and Katakana message files. Only one message file will be supported within one system.

User Interface: The system provides a program user interface tailorable at the following points:

- (1) Sign-on: To change the sign-on procedure.
- (2) Cover Sheet Handling exit: To permit the use of user-designed cover sheet.
- (3) Document Processing exits (Inbound beginning/end time): To provide access to the document file and save it in the user's own file for later printing or modification. The Image Distribution System does not provide tools or processing modules for manipulating the contents of the document file.
- (4) Document Output entry: To print the user-manipulated documents on Scanmaster I.
- (5) Outbound Completion exit: To finish the user process on any required action.

User interface routines may be written in Assembler, COBOL or PL/I, but must observe the CICS command level programming conventions.

SPECIFIED OPERATING ENVIRONMENT**HARDWARE REQUIREMENTS**

The IBM Image Distribution System - CICS/OS/VS is designed to operate with a single IBM 4300, S/370, 303X or 308X processor supported by MVS.

For the execution of the program, a minimum of 128K bytes of real storage is required.

One IBM 3270 display terminal is required for the system control functions.

DASD space is required for document file.

SOFTWARE REQUIREMENTS

The IBM Image Distribution System program runs as an application program under CICS Release 1.6 on a processor supported by OS/VS2 MVS Release 3.8 with SE2, or MVS/SP V1 R3, or MVS/SP V2 R1.

A current release of VSAM or Data Facility Product (DFP), which supports the above operating system release, is required for Image Distribution System generation and execution.

ACF/VTAM Version 2 with ACF/NCP/VS Release 1.3 or Release 2.1 is required.

The Image Distribution System requires the OS PL/I Transient Library (5736-LM5) for its execution.

DOCUMENTATION
(available from Mechanicsburg)

IBM Image Distribution System - CICS Program Description and Operation Manual (SH18-0058 - English) ... IBM Image Distribution System - CICS System and Logic Manual (LY18-1139 - English).

RPQs ACCEPTED: No



PROGRAMMING RPQs

**4720 FORMS/PASSBOOK PRINTER ATTACHMENT to the
3600 FINANCE COMMUNICATION SYSTEM
5799-BJE**

PURPOSE

This support enhances the user's currently installed host support to enable attachment of the 4720 Forms/Passbook printer to installed 3600 systems. All functions of the 4720 Printer are supported.

DESCRIPTION

This support is applied to existing 3600 Host Support, program numbers 5747-BR1 for DOS/VSE and 5744-CA3 for OS/VS, respectively. It enables a user to develop applications in 3600 Assembler language to utilize the 4720 Printer with his existing 3600 Finance Communication System. These applications are developed in the same manner as other 3600 applications, employing the tools and techniques that the user has previously established. Existing applications to which 4720 printer support is added will require source code changes.

SPECIFIED OPERATING ENVIRONMENT

HARDWARE REQUIREMENTS

Applications developed with this support can be utilized with an IBM 3601, 3602 or 3605 controller. This support will require 4,000 bytes of user storage in addition to application program requirements.

An IBM S/370, 303X, 308X or 4300 processor with sufficient storage and input/output devices for 3600 application program development and operational diskette preparation.

SOFTWARE REQUIREMENTS

For application development and transmission, the user should have installed a current release level of one of the following operating systems:

- DOS/VSE (5745-020)
- VSE/Advanced Functions (5746-XE8)
- OS/VS1 (5741-VS1)
- OS/VS2 (5752-VS2)

COMPATIBILITY

Applications developed with this PRPQ for the 3600 Finance Communication System will operate on the 4700 Finance Communication System after reassembly with the appropriate 4700 macros.

PROGRAMMING RPQ

**5799-BJK - SYSTEM/38 PERFORMANCE MEASUREMENT
TOOLS
P84054****PURPOSE**

System/38 Performance Measurement Tools is a set of commands and programs that can be used to help determine the overall performance of a system. With the tools the user can more easily determine how performance could be improved in a system. Using the data provided, the user can correct problems in configuration, application design, or application program implementation.

HIGHLIGHTS

- The System/38 Performance Measurement Tools provide commands to measure overall system performance by presenting data regarding CPU usage, main storage usage, and disk I/O operations at the system-wide level. This data can help the user determine interactive transaction throughput and loading, as well as making possible a relatively accurate determination of interactive response time.
- System overhead of individual jobs and programs can be determined with the data gathering function incorporated in this PRPQ. Data that shows CPU and disk utilization can be viewed at a system level, a job level, or at a program level. This includes displays and printed reports that provide a range of information from a general overview of the system operation to specific detailed information regarding the performance and program flow within an individual job, the programs within that job and the instructions within a program.
- Using the performance data and the capacity planning function, the user can project system growth requirements.

CUSTOMER RESPONSIBILITIES

The customer must restore the tool library diskettes, print the machine-readable documentation, and operate the tool commands to perform the various functions available. Also, should privacy and security of data be desired, the customer should allow for implementation of appropriate security measures.

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 which these tools have been designed to operate is:

- An IBM 5381 System Unit (any model)
- Any 1920-character display of the IBM 5250 Information Display System
- Either a workstation printer or line printer can be utilized.

SOFTWARE REQUIREMENTS

This PRPQ is designed to operate with:

- IBM System/38 Control Program Facility (CPF) (5714-SS1)
- IBM System/38 Interactive Data Base Utilities (IDU) (5714-UT1)

Other Requirements: The distribution media is diskette. The tools and the machine-readable documentation require approximately 3 megabytes of disk storage to be loaded.

Technical Limitations: Tool installation is with the RSTLIB command from diskette and can be done concurrently with normal system operation. During tool operation, disk storage requirements can increase if the trace or sampling functions are being used.

PERFORMANCE

Tool operation can degrade overall system throughput and response time when running the internal machine traces.

DOCUMENTATION
(available from Mechanicsburg)

Licensed Program Specifications (GC21-7958).

**5799-BKE - HOST-6580 DISPLAYWRITER
DOCUMENT INTERCHANGE RELEASE 2**

PURPOSE

The Host-6580 Displaywriter Document Interchange (HDDI) PRPQ Release 2 supports the printing at Displaywriter of documents formatted at host systems running VM/SP CMS, as well as supporting the transfer of revisable documents between Displaywriters and host systems. It also provides a limited capability to convert documents from Displaywriter revisable format to Document Composition Facility (DCF) controls and from DCF to Displaywriter format. The limitations on the documents that may be converted are inherent to the transformations possible between DCF controls and Displaywriter format and are given in the *Introducing Host-Displaywriter Document Interchange* manual. With this product, a Displaywriter user can work in conjunction with a PROFS user and both can take advantage of the power of PROFS to view, edit, store, retrieve, mail and print a document. In addition, this PRPQ provides National Language Support for selected languages.

HIGHLIGHTS

- Supports revisable-document transfer both to and from Displaywriter and VM/SP CMS.
- Provides capability to convert documents both to and from a limited set of Displaywriter revisable format and DCF controls.
- Supports printing at Displaywriter of any VM/SP CMS or PROFS 1403-formatted items, such as documents and notes.
- Provides a full-screen interface integrated with PROFS program product Release 2 and consistent with PROFS panel layout, PF key usage and help facility (also available to other VM/SP CMS users).
- Provides an application programming interface for use by systems programmers.
- Operates with a suitably configured Displaywriter (preferably configured with sufficient memory for alternate task capability, which allows the user to switch from device emulation to Displaywriter mode during document transfer).
- Allows the use of the Host-Displaywriter Document Interchange PRPQ Release 2 by PROFS and other VM/SP CMS users.

DESCRIPTION

The Host-Displaywriter Document Interchange (HDDI) PRPQ Release 2 when used with a suitably configured Displaywriter supports the printing at Displaywriter of documents formatted at the host, in addition to the document transfer and document conversion supported in the earlier release. It also provides a PROFS user with an integrated interface to invoke document interchange functions.

PROFS currently provides its users the ability to interchange documents. With HDDI and PROFS, a range of additional opportunities is opened to Displaywriter and host users.

Displaywriter - Displaywriter: Documents may be created on Displaywriter, transferred to the host and shared with other Displaywriter users through the PROFS update function with no loss of integrity. Documents may also be distributed through the VM network to other similarly attached Displaywriters where they may be viewed, edited and printed with no loss of integrity.

Displaywriter - 327X: Documents may be created on a Displaywriter using a subset of Displaywriter functions, transferred to the host, converted to DCF controls, and mailed through PROFS to other PROFS users where they may be viewed, revised, stored for retrieval, forwarded, or printed.

Documents may be further revised by either 327X or Displaywriter users. A 327X user may revise (or format for viewing or printing) a copy of a document containing DCF controls. A Displaywriter user may continue revising by converting the copy of the document containing DCF controls to Displaywriter format and transferring to the Displaywriter diskette from which it may be viewed, stored, printed, and further revised.

327X - Displaywriter: Documents may be created on a 327X using a subset of DCF controls, converted to Displaywriter format, and transferred to the Displaywriter diskette from which they may be viewed, revised, stored, or printed.

Alternately, documents may be created at the host using full function DCF, including GML, and transferred to the Displaywriter diskette. A secretary who knows DCF can continue the editing process with the rapid response that is characteristic of Displaywriter. This use can improve productivity significantly at installations where host terminals are remotely attached. No conversion of DCF controls takes place. They are carried through to the Displaywriter and are available within the text of the transferred document.

Documents created on either the host (in DCF form) or on Displaywriter without reference to the limitations of the conversion programs, and then transferred and converted to the other medium, will need to be revised to repair the parts of the documents that contained controls that the conversion did not support.

Final Form Document Printing - Displaywriter: With Host-Displaywriter Document Interchange Release 2, a user can print on Displaywriter a document created and formatted at the host. Previously, a document created at the host could be printed at the Displaywriter only by converting and transferring the revisable form of the document to Displaywriter and printing as a Displaywriter document. It is no longer necessary for the user to store a copy of the revisable host form (containing DCF controls) in the host storage. A user may now print on Displaywriter any final form document formatted for 1403 Printers, such as documents or notes received through the PROFS mail facility.

Displaywriter Document Archiving: The PROFS host data base may be used as an archive for Displaywriter documents kept in Displaywriter format, reducing the need for offline diskette storage.

PROFS environment: The HDDI PRPQ can be invoked from:

- The PROFS main and subset menus to transfer and convert documents using HDDI menus
- The PROFS document preparation facility using commands (SENDTO, GETFROM, and HDDI commands)
- The PROFS document preparation, mail, and search facilities
 - The 'Process the Document' menu (F01) contains an entry point (PF10) for the transfer function. This allows revisable text interchange between Displaywriter users and 3270 display users.
 - The 'Print the Document' menu (J00) contains an entry point (PF08) to the final form document transfer function. This allows any PROFS 1403 document to be printed at the Displaywriter.

The PROFS 'file soft copy' function can be used to file documents that have been transferred from Displaywriter to the host. Converting these documents to DCF controls is optional; either Displaywriter or DCF form, or both, can be filed in the PROFS data base. Following retrieval from the PROFS data base, these documents can be converted (as necessary) to Displaywriter format and transferred to a Displaywriter.

As indicated above, a document could be 'roughed out' by a principal on a 327X terminal, passed to a secretary where it would be 'cleaned up' using Displaywriter, and then returned to the principal for final review or for subsequent editing. At any point in the cycle, either the principal or the secretary can electronically mail the document or print it for external mailing.

The PROFS document preparation facility may be used with document formats in either of the following modes:

- **First mode:** Because GML tags and DCF controls are not expanded at the Displaywriter, procedures should be developed by the user in order to use PROFS to create initial draft documents which will be sent to the Displaywriter for revision. A special document format should be created which eliminates most of the header profile tags and DCF controls normally used by the PROFS memo prompter so that the Displaywriter user sees a more representative version of the final document. Information entered in the header is used by PROFS for both indexing and formatting. This information is not available to the Displaywriter; only the body text is available.
- **Second mode:** The final form print function permits a second mode of operation. Any PROFS document format may be used. The Displaywriter operator enters only the body text on Displaywriter, then transfers the document to PROFS where the memo-prompting information is entered. To print the final document, it is formatted in PROFS where all of the DCF and GML controls contained in the PROFS document format are resolved, and then sent to Displaywriter through the final form print function.

VM/SP CMS environment: The Host-Displaywriter Document Interchange PRPQ will also operate in a CMS environment without PROFS. A full-screen interface is provided with both menu and field help. With HDDI Release 2, an online tutorial based on these help screens is also provided.

Document transfer occurs to and from Displaywriter and the user's personal storage at the host. The conversion routines allow the user to change documents from and to Displaywriter format and DCF controls within the limits described below. If documents are converted, they may be revised using XEDIT or any VM/CMS-based editor. Printing documents at the host or sending them to other users can be accomplished with the normal CMS commands.

Document Conversion: Displaywriter and DCF both represent revisable forms of documents. Their approaches are fundamentally different because their environments and intended uses are very different. As a result, the two forms of revisable documents express common concepts in different ways and each also has concepts that the other cannot express at all. Therefore, conversion between these two forms of revisable documents is neither simple nor direct and places certain limitations upon the documents that are to be converted.

Unsupported Displaywriter functions: The following Displaywriter functions are not supported by the conversion programs. Some of these can be approximated by editing with DCF. Some represent functions not applicable or possible with DCF. Any new Textpack 6

PROGRAMMING RPQs

HDDI R2 (cont'd)

controls and functions not contained in Textpack 4 are not supported. When unsupported Displaywriter controls are used in a document, the user must repair the document after conversion.

- Margins and other page-layout information that applies to a Displaywriter printer but does not necessarily apply to a host system printer. (Document formats may be saved and passed back to Displaywriter, if desired.)
- Subscripts and superscripts. (These are saved so they may be passed back to the Displaywriter, if desired.)
- Begin and end overstrike.
- Index key.
- Begin and end keep.
- Decimal, center and right tab alignment. (Normal left tab alignment is supported and substitutes for all tab types.)
- Field centering. (Line centering is supported.)
- Page naming. (Page numbering is supported.)
- Print medium. (The source drawer for forms is saved so that it may be passed back to the Displaywriter, if desired.)
- Font changes within a document. (A document may use only one print font.)
- Keyboard changes within a document. (A document may use only one keyboard.)
- Half justification.
- Spell check attributes.
- Include text unit.
- Page end created by pagination function on Displaywriter.
- HDDI does not support the conversion of files created by Displaywriter features other than TEXTPACK.
- Syllable hyphen.
- Unit backspace.

Supported DCF controls: The following chart shows the subset of DCF control words that can be converted to Displaywriter form.

DCF Control Words	Example of Supported Uses	Effect at Displaywriter	Example of Unsupported Uses
.br	.br	Puts following text on a new line.	
.ce	.ce text	Centers the following text alone on a line.	.ce on .ce off .ce 2
.ds	.ds	Starts a new line and double spaces text on following lines.	
.fo	.fo off .fo on .fo left	Leaves text as it was typed. Adjusts the text to fit on lines with straight left and right margins. Adjusts the text to fit on lines but the right margin is not straight.	.fo right
.hw	.hw re-view	Tells the Displaywriter where to put the hyphen if this occurrence of the word (review) needs to be hyphenated.	
.in	.in 5 .in 0 .in	Starts a new line and starts text on that line and following lines in column 6 (if there is a tab at column 6) or to the next tab to the right of column 6. Starts a new line with no indentation.	.in +5 .in -5 .in 5 for 3 .in 5 for 3 after 2i
.ju	.ju on .ju off	Inserts spaces in following lines to create a straight right margin. Ends inserting of spaces.	
.pa	.pa .pa nostart	Ends the page. Ends the page but allows header or footer change before starting the text for the next page.	.pa 5 .pa +6 .pa -2 .pa odd .pa even

.pp	.pp .pp line	Inserts a blank line. Inserts a blank line before the line of text.	
.rf	.rf on .rf even .rf odd .rf off .rf cancel	Starts the definition of the footer. Starts the definition of the even-page footer. Starts the definition of the odd-page footer. Ends the definition of the footer. Cancels the footer for following pages.	
.rh	.rh on .rh even .rh odd .rh off .rh cancel	Starts the definition of the header. Starts the definition of the even-page header. Starts the definition of the odd-page header. Ends the definition of the header. Cancels the header for following pages.	
.sk	.sk 3	Leaves three blank lines except at the top or bottom of the page.	.sk 3i
.sp	.sp 5	Leaves five blank lines.	.sp 3i .sp 5mm
.ss	.ss	Starts a new line, and single-spaces text on following lines.	
.tb	.tb 4 8 12	Sets tabs at positions 4,8,12,15, and at five-column intervals to the end of the line.	.tb add .tb del
.us	.us on .us off	Underscores following lines. Stops underscoring.	.us text .us 5
.half	.half up .half down	Superscript. Subscript.	

In addition, when converting a document from Displaywriter form to host form, HDDI creates four special uses of the comment (.cm) control word. These special uses are supported to the extent that they can be converted back to Displaywriter form.

The special uses of the comment control word tell Displaywriter which paper source to use:

- .cm printing paper source top.
- .cm printing paper source bottom.
- .cm printing paper source bottom, this page only.
- .cm printing paper source manual feed.

Notes:

1. All other DCF controls that cause a break are converted in the same way as the .br control word.
2. If, after being converted from the host form to Displaywriter form, the document is converted back again to host form, the new document may look different from the original, unconverted host-form document. For example:
 - Skip (.sk) and space (.sp) control words are converted into blank lines in Displaywriter form and are not converted back again into the .sk or .sp control word form.
 - Indent (.in) control words that could not be converted to exactly equivalent Displaywriter form will be different.

All other controls can, at the user's option, be passed to Displaywriter as text. Such controls are for use by a Displaywriter operator who knows DCF and who can ignore them or continue formatting the document using Displaywriter keystrokes to replace DCF controls.

CUSTOMER RESPONSIBILITIES

Installation of Host-Displaywriter Document Interchange is the customer's responsibility.

SPECIFIED OPERATING ENVIRONMENT

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

HARDWARE REQUIREMENTS

For the host system:

- Any currently supported VM/SP CMS IBM S/370, 4300 or 3000-series processor with a minimum main storage size of one megabyte.



PROGRAMMING RPQs

HDDI R2 (cont'd)

- A nine-track tape drive and a 24-line display terminal are required for installation of Host-Displaywriter Document Interchange Release 2.

For the attaching Displaywriter, any one of the following is required:

- Displaywriter 3274/3276 Attached Workstation (AW) Adapter Feature (#8332) and:
 - A minimum of 384K bytes for Textpack 4 (5608-TR4), or
 - A minimum of 448K bytes for Textpack 6 (5608-TR6).
 - Subtract 128K bytes from these requirements if alternate task capability is not desired.
- Displaywriter-3277 Device Emulation (DE) RPQ 8D0098, and:
 - A minimum of 320K bytes for Textpack 4 (5608-TR4), or
 - A minimum of 384K bytes for Textpack 6 (5608-TR6).
 - Subtract 64K bytes from these requirements if alternate task capability is not desired.

The Displaywriter hardware prerequisites for AW and DE are mutually exclusive and cannot coexist.

A Displaywriter with AW or DE cannot be the primary station for printer sharing.

SOFTWARE REQUIREMENTS

HDDI is written in IBM/370 Assembler language, PL/1, EXEC2, and system editor (XEDIT) command languages. It is designed to operate in a VM/SP CMS environment and is dependent on the following licensed programs which are available separately.

For the host system:

- VM/System Product (5664-167) Release 1 or later (VM/SP 2.1 is required for PROFS PP Release 2 function.)
- VM/High-Performance Option (5664-173) Release 3 or subsequent release, unless otherwise specified, for hardware environments that require this extension to VM/SP.
- Document Composition Facility (5748-XX9) Release 2 or later with the appropriate CMS Foreground Environment feature.
- PL/1 Transient Library (5734-LM5).
- Optionally, PROFS PRPQ or PROFS PP Release 1 or later. (Host-Displaywriter Document Interchange Release 2 requires PROFS PP Release 2 for full function.)

On Displaywriter, programming for selected hardware:

- For 3274/3276 AW, prerequisite programming is provided by 3270 Attached Workstation licensed program (AW, 5608-SR9).
- For 3277 DE, prerequisite programming is provided by 3277 Device Emulation/Document Transfer (DE/DT PRPQ P10074, 5799-BKG).

MINIMUM SYSTEMS CONFIGURATION

	DISPLAYWRITER SYSTEM	HOST SYSTEM
	Hardware/Software	Hardware/Soft
3278 Emulation via AW	Feature #8332, (5608 TR4 & 384KB, or 5608 TR6 & 448KB) and 5608 SR9	VM/SP Rel 1, DCF, PL/1 Transient Lib., and 3274 (A Port) or 3276 Controller
3277 Emulation via DE	RPQ 8D0098, (5608 TR4 & 320KB, or 5608 TR6 & 384KB) and 5799 BKG	VM/SP Rel 1, DCF, PL/1 Transient Lib., & 3271, 3272 or 3274 (B Port) Controller

SECURITY, AUDITABILITY AND CONTROL

The Host-Displaywriter Document Interchange PRPQ Release 2 utilizes the security and auditability features of VM/SP CMS. User management is responsible for the selection, application, adequacy, and implementation of all security features and for appropriate application and administrative controls. If sensitive data is sent over external communication facilities, user management may wish to consider the application of cryptography.

PERFORMANCE CONSIDERATIONS

For performance considerations and configuration guidance, consult your National Support Center/Office Systems-Technical host systems representative.

DOCUMENTATION (available from Mechanicsburg)

Introducing Host-Displaywriter Document Interchange (GC09-1037) ... Host-Displaywriter Document Interchange User's Guide (SC09-1024) ... Host-Displaywriter Document Interchange Reference Manual (SC09-1025) ... Host-Displaywriter Document Interchange Reference Card (SX09-1013).

Program Currency: Program services previously announced for Release 1 will be available until July 27, 1984.

RPQs ACCEPTED: No



PROGRAMMING RPOs

**SYSTEM/38 FILE SUPPORT UTILITY
5799-BKP (P84058)****PURPOSE**

The System/38 File Support Utility PRPQ P84058, along with the IBM Personal Computer 5250 Emulation program and the IBM Personal Computer Display Station Emulation Adapter, provide additional support on the System/38 for the IBM Personal Computer (5150) and the IBM Personal Computer XT (5160). The File Support Utility allows the IBM Personal Computer user to create virtual diskettes on the host system. A virtual diskette is a special file formatted by the File Support Utility to the same specifications as a diskette formatted by the IBM Personal Computer Disk Operating System. An IBM Personal Computer user can change virtual diskettes on the System/38 without having to physically handle multiple diskettes. Multiple users can read the same virtual diskette concurrently. The PRPQ also provides a tool to assist System/38 programmers in transferring data between the IBM Personal Computer and the System/38.

HIGHLIGHTS

Allows the user to:

- Create, delete and format a virtual diskette on the host system.
- Access the virtual diskette on the host system from the Personal Computer as if it were a Personal Computer diskette drive.
- Share a virtual diskette among multiple Personal Computers.
- Copy data between the host system data files and the virtual diskette.
- Translate files from EBCDIC to ASCII, or from ASCII to EBCDIC.
- Modify the RPG source code of the File Support Utility PRPQ.
- Access a menu of functions supported by the File Support Utility by the Personal Computer (when in emulation mode).

DESCRIPTION

The System/38 File Support Utility PRPQ P84059, along with the IBM Personal Computer 5250 Emulation program and the IBM Personal Computer Emulation Display Station Adapter for the IBM Personal Computer provide additional support on the System/38 for the IBM Personal Computer (5150) and the IBM Personal Computer XT (5160).

Virtual Diskette Support: The File Support Utility creates a file (a virtual diskette) on the System/38 which IBM Personal Computer user applications can access. The virtual diskette is a special file that has been formatted by the File Support Utility with 9 sectors per track to the same specifications as a single-sided diskette or double-sided diskette formatted by the IBM Personal Computer Disk Operating System Version 2 Modification Level 0 (DOS). This allows DOS 1.1 to use either the 160K- or 320K-byte virtual diskette and DOS 2.0 to use either the 160K-, 180K-, 320K-, or 360K-byte virtual diskette. Each record of the file corresponds to a sector on the diskette. This virtual diskette can hold up to 320K bytes of information and a maximum of 112 files.

The host system data files are accessed by using the File Support Utility to transfer a file from the System/38 data files to the virtual diskette. This is done by selecting an option on the File Support Utility menu.

The File Support Utility allows the user to transfer a file from a virtual diskette to a host file. It translates character data from ASCII to EBCDIC or from EBCDIC to ASCII format. The utility allows the user to specify whether the transfer should terminate, or substitute a specified character, if the utility finds an untranslatable character. An additional option allows the user to transfer a file without translating the data.

The user can create multiple System/38 files to be used as virtual diskettes. Only one virtual diskette can be used as the current virtual diskette for each IBM Personal Computer; however, the File Support Utility allows for changing the virtual diskette being used. This virtual diskette is available to multiple users.

When sharing virtual diskettes among multiple users, System/38 security procedures should be implemented to ensure the integrity of the virtual diskette. For example, one user could be given the ability to both read and write files to the virtual diskette; other users could be allowed only read files from the virtual diskette.

Data Compatibility: The image of the data stored on the virtual diskette is the same as that of a physical IBM Personal Computer diskette. Therefore, this data can be handled by the IBM Personal Computer as if it were on a physical Personal Computer diskette with no restrictions on character representations, encoding, or internal numeric representations. However, there are a number of limitations imposed when translating this data to or from the System/38.

Limitations

- The character representations of the System/38 (EBCDIC) and of the IBM Personal Computer (ASCII) are different. Each supports representation of certain values that do not have a value in the other system's representation. For example, some Personal Computer graphics characters do not have EBCDIC representation.
- The internal numeric representation of the System/38 and the Personal Computer are not interchangeable. Therefore, when using the File Support Utility to move non-character numeric data between the virtual diskette and the System/38 data files, the user must convert these values to character representations prior to copying the data to the virtual diskette and into the appropriate internal numeric representation after copying the data to the virtual diskette.
- Some files on the Personal Computer may contain embedded control bytes (for example, forms feed) that cannot be translated under certain conditions.
- The translation function is performed at the file level only. No field-level distinctions are made.

Enhancements for DOS 2.0 Support: Other functions available in this utility for use with DOS 2.0 (but not available for use by DOS 1.1) are:

- Ability to specify volume label for the virtual diskette.
- Ability to specify read access only for a Personal Computer file on the virtual diskette.
- Ability to use DOS FORMAT command to format a virtual diskette. (DOS 1.1 excludes the use of the DOS FORMAT command to format a 160K-byte virtual diskette.)

The File Support Utility copy functions do not support the DOS 2.0 tree-structured directories. IBM Personal Computer files must be in the root directory of the virtual diskette to be copied to or from the System/38 data files. The tree-structures may be used for IBM Personal Computer files on the virtual diskette if the user does not intend to copy the Personal Computer file to or from the System/38 data files.

DOS 2.0 also provides the capability to create a read-only file on a diskette. The System/38 File Support Utility provides a similar function by protecting all files on a virtual diskette from replacement unless the user specifically requests the file be updated.

Hard File Support: To copy an IBM Personal Computer file from the virtual diskette to a hard file, the IBM Personal Computer file must first be copied from the virtual diskette to a physical diskette. The user must then sign off from the System/38 and IPL the IBM Personal Computer. The IBM Personal Computer file can then be copied from the physical diskette to the hard file.

CUSTOMER RESPONSIBILITIES

IBM may provide marketing assistance. The responsibility for providing accurate ordering information, selecting and training personnel, installing licensed program, providing adequate data security functions, and continued day-to-day operation lies solely with the customer.

SPECIFIED OPERATING ENVIRONMENT**HARDWARE REQUIREMENTS**

The minimum system configuration for which this program has been designed to operate is:

- IBM System/38 (all models).

For hardware requirements on the IBM Personal Computer, refer to Prerequisites on the IBM Personal Computer 5250 Emulation feature (see Announcement Letter 283-037).

SOFTWARE REQUIREMENTS

The IBM System/38 File Support Utility PRPQ has been designed to run under control of the IBM System/38 Control Program Facility (CPF, 5714-SS1) and RPG III (5714-RG1).

The IBM System/38 File Support Utility PRPQ is designed to support the IBM Personal Computer under control of DOS.

DOCUMENTATION

(available from Mechanicsburg)

IBM System/38 File Support Utility PRPQ for the IBM Personal Computer Licensed Program Specifications (GC21-9064) ... IBM System/38 File Support Utility PRPQ for the IBM Personal Computer User's Programmer's Guide (SC21-9059) ... IBM System/38 Keyboard Template (GX21-7756).

RPOs ACCEPTED: Yes



PROGRAMMING RPQs

**SYSTEM/36 BUSINESS GRAPHICS UTILITIES
5799-BNW (P84056)****PURPOSE**

System/36 Business Graphics Utilities PRPQ P84056 provides both batch and interactive utilities which satisfy the business graphics requirement. It supports the 5292 mdl 2 color graphics workstation, 5224, 5225, the Plotter XY/749, and alphameric workstations such as the 5251-11.

HIGHLIGHTS

The System/36 Business Graphics Utilities contain:

- An alphameric interactive interface which allows the user to interactively define the data for:
 - Line graphs (multiple line and surface graphs).
 - Pie charts (with offset segments).
 - Bar graphs and stacked bar graphs.
 - Text graphs.
- A batch graphics interface generates the above charts and outputs them to the 5224 or 5225 Printer..
- Support for the 5292 mdl 2 color graphic display.
- Support for the XY/749 8-color pen plotter.
- An automatic linkage from the Office Systems TOOL's Menu which provides an easy invocation from an office systems environment.
- Five fonts which can be scaled by the user.
- A data file is defined to accept data from IBM or user programs to be plotted. The data can be plotted using either batch or interactive procedures.

DESCRIPTION

Using the 5292 mdl 2 graphic display, data can be entered and interactively displayed as a graph. This graph could also be from a previous definition or output from a user program. The graph definition can also be done from a 5251-11 or similar 24-line display; the graph would then be printed on the 5224 or 5225. It can be saved to be displayed on the 5292 mdl 2 or on an 8-color pen plotter connected to the 5292 mdl 2.

The 5292 mdl 2 also supports a color screen copy unit attached to a printer port. Additionally, the 5292 mdl 2 provides a video output port for attaching an electronic camera for making color 35 slide and 8 x 10 copies or transparencies. The video port can also attach monitors and TV projectors. These interfaces operate without the need of programming support.

The alphameric characters on the 5292 mdl 2 are displayed in colors identical to the 5292 mdl 1. Seven different colors are used for graphics. The colors used for graphics provide contrast but complement the colors used for alphamerics.

A separate utility is provided to print graphs on the 5224 or 5225 Printer as graphic output for day-to-day reports. The user provides a file of data to be plotted in the format described in the documentation. When the program is run, the described data will be plotted on the 5224, 5225 Printer. This same data can be graphically displayed on the 5292 mdl 2.

CUSTOMER RESPONSIBILITIES (not applicable)

BRANCH OFFICE RESPONSIBILITIES (not applicable)

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 36 (any model).
- Minimum region size is 64K bytes.

Either:

- IBM 5291, 5292 or 5251 (mdl 11 or 12) Display Station; plus,
- IBM 5224 mdl 1 or 2 or 5225 mdls 1-4.

Note: When utilizing the IBM 5225 Printer mdls 1-4, factory EC 323150 or no-charge field bill of material (FBM) 6844756 must be installed, and for the IBM 5225 mdl 1, factory EC 987958 or no-charge FBM 6840638 must be installed.

Or:

- IBM 5292 mdl 2.

SOFTWARE REQUIREMENTS

IBM System/36 System Support Program (5727-SS1).

COMPATIBILITY (not applicable)

CONVERSION (not applicable)

SECURITY/INTEGRITY

The same as the IBM System/36 System Support Program (5727-SS1).

PERFORMANCE CONSIDERATIONS

Performance of this program when output is addressed to the 5224, 5225 is dependent on the type of graph being created and printed and the dot density.

DOCUMENTATION

(available from Mechanicsburg)

Business Graphics Utilities PRPQ Guide (SC21-7985) ... Business Graphics Utilities PRPQ Licensed Program Specifications (GC21-7982).

RPQs ACCEPTED: Yes

PROGRAMMING RPQs

5799-BNY - SYSTEM/36 FILE SUPPORT UTILITY

PURPOSE

System/36 File Support Utility (P84059), along with the IBM Personal Computer 5250 Emulation feature (see Announcement Letter 283-037) provides additional support on the System/36 for the IBM Personal Computer. The File Support Utility allows a PC user to create virtual diskettes on the host system. A PC user can change virtual diskettes on the System/36 without having to physically handle multiple diskettes. Also, multiple users can read the same virtual diskette simultaneously. The PRPQ also provides a tool to assist System/36 programmers in transferring data between the Personal Computer and the System/36 system.

HIGHLIGHTS

Allows the user to:

- Create, delete and format a virtual diskette on the host system.
- Access the virtual diskette on the host system from the Personal Computer as if it were a Personal Computer diskette drive.
- Share a virtual diskette among multiple Personal Computers.
- Copy data between the host system data files and the virtual diskette.
- Translate files from EBCDIC to ASCII, or from ASCII to EBCDIC.
- Modify the RPG source code of the File Support Utility PRPQ.
- Access a menu of functions supported by the File Support Utility by the Personal Computer (when in emulation mode).

DESCRIPTION

The System/36 File Support Utility PRPQ P84059, along with the IBM Personal Computer 5250 Emulation program and the IBM Personal Computer Emulation Display Station Adapter for the IBM Personal Computer provide additional support on the System/36 for the IBM Personal Computer (5150) and the IBM Personal Computer XT (5160).

Virtual Diskette Support: The File Support Utility creates a file (a virtual diskette) on the System/36 which IBM Personal Computer user applications can access. The virtual diskette is a special file that has been formatted by the File Support Utility with 9 sectors per track to the same specifications as a single-sided diskette or double-sided diskette formatted by the IBM Personal Computer Disk Operating System Version 2 Modification Level 0 (DOS). This allows DOS 1.1 to use either the 160K- or 320K-byte virtual diskette and DOS 2.0 to use either the 160K-, 180K-, 320K-, or 360K-byte virtual diskette. Each record of the file corresponds to a sector on the diskette. This virtual diskette can hold up to 320K bytes of information and a maximum of 112 files.

The host system data files are accessed by using the File Support Utility to transfer a file from the System/36 data files to the virtual diskette. This is done by selecting an option on the File Support Utility menu.

The File Support Utility allows the user to transfer a file from a virtual diskette to a host file. It translates character data from ASCII to EBCDIC or from EBCDIC to ASCII format. The utility allows the user to specify whether the transfer should terminate, or substitute a specified character, if the utility finds an untranslatable character. An additional option allows the user to transfer a file without translating the data.

The user can create multiple System/36 files to be used as virtual diskettes. Only one virtual diskette can be used as the current virtual diskette for each IBM Personal Computer; however, the File Support Utility allows for changing the virtual diskette being used. This virtual diskette is available to multiple users.

When sharing virtual diskettes among multiple users, System/36 security procedures should be implemented to ensure the integrity of the virtual diskette. For example, one user could be given the ability to both read and write files to the virtual diskette; other users could be allowed only read files from the virtual diskette.

Data Compatibility: The image of the data stored on the virtual diskette is the same as that of a physical IBM Personal Computer diskette. Therefore, this data can be handled by the IBM Personal Computer as if it were on a physical Personal Computer diskette with no restrictions on character representations, encoding, or internal numeric representations. However, there are a number of limitations imposed when translating this data to or from the System/36.

Limitations

- The character representations of the System/36 (EBCDIC) and of the IBM Personal Computer (ASCII) are different. Each supports representation of certain values that do not have a value in the other system's representation. For example, some Personal Computer graphics characters do not have EBCDIC representation.
- The internal numeric representation of the System/36 and the Personal Computer are not interchangeable. Therefore, when using the File Support Utility to move non-character numeric data between the virtual diskette and the System/36 data files, the user must convert these values to character representations prior to copying the data to the virtual diskette and into the appropriate internal numeric representation after copying the data to the virtual diskette.
- Some files on the Personal Computer may contain embedded control bytes (for example, forms feed) that cannot be translated under certain conditions.
- The translation function is performed at the file level only. No field-level distinctions are made.

Enhancements for DOS 2.0 Support: Other functions available in this utility for use with DOS 2.0 (but not available for use by DOS 1.1) are:

- Ability to specify volume label for the virtual diskette.
- Ability to specify read access only for a Personal Computer file on the virtual diskette.
- Ability to use DOS FORMAT command to format a virtual diskette. (DOS 1.1 excludes the use of the DOS FORMAT command to format a 160K-byte virtual diskette.)

The File Support Utility copy functions do not support the DOS 2.0 tree-structured directories. IBM Personal Computer files must be in the root directory of the virtual diskette to be copied to or from the System/36 data files. The tree-structures may be used for IBM Personal Computer files on the virtual diskette if the user does not intend to copy the Personal Computer file to or from the System/36 data files.

DOS 2.0 also provides the capability to create a read-only file on a diskette. The System/36 File Support Utility provides a similar function by protecting all files on a virtual diskette from replacement unless the user specifically requests the file be updated.

Hard File Support: To copy an IBM Personal Computer file from the virtual diskette to a hard file, the IBM Personal Computer file must first be copied from the virtual diskette to a physical diskette. The user must then sign off from the System/36 and IPL the IBM Personal Computer. The IBM Personal Computer file can then be copied from the physical diskette to the hard file.

CUSTOMER RESPONSIBILITIES

IBM may provide marketing assistance. The responsibility for providing accurate marketing information, selecting and training personnel, installing licensed program, providing adequate data security functions, and continued day-to-day operation lies solely with the customer.

SPECIFIED OPERATING ENVIRONMENT

HARDWARE REQUIREMENTS

The minimum system configuration for which this program has been designed to operate is:

- IBM System/36 (any model).

For hardware requirements on the IBM Personal Computer, refer to Prerequisites on the IBM Personal Computer 5250 Emulation feature (see Announcement Letter 283-037).

SOFTWARE REQUIREMENTS

The File Support Utility PRPQ is designed to operate under control of the IBM System/36 System Support Program (5727-SS1).

The File Support Utility PRPQ is designed to support the IBM Personal Computer under control of DOS.

DOCUMENTATION

(available from Mechanicsburg)

IBM System/36 File Support Utility PRPQ for the IBM Personal Computer Licensed Program Specifications (GC21-9068) ... IBM System/36 File Support Utility for the IBM Personal Computer User's Guide (SC21-7992) ... IBM System/36 Keyboard Template (GX21-7987).

RPQs ACCEPTED: Yes

PROGRAMMING RPQs

**SYSTEM/34 FILE SUPPORT UTILITY
5799-BNZ (P84057)****PURPOSE**

The System/34 File Support Utility PRPQ P84057 along with the IBM Personal Computer 5250 Emulation program and the IBM Personal Computer Display Station Emulation Adapter, provide additional support on the System/34 for the IBM Personal Computer (5150) and the IBM Personal Computer XT (5160). The File Support Utility allows the IBM Personal Computer user to create virtual diskettes on the host system. A virtual diskette is a special file formatted by the File Support Utility to the same specifications as a diskette formatted by the IBM Personal Computer Disk Operating System. An IBM Personal Computer user can change virtual diskettes on the System/34 without having to physically handle multiple diskettes. Multiple users can read the same virtual diskette concurrently. The PRPQ also provides a tool to assist System/34 programmers in transferring data between the IBM Personal Computer and the System/34.

HIGHLIGHTS

Allows the user to:

- Create, delete and format a virtual diskette on the host system.
- Access the virtual diskette on the host system from the Personal Computer as if it were a Personal Computer diskette drive.
- Share a virtual diskette among multiple Personal Computers.
- Copy data between the host system data files and the virtual diskette.
- Translate files from EBCDIC to ASCII, or from ASCII to EBCDIC.
- Modify the RPG source code of the File Support Utility PRPQ.
- Access a menu of functions supported by the File Support Utility by the Personal Computer (when in emulation mode).

DESCRIPTION

The System/34 File Support Utility PRPQ P84059, along with the IBM Personal Computer 5250 Emulation program and the IBM Personal Computer Emulation Display Station Adapter for the IBM Personal Computer provide additional support on the System/34 for the IBM Personal Computer (5150) and the IBM Personal Computer XT (5160).

Virtual Diskette Support: The File Support Utility creates a file (a virtual diskette) on the System/34 which IBM Personal Computer user applications can access. The virtual diskette is a special file that has been formatted by the File Support Utility with 9 sectors per track to the same specifications as a single-sided diskette or double-sided diskette formatted by the IBM Personal Computer Disk Operating System Version 2 Modification Level 0 (DOS). This allows DOS 1.1 to use either the 160K- or 320K-byte virtual diskette and DOS 2.0 to use either the 160K-, 180K-, 320K-, or 360K-byte virtual diskette. Each record of the file corresponds to a sector on the diskette. This virtual diskette can hold up to 320K bytes of information and a maximum of 112 files.

The host system data files are accessed by using the File Support Utility to transfer a file from the System/34 data files to the virtual diskette. This is done by selecting an option on the File Support Utility menu.

The File Support Utility allows the user to transfer a file from a virtual diskette to a host file. It translates character data from ASCII to EBCDIC or from EBCDIC to ASCII format. The utility allows the user to specify whether the transfer should terminate, or substitute a specified character, if the utility finds an untranslatable character. An additional option allows the user to transfer a file without translating the data.

The user can create multiple System/34 files to be used as virtual diskettes. Only one virtual diskette can be used as the current virtual diskette for each IBM Personal Computer; however, the File Support Utility allows for changing the virtual diskette being used. This virtual diskette is available to multiple users.

When sharing virtual diskettes among multiple users, System/34 security procedures should be implemented to ensure the integrity of the virtual diskette. For example, one user could be given the ability to both read and write files to the virtual diskette; other users could be allowed only read files from the virtual diskette.

Data Compatibility: The image of the data stored on the virtual diskette is the same as that of a physical IBM Personal Computer diskette. Therefore, this data can be handled by the IBM Personal Computer as if it were on a physical Personal Computer diskette with no restrictions on character representations, encoding, or internal numeric representations. However, there are a number of limitations imposed when translating this data to or from the System/34.

Limitations

- The character representations of the System/34 (EBCDIC) and of the IBM Personal Computer (ASCII) are different. Each supports representation of certain values that do not have a value in the other system's representation. For example, some Personal Computer graphics characters do not have EBCDIC representation.
- The internal numeric representation of the System/34 and the Personal Computer are not interchangeable. Therefore, when using the File Support Utility to move non-character numeric data between the virtual diskette and the System/34 data files, the user must convert these values to character representations prior to copying the data to the virtual diskette and into the appropriate internal numeric representation after copying the data to the virtual diskette.
- Some files on the Personal Computer may contain embedded control bytes (for example, forms feed) that cannot be translated under certain conditions.
- The translation function is performed at the file level only. No field-level distinctions are made.

Enhancements for DOS 2.0 Support: Other functions available in this utility for use with DOS 2.0 (but not available for use by DOS 1.1) are:

- Ability to specify volume label for the virtual diskette.
- Ability to specify read access only for a Personal Computer file on the virtual diskette.
- Ability to use DOS FORMAT command to format a virtual diskette. (DOS 1.1 excludes the use of the DOS FORMAT command to format a 160K-byte virtual diskette.)

The File Support Utility copy functions do not support the DOS 2.0 tree-structured directories. IBM Personal Computer files must be in the root directory of the virtual diskette to be copied to or from the System/34 data files. The tree-structures may be used for IBM Personal Computer files on the virtual diskette if the user does not intend to copy the Personal Computer file to or from the System/34 data files.

DOS 2.0 also provides the capability to create a read-only file on a diskette. The System/34 File Support Utility provides a similar function by protecting all files on a virtual diskette from replacement unless the user specifically requests the file be updated.

Hard File Support: To copy an IBM Personal Computer file from the virtual diskette to a hard file, the IBM Personal Computer file must first be copied from the virtual diskette to a physical diskette. The user must then sign off from the System/34 and IPL the IBM Personal Computer. The IBM Personal Computer file can then be copied from the physical diskette to the hard file.

CUSTOMER RESPONSIBILITIES

IBM may provide marketing assistance. The responsibility for providing accurate ordering information, selecting and training personnel, installing licensed program, providing adequate data security functions, and continued day-to-day operation lies solely with the customer.

SPECIFIED OPERATING ENVIRONMENT**HARDWARE REQUIREMENTS**

The minimum system configuration for which this program has been designed to operate is:

- IBM System/34 (mdls CXX, DXX, EXX, FXX).

For hardware requirements on the IBM Personal Computer, refer to Prerequisites on the IBM Personal Computer 5250 Emulation feature (see Announcement Letter 283-037).

SOFTWARE REQUIREMENTS

The IBM System/34 File Support Utility PRPQ has been designed to run under control of the IBM System/34 System Support Program (5726-SS1).

The IBM System/34 File Support Utility PRPQ is designed to support the IBM Personal Computer under control of DOS.

**DOCUMENTATION
(available from Mechanicsburg)**

IBM System/34 File Support Utility PRPQ for the IBM Personal Computer Licensed Program Specifications (GC21-9065) ... IBM System/34 File Support Utility for the IBM Personal Computer User's Guide (SC21-9059) ... IBM System/34 Keyboard Template (GX21-7993).

RPQs ACCEPTED: Yes

PROGRAMMING RPQs

5799-BPF - VSE BUSINESS GRAPHICS FACILITY

PURPOSE

VSE Business Graphics Facility (7B0891) provides for the presentation of business data in simple, graphical form, on a display station, printer and plotter. VSE users familiar with the operation of the 3270 Information Display family will be able to learn how to use business graphics quickly with the 'HELP' support integrated into the program, and the user publication.

SPECIAL SALES INFORMATION

The Business Graphics Facility is intended for VSE users to provide support for office functions, and as additional applications for end-users. It is a supplemental application to the primarily commercial use of the system.

HIGHLIGHTS

The Business Graphics Facility, a program on VSE/SP and SSX/VSE, includes the following features for the VSE system:

- Ease-of-use characteristics:
 - Menu-driven access to functions
 - Prompts/defaults
 - Help text
- Functions:
 - Produces
 - Pie charts
 - Bar charts
 - Line graphs
 - Histograms
 - Surface charts
 - Scatterplots
 - 4 colors
 - Print/Plot support:
 - 7 fonts
 - 16 fill patterns
 - 4 line types (3 line widths)
- Input of graph data:
 - Import of VSAM files in common* format, including 'stored results' created by Cross System Product/Query (CSP/Q)
 - Files from current applications
 - Files via user program
 - * Common format is fixed-length fields and records, single record type, arithmetic and character string field attributes.
 - User-keyed data file
- Output devices:
 - Standard character graphics
 - 3277/8/9 Display Station
 - Extended fixed-character graphics (with programmable symbol set feature)
 - 3278/9 Display Station
 - Full resolution graphics:
 - 3287 Printer
 - XY/750 Plotter

DESCRIPTION

In addition to the graphics presentation capabilities provided with the VSE Business Graphics Facility, data processing and business graphics processing can be done concurrently. The same display station can be used alternately for data processing and business graphics processing.

Ease-of-Use Characteristics: The user is guided through the graphics program operation by selections from menus. The user is prompted for information only as needed and, where appropriate, defaults to the prompts are provided for ease of use. An explanation of a function is available by pressing the 'help' (PF) key while processing graphs.

Functions: The user can select a graph from the following supported graph types:

- Pie chart
- Bar chart
- Line graph
- Histogram
- Surface chart
- Scatterplot

Graphs are defined interactively, via a 3270 Display Terminal. For ease of use, two methods of operation are provided.

One method of operation allows the user to produce a graph quickly by accepting default graph characteristics, such as line type and fill pattern.

The user selects the graph type, enters only the graph and axis headings, and provides the data.

The other method of operation allows the user to customize the graph definition. The user is guided through a series of menus, and responds to prompts to alter graph characteristics such as line type, fill pattern, and color selection. The user also has additional options such as defining a reference line for a graph, and defining a legend.

The users have many options which allow comprehensive customizing of the characteristics of their charts and graphs. A few examples of the many options follow:

- 7 print font styles are available.
- The fonts can be presented in different sizes and different paths, on the plotter and printer.
- Bar chart options allow presentation of:
 - Numeric slice value
 - Percentage slice value
 - Both numeric and percentage slice value
 - Segment explosion (not for standard character graphics)
- Scatterplot options include line of best fit:
 - Draw a line through median for each plotted value
 - Draw a line through mean for each plotted value
- For distinguishing one charted group from another, 16 print fill patterns are available
- The users can select from among four different types of line presentation for printing and plotting, such as dots or dashes.
- 4 colors are available for color displays and printers.
- Chart labeling options include:
 - Chart titles
 - Axis titles
 - Axis tick marks
 - Grids
- Multiple charts per page can be printed
- Chart definitions and data can be saved

Input of Graph Data: Data from the systems data files can be imported for use in producing a graph or chart. Many user application data files may already be in a format suitable for direct import for use in producing a graph. A 'common' VSAM file format can be directly imported for use in a graph. A 'common' format means fixed-length fields and records, a single record type in the file, arithmetic and character string field attributes. The 'common' format includes 'stored results' created by Cross System Product/Query (5668-918).

Also, files not in a 'common' format can be easily reformatted into 'common' format via a user-supplied format.

The VSE Business Graphics Facility also allows the user to key-enter data, via a formatted display, for use in a graph.

Output Devices: The 3270 Information Display System is supported for display of graphs and charts. Standard, fixed-character graphics are utilized with the 3277, 3278 and 3279 Display Stations. For 3278 and 3279 Display Stations with the Programmable Symbol Set feature, extended fixed-character graphics are provided by the Business Graphics Facility. This provides improved resolution of chart and graph display.

Full resolution of the device is supported for the 3287 Printer and XY/750 Plotter for both monochrome and color.

Planning Information: The Business Graphics Facility includes SSX installation prompters.

CUSTOMER RESPONSIBILITIES

Installation of the VSE Business Graphics Facility is a customer responsibility. Customers are required to install the associated prerequisite programs specified under "Software Requirements". In addition, customers will need a system administration resource to support users of the Business Graphics Facility, e.g., library backup and user assistance. Use of the data import facilities will require the entry of file definition information, and may require file reformatting.

SPECIFIED OPERATING ENVIRONMENT

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

HARDWARE REQUIREMENTS

The VSE Business Graphics Facility is designed to run on any of the following IBM processors that meets the minimum requirements for the current release of the VSE/SP or SSX/VSE Operating System programs:

- IBM 43XX, any model.
- A DASD device supported by VSE/SP or SSX/VSE.

PROGRAMMING RPOs

VSE Business Graphics Facility (cont'd)

- Use of IBM 3278 and 3279 Display Stations with the Programmable Symbol Set feature require attachment via the IBM 3274 Control Unit.
- Use of the IBM 3287 Printer requires the Programmable Symbol Set feature, and attachment via an IBM 3274 Control Unit.
- Use of the XY/750 Plotter requires attachment via the Communications Adapter (CA), and RPO 7S0276. Communications support required for the XY/750 is integrated into the Business Graphics program.

SOFTWARE REQUIREMENTS

The VSE Business Graphics Facility is written in PL/I and Assembler programming languages. It is designed to operate in the following environments:

- VSE/SP Version 1 Release 1
- SSX/VSE Version 1 Release 3

The PL/I Library is required

COMPATIBILITY

The VSE Business Graphics Facility is available to customers who wish to install graphics applications as supplemental to their data processing applications, but do not require the comprehensive presentation graphics support offered by the Interactive Chart Utility (ICU) of the Graphical Data Display Manager (GDDM) program.

CONVERSION

Users migrating from System/36 will find that the VSE Business Graphics facility is similar in function to the System/36 Business Graphics Utilities. No migration or conversion tools are available from IBM.

Users installing the VSE Business Graphics Facility and wishing to consider future migration to GDDM should note that there are no conversion or migration tools available from IBM. However, the Business Graphics Prompted Chart Utility is highly consistent with the Interactive Chart Utility (ICU) of GDDM.

PERFORMANCE CONSIDERATIONS

The VSE Business Graphics performance will vary depending on a customer's particular hardware and software configuration, the size of the user's libraries, the frequency and use of the graphics functions, and the concurrent operation of other applications in the system.

DOCUMENTATION

(available from Mechanicsburg)

VSE Business Graphics Facility Program Description and Operator's Guide.

PROGRAMMING RPQs

5799-BQY - 4700 ADVANCED BRANCH CONTROLLER SYS.

PURPOSE

The 4700 Advanced Branch Controller System is a full-function application program intended for use in the teller and administrative areas of a commercial bank or thrift institution. This PRPQ operates in a 4700 Finance Communication System control unit with 256K memory or larger, and executes the branch environment and transaction definitions generated by the 4700 Advanced Branch Controller System: Format Distribution Services (5799-BQZ).

HIGHLIGHTS

Full Function Teller and 'Admin'

- Full range of Teller and 'Admin' transactions
- Full-screen or function key data entry
- Menu-driven transaction selection
- Speed key transaction selection capability
- Operator prompting
- 'Help' screen facility
- Transaction correction and reversal facilities
- Full cash control
- Electronic journaling
- Full online/offline capability
- High level of security
- Training mode
- Adding machine function
- 'What-if' Financial calculations

Controls

- Operator processing controls
- Supervisor controls

DESCRIPTION

The Advanced Branch Controller System PRPQ executes transactions that have been defined with the 4700 Advanced Branch Controller System: Format Distribution Services PRPQ (5799-BQZ). A transaction definition is a set of records which defines how constants and data are to appear and be processed on the display, printers, journals, magnetic stripe and CPU transmission.

Transaction Processing

- Daily Initialization
If it is the first IPL of the diskette and if the Branch Environment definitions are being used, the information such as date, time, branch identification and the need for a customization table load will be requested or verified.
- Operator/Supervisor Sign-on
Sign-on can be with or without encoded cards. The sign-on requires a password. Floating teller is supported for both electronic journal and teller totals.
- Transaction Selection
Transactions are selected by function keys, transaction codes or through menu selection. Menus can be nested and either bypassed entirely or entered at any level. Single keys may be defined to select often-used transactions. Provision has been made to allow repetition of transactions, automatic transaction reversal and correction and transaction grouping by customer in order to calculate a 'pay' or 'get' for cash amount related to a set of transactions.
- Data Entry Functions
Data entry may be fixed- or random-field mode. Teller transactions may be entered in either mode; administrative transaction data must be entered in fixed-field mode. All transaction input fields can be fully edited and verified.
- Processing
The onhost/offhost status of the system and the nature of the transaction are determined. If onhost, a transaction destined for the host is sent to be processed. If the terminal is offhost, an 'onhost only' transaction is cancelled. All other CPU-destined transactions are flagged on the electronic journal for later forwarding.
- Override Processing
Teller and supervisor overrides may be entered by using magnetic cards and passwords, or passwords alone. In addition, the teller has the option of routing requests for supervisor overrides to a terminal where a supervisor is logged on.

Transaction Output Processing

Transaction-related output is a function of user transaction definition. This definition is accomplished through mapping macros. For each transaction, the user may specify and map one of each of the following types of output: CPU, display, hardcopy journal, electronic journal, passbook and magnetic stripe. Multiple outform outputs may be specified. The transaction definitions specify which of the teller totals are to be affected by each transaction. The format of the teller proof and teller outputs also are specified.

Control Commands: Operator

- Temporary/Final sign-off
- Open/Increase/Decrease/Close cash
- Display/Print journal by account number, amount, transaction code and forward rejects
- Display/Print totals

Control Commands: Terminal

- Start/Stop journal print, manual forwarding, read tracking, training mode, offline mode, transaction chaining, fixed field

Control Commands: Passbook

- Reprint of deposit, withdrawal and interest items

Control Commands: Supervisor

- Encode branch/operator/supervisor card
- Audit teller transactions
- Display forwarding status
- Start/Stop forwarding
- Display active tellers
- Display/Print branch totals
- Change branch sign-on key
- Create operator/supervisor sign-on key
- Display/Print error log
- Restart controller
- Change workstation class

System Security Features

- Branch sign-on required to start controller
- Operator sign-on requires security password
- Supervisor override requires password
- 8 levels of transaction authorization
- Operators can be classified by transaction authorization
- Workstations can be classified by transaction class
- Magnetic stripe encoding can occur before passbook printing

SPECIFIED OPERATING ENVIRONMENT

HARDWARE REQUIREMENTS

The Advanced Branch Controller System PRPQ is designed to operate in an IBM 4700 Finance Communication System control unit. The minimum hardware configuration required consists of the following:

- One IBM 4701 (256K)
- Two terminal keyboard/displays
- One printer

The following IBM 3600 and 4700 terminals are supported:

- 3604 mdls 1, 2, 4 and 6 Keyboard/Displays including MSR, MSR/E and Pin Pad
- 3610 Document Printer
- 3611 Passbook Printer
- 3612 Passbook and Document Printer
- 3615 Administrative Terminal Printer
- 3616 Passbook/Journal Printer
- 4704 mdls 1, 2 and 3 Display Workstation including MSR, MSR/E and Pin Pad
- 4710 Receipt/Validation Printer
- 4720 Printer mdls 1, 2, 3 and 4

Additionally, the following IBM 3270 devices are supported:

- 3178 and 3278 Displays
- 3279 Color Display
- 3287 Printer

The amount of permanent diskette storage required to hold transaction formats is dependent on the number and size of the transaction definitions used.

System/34 and System/36 are supported for communication only.

PROGRAMMING RPQs

4700 Advanced Branch Controller System (cont'd)**SOFTWARE REQUIREMENTS**

The IBM 4700 Advanced Branch Controller System is written in 4700 Assembler language. In order to create an operational diskette and transmit transaction formats for this PRPQ, the IBM 4700 Advanced Branch Controller System Format Distribution Services PRPQ (5799-BQZ), an IBM Virtual Storage S/370, 43XX or 30XX, an Assembler language compiler, 4700 Host Support, VSAM, VTAM, and an IBM 370X with Network Control Program (NCP) are required.

Additionally, a central host computer application program is required to interface with this PRPQ. This host application program must contain interfaces to accept output from this PRPQ for processing in the host program and formatting the host response messages. The transaction messages and responses to and from this program are defined to the Advanced Branch Controller System through the CPU customization macros provided in the IBM 4700 Advanced Branch Controller System: Format Distribution Services PRPQ(5799-BQZ).

INSTALLATION TASKS

ABCS installation requires that the user perform the following:

- Review all related documentation
- Install the necessary host support services including the IBM 4700 ABCS: Format Distribution Services PRPQ (5799-BQZ)
- Restore PID tape
- Assemble and prepare the application and configuration program
- Create an operational diskette
- Assemble and link the sample format macros
- Transmit the formats to the controller diskette
- Test the Advanced Branch Controller System using the sample transactions

PROGRAMMING RPQs

**5799-BQZ - 4700 ADVANCED BRANCH CONTROLLER
SYSTEM: FORMAT DISTRIBUTION SERVICES****PURPOSE**

4700 Advanced Branch Controller System: Format Distribution Services is used to generate and transmit the data required by the 4700 Advanced Branch Controller System PRPQ (5799-BQY) to a permanent diskette file at a 4700 Finance Communication Controller. The data defines the branch environment and teller/administrative transactions. This PRPQ executes in an S/370, 43XX or 30XX system.

HIGHLIGHTS**Host-Generated Transaction Definition**

- Transaction processing definition of input and output formats, transaction selection menus and control functions
- Centralized control and transmission of transaction definition tables
- Primary and alternate set of transaction definition tables
- Transaction definition tables resident on permanent file
- Optional host definition of branch environment

DESCRIPTION

This PRPQ consists of a set of macros that define the branch environment and teller/administrative transactions. Additionally, it consists of a transmission program that transmits the generated data to the diskette permanent file at the branch controllers. Each branch controller has a primary and alternate transaction definition table space. A new library of transactions may be broadcast to all or a subset of remote sites. Also, a transmission may be requested by an individual controller, either automatically when a controller finds that no formats are present or under operator control at the remote branch.

Without a diskette load of these definitions, the 4700 Advanced Branch Controller System PRPQ (5799-BQY) will not function.

There are two types of macros. One set defines the branch environment and is optional. The other set defines the actual teller/administrative transactions. If an installation chooses not to use the branch environment definition macros, an operator will be prompted at each controller to enter the information when the diskette is IPLed the first time.

The information supplied by the branch environment definition macros is the following:

- Name and number of branches serviced by this controller
- Printer sharing by workstation
- Security class by workstation
- Administrative workstation ID

The transaction definition macros define all aspects of a transaction:

- The ways a transaction can be selected
- Menu display associated with the transaction
- Transaction processing options
 - Online only
 - Not correctable
 - Not to be cancelled
 - Security level
 - Supervisor override required
 - Debit or credit transaction
 - Teller totals affected
 - Optional user exits
 - Outputs to be done
- Format definitions for
 - Display input and output
 - CPU input and output
 - Magnetic stripe read and write
 - Electronic journal
 - Cutforms/Passbook/Hardcopy journal
 - Teller proof/totals output

A sample transaction customization table supplied with this PRPQ contains over 55 menus, 130 teller transactions, 25 administrative transactions and over 40 control transactions. Most users should be able to define their required transactions by modification of these samples.

SPECIFIED OPERATING ENVIRONMENT**HARDWARE REQUIREMENTS**

This PRPQ executes in an IBM S/370, 30XX or 43XX system.

SOFTWARE REQUIREMENTS

IBM 4700 Advanced Branch Controller System: Format Distribution Services is written using IBM/370 Basic Assembler language and requires a current release of one of the following operating systems:

- OS/VS1
- OS/VS2
- DOS/VSE
- VSE/Advanced Functions

In addition, the user should have the latest applicable releases of the following components:

- ACF/VTAM
- 4700 Host Support Facility

INSTALLATION TASKS

IBM 4700 ABCS: FDS installation requires that the user perform the following:

- Review all related documentation
- Install the necessary host support services
- Restore PID tape
- Assemble and prepare the application and configuration program
- Create an operational diskette
- Assemble and link the sample format macros
- Transmit the formats to the controller diskette

PROGRAMMING RPOs

**5799-BRJ - SYSTEM/36 PRODUCTIVITY AID
SYSTEM/36 PROGRAMMER and OPERATOR
PRODUCTIVITY AID**

PURPOSE

The System/36 Programmer and Operator Productivity Aid (5799-BRJ) is an integrated set of four utilities having the following characteristics:

- New high-level interface
- Easy to use
- Menu-driven
- Interactive

The functions it provides are commonly performed by application programmers and lead operators. These functions involve using:

- Fixed disk file
- Diskette files
- Libraries
- Library members

HIGHLIGHTS

The File, Library, and Diskette Utilities allow the user to:

- Display the names (up to 64 at one time) of:
 - All files or libraries on the system
 - Members within a selected library
 - All files in a diskette magazine
 - All files on a diskette volume
 - All members within a library file on diskette
- Perform operations (such as copy, print, delete, etc.) on individual files, libraries, or library members by using command keys and simple operation codes.
- Display the data (a full screen at one time) within a data file or library member resident on disk or diskette.
- Browse through the records within a data file or library member by using simple commands and the command function keys.
- Perform character string searches on records within data files or library members.
- Generate test data files.
- Request assistance on utility functions through the online help and tutorial facility.

The Edit Utility allows the user to:

- Create a new, or update an existing, source or procedure member in full-screen mode (22 display lines) or under format control in single-line mode (similar to SEU).
- Select the desired source or procedure member to be edited by:
 - Specifying the appropriate library and member name, or
 - Specifying the library only. The names of the source and procedure members in that library are displayed for your selection. The number of records within a source or procedure member can be displayed.
- Delete, insert, duplicate, and rearrange lines of data.
- Perform operations on either a single line of data or a group of data lines.
- Perform character string searches including optional replacement with another character string.
- Copy lines of data from a member in the same or a different library into the member being edited.
- Print a source or procedure member including formatted printing for a text member.
- Request online help for the edit commands, command and function control keys, and format selection options (single-line mode) via the HELP key.

DESCRIPTION

This PRPQ is intended for programmers and operators who have the responsibility for maintaining files and libraries and for assisting programmers in writing and maintaining applications (programs and procedures). Additionally, the Edit Utility supports a basic document entry with formatted printing facility.

The System/36 Programmer and Operator Productivity Aid is designed for ease of installation and use. After the utility library members are copied from the distributed diskette to a library on the system, the utility functions are available for immediate use. The utility functions can be executed from the menu provided with the utility or from procedure commands.

The System/36 Programmer and Operator Productivity Aid operates within the System/36 security facilities. Access to files, libraries, and members within a library can be controlled by using the resource security functions provided on System/36.

File, Library, and Diskette Utilities: The File, Library, and Diskette Utilities provide the facilities to display from the system disk or a diskette:

- The names of all libraries
- The names of all members within a library
- The names of all files
- The data within a file
- The data within a library member

Up to 64 file names, library names, or library member names are shown at one time. The displays also contain descriptive information to guide the user in using the utility functions. Online HELP and tutorial are provided to aid the new user or provide others with a quick review of the functions.

When displaying the data within a data file or library member, a full screen of data is provided. Function keys and simple commands are used to assist in viewing and moving through the data. While viewing the data, information on the use of the commands and function keys is available by pressing the HELP key.

When displaying the names of libraries, library members, or files, operation codes are provided for requesting various operations to be performed on a specific file, library, or library member. If operation codes require additional information to perform the function requested, prompts for this information are provided.

Command keys: These utilities support the use of the command keys for requesting additional information about the files, libraries, or library members being displayed, for selective control of the information to be displayed, for changing the order (sorted sequence) of the information to be displayed, and for requesting system functions.

User modification: Support is provided for users to define their own operation codes and use of command keys to perform functions that are unique to their installation. Additional operation codes can be defined or operation codes, defined by the utility, can be changed. Unused command keys can be defined. Screen headings, HELP menus, and the tutorial information can also be changed to correspond with the user modifications.

Command line: A command line is provided on the file, library, and library member display screens to allow the user to enter system or application commands. Any statement allowed in a procedure may be entered. Following execution of the command, control is returned to the display screen. This command line can also be used to scroll to a specific file, library, or library member name.

Test File Generation: The File Utility allows a user, via a prompted interface, to generate test data files. This facility provides support for file definition (sequential, direct, or indexed), field definition (character, zoned, packed, or binary), and field initialization (ascending, descending, random, constant, or keyed value). Optionally, RPG II or COBOL source specifications that define the file can be generated.

Edit Utility: The Edit Utility simplifies the creation and changing of source or procedure members by:

- Maintaining a profile record for each user sign-on.
- Prompting the user for job information.
- Setting default initialization values for use during data entry and as replacement options at end of job.
- Allowing the display of the names of all source and procedure members in a selected library.
- Allowing the display of individual members within the selected library.
- Allowing 22 lines of the display for use in entering and editing lines of data.
- Supporting job and screen level functions by command keys, function control keys, and simple commands.
- Providing the option to display and edit lines of data in single-line mode under format control (similar to the System/36 Source Entry Utility).
- Providing both single-line and multiple-line commands for use in deleting, inserting, duplicating, and rearranging lines of data.
- Providing a search facility for locating occurrences of a specified character string and, if desired, to change those occurrences to another character string.
- Allowing statements from a member in the same or a different library to be copied into the member being edited.
- Prompting the user, when editing has been completed, for verification of the control information prior to placing the member back into the library. The request for printing of the source or procedure member is also allowed at this time.

**System/36 Programmer and Operator
Productivity Aid (cont'd)**

- Allowing the user to request the printing only (no editing) of a source or procedure member.

All prompt screens contain descriptive information to guide the user when using the utility functions. Where appropriate, the prompt screens include default information (which can be overridden). HELP displays are also provided where needed to assist the user in entering the requested information. Access to these HELP displays is obtained by pressing the HELP key. A tutorial facility is also available as a menu option.

While editing a library member, pressing the HELP key provides information on the Edit commands, the command and function control keys supported, and the format selection options allowed when editing is to be performed in a single-statement mode.

SPECIFIED OPERATING ENVIRONMENT**HARDWARE REQUIREMENTS**

This PRPQ is designed to operate on an IBM System/36 with a minimum storage of 128K, a printer, and any System/36 Display Station.

SOFTWARE REQUIREMENTS

This PRPQ is designed to operate with the IBM System/36 System Support Program (5727-SS1), Release 1 or later. The largest program requires 48K of user memory to execute.

SYSTEM REQUIREMENTS

The System/36 Programmer and Operator Productivity Aid requires 500 blocks of disk library space. The Edit Utility requires a minimum of 40 blocks of disk file space. An additional 30 blocks (minimum) of file space is required for each additional (other than the first) Edit session. The files will be extended automatically when necessary. The Diskette Utility requires 40 blocks of disk file space when processing diskette magazines.

DOCUMENTATION

(available from Mechanicsburg)

IBM System/36 Programmer and Operator Productivity Aid Description/Operations Guide (SC21-9072) ... IBM System/36 Programmer and Operator Productivity Aid Licensed Program Specifications (GC21-9074).

RPOs ACCEPTED: No

PROGRAMMING RPQs

**6580 DISPLAYWRITER SYSTEM - TEXTPACK 6
MULTIPASS EQUATION PRINT
5799-MP1****PURPOSE**

The Textpack 6 Multipass Equation Print PRPQ provides an optional enhancement for 6580 Displaywriter Textpack 6 (5608-TR6) by providing capability for printing documents which require multiple printwheel changes. The PRPQ will allow the document to be printed in multiple passes using a different printwheel on each pass. This PRPQ will be of particular interest to Displaywriter users who need to print equations.

HIGHLIGHTS

- Minimizes changing printwheels for applications such as equation typing.
- Prints a list detailing the printwheel numbers used in a document and the range of pages on which each printwheel is used.

DESCRIPTION

The Textpack 6 Multipass Equation Print PRPQ for the IBM Displaywriter System consists of four diskettes which contain multipass equation print capability and support all of the text functions of Textpack 6. The user may print a document containing both alphameric and symbol characters in multiple passes using a different printwheel on each pass.

A document is created and revised as necessary using the Textpack 6 text functions. It is then queued to the printwheel printer once for each required print element. During each print pass, only characters contained on the currently specified printwheel are printed. When using the IBM Sheet-Feed Paper Handler, the operator must reverse the page order of the document following each print pass, and reinsert the entire document (or selected pages) into the appropriate sheet-feed tray for printing with the next specified printwheel. See "Usage Considerations and Limitations" for restrictions.

With this PRPQ, a list of the specified printwheels (up to twelve) can be printed for any document created for printing on a 5218 or 5228 Printwheel Printer using a new work diskette task. This list also indicates the range of pages on which each printwheel is used.

The multipass equation print function affects the print operations only. Therefore, use of this PRPQ does not affect the format of documents stored on diskette or subsequently communicated, nor does this PRPQ affect procedures used for creating documents. Normal single pass printing (changing printwheels as required) is also supported by this PRPQ.

A separate program load using Textpack 6 (5608-TR6) program diskettes is required to utilize Displaywriter support programs (such as Reportpack, Communications, etc.). Support programs and the combine program diskette task are not useable with the PRPQ program diskettes.

CUSTOMER RESPONSIBILITIES

In problem situations, the customer will be responsible for completing applicable problem determination procedures prior to contacting the IBM Office Systems Customer Assistance Center, and then performing problem definition activities and remedial actions as requested. Should the customer elect not to perform these activities as required, IBM will charge at the then current hourly rate for providing these services.

SPECIFIED OPERATING ENVIRONMENT**HARDWARE REQUIREMENTS**

The IBM Displaywriter Textpack 7 Multipass Equation Print PRPQ is designed to operate with configurations of the following IBM Displaywriter components:

- IBM 6580 Display Station with a minimum of 320K Memory.
- IBM 6360 Diskette Unit.
- IBM 5218 or 5228 Printwheel Printer, with or without a Sheet-Feed Paper Handler.

SOFTWARE REQUIREMENTS

This PRPQ is available only for customers who have Textpack 6 (5608-TR6) installed or on-order, and is for use only on Displaywriters for which Textpack 6 has been licensed. With the exception of multipass printing, which is described in a separate manual, the customer must refer to the Textpack 6 training and reference material. The Textpack 6 program diskettes are used when Displaywriter support programs are required.

USAGE CONSIDERATIONS and LIMITATIONS

The following considerations and limitations apply when using Textpack 6 Multipass Equation Print PRPQ to print documents via multiple print passes:

Alignment: Character alignment from multiple passes through a printer is affected by a number of factors. Due to possible alignment variations, some pages produced by the multipass method may have to be reprinted. If alignment requirements are very stringent, increased time

for proofreading and reprinting may outweigh the time saved by making fewer printwheel changes with the multiple print passes. Single pass printing, changing printwheels when required, can be used if desired.

Number of Printwheels Used: Increasing the number of passes per document increases the risk of unacceptable alignment variations. Two passes per document is the recommended maximum.

Applications: In some applications, variations in alignment between characters from different printwheels are very noticeable (for example, a single italicized character in the middle of a word). At the other extreme, alignment variations will not be as noticeable when using a different printwheel for headings which are preceded and followed by blank lines. It is expected that operator productivity for most equation applications may be improved by using this PRPQ.

Paper Handling Considerations: If an IBM Sheet-Feed Paper Handler is used, the pages of the document must be reversed between passes. Care must be taken not to move the Sheet-Feed Paper Handler between passes, and the paper must be aligned in the paper drawer the same way for each pass. If the Sheet-Feed Paper Handler is not used, use of the IBM Paper Support Table is recommended as a guide for inserting the paper. The IBM Tractor Feed should not be used for multipass print.

Paper Requirements: For best results, it is recommended that 75 g/m² (20 pound) bond, all-sulphite paper be used. Excess moisture in the paper will degrade performance. It is recommended that letter-size paper be used, and that paper be fed lengthwise.

Other Alignment Considerations: All passes for a document should be produced on the same printer. Carbon copies should not be made using multipass print.

Communicated Documents: Final form (L2DCA) documents can only be printed in a single pass operation. A list of printwheel numbers can not be created for final form documents.

SECURITY, AUDITABILITY and CONTROL

User management is responsible for evaluating, selecting, applying and implementing security and auditability features, and for the appropriate administrative and application controls

DOCUMENTATION

(available from Mechanicsburg)

One copy of the unlicensed documentation (S544-2201) for the Textpack 6 Multipass Equation Print PRPQ will be furnished with the PRPQ diskettes. This documentation will cover only the multipass print operation. Textpack 6 training and reference manuals must be used for all other operations.

RPQs ACCEPTED: No

PROGRAMMING RPQ

**SERIES/1 CONTROL PROGRAM SUPPORT
5799-TAA (PRPQ P82508)****PURPOSE**

Series/1 Control Program Support is a set of object modules which provide Task Management and DP I/O Support. IPL/Loaders for both disk and diskette are also provided. The object modules must be link-edited with a user application by using either the Linkage Editor which is part of the Series/1 Base Program Preparation Facilities, or the Series/1 Program Preparation Subsystem Application Builder. Control Program Support is not provided as an integrated operating system. It performs functions which can be used with user-developed code to produce a particular control program for a given application. The user is responsible for controlling the machine environment.

DESCRIPTION**DP I/O Support**

The DP I/O support provides a Read/Write level of I/O for the following devices, including multiples of the same type:

- Operator Station
- Disk Storage Unit
- Diskette Unit
- Printer

The support also allows the user to overlap I/O via an operation completed indicator or an asynchronous user exit.

A standard I/O Control Block (IOCB), which contains all of the I/O parameters and status, is used by all of the I/O functions. Disk and diskette use the relative sector number address format. The functions provided are:

CONNECT: Initializes a Device Vector Table/Device Description Block relationship and provides a path between a device and a processing program.

DISCONNECT: Disconnects the path to a device.

READ: Validates a request and transfers data from a device to a user buffer.

WRITE: Validates a request and transfers data from a user buffer to a device.

ERROR-LOG: Provides routines to log errors to disk or diskette.

Task Management

Task Management provides a set of basic functions to the user for controlling the program execution environment. The services provided are:

Task Dispatcher
Basic Overlay Support
Timer Support
Supervisor Call
ENQUE/DEQUE
WAIT/POST
QIN/QOUT

The Task Dispatcher provides the ability to initiate parallel tasks and to synchronize their execution.

The Basic Overlay Support provides the user with an overlay function to load additional modules as they are needed. This function allows the user to load a Load Module from disk or diskette to a storage address specified at Link Edit time.

The timer support provides a Time Counter which is updated on a set interval of time, provided by the user. The user can set the value and retrieve the latest value of the Counter. The timer support will also activate a user program at each set interval of time.

The Supervisor Call provides a standard mechanism for program interfaces. Control Program Support provides an interface to save and restore the caller's environment, and to invoke the specified Control Program Support function.

ENQUE/DEQUE, WAIT/POST, and QIN/QOUT provide the user with queuing facilities, the ability to control the use of a serially reusable resource, and task synchronization.

Error Logging

All errors are logged to either the 4962 or the 4964 diskette. A utility is provided to dump the error log to the printer.

Disk IPL/Loader Install Utility

This utility program is provided by Control Program Support to store the disk bootstrap and loader programs in fixed locations on the user's disk. This program is read into main storage, and writes them out to the disk. It may then optionally write user programs to disk and create an index on disk of the user programs.

CUSTOMER RESPONSIBILITIES

The customer is responsible for the installation and use of this licensed program.

SPECIFIED OPERATING ENVIRONMENT

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

HARDWARE REQUIREMENTS

Using the IBM 4952 or IBM 4955, Control Program Support supports these I/O devices:

Operator Station Teletypewriter Adapter #7850 with: IBM 3101 Keyboard/CRT
or
Teletype® Models ASR 33/35

Disk Storage Unit IBM 4962 models 1 and 2 and movable head portion of models 1F and 2F

Diskette Unit IBM 4964

Printer IBM 4974

Timer Feature Feature #7840

SOFTWARE REQUIREMENTS

Control Program Support does not support the IBM 4952 Native Clock/Comparator.

Control Program Support itself requires only:

- Sufficient storage for the code.
- Any I/O device for a device routine that is called.
- A disk or diskette for error logging.

The user can execute code in supervisor or problem state. The user also selects the level (0 - 3) for both the program execution and the I/O devices. The Control Program Support routines called by the user execute on the same level as the calling program. The I/O interrupt handlers execute on the level of the device that they are servicing. There is no storage protection or address translation support provided. The IBM 4952 processor is supported up to 96K bytes of storage (maximum of 128K bytes minus supervisor requirements).

Program Preparation

Two systems can be used for program preparations for Control Program Support.

- System One

The IBM Series/1 Realtime Programming System and the IBM Series/1 Program Preparation Subsystem can be used for program preparation for Control Program Support.

Prerequisites: The IBM Series/1 Base Program Preparation Facilities to IBM Series/1 Program Preparation Subsystem Conversion Utility PRPQ (5799-TCN). This utility is used to reformat Control Program Support object modules in IBM Series/1 Base Program Preparation Facilities record format to a format compatible with IBM Series/1 Program Preparation Subsystem records. This conversion is performed only once on the Control Program Support.

The IBM Series/1 Realtime Programming System Interactive Loader PRPQ (5799-TCK) includes the capability to alternately load Realtime Programming System and Control Program Support systems.

- System Two

The IBM Series/1 Base Program Preparation Facilities (5719-PA1) is the program preparation system for Control Program Support.

The IBM Series/1 Stand-alone Utilities (5719-SC2) are also available for system support.

A 4962 disk or 4964 diskette is required for error logging.

**DOCUMENTATION
(available from Mechanicsburg)**

IBM Series/1 Program Support User's Guide (SC34-1552) ... Control Program Support Licensed Program Specifications (GC34-1557).



PROGRAMMING RPQ

**SERIES/1 4979 DISPLAY STATION
CONTROL PROGRAM SUPPORT
5799-TAE (PRPQ P82515)**

PURPOSE

Series/1 4979 Display Station Control Program Support is an extension to Control Program Support PRPQ (5799-TAA) to provide Read/ Write support for the 4979-1.

Before ordering, refer to pages for 4978/4979 Display Station Control Program Support 5799-TAK (PRPQ P82520) which also supports the IBM 4978 Display Station.

HIGHLIGHTS

Display Station Control Program Support provides Read/Write support for the 4979-1. The following features are supported:

Write Full/Part Screen

- User-defined pre- and post-cursor positions.
- User-defined byte count.
- User-defined operation completed address.
- Write either protected or unprotected.
- Numerous erase operations available after write.

Scatter Write

- Data is distributed (scattered) into sequential, pre-defined fields, either protected or unprotected.
- Other functions are as described under Write Full/Part Screen

Scroll

- Scroll up or down.
- Scroll variable number of lines between user-defined window boundaries.
- After Scroll, user may write variable number of bytes, either protected or unprotected. Scatter write is supported.
- User-defined operation completed address.
- Various erase operations available after write.

Read Full/Part Screen

- User-defined pre- and post-cursor positions.
- User-defined byte count. User-defined operation completed address.
- Read either protected or unprotected.
- Boundary terminators available to Read.
- Read with erase after available.

Read Cursor

- Reads current cursor position and stores at user specified buffer.

Erase Full/Part Screen

- User-defined pre- and post-cursor positions.
- User-defined number of bytes to erase.
- Erase either protected or unprotected.
- Boundary terminators available for Erase.

Shift Followed by Erase

- Shift up or down.
- Shift starts at user-specified line.
- Shift variable number of lines between user-defined window boundaries.
- After shift, user may erase variable number of bytes, either protected or unprotected.
- User-defined operation completed address. Boundary terminators available for Erase.

Interface to user routines to be executed when an interrupting key is pressed.

Screen formatting - Blanks screen and allows multiple protected and/or unprotected fields to be written with a single 4979-1 call.

User-provided IOCB.

Limitations

- No error recovery is provided.
- No device exercisers are provided.

Error Logging

All errors are logged to either the 4962 disk or the 4964 diskette.

CUSTOMER RESPONSIBILITIES

The customer is responsible for the installation and use of this licensed program.

SPECIFIED OPERATING ENVIRONMENT

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

HARDWARE REQUIREMENTS

IBM 4979 Display Station. An IBM 4962 disk or 4964 diskette is required for error logging.

SOFTWARE REQUIREMENTS

IBM Series/1 Control Program Support PRPQ (5799-TAA) is required.

Program Preparation

See the "Program Preparation" section of Control Program Support (5799-TAA).

DOCUMENTATION
(available from Mechanicsburg)

IBM Series/1 4979 Display Station Control Program Support (SC34-1554)



PROGRAMMING RPQ

**SERIES/1 CONTROL PROGRAM SUPPORT
BINARY SYNCHRONOUS COMMUNICATIONS
5799-TAF (PRPQ P82516)**

PURPOSE

The Series/1 Binary Synchronous Communications Control Program Support is an extension to Control Program Support (5799-TAA) to support communication features #2074, #2075, and #2093.

HIGHLIGHTS

- Supports point-to-point communications
- READ/WRITE level supported with transparency
- Auto answer feature is supported
- Trace facilities are provided
- The 4953/4955 station appears as a System/3 to other stations

LIMITATIONS

- Control program support BSC does not provide the following:
 - Exercisers
 - Specific device support
 - Remote IPL
 - Error recovery
 - Line exercisers

Error Logging

All errors are logged to either the 4962 disk or the 4964 diskette.

CUSTOMER RESPONSIBILITIES

The customer is responsible for the installation and use of this licensed program.

SPECIFIED OPERATING ENVIRONMENT

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

HARDWARE REQUIREMENTS

An IBM 4962 disk or 4964 diskette is required for error logging.

- Binary Synchronous Communications Single-Line Control - #2074
- Binary Synchronous Communications Single-Line Control/High Speed - #2075
- Binary Synchronous Communications 8-Line Control - #2093
- Binary Synchronous Communications 4-Line Adapter - #2094

SOFTWARE REQUIREMENTS

IBM Series/1 Control Program Support (5799-TAA) is required. The IBM Series/1 Base Program Preparation Facilities (5719-PA1) is the program preparation system for Control Program Support.

DOCUMENTATION

(available from Mechanicsburg)

Binary Synchronous Communications Control Program Support User's Guide (SC34-1553). ... Binary Synchronous Communications Control Program Support Logic Manual (LY34-0559) ... Binary Synchronous Communications Control Program Support Licensed Program Specifications (GC34-1572).



PROGRAMMING RPQ

**INDEXED ACCESS METHOD
CONTROL PROGRAM SUPPORT
5799-TAH (PRPQ P82519)**

PURPOSE

This Series/1 PRPQ provides an Indexed Access Method for Control Program Support users.

HIGHLIGHTS

Indexed Access Method – IAM provides an index to a data file. Each index record contains an identifying key and the logical record number of its associated data file record. The key may consist of any characters; its length is user-defined. Key duplication is allowed and the user may build multiple indexes for a specific data file. Buffer sharing among data files is supported, as is buffer sharing among index files. Data files and index files on either the 4962 or 4964 diskette are supported.

User Interface – Build and reorganize routines are provided for index file maintenance. User accesses to files are provided by Control Program Support supervisor calls: GET and PUT functions access data file logical records directly. FIND, ENTER and DROP functions access index file entries, while RETRIEVE accesses data file records via the index file, using the identifying key. ADD allows records to be added at the end of the data file, while creating a new index entry for the key. Update of both the data file and the index file is supported.

Limitations

No sort function is provided. Only fixed block records are supported.

CUSTOMER RESPONSIBILITIES

The customer is responsible for the installation and use of this licensed program.

SPECIFIED OPERATING ENVIRONMENT

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

HARDWARE REQUIREMENTS

IBM 4962 Disk Storage Unit, models 1 and 2 and movable head portions of models 1F and 2F.

SOFTWARE REQUIREMENTS

Control Program Support (5799-TAA) is required. A 4962 disk or 4964 diskette is required for error logging.

Program Preparation

See Program Preparation section of the Control Program Support (5799-TAA).

DOCUMENTATION
(available from Mechanicsburg)

IBM Series/1 Control Program Support Indexed Access Method User's Guide (SC34-1556) ... IBM Series/1 Control Program Support Indexed Access Method Logic Manual (LY34-0561) ... IBM Series/1 Control Program Support Indexed Access Method Licensed Program Specifications (GC34-1573).

PROGRAMMING RPQ

**SERIES/1 4991-201 MAGNETIC STRIPE CARD READER
CONTROL PROGRAM SUPPORT
5799-TAJ (PRPQ P82504)****PURPOSE**

This Series/1 PRPQ provides software to support attachment of the Magnetic Stripe Explosion Proof Card Reader (RPQ D02008) on Series/1.

HIGHLIGHTS

The Magnetic Stripe Card Reader software support provides an interface between the application program and the Explosion Proof Card Reader RPQ D02008. The program accepts data from the card readers, translates the data, validates the data and presents it to the application program in a usable form. The card can be read either on insertion or upon withdrawal.

A series of pulses encoded on a magnetic stripe on the card are translated into digits represented in ABA (American Bankers Association) code. Each digit has a unique four-bit code. The program support also performs parity checking and LRC (longitudinal redundancy check) verification.

When the end of the string of pulses is sensed, the translated data is made available to the application program. The application program then processes the data associated with a particular reader.

Other features include:

- Installation Verification
- Error Logging by PI Attachment Card
- Error Documentation (SOM, EOM, LRC Counts)
- Single Interrupt Recognition Program (\$MCI)
- Online Reader Range Checking (Partial PI Card)
- Interrupt on Positive Transition Only Processing
- 15-Character Read Capability

Magnetic Stripe Card Reader Interrupt Program

- Recognizes the Card Reader Interrupt
- Reads the PI/DI Register
- Checks for DI Errors
- Stores the DI Changes Value, the Reader Number and the Hardware Timer Value in the Intermediate Queue Table

Magnetic Stripe Card Reader Initialization

- Prepares and arms the Readers
- Initializes the internal tables

Magnetic Card Build Program

- Removes card data from the intermediate queue
- Converts data and clock pulses to bit or not bit patterns and stores in the reader output table

Magnetic Character Build Program

- After all data from the card is read, the bit-no-bit patterns are converted to numeric characters.
- Data is reversed if read in reverse mode.
- Checks VRC and LRC.
- Activates the application program.

Magnetic Stripe Card Reader Application Diagnostics Program

The Read Card Application Diagnostics Program may be used to test the system card read capability. It will perform the following functions:

- Set and start the Timer Period and Mode
- Display the data read from the supplied sample cards via the Programmer's Console
- Count and display valid SOM and EOM characters
- Count and display VRC and LRC errors

Limitations

This software supports up to 128 Magnetic Stripe Card Readers on a Series/1 using Control Program Support (P82508).

CUSTOMER RESPONSIBILITIES

The customer is responsible for the installation and use of this licensed program.

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 requirements for this licensed program are:

- The IBM 4952, 4953, or 4955 Processor with sufficient main storage for the magnetic stripe reader programs
- Integrated DI-DO (#1560) (only digital input points are used)

- IBM 4964 Diskette Unit
- One 4991-201 Magnetic Stripe Card Reader (RPQ D02008)
- Timer feature (#7840). Exclusive use of one of the Timers.
- Exclusive use of the interrupt level selected for the BCX\$MCB Program
- An IBM 4962 disk or 4964 diskette is required for error logging

SOFTWARE REQUIREMENTS

IBM Series/1 Control Program Support PRPQ (5799-TAA) is required.

Program Preparation

See the Program Preparation section of the Control Program Support (5799-TAA).

DOCUMENTATION

(available from Mechanicsburg)

IBM Series/1 4991-201 Magnetic Stripe Card Reader Control Program Support User's Guide (SC34-1555) ... IBM 4991-201 Explosion Proof Magnetic Stripe Card Reader, RPQ D02008: General Information Manual (GA34-1546) ... Licensed Program Specifications (GC34-1574)

PROGRAMMING RPQ

**SERIES/1 4978/4979 DISPLAY STATION
CONTROL PROGRAM SUPPORT
5799-TAK (PRPQ P82520)****PURPOSE**

This Series/1 PRPQ extends Control Program Support to provide Read/Write level support for both the 4979 Display Station and the 4978 Display Station (RPQ D02038).

HIGHLIGHTS

The 4978/4979 Display Station Support PRPQ provides Read/Write level support for both the 4978 and 4979 Display Stations. Support is provided for configurations containing both types of display stations in any combination.

The capability is provided as a set of object modules which can be link-edited with control modules and user modules to create a system nucleus and application programs.

The functional capabilities provided by 4978/4979 Display Station Support are:

- Scroll
 - Scroll up or down
 - Scroll variable number of lines between user-defined window boundaries
 - After Scroll, user may write variable number of bytes, either protected or unprotected
 - User-defined operation completed address
 - Various erase operations available after write
- Write or Scatter-Write Full/Part Screen
 - User-defined pre- and post-cursor positions
 - User-defined byte count
 - User-defined operation completed address
 - Write either protected or unprotected
 - Numerous erase operations available after write
- Read Full/Part Screen
 - User-defined pre- and post-cursor positions
 - User-defined byte count
 - User-defined operation completed address
 - Read either protected or unprotected
 - Boundary terminators available to Read
 - Read with erase after available
- Erase Full/Part Screen
 - User-defined pre- and post-cursor positions
 - User-defined number of bytes to erase
 - User-defined operation completed address
 - Erase either unprotected or protected
 - Boundary terminators available for Erase
- Shift Followed by Erase
 - Shift up or down
 - Shift variable number of lines between user-defined window boundaries
 - After shift, user may erase variable number of bytes, either unprotected or protected
 - User-defined operation completed address
 - Boundary terminators available for Erase

Audible Cursor Alarm, RPQ D02060, is supported by this RPQ.

Screen formatting - optionally blanks screen and allows multiple protected and/or unprotected fields to be written with a single display station call.

Two Function Key Interrupt Modes**4979**

Control will be passed to specified user routine for each function key.

4978

Multiple function keys will be handled by passing control to a user-supplied function key handler with a code indicating which key caused the interrupt.

Read Modify Function

Data or address information (identifying the modified field) will be passed to the user by appending it to the user's IOCB. No data comparison logic will be performed by this product. The user will be responsible for providing an adequate data buffer and IOCB appendage area.

Attachment Storage Initializer

The attachment storage initializer must be invoked by the user program to load an attachment storage load into the 4978 Display Attachment. This attachment storage load will be supplied on diskette with each keyboard RPQ. This storage load consists of the local function microcode, plus tables which provide for key/role assignment, key/character assignment, key/function assignment, and display

character graphic definition. This storage load can be copied to the 4962 using the Series/1 System Control Programming Diskette to Disk Copy Utility. Changes to these storage loads can be made using the Series/1 System Control Programming (5719-SC2) Disk Patch Utility.

Limitations

- No error recovery is provided
- No device exercisers are provided
- Cannot co-reside in memory with 4979 Display Station Control Program Support, PRPQ 5799-TAE (P82515).

Error Logging

All errors are logged to either the 4962 disk or the 4964 diskette.

CUSTOMER RESPONSIBILITIES

The customer is responsible for the installation and use of this licensed program.

SPECIFIED OPERATING ENVIRONMENT

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

HARDWARE REQUIREMENTS

- IBM 4978 Display Station
- or
- IBM 4979 Display Station
- An IBM 4962 disk or 4964 diskette is required for error logging.

SOFTWARE REQUIREMENTS

IBM Series/1 Control Program Support PRPQ (5799-TAA) is required.

Program Preparation

See the Program Preparation Section of the Control Program Support (5799-TAA).

DOCUMENTATION

(available from Mechanicsburg)

IBM Series/1 4978/4979 Display Station Control Program Support User's Guide (SC34-1568) ... IBM Series/1 4978/4979 Display Station Control Program Support Logic Manual (LY34-0576) ... IBM Series/1 4978/4979 Display Station Control Program Support Licensed Program Specifications (GC34-1575).

PROGRAMMING RPQ

**SERIES/1 CONTROL PROGRAM SUPPORT EXTENSION I
5799-TAL (PRPQ P82525)****PURPOSE**

This Series/1 PRPQ provides a set of functional modules to be used in conjunction with Control Program Support for I/O Queuing, Data File Integrity, and Buffer Pooling.

DESCRIPTION**I/O Queuing**

I/O queuing provides a facility whereby a user may queue I/O requests to a device, even if the device is currently busy or if other user requests to that device are pending.

I/O is accomplished in the same sequence as the requests are made (FIFO) unless a disk or diskette request is made to a 'Locked' data file. An 'unconditional' option is provided to bypass file protection for a data file. An SVC call will effect the I/O requests.

Data File Integrity

A file protection feature is afforded the user by means of a 'LOCK' option on a disk or diskette read request. I/O requests subsequent to the locking of a data file are queued to the device's lock chain until the data set is unlocked and the I/O requests queued to the device. The unlocking is accomplished via an SVC call.

Buffer Pooling

Buffer pooling provides dynamic storage allocation for a user's temporary storage requirements.

Each pool will be segmented into fixed blocks (bytes). The block size and number of pools are defined by the user.

Two user macros are provided to acquire or release storage (e.g., "GETBUF, "FREEBUF").

Storage Requirements (estimated):

I/O Queuing	560 bytes + 8 bytes per device
File Integrity	400 bytes
Buffer Pooling	225 bytes + buffer pool

CUSTOMER RESPONSIBILITIES

The customer is responsible for the installation and use of this licensed program.

SPECIFIED OPERATING ENVIRONMENT

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

HARDWARE REQUIREMENTS

An IBM 4962 disk or 4964 diskette is required for error logging.

SOFTWARE REQUIREMENTS

IBM Series/1 Control Program Support PRPQ (5799-TAA) is required.

Program Preparation

See the Program Preparation section of the Control Program Support (5799-TAA).

DOCUMENTATION

(available from Mechanicsburg)

Control Program Support Extensions User's Guide (SC34-1552).



PROGRAMMING RPQ

**SERIES/1 CONTROL PROGRAM SUPPORT EXTENSION II
5799-TAQ (PRPQ P82526)**

PURPOSE

Provides a set of functional modules to be used in conjunction with Series/1 Control Program Support for Data Editing, EBCDIC/Binary Conversion, Time/Date Reference, and Task Scheduling.

DOCUMENTATION
(available from Mechanicsburg)

Control Program Support Extension II User's Guide (SC34-1559)

HIGHLIGHTS

Data Editing

The Edit capability permits the application programmer to perform commercial editing EBCDIC character strings. The provided functions are:

- a. Suppress non-significant zeros, insert dollar signs, commas, decimal points and slashes, insert minus sign or credit symbol, and specify where suppression of leading zeros should stop.
- b. Test input data against an edit word(s) and at user's option, compress the input data by inserting leading zeros while deleting dollar signs, commas, decimal points, and slashes while maintaining all signs of fields (positive and negative).

EBCDIC/Binary Conversion

EBCDIC/Binary Conversion routine converts a single or double-word binary value to a decimal EBCDIC character string, or converts a decimal EBCDIC character string to a single or double-word binary value.

This routine inserts a blank or minus sign into the high-order character or EBCDIC field or signs the binary value accordingly.

The range is a signed number between + or - 2,147,483,648.

Time/Date Reference

This routine initializes and supports a time-of-day clock and calendar. Data is presented to a user request in the following format:

a. Read/Set realtime clock

	8 Byte	5 Byte	Default
Time format	HH/MM/SS HH:MM:SS HHbMMbSS	HH/MM HH:MM HHbMM	HHMMSS

b. Read/Set Calendar

	8 Byte	6 Byte	Default
Calendar format	MM/DD/YY MMbDDbYY	DDD/YY	MMDDYY

Task Scheduling

This routine allows scheduled activation and deactivation of selected tasks by time of day in conjunction with the cyclic calendar support provided in the PRPQ. Current time is compared to the specified start and stop times contained in a Scheduler Control Block (SCB). If the task should be executed, this is accomplished via the Control Program Support ADDTASK function and an updated start time is built by adding a predefined interval value to the existing start time. Provisions are made for 24-hour rollover and leap year checking.

Optionally, Scheduler Control Block Management can be accomplished under program control. This allows dynamic modification of the scheduler data to enable, disable, or delete a task.

Storage Requirements (estimated):

- EDIT - 340 bytes + 400 bytes if test option included
- EBCDIC/Binary - 300 bytes
- TOD/CAL scheduler - 1300 bytes ((includes scheduler interface)
+ 18 bytes per schedule entry
+ 400 bytes if dynamic scheduler included

CUSTOMER RESPONSIBILITIES

The customer is responsible for the installation and use of this licensed program.

SPECIFIED OPERATING ENVIRONMENT

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

HARDWARE REQUIREMENTS

An IBM 4962 disk or 4964 diskette is required for error logging.

SOFTWARE REQUIREMENTS

IBM Series/1 Control Program Support PRPQ (5799-TAA) is required.

Program Preparation

See the Program Preparation section of the Control Program Support (5799-TAA).



PROGRAMMING RPQ

**SERIES/1 CONTROL PROGRAM SUPPORT SORT/MERGE
5799-TAT (PRPQ P82527)**

PURPOSE

This Series/1 PRPQ provides a set of functional modules to be used in conjunction with Control Program Support for sorting Disk- or Diskette-based Data Files into ascending or descending sequence.

HIGHLIGHTS

The Sort/Merge routine is macro-based and is assembled into a program by the user. A macro source module and object modules, all on a diskette, will be provided. The call interface to the object modules will be generated by the expansion of the Sort/Merge macro with user-defined parameters.

Input

The input to this expanded macro routine is the disk or diskette file to be sorted. Multiple input data sets are supported, up to a total of seven.

Input record length must be defined by the user. Maximum record length is 1,024 bytes. The maximum sum of key lengths is 248 bytes, and up to 12 sort fields can be specified.

A user exit is provided in order to permit modification of input data prior to processing.

Records can be selected or omitted based on comparison with the hexadecimal value in a user-specified field.

Control fields (keys) can be in different locations in the records. They can be sorted in ascending or descending sequence, or mixed (some ascending and some descending).

Output

This program creates a tag file as output. It is the user's responsibility to provide the routine which uses the tag file to construct an output file consisting of the desired records and record format.

The sort routine output consists of the following two segments:

- The first four sectors will contain a double-word binary count of the number of tag words in the output file and a copy of the input/output IOCB's.
- The remainder of the file will consist of records containing a double-word binary tag and the data keys used to perform the sort function. (Note: The data key(s) appended to the double-word binary tag yield a user-defined record size.)

Each entry in the output file consists of two binary words (double-word), whose value will be in the range of +1 through N, followed by the data keys associated with that input record. Each binary entry of the tag file represents the number of a record in the input file. The tag numbers appear in the tag file in the sequence dictated by the user provided sort parameters.

CUSTOMER RESPONSIBILITIES

The customer is responsible for the installation and use of this licensed program.

SPECIFIED OPERATING ENVIRONMENT

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

HARDWARE REQUIREMENTS

Minimum CPU size is 32K bytes. An IBM 4962 disk or 4964 diskette is required for error logging; IBM 4962 Disk Storage Unit, models 1 and 2 and movable head portions of models 1F and 2F.

SOFTWARE REQUIREMENTS

IBM Series/1 Control Program Support PRPQ (5799-TAA) is required.

IBM Series/1 Indexed Access Method Control Program Support PRPQ (5799-TAH) is required if IAM files are to be processed.

Program Preparation

See the Program Preparation Section of the Control Program Support (5799-TAA).

DOCUMENTATION
(available from Mechanicsburg)

IBM Control Program Support Sort/Merge User's Guide (SC34-1560)



PROGRAMMING RPQ

**SERIES/1 CONTROL PROGRAM SUPPORT
DISK TABLE OF CONTENTS
5799-TAW (PRPQ P82528)****PURPOSE**

The Series/1 Disk Table of Contents PRPQ allows a user to create, maintain and dynamically locate symbolic files on a 4962 disk storage unit.

DESCRIPTION

The support consists of a dynamic locate function and a utility program providing four functions: Format, Update, List and Pack. The utility is provided as both a standalone storage load and a set of object modules which can be link-edited into the user's application program and invoked by the user's application program. The user must write an interface module in which IOCBs are properly connected in order to include the utilities in his application program.

The standalone storage load is IPL'd from disk to diskette. It will ask the operator which of the four utility functions is desired and then invoke the requested utility.

Format

This utility creates, on a previously initiated disk, a directory which defines a symbolic data file area. The operator will be prompted, via the operator station, to provide the address of the disk, the name of the symbolic data file area, the starting and ending extents of the symbolic data file area, and the number of directory entries. Up to 256 directory entries can be defined.

Update

The utility provides the user the ability to define and delete symbolic data files within the symbolic data file area. A directory for the symbolic data file area must previously have been created with the Format utility. The user can define two types of data files - sequential or one that will contain members. If the user defines one that will contain members, the area is allocated in the DISK TOC directory and another directory (same format as the one created by Format) is built at the beginning of the allocated area. Subsequently, the Update utility can be used to define up to 256 members in this area.

List

This utility gives the user the ability to list the directory of the symbolic data file area or of a data file that contains members. The operator, via the operator station, is prompted for the output address, the disk address, and the symbolic name of the data file area or a member file. A directory listing is produced on the printer or operator station.

Pack

This utility packs the allocated areas so that all the freespace will be at the end of the area or file. The operator is prompted to provide the disk address and the symbolic name of the file directory. An option is to pack all of the disk space identified in the Table of Contents.

Locate

Consists of a macro call and locate module. The user issues the macro, passing the symbolic file name, member name (if required), volume IOCB address, and output option address.

The Locate function utilized the ADDTASK and ACTIVATE functions of Control Program Support. The user issuing the Locate request must previously have built and connected an IOCB (as stipulated in the *Control Program Support User's Guide*) for the disk volume. The Starting Extent in this IOCB must be 000000 and the Ending Extent must include the entire Symbolic File Area. The issuer has three options on type of output received.

- Eight bytes are returned at the specified address. The first 4 bytes will contain the starting extent and the second 4 the ending extent. The user could specify the address in a disk IOCB that should contain these values and then connect this IOCB.
- Eight bytes are returned at the specified address. The first 4 bytes will contain the relative sector number from the start of the device to the file or member. The second 4 bytes will contain the relative sector number from the start of the file or member to the last sector.
- The previously connected disk IOCB at the specified address is modified so that it will look like the user had connected the IOCB with the extents of the file or member.

CUSTOMER RESPONSIBILITIES

The customer is responsible for the installation and use of this licensed program.

SPECIFIED OPERATING ENVIRONMENT

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

HARDWARE REQUIREMENTS

IBM 4962 Disk Storage Unit models 1 and 2 and movable head portions of models 1F and 2F. An IBM 4962 disk or 4964 diskette is required for error logging.

SOFTWARE REQUIREMENTS

IBM Series/1 Control Program Support PRPQ (5799-TAA) is required.

Program Preparation

See the Program Preparation Section of the Control Program Support (5799-TAA).

**DOCUMENTATION
(available from Mechanicsburg)**

IBM Series/1 Control Program Support Disk Table of Contents User's Guide (SC34-1561)

PROGRAMMING RPQ

**SERIES/1 CONTROL PROGRAM SUPPORT DISK SPOOL-
ING
5799-TAY (PRPQ P82529)****PURPOSE**

This Series/1 PRPQ provides a method of sequentially buffering and retrieving variable-length text records, associated with multiple reports, on disk.

HIGHLIGHTS

Text records of variable length (248 byte maximum) may be placed in report members. The disk spooling data sets, each containing up to 20 report members, are defined by user-supplied and connected IOCBs.

Disk spooling can be interrupted in an orderly manner by using the STOP function. Spooling can subsequently be continued with the RESTART function. Should an unintentional interruption occur, a means is provided to reinitialize the disk spooling data set. In this case the last record residing on the disk can be read to verify data integrity.

Report members may be retrieved more than one time. A specific command is required in order to delete the report members, and the user is warned if an attempt is made to delete a report member which has not been retrieved in its entirety.

As an option, multiple blank characters within text records can be compressed prior to being placed on disk and are expanded to their original form when retrieved. A character other than the EBCDIC blank can be chosen for compression. As an option, the program will assign a sequential record identification number to report member entries.

Functions

INITIALIZE	Initializes the disk spooling data set, or re-initializes the data set following an unintentional interruption. This function will increase the size of the spooling data set in response to changes to the user provided IOCB.
GATHER	Moves selected fields of variable length data into a user-specified storage location.
PUT	Writes the next sequential text record into a specified report member.
GET	Retrieves a text record from a specified report member.
FSTRCD	Sets the retrieve pointer to the first record of a specified member so that it can be retrieved again from its beginning.
LSTRCD	Sets the retrieve pointer to the last record of a specified member so that the contents of the last record can be verified.
DELETE	Returns all active sectors in a specified member to a free sector pool in the spooling data set.
STOP	Causes partially filled buffers to be written to the disk spooling data set.
RESTART	Allows continuation of disk spooling operations provided that were discontinued with the STOP function.

Optimum storage utilization is facilitated since only the functions which will be used need to be resident in a storage load.

CUSTOMER RESPONSIBILITIES

The customer is responsible for the installation and use of this licensed program.

SPECIFIED OPERATING ENVIRONMENT

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

HARDWARE REQUIREMENTS

IBM 4962 Disk Storage Unit models 1 and 2 and movable head portions of models 1F and 2F.

SOFTWARE REQUIREMENTS

IBM Series/1 Control Program Support PRPQ (5799-TAA) is required. An IBM 4962 disk or 4964 diskette is required for error logging.

Program Preparation

See the Program Preparation Section of the Control Program Support (5799-TAA).

DOCUMENTATION
(available from Mechanicsburg)

Control Program Support Disk Spooling User's Guide (SC34-1563)

PROGRAMMING RPQ

**SERIES/1 CONTROL PROGRAM SUPPORT
FORMAT/PRINT
5799-TBA (PRPQ P82530)****PURPOSE**

This Series/1 PRPQ provides a method for expanding a variable-length record containing EBCDIC character data into a formatted print image.

HIGHLIGHTS

Format functions are provided which can be used in various combinations to create printer output.

- Move selected fields of variable length data into a user-specified storage location.
- Merge EBCDIC character data with pre-defined format records to create print images.
- Output print images to a printer device.

Up to four printers may be connected at one time. When used in conjunction with Disk Spooling 5799-TAY PRPQ (P82529), support is extended to formatted printing of reports which have been previously stored on disk and retrieved by that program. These two PRPQs in combination provide a complete spooling package for the Control Program Support user.

FORTRAN-like format statements are stored and retrieved from a user-defined data set. The user chooses the size and location and provides a connected IOCB.

Each format statement consists of a string of alphameric characters separated by commas and enclosed in parentheses. The number of parameters multiplied by two, plus the number of literal characters appearing in a format statement may not exceed 124. The parameters provide for:

- Forms Control
- Insertion of blank characters
- Insertion of pre-defined global data
- Insertion of pre-defined counter data
- Duplication of portions of a previous print image
- Insertion of literal data

By setting a bit in a print parameter list, the user can flag the need for non-standard forms. A message is printed identifying the report number involved. The user must provide an operator interface routine to signal the PRPQ that the form has been changed and that printing is to resume.

A restart capability is provided which allows the user to supply a page number to resume printing of a report at the selected page. The operator interface for inputting the page number is a user responsibility.

A format maintenance function provides the means for creating and maintaining format information on disk.

CUSTOMER RESPONSIBILITIES

The customer is responsible for the installation and use of this licensed program.

SPECIFIED OPERATING ENVIRONMENT

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

HARDWARE REQUIREMENTS

IBM 4962 Disk Storage Unit, Models 1 and 2 and movable head portions of models 1F and 2F. IBM 4974 Printer. A 4962 disk or a 4964 diskette is required for error logging.

SOFTWARE REQUIREMENTS

IBM Series/1 Control Program Support (5799-TAA) is required.

Program Preparation

See the Program Preparation section of the Control Program Support (5799-TAA).

DOCUMENTATION
(available from Mechanicsburg)

IBM Series/1 Control Program Support Format/Print User's Guide
(SC34-1564)

PROGRAMMING RPQ

**SERIES/1 CONTROL PROGRAM SUPPORT
OPERATOR STATION/DEBUG PACKAGE
5799-TBB (PRPQ P82532)****PURPOSE**

This Series/1 PRPQ provides a set of functional modules to be used in conjunction with Control Program Support for providing an operator interface to the application program. The modules allow activation of tasks from either an operator station or 4979 Display Station. Integrated into this support are debug features (Dump, Patch, Snap, Breakpoint, Trap, Calc, and Mark) and a message transfer function.

HIGHLIGHTS**Operator Interface Support**

This module allows the CPS user a software interface to execute a preassigned task via console interrupt and input command from either an operator or display station. The tasks to be executed must be defined by specification macros inserted in the user's program.

The user codes a set of specification macros that identify four-character input commands, the entry points of the tasks associated with those commands, and the level of execution for those tasks. The user executes a task by pressing the console interrupt button. The operator interface software requests a four-character input on the operator input station and transfers control to the requested task. The operator input/output station can be a Teletype® Models ASR 33/35 or equivalent attached to the TTY adapter, a 4979 Display Station or a 3101 Display Terminal model 1 or model 2 operated as a Teletype® Models ASR 33/35 equivalent device.

The Operator Interface Support module provides a direct branch-to-address entry to any address in storage at any specified level if the user specifies a hexadecimal location and level in the form: @XXXX,N—where XXXX is in the range of 0000 to FFFF and N is in the range of 0 to 3.

Debug Assistance**DUMP**

The storage dump module allows the user to display selected areas of storage on the Display Station or printer via input commands from his operator input station.

PATCH

The interactive storage patch module allows the user the ability to modify storage locations via input commands from the operator input station.

SNAP

A snapshot logging facility is provided through a SNAP macro that in execution logs the status of registers to a SNAP storage resident log area.

BREAKPOINT

The breakpoint module allows the user the opportunity to replace selected instructions in the execution code with transfer instructions (SVCs) to a display and halt routine. He can then analyze storage and register conditions before continuing execution of the code. Dumps and patches can be invoked at this time.

TRAP

The trap module can be included in the user's program to intercept class interrupts such as program, machine, and exception checks. When the trap causes the system to stop, a debug display is presented. The user may then dump or patch areas of storage.

CALC

The calculator module allows the user the ability to add or subtract hexadecimal numbers on the operator input/output station during a debug session. The results are presented in hexadecimal and straight decimal.

MARK

A mark logging facility is provided that records each execution of inserted MARK macros in a storage resident log area as they are encountered in the user's code.

Message Transfer Function

Special entry points are provided in the operator interface module which facilitate user input or output of EBCDIC messages through the operator input/output station to or from predefined buffers in his system.

CUSTOMER RESPONSIBILITIES

The customer is responsible for the installation and use of this licensed program.

SPECIFIED OPERATING ENVIRONMENT

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

HARDWARE REQUIREMENTS

The debug package will use either an IBM 4979 Display Station, a Teletype® Models ASR 33/35 or equivalent device, or an IBM 3101 Display Terminal model 1 or model 2 operated as a Teletype® Models ASR 33/35 equivalent device as the Operator Station. An IBM 4974 printer, if available, may be used for data displays or console logging. An IBM 4962 disk or 4964 diskette is required for error logging. A Programmer Console (#5650) on the IBM 4953 or 4955 Processor is required.

SOFTWARE REQUIREMENTS

IBM Series/1 PRPQ Control Program Support (5799-TAA) is required. IBM Series/1 Display Station Control Program Support, PRPQ (5799-TAE) (P82515) is required if an IBM 4979 Display Station is used.

Program Preparation

See the Program Preparation section of the Control Program Support (5799-TAA).

DOCUMENTATION
(available from Mechanicsburg)

IBM Series/1 Control Program Support Operator Station/Debug Package User's Guide (SC34-1562)



PROGRAMMING RPQ

**SERIES/1 CONTROL PROGRAM SUPPORT AUTO-CALL
5799-TBC (PRPQ P82533)**

PURPOSE

This Series/1 PRPQ provides a set of functional modules to be used in conjunction with Control Program Support for the support of the Auto-call Originate Hardware RPQ.

HIGHLIGHTS

This support consists of a macro routine that the user can code to provide outgoing dialing of a prepared telephone number. The execution code interfaces with the Auto-call Hardware RPQ (D02013) to dial 0-9 and provide for 0 to 15 second pauses between digits. This PRPQ supports the 2 line interfaces on each auto-call unit and multiple auto-call units per system.

Telephone Number Characteristics

- 0-9 Dial Digits (in HEX)
- C End of number indicator (HEX)
- D Separator character (HEX)

The separator character can be used on data sets that support the separator character double dial tones (that is, tie-lines).

Formats of telephone numbers supported are as follows:

- Internal - 4977C
- Local - 9944977C
- Tie Line - 8D4733504C
- Long Distance - 4155541976C, 14155541234C
- Outside - 9D7533333C
- Area - 67D5511122C

Note: Pause control characters may be interjected between any digits in the dial sequence from 1 to 15 seconds. For data set connections that do not support the separator character (HEX D), a pause allows the telephone line to connect. The Auto-call Support interfaces to all communication options on the Series/1, such as single and multiline asynchronous, binary synchronous, and SDLC features.

CUSTOMER RESPONSIBILITIES

The customer is responsible for the installation and use of this licensed program.

SPECIFIED OPERATING ENVIRONMENT

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

HARDWARE REQUIREMENTS

RPQ D02013 Auto-call Originate Attachment Card. A 4962 disk or a 4964 diskette is required for error logging.

SOFTWARE REQUIREMENTS

Control Program Support (5799-TAA) is required.

Program Preparation

See the Program Preparation section of the Control Program Support (5799-TAA).

DOCUMENTATION

(available from Mechanicsburg)

IBM Series/1 Control Program Support Auto-call Support User's Guide (SC34-1552).

PROGRAMMING RPQ

**SERIES/1 CONTROL PROGRAM SUPPORT
COMMERCIAL ARITHMETIC
5799-TBD (P82534)****PURPOSE**

This Series/1 PRPQ provides a set of functional modules to be used in conjunction with Control Program Support for performing packed decimal arithmetic.

HIGHLIGHTS

The Commercial Arithmetic routines consist of a set of macro source modules and object modules distributed on diskette. The ability to add, subtract, multiply, divide, and compare up to fifteen (15) packed decimal digits per operand is provided. A separately callable routine provides conversion between EBCDIC (unpacked) and packed decimal formats.

These routines provide for accurate results to fifteen (15) decimal digits. If an insufficient number of digits is assigned for the result, the answer will be truncated on both sides of the designated decimal point. It is the user's responsibility to insure that the target field has been defined with sufficient precision to accommodate the entire value of the result.

As with other extensions to Control Program Support, these routines must be assembled into a program by the user. A call interface to the object modules is generated by expansion of source macros with user-defined parameters.

The actual input to these arithmetic routines must be in packed decimal format, and each argument may be specified as to length and decimal point location. As an option, the user can put the result of the arithmetic operation into a separate target variable, thus preserving the input data. While the routines do not check for valid input data, an error indicator is returned if the result of an arithmetic operation is not a valid packed decimal number. An optional STOP parameter is provided as an aid for program testing. Error indicators are provided for 'divide by zero', 'overflow', and presence of a valid sign character, but it is a user responsibility to check for error conditions and take appropriate actions.

CUSTOMER RESPONSIBILITIES

The customer is responsible for the installation and use of this licensed program.

SPECIFIED OPERATING ENVIRONMENT

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

HARDWARE REQUIREMENTS

An IBM 4962 disk or 4964 diskette is required for error logging.

SOFTWARE REQUIREMENTS

IBM Series/1 PRPQ Control Program Support (5799-TAA) is required.

Program Preparation

See the Program Preparation section of the Control Program Support (5799-TAA).

DOCUMENTATION

(available from Mechanicsburg)

IBM Series/1 Control Program Support Commercial Arithmetic User's Guide (SC34-1566).



PROGRAMMING RPQ

**SERIES/1 CONTROL PROGRAM SUPPORT
4978/4979 DISPLAY MAP
5799-TBE (PRPQ P82531)****PURPOSE**

This Series/1 PRPQ provides a set of functional modules to be used with Control Program Support for the generation of display station formats, known as 'Maps,' and the handling of data associated with those Maps.

HIGHLIGHTS

The IBM Series/1 Display Map PRPQ builds upon the basic 4978/4979 PRPQ (5799-TAK) for developing applications requiring considerable operator guidance for the data entry and inquiry functions. The product is composed of:

- An offline utility function, shipped in loadable form, for the definition and maintenance of screen Maps
- A macro library containing specification and execution macros for use in Application Programs
- Object modules, also for use in Application Programs, to support these execution macros

MAP Generation/Maintenance Utility

This utility program will allow the user to prepare Display Maps on a 4978 or 4979 display station. The Maps are defined to appear essentially as they would appear to the application display station operator. They are then stored on disk for later retrieval by application programs. Special features are provided as follows:

- A single utility to perform definition and maintenance.
- Maps may be stored and recalled from disk storage by symbolic name.
- Map definitions may vary in length up to 24 display lines.
- Maps are stored in data set members that are predefined with the Disk Table of Contents Utilities before the start of a session.

At definition time, Maps are stored on disk. At execution time the Maps may be loaded from disk storage or diskette storage. Diskette Maps must have been copied from the disk previous to the execution time requirement.

Online Specification Macros

Three macros are required by the application program for use in defining the user environment.

- DISPLAY - This macro is used to define the physical devices supported.
- MAP - This macro is used to define a Map for use with one or more physical devices. It forms the link between the disk-resident Map and the application program.
- INTMAP - This macro is used to define the servicing tasks for display station interrupting keys and error conditions.

Online Data Handling Routines

Unique data handling macros are used to process the disk-resident Maps.

LOADMAP - This macro and its associated object module will read disk/diskette resident Maps into main storage and write these or storage-resident Maps to the specified display station(s). Having loaded all the Maps he desire, the user may overlay the object module, LOADMAP macro, and associated (loading) buffers.

READMAP/WRITMAP - These are the primary input/output macros of the Display Map support. Through these macros data is transferred between a user buffer and the unprotected data fields of specified Maps and Displays.

FREEMAP - Following any keyboard interrupt or execution of a Display Map Input macro, the keyboard of the associated display station is locked. The FREEMAP macro reverses this condition and returns keyboard control to the operator.

CUSTOMER RESPONSIBILITIES

The customer is responsible for the installation and use of this licensed program.

SPECIFIED OPERATING ENVIRONMENT

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

HARDWARE REQUIREMENTS

An IBM 4962 disk or a 4964 diskette is required for error logging.

Required hardware includes:

One IBM 4952, 4953, or 4955 processor with a minimum of 32K bytes of main storage and appropriate features.

One IBM 4962 disk storage unit for Map preparation.

One IBM 4962 disk storage unit or one IBM 4964 diskette unit for execution, unless all Maps are storage-resident.

SOFTWARE REQUIREMENTS

- IBM Series/1 PRPQ Control Program Support (5799-TAA) is required.
- The IBM Series/1 4979 Display Station PRPQ (5799-TAE) is required if only IBM4979 Display Stations are installed on the system. If IBM 4978 Display Stations are used independently or in combination with the IBM 4979 Display Stations, the 4978/4979 Display Station PRPQ (5799-TAK) is required.
- The Disk Table of Contents PRPQ (5799-TAW) is required for the Map generation utility program. However, during execution, Maps may be loaded with or without symbolic support.
- The Display Map PRPQ will logically support from 1 to 128 IBM 4978 or 4979 display units in any combination.

The Display Map support uses the Scatter-Write function of either the 4979 or 4978/4979 Control Program Support. This function in turn requires that any 4979 display station attachment (#3585) used be at or above EC level 578677.

Program Preparation

See the Program Preparation section of the IBM Series/1 Control Program Support PRPQ (5799-TAA).

DOCUMENTATION
(available from Mechanicsburg)

IBM Series/1 Control Program Support 4978/4979 Display Map User's Guide (SC34-1567) ... Licensed Program Specifications (GC34-1585)



PROGRAMMING RPQ

**SERIES/1 REALTIME PROGRAMMING SYSTEM
REMOTE JOB ENTRY
5799-TBK (PRPQ P82575)**

PURPOSE

Series/1 Remote Job Entry provides the Series/1 Realtime Programming System user the ability to transmit jobs and receive their output from a host S/370 having OS/VS2 and JES/2 installed.

HIGHLIGHTS

Supports Binary Synchronous Communications over a point-to-point (switched or nonswitched) line. Input is via the operator station, disk, or diskette. Output is to printer, disk or diskette. RJE runs as a task set in a 16K partition under the IBM Series/1 Realtime Programming System.

In addition, RJE provides:

- Concatenation of input data sets
- Data compression/expansion
- Series/1 command syntax checking
- 3780 emulation
- RJE session statistics
- Logging to a history file (SYSLOG) of pertinent RJE session information

Devices Supported

The following devices are specifically supported by this PRPQ:

- 4962 Disk Storage Unit
- 4964 Diskette Storage Unit
- 4974 Matrix Printer
- 4973 Line Printer
- #2074 Binary Synchronous Single-Line Control
- #2075 Binary Synchronous Single-Line Control - High Speed
- #2093 Binary Synchronous Communications 8-Line Control
- #2094 Binary Synchronous Communications 4-Line Adapter
- 4979 Display Station or Teletypewriter Adapter #7850 supported for use with 3101 Display Terminal or Teletype® Models 33/35 equivalent device.

For specific models of the above devices, please refer to the sales manual page for the IBM Series/1 Realtime Programming System as described below under "Hardware Requirements".

CUSTOMER RESPONSIBILITIES

The customer is responsible for the installation and use of this licensed program.

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 for execution of the PRPQ is specified in the version of the IBM Series/1 Realtime Programming System selected. In addition, this PRPQ requires one of the Binary Synchronous features (#2074, #2075, or #2093, and one #2094) and one IBM 4979 or Teletypewriter Adapter #7850 supported for use with Teletype® Models 33/35.

SOFTWARE REQUIREMENTS

The minimum system for installation of this PRPQ is specified in versions of the IBM Series/1 Realtime Programming System and the IBM Series/1 Program Preparation Subsystem.

COMPATIBILITY

This PRPQ is compatible with the Series/1 Realtime Programming System Version 1, Version 2, Version 3 and Version 4; and the Series/1 Program Preparation Subsystem Version 1, Version 2 and Version 3.

DOCUMENTATION
(available from Mechanicsburg)

IBM Series/1 Remote Job Entry Programming RPQ P82575 Users Guide (SC34-1589) ... IBM Series/1 Remote Job Entry Programming RPQ P82575 Licensed Program Specifications (GC34-1599)



PROGRAMMING RPQ

**SERIES/1 REALTIME PROGRAMMING SYSTEM
DISK SPOOLING
5799-TBL, 5799-TCG, 5799-TCH (PRPQsP82574)**

PURPOSE

Series/1 Disk Spooling provides Disk Spooling to Realtime Programming System users. A version of the Disk Spooling is provided to support each version of the Realtime Programming System (V1, V2, V3, V4). Customers must order the PRPQ which supports the version of the Realtime Programming System which will be used for execution of the Disk Spooling.

The function provided in each version of the PRPQ is identical. Version-dependent information in the "Software Requirements" section is identified by version number.

HIGHLIGHTS

Version 1: 5799-TBL to support the IBM Series/1 Realtime Programming System Version 1, Modification Level 1 and subsequent modification levels 5719-PC1

Version 2: 5799-TCG to support the IBM Series/1 Realtime Programming System Version 2, Modification Level 1 and subsequent modification levels 5719-PC2

Version 3: 5799-TCH to support the IBM Series/1 Realtime Programming System Version 3, 5719-PC3 and Version 4, 5719-PC4

When spooling is active, print records (133 byte maximum) will be written to a user allocated spool data set. The support will be available to programs using the Realtime Programming System's write or put level access. This includes programs written in Assembler language, PL/I, or FORTRAN.

The following functions will be provided by Disk Spooling:

- Start/Stop of Spooling
- Spool File Allocation
- Print Job Start/Stop
- Job/Page Restart
- Multiple Printer Support
- Forms Control
- Display Print Queue Status
- Change Print Queue Sequence
- Cancel Print Jobs

Devices Supported

The following devices are specifically supported by this PRPQ:

- 4962 Disk Storage Unit
- 4963 Disk Subsystem
- 4974 Matrix Printer (multiple)
- 4973 Line Printer (multiple)

For specific models of the above devices, please refer to the sales manual for the Realtime Programming System as described below under "Hardware Requirements".

CUSTOMER RESPONSIBILITIES

The customer is responsible for the installation and use of this licensed program.

SPECIFIED OPERATING ENVIRONMENT

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

HARDWARE REQUIREMENTS: None

SOFTWARE REQUIREMENTS

The minimum system for execution of this PRPQ is as specified for the appropriate IBM Series/1 Realtime Programming System version.

PRPQ Version 1 will execute with Realtime Programming System Version 1, Modification Level 1 and subsequent modification levels. It will not execute with Version 1, Modification Level 0.

PRPQ Version 2 will execute with Realtime Programming system Version 2, Modification Level 1 and subsequent modification levels. It will not execute with Version 2, Modification Level 0.

DOCUMENTATION

(available from Mechanicsburg)

IBM Series/1 Realtime Programming System Disk Spooling Programming RPQ P82574 User's Guide (SC34-1594)

PROGRAMMING RPQ

**SERIES/1 REALTIME PROGRAMMING SYSTEM
4978 DISPLAY SUPPORT
5799-TBM, 5799-TCD, 5799-TCE (PRPQs P82572)****PURPOSE**

Series/1 4978 Display Support provides 4978 Display Support to Realtime Programming System users. A version of the 4978 Display Support is provided to support each version of the Realtime Programming System (V1, V2, V3, V4). Customers must order the PRPQ which supports the version of the Realtime Programming System which will be used for execution of the 4978 Display Support.

HIGHLIGHTS

Version 1: 5799-TBM to support the IBM Series/1 Realtime Programming System Version 1, Modification level 1 and subsequent modification levels 5719-PC1.

Version 2: 5799-TCD to support the IBM Series/1 Realtime Programming System Version 2, Modification level 1 and subsequent modification levels 5719-PC2.

Version 3: 5799-TCE to support the IBM Series/1 Realtime Programming System Version 3, 5719-PC3 and Version 4, 5719-PC4.

The functional capabilities provided by Display Station Support are:

Scroll

Scroll up or down.
Scroll variable number of lines between user-defined window boundaries.
After Scroll, user may read or write variable number of bytes, either protected or unprotected.
User-defined event (or event list) to be posted upon operation complete.
Various erase operations.

Write Full/Part Screen

User-defined pre- and post-cursor positions.
User-defined byte count.
User-defined event (or event list) to be posted upon operation complete.
Write either protected or unprotected.
Write with erase after.

Read Full/Part Screen

User-defined pre- and post-cursor positions.
User-defined byte count.
User-defined event (or event list) to be posted upon operation complete.
Read either protected or unprotected.
Boundary terminators.
Read with erase after.

Erase Full/Part Screen

User-defined pre- and post-cursor positions.
User-defined number of bytes to erase.
User-defined event (or event list) to be posted upon operation complete.
Erase either protected or unprotected.
Boundary terminators.

Audible Cursor Alarm, RPQ D02060, is supported by this PRPQ.

Multiple Interrupt Keys

Multiple interrupt keys will be handled by providing the following options:

1. The user can define up to six events which are to be posted when interrupting keys are pressed.
2. The user can define one event which will be posted when any interrupting key is pressed. In either case, the code for the interrupting key will be passed to the user, if the user Task Set is not rolled out.

Read Field Address Function (4978 only)

Address information (identifying the modified field) will be passed to the user. No data comparison logic will be performed by this product.

Character Font Definition Function

A function will be provided to allow the user to interactively generate the matrix pattern and to define other key attributes for each key. The output of this function will be an updated Attachment Control Store Load.

Attachment Initialization (4978 only)

The initialization function will be invoked by the user program to load Display Attachment from storage, the 4962, or 4964.

Attachment Control Store Loads (4978 only)

An attachment control store load will be supplied on diskette with each keyboard RPQ. This storage load can be copied to the 4962 using a Realtime Programming System Utility (COPY).

Changes to this storage load can be made using the Character Font Definition function or the Realtime Programming System Utility (PATCH).

Limitations

No device exercisers are provided.
Not supported as System Console in Starter System from PID.

Devices Supported

The following devices are specifically supported by this PRPQ:

- 4962 Disk Storage Unit
- 4963 Disk Subsystem
- 4964 Diskette Unit
- 4969 Disk Magazine Unit
- 4978 PRPQ Display Station
- 4979 Display Station (PRPQ Version 2, 3 only)

CUSTOMER RESPONSIBILITIES

The customer is responsible for the installation and use of this licensed program.

SPECIFIED OPERATING ENVIRONMENT

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

HARDWARE REQUIREMENTS

PRPQ Version 1 will not execute with IBM Series/1 Realtime Programming System Version 1, Modification Level 0. It will execute with Version 1, Modification Level 1 and subsequent modification levels.

PRPQ Version 2 will not execute with IBM Series/1 Realtime Programming System Version 2, Modification Level 0. It will operate with Version 2, Modification Level 1 and subsequent modification levels.

In addition, the following EC levels apply:

- 1) Display Station 4978 attachment card (RPQ D02038) must be PN 4413882, at EC 754933 level or later.
- 2) Keyboard Diskette Prerequisite. If the keyboard provided by RPQ D02056 is installed, the corresponding keyboard load Diskette must be at EC 755384 level or later.

If the keyboard provided by RPQ D02057 is installed, the corresponding keyboard load Diskette must be PN 8333616, at EC 755384 level or later.

SOFTWARE REQUIREMENTS

The minimum system for execution of this PRPQ is as specified for the IBM Series/1 Realtime Programming System version.

DOCUMENTATION

(available from Mechanicsburg)

IBM Series/1 Realtime Programming System IBM 4978 Display Station Support Programming RPQ P82572 (5799-TBM) (GC34-1593) ... User's Guide (SC34-1592)

PROGRAMMING RPQ

**SERIES/1 REALTIME PROGRAMMING SYSTEM
INDEXED ACCESS METHOD
5799-TBN, 5799-TCA, 5799-TCB (PRPQs P82570)**

PURPOSE

Series/1 Indexed Access Method provides an Indexed Access Method to Realtime Programming System users. A version of the Indexed Access Method is provided to support each version of the Realtime Programming System (V1, V2, V3, V4). Customers must order the PRPQ which supports the version of the Realtime Programming System which will be used for execution of the Indexed Access Method.

The function provided in each version of the PRPQ is identical. Version-dependent information in the "Specified Operating Environment" section is identified by version number.

HIGHLIGHTS

Version 1: 5799-TBN to support the IBM Series/1 Realtime Programming System Version 1, Modification Level 1 and subsequent modification levels (5719-PC1)

Version 2: 5799-TCA to support the IBM Series/1 Realtime Programming System Version 2, Modification Level 1 and subsequent modification levels (5719-PC2)

Version 3: 5799-TCB to support the IBM Series/1 Realtime Programming System Version 3 (5719-PC3) and Version 4 (5719-PC4)

The Indexed Access Method support provides keyed access to user data to support a wide variety of applications ranging from batch processing to multi-user interactive applications.

The data file organization is designed to provide efficient random and sequential processing of files. This is accomplished by using cascading index techniques for random processing and by sequence chaining of the data blocks for sequential processing.

The access method design supports files which have high add/delete activity (such as open order files) to minimize performance degradation. This is accomplished by distributing free space for additions throughout the file, by updating and inserting additions in place, and by dynamically reclaiming space after deletions.

Indexed Access Method supports multiple tasks sharing the same data files. In a shared environment, data integrity is maintained by record level locking to prevent multiple concurrent updates of the same record.

DESCRIPTION

The following user services are provided:

Open - Initiates and connects user to requested data files

Modes:

Load - Initial load of file
Process - Access file for input, output, or update

Close - Terminates and disconnects user from requested data file. Forces buffer flush and releases any outstanding record locks.

Get - Retrieves a single record from the data file and moves it into a user area.

Modes:

Update - Retrieves a record and obtains a record lock.
Read Only - Retrieves a record.

Access:

Direct (by key) - Retrieves the record from the file which has a key equal (EQ), greater than (GT), or equal to or greater than (GE) the requested key. This operation can operate on a full or partial key.
Sequential - Retrieves the next record (in ascending key order) from the point of the last access whether random or sequential.

Put - Moves a single record from a user area to the data file.

Modes:

Update - Replaces the record previously retrieved and releases the lock.
New - Inserts a new record into the data file. The new key must be unique from those in the data file.
Delete - Logically and physically deletes the record previously retrieved and releases the record lock.
Delete - Logically and physically deletes a record from the data file.
Release - Frees a previously obtained record lock. This eliminates the need for the user to replace unmodified records. Release also can be used with a sequential option to terminate a sequential operations.
Define - Calculates the disk space required for the data file, indexes, and control information based on

user supplied information. Also defines data set information to the Realtime Programming System.

Users of high level languages (PL/I and FORTRAN) can write Macro Assembler language subroutines to be CALLED by application programs written in the high level languages, and thus take advantage of the functions provided by the Indexed Access Method.

Fixed length user data records are supported. The user records may be blocked in the data file.

User keys must be unique in each file. The keys must be fixed length (254 byte maximum) and must be imbedded and contiguous in the data record.

Devices Supported

The following devices are specifically supported by the PRPQ:

- 4962 Disk Storage Unit
- 4963 Disk Subsystem
- 4964 Diskette Storage Unit
- 4966 Diskette Magazine Unit

For specific models of the above devices, please refer to the pages for the Realtime Programming System as described below under "Hardware Requirements".

CUSTOMER RESPONSIBILITIES

The customer is responsible for the installation and use of this licensed program.

SPECIFIED OPERATING ENVIRONMENT

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

HARDWARE REQUIREMENTS

PRPQ Version 1 will not execute with IBM Series/1 Realtime Programming System, Version 1 modification level 0.

PRPQ Version 2 will not execute with IBM Series/1 Realtime Programming System, Version 2 modification level 0.

SOFTWARE REQUIREMENTS

The minimum system for execution of this PRPQ is as specified for the appropriate IBM Series/1 Realtime Programming System version.

DOCUMENTATION

(available from Mechanicsburg)

IBM Series/1 Realtime Programming System Indexed Access Methods Programming RPQ P82570: User's Guide (SC34-1590).

**SERIES/1 REALTIME PROGRAMMING
SYSTEM BASIC SORT
5799-TBP (PRPQ P82573)****PURPOSE**

Series/1 Basic Sort provides a set of functional modules to be used in conjunction with the Realtime Programming System for sorting disk- or diskette-based data files into ascending or descending sequence.

HIGHLIGHTS

The Basic Sort is macro-based and is assembled into a program by the user. A macro source module and object modules, all on a diskette, will be provided. The CALL interface to the object modules will be generated by the expansion of the Basic Sort macro with user-defined parameters.

Input - The input to this expanded macro routine is the disk or diskette file to be sorted. Multiple input data sets are supported, up to a total of seven.

Input record length must be defined by the user. Maximum record length is 1,024 bytes. The maximum sum of key lengths is 248 bytes, and up to 12 sort fields can be specified.

A user exit is provided in order to permit modification of input data prior to processing.

Records can be selected or omitted based on comparison with the hexadecimal value in a user-specified field.

Control fields (keys) can be in different locations in the records. They can be sorted in ascending or descending sequence, or mixed (some ascending and some descending).

Output - This program creates a tag file as output. It is the user's responsibility to provide a routine to use the tag file to construct an output file consisting of the desired records and in the desired record format.

The sort output is a file consisting of records containing a double-word binary tag and the data keys used to perform the sort function. Note: The data key(s) appended to the double-word binary tag are equal to a user-defined record size.)

Each entry in the output file consists of the double-word whose value will be in the range of +1 through N, followed by the data keys associated with that input record. The tag numbers appear in the tag file in the sequence dictated by the user-provided sort parameters. The first byte of the double word is a unique file identifier and the remainder of the double word is the relative record number of the record within the file.

CUSTOMER RESPONSIBILITIES

The customer is responsible for the installation and use of this licensed program.

SPECIFIED OPERATING ENVIRONMENT

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

HARDWARE REQUIREMENTS

- IBM 4962 Disk Storage Unit
- IBM 4964 Diskette Storage Unit
- IBM 4974 Matrix Printer
- IBM 4973 Line Printer

SOFTWARE REQUIREMENTS

The minimum system for program preparation of this PRPQ is specified for the version of the IBM Series/1 Realtime Programming System/Program Preparation Subsystem selected.

COMPATIBILITY

This PRPQ is compatible with the licensed programs which are identified in the System Requirements section above.

DOCUMENTATION

(available from Mechanicsburg)

IBM Series/1 Realtime Programming System Basic Sort Programming RPQ P82573 Licensed Program Specifications (GC34-1597) ... IBM Series/1 Realtime Programming System Basic Sort Programming RPQ P82573 Users Guide (SC34-1596) ... IBM Series/1 Realtime Programming System Basic Sort Programming RPQ P82573 Logic Manual (LY34-0585).



PROGRAMMING RPQ

**SERIES/1 CONTROL PROGRAM SUPPORT
EXTENDED FUNCTION
5799-TBQ (PRPQ P82535)****PURPOSE**

This Series/1 PRPQ provides a set of functional modules that provides Control Program Support for extended function disk and printer devices and enhances system usability.

HIGHLIGHTS**Hardware Support**

The Control Program Support Extended Function PRPQ provides support for the following hardware units:

4973 Model 1 & 2 Line Printers

The 4973 model 1 & 2 Line Printers are supported at a level equivalent and compatible to the 4974 Matrix Printer support. Support for concurrent operation of multiple 4973 and 4974 printers is provided with identical user interfaces. The 4974 Matrix Printer support is extended to provide line spacing of 6 or 8 lines per inch.

4962 Model 3 & 4 Disk Storage Units (13.9 MB)

The Disk File Support is extended to support one or more 4962 model 1, 1F, 2, 2F, 3 or 4 disk storage units in any combination. The user's interface to all disk and diskette devices is identical.

4962 Model 1F & 2F Fixed Head Feature

Support of the 4962 disk storage unit is extended to include the fixed head facility of that unit.

Software Support

The Control Program Support Extended Function PRPQ includes the following software enhancements:

Table of Contents

Provides the ability to create, maintain, and dynamically locate symbolic files on all models of the 4962 Disk Storage Unit and 4964 Diskette Unit. Additionally, there is transportability between diskettes written on a Realtime Programming System configuration and a system running Control Program Support. This support includes data set definition, deletion, open, symbolic copy, and other data set manipulation utilities.

Operator Message I/O

This function provides the user with a capability to send messages to operator consoles. Messages can be informational only or informational with a request for a reply or acknowledgment. Messages requiring a reply are numbered for operator convenience. Two types of macros are provided. The first macro provides for an interface to the I/O communications support routines. The second macro is used to construct the messages.

Operator consoles supported include the:

- 4978 Display Station
- 4979 Display Station
- Teletypewriter Adapter 7850 with:
 - 3101 Display Terminal
 - Teletype® Models ASR 33/35

Multiple consoles and alternate backup consoles are supported for system messages and operator commands.

Relocating Loader/Overlay Manager

A facility is provided which allows the loading from disk or diskette of relocatable program modules into various user controlled overlay areas. There are three parts to this support:

Relocatable Module Preparation Utility

This program is executed immediately following the Basic Program Preparation Facility Linkage Editor to reformat the load module into the format required by the relocating loader.

Resident Relocatable Loader

This routine accesses and optionally relocates a program module from a disk or diskette using disk/diskette table of contents support and loads it into a storage area specified at load time for immediate or delayed execution.

Overlay Manager

This facility manages a system overlay storage pool as defined by the user. The overlay area is segmented into smaller areas which are dynamically allocated to accommodate multiple program modules of varying size.

SPECIFIED OPERATING ENVIRONMENT

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

HARDWARE REQUIREMENTS

The system requirements for an application which uses this IBM Series/1 PRPQ in an execution environment are dependent on the application. The use of 8-lines-per-inch printing on the IBM 4974 Printer requires RPQ D02072. Series/1 Base Program Preparation Facilities (5719-PA1).

SOFTWARE REQUIREMENTS

Version 1, Modification 1 of IBM Series/1 Control Program Support PRPQ (5799-TAA) is required. An IBM 4962 disk or a 4964 diskette is required for error logging. The Disk Table of Contents PRPQ (5799-TAW) is required by the relocating loader and overlay manager facilities of this product. This is a no charge RPQ that provides hardware diagnostics.

Program Preparation

See the Program Preparation section of the Control Program Support (5799-TAA).

CUSTOMER RESPONSIBILITIES

The customer is responsible for the installation and use of this licensed program.

DOCUMENTATION

(available from Mechanicsburg)

IBM Control Program Support Extended Function User's Guide (SC34-1570) ... Licensed Program Specifications (GC34-1586)



PROGRAMMING RPQ

**SERIES/1 CONTROL PROGRAM SUPPORT
ADDRESS RELOCATION TRANSLATOR
5799-TBT (PRPQ P8253)**

PURPOSE

This Series/1 PRPQ provides Control Program Support (CPS) users with the ability to utilize main storage above 64K bytes.

HIGHLIGHTS

The CPS Address Relocation Translator Support PRPQ provides the following features:

- Allows addressing of physical storage above 64K to the upper limit of the processor.
- Supports up to eight user address spaces.
- Provides for common mapping of storage loads across address spaces.
- Provides for multiple tasks and storage loads per address space.
- Provides for the use of the Overlay Management/Relocating Loader (CPS Extended Function PRPQ) within each user address space.
- Provides a debugging package which supports a Storage Address Relocation Translator environment.
- Allows grouping of address spaces by classes.
- Provides for the queuing of programs by address space class.
- Provides for queuing of programs by name (Symbolic program file support).

CUSTOMER RESPONSIBILITIES

The customer is responsible for the installation and use of this licensed program.

SPECIFIED OPERATING ENVIRONMENT

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

HARDWARE REQUIREMENTS

The use of this PRPQ requires an IBM 4955 model D processor equipped with Storage Address Relocation Translator feature (#6335) or an IBM 4955 model E or F Processor or IBM 4952 (all models). This product operates under control of IBM Series/1 Control Program Support PRPQ (5799-TAA).

SOFTWARE REQUIREMENTS

Control Program Support PRPQ (P82508) 5799-TAA) is a required prerequisite for all users of this product.

The use of the Debug facility and/or the Address Space Management facility of this product requires the use of the Control Program Support Extended Function PRPQ (P82535) (5799-TBQ).

The Extended Function PRPQ requires the Control Program Support Disk Table of Contents PRPQ (P82528) (5799-TAW) as a prerequisite.

An IBM 4962 disk storage unit or an IBM 4964 diskette storage unit is required for error logging.

The IBM Series/1 Base Program Preparation Facilities (5719-PA1) is the program preparation system for Control Program Support.

DOCUMENTATION

(available from Mechanicsburg)

IBM Series/1 Control Program Support Address Relocation Translator Support User's Guide (SC34-1602) ... IBM Series/1 Control Program Support Address Relocation Translator Support Licensed Program Specifications (GC34-1601)



PROGRAMMING RPQ

**SERIES/1 REALTIME PROGRAMMING SYSTEM
ADDRESS TRANSLATOR TRANSIENT SUPPORT
VERSION 3 (5799-TBY) (PRPQ P82585)**

PURPOSE

Version 3 supports the Series/1 Realtime Programming System Version 3, (5719-PC3). The Address Translator Transient Support provides the Series/1 Realtime Programming System user with a system-controlled pool of transients located in secondary storage (outside the first 64K of physical storage).

HIGHLIGHTS

The support eliminates the need to specify which modules should be made storage-resident at SYSGEN time. Frequently used transients will tend to be retained in the storage pool while less frequently used ones will normally have to be loaded from disk. The more storage allocated for the pool, the more transient requests are satisfied from the pool rather than from disk and the better the performance of the system. Transients are moved by processor instructions between Address Spaces 0 (containing the transient area where execution occurs) and the system-controlled pool of transients in secondary storage. As the content of the pool changes, it is kept packed to hold the maximum number of transients. This support can share control of secondary storage with storage overlays.

Limitations

All transients (user and system) must be in libraries on the same disk drive.

Only a single transient area may be included in the supervisor.

During the search-and-move step, the system is masked and will not acknowledge interrupts. This period may be up to 3 milliseconds for a system transient, depending on the size of the transient and the size of the transient pool.

During a pool compression operation, necessary whenever one transient is replaced by another in the pool, the system is masked and will not acknowledge interrupts. This period can be up to 200 milliseconds for a single system transient exchange and several times that long if several small transients must be removed to accommodate a larger one.

Note: Realtime applications whose design is incompatible with this masked compression time can successfully use this PRPQ only if the dynamic storage pool is made large enough to contain all transients which must be used when higher levels of responsiveness are required.

Users of Direct Program Control devices (Teletypewriter Adapter #7850) should also consider the effects of this masking.

CUSTOMER RESPONSIBILITIES

The customer is responsible for the installation and use of this licensed program.

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 for execution of this PRPQ is as specified in the pages for the appropriate IBM Series/1 Realtime Programming System version.

The minimum hardware required to execute this PRPQ is:

Processor - IBM 4955 Processor models B or D with at least 80K bytes of processor storage and the Storage Address Relocation Translator (#6335), or an IBM 4955 Processor model E with at least 96K bytes of processor storage.

IPL devices - one IBM 4962 model 2 or 2F Disk Storage Unit (combination disk/diskette unit) or one IBM 4962 model 1 or 1F Disk Storage Unit, or one IBM 4963 Disk Subsystem.

SOFTWARE REQUIREMENTS

The Address Translator Transient Support PRPQ Version 3 operates under the control of, and has as a prerequisite the IBM Series/1 Realtime Programming System (5719-PC3).

DOCUMENTATION

(available from Mechanicsburg)

IBM Series/1 Realtime Programming System Address Translator Transient Support User's Guide (SC34-1603) ... IBM Series/1 Realtime Programming System Address Translator Transient Support Licensed Program Specification (GC34-1607)

PROGRAMMING RPQ

**SERIES/1 REALTIME PROGRAMMING SYSTEM
COMMUNICATIONS MONITOR for the SERIES/1
5799-TCX (PRPQ P82598)****PURPOSE**

Communications Monitor for the Series/1 manages communication between a Series/1 and other Series/1s; between a Series/1 and other computers; and between a Series/1 and various input/output devices. It supports various devices and communication links, and accommodates user-written support for other devices. It also manages user-supplied application programs.

HIGHLIGHTS**A Message Management Program**

The Communications Monitor's function is to manage the flow of messages between computers, devices, and application programs. A message can be any unit of information - from a record of a sales transaction to a large data set.

Series/1-to-Series/1 Communication

The Communications Monitor manages communication between Series/1s, at the same location or at geographically dispersed locations, that are connected by means of a point-to-point, binary synchronous communications (BSC), non-switched line.

Series/1-to-host-Processor Communication

The Communications Monitor supports communication between a Series/1 and a host computer in two ways: BSC transparency and 3271 emulation.

Series/1-to-3271 Communication

The Communications Monitor manages communication between a Series/1 and 3277 displays. The 3277s are attached to a 3271 control unit. The 3271 units communicate over multipoint BSC leased lines to the Programmable Communications Subsystem, which is attached to the Series/1. Multiple control units can be attached to each line.

Printers, Display Units, Teletypewriters, Disks and Diskettes

Other devices the installation can make part of its Communications Monitor configuration are:

- 4973 line printers
- 4974 matrix printers
- 4979 display stations, and 4978 display stations in 4979 mode RPQ D02055
- Teletype® Models 33/35 ASCII equivalent teletypewriter devices attached through the teletypewriter adapter (#7850)
- 4962 and 4963 disk units
- 4964 diskette units and the diskette drives in 4962 model 2, 2F, and 4 disk units
- 4966 diskette units

Other Devices

The Communications Monitor makes it convenient for the installation to add support for devices - such as specialized terminals - to the product as supplied by IBM. The additional devices can be attached to the Series/1 through the programmable Communications Subsystem or through native adapters.

A Base for Applications

The Communication Monitor manages the communication of messages to and from user-supplied application programs. Applications can take many forms:

- Data entry
- Message routing
- Distributed processing
- Store-and-forward
- Line concentration

Macro Instructions for Program Development

The Communications Monitor includes a set of Assembler language macro instructions for the use of programmers writing Communications Monitor applications or message path programs.

The macro instructions allow programmers to:

- Create, send, receive and cancel messages
- Control the operation of stations (the devices, communications links and application programs that make up the communications configuration)
- Get and free blocks of storage

- Create new operator commands

Commands for Online Control

The Communications Monitor includes a set of operator commands to allow computer operators and terminal operators online control of the configuration.

The commands allow operators to:

- Start and stop the Communications Monitor
- Define and delete stations and change their attributes
- Hold messages intended for a station, release held messages and cancel all messages pending for a station
- Display status information and error counts that pertain to a station

Orderly System Definition

Each Series/1 in a Communications Monitor configuration is called a node. At each node, the installation does a system definition process that defines the Communications Monitor configuration as viewed by that node. The definition includes all the stations within the node, all the other nodes it communicates with and all the stations at other nodes (remote stations) that it is going to communicate with directly. Once the system definition has been done, users at a local node can treat remote stations as if they were local stations for most services.

A System Generation Answer File

The Communications Monitor is supplied to the installation with a system generation answer file. When used as input to the Realtime Programming System generation process, the answer file produces a Realtime Programming System with the Communications Monitor integrated. The resulting system supports:

- One BSC attachment
- One 4979 display
- One 4973 line printer
- One 4974 matrix printer
- One teletypewriter adapter (#7850)
- Two 4962 or 4963 disk units
- Two 4964 or 4966 diskette drives
- One timer attachment (#7840)

Aids for Operators

The Communications Monitor issues various error messages. The installation can designate a primary and a secondary station where those messages are to be logged.

For each station that sends or receives messages, the Communications Monitor maintains a count of messages and characters sent from and received by the station. Operator commands allow operators to display and reset the values of each message queue associated with a station.

CUSTOMER RESPONSIBILITIES

The customer is responsible for the installation and use of this licensed program.

SPECIFIED OPERATING ENVIRONMENT

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

HARDWARE REQUIREMENTS

To run the Communications Monitor, the installation must have:

- An IBM Series/1 4955 processor with a least 128K bytes of processor storage and the address translator
- A Realtime Programming System-supported IBM disk unit
- A Realtime Programming System-supported IBM diskette drive (required for installation only)
- An IBM 4973 or 4974 printer
- An IBM 4979 display station, an IBM 4978 display station in IBM 4979 mode with RPQ D02055, or a teletypewriter adapter (#7850) with Teletype® Model 33/35 teletypewriter ASCII equivalent device attached.



PROGRAMMING RPQ

Communications Monitor for the Series/1 (cont'd)

SOFTWARE REQUIREMENTS

The Communications Monitor runs under control of the IBM Series/1 Realtime Programming System, Version 4 (5719-PC4). For preparation of user written programs, the IBM Series/1 Program Preparation Subsystem, Version 4 (5719-AS4) is required. If the installation is going to add unsupported devices attached through the Programmable Communications Subsystem or use the IBM-supplied device support that uses the Programmable Communications Subsystem, the Programmable Communications Subsystem Extended Execution Support (5719-CS2) is required. To add unsupported devices through the Programmable Communications Subsystem, the Programmable Communications Subsystem Preparation Facility (5719-CS0) is required as well.

COMPATIBILITY

This PRPQ is compatible with the licensed programs which are identified in the "Software Requirements" section above.

DOCUMENTATION
(available from Mechanicsburg)

IBM Communications Monitor for the Series/1 Licensed Program Specifications (GS23-0003) ... IBM Communications Monitor for the Series/1 Introduction Manual (GL23-0002) ... IBM Communications Monitor for the Series/1 Design and Installation Guide (SL23-0004) ... IBM Communications Monitor for the Series/1 Programmer's Guide (SL23-0005) ... IBM Communications Monitor for the Series/1 Operator's Guide (SL23-0006) ... IBM Communications Monitor for the Series/1 Debugging Guide (LL23-0007).

PROGRAMMING RPQ

**SERIES/1 REALTIME PROGRAMMING SYSTEM
MULTIPLE TERMINAL MANAGER VERSION 1
5799-TCY (PRPQ P82596)**

PURPOSE

Series/1 Multiple Terminal Manager for the Realtime Programming System provides facilities for the management and control of user-written programs that execute from multiple 4978, 4979 Display Units or Teletype® Models ASR 33/35 or equivalent device. User-written transaction application programs using Assembler, FORTRAN IV, PL/I, or COBOL may be supported by the Multiple Terminal Manager.

HIGHLIGHTS

- Full screen support for 4978/4978/5251 model 11 Displays
- Provides management of buffer allocation and I/O for supported displays/terminals
- High-level language interface to Index Access Method (Programming RPQ or Licensed Program 5719-AM2), random and keyed direct files
- User-written transaction application programs are written as a simple single thread, single terminal transaction
- User transaction application programs can be invoked via menu or function key at 4978/4979/5251 model 11 Display
- Eliminates the need for application programmers to deal with Realtime Programming System task work stacks, control blocks, etc.
- New displays/terminals and transaction applications programs can be added without rebuilding the manager
- The Multiple Terminal Manager provides users with a productivity enhancement for the implementation of transaction applications

CUSTOMER RESPONSIBILITIES

The customer is responsible for the installation and use of the licensed program.

All material is delivered in source form. To install the system the user must:

- Generate the appropriate Realtime Programming System including (a) the 4978 Support PRPQ if the system has either the 4978 or 4979 and (b) the Indexed Access Method PRPQ if the application uses it.
 - Tailor the Multiple Terminal Manager configuration by coding the appropriate file definition macros.
 - Assemble and build all modules of the Multiple Terminal Manager.
 - Assemble and build the provided application segments desired (screen utility, terminal report, etc.) and place them in the program library.
- Create a text file containing one line of text/terminal describing the terminal's options (Data Set Descriptor name, menu screen number, sign-on/sign-off to be used, buffer length, and, for 4978s only, Data Set Descriptor name for the Random Access Memory load data set to be used).

- Build application screen formats with the provided online screen format maintenance program.
- Write, assemble, or compile application build and test application programs.

Limitations

Only one high-level language (FORTRAN, COBOL, PL/I) can be used at one time.

SPECIFIED OPERATING ENVIRONMENT

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

HARDWARE REQUIREMENTS

- Processors: IBM 4952, IBM 4953, IBM 4955
- Disks: IBM 4962, IBM 4963
- Diskettes: IBM 4964, IBM 4966
- Displays: IBM 4979, IBM 4978 RPQ, IBM 5251 model 11
- Printers: IBM 4973, IBM 4974
- Communications: IBM 3101 Display Terminal or Teletype® Models ASR 33/35 or equivalent device attached via a single or multiline asynchronous communications adapter (#1610 or #2091 and #2092)

SOFTWARE REQUIREMENTS

This PRPQ requires the following licensed programs:

- IBM Series/1 Realtime Programming System Versions 2, 3 or 4 (5719-PC2, 5719-PC3 or 5719-PC4)
- IBM Series/1 Program Preparation Subsystem Versions 2, 3, or 4 (5719-AS2, 5719-AS3, or 5719-AS4)

For compatibility statements between Realtime Programming System Versions and the Program Preparation Subsystem Versions, refer to the appropriate pages of the respective programs.

For certain environments and functions, the following licensed programs may be required:

- IBM Series/1 4978 Support PRPQ Versions 2 or 3 (5799-TCD or 5799-TCE) - Required for IBM 4979 or IBM 4978
- IBM Series/1 Indexed Access Method PRPQ Versions 2 or 3 (5799-TCA or 5799-TCB)
- IBM Series/1 Indexed Access Method licensed program (5719-AM1)
- IBM Series/1 Address Translator Transient Support PRPQ Versions 2 or 3 (5799-TBX or 5799-TBY)
- IBM Series/1 FORTRAN IV Version 1 (5719-FO1)
- IBM Series/1 FORTRAN IV Version 2 (5719-FO2)
- IBM Series/1 FORTRAN IV Realtime Subroutine Library (5719-FO3 and 5719-FO4)
- IBM Series/1 Mathematical and Functional Subroutine Library Versions 1 or 2 (5719-LM1 or 5719-LM2)
- IBM Series/1 PL/I (5719-PL1)
- IBM Series/1 PL/I Transient Library (5719-PL3)
- IBM Series/1 PL/I Version 2 (5719-PL2) Compile and Resident Library
- IBM Series/1 PL/I (5719-PL4) Transient Library
- IBM Series/ COBOL (5719-CB1)
- IBM Series/1 COBOL Transient Library (5719-CB2)

Some are licensed on the Program Preparation System only. Some may also have dependencies on specific versions of the Realtime Programming system.

COMPATIBILITY

This PRPQ is compatible with the licensed programs which are identified in the "Software Requirements" section above.

DOCUMENTATION
(available from Mechanicsburg)

User's Guide (SC34-1658).



PROGRAMMING RPQ

**SERIES/1 CONTROL PROGRAM SUPPORT
4963 DISK SUBSYSTEM SUPPORT
5799-TCZ (PRPQ P82541)**

PURPOSE

This PRPQ provides programming support for the 4963 Disk Subsystem under the Series/1 Control Program Support (P82508, 5799-TAA).

HIGHLIGHTS

The IBM Series/1 Control Program Support 4963 Disk Subsystem Support PRPQ provides the user with device support for the 4963 Disk Subsystem under Control Program Support (5799-TAA), as well as symbolic file support, as provided for the 4962 Disk Storage Unit under the Control Program Support Extended Function PRPQ (5799-TBQ).

The symbolic file support provided by this PRPQ consists of a dynamic locate function and a utility package. The utility package provides the following utility functions:

- FORMAT:** Initialize the directory of a symbolic data file area on a direct access device.
- UPDATE:** Provides two functions: Allows the user to define and delete symbolic data files in the directory.
- LIST:** Provides a listing on the printer or operator station of a symbolic data file area directory.
- PACK:** Copies a data file area moving allocated space to the beginning of the file and free space to the end.
- COPY:** Copies data to and from symbolic files, file members, and absolute addresses on all supported direct access devices.
- RENAME:** Provides the ability to change the symbolic name of files and file members.
- PATCH:** Enables modification of data on all utility-supported direct access devices.

CUSTOMER RESPONSIBILITIES

The customer is responsible for the installation and use of this licensed program.

SPECIFIED OPERATING ENVIRONMENT

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

HARDWARE REQUIREMENTS

The use of this PRPQ requires an IBM 4952, 4953, or 4955 processor with 32K bytes of storage and with an IBM 4963 Disk Subsystem Attachment Feature (#3590), and one IBM 4963 Disk Subsystem, model 58A, 58B, 64A, or 64B.

SOFTWARE REQUIREMENTS

IBM Series/1 Control Program Support Extended Function PRPQ (P82535), (5799-TBQ) and IBM Series/1 Control Program Support PRPQ (P82508), (5799-TAA), are prerequisite for all users of this product.

Programming Preparation

The Series/1 Base Program Preparation Facilities, (5719-PA1), is the program preparation system for Control Program Support.

DOCUMENTATION

(available from Mechanicsburg)

IBM Series/1 Control Program Support 4963 Disk Subsystem Support PRPQ User's Guide (SC34-1645) ... IBM Series/1 Control Program Support 4963 Disk Subsystem Support PRPQ Licensed Program Specifications (GC34-1638)

PROGRAMMING RPO

**SERIES/1 EVENT DRIVEN EXECUTIVE
DATA COLLECTION INTERACTIVE
5799-TDE (PRPQ P82600)****PURPOSE**

Series/1 Data Collection Interactive Support provides a programmable interface between the Series/1 Data Collection attachment (RPQs D02312, D02313, D02314) and the Event Driven Executive operating system. It allows for central data collection from 5234 Time Entry Stations, 5235 and 5236 Data Entry Stations, and 5239 Value Read Modules. Series/1 Data Collection Interactive Support consists of: System personalization functions ... routing/formatting routines ... IOCS hardware interface.

HIGHLIGHTS**System Personalization Functions**

System personalization functions allow the user to define (via prompts at a 4978/4979 terminal) actions to be undertaken at the entry stations. Personalization once established is transportable and modifiable. Upon automatic IPL, the personalization configuration is restored to the last executed configuration. For example, personalization of a 5235 or 5236 Data Entry Station may consist of user-designated functions for each action key and mode switch position. These designated functions can be a combination of one or more of the following entries:

- Card (80 or 96-column)
- Badge (magnetic stripe or punched hole)
- Key

Note: Only badge entries are valid for the 5234 Time Entry Station. The 5239 Value Read Module provides a method for entering values from external devices such as scales, counters, switches, keyboards and other similar devices, through a 5235 or 5236 Data Entry Station.

Routing/Formatting Routines

The routing/formatting routines interface with the input/output control system (IOCS) to handle incoming data (in the form of 180-byte records) from the Series/1 data entry loop/master scheduler attachment. Incoming data can be reformatted via system personalization functions into records of multiples of 128 bytes to be routed to disk, diskette, or remain in the incoming format (180 bytes) and be passed to the user program. If routing to disk/diskettes, the following options are available: Common data with buffers, sequenced buffers and buffers containing both complete and incomplete records.

IOCS Hardware Interface

IOCS provides the interface to the hardware required for controlling the data entry loops. Each data entry loop (controlled by a multiplexer) provides the capability of collecting data from up to four entry stations (any combination). One entry station per system is reserved for maintenance and is always part of the first loop. Also provided in the IOCS are time-of-day routines, message broadcasting of up to 8 digits or a limited number of alphabetic characters, initiation of online test, setting of audible alarm/contact closure and error handling.

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 configuration is:

Processor	IBM 4952, 4953, 4955
Storage	16K bytes plus required storage for EDX and customer application code
Disk/Diskette	IBM 4962 model 2, 2F or 4 Disk Storage Units (combination disk/diskette unit) or IBM 4962 model 1, 1F or 3 Disk Storage Units and IBM 4964 Diskette Unit or IBM 4964 Diskette Unit
Operator Station	IBM 4978 or 4979 Display Station
RPQs	IBM Series/1 Data Collection Interactive Attachment device (RPQ D02312)

The minimum configuration can be expanded by adding one or more of the following RPQs:

- D02313
- D02314

A maximum of 31 terminals are supported.

Time/Data Entry Station	IBM 5234 Time Entry Station or IBM 5235 Data Entry Station or
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IBM 5236 Data Entry Station

SOFTWARE REQUIREMENTS

IBM 523X Entry Station Direct Attachment Support operates under the appropriate IBM Series/1 Event Driven Executive Programming Support (5719-XS1, 5719-UT3, 5719-XX2, 5740-LM2, 5719-LM5) depending on application and method of compilation.

DOCUMENTATION

(available from Mechanicsburg)

IBM Series/1 Data Collection Interactive PRPQ P82600 User's Guide (SC34-1654) ... IBM Series/1 Data Collection Interactive PRPQ Licensed Program Specification (GC34-1652)



PROGRAMMING RPQ

**SERIES/1 REALTIME PROGRAMMING SYSTEM
TRANSIENT ACTIVITY TOOL VERSION 1
5799-TDG (PRPQ 82606)**

PURPOSE

PRPQ Version 1, 5799-TDG, supports the Realtime Programming System Version 3 (5719-PC3) and Version 4 (5719-PC4). Series/1 Transient Activity Tool provides transient input/output frequency counts by module as an aid in performance tuning of the Series/1 Realtime Programming System, Version 3 or 4. PRPQ Version 1 may be used in conjunction with the Address Translator Transient Support PRPQ Version 3 (5799-TBY) or may be used in conjunction with the dynamic transient pool management support contained in the Realtime Programming System, Version 4 (5719-PC4).

HIGHLIGHTS

The program functions provided are:

- Transient Monitoring Routines
- Command Action Routines
- Report Generator

The Command Action Routines provide the ability of turning the transient monitoring on and off with an operator command. The Command Action Routines also provide the ability to dynamically LOAD and UNLOAD system transient programs specified by the user. A macro interface is provided to the Transient Monitor SVC, which also enables monitoring to be turned on and off under program control. With this facility, user-written analysis programs have control over monitoring more detailed aspects of system performance. I/O frequency counts are maintained in the following categories:

- Load - The number of times the transient was temporarily made resident.
- Fetch - The number of times I/O is required as the result of a transient call.
- Refresh - The number of times the transient has to be read back into storage due to contention for the transient area.

The Transient Monitoring Routines automatically suppress data collection if an accumulator is about to overflow.

A parameter when turning monitoring off identifies a consecutive data set where the accumulators are written and saved for later use. The Report Generator prints a formatted listing of:

- Module Name
- Module Relative Disk Address
- Module Size
- Load Count
- Fetch Count
- Refresh Count
- Total Transient I/O Count Per Module
- Total Transient I/O Count

Limitations

The maximum accumulator count value before overflow is 65,535. Only system transients can be monitored. The Transient Monitoring Routines automatically suppress data collection if an accumulator is about to overflow.

CUSTOMER RESPONSIBILITIES

The customer is responsible for the installation and use of this licensed program.

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 for program preparation of this PRPQ is that required for the execution of the Version of the IBM Series/1 Realtime Programming System/Program Preparation Subsystem, selected (Version 3 or 4).

SOFTWARE REQUIREMENTS

The minimum system for program execution of this PRPQ is that required for the execution of the Version of the IBM Series/1 Realtime Programming System, selected (Version 3 or 4).

COMPATIBILITY

This PRPQ is compatible with the licensed programs which are identified in the "Hardware Requirements" section above.

DOCUMENTATION
(available from Mechanicsburg)

IBM Series/1 Realtime Programming System Transient Activity Tool Programming RPQ P82606 User's Guide (SC34-0287) ... IBM Series/1 Realtime Programming System Transient Activity Tool Programming RPQ P82606 Licensed Program Specifications Version 1 (GC34-0286).

PROGRAMMING RPQ

**SERIES/1 REALTIME PROGRAMMING SYSTEM
REMOTE MANAGEMENT UTILITY
5799-TDH (PRPQ P82597) 5**

PURPOSE

Series/1 Realtime Programming System Remote Management Utility is designed to allow the user to communicate between a host computer and remotely located Series/1 to perform various file, system maintenance and system functions without the necessity of having an operator at the remote Series/1.

HIGHLIGHTS

The Remote Management Utility executing in a Series/1 provides the host processor with access to Series/1 Remote Management utility functions. Based on the host program's selection of the function, the user's written host application program can perform operations such as file transfer to and from a Series/1, file creation or deletion, file maintenance and Series/1 program execution. Communication is performed on a processor-to-processor level using point-to-point binary synchronous communications.

The Remote Management Utility can transfer the following:

- User data files
- User print files
- Utility command data sets
- Job stream processor command data sets
- User program files
- System program files
- Assembler output files
- Application builder output files

In addition, the Remote Management Utility provides limited system maintenance functions which allow the user to maintain the Realtime Programming System from the host computer.

The Remote Management Utility is written in Series/1 Assembler language and requires a binary synchronous communications line to be defined at system generation.

The Remote Management Utility transfers files between a host and a remote Series/1. It facilitates the operation of the remote Series/1 in a loosely coupled distributed data processing system. It runs as a taskset under the Realtime Programming system on the Series/1. It works with user-written application programs in the host through standard support in the IBM Series/1 Realtime Programming System (Versions 2, 3, or 4).

The Remote Management Utility interacts with the host program via a point-to-point or multipoint binary synchronous communications connection in the sense that it receives commands from the host and returns codes to the host to signal the results of command execution. At the end of the transmission of a data set in either direction, it returns a count of records received or transmitted so that the host application program can build a session log.

The Remote Management Utility is designed in a modular fashion and is written using the Realtime Programming System Structured Macros.

The following are the functions provided:

Function	Description
CREATE	Requests the Utility to create a disk or diskette data set, member or volume on the Series/1.
DELETE	Requests the Utility to delete a disk or diskette data set, member or volume on the Series/1.
DUMP	Requests a dump of the current Realtime Programming System storage load to a predefined Series/1 disk or diskette data set.
IDCHECK	Requests the Utility to compare the identification in the HDDSD request header field; upon valid comparison, the Utility transmits the unique remote identification to the host.
LINKTS	Requests the utility to link to a named task set in the Utility partition upon normal termination.
QUETS	Requests the Utility to queue a named task set for execution in any valid partition.
RECEIVE	Requests the utility to receive a data set, member, or volume from the host and write it to a disk or diskette data set.
RESET	Requests the Utility to reset the end-of-data indicator for a data set or member.
RESTART	Requests the Utility to initial program load (IPL) the alternate Realtime Programming System upon normal termination.

SEND

Requests the Utility to read a disk or diskette data set, member or volume and transmit it to the host.

SHUTDOWN

Requests normal termination of the Utility.

WRAP

Requests transmission of the request header just received from the host back to the same host.

Records transmitted contain in the following the first 2 byte positions:

EBCDIC

Meaning

HR

This is a header (command) record. (Received only)

HD

This is a data record. (Received and sent)

HS

System Status information. (Sent only)

The session with the Series/1 can be opened by dialing the Series/1 on a switched line by manual dialing from the Series/1, and by initiating transmission to the Series/1 on a point-to-point leased line, or by polling the Series/1 on a multi-drop line (using V4 of Realtime Programming System only). The Series/1 supervisor must have the communication line to the host properly described during system generation. The Remote Management Utility must be in execution in the Series/1 prior to session initiation.

CUSTOMER RESPONSIBILITIES

The customer is responsible for the installation and use of this licensed program.

In order to communicate with the Remote Management Utility in a remote Series/1, it is necessary to write and test a program on the host computer. This program will 'converse' with the Series/1 according to rules to be described in the *User's Guide*. A sample program will be provided in the *User's Guide*.

In addition, it is necessary to tailor, assemble, application build, install and test the Programming RPQ on the Series/1.

SPECIFIED OPERATING ENVIRONMENT

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

HARDWARE REQUIREMENTS

The following devices are supported by this PRPQ via standard Realtime Programming System interfaces:

- IBM 4962 and 4964 Disk and Diskette
- IBM 4963 Disk
- IBM 4966 Diskette
- #2074 and #2075 Binary Synchronous Communications Single-Line Control
- #2093 with #2094 Binary Synchronous Communications Multiline Control/Adapter

SOFTWARE REQUIREMENTS

This PRPQ requires the following licensed programs:

- IBM Series/1 Realtime Programming System, Version 2, 3, or 4 (5719-PC2, 5719-PC3, or 5719-PC4)
- IBM Series/1 Program Preparation Subsystem, Version 2, 3, or 4 (5719-AS2, 5719-AS3, or 5719-AS4 - not required for execution of user applications)

COMPATIBILITY

This PRPQ is compatible with host communications facilities for the selected version of the Realtime Programming System.

DOCUMENTATION

(available from Mechanicsburg)

IBM Series/1 Realtime Programming System Remote Management Utility User's Guide (SC34-1664) ... IBM Series/1 Realtime Programming System Remote Management Utility Licensed Program Specification (GC34-1663).



PROGRAMMING RPQ

**SERIES/1 CONTROL PROGRAM SUPPORT
4963/4966 SAVE/RESTORE
5799-TDK (PRPQ P82539)**

PURPOSE

This Series/1 PRPQ provides the Control Program Support user with a stand-alone utility to save all or part of the contents of a 4963 Disk Subsystem onto diskettes in a 4966 Diskette Magazine Unit, and to restore that data from the 4966 to its original location on the 4963.

HIGHLIGHTS

The IBM Series/1 Control Program Support 4963/4966 Save/Restore PRPQ provides the user with a set of functions contained in a load module which is IPLable from a 4964 Diskette Unit. These functions together provide the user with the ability to save all or any part of the data stored on a 4963 Disk Subsystem and to store the saved data on a 4966 Diskette Magazine Unit; subsequently, this data may be restored to its original location on the same 4963. This product includes the following three functional elements:

- Standalone Monitor
- SAVE Utility
- RESTORE Utility

The Standalone Monitor allows the operator to select the utility to be executed and then passes control to the proper utility.

The SAVE Utility transfers 4963 data to 4966 diskettes in magazines. These diskettes must have been initialized to double-density 512 byte/sector format to be acceptable to the SAVE Utility.

The RESTORE Utility provides the ability to 'put back' the data saved on diskettes. The restore may be a partial restore and any of the SAVE diskettes may be used.

CUSTOMER RESPONSIBILITIES

The customer is responsible for the installation and use of this licensed program.

SPECIFIED OPERATING ENVIRONMENT

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

HARDWARE REQUIREMENTS

The use of this PRPQ requires the following minimum Series/1 hardware:

- IBM 4952, 4953 or 4955 processor with 32K bytes of storage
- IBM 4963 Disk Subsystem Attachment Feature (#3590)
- IBM 4966 Diskette Magazine Unit Attachment Feature (#1205)
- IBM 4964 Diskette Unit Attachment Feature (#3581)
- IBM 4963 Disk Subsystem, model 58A, 58B, 64A, or 64B
- IBM 4964 Diskette Unit
- IBM 4966 Diskette Magazine Unit

There may be additional hardware requirements imposed by the application.

SOFTWARE REQUIREMENTS

This product is standalone and has no prerequisites.

DOCUMENTATION
(available from Mechanicsburg)

IBM Series/1 Control Program Support 4963/4966 Save/Restore Utility PRPQ User's Guide (SC34-1626) ... IBM Series/1 Control Program Support 4963/4966 Save/Restore Utility PRPQ Licensed Program Specifications (GC34-1622).

**SERIES/1 CONTROL PROGRAM SUPPORT
4969 MAGNETIC TAPE SUBSYSTEM SUPPORT
5799-TDW (PRPQ P82621)****PURPOSE**

This Series/1 PRPQ provides software to support attachment of the 4969 Magnetic Tape Unit on the Series/1 for Control Program Support users.

HIGHLIGHTS

The 4969 Magnetic Tape Unit PRPQ provides Read/Write level and Tape Control support for the Series/1 Control Program Support user.

The functional capabilities provided by the 4969 Magnetic Tape Unit PRPQ are:

- Connect a user program to a tape transport device
- Disconnect a user program from a tape transport device
- Read a record from tape
- Write a record to tape
- Rewind tape
- Set tape transport offline
- Rewind tape and set tape transport offline
- Write tape mark
- Forward space tape record(s)
- Forward space tape mark(s)
- Backward space tape record(s)
- Backward space tape mark(s)
- Erase tape

No label processing is provided. The basic level I/O support allows the user to process labels as any other record would be processed.

Up to four 1600-bpi 4969 Magnetic Tape Units are supported by this PRPQ. The PRPQ *User's Guide* will provide guidelines for adapting this PRPQ to process 800-bpi tape densities.

Limitations

The following hardware functions are not supported:

- Test Read Mode
- Attachment RAM Diagnostic
- Start Cycle Steal Diagnostic
- IPL from Magnetic Tape

CUSTOMER RESPONSIBILITIES

The customer is responsible for the installation and use of this licensed program.

SPECIFIED OPERATING ENVIRONMENT

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

HARDWARE REQUIREMENTS

IBM 4969 Magnetic Tape Unit

IBM 4969 Magnetic Tape Attachment #1215

SOFTWARE REQUIREMENTS

IBM Series/1 Control Program Support PRPQ (5799-TAA) is required. Diskette or Disk is required for error logging.

Program Preparation

See the Program Preparation Section of the Control Program Support (5799-TAA).

DOCUMENTATION

(available from Mechanicsburg)

IBM Series/1 Control Program Support 4969 Magnetic Tape PRPQ Users Guide (SC34-0348) ... IBM Series/1 Control Program Support 4969 Magnetic Tape Licensed Program Specifications (GC34-0347)

**SERIES/1 REALTIME PROGRAMMING SYSTEM
MULTIPLE TERMINAL MANAGER VERSION 2
5799-TDX (PRPQ P82622)**

PURPOSE

Series/1 Multiple Terminal Manager provides a set of high-level functions to assist transaction-oriented application programs such as inquiry, file update, data collection and order entry. These application programs may be written in Assembler and/or either COBOL, FORTRAN or PL/I. Also included are management and control facilities to allow execution of these application programs from multiple terminals attached to the Series/1.

HIGHLIGHTS

Version 2 of the Multiple Terminal Manager (5799-TDX) operates under control of the Realtime Programming System Version 4 (5719-PC4) or Version 5 (5719-PC5) and, in addition to supporting all facilities of Version 1 of the Multiple Terminal Manager (5799-TCY), includes the following:

- 3270 Device Emulation
- 3101 Display Terminal Support
- 3270 Information Display System Support
- Additional IBM Products Supported
- Additional Disk File Support (FILEIO)
- Communications Monitor Bridge Service
- Terminal Controller Interface
- Improved Installation Procedures
- New Utility Functions
- New Usability Enhancements

3270 Device Emulation

Multiple Terminal Manager 3270 Device Emulation support allows the Series/1 to appear to a host system as one or more remotely connected 3270 subsystems. No user programming on the Series/1 is required.

- Series/1 appears to the host as a 3271 model 2 under Binary Synchronous Communications (BSC) or as a 3274 model 51C under System Network Architecture/Synchronous Data Link Control (SNA/SDLC).
- A 3101 Display Terminal in character mode locally attached to the Series/1 via the Teletypewriter Adapter (#7850) appears to the host as a 3277 model 2 (BSC) or as a 3278 model 2 (SNA/SDLC).
- A 4973, 4974 or 4975 printer attached to the Series/1 appears to the host as a 3287/3289 printer (SNA/SDLC only).

Although differences exist between this support on the Series/1 and a real 3270 subsystem configuration (see note below), many host systems that support 3270 protocol and the above 3270 subsystem devices on a multipoint communications link will support the Series/1 with the Realtime Programming System Multiple Terminal Manager on those networks. Users at local Series/1 attached 3101s are able to establish sessions with a host processor (as a 3270), while users at other terminals concurrently execute local applications on the Series/1. Since the Multiple Terminal Manager translates the data stream, host applications will, generally, require no changes to support the Series/1.

The Multiple Terminal Manager, utilizing the 3101 Display Terminal, emulates a subset of the functions available on a 3277/3278. Only the EBCDIC typewriter keyboards and transmission codes are supported. Certain keys operate differently and are in different locations on the 3277/3278 and the 3101. Function keys on the 3277/3278 are mapped onto the 3101 to provide the same functions. The copy command is not supported. However, the PF2 key on the 3101 can provide an equivalent function in many cases. Selector light pen operation and magnetic stripe reader operation are not supported. Refer to "Passthrough Operating Considerations" in Chapter 8 of the *User's Guide* (SC34-1692) for additional considerations.

Note: Support differences are imposed not only by the Multiple Terminal Manager, but the Realtime Programming System and Series/1 hardware. There may also be restrictions or limitations imposed by the communications protocols employed by the host subsystems a user desires to use (for example, TSO, IMS, CICS). Refer to the host documentation and to Chapters 8 and 9 in the *Multiple Terminal Manager User's Guide* to insure that the desired configuration is supported.

BSC Considerations

For BSC, 3270 Device Emulation allows a Series/1 to be attached to a BSC 3270 multipoint network, and appears as a 3271 model 2 cluster control unit to that network. A 3101 Display Terminal (character mode) locally attached to the Series/1 via the Teletypewriter Adapter (#7850) emulates a 3277 model 2 Display locally attached to a 3271 model 2; emulation of 3270 printers is not provided.

BSC 3270 Device Emulation requires one of the following Series/1 hardware attachments:

- BSC Single-Line Control (#2074)
- BSC Single-Line Control/High Speed (#2075)
- BSC 8-Line Control/4-Line Adapter (#2093/#2094)

SNA Considerations

For SNA/SDLC, 3270 Device Emulation allows a Series/1 to be attached to a SNA/SDLC 3270 network, and appears as a 3274 model 51C control unit to that network. A 3101 Display Terminal (character mode) locally attached to the Series/1 via the Teletypewriter Adapter (#7850) emulates a 3278 model 2 Display locally attached to a 3274 model 51C; and a 4973, 4974, or 4975 printer attached to the Series/1 emulates a 3287/3289 printer (in SNA character set mode) locally attached to a 3274 model 51C.

SNA/SDLC 3270 Device Emulation requires an SDLC Single Line Control (#2090).

3101 Display Terminal

Version 2 of the Multiple Terminal Manager includes formatted full screen support for all models of the 3101 Display Terminal both the block mode, as well as the character mode models. The level of support provided for the 3101 is equivalent to that provided for the 4978 and 4979. From a programming viewpoint, the 3101, 4978 and 4979 are functionally similar.

For the 3101 character mode models, in-storage buffers are used to simulate a buffered terminal such as the 4978.

For the 3101 block mode models, the following considerations apply:

- The field types supported are low-intensity (protected) and high-intensity (unprotected); other functions such as the highlighting or blinking of selected fields are not supported.
- The character in row 1, column 1 must be a protected blank.
- Each unprotected field must be immediately preceded or followed by a protected blank.
- No more than 127 unprotected fields are allowed on any screen.

The formatted full screen support for the 3101 described above is in addition to the basic unformatted support for the 3101 character mode models (or equivalent ASCII devices) in Version 1 of the Multiple Terminal Manager.

Following are the attachment methods supported for each of the various models and operational modes for the 3101 Display Terminal:

3101 Model/ Mode of Operation	Attachment Features			
	#7850	#1610 or #2091/ #2092	#2095/ #2096	#1310
Block Mode, Formatted (Models 20, 22 and 23)	X		X	X
Char. Mode, Formatted (all 3101 models capable)	X			
Char. Mode, Unformatted (all 3101 models capable)		X		

3270 Information Display System Support

Version 2 provides support for 3270 Information Display System devices attached via either BSC Single Line Control (#2074) or BSC 8-Line Control/4-Line Adapter (#2093/#2094) utilizing the EBCDIC transmission code.

- Formatted full screen support for 1920-character 3270 Display Stations.
- 3270 display contents may be printed on a 328X printer attached to the same control unit through the use of the PF2 key; only one 328X printer per control unit is supported.
- All 3270 Control Units must be attached to a single BSC multipoint line; only one BSC line with 3270 devices attached is supported per Multiple Terminal Manager task set.

Multiple Terminal Manager V2 (cont'd)

The following table summarizes the 3270 devices, device models, and attachment methods supported:

3270 Device	Model	Attachment Method			
		BSC	3271	3274	3276
3271 Control Unit	2	X			
3274 Control Unit	1C, 51C	X			
3276 Control Unit/ Display Station	2	X			
3277 Display Station	2		X	X	
3278 Display Station	2			X	X
3284/3286 Printer	1, 2		X	X	
3287 Printer	1, 2		X	X	X
3288 Line Printer	2		X	X	
3289 Line Printer	1, 2			X	X

Additional IBM Products Supported

The Multiple Terminal Manager supports each of the following IBM products as a teletypewriter:

- IBM Personal Computer with the Asynchronous Communications Adapter and utilizing the Asynchronous Communications Support licensed program or appropriate user programming.
- System/23 Datamaster with the Communications Adapter Feature and utilizing the Asynchronous Communications licensed program.
- Displaywriter system with a Communications Adapter and utilizing the Asynchronous Communications licensed program.

The Multiple Terminal Manager supports these products via the asynchronous communications attachments #1610 and #2091/#2092 in switched and point-to-point nonswitched connections.

Additional Disk File Support (FILEIO)

In addition to random, keyed direct and indexed file support, Version 2 includes consecutive file support. Consecutive files are handled the same as random files (fixed or fixed blocked format, access by relative record number, etc.). New records can be added at the logical end of the files without supplying a relative record number.

Communications Monitor (5719-CM1) Bridge Service

The Multiple Terminal Manager can now exchange messages with the Communications Monitor executing on the Series/1. This bridge service enables a transaction program to exchange messages with any device station or program station known to the Communications Monitor.

Terminal Controller Interface

The Terminal Controller provides a common interface for sharing terminals between subsystems. The Multiple Terminal Manager can now appear as a subsystem to the Terminal Controller. Note: The 3101 model 2 is not supported by the terminal controller interface.

Improved Installation Procedures

The installation of the Multiple Terminal Manager has been simplified through the use of a menu-like interface to the installation procedure. Installation time has been reduced by allowing the user to include pre-built object modules and pre-built sample and utility programs; thus, no assemblies of these programs are required at installation time.

New Utility Functions

New utility functions allow users at Multiple Terminal Manager displays to:

- Set the date and time
- Build an Indexed Access Method file
- Display disk file statistics
- DISPLAY dynamic storage and VCBA storage sizes
- Send messages between terminals (or broadcast)

New Usability Enhancements

New enhancements improve usability of the Multiple Terminal Manager and allow users to:

- Build an application which is not bound to a particular task set
- Utilize secondary storage for roll/in - roll/out of application programs
- More easily edit and build display screens
- Execute application programs with a pseudo terminal assigned, so as not to lock out the operator terminal during execution

CUSTOMER RESPONSIBILITIES

The customer is responsible for the installation and use of this licensed program. Refer to the user's guide *Creating Your Multiple Terminal Manager*, (SC34-1692) for information relating to generating a Realtime Programming System supervisor to support the desired configuration and creating the Multiple Terminal Manager.

SPECIFIED OPERATING ENVIRONMENT

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

HARDWARE REQUIREMENTS

- IBM 4952 and 4955 Processor (128K bytes of storage minimum)
- IBM 4962 Disk Storage Unit
- IBM 4963 Disk Subsystem
- IBM 4964 Diskette Unit
- IBM 4965 Diskette Drive and I/O Expansion Unit
- IBM 4966 Diskette Magazine Unit
- IBM 4973 Line Printer
- IBM 4974 Printer
- IBM 4975 Printer
- Display Stations and Terminal Devices

Formatted:

- IBM 3101 Display Terminal (Block and Character Mode)
- IBM 3270 Information Display System
- IBM 4978 Display Station
- IBM 4979 Display Station
- IBM 5251 Display Station (model 11)

Unformatted:

- IBM 3101 Display Terminal (Character Mode) or equivalent ASCII device
- Communications
 - Binary Synchronous Communications Single-Line Control (#2074)
 - Binary Synchronous Communications Single-Line Control/High Speed (#2075)
 - Binary Synchronous Communications 8-Line Control/4-Line Adapter (#2093/#2094)
 - Asynchronous Communications Single-Line Control (#1610)
 - Asynchronous Communications 8-Line Control/4-Line Adapter (#2091/#2092)
 - Multifunction Attachment (#1310)
 - Feature-Programmable 8-Line Communications Control/4-Line Communications Adapter (#2095/#2096)
 - SDLC Single Line Control (#2090)
 - Teletypewriter Adapter (#7850)

Terminal and Performance Considerations

The number of terminals that can be supported by the Multiple Terminal Manager is dependent upon storage availability, terminal type(s) selected and performance requirements of the user's application. Performance is dependent upon many factors; for example, the system hardware configuration, Realtime Programming System generation options selected, application program design, how often programs must access the terminals, etc. Analysis is required to evaluate expected performance.

SOFTWARE REQUIREMENTS

Version 2 requires the following IBM Series/1 licensed programs:

- Realtime Programming System Version 4, modification level 2 (5719-PC4) or Version 5 (5719-PC5). The Command Language Facility is required for installation and generation of the Multiple Terminal Manager.
- Program Preparation Subsystem Version 4, modification level 2 (5719-AS4) or Version 5 (5719-AS5) is required for the preparation of user applications.

For certain environments and functions, the following IBM Series/1 Realtime Programming System licensed programs may be required:

- Realtime Programming System Version 5 modification level 1 for 4965 and 4975 support
- IBM 4978 Support Programming RPQ Version 3 (5799-TCE), modification level 2 is required for IBM 4978 and/or 4979.
- IBM 5250 Information Display System Attachment Support (5719-TA1) is required for 5251 Model 11.
- Indexed Access Method (5719-AM1), modification level 2



PROGRAMMING RPQ

Multiple Terminal Manager V2 (cont'd)

- Indexed Access Method Version 2 (5719-AM2)
- FORTRAN IV Compiler and Object Support Library (5719-FO2) and Realtime Subroutine Library (5719-FO4)
- Mathematical and Functional Subroutine Library Version 2 (5719-LM2)
- COBOL Compiler and Resident Library (5719-CB1) and Transient Library (5719-CB2)
- COBOL Compiler and Resident Library Version 2 (5719-CB7) and Transient Library Version 2 (5719-CB8)
- PL/I Compiler and Resident Library Version 2 (5719-PL2) and Transient Library Version 2 (5719-PL4)
- Disk Spooling PRPQ (5799-TCH)

COMPATIBILITY

This PRPQ is compatible with the licensed programs which are identified in the "Software Requirements" section above.

DOCUMENTATION
(available from Mechanicsburg)

IBM Series/1 Realtime Programming System Multiple Terminal Manager Version 2 Programming RPQ P82622 Licensed Program Specifications (GC34-1691) ... IBM Series/1 Realtime Programming System Multiple Terminal Manager Version 2 Programming RPQ P82622 User's Guide (SC34-1692)



PROGRAMMING RPQ

**SERIES/1 REALTIME PROGRAMMING SYSTEM
JOB STREAM PROCESSOR
5799-TEC (PRPQ P82635)**

PURPOSE

Series/1 Job Stream Processor provides the Series/1 user with a batch processing facility without requiring the Program Preparation Subsystem. This program and separate offering provides a convenient method of invoking programs, communicating with these programs, and defining or creating the data sets the programs will use. The facilities of the Job Stream Processor are used to run programs on a Series/1 Production (non-development) system. The installation of this PRPQ is accomplished by a Command Language Facility Install command or a System Utility Command Stream.

CUSTOMER RESPONSIBILITIES

The customer is responsible for the installation and use of this licensed program.

SPECIFIED OPERATING ENVIRONMENT

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

HARDWARE REQUIREMENTS: None

SOFTWARE REQUIREMENTS

The minimum system for installation and program execution of this PRPQ is specified in the IBM Series/1 Realtime Programming System Version 5 (5719-PC5).

COMPATIBILITY

This PRPQ is compatible with the Series/1 Realtime Programming System Version 5 (5719-PC5).

DOCUMENTATION

(available from Mechanicsburg)

IBM Series/1 Job Stream Processor Licensed Programming Specifications (GC34-0398) ... IBM Series/1 Job Stream Processor Installation and User's Guide (SC34-1716).

PROGRAMMING RPQ

**SERIES/1 REALTIME PROGRAMMING SYSTEM
SNA REMOTE MANAGEMENT UTILITY
5799-TEF (PRPQ P82639)**

PURPOSE

Series/1 SNA Remote Management Utility is designed to allow the user to communicate between a host computer and remotely located Series/1 to perform various file, system maintenance, and system functions without the necessity of having an operator at the remote Series/1.

The SNA Remote Management Utility executing in a Series/1 provides the host processor with access to Series/1 Remote Management utility functions. Based on the host program's selection of the function, the host application program can perform operations such as file transfer to and from a Series/1, file creation or deletion, file maintenance and Series/1 program execution. Communication is performed on a processor-to-processor level using SNA/SDLC communications.

The Remote Management Utility can transfer the following:

- User data files
- User print files
- Utility command data sets
- Job stream processor command data sets
- User program files
- System program files
- Assembler output files addition, the SNA Remote Management Utility provides limited system maintenance functions which allow the user
- Application builder output files

In addition, the SNA Remote Management Utility provides limited system maintenance functions which allow the user to maintain the Realtime Programming System from a System/370 host computer.

The SNA Remote Management Utility is written in Series/1 Assembler language.

HIGHLIGHTS

The Remote Management Utility facilitates the operation of the remote Series/1 in a loosely-coupled distributed data processing system. It provides both a Series/1 program and VTAM application program - accessible either interactively via TSO, or via batch on a host System/370.

As a network management tool, the Remote Management Utility PRPQ provides the following:

- The ability to access a Series/1 from a System/370 terminal and issue Realtime Programming System operator commands. Most Realtime Programming System operator commands (except those that require operator intervention at the Series/1, such as inserting a diskette, or debug, which requires the PF3 key) can be performed as though the terminal were directly connected to the Series/1.
- The ability to send, receive, create, reset, or delete a data set on the remote Series/1.
- The ability to cause the Realtime Programming System to take a Series/1 storage dump (which can be sent to the host)
- The ability to queue a task on the remote Series/1. This includes the ability to execute the system utilities (SYSUTILS) remotely with disk input/output.
- The ability to shut down the Remote Management Utility at the remote Series/1 from a host System/370 VTAM connected terminal.
- The ability to access the remote Series/1 through TSO from a 3270 terminal that is attached to a System/370 as a local (either SNA or non-SNA), binary synchronous communication (BSC), SNA or SNA/SDLC display terminal.
- Time-stamped logging of all commands to a QSAM dataset.
- HELP assistance on TSO terminal.

The Remote Series/1 Management Utility is designed in a modular fashion and written using the Realtime Programming System structured macros; the host System/370 Remote Management Utility is written in System/370 Assembler.

DESCRIPTION

The following functions are supported between the host System/370 and the remote Series/1.

Function	Description
CREATE data set from remote	Requests the Utility to create a disk(ette) data set, member, or volume on the Series/1.

DELETE data set from remote	Requests the Utility to delete a disk(ette) data set, member, or volume on the Series/1.
DUMP Series/1 storage	Requests a dump of the current Realtime Programming System storage load to a predefined Series/1 disk(ette) data set.
LINK to Task Set on Remote	Requests the Utility to link to a named task set in the Utility partition upon normal termination.
QUEUE a Task Set on Remote	Requests the Utility to queue a named task set for execution in any valid partition.
RECEIVE data set from remote	Requests the Utility to receive a data set, member, or volume from the host and write it to a disk(ette) data set.
RESET data set on remote	Requests the Utility to reset the end-of-data indicator for a data set or member.
RESTART alternate system	Requests the Utility to initial program load (IPL) the alternate Realtime Programming System upon normal termination.
SEND data set to remote	Requests the Utility to read a disk(ette) data set, member, or volume and transmit it to the host.
SHUTDOWN RMU on remote	Requests normal termination of the Utility.
COMMAND Send Realtime Programming System command	Send command to the Realtime Programming System and receive reply. Reply is displayed on TSO terminal.

The session between the host System/370 and the remote Series/1 can be established using point-to-point leased or multipoint, or point-to-point switched telephone network lines. The network at the remote Series/1 must have been properly activated prior to session initiation from the host System/370.

CUSTOMER RESPONSIBILITIES

The customer is responsible for the installation and use of the licensed program. It is necessary to properly install the licensed programs both at the host System/370 and the Series/1 Realtime Programming System as described in the *User's Guide*. Responsibilities include assembly, installation, test and appropriate VTAM/NCP definitions at the host System/370, and installation using a Command Language Facility install file and test at the Series/1.

SPECIFIED OPERATING ENVIRONMENT

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

HARDWARE REQUIREMENTS

The following devices are supported by this PRPQ via IBM Series/1 Realtime Programming System Version 4 at the remote Series/1:

- IBM 4962 Disk Unit and 4964 Diskette Unit
- IBM 4963 Disk Subsystem
- IBM 4966 Diskette Magazine Unit

The Remote Management Utility permits access to the remote Series/1 via TSO from a 1920-character IBM 3270 terminal that is attached to an IBM System/370 as a local (either SNA or non-SNA) binary synchronous communications (BSC), SNA, or SNA/SDLC display terminal.

Communications from the host to the remote IBM Series/1 is via SDLC point-to-point leased or multipoint, or point-to-point switched telephone network.

- MVS Release 3.8 with TSO
- VTAM 2 and NCP/VS Release 5 and subsequent versions of VTAM/NCP.

SOFTWARE REQUIREMENTS

This PRPQ requires the IBM Series/1 Realtime Programming System, Versions 4 or 5 (5719-PC4 or 5719-PC5).

PROGRAMMING RPQ

SNA Remote Management Utility (cont'd)**COMPATIBILITY**

This PRPQ is compatible with the licensed programs which are identified in the "Specified Operating Environment" section above. In addition, this PRPQ is compatible with host communications facilities as identified in the pages for selected version of the Realtime Programming System.

DOCUMENTATION

(available from Mechanicsburg)

IBM Series/1 Realtime Programming System SNA Remote Management Utility User's Guide (SC34-1712) ... IBM Series/1 Realtime Programming System SNA Remote Management Utility Licensed Program Specifications (GC34-1711).

PROGRAMMING RPQ

SERIES/1 LETTER WRITER VERSION 1
5799-TEH (P82630)**PURPOSE**

Series/1 Letter Writer provides letter writing capabilities for the Series/1. This program permits multiple users to create, edit, print and manage letters or multi-page documents via 3101 Display Terminals. This program also provides the capability to merge defined data processing files with user-created letters to produce integrated mass mailings. The number of terminals that can be supported and the performance that can be expected is dependent upon a number of factors, for example: System configuration ... available storage ... other applications running in the same system. Boca Raton MSC approval is required prior to proposing. Contact the manager of RPS/Communications Systems Support for approval.

HIGHLIGHTS

The Series/1 Letter Writer PRPQ (5799-TEH) allows the Series/1 to be used as a letter-writing system. It provides the ability to merge data processing files with a user-created document to produce customized documents for mass mailing or other applications.

The Series/1 Letter Writer consists of a number of programs that execute under control of the Realtime Programming System and the Multiple Terminal Manager. The following Document Edit functions are provided:

- Delete Character
- Delete/Restore Word
- Delete/Restore Sentence
- Delete/Restore Line
- Delete/Restore Paragraph
- Delete/Restore Page
- Move Unit (via Delete and subsequent Restore actions)
- Copy Unit (via Delete/Restore/Restore actions)
- Insert Character
- Bulk Text Insert mode
- Margin Definition
- Tab Definition
- Text Alignment Definition (left, right, center).
- Text Justification (not supported by feature codes #5052, #5053 or #5054)
- Text Adjustment Definition (text flow, or leave as entered)
- Begin Continuous Underscore
- Word/End Continuous Underscore
- Dynamic On-screen Reformatting
 - Most simple reformatting actions occur in real time, as the user types (Auto Work Wrap, Character Delete/Insert, etc.)
 - All other reformatting occurs each time the user presses the ENTER key.
- 'Ghost' Cursor (an indicator in the screen heading that graphically shows column position)
- Tab Rack (identifies tab and margin settings at all times)
- Edit Status heading (other information about the edit session):
 - Document Name
 - Page Number
 - Line Number on Page
 - Adjust Setting
 - Alignment Setting
 - Control Character Type
 - Edit/Browse Mode
 - Scroll Amount
- Automatic date insertion at print time (not supported by feature codes #5052, #5053 or #5054)
- Margin text and automatic page numbering (not supported by feature codes #5052, #5053 or #5054)
- Standard Paragraph Support: This allows the user to interactively merge documents by selecting pages (from another document) to be copied into the current document being edited. (Only supported by feature codes #5058, #5059, #5060)

DESCRIPTION

A Spelling Aid is provided with a dictionary containing up to approximately 130,000 predefined words. The dictionary consists of a combination of General, Medical and Legal dictionaries. Up to 2,000 user-defined words may also be defined and included in the dictionary. Operationally, the user places the cursor under a word whose spelling is questioned. The 'Spelling Verification' key causes a search for the word

in the dictionary. If it is found, the user is notified that the word is correctly spelled. If it is not found, the Spelling Aid will display a number (possibly none) of candidate words whose spelling is phonetically close to the word on the screen. The user may select one of these words to automatically replace the one in question.

The installation process will allow the user to select the General dictionary only (approximately 80,000 words), or the combined General/Medical/Legal dictionary (approximately 130,000 words).

Document access control is provided via authorized user names, passwords, user access codes, and document access levels. Any individual user may only view a subset of the documents in the document library as defined by the combination of user access codes and document access levels. A document may not be modified by general users (other than the owner) if it is marked 'Read-Only'. Document lists displayed interactively contain status information such as Date-Last-Accessed, Date-Last-Archived, Date-Last-Printed, etc.

The Letter Writer PRPQ also provides a number of full-screen-oriented utilities. These utilities support the following functions:

- Select Documents via document access lists
- Select Documents via Principal Name (not supported by feature codes #5052, #5053 or #5054)
- Copy Document
- Rename Document
- Delete Document
- Place Document on Class Queue for Printing
- Manage Print Class Queues
- Proof Print
- Pagination
- Start/Stop Printer
- Manage Printer
- Archive/Retrieve Documents
- Manage Document Library
- Build User Spelling Aid Dictionary
- Browse Archive/Print Log
- Manage User/Document Passwords, Access Codes, and Access Levels

The system is designed for use by non-data processing personnel.

The Letter Writer program can be used in conjunction with other data processing application products in commercial environments such as insurance agencies.

These application programs may be written to control specific Letter Writer functions (Print, Edit, Browse, Copy, Rename, Delete, etc.) on behalf of the terminal user. For example, a Multiple Terminal Manager application program may directly invoke the Letter Writer Edit screen for a particular document on behalf of the terminal user. Feature codes #5052, #5053 and #5054 allow direct control of the Print function only.

CUSTOMER RESPONSIBILITIES

The customer is responsible for the installation and use of the program.

SPECIFIED OPERATING ENVIRONMENT

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

HARDWARE REQUIREMENTS

The hardware required is the same as for the base operating system with at least one additional IBM 3101 display terminal.

Feature codes #5052, #5053, #5054, #5055, #5056, and #5057 require a minimum of 128K bytes of storage for execution. Feature codes #5058, #5059, and #5060 require a minimum of 192K.

SOFTWARE REQUIREMENTS

The IBM Series/1 Letter Writer PRPQ can be obtained with two types of installation procedures; one designed for ease-of-use, and one designed for flexibility.

The installation procedure designed for ease-of-use provides pregenerated Realtime Programming Systems and a pregenerated Multiple Terminal Manager, as well as a question and answer-driven procedure to install Letter Writer and the pregenerated systems. The installation procedure designed for flexibility provides some usability aids to help the user do custom generations of the Realtime Programming System and the Multiple Terminal Manager.

S/1 Letter Writer Version 1 (cont'd)**IBM 3101 Display Terminal**

All feature codes support all models of the IBM 3101 in character mode only via the teletypewriter adapter (feature #7850) or feature-programmable multiline communications adapters (8-line controller feature number #2095 and 4-line adapter feature number #2096). Feature codes #5055, #5056, #5057, #5058, #5059, and #5060 add support for the multifunction attachment (feature #1310).

It is recommended that the IBM 3101 Display Terminals operate with a 9,600 bps line speed. Note that the Feature-programmable Multiline Communications Adapters support a maximum aggregate throughput rate of 64,000 bps. Therefore, only six IBM 3101 Display Terminals running at 9,600 bps can be configured to a single Feature-programmable 8-line Controller.

Printer Support

All feature codes support the IBM 4974 printer and the IBM 4973 line printer for medium and high speed proof printing of documents. The line printer requires the 96-character print belt (#9492). All feature codes also support teletypewriter-type printers with the 96-character ASCII character set.

Feature codes #5055, #5056, #5057, #5058, #5059 and #5060 support the IBM 4975 printer. The IBM 4975 (models 1L and 2L only) printer is supported with the following capabilities:

- Proportional spacing in quality mode
- Ten-pitch font in draft mode
- Nominal ten or twelve-pitch fonts in quality mode
- Automatic quality mode for final print

Feature Code #5052 - Letter Writer Version 1 with no Pregenerated Systems**Prerequisites:**

- Realtime Programming System Version 4.2 (5719-PC4)
- Multiple Terminal Manager Version 1.2 (5799-TCY)

Prerequisite: (for custom installation process only)

- Program Preparation Subsystem Version 4.2 (5719-AS4)

Feature Code #5053 - Letter Writer Version 1 with Basic Pregenerated Systems

Prerequisite: (for custom installation process only)

- Program Preparation Subsystem Version 4.2 (5719-AS4)

The user must be a licensed user for the following products:

- Realtime Programming System Version 4.2 (5719-PC4)
- Multiple Terminal Manager Version 1.2 (5799-TCY)

Feature Code #5054 - Letter Writer Version 1 with pregenerated systems packaged with the 4978 Support, Indexed Access Method and Disk Spooling licensed programs

Prerequisite: (for custom installation process only)

Program Preparation Subsystem Version 4.2 (5719-AS4)

The user must be a licensed user for the following products:

- Realtime Programming System Version 4.2 (5719-PC4)
- Multiple Terminal Manager Version 1.2 (5799-TCY)
- Disk Spooling Version 3.2 (5799-TCH)
- Indexed Access Method Version 1.2 (5719-AM1)
- IBM 4978 Display Station Support Version 3.2 (5799-TCE)

Feature Code #5055 - Letter Writer Version 1 with No Pregenerated Systems**Prerequisites:**

- Realtime Programming System Version 5.1 (5719-PC5)
- Multiple Terminal Manager Version 1.2 (5799-TCY)

Prerequisite: (for installation process only)

- Program Preparation Subsystem Version 5.1 (5719-AS5)

Feature Code #5056 - Letter Writer Version 1 with Basic Pregenerated Systems

Prerequisite: (for custom installation process only)

- Program Preparation Subsystem Version 5.1 (5719-AS5)

The user must be a licensed user for the following products:

- Realtime Program System Version 5.1 (5719-PC5)
- Multiple Terminal Manager Version 1.2 (5799-TCY)

Feature Code #5057 - Letter Writer Version 1 with Pregenerated systems packaged with the Indexed Access Method Licensed Program

Prerequisite: (for custom installation process only)

- Program Preparation Subsystem Version 5.1 (5719-AS5)

The user must be a licensed user for the following products:

- Realtime Programming System Version 5.1 (5719-PC5)
- Multiple Terminal Manager Version 1.2 (5799-TCY)
- Indexed Access Method Version 1.2 (5719-AM1)

Feature Code #5058 - Letter Writer Version 1 with no pregenerated systems

Prerequisites:

- Realtime Programming System Version 5.2 (5719-PC5)
- Multiple Terminal Manager Version 3.0 (5719-MT1)
- Program Preparation Subsystem Version 5.1 (5719-AS5) (for installation process only)

Feature Code #5059 - Letter Writer Version 1 with Basic Pregenerated Systems

Prerequisite: (for custom installation process only)

- Program Preparation Subsystem Version 5.2 (5719-AS5)

The user must be a licensed user for the following products:

- Realtime Programming System Version 5.2 (5719-PC5)
- Multiple Terminal Manager Version 3.0 (5719-MT1)

Feature Code #5060 - Letter Writer Version 1 with Pregenerated System packaged with the Indexed Access Method licensed program

Prerequisite: (for custom installation process only)

- Program Preparation Subsystem Version 5.2 (5719-AS5)

The user must be a licensed user for the following products:

- Realtime Programming System Version 5.2 (5719-PC5)
- Multiple Terminal Manager Version 3.0 (5719-MT1)
- Indexed Access Method Version 2.0 (5719-AM2)

Note: The Programming Preparation Subsystem Version 5.2 (5719-AS5) and the Realtime Programming System Version 5.2 (5719-PC5) are available as maintenance releases of these products.

DOCUMENTATION

(available from Mechanicsburg)

IBM Series/1 Letter Writer Version 1 Programming RPQ P82630 Licensed Programming Specifications (GH30-0711) ... IBM Series/1 Letter Writer Version 1 Programming RPQ P82630 Operation Manual (SB30-0461) ... IBM Series/1 Letter Writer Version 1 Programming RPQ P82630 User Procedure Notebook (SB30-0462) ... IBM Series/1 Letter Writer Version 1 Programming RPQ P82630 Installation Manual (SB30-0463) ... IBM 3101 Display Terminal Keyboard Label Series/1 Letter Writer Programming RPQ P82630 (SB30-0452).

PROGRAMMING RPQ

**SERIES/1 CONTROL PROGRAM SUPPORT
4965 DISKETTE DRIVE
5799-TEK (PRPQ P82636)****PURPOSE**

This Series/1 PRPQ provides the Series/1 Control Program Support user with basic software to support the 4965 Diskette Drive. This support enables Control Program Support 4964 Diskette device users to upgrade to a larger and more flexible diskette media. It also allows Control Program Support programs executing on a 4952 mdl C to access the integrated diskette drive(s) in that processor.

HIGHLIGHTS

The Control Program Support 4965 Diskette Device PRPQ provides the user with a basic read/write level of support (via cylinder, head, sector mode). Diskette Types 1, 2, and 2D are supported. Standalone utilities are provided for Copy and Diskette Initialization. IPL support is provided.

This PRPQ is also applicable to the diskette drive included with the 4952 model C Processor. The use of Control Program Support with the 4952 model C Processor provides the user with the capability of tailoring an application with a minimum storage, diskless configuration.

CUSTOMER RESPONSIBILITIES

The customer is responsible for the installation and use of this licensed program.

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 requirement for this PRPQ is:

- IBM 4965 Diskette Drive and I/O Expansion Unit or IBM 4952 model C processor
- Minimum Control Program Support System Configuration

There may be additional hardware requirements dependent upon the particular application.

SOFTWARE REQUIREMENTS

IBM Series/1 Control Program Support PRPQ (5799-TAA).

DOCUMENTATION

(available from Mechanicsburg)

IBM Series/1 Control Program Support 4965 Diskette Drive User's Guide PRPQ P82636 (SC34-1718) ... IBM Series/1 Control Program Support 4965 Diskette Drive Licensed Program Specification (GC34-1717)

PROGRAMMING RPQ

**SERIES/1 EVENT DRIVEN EXECUTIVE
HOST COBOL
5799-TEL (PRPQ P82647)****PURPOSE**

Host COBOL Compiler and Resident Library for the Series/1 Event Driven Executive provides a host System/370 compilation facility for users of the Series/1 Event Driven Executive. COBOL programs may be compiled on the host machine and the object code transmitted to the Series/1 for execution. The level of COBOL language supported on this Host COBOL is equivalent to that available for the Event Driven Executive COBOL Version 2 on the Series/1, so that no source code modification is required to transfer from host to native compilation. The language facilities provided in Host COBOL are described in the *Series/1 COBOL Language Reference Manual (GC34-0392)*.

HIGHLIGHTS

- Language
 - Series/1 Host COBOL is designed according to specifications for American National Standard (ANS) COBOL X3.23-1974 as understood and interpreted by IBM as of August, 1981. Series/1 Host COBOL exceeds the Low Intermediate Level COBOL as defined by the Federal Information Processing Standards - FIPS 21-1 with the exception of the RERUN clause.
- System Benefits
 - Allows multiuser/interactive compilation capability on System/370 with access to System/370 - Structured Programming Facility (SPF) and Time Sharing Option (TSO) editing.
 - Allows Series/1 program development to conform to large account control procedures established on the System/370, such as maintaining user program libraries or developing new applications in a controlled fashion.
- Features
 - Allows programs to be compiled on a System/370 and produce Series/1 object modules.
- Extensive User Options
 - Source listings - Object listings
 - Cross-reference - Statement offset listing
 - Storage map of variables - MAP370 listing option
- Program Development and Productivity Aids
 - FIPS Flagger enables quick and easy identification of COBOL source statements which exceed the specified Federal Information Processing Standards language level.

CUSTOMER RESPONSIBILITIES

The customer is responsible for the installation and use of the licensed program.

SPECIFIED OPERATING ENVIRONMENT

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

HARDWARE REQUIREMENTS

- For Host Program Compilation:
 - An IBM System/370 configuration capable of supporting OS/VS2 (MVS).
- For transmission from the System/370 to Series/1:
 - Binary Synchronous Communications - comparable binary synchronous capabilities on System/370 to support the binary synchronous feature for Series/1.

SOFTWARE REQUIREMENTS

- For Host Program Compilation:
 - IBM OS/VS2 (MVS)
- For Host Communication Facility if \$HCFUT1 is used on the Series/1:
 - IBM System/370 Event Driven Executive Host Communication Facility IUP (5796-PGH)
- For Program Preparation on Series/1
 - IBM Series/1 Event Driven Executive Basic Supervisor and Emulator Version 3.1 (5719-XS3)
 - IBM Series/1 Event Driven Executive Utilities Version 3.1 (5719-UT5)
- For Program Execution on the Series/1
 - IBM Series/1 Event Driven Executive Basic Supervisor and Emulator Version 3.1 (5719-XS3)
 - IBM Series/1 Event Driven Executive COBOL Transient Library Version 2 (5719-CB6)

The Host COBOL is supplied in load module form on tape for System/370. The installation consists of allocating data sets on the host system and loading the installation tape into the appropriate data sets.

**DOCUMENTATION
(available from Mechanicsburg)**

IBM Series/1 Host Event Driven Executive COBOL Programming RPQ P82647 Licensed Program Specifications (GC34-1720) ... IBM Series/1 Event Driven Executive Host COBOL Programming RPQ P82647 Installation and User's Guide (SC34-0412) ... IBM Series/1 COBOL Language Reference Manual (GC34-0392) ... IBM Series/1 Event Driven Executive COBOL Version 2 Programmer's Guide (SC34-0393).

PROGRAMMING RPQ

**SERIES/1 REALTIME PROGRAMMING SYSTEM
HOST COBOL
5799-TEP (PRPQ P82648)****PURPOSE**

Host COBOL Compiler and Resident Library for the Series/1 Realtime Programming System provides a host S/370 compilation facility for users of the Realtime Programming System. COBOL programs may be compiled and debugged on the host machine and the object code transmitted to the Series/1 for execution. The level of COBOL language supported on this Host COBOL is equivalent to that available for the Realtime Programming System COBOL Version 2 on the Series/1, so that no source code modification is required to transfer from host to native compilation. The language facilities provided in Host COBOL are described in the *Series/1 COBOL Language Reference Manual* (GC34-0392).

HIGHLIGHTS

- Language
 - Series/1 Host COBOL is designed according to specifications for American National Standard (ANS) COBOL X3.23-1974 as understood and interpreted by IBM as of August, 1981. Series/1 Host COBOL exceeds the Low Intermediate Level COBOL as defined by the Federal Information Processing Standards - FIPS 21-1 with the exception of the RERUN Clause.
- System Benefits
 - Allows multiuser/interactive compilation capability on System/370 with access to System/370 - Structured Programming Facility (SPF) and Time Sharing Option (TSO) editing.
 - Allows Series/1 program development to conform to large account control procedures established on the System/370, such as maintaining user program libraries or developing new applications in a controlled fashion.
- Features
 - Allows programs to be compiled on a System/370 and produce Series/1 object modules.
- Extensive User Options
 - Source listings - Object listings
 - Cross-reference - Statement offset listing
 - Storage map of variables - MAP370 listing option
- Program Development Aids
 - FIPS Flagger enables quick and easy identification of COBOL source statements which exceed the specified Federal Information Processing Standards language level.

CUSTOMER RESPONSIBILITIES

The customer is responsible for the installation and use of the licensed program.

SPECIFIED OPERATING ENVIRONMENT

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

HARDWARE REQUIREMENTS

For host program compilation: An IBM System/370 configuration capable of supporting OS/VS2 (MVS). Additional communication facilities are required if using the System/370 Program Preparation for Series/1 (5798-NNQ) and Series/1 Native Application Load Facility - Version 2 (5798-RBR) or SNA Remote Management Utility (5799-TEF) for Series/1 - System/370 communication.

SOFTWARE REQUIREMENTS

- For host program compilation:
 - IBM OS/VS2 (MVS)
- For taskset creation on the System/370
 - IBM System/370 Program Preparation Facilities for Series/1 (5798-NNQ Version 1.2)
 - IBM Series/1 COBOL Version 2 Transient Library (5719-CB8)
- For taskset creation on the Series/1
 - IBM Series/1 Realtime Programming System Version 5 (5719-PC5)
 - IBM Series/1 Program Preparation Subsystem Version 5 (5719-AS5)
 - IBM Series/1 COBOL Transient Library Version 2 (5719-CB8)
- For program transmission of object programs and task set to Series/1
 - IBM Series/1 native Application Load Facility - Version 2 (5798-RBR)
 - or
 - IBM Series/1 Realtime Programming System SNA Remote Management Utility PRPQ (5799-TEF)

DOCUMENTATION

(available from Mechanicsburg)

IBM Series/1 Realtime Programming System Host COBOL Programming RPQ P82648 Licensed Program Specifications (GC34-1721) ...
IBM Series/1 Realtime Programming System Host COBOL Programming RPQ P82648 Installation and User's Guide (SC34-0413) ...
IBM Series/1 COBOL Language Reference Manual (GC34-0392) ...
IBM Series/1 Realtime Programming System COBOL Version 2 Programmer's Guide (SC34-0394).

PROGRAMMING RPQ

**SERIES/1 LETTER WRITER VERSION 2
5799-TEY (P82667)**

PURPOSE

Series/1 Letter Writer Version 2 provides letter writing capabilities for the Series/1. This program permits multiple users to create, edit, print and manage letters or multi-page documents via 3101 Display Terminals. This program also provides the capability to merge defined data processing files with user-created letters to produce integrated mass mailings. The number of terminals that can be supported and the performance that can be expected is dependent upon a number of factors, including: System configuration ... available storage ... other applications running in the same system.

DESCRIPTION

VERSION 2 ENHANCEMENTS

The Series/1 Letter Writer Version 2 provides significant enhancements to Version 1 in the areas of document creation and retrieval, editor, and print functions. These enhancements consist of the following:

- **Global Find/Replace**
The ability to find a word, phrase or character string in a document and to replace the word, phrase or character string as desired.
- **Block Units**
The ability to copy, move and delete text starting and ending at any location within a page specifically defined by the user.
- **Copy/Move Within Document**
The ability to copy/move text within the document currently being edited.
- **User Profile**
Provides each user with certain unique attributes/defaults when using the Letter Writer system.
- **Folder Support**
Provides for storing/retrieving documents in topical grouping; that is, mail, activity reports, etc.
- **Automatic Hyphenation**
Hyphenation will be performed automatically as required during the pagination process.
- **Global Spelling Verification**
The ability to locate misspelled words in a document. Once found, the user can request the system to provide candidate words which are phonetically close to the misspelled word. The user can choose one of the candidate words to replace the misspelled word in the text. Alternatively, the user may simply correct the word by typing over it, or the Find/Replace function may be used to correct the spelling throughout the document.
- **Multiple Printer Managers**
Multiple batch partitions can be started. Each partition can control a specific printer.
- **Widow Line Control**
Insures that widow lines will not occur. A 'Widow' line is a single line that begins or ends a paragraph and (because of the number of print lines on a page) appears on the top or bottom of a page.
- **5218 Printer support**
- **Daisy wheel quality printing**
- **Standard Paragraph support**
This will allow the user to interactively merge documents by copying or moving pages of another document to or from portions of the current page being edited.

A print include capability is also provided to allow another document or a page of another document to be merged into the document being printed.

HIGHLIGHTS

The Series/1 Letter Writer PRPQ (5799-TEY) allows the Series/1 to be used as a letter writing system. It provides the ability to merge data processing files with a user-created document to produce customized documents for mass mailing or other applications.

The Series/1 Letter Writer consists of a number of programs that execute under control of the Realtime Programming System and the Multiple Terminal Manager.

1. The following Document Edit functions are provided:
 - Global Find/Replace
 - Global Spelling Verification
 - Delete Character

- Delete/Restore text units
- Move Text Unit
- Copy Text Unit
- Supported text units:
 - Word
 - Sentence
 - Line
 - Paragraph
 - Page
 - Block
- Insert Character
- Bulk Text Insert mode
- Margin Definition
- Tab Definition
- Text Alignment Definition (left, right, center)
- Text Justification
- Text Adjustment Definition (text flow, or leave as entered)
- Begin Continuous Underscore
- Word/End Continuous Underscore
- Dynamic On-Screen Reformatting
 - Most simple reformatting actions occur in real time, as the user types (Auto Word Wrap, Character Delete/Insert, etc.)
 - All other reformatting occurs each time the user presses the 'ENTER' key.
- 'Ghost' Cursor (an indicator in the screen heading that graphically shows column position)
- Tab Rack (identifies tab and margin settings at all times)
- Edit Status heading (other information about the edit session):
 - Document Name
 - Page Number
 - Line Number on Page
 - Adjust Setting
 - Alignment Setting
 - Control Character Type
 - Edit/Browse Mode
 - Scroll Amount
- Automatic date insertion at print time
- Margin text and automatic page numbering
A Spelling Aid is provided with a dictionary containing up to approximately 250,000 predefined words. The dictionary consists of a combination of General, Medical and Legal dictionaries. Up to 2,000 user-defined words may also be defined and included in the dictionary. Operationally, the user specifies that the next misspelled word be located. When the word is found, the system will display a number of candidate words (possibly none) whose spelling is phonetically close to the word in question. The user may select one of these candidates to automatically replace the word in question. The user can then proceed to find the next misspelled word until all misspelled words are found. Once a misspelled word is found, it can be replaced throughout the document using the "Global Find/Replace" procedure. The installation process will allow the user to select the General dictionary only (approximately 130,000 words), or the combined General/Medical/Legal dictionary (approximately 250,000 words).
- 2. Document Management
Document management provides the security for Letter Writer documents.
 - Control Document Access
Documents are secured via authorized user names, passwords, user access codes, and document access levels. Any individual user may only view a subset of the documents in the document library as defined by the combination of user access codes and document access levels.
 - Select Documents via document access lists: Document lists displayed interactively contain status information such as Date-Last-Accessed, Date-Last-Archived, Date-Last-Printed, Titles, Principal Owner, etc.
 - Select Documents via Folders
 - Select Documents via Principal Name
 - Select Documents via Owner ID

PROGRAMMING RPQ**Letter Writer V2 (cont'd)**

- Provide Modification Security: A document may not be modified by other users if the owner has indicated that the document is "Read-Only" or "Read-Copy".

3. Printer Management

Printer management controls the actual printing of your documents. Some of its functions are:

- Place Document on Class Queues for Printing
 - Manage Print Class Queues
 - Manage the Physical Printers
 - Merge standard paragraphs into documents for Mass Mailings
 - Auto hyphenation
 - Keep and widow line control
 - Proof Print
 - Pagination
- 4. Letter Writer Utilities**

Letter Writer also provides a number of full-screen oriented utilities. These utilities provide the ability to define where your document should reside and what type of security should be associated with users and documents.

- Copy Documents Within/Between Folders
- Move Documents Within/Between Folders
- Delete Documents
- Rename Documents
- Modify Document Descriptions
- Modify Document Access Information
- Archive/Retrieve Documents
- Manage Document Library
- Build User Spelling Aid Dictionary
- View Archive/Print Logs
- Manage User/Document Passwords, Access Codes, and Access Levels

The system is designed for use by non-data processing personnel.

The Letter Writer product can be used in conjunction with other data processing application products in commercial environments such as insurance agencies. These application programs may be written to control specific Letter Writer functions (Print, Edit, Browse, Copy, Rename, Delete, etc.) on behalf of the terminal user. For example, a Multiple Terminal Manager application program may directly invoke the Letter Writer Edit screen for a particular document on behalf of the terminal user.

CUSTOMER RESPONSIBILITIES

The customer is responsible for the installation and use of the program.

SPECIFIED OPERATING ENVIRONMENT

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

HARDWARE REQUIREMENTS

The hardware required is the same as for the base operating system with at least one additional IBM 3101 Display Terminal. A minimum of 192K bytes of storage are required for execution.

Version 2 of Letter Writer supports all models of the IBM 3101 Display Terminals in character mode only via the Teletypewriter Adapter (feature #7850) or Feature-programmable Multiline Communications Adapters (8-line controller feature #2095 and 4-line adapter feature #2096), or the Multifunction Attachment (feature #1310). The Feature-programmable Adapters or Multifunction Attachments are preferred due to performance considerations.

It is recommended that the 3101 Display Terminals operate with a 9600 bps line speed. Note that the Feature-programmable Multiline Communications Adapters support a maximum aggregate through-put rate of 64,000 bps. Therefore, only six 3101 Display Terminals running at 9600 bps can be configured to a single Feature-programmable 8-line Controller.

SOFTWARE REQUIREMENTS

The IBM Series/1 Letter Writer PRPQ can be obtained with two types of installation procedures; one designed for ease-of-use and one designed for flexibility.

The installation procedure designed for ease-of-use provides pregenerated Realtime Programming Systems and a pregenerated Multiple Terminal Manager, as well as a question and answer-driven

procedure to install Letter Writer and the pregenerated systems. The installation procedure designed for flexibility provides some usability aids to help the user do custom generations of the Realtime Programming System and the Multiple Terminal Manager.

Feature Code #5061 - Letter Writer Version 2 with no pregenerated systems

Prerequisites:

- Realtime Programming System Version 5.2 (5719-PC5)
- Multiple Terminal Manager Version 3.0 (5719-MT1)
- Program Preparation Subsystem Version 5.2 (5719-AS5) (for installation process only)

Feature Code #5062 - Letter Writer Version 2 with Basic Pregenerated Systems

Prerequisite: (for custom installation process only)

- Program Preparation Subsystem Version 5.2 (5719-AS5)

The user must be a licensed user for the following products:

- Realtime Programming System Version 5.2 (5719-PC5)
- Multiple Terminal Manager Version 3.0 (5719-MT1)

Note: The Program Preparation Subsystem Version 5.2 (5719-AS5) and the Realtime Programming System Version 5.2 (5719-PC5) are available as maintenance releases of these products.

Version 2 Printer Support

- Teletypewriter-type printers with the 96-character ASCII character set via the Teletypewriter, Multifunction, or Feature-programmable Adapters. Only a subset of the standard ASCII control characters are used by the Letter Writer product to control the printer (CR and LF).
- IBM 4974 and 4973. The 4973 Line Printer requires the 96-character print belt (feature #9492).
- IBM 4975 (models 1L and 2L) with the following capabilities:
 - Proportional spacing in quality modes
 - Ten-pitch font in draft mode
 - Nominal ten or twelve-pitch fonts in quality modes
 - Automatic quality mode for final print
 - Automatic draft mode for proof print
- IBM 5218 Models A1 and A2.

This printer can only be used by Letter Writer. It can not be used as a system printer. This is the same printer that is used on the IBM Display Writer which provides 'daisy-wheel' quality print.

DOCUMENTATION

(available from Mechanicsburg)

IBM Series/1 Letter Writer Version 2 Programming RPQ P82667 Licensed Programming Specifications (GH30-0713) ... Installation Manual IBM Series/1 Letter Writer Version 2 Programming RPQ P82667 Installation Manual (SB30-0467) ... IBM Series/1 Letter Writer Version 2 Programming RPQ P82667 Operation Manual (SB30-0465) ... IBM Series/1 Letter Writer Version 2 Programming RPQ P82667 Procedure Notebook (SB30-0466) ... IBM 3101 Display Terminal Keyboard Label Series/1 Letter Writer Programming RPQ P82667 (SB30-0468)

PROGRAMMING RPOs

**SERIES/1 VIDEOTEX SYSTEM (SVS/1)
VERSION 1 RELEASE 1
5799-TFN****PURPOSE**

The Series/1 Videotex System provides a videotex information storage and retrieval facility on Series/1. When used with videotex terminals conforming to Prestel* Terminal Specification, or to the North American Presentation Level Protocol Syntax (NAPLPS)**, this program will enable the implementation of private videotex systems within business enterprises and establishments.

* Prestel is a registered trademark of British Telecom, Ltd.

** NAPLPS is a proposed Videotex protocol in the U.S. and Canada.

OVERVIEW

Videotex is a generic term used to describe a means of communicating to casual users, by means of switched public telephone facilities and suitable television display terminals, 'pages' or 'frames' of computer-based information.

In general, the terminals may be either properly-configured business terminals, or properly-adapted residential television sets.

The 'pages' or 'frames' of data displayed on the terminals can contain both textual and graphic information and typically use a high level of color content to present a more effective image to the user.

A simple numeric keypad or alphameric keyboard associated with the television set or terminal enables a requesting user to specify the desired information either through a sequence of responses to displayed options (i.e., a menu), or by directly accessing a specific page of information by its reference number.

Videotex systems are designed to be simple to use. Taking advantage of color, text, graphics, and a general popular familiarity with television sets, videotex systems can be used without special training to provide a new means of retrieving or distributing information quickly and effectively.

Public videotex systems are currently in operation or under development in several countries throughout the world. Depending upon the country involved, these systems go by such names as Prestel*, Teletel, Telidon, Bildschirmtext, and Viewdata. These systems are generally operated by the postal, telephone, and telegraph agency (PTT) within each country, and generally supply, on an unrestricted basis, information of general interest to subscribers.

In some countries, private videotex systems are also in operation. These systems are used within business enterprises to create, maintain and distribute information of specific importance to such enterprises. This information can be supplied, under controlled access conditions, to either specific individuals or groups of such individuals within an enterprise, or to an entire enterprise population.

HIGHLIGHTS

The Series/1 Videotex System (SVS/1) is a licensed program which facilitates the implementation of private videotex systems using the Series/1. This system, designed to operate as an application program under control of the Series/1 Event Driven Executive (EDX) Operating System, is functionally similar to the British Telecom PRESTEL* system in use in the United Kingdom. It includes a number of features which take advantage of specific Series/1 capabilities. Among these features are:

- User-written program interface
- Frame creation
- Data security
- Data entry
- Message exchange
- Transaction logging
- Data base bulk update
- Host communication support
- Teleconferencing
- Billboard

Since EDX supports multiple, concurrently-executing application programs, other IBM-supplied or user-written programs may be executed concurrently with SVS/1, subject to the availability of relevant Series/1 system resources, such as memory and communications line handling capacity. Such programs may make use of subroutines provided with SVS/1 which allow for extracting videotex data base (VDB) data in real time, thus providing a significant enhancement to the basic videotex system.

DESCRIPTION

Expanding on the features identified above, SVS/1 provides the following:

- Functional similarity to the British Telecom PRESTEL* system, including response frame/page format and terminal user command formats for functions which are common to both systems.
- Support for 32 input/output ports, for concurrent operation by end-users at up to 32 connected videotex terminals.
- Support for managing and retrieving concurrently both Prestel* and PLP frames of information from the videotex system data base. A page of information consists of one or more frames. Actual frame storage capacity will depend on disk configuration selected.
- Varying levels of data security through the use of individual user identity and password combinations, in conjunction with a standard sign-on procedure. Further access restriction can be imposed by defined security levels and defined user groups associated with individual frames. User management is responsible for evaluating, selecting, applying and implementing such features and for the appropriate administration and application controls.
- Data entry capability using 'prompt-oriented' response frames. The user fills in the blank fields and 'sends' the frame to the system for retrieval by an associated program. The sender's name, address and telephone number, plus the current date, can be added automatically by the system. Captured data is held by the system for access directly by videotex terminals, or for subsequent processing by related programs.
- Ability to send messages to other users or groups of users. The sender's name and address, plus current date and time, can be added to the message automatically by the system.
- A transaction logging facility with time-stamps and transaction information such as user number and page number. This file may be analyzed via user-written EDX programs to produce an audit trail, usage statistics, and page cost allocations.
- A user-program interface and new host access subroutines allows the user to initiate programs written in high-level languages for the purpose of accessing either host or local data contained in files other than the VDB, for display at the videotex system terminal. These programs use input parameters created via response-frame input. These parameters may be used to update data files, or to form inquiries against data files.
- The ability for one user terminal to simultaneously display a frame to multiple user terminals to enable Videotex Teleconferencing.
- Support for a continuous wrap-around display or 'billboarding' of videotex frames.
- Page numbering scheme N(page).N(frame) which supports 64 frames-per-page.
- Support for bulk updating of videotex data base frame information from devices supported by the EDX utility set, e.g., communications link, magnetic tape or diskette. This data must either be in a prescribed SVS/1 format, or in the format specified by the British Telecom PRESTEL* Bulk Update Technical Specification, April 1981.
- Support for backup of data base to tape and diskette.
- A migration utility which will convert an SVS/1 Version 1.0 data base to Version 1.1 format.
- System Controller functions including:
 - Start-up and shut down management
 - Videotex system data base management
 - Security control
 - Error logging
 - Message broadcasting
 - User profile management
 - Terminal status inquiry
 - Change individual modem line speeds

CUSTOMER RESPONSIBILITIES

The customer is responsible for the installation and use of this licensed program. Detailed information is included in the IBM Series/1 Videotex System publications identified below.

Inasmuch as IBM does not offer any videotex terminals as part of its product line, procurement and installation of such terminals are customer responsibilities. In this regard, IBM Marketing Representatives can identify vendors from whom such terminals can be obtained, subject to established procedures for referencing sources of third party equipment. (See the appropriate General Information section.) IBM makes no warranty of any kind that SVS/1 will be suitable for use with any particular non-IBM equipment. It is the customer's responsibility to determine the suitability of any such equipment for use with SVS/1.

PROGRAMMING RPQs

Series/1 Videotex System (cont'd)

Branch personnel should contact their regional Series/1 Marketing representative for assistance in identifying third-party vendors of videotex terminals having the required characteristics.

Although the SVS/1 program is designed to operate within the minimum system configuration stated above, the system configuration for any particular customer installation must be determined by that customer, based on his own expected business volumes, data base size, and operating requirements.

SPECIFIED OPERATING ENVIRONMENT

HARDWARE REQUIREMENTS

This PRPQ is designed to operate on a minimum IBM Series/1 as follows:

- IBM 4954, 4955 or 4956 Processor with at least 256KB processor storage and the following features installed (in addition to those required to attach the below listed I/O and storage units):
 - Feature #2095: Programmable 8-line Communications Control
 - Feature #2096: Programmable 4-line Communications Adapter
 - Feature #7840: Timer (required for 4955 Processor)
 - RPQ D02063: Duplex EIA Cable
- One IBM 4962 mdl 1, 1F or 3 Disk Storage Unit and one IBM 4964 or 4966 Diskette Unit or one IBM 4966 Diskette Magazine Storage Unit
 - One IBM 4962 mdl 2, 2F or 4 Combined Disk/Diskette Unit.
- IBM 4973 or 4974 Printer Unit or IBM 4975, 52XX Printers compatible with the 4974/75
- IBM 4978 Display Station or IBM 3101 Display Station compatible with the 4978.
- A videotex display set (with modem) close to the Series/1, and available for IBM Customer Engineering use.

This minimum configuration will store up to approximately 5,000 960-character frames of information, and will support two online users.

For SVS/1 host communications support, the minimum processor size required is 512KB along with one or more of the following communication hardware features:

- BSC, features #2074, #2075, #2080, #2093/#2094, #1310
- SDLC, feature #2090

Version 1.1 also supports the IBM 4956 Processor, the IBM 4963 and 4967 Disk Facility, the IBM 4968 and 4969 Magnetic Tape Units.

SOFTWARE REQUIREMENTS

- IBM Series/1 Event Driven Executive Basic Supervisor and Emulator Version 3 (5719-XS3) or Version 4 (5719-XS4)
- IBM Series/1 Event Driven Executive Program Preparation Facility Version 3 (5719-XX4) or Version 4 (5719-XX5)
- IBM Series/1 Event Driven Executive Utilities Version 3 (5719-UT5), if 5719-XS3 is used.

The following licensed program is required for Host Data Access:

- IBM Series/1 Event Driven Executive Communications Facility Version 1 (5719-CF1)

The following is required for a SNA/SDLC connected host:

- IBM Series/1 Event Driven Executive System Network Architecture (5719-SX1)

OPERATIONAL CONSIDERATIONS

Processor Size: The minimum processor storage requirement for SVS/1 without SVS/1 host communication is 256KB. Due to the desirability of having multiple applications executing on the same Series/1 system as that which is running SVS/1, possibly linked via the user program interface, it is suggested that a 4955 or 4956 Processor with 512KB be strongly considered for the SVS/1 application, in order to allow for application expansion. The minimum processor size required for SVS/1 host communications support is 512KB.

Although SVS/1 does not utilize the 4956 Processor's additional storage above 512KB, it is available to other applications directly through EDX Version 4.

Disk Storage: For any given SVS/1 installation, the number of frames of information that can be stored on the Series/1 is dependent on frame size and the number of disk storage devices attached to the system. As a guide, the user should expect to be able to store approximately 725 960-character frames per million bytes of disk storage, up to a maximum of 350,000 960-character frames. This is exclusive of the requirements for SVS/1 loadable programs (approximately 0.5MB), prerequisite system programs and program

products, and data files used by SVS/1. A guide on the sizing of the latter may be found in the *SVS/1 Installation and Operations Guide*.

Based on the above considerations, specific storage requirements for any given SVS/1 installation will be dependent on the size of the videotex data base (VDB) required by the user. This VDB must not be spread over more than 8 disk spindles. Based on using the IBM 4963 Disk Storage Drive, this would provide a user with a maximum of 512MB of disk storage for holding the VDB, with a maximum frame capacity of approximately 350,000 960-character frames. It must be stressed, however, that attaining this maximum is dependent on the nature of the application, NAPLPS** frame design, the prevalent transaction rate, the size of other Series/1 files frame size, and the existence of other Series/1 programs.

Videotex Terminals: Videotex terminals for use with SVS/1 must conform to PRESTEL* or NAPLPS** terminal specifications. These specifications are defined respectively in the publication *PRESTEL Terminal Specifications Edition One* issued January 1981, by the PRESTEL* Liaison Group Technical Sub-Committee and for NAPLPS**, the Canadian Standards Association (CSA) T500 document, ANSI X3L2 Committee BSR X3.110 document equivalent to the Canadian government Department of Communications Level 709E specification. These specifications are the basis for implementation of NAPLPS** in SVS/1 as interpreted by IBM. (See "Customer Responsibilities" regarding procurement of such terminals.)

With respect to terminal support requirements, each active input/output port will require, in addition to the Series/1 communications feature identified above, connection to a modem which meets requirements for switched asynchronous full-duplex operation.

With the material supplied by IBM, plus modems to be supplied by the user, a user may configure SVS/1 for simultaneous connection of up to 32 (SVS/1 Version 1.1) videotex sets.

DOCUMENTATION
(available from Mechanicsburg)

IBM Series/1 Videotex System Information Provider's Guide (SC34-1734) ... IBM Series/1 Subscriber's Guide (SC34-1735) ... IBM Series/1 Videotex System Programmer's Guide (SC34-1736) ... IBM Series/1 Videotex System Installation and Operator's Guide (SC34-1734) ... IBM Series/1 Quick Reference Card (GX34-0136-2).



PROGRAMMING RPOs

**SYSTEM/3 SUPPORT PROGRAM for the
3735 PROGRAMMABLE BUFFERED TERMINAL
5799-WER (PRPQ P84002)**

PURPOSE

The Support Program is a series of programs that permits the System/3 user to specify, assemble, and store for later transmission Form Description programs for the 3735. A transmit program is also included for transferring the Form Description programs from the System/3 disk to the 3735.

HIGHLIGHTS

- Compile time is fast.
- Language is data-source related.
- Source coding on RPG forms.
- Programmer controls printing motion.
- No branching restrictions.
- Compiled output placed on disk file.
- Transmit utility included for switched line with EBCDIC.

SPECIFIED OPERATING ENVIRONMENT

HARDWARE REQUIREMENTS

Requires an IBM System/3 model 10 Disk System with minimum core of 24K for compilation ... 16K for transmission.

For transmission, the System/3 must be equipped with BSCA as follows:

- First BSCA (#2074) or Second BSCA (#2084).
- EBCDIC Transmission Code (#9060 or #9070).
- Point-to-Point Switched Network Attachment (#9483 or #9583).

DOCUMENTATION
(available from Mechanicsburg)

IBM 3735 Programmable Buffered Terminal Concept and Application
(GA27-3043).

Programming Service Classification is B.

PROGRAMMING RPQ

**DOS SUPPORT PROGRAM for the
3735 PROGRAMMABLE BUFFERED TERMINAL
5799-WEZ (PRPQ P85011)****PURPOSE**

The Support Program (requires a 24K partition) is a series of programs that permits the DOS or DOS/VS user to specify, assemble and store for later transmission, programs for the 3735 Programmable Buffered Terminal. The user specifies the 3735 programs in a language which can be coded on RPG statement sheets.

HIGHLIGHTS

- Compile time faster than with the macros.
- Provides program space-saving features.
- No branching restrictions.
- Ability to cycle on a field.
- Variable-length forms.
- All printing motion controlled by programmer.
- Access to reader punch buffer in playback mode.

DOCUMENTATION: [order from Mechanicsburg]

IBM 3735 Programmable Buffered Terminal Concept and Application (GA27-3043) and IBM Operator's Guide (GA27-3061).



PROGRAMMING RPQ

**3333/3330 MDL 11 SUPPORT for DOS/VS
5799-WHZ (PRPQ EF4346)**

PURPOSE

3333/3330 mdl 11 (hereafter referred to as mdl 11) support for DOS/VS provides the user with the capability to support mdl 11 DASF, in a DOS/VS operating environment, on S/370s which support 3333/3330 mdl 11 DASF. The mdl 11 DASF offers twice the data capacity of a mdl 1 DASF with the same floor space and power requirements.

DESCRIPTION

All standard DOS/VS functions supported on the Model 1 are supported on all cylinders of a Model 11 with the following exception. The PID distribution programs INTDSK and DISRST do not support addresses beyond cylinder 403.

All programs and program products which are supported by DOS/VS Release 30, which support 3333/3330 Models 1 and 2, and which adhere to standard logical IOCS (LIOCS) interfaces will be able to access all 808 cylinders of a 3336 Model 11.

Not all program products have been tested with this PRPQ.

Potential users should be advised to investigate program products they plan to use in conjunction with this PRPQ before its implementation. Consult the SECOM entry for this PRPQ for further information.

HIGHLIGHTS

Supports DOS/VS systems functions on Model 11 drive.

- Systems residence file
- Systems recorder file
- Page data set
- Systems I/O device

Is compatible with all supervisor options

Supports DOS/VS Utilities, Librarian and Service Programs

Supports Assembler, Job Control, OLTEP

Supports POWER, POWER/VS, Error recovery

Supports RPS

Supports intermix of Model 11 drives and other DASD

Enables user files to span all 808 cylinders of a 3336-11

Requires no change to main storage requirements

Supports SAM, DAM, ISAM, VSAM

SPECIFIED OPERATING ENVIRONMENT

HARDWARE REQUIREMENTS

A System/370 Model 135 capable of supporting 3333/3330 Model 11 DASF and DOS/VS Release 30. One magnetic tape unit is recommended to implement this PRPQ.

SOFTWARE REQUIREMENTS

This support is available for DOS/VS Release 30 only.

Documentation accompanying machine readable material provides instructions for installation of this PRPQ in RPS and non-RPS environments.

Portability of storage volumes used with 3333/3330 Models 1 and 2 between DOS/VS and OS/VS is not supported when this PRPQ is used.

PROGRAMMING RPQ

**AIRLINE CONTROL PROGRAM
ACP (5799-WKG) (PRPQ PO9003)**

PURPOSE

ACP is a reliable, highly responsive, performance-oriented operating system for realtime transaction-driven applications. ACP systems are characterized by thousands of terminals dispersed over a large geographical area where each location may have from one to several hundred terminals. ACP provides realtime inquiry and update to a large centralized data base where message length is relatively short in both directions and response time is generally less than three seconds.

DESCRIPTION

A key attribute of ACP is its reliability and availability. This is a result of a well managed operation and the use of the many support tools provided with ACP:

- Over 280 operator commands.
- 1- to 3-minute system restart.
- Online data base load/dump/copy.
- Online debugging aids and offline test tools.
- Dynamic system performance monitoring.
- Processor, line, and I/O error recovery and recording.

Applicability: ACP is applicable to any online transaction oriented application which requires fast message response time from a large number of terminals. Some examples of applications are airline seat reservations ... hotel reservations ... credit authorization/verification ... car rental reservations/billing ... police car dispatching ... electronic funds transfer switching ... teller memo post ... message switching ... loan payment processing.

System Supervisor

Work Management: Messages, entries, tasks and jobs are terms used to describe units of work in an operating system. The terms used in ACP are *message* or *entry*, both of which apply to the input characters that trigger a work unit.

At any one time, there are likely to be many entries in the system, each handling a unique unit of work. ACP will service existing entries which are ready to be processed before creating entries to service new input messages. The creation of entries in the system is controlled by the amount of main storage available and the number of active entries. This prevents multiple inputs or unusual processing conditions from overloading the system. While the application can defer processing an entry, the primary thrust is to speed an entry through the system.

Main Storage Management: The organization of main storage is one of the keys to the high performance of ACP. Part of main storage contains programs and data that are common to all entries and which remain in main storage. This portion is called fixed storage. Another portion, called working storage, is allocated to entries as required. Storage protection is used for fixed storage, inhibiting an application from illegally modifying the control program, core-resident application programs, and critical data records. Working storage is divided into fixed size blocks. These block sizes are the same size as file resident programs and data records, thereby eliminating the memory fragmentation problem which can exist in a dynamically managed working storage architecture.

Program Management: Application programs are written in Assembler language and request control program services by means of system-supplied macros. Programs may either reside in fixed main storage or file storage. These programs must be written in a re-entrant fashion so that one copy of the program may be shared by many entries at the same time.

Data Management: ACP considers the online files as a common data resource to be shared by the applications. An application may structure data to satisfy unique processing requirements, but the structuring is done within the context of the basic data structure supported by the system programs. These basic data structures are fixed, pool, tape, general file and general data set.

Fixed file records are records whose symbolic addresses can be calculated using a record type and an ordinal number. The record type identifies a set of data within the data base (similar in concept to an OS/VS data set) and the ordinal number identifies a specific record within the record type. The fixed structure is logically similar to a DAM file being retrieved by relative record numbers.

Pool records are records set up in file storage whose addresses are managed by ACP. When an application needs additional file space, ACP assigns the symbolic address of one of the available records in the pool. When the application is finished with the record, its address is returned for reuse. ACP ensures that an address is not given to more than one requester before its release.

To retrieve a pool record, the application must be able to obtain its address. The common technique used by applications is to form data structures that use fixed records as indexes to pool records. The combination of fixed and pool structures provides the application designer with the tools to implement an application data structure with a minimum of system imposed overhead.

A number of important features are available to the user of fixed and pool structures:

Record hold is a method of reserving data records for the exclusive use of an entry during a record update. This feature prevents lost data when multiple entries are trying to update the same record.

Record duplication is insurance against loss of critical data due to hardware failure. If a record is duplicated, two copies, on separate devices, will be updated whenever file storage is updated. When requested, either copy can be used, dependent on queuing on the devices or the inability to retrieve one of the copies.

ACP has the capability of automatically logging all file updates to tape for selected record types. This function can be used for file backup.

The device that the file records are located on is completely transparent to the application. This device independence allows easy migration between file devices without application coding complications or modifications.

The organization of fixed and pool files is intended to distribute the records associated with a record type over physical file storage to reduce queuing time at the devices. Thus, when an application accesses successive records within a record type, each record is obtained from a different physical component. The physical organization might be envisioned as a group of disk packs, each identical in format and type of contents. The logical files are layers on the packs, each pack with an equal percentage of the total logical file.

Tape files are classified into two categories, realtime and general. Realtime tapes are mandatory on a system and are used by ACP and applications for output critical to system operation and for testing. General tapes are treated as a sequential file and can be either written or read by the online system.

General files and general data sets are equivalent in meaning to an OS/VS data set. The records of a general data set are allocated sequentially within the same disk module. The allocation of a general data set to physical devices is done during online execution. The data set is dedicated to the entry requesting the use of the data set. The structure of the data within a general file or data set is application-dependent.

Restart: ACP updates the file storage copy of critical data either when it is modified or on a time-initiated basis. Examples of system data that could be considered critical are file status and SNA logical unit message sequence numbers. The system data considered critical is grouped into special records called keypoints.

In some cases, critical application data must be preserved and are grouped into records called globals.

These globals and keypoints are periodically written to different disk modules on a cyclic basis. In the event of a device failure from the primary pack, the most recent backup device can be used to restart. A restart may be initiated automatically by ACP when it determines that such action is required, or by an operator taking a manual action. Restart time is usually one to three minutes.

Cohabitation: At other than peak periods, a considerable amount of processor power is usually unused when a system is dedicated to online processing. ACP utilizes this available processor power by allowing OS/VS or a second ACP system to operate in the same processor with and under the control of a production ACP. Cohabitation of ACP together with OS/VS or a second ACP is effected using a software facility of ACP, known as the hypervisor, in conjunction with S/370 relocate hardware. The hypervisor facility, though basically similar to VM/370, differs in that the hypervisor is dedicated to maintaining the high performance characteristics of a production ACP system by servicing ACP requests first. The Virtual Machine Assist (VMA) feature may be used to improve performance of the hypervised systems if it is available on the processor.

The hypervisor facility is part of ACP. The hypervisor intercepts all system interrupts and, depending on which operating system is in control, either passes the information on to the proper interrupt handling program or queues it for later processing. The two systems are protected from each other such that failure of one will not adversely affect the other.

The hypervisor allows sharing of the system byte and block multiplexer channels and main storage. While individual control units and their associated input/output devices cannot be shared by ACP and the hypervised system, their assignment can be changed from one system to the other by the operator.

The hypervisor will support OS/VS1 or OS/VS2 (SVS or MVS) under ACP. Alternately, a second ACP system, commonly a test system, may be supported.

Operator Commands: ACP provides a complete set of operator commands and programs to allow the operator to control the system. The commands perform such functions as hardware reconfiguration, altering system tuning parameters, changing the current application

Airline Control Program (5799-WKG) (cont'd)

program version to be used, starting OS/VS operation under the hypervisor and sending broadcast messages. In all, there are over 280 different operator commands available. These commands can be entered from up to ten selected terminals that function as operator consoles.

Communications Facilities: Both large terminal networks and computer networks are supported by ACP.

ACP's terminal environment consists of remote cluster controllers connected to the host system via medium speed communication lines using either Synchronous Data Link Control or Airlines Line Control.

ACP's computer network environment consists of remote central processing units connected to the ACP host system via medium speed communication lines using either Binary Synchronous Communications or Synchronous Link Control.

Extensive functional capabilities are provided in the area of message handling for long message input assembly and long message output transmission. Unsolicited message support allows the broadcasting of output from either an application or the computer operator. Application independence for the 3270 terminal is provided by the screen mapping and paging package.

Communications support functions include a comprehensive set of operator commands for network monitoring and control. Online utilities are provided to load and dump the programmable communications controllers (3705 and 3600). Reliability, availability and serviceability features include numerous communication trace functions as well as controller and link diagnostics.

Systems Network Architecture: ACP provides Systems Network Architecture (SNA) support for the 3600 Finance Communications System and for the 3270 Information Display System. The following functions are provided with SNA support:

- Distributed function of remote intelligent controllers.
- SNA and SDLC message integrity.
- SDLC line control efficiency.

ACP resides in the host S/370 and interfaces with the SNA network via the 3705 Network Control Program (NCP/VS) in the same manner as VTAM in the OS/VS environment. No modifications have been made to the NCP/VS or to the 3600 software or hardware. The message protocol used by the 3600 application programs generated via the Program Customizer (PC3600) is supported by ACP.

Application Interface: The ACP/application message interface consists of a parameter list with message routing information and a core block containing the text of the message. This interface is common to all network components regardless of line discipline and terminal characteristics. The terminal or logical unit address is used in physical hardware form to ensure a short instruction path for message transmission. However, each SNA network node can optionally be addressed by a symbolic eight character name.

Message Integrity/Security: The complete message integrity capability provided in SNA by message sequence numbering is fully supported by ACP. The SNA sequence number of an inbound message is available to both the host and the cluster application programs. This number can be used for message recovery, audit trails and output reply correlation at the cluster controller.

As an optional feature, ACP provides a complete message recovery and reply tracking package. As each message is received in the host, it is analyzed by the application to determine if it is recoverable. ACP will write each recoverable message to the online disks and track the expected reply. When the reply is received from the application, it is written to disk and tracked until the positive response is received from the cluster controller. Recovery action is initiated if the application reply or the cluster response is not received within the specified time. In addition, ACP provides an application oriented recovery package which allows message recovery and data base recovery to be combined. This message recovery package can also be used by the application program to *age* messages sent to remote processors in the network.

ACP provides the support to encipher and decipher messages to or from the 3614 or 3624 Consumer Transaction Facility. To facilitate the exchange of encrypted messages from any network end point (remote processors as well as 3614s, 3624s), the encrypt/decrypt algorithm is provided as a supervisor call subroutine in ACP. Since this same algorithm is also provided in the 3600 software, all messages in the SNA 3600 network may be encrypted for maximum security.

Message Handling: ACP provides broad functional support in the area of message handling. Major areas of support include:

Long Message Assembly: Long messages sent from the remote controllers are segmented for transmission to the host. These segments are assembled on disk by ACP before presenting the entire message to the application program.

Long Message Transmission: Long messages sent by the application are segmented and queued on disk by ACP for transmission to the remote cluster controller. For 3600, these segments are transmitted using SNA pacing to protect against overloading the cluster controllers and the

3705. For 3270, these segments are collected by ACP and transferred to the NCP in a continuous data stream.

Unsolicited Message Transmission: An unsolicited message is an output message without a corresponding previous input. At the request of the application program, ACP queues unsolicited messages on disk by destination address. Prior to transmission, permission to send is requested and a positive response from the terminal or logical unit triggers the transfer.

Bulk Data Transfer: ACP provides specialized SNA support to facilitate the transfer of bulk data to and from the remote cluster controllers. Transmission of negative credit files and off-host authorized transactions are two examples of bulk data. On interactive transaction messages, the application is shielded from the details of the SNA message protocol by ACP. However, during long transmission the host application must establish meaningful checkpoints to minimize retransmission time in the event of a failure. For defined batch transfer logical units and application programs, ACP allows the application to receive, decode and send SNA responses. The normal long message assembly and transmit support is used in handling multiple segment output for the batch logical unit.

Screen Mapping: The application program achieves 3270 device independence by using the ACP screen mapping package to edit, construct and format 3270 data streams. Input messages originating at the terminal contain field oriented data consisting of device dependent control characters and message text. ACP deletes the control characters and presents the text to the application as a set of variable length data fields. This process is controlled by a predefined screen map. In the outbound direction, ACP constructs the terminal dependent data stream from the application provided data fields and the screen map.

3270 Scrolling and Paging: When a display message is greater than the screen size, it is either handled as a continuous scroll or as pages in a book. The application provides the display message as a long output message. After the first page is displayed on the screen, the terminal operator controls the screen with page or scroll commands. Scroll commands reposition the screen image a line or group of lines at a time. The entire process is controlled by the screen map which defines the page or scroll size. This feature facilitates split screen operation.

Support Functions: The supporting functions provided with the ACP SNA capability include the following:

Operator Commands: These commands give the ACP computer operator the ability to control the SNA network. The status of an NCP, a line, a cluster controller or an individual logical unit may be displayed at the console. The operator may also stop or start any portion of the SNA network and may alter the frequency for host selection of the NCP.

Online 3705 load/dump: The 3705 may be loaded or dumped online in parallel with realtime operation. The OS/VS provided NCP generation process is used offline to create 3705 load modules. These load images are then stored in the online disk files and are transferred to the 3705 on command from the ACP operator. Dump images are temporarily accumulated online for later spooling to tape and offline printing in standard format.

Online 3600 load/dump: The 3600, 3614 and 3624 may be loaded online in parallel with realtime operation. The OS/VS-provided Subsystem Support Services package is used offline to create remote controller load images. The load images are stored in the online ACP disk files and are transferred to a 3600, 3614 or 3624 on command from either the ACP operator's console or from the remote cluster. Dump images are temporarily accumulated online for later spooling to tape for offline printing in standard format by Subsystem Support Services.

3705 and SDLC Link Diagnostics: ACP provides for concurrent maintenance of the SNA network with online 3705 diagnostics. These 3705 resident diagnostics are activated from the ACP operator's console and perform data path tests in parallel with normal message flow in the NCP. The link test transmits a test message and receives an echo on the SDLC link without disturbing the normal message traffic on other lines connected to the NCP.

Line and Message Trace: ACP provides extensive communication trace facilities at a link and NCP level. These trace functions are initiated from the ACP operator's console and the output is written to a log tape for offline printing. All messages sent to and received from the NCP can be traced. Link trace is performed in the NCP with accumulated trace data forwarded to ACP for logging.

Line fallback: In the event of a permanent SDLC failure, the host operator can perform line fallback by manually dialing each cluster controller on the failing link. Normal message flow is resumed by an ACP operator command which makes the necessary control block adjustments. The application program is unaware of the address change that has taken place.

Performance Measurement: This package performs online gathering of raw measurements for the offline data reduction package. The reduction programs produce reports which can be used to determine input loads, output loads, message rates, message processing characteristics, line occupancy and response time. SNA communication

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Airline Control Program (5799-WKG) (cont'd)

statistics are compiled and presented at varying levels of detail, extending from the system as a whole to the individual logical unit.

Network Generation: A single SNA network definition (NCP system generation input) is used to create both the NCP and the ACP network tables. The ACP SNA table generation program runs independently of the ACP system generation. This facilitates network configuration changes and growth without requiring a new ACP system generation.

Binary Synchronous Communications: ACP provides Binary Synchronous Communications (BSC) support using standard point-to-point and multipoint data link protocols (for details see the *General Information - Binary Synchronous Communication manual* (GA27-3004). This facility is primarily directed at the computer networking requirement of large geographically dispersed networks. ACP supports BSC line protocol with non-IBM as well as IBM systems.

Data Link Operation: The ACP support of BSC links is characterized by the following operational attributes:

Transmission code: To provide more general usability, ACP handles BSC lines operating with either EBCDIC or USASCII transmission code. EBCDIC transparency is optionally provided to allow the transmission of binary data between computers.

Blocked transmission: Long messages consisting of multiple message blocks can be received and sent by ACP. There is no limit to the total message size in either the inbound or the outbound direction.

Send limit control: To balance line utilization between input and output, ACP limits the number of output messages sent between input operations. The send limit is defined at network generation time and can be altered online by the ACP operator.

Master/slave contention priority: BSC point-to-point message protocol allows each end of the line to contend for transmission time. When both ends bid for the line simultaneously, the contention is resolved by a master/slave relationship. ACP may be either master or slave. This attribute is defined by line at network generation time and can be changed online by the ACP operator.

Control or tributary multipoint support: The control station on a BSC line either polls or selects the tributary stations. Polling invites the tributary to send data. Selection requests permission to send from the control station to the tributary station. ACP may be either the control or the tributary station.

ACP interfaces with the BSC lines via the 3705 Emulation Program (EP). When SDLC and BSC links are connected to the same 3705, ACP supports the Partitioned Emulation Program (PEP).

ACP BSC support provides least queuing by communication line. When multiple lines exist between two computers, output messages are queued to the line with the smallest message queue. This balances the line usage and promotes fast delivery of messages.

Message Integrity: BSC line protocol requires positive acknowledgement for each message transmitted. In addition, ACP provides a generalized message logging and tracking mechanism which can be used by the application programs. Prior to transmitting a request to a remote computer, the application can request that ACP log the output with any associated data and activate a time out. When the data reply is received from the remote computer, the application can retrieve the log record and deactivate the time out. ACP ensures the integrity of the log over a system interruption.

Although 3614 and 3624 encryption is provided with the SNA support, this algorithm can also be used to encipher and decipher messages sent and received over BSC lines.

Application Interface: The application can address the BSC network with either physical or symbolic addresses. The physical addressing is provided to ensure a short instruction path for message transmission.

When multiple BSC lines exist between two computers, ACP provides alternate line routing in the event that one or more of the lines fail. ACP also returns undeliverable messages to the originating application when all lines to a particular destination are inoperative.

Message Handling: ACP provides normal long message handling for both incoming and outgoing long multiple block messages.

Blocked input messages are assembled on disk before presenting the entire message to the application program. While input message size and block size is unlimited, message blocks which are compatible with ACP core blocks are handled most efficiently.

Long output messages are segmented on disk by the application and are queued by ACP on a line basis. ACP controls the transmission of each block and ensures that the entire message is sent successfully. Although output message size is unlimited, output message blocks must be 1,020 bytes or less.

Operator commands: A complete set of operator commands are provided for monitoring and control of the BSC network. The status of each line and station may be displayed at the operators console. The operator may stop or start any network component, alter lines

operational characteristics, load or dump the 3705 or initiate selected online link diagnostics.

Synchronous Link Control (SLC): SLC is a highly efficient protocol designed to control the interchange of messages on a point-to-point link between two processors. The link is synchronous on full duplex, private leased voice grade lines. Each link consists of up to seven communication lines. The transmission load is balanced across the available lines (parallel transmission of data blocks). ACP supports SLC links with lines operating at speeds of up to 9600 bps.

All data messages are sequenced allowing each processor to detect missing or spurious messages and permit corrective procedures. The 3705 (EP), in conjunction with a prerequisite RPQ (see special RPQs/features), is used to attach SLC lines to the processor.

Airline Line Control (ALC): Airline Line Control was developed to satisfy the high speed communications requirements of airline reservation applications, but has since been adopted by other industries. ALC uses synchronous line transmission, full duplex, on dedicated communications lines. The lines may be either leased common carrier or private.

ALC characters are six bits in length, allowing for more efficient use of the line. Transmission integrity is maintained using cyclic checks. Terminal interchanges (e.g., 2946, 2948) and the S/7 when used as a line concentrator, use ALC.

Polling is performed using roll call or hub polling methods. Roll call causes each interchange/concentrator to be separately polled by the processor. In hub polling, the processor initiates the polling scan by sending a poll to the most remote interchange/concentrator. The poll message then ripples automatically down to the closest remote interchange/concentrator. This significantly reduces processor polling overhead and increases line efficiency.

Extensive management facilities are available to control the ALC networks and provide status information. Operator commands are provided to alter or stop polling, reconfigure and display the status of individual network components. Segmentation and reblocking of long messages, and the handling of unsolicited messages are performed by the ACP.

The 3705 in conjunction with the Emulation Program (EP) and a prerequisite ALC RPQ (see special RPQs/feature), is used to attach ALC lines to the processor. ACP provides load (IPL) and dump support for the 3705 (EP). The Partitioned Emulator Program (PEP) does not support ALC.

The S/7 (RMX S/7) is supported as a remote concentrator and provides the interface between line disciplines and the ALC functions in ACP. RMX S/7 can be used for the attachment of devices utilizing BSC and start/stop line disciplines (e.g., 3270, 2740). S/7 RMX utilizes standard software support (MSP 7 and TPMM) to provide the necessary line controls, translation, message queueing and processing functions.

Data collection counters are maintained in the RMX S/7 and, along with other data, are sent to the processor to facilitate the evaluation of the S/7 performance.

Screen Mapping/Paging functions, described earlier under SNA support, are also available to applications utilizing S/7 attached 3270s. The 3270 terminals can be logged onto a S/7 resident application. Log messages to non-S/7 resident applications are forwarded to ACP for processing.

Networking: ACP networking support is provided by a message routing package which provides the networking advantages of shared terminals, shared lines and reduced application/data base redundancy. Synchronous Link Control (SLC) and Binary Synchronous Communications (BSC) may be used for intercomputer communication. ACP message routing supports terminal to remote application and application to remote application. Application-to-application message routing through an intermediary ACP computer is also supported.

Message Router Functions: The ACP message router provides for terminal log-in, alternate line selection on errors, and message least queueing for load balancing over multiple lines.

Terminals or SNA logical units may be either permanently logged into a fixed application or dynamically logged in with a special terminal operator log-in message. The permanent log-in could be used for the point of sale environment, where many terminals share a single communication path to the host. The dynamic log-in provides more flexibility but still requires the terminal operator to input a special ACP log-in message.

Alternate line selection is provided to ensure that all messages are delivered to the addressed destination. If there are multiple lines to a remote computer and a line experiences a permanent failure, ACP will use an alternate line to transmit the message. If an alternate line is not available, the message is returned to the originator.

Least queueing is the selection of the communication line with the smallest queue for the transmission of output messages. This

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technique balances the communications load over multiple lines to a single destination and promotes prompt message delivery.

Application Interface: The message router interface is the common ACP/application interface used for communication with all network components regardless of line discipline or terminal characteristics. The message text and a small set of routing parameters are provided by ACP on initial entry to the application. On output the message text and associated routing parameters are returned to ACP. This interface also allows the application program to be independent of the computer which controls the terminals.

Support Functions: Message router support functions include operator commands, network awareness and network trace.

Operator Commands: Provide monitoring and control of the computer network. The status of the communications link (multiple lines) to a remote computer and of an individual application can be displayed at ACP operator's console. The capability to start or stop an individual application and a communications path is provided.

Network Awareness: When the status of an individual application is changed (stopped or started), this change is sent to all ACP systems in the network. In the event of a lost status change message, a complete status of all applications is sent on a time initiated basis. In this way, network awareness is maintained in the ACP components of the network.

Network Trace: Many terminals and applications may send a message to a single remote computer over one communications link. In this environment it is highly desirable to single out particular terminal or application traffic for tracing. ACP provides a network trace which allows console operator selection of specific network paths, trace points and trace data for collection.

Support Programs: Support programs include those that help ensure against permanent loss of data records, programs that facilitate the expansion of file storage, programs that assist in maintaining system file storage integrity and programs used in the initialization, installation and performance measurement processes.

Capture/Restore: The constant availability of the online data increases the exposure of file storage to the effects of software and/or hardware malfunctions. This exposure is minimized by ensuring that critical data can be replaced if necessary.

Maintenance of file storage copies on auxiliary storage media (disk packs, tapes, etc.) helps ensure against the loss of critical data. The process of copying file storage to auxiliary storage is called CAPTURE, and the process of restoring the capture to file storage is called RESTORE. The period of capture typically varies from one per day to one per week depending on user requirements.

One means of capturing file storage is to stop the system, then using standard OS/VS utilities, copy the storage to disk or tape. This procedure prevents the online use of the ACP system during a capture. A second method is to use the online capture supplied with the ACP system. This program captures the files during normal system operation, but during periods of low activity. Each file storage device is copied to magnetic tape. Simultaneously, a separate tape, called an exception tape, collects a copy of all records modified while the capture is in progress. The combination of the two sets of tapes represents a consistent, and static capture of the data base at the instant the online capture program completes processing. A significant advantage of the Capture/Restore feature is that it permits 24-hour operation of the system by performing its function while the system is operational.

Restoration of a full system restores the system to the time and date of the capture. Further programs or procedures may be required to reconstruct the files due to the activity between the time of capture and time of restore. Since the data is application dependent, the additional reconstruction is a user responsibility. A way of accomplishing the reconstruction is by using an ACP facility to log all file updates. These updates can then be applied to the restored module(s).

File Reorganization: Normal system growth usually dictates an increase in the number of file storage devices. Addition of new devices provides an increase in both fixed and pool areas.

A fixed file reorganization program is provided to accomplish this expansion. This program collects all records in the fixed area using the record types and ordinal numbers of the old system definition. The records are written onto the new system configuration by using the new system definition of file storage. Since application programs use a record type ordinal number to reference fixed file storage records, the reorganization is transparent to the application.

File Address Recoup: Application programs may fail to return pool addresses, in which case the record is lost for further application usage, which diminishes the number of available pool records. Correction of application errors eliminates the problem but the system must recover the records. Also, whenever the system encounters a catastrophic failure some records may be made unavailable. The File Recoup program is provided to recover lost pool records so they can be made available to the system for further usage. The Recoup program interfaces closely with the application environment to determine which

records are valid. A useful by-product of the File Recoup program is information which identifies application programs which may have lost the file pool addresses. Another useful function is surveillance of the data base to discover potential deterioration such as broken chain structures.

Test Facilities: A comprehensive set of test facilities is provided for application development and maintenance.

The ACP test facilities provide:

- A check on violations (or possible violations) of programming conventions.
- An orderly progression from simple debugging through complex multiprogramming tests including the entry of messages from terminals.
- A uniform data definition and data base for use in all levels of testing.
- The ability to batch various test runs.
- A flexible method to specify and/or modify data for each test, including the facility to restore the test data base between individual test cases.
- A method of simulating unavailable programs.
- Flexibility in specifying the types of output desired.
- Online components to assist in the detection of faulty programs.
- Offline components to print the results of a test.
- Debugging Aids (traces, formatted dump, address stop).

The ACP test facilities are designed to be used at three major levels of testing:

Unit Testing: The independent testing of an individual program segment.

Package and Transaction Testing: Testing several programs together to check the validity of interrelated functions within a package of programs. This may include testing a complete transaction in a single or multi-thread environment. Multi-thread means concurrent entries will be processed by the package. Thus, the reentrant programming conventions are verified.

System Test: Multi-thread test through a realistic simulation of the environment in which the programs will ultimately operate.

Components of the ACP Testing Environment

System Test Compiler (STC): Used to create a test data base, input test messages, and control information for a test unit. STC runs offline under control of OS/VS and is the primary vehicle for test data preparation.

Program Test Vehicle (PTV): Creates a testing environment which runs under ACP. Interfaces between PTV and the control program are used to provide comprehensive checks on application programs. PTV can be best thought of as an additional program loaded with an ACP system. This program, when activated, controls the execution of test cases. Live terminals can be active simultaneously with PTV.

Real Time Trace (RTT): Used to monitor and record the activity of application programs in the ACP system. RTT can be run either in an operational system or when testing under the control of PTV. The output of RTT is a historical record of input message and control program macro activity. The level of output detail is controlled by option indicators in functional messages when used in an operational environment, and by control statements when used in a PTV environment.

Selective File Dump & Trace (SFDT) and System Test Post Processor (STPP): Writes specified file records to tape and, in conjunction with the STC post processor, formats all traces and printouts of main storage for ease of analysis. Key areas with symbolic names are labeled. Data blocks associated with each entry are grouped with that entry.

System Initialization Program (SIP): This package consists of documentation, macros and programs that are used to generate an ACP system. The generator of a system using SIP assigns variables, using terms that are common to the environment. SIP is designed to ensure that the assignment of variables is complete and that the variables are consistent with one another.

SIP permits the system installers to declare ACP system parameters through the use of macro instructions. These SIP macro instructions are used by the OS/VS assembly program to process parameters which are dependent upon a unique system configuration. SIP macro instructions are used to generate a portion of the configuration-dependent data macros as well as keypoints. The SIP macro instructions also produce the OS/VS job control language (JCL) which is necessary to catalog the ACP macro definitions and assemble the ACP programs.

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The major output of SIP is:

- An OS/VS object library of all online and offline programs.
- An OS/VS macro library of ACP macros.
- An OS/VS Load Module Library of ACP programs.
- An OS/VS Source Library of ACP programs.
- The System Allocator Table (as an OS/VS data set) which assigns programs to their storage locations.
- Formatted Loader File which includes the assembled IPL program which loads the ACP system.

System Performance Measurement: System performance functions (data collection/reduction) are designed to provide operational data on significant activities involved in processing messages. By analyzing the reports generated by this package, the user can determine how efficiently the installation is running, discover where the bottlenecks are and what changes in system allocation (core, file, lines, terminals) could improve system performance.

The major functions of this program are to:

- Provide a tool that can be used during the installation and post-cutover periods to tune the system to peak efficiency.
- Provide a means of periodically monitoring system performance.
- Provide sufficient statistics so that long-term trends can be observed from the runs, thus providing the base for predicting growth in system load and justification for future expansion

Data Collection: Collectors are run in a sampling mode, allowing multiple types of data to be collected while avoiding significant interference with message processing. All collection programs write the data gathered to an online tape. No attempt is made to reduce any of the data online, as this would defeat the objective of causing a minimum impact on the system being measured. Data collection can be run to provide a history file of key system parameters such as milliseconds per message, file accesses per message, core usage per message, program calls per message, message rate and message length. The above information, plus the transaction history and trend, can be used to predict the need for more memory, channels, files, lines or terminals or the need for more processor capacity.

Data Reduction: All data reduction associated with the system performance package is executed under control of an OS/VS system. The data reduction reports are designed to be used by an analyst familiar with ACP, but not necessarily a statistician. Frequency distribution reports including means, standard deviations, and variations of each parameter are also available.

This program is written in PL/I to allow easy tailoring for each installation.

ACP Installation Package: ACP Installation Package addresses building an initial ACP system and developing procedures to tailor a system for a test environment as well as providing *how to* guidance for installation and use.

The package consists of a pregenerated system with pre-applied PTFs to support a minimal ACP hardware and software configuration. The ACP Installation Package has been designed to reduce the machine and personnel resource normally required to install a user's initial ACP system. The ACP Installation Package may be used for planning, benchmarking, and illustration of the use of ACP features through execution of sample code.

The pregenerated minimum configuration includes two 3340 Modules ... one 3705 Communication Controller ... one SDLC Line ... one 3601 or 3602 Finance Communication Controller or 3694 Document Processing System ... four 3420 Magnetic Tape Units ... one 3215 Console Printer-Keyboard.

OS/VS, VSAM and 3600 Subsystems Support Services (SSS) components must be pregenerated and integrated at the location where this package will be used.

The NCP sysgen, together with the cluster controller/sysgen, reside on the ACP online files and can be loaded to the appropriate devices via an ACP operator command following the IPL. Also included is an ACP sample program to accept a specific set of input messages from operational terminals or links and to return a canned response to the originating source. User exits are provided to allow customization of the response and access to the data base. A sample user's data set (fixed file area) has been provided with the ACP generation. A companion 3600 application program is also provided for the generated cluster controller. The ACP program test vehicle (PTV) is included in the generation of the system.

A restorable system on magnetic tapes contains the ACP source libraries used to create the system. This includes a copy of all the punched cards used for the generation of ACP/NCP/Cluster Controllers. An installation guide is also supplied which:

- Describes the contents of the package.
- Describes the sysgened configuration.
- Provides JCL statements and information on how to install the package.
- Provides advice and procedures for implementing and using the facilities of the package.
- Provides advice and procedures for modification of the ACP sample program and allocated data base to reference a users customized data records.
- Contains a cross reference to the ACP source libraries identifying their contents, especially for those components which are referenced in the procedure for tailoring the system.
- Contains a description of the selection of ACP parameters used in the generation of the system with the reason for their selection.
- Contains a description of required prerequisites.

CUSTOMER RESPONSIBILITIES

To successfully install and use ACP, the customer responsibility includes installing at least the minimum required machine configuration, communication equipment and appropriate communications lines. In addition, the customer must have installed the appropriate operating system as required by the ACP Support functions ... have a thorough knowledge of the ACP application ... train systems analysts, programmers and operators in ACP ... develop an implementation plan ... design and create a data base ... design terminal formats ... design and implement the ACP system ... prepare the physical site ... design and implement application programs using ACP macro instructions and the basic assembler language ... develop procedures to assure adequate security for data in the system ... develop appropriate backup procedures for the customer's application ... develop conversion procedures and schedules.

DEVICE SUPPORT

Processors
S/370 mdl 135, 135-3, 138, 145, 145-3, 148, 158, 158-3, 168, 168-3, 195, 3033 Processor

Channels
2860-1,2,3 Selector Channel
2870-1 Multiplexer Channel
2880-1,2 Block Multiplexer Channel

Direct Access Storage Devices
2305-2 Fixed Head Storage
2314 Direct Access Storage Facility
(with Airline Buffer RPQ)
2319 Disk Storage
2835-2 Storage Control
3330-1 Disk Storage
3333-1 Disk Storage
3340 Direct Access Storage Facility
3350 Direct Access Storage Facility
(Native mode only)
3830-1,2 Storage Control
Integrated File Adapter for mdl 135, 138
Integrated Storage Control for mdls 145, 148, 158 and 168

Tape
240X Tape
2803 Tape Control
3420 Magnetic Tape Unit
3803 Tape Control

Unit Record
3211 Printer
3505 Card Reader
3525 Card Punch

Transmission Control Unit
2703 Transmission Control
2969 Programmable Terminal Interchange
3705 I, II Communications Controller (Locally attached)

Terminal Interchange/Control Units
2946-4 Terminal Control Subsystem
2948 Display Terminal Interface
S/7 (RMX/7) Remote Multiplexer
3271 Control Unit mdls 11, 12
3272 Local Control Unit mdls 1, 2
3601 Finance Communication Controller
(via 3705 NCP) mdls 1, 2A, 2B, 3A, 3B
3602 Finance Communication Controller
(via 3705 NCP) mdls 1A, 1B
3694 Document Processing System
(supported as a 3602)
7411 Terminal Control Unit
1971 Terminal Control Unit
7441 Terminal Control Unit

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Terminals

1977-1	Terminal Unit
1980-9	I/O Typewriter
1980-21/24	Terminal Printer
2740-2	Communication Terminal
2915-3	Display Terminal
3275,77	Display Stations
3284,86,88	Printers
3604	Keyboard Display mdls 1-6
3606	Financial Services Terminal mdls 1,2
3608	Printing Financial Services Terminal mdls 1,2
3610	Document Printer mdls 1-4
3611	Passbook Printer mdls 1,2
3612	Passbook and Document Printer mdls 1-3
3614	Consumer Transaction Facility mdls 1,2,11,12
3618	Administrative Line Printer mdl 1
3624	Consumer Transaction Facility mdls 1,2,11,12
3767	Communication Terminal (2740 Emulation)
4505	Video Display

Consoles

1052-7	Printer-Keyboard
2150	Console (with 1052-7)
3210-1	Console Printer-Keyboard
3215	Console Printer-Keyboard
7412	Console (with 3215)
3277	Display Station (with 328X Printer)

Features Recommended

- VM Assist
- Two-channel Switch
- DASD String Switch
- Tape Switching

SPECIAL RPQs/FEATURES

3705 EP

- Airline Line Control**
- PRPQ P85000 SABRE Line Control, one/3705 (3705 mdl 1 only)
- RPQ 858655 SABRE Full Duplex Line Control, one/3705
- #4701 Line Interface Base, Type 1
- RPQ 858657 SABRE FDX Line Set, one/FDX Line
- #1642 Communication Scanner, Type 2 only
- Synchronous Link Control**
- PRPQ 750003 Line Control FDX IATA, one 3705
- #1642 Communication Scanner, Type 2 only
- #4718 Line Set, Type 1H, 1/FDX Line
- Binary Synchronous Communications**
- #4714 Line Set, Type 1D, one/two HDX

S/7, ALC Line Control, BSC, 2740

Software

- TPMM 5799-WFG, MSP 7
- RMX/7

Hardware

- D08010 TP Multiplex Feature
- D08011 TP Multiplex Module
- D08123 TPMM Synchronous Direct Interface
- D08014 Interface Group
- D08015 Data Set Interface Cable

SPECIFIED OPERATING ENVIRONMENT

HARDWARE REQUIREMENTS

The minimum hardware system configuration required for operating ACP 9.2:

- S/370 mdl 135 - 512K
- System Console/Printer
- Two 3330, 3340 or 3350 Modules
- Four 3420 Tape Drives
- One 3705 Communications Controller

Configuration Alternatives: System throughput is governed by the most restrictive system element and generally the processor instruction execution rate is the limiting element. Based upon this condition the communication and file subsystem should be designed to support the processor with the objective that they *do not* become the limiting system element.

SOFTWARE REQUIREMENTS

ACP requires OS/VS1 or OS/VS2 for offline batch utility functions. If support for the IBM 3600 Finance Communication System is used, ACP requires those versions of OS/VS1 or OS/VS2 which support Subsystem Support Services (SSS). See the appropriate 3600 SRLs for required configurations needed to support OS/VS1 or OS/VS2.

In addition, ACP 9.2 requires that NCP/VS reside within the 3705 Communications Controller supporting SDLC lines. Support for BSC is through EP/VS. Support of the Partitioned Emulator Program (PEP) is provided for configurations requiring both SDLC and BSC lines.

PERFORMANCE

SNA support is provided without compromise of the ACP high performance characteristics. For an inquiry message the instruction path is shorter than the performance oriented Airlines Line Control (ALC) path. This is primarily due to the line handling responsibilities assumed by the NCP/VS (i.e., polling, error recovery, translation).

In addition to the one input and one output message protocol used by PC3600, ACP provides logical unit pipeline support similar to CICS. This feature is directed at the point of sale environment, where multiple terminals at the intelligent controller share a single SNA communication path to the host.

In any telecommunications system, the time required to perform a restart after a system interruption must be short. In keeping with the objective of less than 3-minute restart, the ACP SNA software does not automatically reinitialize the network on restart. Normally, the host and the cluster controllers will preserve message sequence numbers over a system interruption and no network initialization is required. However, following a 3705 failure, ACP performs the network start up function. This is performed in a fully parallel fashion to minimize the time required for network restart.

DOCUMENTATION [order from Mechanicsburg]

Airlines Control Program - An Overview (GE20-0423) ... ACP System Concepts and Facilities (GH20-1473) ... ACP System Design Guide (ZZ20-3637).



PROGRAMMING RPQs

**SYSTEM/32 REMOTE JOB ENTRY (RJE)
5799-WKJ (P84011)**

PURPOSE

System/32 Remote Job Entry provides the System/32 user with the ability to communicate as a 3780 terminal to a host system using HASP or POWER/VS. The user must have a knowledge of OS or DOS job control in order to prepare the data for transmission.

DESCRIPTION

HASP and POWER/VS commands can be entered from the keyboard. The System/32 RJE command uses the System/32 disk storage for data input. The input data file includes the job control statements and program data. All input must consist of 80 character records. Multiple jobs can be stacked in the one file when separated by /* statements. The output data is directed to either the System/32 print facility or disk storage, or both depending on the parameters entered by the operator with the RJE command. Two subroutines handle variable-length blocked, spanned, truncated, and optionally, blank compressed records.

System/32 RJEPRINT command is used to list files which were previously received. By doing the printing offline, the communications line time may be reduced.

HIGHLIGHTS

- Allows a System/32 to communicate as a 3780 with HASP or POWER/VS.
- Improves existing System/32 communication line efficiency by sending and receiving variable length records with blank compression.
- Can be used with either switched or leased point-to-point lines.
- Output may be either to the print facility or the disk storage.
- Input data may be from the keyboard and/or disk storage.
- HASP and POWER/VS commands can be entered through the keyboard.
- No RPG II compiler is required.
- RPG II source statements are provided for ease of modifications.

SPECIFIED OPERATING ENVIRONMENT

HARDWARE REQUIREMENTS

The minimum IBM System/32 configuration required to support the RJE program is:

- IBM 5320 System Unit (all models).
- Binary Synchronous Communications Adapter (#2074).

SOFTWARE REQUIREMENTS

System Control Program (5725-SC1) Version 2 or later.

DOCUMENTATION
(available from Mechanicsburg)

System/32 Remote Job Entry PRPQ Information Manual (GC21-7653).

PROGRAMMING RPQs

**CONTROLLED ACCESS SYSTEM
5799-WKY (P82001)****PURPOSE**

The Controlled Access System monitors and controls entrances to a restricted area, building or room. A magnetic card reader is installed at each monitored entrance. The PRPQ also provides logging, emergency action, and initial card encoding facilities.

DESCRIPTION

This PRPQ consists of two programs and a set of 15 operator intervention subroutines. The two programs provided are:

- Card Number Generation Program
- Controlled Access Application Program

The Card Number Generator program provides the means for producing a set of 10-digit decimal numbers to be encoded on the user's cards by the customer's card vendor. The Controlled Access Application program monitors and controls access to specified areas.

HIGHLIGHTS

- Decodes and validates the 10-digit decimal number encoded on a card.
- Determines whether the card holder is allowed in the area to which he is attempting entry.
- Maintains a list of cards that have been lost or stolen.
- Controls locks on doors in the system, unlocking them only for valid cards.
- Detects errors in the physical operation of the doors in the system.
- Alerts security personnel of any detected errors in the system or of system detected attempts to violate the system.
- Provides recovery procedures following a power failure.
- Provides emergency procedures to lock or unlock all doors in the system.
- Has the ability to trace transactions in the system and to save this information on disk.
- Has the capability to allow certain card identification numbers entry at a specified door.
- Has the capability of requiring two valid cards to be presented to a specified entrance before entry is allowed.
- Has the capability for detecting doors in the system that have been opened without a valid card presentation.

The Operator Intervention Subroutines, which operate as program overlays under the supervision of the Controlled Access Application program, provide the following functions via the 5028 Operator Station:

- Validate or invalidate a card identification number for a specified door.
- Add or remove doors currently under the direction of the system.
- Manual control and system inquiry.
- Start or stop any of the monitoring or control activities of the system.
- Check or reset the status of the system.

The maximum number of doors which may be controlled by the PRPQ is 64.

SPECIFIED OPERATING ENVIRONMENT**HARDWARE REQUIREMENTS**

Actual storage requirements will vary depending upon the MSP/7 release level, number of doors, number of badges and number of classes configured. Minimum system storage requirements under MSP/7 Release 9.0 is 10K storage.

The additional storage requirement for Symbolic Disk Support is due to the additional file functions available.

SOFTWARE REQUIREMENTS

Prerequisites: Reader RPG D08140, D08141, D08142, D08242, D08244, D08246, PSH 5799-WKY ... 5022 Disk, Auto Restart ... MSP/7 Host Preparation Facilities II.

DOCUMENTATION

(available from Mechanicsburg)

User's Guide (SC34-1511) ... PRPQ Description User's Manual (SC34-1532) ... Controlled Access Installation Manual Physical Planning (GA34-1500) ... Controlled Access System Customer Brochure (G520-2540) ... Implementation Service for IBM Programs Service Description - Controlled Access Application Program (G120-2379).

PROGRAMMING RPQ

MSVIZAP (5799-WPK)**PURPOSE**

MSVIZAP, operating as a problem program, assists the user in restoring the Mass Storage Volume Inventory (MSVI) data set to match the Mass Storage Control Tables in the event of program failures, system failures, or power failures. MSVIZAP enables the user to alter or display the contents of the MSVI data set. MSVIZAP supplements the MSS Access Method Services for recovery.

HIGHLIGHTS

MSVIZAP has seven functions that can be used to update the MSVI data set:

- **ADD** - adds a new record to the MSVI data set.
- **VERIFY** - verifies that specific data is at a given offset in a record.
- **REPLACE** - replaces data at a given offset in a record.
- **PRINT** - prints a specific record, a range of records, or the entire MSVI data set.
- **DELETE** - deletes a specific record.
- **LOCATE** - locates and prints information as a message about a specific cartridge, volume, copy volume or duplicate volume.
- **CONSOLE** - indicates that the program control statements are to be entered at the operator's console.
- **END** - returns control from the operator's console to the input data set.

MSVIZAP can be invoked with Job Control Language statements through normal job stream processing, invoked from the operator's console, or linked from a problem program. In all cases the Mass Storage Volume Control (MSVC) functions can remain active (enabled) in all systems, because MSVIZAP issues the same RESERVE/DEQ for the MSVI data set as the MSVC task does.

CUSTOMER RESPONSIBILITIES

- Understand the 3850 Mass Storage System.
- Understand the function and architecture of Mass Storage Volume Control component of either MVS, SVS, or VS1 and the Mass Storage Volume Inventory Data Set.
- Understand the format and contents of the Mass Storage Control Tables.
- Prepare the control statements for the MSVIZAP program. Each MSVIZAP function operates on only the record specified. Related records may also require alteration, addition or deletion.
- Implement appropriate security procedures for use of the MSVIZAP program.

SPECIFIED OPERATING ENVIRONMENT**HARDWARE REQUIREMENTS**

MSVIZAP is a problem program applicable to IBM S/370s with the 3850 MSS attached. MSVIZAP requires the Mass Storage Volume Inventory data set and VSAM.

SOFTWARE REQUIREMENTS

MSVIZAP is released to work with OS/VS1, Release 6; OS/VS2, Release 1.7, and OS/VS 3.7. Prerequisite for the MSVIZAP Program on OS/VS1 release 6 is SU5 (5741-605). Prerequisite for OS/VS2 release 1.7 is 3850 MSS allocation to mounted volumes ICR, and on OS/VS2 release 3.7 is SU24 (5752-824).

DATA SECURITY AND AVAILABILITY

MSVIZAP may be loaded into an Authorized Program Facility (APF) library.

DOCUMENTATION: (available from Mechanicsburg)

MSVIZAP Program (GC35-0031) ... *MSVIZAP Program Logic* (SY35-0032).