

SIGMA 6,7,9 CP-V

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1.0 PRODUCT DESCRIPTION

1.1 Purpose

The purpose of the B00 release of CP-V is to provide for distribution to the field a combined major development and maintenance release. Ten CP-V development projects and 407 SIDR fixes are included with the release.

1.2 Features

The major features implemented in CP-V B00 are described below.

1.2.1 Real-Time Processing

The B00 release of CP-V supports real time processing. There are two major categories of CP-V real time programs, mapped and unmapped. Mapped real time programs begin execution as normal batch, on-line, or ghost programs. They are known to the CP-V execution scheduler and have their interrupt centrally connected such that they cause events to be reported to the execution scheduler. Mapped real time programs may use any available monitor services. Although normally subject to swapping, mapped users may lock themselves in core if required.

Unmapped real time programs are loaded into the reserved resident foreground memory by normal mapped user programs which use the M:CVM (Change Virtual Map) procedure to map onto the foreground memory area and install any desired program. Note that I/O may be performed into virtual pages whose physical correspondence has been established via the M:CVM service.

Unmapped programs may only be directly connected to their interrupts, the CP-V monitor will be unaware of the occurrence of those interrupts. An active unmapped real time program is equivalent to the CP-V monitor and any programming error resulting in any trap will cause a software check. An unmapped real time user may not execute CALs and in general, may not use monitor services. A selected set of monitor services is available to unmapped programs via direct BAL linkages to the monitor.

1.2.2 Extended User Size

The extended user size feature provides an increase in available virtual memory size from 76K to 92K. The format of user program virtual memory in previous systems was from X'C000' to X'1C0000'; however, in B00, the entire virtual area from X'A000' to X'1FFFF' is available for a user program's data, DCBs, and procedure (in that order). If a user's program is associated with the special shared processor region (i.e., as in execution with the Fortran Public Library, :PO), then a smaller range of memory from X'A000' to X'1C000' is available to that program. The B00 Loader automatically ascertains which address range should be used and builds the load module accordingly.

1.2.3 Enqueue/Dequeue

The Enqueue/Dequeue feature permits users to coordinate the use of a resource among themselves. This includes, but is not limited to, the shared use of random files for simultaneous update by several jobs. The feature includes the ability to deal with individual elements or all of a resource, with explicit release or automatic release at the end of either the job step or the job. The feature also includes deadlock detection such that users cannot unknowingly be mutually waiting for another to release a resource or element. Access to the Enqueue/Dequeue feature can be restricted to selected users and/or selected times via SUPER and CONTROL.

1.2.4 RMA Enhancements

The CP-V B00 Monitor contains the device/controller model numbers for each peripheral in the system. This is required for device partitioning, on-line diagnostics, and the error logging enhancements.

The model numbers are defined on the :DEVICE commands during SYSGEN PASS2. PASS2 verifies the defined model numbers as a valid combination (i.e., controller and device) through the M:MODNUM file. The M:MODNUM file contains a list of all of the controller/device model number combinations. When defining the :DEVICE commands for SYSGEN PASS2, the device model number is required. If no controller model number is defined, PASS2 will take the last controller model number for the specified device in M:MODNUM when there is more than one entry for a given device model number. However, if a controller model number is defined on the :DEVICE command, the device/controller combination is verified in M:MODNUM as a legal combination. When a device and/or controller model number is unknown, the value FFFF must be used as the device model number and also the controller model number (i.e., if specified) on the :DEVICE command. When a foreign device and controller have known model numbers and no such combination exists in M:MODNUM, then the desired model numbers must be inserted into the M:MODNUM file prior to doing SYSGEN PASS2 or the :DEVICE commands with the new model numbers will not be accepted. The value FFFF can be used even if the model numbers are known. New model number combinations are inserted into M:MODNUM through the new processor, SYSCON. The following list identifies the acceptable device/controller model number combinations.

<u>DEVICE</u>		<u>CONTROLLER</u>	<u>DEVICE</u>		<u>CONTROLLER</u>
FFFF	DEFAULT	FFFF	7016	TTY	7016
7012	TTY	7012	7017		7017
7015		7015	7020		7020
7122	CR	7122	2741		2741
7140		7140	7060	PT	7060
7165	CP	7265	7120	CR	7120
3463	LP	3463	7121		7121
3465		3465	7160	CP	7160
7372	TT	7371	7530	PL	7530
7315	QT	1038	7440	LP	7440
7316		1038	7441		7441
7322		1038	7445		7445
7332	BT	7330	7446		7446
7333		7330	1200		1200
3345		3340	7362	TT	7361
3347		3340	7322	QT	7330
7212	DC	7211	7333	BT	1038
7232		7231	7322	QT	7321
3215		3211	7323		7321
7270	DP	7270	7232	DC	7236
7271		7270	7242	DP	7240
7275		7275	7246		7240
7277		7275	7261		7260
3275		3275	7266		7265
3277		3275	7242		7243
3270		3270	7611	COC	7611
3271		3270	FFFF	DEFAULT	FFFF
7602	COC	7602			
7605		7605			
7630		7630			
7631		7630			
0000	NULL	0000			

1.2.4.1 Device Partitioning

Most devices and their associated controllers can be partitioned (i.e., removed from the CP-V system) by invoking the SYSCON processor. Devices that may not be partitioned include: TY (teletype), COC (communications hardware), DC (RADs), public disk packs, and associated controllers. SYSCON can also return previously partitioned devices and/or controllers, display the status of selected combinations of devices, build or update the M:MODNUM file (the file which contains the device model numbers and their associated controllers; used by PASS2 for verification of devices and controller model number combinations), and display the contents of this file. SYSCON is a system control processor that may be executed as a ghost job or on-line providing the user has AO privilege or greater.

1.2.4.2 On-Line Diagnostic Services

The on-line diagnostic capability is presented in CP-V B00 in the form of various monitor services (i.e., CALs). These services permit a privileged user, who must also have proper authorization, to acquire any device other than a RAD or public disc. Once the device is acquired, the user may run functional tests in order to isolate problems to the lowest possible level, exercises for verifying operation, or preventive maintenance tests concurrently with the operating system. With these enhancements, the user has the ability to lock himself in memory, to partition or return devices, to issue his own command list, and to obtain address conversion. Furthermore, the user may request the operating system to construct a data area for communications, to convert his virtual command list into a physical command list in the data area, to start his I/O and return the status, and to specify if he should become a candidate for swapping.

1.2.4.3 Analyze Enhancements

In addition to the B00 specific changes, ANLZ has been up-graded to both improve performance and make more information available.

Additional analysis of data, JITs and maps has been introduced so ANLZ can effectively warn the peruser of incorrect information; additional displays have been added to aid the user of ANLZ. Run-time size has been decreased from 32K to 27.5K and run-time speed improved 40% (once the symbol table file is built).

The symbol tables ANLZ uses will now be saved in the :SYS account in a file named 'SYMBOLS'. This file contains the images ANLZ uses for the dump output, and allows ANLZ to run faster than it would if it had to build the symbol tables. In addition to saving the symbol tables, ANLZ can be directed to restore the tables by the command 'IS', whereupon a user can input to ANLZ 'SYMBOL/' and ANLZ will identify the symbol address and contents.

When ANLZ runs as part of system recovery (at restart time), its function is to ANALYZE the last created MONDMP file. A new feature has been introduced into ANLZ to allow inter-active use at the operator's console. If ANLZ finds that it is not running as part of system recovery, it will query the operator as to what function ANLZ should perform. The operator has the choice of telling ANLZ to Analyze the last MONDMP file, read a recovery build tape, read a previously built recovery file, run inter-actively at the operator's console, or to exit. This feature allows ANLZ to run as a ghost and take its direction from the operator. The inter-active ANLZ ghost is identical to using ANLZ at a terminal, i.e., it prompts for input, and reacts the same as it would at a terminal (output is directed to the LP however).

TSTACK is now formatted (after each JIT is displayed) with addresses and contents of the address displayed by symbol name plus offset, if any. The address contents are displayed as data or instructions as appropriate.

The screech code error messages are now part of the standard error message file in the :SYS account. This allows an installation to include their own messages or information.

As user documentation typically finds itself not available when you need it, a HELP command has been added to ANLZ to display all of the commands, their options and a brief description of the output produced by that command.

1.2.4.4 Error Log Additions

The error logging mechanism has been enhanced to include significantly more information than has been previously reported. This includes the addition of new error log entries and the modification of existing error log entries. Refer to Systems Management Reference Manual for details.

1.2.5 File Management Enhancements

1.2.5.1 Shared Update Random Files

- A. A facility has been provided to permit a shared update capability for random files. When all users have specified the shared mode, this facility permits up to 127 update and 127 input users to simultaneously access a random file. There are several protocol requirements enumerated below. When none of the users specifies the shared mode, one

updater and up to 127 input users are permitted as was the previous practice. No simultaneous use of a random file by mixed shared and non-shared user is permitted.

The method of implementation of these facilities places a responsibility on the user to follow special protocol to obtain desired results. The enqueue/dequeue facility has also been included in the B00 release to provide the requisite staging capability.

In a shared update environment, there are three types of operation to be considered:

1. Statistical read - the process of reading without concern as to whether the current record, or other records associated with the current record because of application considerations, are being updated.
2. Exact read - the process of reading with the assurance that the current record and possibly other application associated records are not in the process of an update which is only partially complete.
3. Update - changing the data content of a record or a group of application associated records.

To accomplish statistical reads, there are no special protocol requirements; however, for exact reads and updates, it is necessary to obtain some protection from other use of the block(s) in question. The enqueue/dequeue facility has been included in B00 for this purpose and the documentation of that facility is commended to the reader's attention. In order to process an exact read, it is necessary to obtain shared use of the block(s) in question, while, to process an update, exclusive use is a requirement. In addition, once an operation has been completed, the enqueued items should be dequeued promptly. It is essential that all users conform to this protocol or inefficient operations and data damage may ensue. CP-V does not enforce a correct enqueue/dequeue sequence

Since a random file consists only of data as far as file management is concerned, CP-V does not enforce any new restrictions on random file operations in the shared mode.

Since there is a possibility for an extensive monitor data area for enqueue tables, it is appropriate to compress the queue and subqueue names by hashing techniques to minimize the impact. The EDMS routines use a hash of the file identifier which results in a 24 bit value for any file name, account pair. The subqueue name used is a 24 bit representation of the block number in question.

The following program displays the hashing algorithm used. Tests on several 10,000 file sets indicate an incidence of duplicate hashes of considerably less than one percent.

	LI,1	BA(FILENAME)	
	LI,3	0	
	LB,2	0,1	TEXTC COUNT
ST1	AI,1	1	
	LB,4	0,1	
	AW,3	4	
	SCS,3	6	
	BDR,2	ST1	
	LI,1	BA(ACCT)	
	LI,2	8	8 CHARACTERS IN ACCT
ST2	LB,4	0,1	
	AW,3	4	
	SCS,3	6	
	AI,1	1	
	BDR,2	ST2	
*	REGISTER 2	CONTAINS ZERO	
	DW,2	PRIME	
	STW,2	HASH	REMAINDER IS HASH VALUE
	:		
	:		
	PRIME DATA	16777213	

Whether hashing techniques are used or not, it should be emphasized that the above described protocol must be followed by all shared update users of a file to obtain desired results. Also, if hashing is used by any shared user for his calls to enqueue/dequeue, the identical hashing algorithm must be used by all users of that file. When using any hashing technique, the user must be prepared for the X'3101' and X'3102' abnormal returns from an enqueue CAL, since more than one element may produce identical hash values.

1.2.5.2 Read-Ahead and Associated I/O Reduction (AIR)

These two features are closely related. Both share code in module RA (optionally included at SYSGEN time).

A. Read-Ahead

Read-Ahead is the anticipatory reading of disc file granules for keyed or consecutive files open IN with sequential access. Its purpose is to improve system throughput by reducing the amount of time that users must wait for I/O to complete. The I/O is done into a monitor page so that the user is not locked in core. Only one read-ahead may be active for a given DCB at one time, but one user may have many DCBs with active read-aheads.

A read reverse or a read specifying a key will cause any read-ahead operation currently in progress to be aborted and will prevent a new one from being initiated until the DCB has been closed and re-opened.

The CONTROL parameters RAM and RATO set the maximum number of read-aheads allowed and the time-out value in milliseconds. A read-ahead will be aborted if it has timed-out and either the buffer page is needed by the scheduler for an in-swap or the table entry is needed for another read-ahead.

The following cells contain information about read-ahead:

RA:AINIT	# attempts to initiate a read-ahead.
RA:SINIT	# successfully initiated.
RA:CURR	# currently active.
RA:ABNTB	# unable to start - no table entry available or max # already initiated.
RA:ABNCO	# unable to start - no core page available.
RA:ABNWP	# times wrong granule read (user did M:PRECORD or error in read-ahead logic).
RA:SCHK	# successfully completed.
RA:IOW	# times users had to wait for I/O to complete on read-ahead granule.
RA:ABNNN	# aborted because granule not needed (DCB closed when not at EOF, read reverse, or keyed read).
RA:ABNTR	# timed out.

B. AIR

The purpose of AIR is to reduce the number of disc I/O reads necessary to read file directory (FD) granules. When file management is finished with a buffer containing a FD granule, the core buffer is not released but is removed from the user (a page from the monitor's free page pool is substituted) and a pointer to it placed in the read-ahead tables. Whenever a FD granule is to be read, the read-ahead tables are searched first. If the desired granule is already in core, the user is simply mapped onto the core buffer, thereby saving a disc read.

AIRM and AIRTO are the control parameters to set the maximum number of AIR core buffers and the time-out value in milliseconds.

The following cells give information about AIR:

RA:CURA	# currently tabled.
RA:ASTOR	# attempts to table.
RA:SSTOR	# successfully tabled.
RA:AGET	# time tables searched.
RA:SGET	# retrieved from tables.
RA:ABNTA	# timed-out.

C. Pool of Free Pages

In order to minimize the number of read-ahead and AIR operations which cannot be initiated because no core page is available, a pool of free core pages is maintained. SL:RAMF contains the maximum number of pages allowed in the pool (default = 2), and RA:CURF the current number. If a page is needed by the scheduler, the pages in the free pool will be released before any read-ahead or AIR entries.

D. Tuning

Suggested values for the CONTROL parameters are 4 to 6 for AIRM and 6 to 8 for RAM. Increasing AIRM causes the I/O rate to decrease, but the available core is reduced by one page for each active AIR entry. With AIRM set to 5, the I/O rate should decrease by 5% to 10%. For read-aheads, RA:ABNTB gives the number which could not be initiated because no table entry was available. RAM should be set so that RA:ABNTB stays small.

The PASS2 parameter RASIZE determines the number of read-ahead table entries built (approximately 3 words per entry). It should be at least as large as the sum of AIRM and RAM (perhaps 20 to 30).

1.2.6 Monitor Size Reduction

1.2.6.1 Reduced CFU Table Requirements

A new method of managing the user CFU space has been provided. This results in a reduced requirement for CFU storage space to run the same mixture of jobs as compared to previous releases. Our best estimate is that the installation should request 60% of the CFUs in his SYSGEN as was his previous practice.

1.2.6.2 Increased Monitor Overlaying

The CP-V resident portion has been reduced in size by moving low frequency execution routines to overlays. The earlier restriction of 15 monitor overlays has been removed; the STEP module and the AVR routine have been moved to overlay segments. New features have been implemented taking advantage of this by placing their low frequency execution routines into overlays.

1.2.6.3 Condensed Disk Pack Handler

The previous disk pack handler modules, DPAK and DISKAB, have been rewritten to form one common handler. The new routine was integrated with the HANDLERS module to take advantage of common data areas to reduce the size of the new handler to less than either of the two previous modules. RMA improvements were made which provide more detailed error log information in a secondary device error record. The retry sequence has been improved; each retry will now restore the carriage arm before performing the seek and data transfer operations so that the arm positioning operation is completely retried.

1.2.7 Performance Enhancements

1.2.7.1 Disk Pack Seek Optimization

Disk pack arm movement optimization has been incorporated in the I/O system. In effect, a single sweep algorithm has been implemented by inserting I/O requests at a given priority for a disk pack device into its channel queue by consideration of arm position. A new disk pack device request, for an operation on a cylinder other than that for the device's current operation, is inserted into its priority subqueue such that the

arm will be driven towards cylinder 0 as the I/O requests are performed. Within a priority subqueue, I/O requests within the same cylinder are serviced on a first in, first out basis.

1.2.7.2 ALLYCAT Improvements

Because of the increased size of new disk pack granule maps (HGPs), (i.e., a 7242 contains X'177' words, a 7260 contains X'2EE' words and a 7275 has X'522' words) ALLYCAT has been modified to speed up disk address extraction from the maps.

A00/A01 ALLYCAT, using a 7260 bit map for reference, required a minimum of 145 usec and a maximum of 7.742 ms to get and convert an HGP bit into a disk address. In B00, ALLYCAT requires 106-141 usec to get and convert the same bit.

B00 ALLYCAT builds and maintains a set of tables that identify where to find RAD, PACK, SYMBIONT or cylinder disk addresses. The tables identify the HGP location, the word inside the HGP, and the bit index in that word where a bit can be located. As an HGP is depleted, ALLYCAT will either switch to the next HGP if there is one, or re-search the only HGP to insure that the HGP is in fact empty. If the HGP has been exhausted, bit 18₁₀ of word 1 in the header will be set to avoid scanning this HGP until such time as a user releases a bit into that HGP. At that time, bit 18 will be reset, allowing a scan later.

In addition to the ALLYCAT speed-up, further modifications have been made to the resident portion of ALLYCAT to speed up that path in obtaining disk addresses. In A00/A01, certain paths through GRAN (the resident portion of ALLYCAT) require twice as many instructions to be executed as does B00 GRAN. As this is a frequent path in obtaining a disk address, the net result is additional CPU time available for users.

In past versions of CP-V, it was impossible to calculate how much disk space was currently in use by the symbionts. This has been corrected in B00 CP-V by correctly counting the symbiont granules busy (SGB) as they are obtained/released by the symbiont routines. SGB is an absolute count however, and does not reflect PFA granules stolen count. It is a sum of all granules (PER and PFA) currently in use by symbionts.

1.2.8 New I/O Device Support

1.2.8.1 Full Support for Sigma Disk 33 (Model # 7275)

Full support of model 7275 disk is provided in the B00 release. Limited support in the A01 release was characterized by the following list of attributes:

1. 404 primary cylinders and 7 alternate cylinders.
2. 18 tracks per cylinder.
3. 11 sectors per track.
4. 198 sectors per cylinder.
5. 99 granules per cylinder.

Full support is characterized by the following list of attributes:

1. 404 primary cylinders and 7 alternate cylinders.
2. 19 tracks per cylinder.
3. 11 sectors per track.
4. 208 sectors per cylinder.
5. 104 granules per cylinder.

Private packs created under A01 should be copied to tape, reinitialized with VOLINIT D00, and then restored. This will allow the entire device to be utilized. In order to continue using A01 packs under B00, they must continue to be described for SYSGEN as noted in document 707000-61A01 with the exception that a fictitious device type must be substituted for 7275 (i.e., 7274).

1.2.8.2 2780 Remote Terminal Support

A. Hardware

Terminals - CP-V 2780 support will operate to IBM 2780 RBTs and any terminal which emulates them subject to the conditions in Section C below.

Data Set Controllers - 2780 support requires a Xerox 7605 data set controller, full or half duplex. 2780s and IRBTs may use the same 7605 at different times and the system will distinguish which is connected.

B. Protocol

2780 terminals use a subset of the Binary Synchronous Protocol as defined in Component Description: IBM 2780 Data Transmission Terminal (IBM-GA27-3005-3). CP-V provides support for a subset of these terminals with the following characteristics:

- a) EBCDIC transmission code.
- b) Non-transparent line protocol (no binary cards sent or received).
- c) Single record or 400 byte block transmission.
- d) Support of the IBM 3780 is not included.
- e) Support of multi-drop lines is not included.

C. Functional Differences

The 2780 remote terminal is supported, just as the 7670 has been supported, with the following exceptions:

1. The nature of the 2780 hardware is such that output files in progress cannot be suspended by the remote operator. This, of course, disallows the use of the control commands listed under RESTART COMMANDS in the CP-V Remote Processing Manual (page 15). Unlike the 7670, the 2780 can transmit input between output files without operator intervention, and this in some way makes up for the above.
2. The additional VFC characters X'F2' - X'F7' will be accepted. They specify skip to channels 2-7.
3. The 7670 options in SUPER and SYSGEN are replaced by 2780 for these devices. In addition, if TYP=2780 is specified, the option MRB and the NMRB are allowed. MRB specifies multi-record blocks of 400 characters. NMRB specifies one record per block and is the default.

1.2.9 Uniform Patching and System Initialization Enhancements

System initialization has been improved in a number of ways. It is no longer necessary to be choosy about which patches to include in your deck since those that don't belong will be ignored automatically. The patch deck size is no longer an excuse for leaving out patches, since the patch deck can be included on the tape at DEF time and the printer can be turned off at boot time. Absolute patches have been eliminated by the dynamic creation of the patching symbol tables at DEF time. Details on these and other improvements can be found in the System Management Reference Manual.

1.2.10 Compatible File Maintenance Tape Formats

The B00 versions of the file maintenance processors (FSAVE, FRES, FILL) have been modified to allow creation of compatible back-up tapes. A tape created by FSAVE can be read by FILL and FRES; FRES can read FILL created tapes. Restrictions are noted in Section 6.2 of this document.

FILL Data Base Files and Tapes Format

INPUT - The schedule file BACK:SCHED, :SYS is read and each request is scanned and sorted into a table by request time. Any requests which contain errors are deleted from the file.

The file F:BACKUP, :SYS contains the keyed record BACKUP which is written by the TEL command BACKUP. It contains the user's requests of the name, account, and password already formatted for the parameter list of OPEN. There is a one page limit set by TEL for this record.

The file F:BREC, :SYS can contain two keyed records. the SAV record contains checkpoint information for automatic backup; it contains the completion time of the last Saveall, Incremental and Squirrel; the type of the last backup; whether or not a tape is mounted; the completion time of the last FILL. The SEL:FIL record is used by FILL to selectively restore files from FILL or FSAVE tapes.

The cell DEBUG allows FILL to be run on-line if it is non-zero.

All files in all accounts are read by automatic backup regardless of their password or read-access.

OUTPUT - The backup tapes are created as multi-file, multi-reel, labeled tapes. These tapes are now compatible with FSAVE/FRES. Each user file is opened with FPARAM and the information thus returned is used to write a user tape label when the file is opened on tape.

1.3 Unannounced Features

This section contains features which were not committed but are in fact operational in the CP-V B00 release.

1.3.1 ANS Tape as a Standard Feature

The ANS tape capability is now a standard feature and the levels of protection for ANS tapes has been expanded to provide all the options previously available. The PASS2 command :MON now has an ANSDET option in addition to the previous ANS tape protection of ANSPROT. ANSPROT and ANSDET are the same as ANSPROT and no option, respectively, where in previous systems that included the ANS option. Specification of neither provides the same operations as previous non-ANS systems except that ANS tapes may also be processed.

1.3.2 Tape Write Ring Controls

New, optional safeguards are available to avoid the necessity of inserting a write-ring in a tape reel when the tape position is not at load point. These safeguards are active if the PASS2 :MON command includes either the ANSPROT or ANSDET option.

The mounting of a tape volume is implicit, being performed as an auxiliary function of the first open for that serial number. Under this optional feature, a "function" is associated with the volume which is determined by the first open; it is either IN (input only) or any of INOUT, OUT, or OUTIN (not restricted to input). If the volume is OUT or OUTIN, no special procedures apply as the first write occurs while the tape is still at load point, and existing operator interaction procedures handle the situation. If the volume is IN, the optional safeguard prevents writing on the volume, i.e., if a DCB for that volume is subsequently opened INOUT, it is changed to IN, and if opened OUT or OUTIN, an error is returned (except, see "Remount" below).

If the volume is mounted INOUT, the optional safeguard checks for the presence of the write ring. If present, operation proceeds normally. If absent, the message:

RING, ndd

is output on the operator's console. The operator then may either place a write ring in the reel, ready the drive, and do an AVR or repeat the original mounting keyin (MOUNT ndd or ANSMOUNT ndd excluding user number and serial number), or, if it is known that the tape is only to be read, the operator does the following keyin:

READ ndd

The READ keyin has the same affect as though the user program had opened IN instead of INOUT. If the :MON command specified ANSPROT, the READ keyin will be accepted only if the user has at least a X'CO' privilege.

Since the purpose of this optional safeguard is to avoid insertion of write rings at other than load point, it follows that a write ring can be inserted any time the tape is at load point. Therefore, there is a "remount" procedure such that any time an IN volume is opened while at load point, the procedures described above are followed.

Users of PCL need exercise a little descretion. If the intention is to add to a tape, the "mounting" PCL command should be SPE or SPF 0 to assure an update mount.

1.3.3 STATS/SUMMARY

A. The STATS processor has been modified as follows:

Deletions:

1. History files are no longer generated or processed by STATS in order to eliminate the history file space requirements of ten granules per record. The snapshot files are created as the intervals are completed which removes the need for processing history files at the end of the week to get snapshot files. Each snapshot record takes about 1/2 a granule each which requires one granule for the two snapshot records. (SNAPSHOT requires one record and SSNAPSHOT requires one record.)
2. Base files are no longer generated or processed by STATS. This function was not commonly used and was an extension of the history file idea.
3. The statistical group INTERACT was dropped since the data is no longer gathered in the root of the monitor.
4. The N(UMBER) of lines in the current display is not implemented.
5. Many print flag options have been deleted in favor of group print flags to simplify the use of STATS. Use of LIST command to get the current flags and their status.

Additions:

1. Snapshot records may be created at the end of each snapshot interval.
2. The HELP command lists the commands with concise descriptions.
3. The LIST command has been extended to list all the flags and their status.

4. The print format no longer requires blanks for groups with reset print flags. The format is more flexible and is packed for more efficient on-line displays.
5. Statistical measures which have been added to the PARAM and SUMMARY groups.
6. The order in which the statistical groups will be printed is as follows:

PARAM		
SUMMARY	CPU	
BATCH	ON-LINE	USERS
I/O	TASK	QUEUE

7. The total number of counts in the histograms is now printed as an added statistic.
8. The default display, BUILD 4, includes the SUMMARY and CPU display groups.

- B. The SUMMARY processor has been modified as follows:

Deletions:

1. The INTERACT statistical group is no longer available.

Additions:

1. The HELP command is available at the command level (-) prompt to provide a concise description of commands and options.

2. The LIST command is available at the command level (-) prompt to provide a listing of statistics by name, number and by group number and name.
3. New headings and the new group numbers coincide with the re-ordering of groups in STATS.

Group #

0	PARAM
1	SUMMARY
2	CPU
3	BATCH
4	ONLINE
5	USERS
6	I/O
7	TASK
8	QUEUE
9	HISTOGRAMS

4. The core requirements of SUMMARY now fit in a 20K partition.

1.3.4 Copy Over of a File with a Bad FIT

If a file cannot be read because of a 75-03 situation, it is possible for a CO privilege user or a user logged on under the same account as the file to open an output file of the same name. If this new file is then closed with SAVE, it will replace the previously existing file which produced the 75-03 error situation. The file can then be deleted or retained as the user desires.

1.4 Supporting Publications

The major features of the B00 release of CP-V are described in the following documents:

CP-V SM Reference Manual	90 16 74F
CP-V TS Reference Manual	90 09 07E
CP-V BP Reference Manual	90 17 64E
CP-V OPS Reference Manual	90 16 75F
CP-V Users' Guide	90 16 92D
CP-V Remote Processing Manual	90 30 26B

Corrections and updates to these manuals are contained in Appendix 1 of this document.

2.0 HARDWARE CONFIGURATION

Real Time External Interrupts

External interrupts for centrally connected real time programs must be of lower hardware priority than the I/O group of interrupts. External interrupts for use by directly connected, unmapped tasks, may have a hardware priority higher than the I/O group.

3.0 SIDRs CLOSED

3613	10259	10907	11197	11561	11839
3844	10265	10928	11199	11563	11843
5093	10266	10962	11200	11564	11847
5401	10337	11014	11202	11566	11849
5609	10353	11065	11203	11570	11850
7138	10390	11069	11204	11590	11851
7554	10429	11111	11205	11591	11852
7941	10450	11120	11206	11604	11853
8070	10467	11132	11219	11608	11924
8801	10468	11137	11231	11632	11925
8893	10488	11138	11232	11640	11957
8968	10553	11139	11235	11675	11958
8998	10554	11140	11262	11685	11961
9015	10576	11143	11265	11687	11975
9065	10587	11148	11296	11710	11980
9155	10598	11149	11302	11716	11981
9158	10610	11151	11330	11747	11985
9380	10637	11153	11331	11748	11986
9514	10675	11157	11340	11757	11990
9573	10695	11158	11358	11774	11999
9600	10696	11161	11425	11786	12041
9615	10697	11170	11429	11789	12043
9681	10727	11174	11432	11798	12057
9682	10773	11178	11434	11804	12073
9742	10787	11181	11461	11809	12081
9888	10861	11183	11473	11826	12082
9940	10862	11185	11474	11827	12086
10076	10886	11190	11478	11830	12100
10116	10899	11192	11519	11831	12106
10118	10900	11193	11526	11832	12120
10238	10905	11195	11531	11834	12134

12136	20001	20052	20158	20380	20593
12139	20002	20053	20159	20383	20608
12141	20003	20054	20160	20385	20611
12152	20004	20055	20171	20393	20612
12153	20005	20056	20181	20398	20613
12154	20008	20057	20182	20399	20615
12166	20011	20058	20192	20401	20618
12170	20014	20059	20196	20420	20623
12185	20015	20060	20200	20427	20624
12197	20016	20061	20204	20438	20625
12212	20019	20062	20206	20465	20626
12213	20020	20063	20215	20479	20628
12216	20021	20064	20237	20485	20629
12225	20022	20066	20240	20491	20630
12226	20023	20068	20245	20493	20631
12245	20024	20069	20247	20495	20632
12246	20025	20070	20250	20496	20633
12247	20026	20071	20252	20500	20634
12248	20028	20072	20266	20502	20635
12254	20033	20073	20271	20503	20636
12257	20034	20080	20280	20511	20637
12261	20036	20081	20290	20530	20638
12262	20038	20087	20306	20540	20639
12271	20039	20089	20308	20550	20640
12278	20040	20091	20309	20551	20641
12317	20041	20094	20322	20562	20643
12318	20043	20095	20325	20573	20644
12347	20045	20098	20329	20576	20647
12366	20047	20099	20358	20577	20650
12373	20048	20100	20363	20578	20653
20000	20049	20107	20373	20589	20655
20001	20050	20117	20375	20592	20658

20773 21528
20878 21549
20881 21590
20882 21828
20883 21908
20884
20895
20896
20897
20898
20922
20978
21005
21013
21037
21052
21058
21347
21351
21392
21393
21401
21422
21425
21427
21436
21454
21485
21501
21512

The H00 SIDs listed are closed in the CP-V B00 release. A description of these SIDs can be found in the monthly Software Maintenance Report.

4.0 RELEASE CONTENTS

4.1 B00 Release Tape (707000-26/46/66 B00)

An FSAVE formatted two volume tape set, INSN = 87H0,87H1
ACCOUNT = :SYS.

This tape contains all input necessary to generate a CP-V B00 system. There are also control files on the tape which will facilitate the SYSGEN process. The contents of each account on this tape are described in detail below.

4.1.1 :B00B0

The account :B00B0 contains all the binary ROMs necessary to generate a CP-V system. It also contains the following control files:

\$LOCCTS - This job is the source for all CP-V LOCCTs which are needed in the PASS3 phase of the SYSGEN. The element files are listed one per line with the account specification included. All LOCCTs point to the account :B00B0 except for the PASS2 generated files and HANDLER files which are expected to be in the current account (i.e., usually :BOOSGEN).

\$PASS2 - This job is the PASS2-portion of the SYSGEN and is identical to one used in El Segundo for experimental development; it should be modified to fit the particular installation's hardware configuration, software requirements, and system management controls (reference: CP-V System Management Reference Manual, 90-16-74F, 1974).

\$P2MINI - This is an example of the PASS2 that was used to create one of the MINI-starter PO tapes.

\$GENJOB1 - This job brings in the required files from the :BOOBO account; loads M:MON, JIT, and GHOST1; builds :JO, :J1, and MONSTK; BATCHes off the \$GENJOB2 file which loads the rest of the monitor overlays and processors.

\$GENMINI1 - This job functions the same as \$GENJOB1 except that it is designed to be run on systems that have only 64K of memory.

\$GENJOB2 - This job is BATCHed by either \$GENJOB1 or \$GENMINI1 and loads the rest of the monitor overlays and processors.

\$DEFJOB - This job writes the user's PO tape.

\$CPYSTD - This file is in the form of a PCL standard file; it contains the names of all the files which must be resident in the SYSGEN account. These include all of the handler ROMs, the system libraries, the DCBs, and the various system procs (BPM, SIG7FDP, etc.), and processors from account 3531SYS (METASYM, FORTRAN, etc.). Each genjob mentioned above begins with a PCL copy standard of this file to the SYSGEN account.

\$GENUCOC1 - An example of a modified \$GENJOB1 for a non-COC system.

\$P2MINIUC - An example of a modified PASS2 file for a non-COC system.

The DEVDMF file is a stand-alone, self-booting program that will produce a device copy of any RAD or pack on magnetic tape (see Operations Reference Manual, 90-16-75F). To obtain a copy, use PCL to COPY DEVDMF.:BOOBO to CP(BIN).

4.1.2 :BOOCI

Compressed files for CP-V B00.

DATADF is carried as a file in the :BOOCI account for persons wanting to assemble the module PART. DATADF is not a standard CP-V B00 release element and no development support of DATADF is implied.

4.1.3 :B00SI

Updates that have been applied ^{with} the compressed files ~~to~~ in generating the ROMs

Note: The two accounts, :B00CI and :B00SI, should not be needed if a new PO tape is all that is required.

The ROMs in account :B00B0 are the result of assembling the compressed decks in :B00CI with updates supplied from :B00SI. These accounts enable the installation to recreate every ROM in :B00B0.

4.1.4 3531SYS

Account 3531SYS contains the following standard processors. The \$CPYSTD file copies them from 3531SYS to the SYSGEN account.

<u>FILE NAME</u>	<u>PROCESSOR</u>	<u>VERSION</u>	<u>TECHNICAL BULLETINS</u>
:BLIB	Ext. FORT. IV/IVH	E00	1
:DIC	Ext. FORT. IV/IVH	E00	1
:LIB	Ext. FORT. IV/IVH	E00	1
:PO	Ext. FORT. IV/IVH	E00	1
:POO	Ext. FORT. IV/IVH	E00	1
:P1	Ext. FORT. IV/IVH	E00	1
:P11	Ext. FORT. IV/IVH	E00	1
APL	APL	B00	1-2
APLTRMSB*	Required for APL	B00	1-2
BASIC	BASIC	C01	1-2
COBOL	COBOL	E00	1
EASY	EASY	A00	1-4
ERRNOTES	RPG Error Message File	A01	
FLAG	FLAG	D00	1-6
FORT	Ext. Fortran IV	E00	
FORTLIB	SYSTEM FORTLIB	A01	
MERGE	MERGE	E00	1-6
METASYM	META-SYMBOL	H01	
RPG	RPG	B00	
SIML	1400 Simulator	E00	1-5
SORT	SORT	E00	1-6
TEXT	TEXT	A02	

* The file 'APLTRMSB' has the password 'STRUDEL' which must be retained for the processor.

4.1.5 COBLIBFILENAME

:DIC
:LIB
BLIB:
S:SRT

4.1.6 RPGLIBFILENAME

:DIC
:LIB
BLIB:

4.1.7 X

Account X contains a series of utility programs used by development programming which are not supported but which tend to be useful to other CP-V installations. The source for each program is included in compressed files so that anyone desiring improvements or corrections may do so on their own. The file JOBMNSTK contains the JCL for compiling and loading programs that require the Monitor Symbol Table or JIT definitions and must be batched after the new system is generated. The file JOB contains the JCL for building all programs.

The file HELP contains information about the use of each of the programs. Only those that have been added since the last release (A01) are mentioned specifically below:

SHOW - The SHOW processor will provide the user with various information about his system resources and service limits, his peripheral device authorization, and his current DCB assignment. Refer to the HELP file for details. In order to implement SHOW, GENMDs must be applied to TEL and CCI. These GENMDs may be found in the HELP file.

LMNCHK - The LMNCHK processor was developed to aid in the process of upgrading to CP-V B00. It will give the user information concerning the status of his load modules on a B00 system.

The LMNCHK processor scans accounts and prints statistics about load modules and SAVE/GET files. The data presented consists of the version (B00, pre-B00, or unknown), the load module type (LOADER built, PASS2 built, LOADER built library, DEFCON built, LINK built, LOADER built paged, or SAVE/GET file); associated core library, if any; number of DCB pages; size of the load module in granules; and the load module name. In addition to providing these statistics, LMNCHK has the option to delete pre-B00 load modules; it automatically deletes pre-B00 SAVE/GET files.

Acceptable commands to LMNCHK are:

DELETE: This causes old (pre-B00) load modules to be deleted when detected. It must be the first command entered following the call to LMNCHK if it is used; if not used, it applies to following account specifications. To delete other user files, of course, requires 'CO' privilege.

ALL: All accounts are to be searched, starting at the beginning of the account directory.

Specific Account Name: This account only will be searched.

All commands or account specifications must begin in column 1 (i.e., no leading blanks). LMNCHK may run on-line or batch.

INITVOL - INITVOL is a substitute for VOLINIT (NO TEST) that will run only in B00.

It may be used in any CO privilege environment (batch, on-line, or ghost). In batch or ghost, it will communicate through the OC device, on-line through UC. First it requests the device address of the pack to be re-initialized:

DEVICE ADDRESS(NDD)=

The corresponding device must be accessible to the system as a private DP device, and the spindle must be 'EMPTY' (as in DISPLAY VOLUMES). Then:

CYLINDER SIZE=

requests the (decimal) number of granules per cylinder (maximum 255). If zero or no response, INITVOL will use the value currently in the system's allocation table for the spindle (the default value for the spindle or the value from the last pack that was MOUNTed there). The resulting allocation table (bit map) must fit in one page. If it is too large to be MOUNTable on the current spindle, the message:

WARNING: BAD VTOC

will so indicate.

SERIAL NUMBER=

requests the serial number for the pack. At least one non-control character must be input.

ACCOUNT=

requests the account, which is optional. If the initialization is successful, no further indication is given and INITVOL exits. If it aborts for any of the aforementioned limitations:

INITVOL ABORTED

will be output before exiting.

LOADDEVDMPT-The stand-alone loader is needed to boot DEVDMPT if only a ROM of DEVDMPT is available.

4.2 Starter Systems

Two "starter" PO tapes. Since any of several types of discs may be used as the system (swapping) device, two PO tapes are available: 707000-86B00, Volume 1 of 2, is a PO tape for a 7242 or 7271 swapper; 707000-86B00, Volume 2 of 2 is a PO tape for a 7260 or 7275 swapper. The INSN of both tapes is CPB0 and the account is :BOOSGEN. These "starter" tapes should be used only to perform the initial SYSGEN.

4.3 -11

This document (707000-11B00) which includes a description of the product, list of SIDRs closed, SYSGEN procedures, maintenance procedures, a description of restrictions and incompatibilities, and documentation corrections.

4.4 Patch Deck

An initial patch deck (707000-64B00) to be used with the target system (not required with starter-PO tapes for SYSGEN).

4.5 Test Tape

A test tape (707000-76B00) containing the CP-V B00 Test Case Library (see Section 9, this document). This tape is an FSAVE formatted tape, INSN= 86EO and ACCOUNT= :SYS.

4.6 Compressed Listing Tape

A compressed listing tape in two volumes (707000-56B00) which may be uncompressed and printed using the UTILIST utility program. (See Example 8, page 62, which shows standard UTILIST jobs.) The tape labels are CLBA, and CLBB in account :B00LO. All supported modules are included with the exception of SYSTEM BPM, which may be assembled from the :SYS account of a B00 system.

4.7 VOLINIT

Only the D00 version of VOLINIT (706226-D00) may be used for disk pack initialization. A complete description of the VOLINIT processor may be found in the Operations Reference Manual, 90-16-75F.

4.8 -02 Element, Unpublished Technical Documentation

This element consists of CP-V B00 internal (design) specifications which were written to implement the new CP-V features. This element is not a part of the standard release package, but can be obtained by special order for 707000-02. A Data Base Technical Manual which describes CP-V B00 system tables will be available in late May, but is not a part of the B00 release package; it must be ordered via program/literature request specifying publication number 90-19-95B.

The specifications in the -02 element are:

<u>Title</u>	<u>Dwg. System No.</u>
On-Line Diagnostics	703162
Enqueue/Dequeue	703247
Extended User Size	703245
File Management Enhancements	703211
Real Time Phase I	703213
Sigma Disk 33 (7275)	703253
Reconfiguration & Partitioning	703240

5.0 SYSGEN PROCEDURE

5.1 Introduction

The following sections describe the procedures to follow when doing a B00 SYSGEN. Two "starter" PO tapes are available, one for a 7242 disk pack swapper (for use with 7242, 7271, or other 6-sector-per-track disks); the other for a 7260 disk pack swapper (for use with 7260, 7265, 7275, or other 11-sector-per-track disks). These "starter" PO tapes are supplied as starter systems to generate CP-V B00 target systems.

5.2 How To Sysgen CP-V B00

- Step 1 Boot starter PO tape, keying-in "IFT" upon request. NOTE: DELTA is not desired while generating the target system.
- Step 2 Use SUPER to modify the :SYS account for maximum privilege and core, plus tapes. Create the :BOOSGEN account. The SYSGEN will be performed in this account. Account authorization should include tapes, core, RAD, and disk. (See example 1 below.)
- Step 3 Using FRES (see example 2 below) restore accounts :BOOBO and 3531SYS from the release tape to secondary storage; these accounts contain all of the files necessary to perform the target SYSGEN.
- Step 4 Logon under the :BOOSGEN account and copy the following files into the SYSGEN account from the :BOOBO account:
- \$LOCCTS
 - \$PASS2 (example 3)
 - \$GENJOB1 (example 4)
 - \$GENJOB2 (example 5)
 - \$DEFJOB (example 6)

Maintain these files in the :BOOSGEN account for inclusion on the target PO tape. These SYSGEN files will then be available in the :SYS account when the PO tape is booted for future reference and/or future SYSGEN modification.

- Step 5 BATCH the file \$LOCCTS. This job will create LOCCTS for the PASS3 loads. All steps should terminate normally.
- Step 6 EDIT the \$PASS2 files to fit the hardware configuration and the desired installation management parameters. The \$PASS2 file supplied with the release tape duplicates one of the PASS2s used for testing in E1 Segundo; the \$P2MINI file (included in the :BOOBO account on the Release Tape) may be used as an example of a PASS2 used to generate a 64K starter system.
- Step 7 BATCH the EDITed \$PASS2 file and verify the results.
- Step 8 BATCH the \$GENJOB1 file; this job will, in turn, BATCH the \$GENJOB2 file so make sure that it exists under that name in the sysgen account.
- Step 9 Check all output from \$GENJOB1 and \$GENJOB2. All steps should run without errors. The only PREFs will be in: OCPGHST if there were no 'XP' devices (Xerox 1200 printers) specified via PASS2; ENQ if the ENQ/DEQ option was not selected via PASS2; RTNRRRT if the Real Time option was not selected via PASS2; and ANLZ.
- Step 10 At this point, the :BOOSGEN account will contain everything necessary to generate a CP-V B00 PO tape. If other processors are desired on the PO tape by the installation, they should be loaded in the :BOOSGEN account prior to DEFing the tape. (NOTE: All processors and user-programs must be re-loaded before they will execute under the B00 version of CP-V.)

- Step 11 It is possible (under the B00 version of CP-V) to include the patch deck on the PO tape such that it will be processed at boot-time by XDELTA. If this is desired, use !!NCTL to copy the B00 Patch Deck (707000-64B00) to a file. Next, EDIT the file \$DEFJOB by inserting the following ASSIGN command at line #3.5: !ASSIGN M:PATCH,(FILE,file[,account]). BATCH the file \$DEFJOB to create the PO tape.
- Step 12 After booting the new CP-V PO tape, restore the COBLIB and RPGLIB accounts from the Release Tape.

5.3 How To Do A SYSGEN On And For A 64K Machine

- Steps 1-3 Identical to Section 5.2.
- Step 4 Identical to Section 5.2 except substitute the file \$GENMINI1 (example 7) for \$GENJOB1. The differences between these two files have to do mainly with reducing the size of the GHOST1 load module by using SYMCON to discard unused DEFs from MONSTK.
- Steps 5-7 Identical to Section 5.2.
- Steps 8-12 Identical to Section 5.2 except substitute \$GENMINI1 for references to the file \$GENJOB1.

5.4 How To Do A SYSGEN With No COC

- Steps 1-3 Identical to Section 5.2.
- Step 4 Identical to Section 5.2 except substitute the file \$GENUCOC1 (in account :BOOBO on the Release Tape) for \$GENJOB1. The difference between the two files is that the monitor LOCCT is changed such that the COC modules are deleted and an interface module is inserted.
- Steps 5-7 Identical to Section 5.2. The \$PASS2 file is edited to delete COC and ONLINE references. The file \$P2MINIUC (in account :BOOBO on the Release Tape) provides an example of such a PASS2 for a 64K system.
- Steps 8-12 Identical to Section 5.2 except substitute \$GENUCOC1 for references to the file \$GENJOB1.

NOTE: EDIT may be used as a GHOST from the OC when the system has no COC.

Example 1 - SUPER Setup for SYSGEN

Log on to :SYS,LBE

!SUPER

M :SYS,LBE

B\$PR = C0; O\$PR = C0

OMCO = 64; BMCO = 64

BM9T = 2; OM9T = 2

BMPDISC = 32000; OMPDISC = 32000

BMTSTORE = 32000; OMTSTORE = 32000

BMPSTORE = 32000; OMPSTORE = 32000

C :BOOSGEN, CPV

B\$PR = 40; O\$PR = 40

BMCO = 64; OMCO = 64

BM9T = 2; OM9T = 2

BMPDISC = 32000; OMPDISC = 32000

BMTSTORE = 32000; OMTSTORE = 32000

BMPSTORE = 32000; OMPSTORE = 32000

BMTIME = 999; OMTIME = 999

BMLO = 9999; OML0 = 9999

Example 2 - FRES Setup for SYSGEN

!JOB :SYS,LBE,7

!LIMIT (9T,1),(CORE,50)

!FRES

+VOL

87H0

+SELECT

:BOOB0

3531SYS

+END

EXAMPLE 3 - \$PASS2

```

1 - 1.000 JBB
2 - 2.000 LIMIT (TIME,5),(CORE,32),(ORDER)
3 - 3.000 ASSIGN M:EI,(FILE,M:MODNUM,;BOOB0),(IN)
4 - 4.000 PASS2 CP
5 - 5.000 :CHAN
6 - 6.000 :DEVICE TYA01,(MOD,7012,7012)
7 - 7.000 :CHAN
8 - 8.000 :DEVICE LPA02,(MOD,7445,7445)
9 - 9.000 :CHAN
10 - 10.000 :DEVICE LPA0F,(MOD,7446,7446),(HAND,7446IB,7446CU)
11 - 11.000 :CHAN
12 - 12.000 :DEVICE CRA03,(MOD,7140,7140)
13 - 13.000 :CHAN
14 - 14.000 :DEVICE CPA04,(MOD,7160,7160)
15 - 15.000 :CHAN
16 - 16.000 :DEVICE PRA08,(MOD,7060,7060)
17 - 17.000 :DEVICE PPA08,(MOD,7060,7060)
18 - 18.000 :CHAN
19 - 19.000 :DEVICE RBA14,(MOD,FFFF,FFFF),(FULL),(2780),(IRBT),(RBX)
20 - 20.000 :CHAN
21 - 21.000 :DEVICE 9TA80,(MOD,7322,7321)
22 - 22.000 :DEVICE 9TA81,(MOD,7322,7321)
23 - 23.000 :DEVICE 9TA82,(MOD,7322,7321)
24 - 24.000 :DEVICE 9TA83,(MOD,7322,7321)
25 - 25.000 :CHAN
26 - 26.000 :DEVICE 7TAE0,(MOD,7372,7371)
27 - 27.000 :CHAN
28 - 28.000 :DEVICE BTDF1,(MOD,7333,7330),(T),(IB),(BIN),(HAND,MTAP,MTAPCL),(CLIST,8),(R)
29 - 29.000 :DEVICE BTDF2,(MOD,7333,7330),(T),(IB),(BIN),(HAND,MTAP,MTAPCL),(CLIST,8),(R)
30 - 30.000 :DEVICE BTDF3,(MOD,7333,7330),(T),(IB),(BIN),(HAND,MTAP,MTAPCL),(CLIST,8),(R)
31 - 31.000 :DEVICE BTDF4,(MOD,7333,7330),(T),(IB),(BIN),(HAND,MTAP,MTAPCL),(CLIST,8),(R)
32 - 32.000 :CHAN
33 - 33.000 :DEVICE DCBF0,(MOD,D,7212,7211),(PSA,40)
34 - 34.000 :CHAN

```



```

35 - 35.000 :DEVICE DCCF0,(M0D,C,7232,7236),(PER,100),(PFA,100)
36 - 36.000 :CHAN
37 - 37.000 :DEVICE DPDR0,(M0D,C,7242,7240),(PFA,C8)
38 - 38.000 :DEVICE DPDR1,(M0D,C,7242,7240),(PFA,C8)
39 - 39.000 :DEVICE DPDR2,(M0D,C,7242,7240),(PRIV)
40 - 40.000 :DEVICE DPDR3,(M0D,C,7242,7240),(PRIV)
41 - 41.000 :DEVICE DPDR9,(M0D,C,7271,7270),(PFA,190),(CYLINDER)
42 - 42.000 :DEVICE DPDR91,(M0D,C,7271,7270),(PRIV)
43 - 43.000 :CHAN
44 - 44.000 :DEVICE MEA10,(M0D,7611,7611)
45 - 45.000 :SDEVICE (IN,CRA03),(OUT,LPA02),(OUT,LPA0F),(OUT,CPA04),(MXSTRM,7)
46 - 46.000 :LDEV (C2,CR),(C3,CR),(L2,LP),(L3,LP),(L4,LP),(L5,LP),;
47 - 47.000 : (L6,LP),(L7,LP),(L8,LP),(L9,LP),(P2,CP),(P3,CP)
48 - 48.000 :RES (RES,C0),;
49 - 49.000 : (BSUM,32767),(BMAX,127),(BDEF,32),;
50 - 50.000 : (BSUM,32767),(BMAX,127),(BDEF,32),;
51 - 51.000 : (RES,9T),(TOT,4),;
52 - 52.000 : (BSUM,4),(BMAX,4),(BDEF,0),;
53 - 53.000 : (BSUM,3),(BMAX,3),(BDEF,0),;
54 - 54.000 : (GSUM,4),(GMAX,4),(GDEF,2),;
55 - 55.000 : (RES,BT),(TOT,4),;
56 - 56.000 : (BSUM,4),(BMAX,4),(BDEF,0),;
57 - 57.000 : (BSUM,2),(BMAX,2),(BDEF,0),;
58 - 58.000 : (GSUM,4),(GMAX,4),(GDEF,2),;
59 - 59.000 : (RES,7T),(TOT,1),;
60 - 60.000 : (BSUM,1),(BMAX,1),(BDEF,0),;
61 - 61.000 : (BSUM,1),(BMAX,1),(BDEF,0),;
62 - 62.000 : (GSUM,1),(GMAX,1),(GDEF,1),;
63 - 63.000 : (RES,SP),(TOT,3),;
64 - 64.000 : (BSUM,3),(BMAX,3),(BDEF,0),;
65 - 65.000 : (BSUM,3),(BMAX,3),(BDEF,0),;
66 - 66.000 : (GSUM,3),(GMAX,3),(GDEF,3)
67 - 67.000 :M0N (SIG9),(INFILE,100),(OUTFILE,60),(CORE,128),;
68 - 68.000 : (QUEUE,30),(MP00L,25),(CP00L,7),(CFU,40),;
69 - 69.000 : (ORG,80),(MPATCH,700),(SITE,ELSEG),(ENQ,120),;
70 - 70.000 : (ANSDET)
71 - 71.000 :FAUTH (EQ),(JE),(RP)
72 - 72.000 :BLIMIT (TIME,5,999),(FP00L,4,18),;

```

```

73 - 73.000 : (L0,9999,9999),(P0,9999,9999),(D0,9999,9999),(L0,9999,9999);
74 - 74.000 : (TSTORE,64,1000),(PSTORE,64,1000);
75 - 75.000 : (TDISK,32767,32767),(PDISK,32767,32767)
76 - 76.000 :BLIMIT (TIME,9999,9999),(FP00L,4,18);
77 - 77.000 : (L0,9999,9999),(P0,9999,9999),(D0,9999,9999),(U0,9999,9999);
78 - 78.000 : (TSTORE,64,1000),(PSTORE,64,1000);
79 - 79.000 : (TDISK,32767,32767),(PDISK,32767,32767)
80 - 80.000 :GLIMIT (TIME,9999,9999),(FP00L,6,6);
81 - 81.000 : (L0,9999,9999),(P0,9999,9999),(D0,9999,9999),(L0,9999,9999);
82 - 82.000 : (TSTORE,64,1000),(PSTORE,64,1000);
83 - 83.000 : (TDISK,32767,32767),(PDISK,32767,32767)
84 - 84.000 :ELIMIT (TIME,30),(L0,20),(P0,100),(D0,20);
85 - 85.000 : (U0,20),(TSTORE,64),(PSTORE,20)
86 - 86.000 :IMC (MAXG,15),(MAXBL,25),(MAXR,1),(BLOCK,20),(LNBL9CK,14);
87 - 87.000 : (QUANTA,300),(MINQUAN,10),(PERCENT,50);
88 - 88.000 : (BPRI0,FE),(0PRI0,FE),(GPRIO,FE);
89 - 89.000 : (C0CBUF,15),(PI,0);
90 - 90.000 : (THRESHOLD,2500),(LOGT,15),(INTI,30);
91 - 91.000 : (EXPIRE,29,23),(RASIZE,25),(RAT0,5000)
92 - 92.000 :PART (UNL0CK),(SWAP),(7T,0,1),(GUAN,500),(9T,0,4),(BT,C,2);
93 - 93.000 : (SP,0,3),(C0,C,127),(TIME,C,999),(PART,16)
94 - 94.000 :SPR0CS (M0N,ENQ,RTNRRT);
95 - 95.000 : (DRSP,M),(EASY,T);
96 - 96.000 : (M0SPACE,3),(PSPACE,4,64),(P0SPACE,10)
97 - 97.000 :C0C (DEVICE,A10),(LINES,40),(BUFFERS,60);
98 - 98.000 : (HARDWIRE,0,1);
99 - 99.000 : (2741,2,3,12-15);
100 - 100.000 : (7015,0,1),(TYPE,0,0,1);
101 - 101.000 : (SS),(SA),(ES),(EA);
102 - 102.000 : (RATE,30,8-11),(TYPE,5,8-11)
103 - 103.000 :FRGD (RESDF,4),(NINT,16)
104 - 104.000 :INTLB (R4,64),(R5,65),(R6,66),(P1,1001),(P2,1002),(CA,58)

```

EXAMPLE 4 - \$GENJOB1

```
1 - 1.000 JOB
2 - 2.000 LIMIT (TIME,15),(LB,9999),(CBRE,48),(ORDER)
3 - 3.000 PCL
4 - 4.000 DELETED M:M0N,;J1,M0NSTK,JITO,;JO
5 - 5.000 COPYSTD $CPYSTD.:800B0 TB DC
6 - 6.000 COPY :BLIB ,SSSR0M.:800B0 OVER :BLIB
7 - 7.000 END
8 - 8.000 PASS3
9 - 9.000 :M:M0N
10 - 10.000 :JITO
11 - 11.000 ASSIGN M:EI,(FILE,M:M0N)
12 - 12.000 ASSIGN M:EB,(FILE,;J1)
13 - 13.000 DEFC0M
14 - 14.000 ASSIGN M:EI,(FILE,M:M0N)
15 - 15.000 ASSIGN M:EB,(FILE,M0NSTK)
16 - 16.000 DEFC0M
17 - 17.000 ASSIGN M:EI,(FILE,JITO)
18 - 18.000 ASSIGN M:EB,(FILE,;JO)
19 - 19.000 DEFC0M
20 - 20.000 ASSIGN M:EI,(FILE,M:M0N),(INBUT)
21 - 21.000 SYMC0N
22 - 22.000 BUILD (LIB)
23 - 23.000 END
24 - 24.000 PASS3
25 - 25.000 :GH0ST1
26 - 26.000 STEP EQ,0
27 - 27.000 BATCH $GENJ0R2
```

EXAMPLE 5 - \$GENJOB2

```
1 - 1.000 JOB
2 - 2.000 LIMIT (TIME,10),(CORE,12),(LB,9999)
3 - 3.000 PASS3
4 - 4.000 :ALLCAT
5 - 5.000 :ANLZ
6 - 6.000 :CLSE
7 - 7.000 :CONTRL
8 - 8.000 JOB
9 - 9.000 LIMIT (TIME,7),(CORE,12),(LB,9999)
10 - 10.000 PASS3
11 - 11.000 :DEBUG
12 - 12.000 :DRSP
13 - 13.000 :ENC
14 - 14.000 :ERR:FIL
15 - 15.000 JOB
16 - 16.000 LIMIT (TIME,6),(CORE,12),(LB,9999)
17 - 17.000 PASS3
18 - 18.000 :ERR:LIST
19 - 19.000 :FILL
20 - 20.000 :FILLA
21 - 21.000 :FRES
22 - 22.000 JOB
23 - 23.000 LIMIT (TIME,12),(CORE,12),(LB,9999)
24 - 24.000 PASS3
25 - 25.000 :FSAVE
26 - 26.000 :I8DTPR
27 - 27.000 :KEYIN
28 - 28.000 JOB
29 - 29.000 LIMIT (TIME,12),(CORE,12),(LB,9999)
30 - 30.000 PASS3
31 - 31.000 :LDLNK
32 - 32.000 :LISTDIR
33 - 33.000 :LTAPE
34 - 34.000 :MIS0V
35 - 35.000 JOB
```

```
36 - 36.000  LIMIT (TIME,12),(CORE,12),(L0,9999)
37 - 37.000  PASS3
38 - 38.000  :MUL0V
39 - 39.000  :0CPGHST
40 - 40.000  :0PEN
41 - 41.000  :PACKRECON
42 - 42.000  J0B
43 - 43.000  LIMIT (TIME,13),(CORE,12),(L0,9999)
44 - 44.000  PASS3
45 - 45.000  :RBBAT
46 - 46.000  :RECOVER
47 - 47.000  :RMA0V
48 - 48.000  :RTNRRT
49 - 49.000  J0B
50 - 50.000  LIMIT (TIME,13),(CORE,12),(L0,9999)
51 - 51.000  PASS3
52 - 52.000  :RUNNER
53 - 53.000  :RVGH0ST
54 - 54.000  :STATS
55 - 55.000  :STEP0VR
56 - 56.000  J0B
57 - 57.000  LIMIT (TIME,8),(CORE,12),(L0,9999)
58 - 58.000  PASS3
59 - 59.000  :SYSC0N
60 - 60.000  :XDELTA
61 - 61.000  J0B
62 - 62.000  LIMIT (TIME,3),(CORE,12),(L0,9999)
63 - 63.000  PASS3
64 - 64.000  :BATCH
65 - 65.000  :CCI
66 - 66.000  :DEF
67 - 67.000  :DELTA
68 - 68.000  J0B
69 - 69.000  LIMIT (TIME,2),(CORE,12),(L0,9999)
70 - 70.000  PASS3
71 - 71.000  :EDIT
72 - 72.000  :ERR:SUM
73 - 73.000  :ERRMWR
```

74 - 74.000 :LDEV
75 - 75.000 JBR
76 - 76.000 LIMIT (TIME,3),(CORE,12),(LG,9999)
77 - 77.000 PASS3
78 - 78.000 :LINK
79 - 79.000 :LBADER
80 - 80.000 :LBGN
81 - 81.000 :PCL
82 - 82.000 JBR
83 - 83.000 LIMIT (TIME,2),(CORE,12),(LG,9999)
84 - 84.000 PASS3
85 - 85.000 :RATES
86 - 86.000 :SUPER
87 - 87.000 :SYMCBN
88 - 88.000 JBR
89 - 89.000 LIMIT (TIME,2),(CORE,12),(LG,9999)
90 - 90.000 PASS3
91 - 91.000 :DEFCBM
92 - 92.000 :GAC
93 - 93.000 :GRUP30
94 - 94.000 :S:BVRL
95 - 95.000 :TEL
96 - 96.000 JBR
97 - 97.000 LIMIT (TIME,2),(CORE,12),(LG,9999)
98 - 98.000 PASS3
99 - 99.000 :LABEL
100 - 100.000 :LBCCT
101 - 101.000 :PASS2
102 - 102.000 :PASS3
103 - 103.000 JBR
104 - 104.000 LIMIT (TIME,3),(CORE,12),(LG,9999)
105 - 105.000 PASS3
106 - 106.000 :PFIL
107 - 107.000 :REW
108 - 108.000 :SUMMARY
109 - 109.000 :WEPF
110 - 110.000 JBR
111 - 111.000 LIMIT (TIME,2),(CORE,10),(ORDER)

112 * 112.000 ASSIGN M:EI,(FILE,ERRTEXT)
113 * 113.000 RUN (LMN,ERRMWR)

EXAMPLE 6 - \$DEFJOB

```
1 - 1.000 JOB  
2 - 2.000 LIMIT (TIME,3),(CORE,32),(9T,1),(ORDER)  
3 - 3.000 ASSIGN M:PB,(DEVICE,9T),(OUTSN,CPBO)  
4 - 4.000 DEF CP,BOO  
5 - 5.000 :INCLUDE (RTPROCS,DIAG)  
6 - 6.000 :WRITE  
7 - 7.000 EBD
```


EXAMPLE 7 - \$GENMINI1

```

1 - 1.000 JOB
2 - 2.000 LIMIT (TIME,15),(LR,9999),(CORE,48),(ORDER)
3 - 3.000 MESSAGE THIS IS THE GENJOB FOR THE 1ST PART OF THE MINI SYSTEM
4 - 4.000 MESSAGE IT INCLUDES 2741 SUPPORT.
5 - 5.000 MESSAGE TO CREATE A SMALLER SYSTEM WHICH DOES
6 - 5.100 MESSAGE NOT SUPPORT 2741 TERMINALS, INSERT THE
7 - 5.200 MESSAGE LINE 'COPY MINICBC.:BOOB0 OVER CBC' IN
8 - 5.300 MESSAGE THE PCL PART OF THIS JOB.
9 - 7.000 PCL
10 - 8.000 DELETE M:M0N,;J1,M0NSTK,JIT0,;JO
11 - 9.000 COPYSTD $COPYSTD.:BOOB0 TO DC
12 - 10.000 COPY :BLIB.:SYS,SSSR0M.:BOOB0 OVER :BLIB
13 - 12.000 END
14 - 13.000 PASS3
15 - 14.000 :M:M0N
16 - 15.000 :JIT0
17 - 16.000 ASSIGN M:EI,(FILE,M:M0N)
18 - 17.000 ASSIGN M:EB,(FILE,;J1)
19 - 18.000 DEFC0M
20 - 19.000 ASSIGN M:EI,(FILE,M:M0N)
21 - 20.000 ASSIGN M:EB,(FILE,M0NSTK)
22 - 21.000 DEFC0M
23 - 22.000 ASSIGN M:EI,(FILE,JIT0)
24 - 23.000 ASSIGN M:EB,(FILE,;JO)
25 - 24.000 DEFC0M
26 - 25.000 ASSIGN M:EI,(FILE,M:M0N),(IN0UT)
27 - 26.000 SYMC0N
28 - 27.000 BUILD (LIB)
29 - 28.000 END
30 - 29.000 ASSIGN M:EI,(FILE,M:M0N)
31 - 30.000 ASSIGN M:EB,(FILE,M0NG1)
32 - 31.000 DEFC0M
33 - 32.000 ASSIGN M:EI,(FILE,M0NG1)
34 - 33.000 SYMC0N
35 - 34.000 KEEP :9,ACNCFU,ALL00,AL0CCT,;

```

36 -	35.000	AVRTBL,AVRTBLNE,AVRTBLSIZ,BATAPE,,
37 -	36.000	BGRAN,BL:IFS,BL:OFS,,
38 -	37.000	BBSYBAND,CDPB,CHKDA,,
39 -	38.000	CIC,CJOB,,
40 -	39.000	COCINIT,COCLN,COCMESS,CPB,,
41 -	40.000	COCHPB,C:MSM,,
42 -	41.000	CPPB,CUPB,CURBUF,CURGRAN,,
43 -	42.000	DATE,DCACCESS,DCTSIZ,DCT1,,
44 -	43.000	DCT2,DCT3,DCT4,DCT7,,
45 -	44.000	DLTEIAS,DLTSZ,DPACCESS,,
46 -	45.000	DSCCVT,ERRLOG,FGRAN1,FILCFU,,
47 -	46.000	EAPL,EAPLLC,EAPLUC,ESTDLC,,
48 -	47.000	ESTDUC,ESTD,,
49 -	48.000	FNDHGP,GI:ASPN,GI:FRE,GI:RES,,
50 -	49.000	GI:SDA,GIB:PRT,GIB:RID,GIB:SLN,,
51 -	50.000	GIB:UN,GIB:XLN,GIH:TIM,GMB,,
52 -	51.000	GRAVAIL,HIGH,IPDTYSEG,J:ACCN,,
53 -	52.000	J:AMR,J:CALCNT,J:DLL,J:EXTENT,,
54 -	53.000	J:INTER,J:JIT,J:PTIME,J:STAR,,
55 -	54.000	J:UNAME,J:UTIME,,
56 -	55.000	JB:ORG,JB:PEAK,JB:PMTS,,
57 -	56.000	JB:PNR,JB:PRIV,JB:STEP,JB:TMTS,,
58 -	57.000	JBPCDD,JBPCP,JBUPVP,JBVLH,JEUPVP,,
59 -	58.000	JCLE,JCL,JDA,JDDLL,,
60 -	59.000	JDDUL,JDLL,JDUL,,
61 -	60.000	JIT,JLMAP,JOVVP,JRNST,,
62 -	61.000	JSPVP,JX:CMAP,LCOC,LEE20,,
63 -	62.000	LPART,MAP,MAXOVLY,MB:GAM4,,
64 -	63.000	M:ADRINCR,M:CLBGN,,
65 -	64.000	M:FPPC,,
66 -	65.000	M:FPPH,M:FPPT,M:FREE#GRAN,M:GASLIM,,
67 -	66.000	M:GATLIM,M:HLTIC,M:JITPAGE,,
68 -	67.000	M:HC,,
69 -	68.000	M:RCL0K2,M:SBAND,M:SGP,,
70 -	69.000	M:SNSDA,M:SWAPD,M:SWPEND,,
71 -	70.000	M:UC,M:WCKBCL,M:WCKECL,M:XX,,
72 -	71.000	MB:GAM5,MB:GAM6,MB:GPT,MB:SDI,,
73 -	72.000	MING,MX:PPLT,M15,M16,,

74 - 73.000 M17,M19,M24,M7,,
75 - 74.000 M8,NEWQ,NSVT,,
76 - 75.000 BCNDD,,
77 - 76.000 P:AC,,
78 - 77.000 P:NAME,P:SA,P:TCH,PB:DCBSZ,,
79 - 78.000 PB:DSZ,PB:HVA,PB:LNK,PB:PSZ,,
80 - 79.000 PB:PVA,PH:DDA,PH:PDA,PNAMEND,,
81 - 80.000 PPRPCS,PRDCRM,PRDPRM,PRT,,
82 - 81.000 PUF,QUEUE,RBG,RCVRAD,,
83 - 82.000 RCVRCNT,RCVRDSZ,RCVRGFC,RCVSTART,,
84 - 83.000 RCYL,RMB,RSG,,
85 - 84.000 RUNFLAG,S:RFIS,S:DP,,
86 - 85.000 S:GJOBTBL,S:PCORE,S:USID,,
87 - 86.000 SAVRL#,SB:TQ,SGB,,
88 - 87.000 SGCHD,SGRAN,,
89 - 88.000 SMUIS,SNDDX,SpsIZE,SSIG,,
90 - 89.000 SYSACCT,SYSID,T:BTSCHEd,T:GJOBSTRT,,
91 - 90.000 T:OVER,T:OVERLAY,T:REMEMBER,T:SAVE,,
92 - 91.000 T:SELFDESTRUCT,T:SGAJIT,T:SGRNU,,
93 - 92.000 TIME,TMDCRM,TMDPRM,TMPDCPK,,
94 - 93.000 TMPDPPK,TPACCESS,TPIOT,,
95 - 94.000 TSTACK,TUIOT,,
96 - 95.000 UB:FL,UB:SWAPI,UNMAP,,
97 - 96.000 XFFFD,,
98 - 97.000 XF7FF,X1,X100,,
99 - 98.000 X10,X2,,
100 - 99.000 X20,X4,X400,,
101 - 100.000 X4000,X40,X8,,
102 - 101.000 X8000,X80,Y02,,
103 - 102.000 PB:C#,PB:DC#,PL:CHG,,
104 - 103.000 PL:JIF,PLB:USR,,
105 - 104.000 PLD:ACT,PLH:CUR,PLH:FLG,PLH:GN,,
106 - 105.000 PLH:TL,PLH:TBL,PLH:TU,RB:FLAG,,
107 - 106.000 RB:FLAG,,
108 - 107.000 RBSS,SSSBIT,,
109 - 108.000 RBH:ID,,
110 - 109.000 RBLIMSZ,,
111 - 110.000 S:GUAIS,S:MBSF,,

```

112 - 111.000 SL:BNCR,SL:BXMF,SL:PI,,
113 - 112.000 S:CYLSZ,S:LCYL,UB:C#,
114 - 113.000 BBTBM,BT31T00,CIT1,CNUD,,
115 - 114.000 CYL$SHFT,DCT22,DCT8,DCT$MASK,,
116 - 115.000 DISCLIMS,DUMPFIL,INVERTED$DCT$MASK,,
117 - 116.000 JACCN,JB:CLR,JB:FRS,JB:MAX,,
118 - 117.000 LLNDD,LOAD$SECTOR$ADDR,,
119 - 118.000 MPPSEEK,MXSTRM,NB31T00,NCYL,,
120 - 119.000 NSPT,NTPC,PLB:MAX,PLB:MIN,,
121 - 120.000 PSA$END,RBLIMS,RCVCODE,S:ACORE,,
122 - 121.000 S:STLC,S:SYMDB,S:SYMDG,S:SYMDB,,
123 - 122.000 SB:RBDf,SB:RBMX,SB:RGDF,SB:RGMX,,
124 - 123.000 SB:R0DF,SB:R0MX,SB:RTY,SECTOR$MASK,,
125 - 124.000 SEC$SHFT,SH:RBSUM,SH:RUSUM,SH:RNM,,
126 - 125.000 SH:R0SUM,SH:RT0T,SL:BDf,SL:BMX,,
127 - 126.000 SL:CAR,SL:ETIMF,SL:GDF,SL:GMX,,
128 - 127.000 SL:0DF,SL:0MX,SL:RSVP,SL:STLM,,
129 - 128.000 SNDDXSIZ,STB:TYP,STORE$DCT$CDA,,
130 - 129.000 ST0RF$DCT$SR1,SV:LIN,SV:RSIZ,,
131 - 130.000 SYMX,TB:FLGS,T0P,,
132 - 131.000 TRK$SHFT,W0RDCNT,YFFFF,Y002,Y8,,
133 - 132.000 C0:RCVD0FF,C0:XPSD1,,
134 - 133.000 C0:XPSDB,C0C,C0D:LPC,,
135 - 134.000 C0H:0N,C0H:11,C0H:10,CTWD,,
136 - 135.000 CURPDA,FPDTTF,H$AKTIM,,
137 - 136.000 H$CMP,LN0L,M0DE4,,
138 - 137.000 M0DE4INIT,,
139 - 138.000 SSSBIT,,
140 - 139.000 ALL0REG,BGRCFU,B00TFLG,DCT24,,
141 - 140.000 LASTCFU,MASKS,,
142 - 141.000 NSPC,NSWAPS,0H:NM,,
143 - 142.000 SSTAT,TYPMNSZ,Y008,1MIN,75BUF
144 - 143.000 END
145 - 144.000 PCL
146 - 145.000 COPY M0NG1 0VER M0NG1
147 - 146.000 END
148 - 147.000 L0CCT (LMN,GH0ST1),(BIAS,A000),(SL,F),(N0TCB),,
149 - 148.000 (PERM),(ABS),(N0SYSLIB),,

```

```

150 - 149.000      (MAP),(EF);
151 - 150.000      (GH0ST1D,:B00B0);
152 - 151.000      (RTB00T,:B00B0);
153 - 152.000      (SYSMAK1,:B00B0);
154 - 153.000      (P0DCBS,:B00B0);
155 - 154.000      (GENMDG,:B00B0);
156 - 155.000      (BIT0TM,:B00B0);
157 - 156.000      (CCIO,:B00B0);
158 - 157.000      (RECOVER2,:B00B0);
159 - 158.000      (RCVRI0,:B00B0);
160 - 159.000      (ACCTSUM,:B00B0);
161 - 160.000      (M0NG1);
162 - 161.000      (HGPRECBN,:B00B0);
163 - 162.000      (M:HGP);
164 - 163.000      (MAILBX,:B00B0);
165 - 164.000      (JULIAN,:B00B0);
166 - 165.000      (M:FIDCB,:B00B0);
167 - 166.000      (M:E0DCB,:B00B0)
168 - 167.000      DATA
169 - 168.000      :L0CCT      MGH0ST1
170 - 169.000      PASS3
171 - 170.000      :MGH0ST1
172 - 171.000      STEP EQ,0
173 - 172.000      BATCH $GENJ0B2

```

LOADS WITH RESIDENT M0NG1

PASS2

Example 8 - Usage of UTILIST

List all files on CP-V B00 listing tapes.

```
!JOB
!LIMIT (TIME,9999),(UO,32000)
!ASSIGN M:EI,(LABEL,$,:BOOLO),(INSN,CLBA,CLBB)
!UTILIST FB
```

List a single module, for example: SCHED

```
!JOB
!LIMIT (TIME,5),(UO,999)
!ASSIGN M:EI,(LABEL,$,:BOOLO),(INSN,CLBB)
!UTILIST FB
SCHED
```

6.0 INCOMPATIBILITIES

6.1 Load Modules and Extended User Size

6.1.1 User Programs

The following is a summary of the changes that will affect user's programs:

- o All programs must be reloaded to execute on B00. This may be done beforehand using the conversion package described in Section 6.1.3 or after B00 is installed.
- o Programs that perform M:LINK or M:LDTRC, or the associate CAL, may need to use the B00 Loader's new CORELIB option.
- o Minor changes to DCB fields.
- o Core limits may need adjustment depending on the program size and the number of DCB pages.

The section below describes the above items in more detail.

A. Reloading of Programs

Due to the relocation of DCB pages from the context area to the user area and the rebiasing of core library data, all load modules created under CP-V A01 or earlier systems must be reloaded to run under B00. Attempts to execute these obsolete load modules on CP-V B00 will abort the user with the error code "A560 LOAD MODULE IS PRE-B00.

B. Programs with M:LINK and M:LDTRC (CORELIB Option)

The majority of programs can execute correctly under B00 merely by reloading; however, there exist two cases which require the use of the new B00 loader option, CORELIB, for correct operation. The CORELIB option causes the loader to reserve the portion of memory which is normally dedicated to public library procedure during execution (X'1C000' to X'1FFFF'), even though the program does not contain references to a public library.

The CORELIB option must be used when loading programs that do not require a public library, but do perform an M:LINK or an M:LDTRC to a load module that does require a public library. For example, a load module which is coded in assembly language and does not require a public library but executes another load module which does require a public library must specify the CORELIB option. Programs that reference public library routines, such as FORTRAN coded programs, need not specify the CORELIB option since the loader will reserve the library space when it recognizes library references.

The CORELIB option is also required for programs that use the Associate Public Library CAL (CAL1,4 with FPT code X'04') if the program does not reference a public library either by external reference or UNSAT.

C. DCB Format Change

The format of some file and tape DCB fields used by monitor file management routines is modified. These fields are, in general, not useful to user programs. Thus, the changes should have no effect on them. A description of the changes can be found in the CP-V Batch Processing Reference Manual, 90 17 64E.

D. Core Limits

Since the B00 DCBs are placed in the user area, they are included in user memory size computations and will cause an increase in user memory requirements. (They have not been included in memory size calculations in previous systems.) Therefore, programs which operated near the limit of their account authorizations prior to B00 may require an increase in the account authorization for memory; this increase should equal the number of pages of DCBs used by the program. Similarly, the value specified for the CORE option on the !LIMIT control command may need to be increased to account for the DCB pages.

6.1.2 Shared Processors

The following is a summary of changes that will affect user built processors.

A. Standard Shared Processors

The same restrictions that apply to user programs apply also to standard shared processors.

Also, a standard shared processor that issues an interpretive exit passing information in common pages should not be allowed to use the special processor area if the called process will require the use of this area. These processors should be loaded with the CORELIB option specified on the LOAD or LOCCT command.

B. Special Shared Processors

As with all other load modules built using the BOO loader, the DCB pages for special shared processors follow the data pages. Therefore, the DCB pages will reside in the special shared processor area along with the data and procedure.

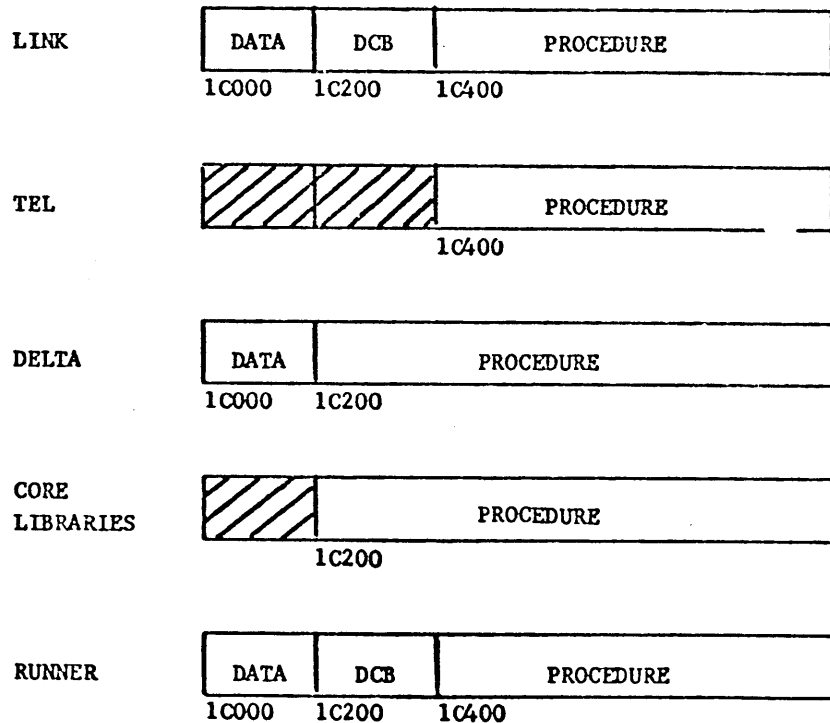
The only portion of the special processor area that is actually shared is the procedure portion. The virtual memory used for procedure for a special shared processor may not overlap the virtual memory used for data or DCBs of another special shared processor if those processors may "co-exist".

Co-exist in this context means that a user can associate Special Shared Processor 1 (SSP1), suspend operation of SSP1 and associate another Special Shared Processor (SSP2), exit SSP2 and return to SSP1 assured that context and data from the previous operation of SSP1 is still intact. For example: a user may begin a LINK operation, suspend it and use TEL, and then return to LINK and resume operation.

TEL's procedure pages must not extend downward over DELTA's data page nor over LINK's data or DCB page. TEL's procedure may extend downward over RUNNER's data and DCB pages as a user may not associate both RUNNER and TEL (RUNNER may be accessed by batch users only; TEL may be accessed by on-line users only). Core library procedure may not extend downward over DELTA's data page as a user may have both a core library and DELTA associated; core library procedure may extend downward over LINK's data and DCB pages as a core library may not be associated with LINK.

Use of the special shared processor area is controlled through the use of the BIAS option of LOCCT.

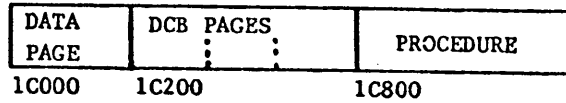
CP-V B00 special shared processors have been loaded as follows:



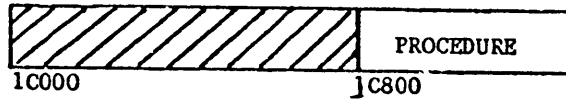
A user that has written his own special shared processors must take this into consideration when reloading those processors for B00. If any one of his special shared processors has more than one DCB page, and that special shared processor may co-exist with TEL, TEL must be reloaded so that TEL's procedure does not extend downward over the user's special shared processor DCB pages.

For example:

User's Special Shared Processor (may co-exist with TEL)



TEL as reloaded by the user



6.1.3 CP-V B00 Load Module Conversion Package

A conversion package is available from Software Library (707000-91, -96) for UTS D00 and CP-V A00/A01, which may be used to reload programs and produce B00 load modules prior to installing CP-V B00.

This conversion package consists of the labeled tape CBLF which was created under the :BOOSGEN account and contains the following 7 files:

1. :JO The definition values for the B00 JIT.
2. :P0 FORTRAN public core library definition values. This is Catalog No. 705820, Version E00.
3. :P1 FORTRAN public core library definition values. This is also Catalog No. 705820, Version E00.
4. A00BLOAD A B00 loader which will run on CP-V A00/A01.
5. A00GENMDCCI GENMDs for CCI for CP-V A00/A01.
6. D00BLOAD A B00 loader which will run on UTS D00.
7. D00GENMDCCI GENMDs for CCI for UTS D00.

This tape, along with documentation describing procedures for the installation and use of the conversion package may be obtained from Field Engineering.

6.2 Restoring FILL Tapes and FSAVE Tapes from Previous UTS or CP-V Systems

The B00 versions of the file maintenance processors (FSAVE, FRES, FILL) have been modified to allow creation of compatible backup tapes. A tape created by FSAVE can be read by FILL and FRES; FRES can read FILL-created tapes with the following restriction: A SQUIRREL tape may not restore properly as it is possible for the files to be out of order. FILL must be used to restore a SQUIRREL tape with out of order files. The same restriction applies to user-created tapes (!BACKUP command) and tapes created by PURGE UNTIL operations. PURGE OLDER will create a properly ordered tape.

The only visible change to FSAVE is the serial number of the output tapes: these are now created in the FILL format, i.e., the two character julian day, a series letter, and a tape number/letter. This requires that the +VOL option be used when restoring files with FRES.

Tapes created by pre-B00 FSAVE (PRG1 serial numbers) may be restored with FRES; FILL, however, cannot be used. Tapes created by pre-B00 FILL may be restored with the FILLA processor; this processor is unsupported except for the purpose of restoring old FILL tapes.

To upgrade to CP-V B00, perform an FSAVE save-all and restore the files to CP-V B00 using FRES-B00.

If for any reason, the B00 file maintenance tapes are to be restored to an earlier system FRES-B00 may be used. The FRESBO file can be copied from the B00 release tape via PCL. Because of a PREF, it must be loaded with a modify card as follows:

```
!LOAD (EF,(FRESBO),(MONSTK,,:SYS)),(PERM),;
! (LMN.FRES),(NOTCB),(SL,F)
!MODIFY EAREAD+19,21F00015
```

6.3 Private Pack Restrictions

In general, "existing" private packs, those created under UTS D00 or CP-V A00/A01, may be used directly on CP-V B00. The following restrictions, however, should be observed.

- o Existing private packs may be read or updated on CP-V B00, however, they should be used on disk drive spindles whose Sysgen specified number of granules per logical cylinder (CYLIN option on :DEVICE command) is the same as that of the private pack.

- o Private packs created on 7275 disk drives under CP-V A01 used 18 of the 19 tracks per physical cylinder available for user storage. Since CP-V B00 provides full support of this device, it is recommended that such packs be re-initialized using VOLINIT, version D00, as specified in the CP-V B00 Operations Reference Manual.
- o When using VOLINIT to initialize private packs for CP-V B00, version D00 VOLINIT should be used specifying NGC (number of granules per logical cylinder) as given in Table 4 of the CP-V B00 Operations Reference Manual.
- o When VOLINIT is used to initialize private packs, the members of a multi-volume private pack set must have the same physical characteristics and logical cylinder size.
- o A limited number of consecutive files may cross the boundary between two members of a private pack set. The number is one less than the number of granules per logical cylinder for that pack set or thirty-one, whichever is smaller.
- o Private packs created under CP-V B00 on 7242, 7260 and 7270 disk drives cannot generally be read or updated on CP-V A00/A01 or UTS D00 because CP-V B00 writes a new field on the VTOC. However, if the patch:

```
#PREPACK=1
```

is included in the B00 patch deck, packs then created under CP-V B00 can then be used on pre-B00 systems. Private packs created under CP-V B00 on 7275 disk drives cannot be read or updated on CP-V A00/A01 or UTS D00.
- o If INITVOL, from the X account, is used to rewrite the VTOC on private packs under B00, those packs cannot be mounted by CP-V A00/A01 or UTS D00.

7.0 RESTRICTIONS/KNOWN PROBLEMS

7.1 DRSP

DRSP should not be used to replace a command processor. To replace a command processor, replace the load module in the :SYS account, and, when the system is quiescent, boot under the files. The new load module will then be used to form the shared command processor.

7.2 LINK

When LINK is executed in batch, an output load module name must be specified. The default LMN (Load Module) created by LINK cannot be called for execution by the !RUN command in batch.

The following sequence will not work:

```
!METASYM SI,GO
```

```
⋮
```

```
!LINK $
```

```
!RUN
```

```
(At this point, you will get:"ABOVE CONTROL COMMAND  
IN ERROR - ILLEGAL OR INSUFFICIENT INFORMATION ON  
RUN CC")
```

The following sequence will work:

```
!METASYM SI,GO
```

```
⋮
```

```
!LINK $ ON LMN1A
```

```
!RUN (LMN,LMN1A)
```

```
!FIN
```

8.0 MAINTENANCE PROCEDURES

8.1 Patch Deck

In CP-V, corrections to problems are distributed to users via patches. No Technical Bulletins are issued. Less than severity 1 or 2 problems are not patched and SIDRs are closed as pending the next release.

The patches for severity 1 and 2 problems are made available in two ways. A copy of the patch deck which has been tested and used in a production environment is available as file BOOPATCH in account PATCH on the Sigma 7F in El Segundo. This file is updated once a week (usually Monday). A patch space of 700 is assumed. The additions to the patch file are also added to the front of the file CHRONO-B00. This chronological file contains explanatory notes about each set of patches. The chrono file may be updated more often than the patch file, depending upon criticality of problems. All of the pertinent patch files are copied to tape and distributed to the field by Software Services approximately every two weeks. The content of this tape, its distribution list, and its frequency is controlled by the Field Engineering Home Office personnel. The local Field Engineering analyst is responsible for supplying the customer with the current patches.

At the time of the release, the current patch deck is sent to the Software Library as item 707000-64B00.

8.2 Problem Reporting

Difficulties encountered in the use of CP-V, as well as suggested improvements, should be reported via the SIDR System. Use of the SIDR System is documented in the PAL (Program Availability List) Manual.

The system catalog number for CP-V is 707000. The program catalog numbers to be used in submitting SIDRs reflect functional areas:

707001	File Maintenance
707002	File Management
707003	System Management (includes Real Time Processing)
707004	Communications
707005	Recovery
707006	Software Checks
707007	Operator Communications
707008	SYSGEN
707009	Debug
707010	Loaders
707011	Symbiont
707012	Accounting & Performance
707013	Monitor Services (including Enqueue/Dequeue)
707014	Initialization
707015	Reliability
707016	Job Processors
707017	Utility Processors
707018	Miscellaneous

9.0 MONITOR SIZING

9.1 General Core Requirements

An IRBT system should have 80K of core. About 1560 words are required for the handler which is imbedded in the resident monitor. In addition, 512 words obtained from the monitor page pool are required per 7605 device.

A system that supports 2780 requires 1120 words for the handler plus 256 words per 7605 device. An IRBT system that supports 2780 requires 2100 words plus 512 words for each 7605 device.

For a system that provides 7670 support, add 750 words for the handler. A system supporting 7670 and 2780 has 1780 words for the handlers plus 256 words for each 7605 device. 7670 support on an IRBT system requires a total of 2220 words for the handlers plus 512 words for each 7605.

A system that supports all of IRBT, 2780, and 7670 requires 2750 words for the handlers plus 512 words for every 7605 controller.

A system that has the ENQ/DEQ feature implemented will contain a table of doublewords that is as large as the value specified for the ENQ option on the :MON card of the PASS2. The resident monitor will be increased by the size of this table.

A real time system requires about 500 words for the module RTROOT in the resident monitor. In addition, the maximum user size will be decreased by the number of pages specified for the RESDF option.

9.2 Monitor Size Changes Due To SYSGEN Parameters

<u>MODULE</u>	<u>FACTOR</u>	<u>SYSGEN KEYWORD</u>
M:SPROCS	9½ words per shared processor entry-10 if disk swapping or BIG9 - 10½ if disk swapping and BIG 9.	:SPROCS entries
M:IMC	8¼ words per user 2¼ words per ghost job	MAXG + MAXB +MAXOL
M:COC	4 words per buffer 6 words per line 1 word per buffer	COCBUF LINES RING
M:CPU	34 words per MPOOL 40 words per CPOOL 8 words per IOQ 19 words per CFU 18 words for Sigma 9 PSDS Patch Space 2 words per RBT device ¼ word per physical page (½ word of BIG9) 1½(LPART) (<u>AVGSER</u> +1) 4 1 word for every word between X'62' and ORG	MPOOL CPOOL QUEUE CFU SIG 9 BIG 9 MPATCH :DEVICE CORE, (BIG9) AVGSER LPART ORG
M:SDEV	3 words per symbiont device plus (4½ words * MXSTRM)	SDEVICE MXSTRM
M:FRGD	12 * possible active interrupts 1 word for every label	NINT INTLBL
S9TRAPS	165 words for Sigma 9 traps	SIG9,BIG9
IOTABLE	15 words per DCT 2 words per CIT 3½ words per tape & private pack (AVR) 8 words per public HGP 20 words per private pack HGP (for 30 gran per logical cyl for 7242) number increases as # of granules per logical cylinder decreases and is a function of the size of the disk pack. Note - each word represents 32 logical cylinders.	:DEVICE :CHAN one per PRIV + tapes one per pack or RAD one per PRIV pack

<u>MODULE</u>	<u>FACTOR</u>	<u>SYSGEN KEYWORD</u>
	7-74 words CLIST per device may vary depending on CLIST option if non- standard device	one per device Punch - 74 DP - 12 other - 6-8
	5 words per RBT device	:DEVICE
	7 words per disk pack or RAD device Model #	:DEVICE model numbers
SG:RNT	$\frac{1}{2}$ word per RES specified (minimal RES options 4, max 15)	:RES RES option
SG:RTY	$\frac{1}{4}$ word per RES OPTION	:RES
SG:RCT	6 words per RES option	:RES
M:PART	6-3/4 words per partition + $\frac{1}{4}$ word per RES option per partition	max n in PART, n :RES RES option
SG:OPNM	$\frac{1}{2}$ word for each nonstd device type	:DEVICE
	$\frac{1}{2}$ word for each nonstd oplabel	:OPLBLT
	$\frac{1}{2}$ word for each LDEV entry	:LDEV
SG:OPX	3/4 word for each nonstd device type	:DEVICE
	3/4 word for each nonstd oplabel	:OPLBLT
	$\frac{1}{4}$ word for each LDEV entry	:LDEV
SG:FLG	3/4 word for each nonstd device type	:DEVICE

Most test programs are self-sufficient and do not rely on operator intervention except for tape mounting and responding to key-ins. Where operator intervention is required, comprehensive instructions are displayed on the operator's console.

10.2 Use of the Test Tape

Test case groups are entered into the job stream by the BATCH processor. The following job is used to restore the test case library, to authorize accounts, and to set up partitions.

```

+VOL
86E0  → !JOB :SYS,LBE,7
        !LIMIT (9T,1),(CORE,50)
        !FRES
        +END
        !BATCH 99QUAC.C7308398
        !FIN

```

Test case groups are entered into the batch stream from the :SYS,LBE account by a !BATCH desired-group command. For example, the following commands enter the PCL test cases into the job stream:

```

!JOB :SYS,LBE,7
!BATCH 99GROUPSA.C7308398
!FIN

```

Due to the special system control parameter settings required for certain test case groups, only one test group should be run at a time.

Test cases can be selectively entered into the job stream by using the DUCK program on-line. The description of how to use DUCK is found in the DUCKHELP file in account C7308398. The file DUCK has to be copied from the C7308398 into :SYS,LBE account. A !DUCK command from the C7308398 account (on-line) will start the program.

10.3 Updating the Test Library

Test cases can be added or deleted by editing the relevant 99GROUP. Then a new TEST tape can be generated by the following commands:

```
!JOB :SYS,LBE,7
!BATCH QUAC.C7308398
!FIN
```

where QUAC is the following job:

```
!JOB
!LIMIT (9T,1)
!MESSAGE ***THIS JOB NEEDS OUTPUT TAPE #---WITH WRITE RING***
!FSAVE
+DUMP
+SELECT
C7308398
+END
```

Some tests require processors and libraries which are not distributed with the CP-V releases. A list of the processors and libraries included with the B00 release can be found in Section 4.1.4. An installation can create a complete TEST tape which includes all the needed and available processors. The following sample job stream illustrates an expanded QUAC job which was used to create an installation specific TEST tape.

```
!JOB
!LIMIT (9T,1)
!MESSAGE ***THIS JOB NEEDS OUTPUT TAPE #---WITH WRITE RING***
!FSAVE
+DUMP
+SELECT
:SYS COBOL
:SYS DICTNARY
:SYS DMSDUMP
:SYS DMSINIT
:SYS DMSLOAD
:SYS EDMSDUMP
:SYS EDMSFDP
:SYS EDMSINIT
:SYS EDMSLOAD
:SYS EDMSSUMS
```

(cont. on next page)

:SYS FDP
:SYS FILEUP
:SYS FLAG
:SYS MANAGE
:SYS MAP
:SYS MERGE
:SYS REPORT
:SYS RETRIEVE
:SYS RPG
:SYS SORT
COBLIB
DMSLIB
EDMSLIB
RPGLIB
C7308398
+END

Processors and Libraries

needed for running:

99GROUPT (FORTRAN, COBOL, MANAGE, SORT)

99GROUPl (General Exerciser)