

CP-V F00-11

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1.0 PRODUCT DESCRIPTION

1.1 Purpose

The purpose of the F00 release of CP-V is to provide for the distribution to the field of a major Development release, including support for MPC tape units, multi-processor Sigma 6/7 systems, and Sigma MOS memory. Many other areas have been enhanced, and 418 SIDR fixes are included with this release.

1.2 Features/Areas of Enhancement

The major features of CP-V F00 and areas of development enhancement are described below.

1.2.1 MPC tape drive support

CP-V F00 provides software support for Honeywell MPC (Micro Programmed Controller) tape drive subsystems. MPCs may be attached to Sigma series systems via a standard Sigma IOP, and may be attached to Xerox 560 systems via a 560 Sigma adapter. To each MPC (Honeywell model XTU 9310) may be attached up to 15 tape drives of varying speeds - model 9313 operates at 125 inches per second, and model 9314 operates at 200 inches per second. Both models can read and write at both 800 and 1600 BPI, and are compatible at the user level with Xerox 560 dual-density (NS) tape drives (except that MPC tape drives cannot bootstrap 1600 BPI tapes).

MPC tape support features are selected at SYSGEN time by the inclusion of a :DEVICE card that specified (MOD,931x,9310) and (HANDLER,MPCTIO,MPCTCU). PASS2 will add the MPC9310 overlay (which contains the necessary MPC firmware) to the monitor's tree structure.

Operationally, MPC tape drives function almost identically to other types of Sigma and 560 tape drives. While the MPC hardware does not support the "read reverse" operation, the MPCTIO handler will simulate this operation in a fashion transparent to the user. Programs which make use of the M:NEWQ or M:QUE service calls to perform real-time I/O need not be changed, as the standard 9T function codes function identically on MPC tape drives. Real-time or special-purpose programs accessing MPC tape drives should not use M:IOEX or M:EXCP, or issue SIO instructions, as there is a protocol that such requests must follow that should be left to the standard handler (MPCTIO). Operational differences visible to the system operator are described in detail in the CP-V F00 Operations Reference Manual (publication number 90 16 75).. CP-V will

automatically down-load the necessary firmware at system startup time; in case of MPC failure, the operator can initiate the download process with a "yyndd,F" key-in. MPC tape drives will not "run away" if a degaussed tape is mounted, as they will halt after reading past 25 feet of blank tape and request operator intervention.

1.2.2 Large-memory and multi-CPU Sigma 6/7s

CP-V F00 provides full support for two hardware options designed to increase the maximum power of Sigma 6 and 7 systems.

- * Honeywell hardware option XPF 6850 may be used to increase the size of a Sigma 6 or 7 from the previous upper limit of 128 K of core memory to a new upper limit of 256K of Honeywell MOS memory. This option adds an extra bit to the physical memory addressing lines and memory map, and adds the LMS ("Load Memory Status") instruction to the Sigma 6/7 instruction set.
- * Honeywell hardware option XPF 6851 enables two or more Sigma 6 and/or Sigma 7 CPUs to be run in a standard multi-processing environment. The large-memory option (XPF 6850) must also be installed.
- * No major changes to SYSGEN procedure are necessary for large-memory or multi-CPU Sigma 6/7 systems. The (BIG) option may now be specified alone with (SIG7) on the :MON card, and the :SCPU card is permitted in Sigma 6/7 SYSGENS.
- * Operation of a multi-CPU Sigma 6/7 system is essentially identical with the operation of a multi-CPU Sigma 9 system. The CP-V F00 Operations Reference Manual contains descriptions of all operator procedures necessary for normal system operation.

1.2.3 MOS memory single-bit error detection

The single-bit correctable-error detection facility inherent in Sigma series MOS memory (Honeywell model XPF 9850) is supported under CP-V F00. Associated with each bank of MOS memory is an error-detection flag, a threshold error count, and a current error count. If a single-bit correctable error ("SBCE") occurs in a bank whose error detection flag

is set, the system will increment the bank's current error count and generate an entry in the system error log for later analysis. If a bank's current error count exceeds its threshold error count, the bank's error detection flag will be reset, the operator will be warned, and no further errors from that bank will be reported unless the threshold error count is increased by the operator or system manager via the CONTROL processor's "MOS" command.

Several areas of CP-V have been enhanced to provide SBCE detection and reporting:

- * PASS2 will create a table called "MOSTAB" if the "(MOS)" option is specified on the :MON card.
- * The system initialization routines will enable the memory units' SBCE detection facility at boot time or after a power failure recovery.
- * The system fault handlers will recognize SBCEs and will produce a Sigma-type "Memory Parity Secondary" error-log record (type X'43') with no associated "MFI Primary" record (type X'31'). This permits ERR:FIL to correctly log the error without producing the "Hardware error detected" warning message associated with MFI primary records.
- * A new ELLA command "MOS" may be used to generate a graphic display of any SBCEs that have occurred in specific units or banks of memory (or in all of memory). The display will identify the failing boards and components (down to the individual IC chip). ELLA's "SUM" command will display the number of SBCEs reported in the interval specified by the "TIME" command.
- * The CONTROL processor may be used to enable and disable SBCE recording, to set the error threshold, and to display the current SBCE error count. All of these options may be applied to individual units of memory, to individual banks (sub-units), or to all of memory.

1.2.4 DEVDMF version B00

- * DEVDMF can now save data to, and restore data from, tapes written on Honeywell MPC tape drives. Such drives are specified as "XTndd" and are treated as 9-track dual density drives; DEVDMF will automatically down-load the necessary firmware into the MPC, and will detect and report those device errors specific to MPC tape drives.

Note that while MPC drives can read and write both 800 and 1600 BPI tapes, they can bootstrap only 800 BPI tapes; therefore, DEVDMPTapes which must be MPC-bootable should be written at 800 BPI only.

- * If sense switch 1 is on during a RESTORE operation, DEVDMPT will perform check-writes on all data written to the RAD or disk device.
- * If sense switch 4 is off, an irrecoverable RAD or disk read error will cause a COPY operation to be aborted (as in A00 DEVDMPT). If sense switch 4 is on, an attempt will be made to correct the situation by zeroing out the problem-causing sector and retrying the read; if the error persists, DEVDMPT will skip over the erroring section of the disk (which will include the offending sector and several nearby sectors) and continue copying. DEVDMPT will report (to the operator's console) the identity of each sector zeroed out, and will also report the identity of any sections of the RAD or disk that were skipped.

If a persistent error occurs and DEVDMPT is forced to zero out or skip one or more sectors of the RAD or disk being dumped, further CP-V recovery may be necessary once the unit has been repaired and the tape restored. If the unit in question contains only PSA (swap) space, CP-V should be booted from tape "under the files" to ensure that the monitor root and overlays are correct. If the unit in question contained any PFA (file) or PER (symbiont) space, CP-V should be booted "under the files" with the "I" option, and an HGP reconstruction should be requested; if the HGP reconstruction shows evidence of serious file system damage, the operator should use FILL to perform a Squirrel save, and should then perform a cold boot (with the "F" option) and restore the file system from the Saveall, Incremental, and Squirrel tapes.

- * Code has been added to DEVDMPT to permit it to be run as a standard CP-V load module to create a new DEVDMPTape (it cannot actually dump devices when run under CP-V). When run in this fashion, DEVDMPT will request a standard CP-V tape (device type 9T, serial number "BOOT") and will then write itself to the tape preceded by a bootstrap record. A !SET or !ASSIGN command may be used to assign to F:BOOT DCB to another type of tape drive or to declare the proper tape density if desired; if the tape is ever to be booted on an MPC drive, it should be written at 800 BPI only. The resulting tape may be booted to load and run the real DEVDMPT program.

1.2.5 Magnetic tape error recovery improvements

Recovery from magnetic tape errors has been significantly improved; certain errors which were not being detected now are, and severe write errors are handled with a greater chance of successful recovery.

- * If a write error is detected while the tape is at load point, the normal write recovery process will not be performed; instead, the message "STRIP TAPE AND RETRY" will be output. The operator should strip off the first few feet of the tape (up to the existing load point marker) and put a new load point marker on the tape, and then key in "yyndd,R".
- * The tape handlers will now calculate the correct number of tape erasures to be performed during successive retries of a write error, thus improving the recoverability of long-record writes.
- * The handling of multiple errors that occur during write error recovery has been improved.
- * Errors that occur after the end-of-tape marker will now be handled properly.
- * The handling of device timeouts has been improved. In prior versions of CP-V, timeouts were handled as device independent conditions; since the operation that timed out would often have moved the tape, the normal recovery sequence (a "yyndd,R" key-in) would not always have meaningful results. In F00, tape timeouts are passed to the device handler via the error path from the general I/O checking routine (IOSERCK). If the device handler can positively determine that no tape motion occurred, the error is passed back to IOQ to report "yyndd TIMED OUT" and to request operator action. Otherwise, the handler reports "yyndd TAPE POSITION LOST" to the operator and returns a TYC of 8 (irrecoverable error) to the user.

1.2.6 Deferred I/O

CP-V's ability to deal with faulty peripheral devices has been significantly enhanced. In prior versions of CP-V, a defective peripheral could cause software check 79-00s by accepting SIOs and immediately interrupting with a fault condition; the I/O scheduler would attempt to retry the I/O operation and would receive another fault, thus causing

multiple I/O interrupt environments to be pushed onto the monitor stack. In CP-V F00, the I/O scheduler is capable of determining that too many interrupt environments have been pushed onto the stack; in such a case it will defer issuing any further SIOs on the offending device until the previous interrupt environments have been pulled from the stack. Three new DCT tables (DCT27, DCT28, and DCT29) are used to properly manage this feature. Of greatest interest to systems programmers and customer engineers is DCT29, which is a halfword table containing an entry for each device indicating the number of times that I/O startup has been deferred for the device; any non-zero value in this table indicates a possible hardware problem, as it is unlikely that normal system operations will ever cause more than 9 interrupt environments to be pushed onto the stack.

1.2.7 EDIT enhancements

EDIT has been significantly enhanced in several areas, providing both greater capabilities and greater convenience of operation.

- * EDIT may now be used in batch. Commands are read through M:C. Output is written through M:DO, which may be assigned to a file. The user may use an !ASSIGN or !SET command to specify tab stops for the M:DO DCB; these tab stops will be used for tab expansion and compression during the batch edit unless overridden by an EDIT TA command.
- * The initial !EDIT command may be used to specify a command for EDIT to process. For example, "!EDIT XEQ SETUP" will cause EDIT to be entered; EDIT will then process the XEQ command as though it had been entered from the terminal (or from the batch stream if EDIT is being run in batch). This method may also be used to pass a command to EDIT via a properly coded M:LINK call that specifies the (CMD) option.
- * The GS character (usually control shift M) performs a function similar to that of the Line Feed character - that is, if an SE range was previously specified, the SE range will be reset to the first record after the SE range and the record typed in the format specified by the most recent RR, TC, TS, or TY command. Since the GS character acts as an end-of-message character and does not cause the terminal platen to advance, the record will be displayed on the same line as the EDIT prompt ("*"), thus permitting the user to scroll down through successive lines of the file without wasting paper.

- * The EOT character (usually control D) performs the same function as the GS character except that the SE range is reset to the first record preceding the SE range; EOT may be used in place of the up-arrow command if desired, to save paper.
- * When the SS or ST command is being used to display and edit successive lines in a file, the user may indicate "no change" by entering either a "NO" followed by a carriage return (as in previous versions of EDIT) or by entering a line consisting of a single line feed.
- * EDIT's string selection, matching, and replacement routines now recognize the existence of "wild card" strings whose exact content is unimportant. Two forms of "wild card" strings exist - one form (represented by "?n") will match against any string of exactly "n" characters; the other (represented by "?") will match against any string of any length (including the zero-length, or null string). "Wild card" strings may be freely intermixed with specific strings to form complex string expressions (however, a "wild card" string in the last position of a string expression will never match with anything.) For example, the user might specify:

```
*FD0-999, /DO/?/VAR/?2/Z/
```

which would delete any lines between 0 and 999 that contained the string "DO", possibly followed by some unimportant characters, followed by the string "VAR", immediately followed by two unimportant characters, followed by a "Z". Each time EDIT matches a "wild card" against a real string, it remembers the content of the string that caused the match. If the "?" or "?n" constructs are used on the right side of a string substitution operator (S, F, P, O, or E), EDIT will use the value of the remembered string in place of the "?" or "?n" - specifying "?n" will retrieve the next "n" characters of the string, and specifying "?" will retrieve the remainder of the string and will reset the string back to the beginning. For example: the command

```
*SE; 0/AB/?3/CD/S/A/?1/B/?1/C/?/D/?
```

would change all occurrences of the string "ABxyzCD" to "AxByCzDxyz" (where "xyz" is any string of 3 characters).

- * The TABC command may be used to specify tab compression. If "TABC ON" is specified, EDIT will replace strings of blank characters in any lines written to the edit file

with TAB characters based upon the user's current tab settings. This can sometimes result in a significant reduction in the size of the file. "TABC OFF" (the default) may be used to inhibit the tab compression.

- * Multi-line editing commands may be entered. The user may request continuation of a command line by ending the current command line with a semi-colon (the semi-colon must not lie within a string, and must appear at a point in the command at which a semicolon is syntactically permitted); EDIT will prompt the user (with ">") for the remainder of the command. Multiple lines of continuation may be entered. Commands in an Edit XEQ file may be continued in a similar fashion. The command is parsed and checked for errors on a line-by-line basis as it is typed (or read from the XEQ file); the maximum size of a command is limited solely by the amount of memory available to EDIT.
- * The "L" command may be used to invoke PCL's "LIST" command from within EDIT.
- * EDIT may be used to examine (although not to update, nor to merge records into) consecutive files. EDIT will display the line numbers of the file as integers. Any attempt to update the file will be aborted.
- * FOO EDIT will automatically set the SE range upon the completion of a command in several cases where E01 EDIT would not. When the user enters an "EDIT fid" command, the SE range will be set to include the entire file. When the user exits from a BUILD, IN, or IP operation the SE range will be set to the last line entered. When the user uses RN to move a single line, the SE range will be set to the (moved) line. When EDIT completes a MK (or MKP) operation the SE range will be set to the destination range.
- * If the user enters an IN, IP or IS command without a starting line number, the insertion will be started at a line one increment beyond the end of the current SE range. The user may specify an increment on the IN or IP command without being required to specify the starting line number - for example, entering "IN ,.1" is taken to mean "Start inserting at a line whose number is 0.100 beyond the end of the range that I'm SE'd to."
- * Conditional editing of lines within the current SE range may be specified with the IF, EL ("ELse"), and EI ("EndIf") commands. The IF command is of the form

```
[.....;] IF sse; ..... [;EL; ..... [;EI; .....]
```

If the SSE is true for the current SE line, the commands following the IF are executed; if the SSE is false for the current SE line, the commands following the ELSE are executed (if the ELSE was specified). IFs may be nested to any depth. It is not necessary to specify ELSES or ENDIFs for all IFs in a command; the default assumption is that if the SSE is false no commands should be executed for that IF case; any ENDIFs not entered by the user will be assumed to fall at the end of the command.

- * Column zero now refers to the last non-blank column on the line. This is most useful when used with the F (Follow) operator, as it allows appending of data to the end of the current SE line.
- * The RL ("Repeat Line") command may be used in a command sequence that updates lines in an SE range; it causes EDIT to jump back to the beginning of the command and continue editing the current record if (and only if) the current record has been modified by a string substitution or movement command.
- * The QR ("Quit Record") command may be used to indicate that EDIT should stop processing the current record (as though the end of the command had been encountered) and should go on to the next line in the SE range.
- * The NO ("No change") command may be used within a command line to indicate that the current SE line should not be changed regardless of any changes that may have been indicated by any string substitution operations earlier in the command. The CL ("Column Limit") command may be used to change the column limits for string searches and changes; the changed limits apply only to the current line, and are reset to the limits specified on the SE command when the next line in the SE range is edited.
- * Two new commands have been added which permit the selective copying of the lines specified in the SE range to another area in the file. The CP ("Copy Protected") and CI ("Copy Interlaced") commands take the form "CP (or CI) [n][,i]" where "n" specifies the beginning of the destination area and "i" specifies the line number increment for copied lines. The CP command will not copy the indicated line(s) if: (1) the line indicated by "n" exists in the file, or (2) if the incremented "n" value equals or exceeds a line number existing in the file ("CP" behaves much like the "IP" command in this way). The "CI" command will copy the indicated lines regardless of whether the copy operation

is over-writing existing lines in the destination range. The CP and CI commands need not be the first (or only) intra-line editing command specified in a command; the user may precede the CP or CI command with one or more string substitution or shifting commands, in which case the line(s) copied to the destination area will be the SE'd lines as altered by the specified substitutions. It is even possible to copy the line in a changed form without altering the original line, by following the CP or CI command with a NO command. For example,

```
*SE 1-100
*IF /WHICH/; O/FEE/S/BIRD<Macbeth>/; CP200,1; NO; EL; DE
```

This command sequence will scan all lines in the range from 1 to 100. If a line contains the string "WHICH", EDIT will copy the line to an area which begins at line 200 (with increments of 1.000 between successive lines); the new copies of the lines (but not the original lines) will have all occurrences of the string "FEE" changed to "BIRD<Macbeth>". Any lines in the range 1-100 that do not contain the string "WHICH" will be deleted.

- * If the user enters a "DE" command without a line number, and if the command that specified the current SE range includes more than one line and did not specify a string selection expression (SSE), and if the DE command was not entered from an XEQ file, EDIT will type

```
"--DELETE FROM mmmm.mmm TO nnnn.nnn? (Y OR N)"
```

and prompt for a response. If the user enters "Y", EDIT will delete the entire SE range; if the user enters anything else, EDIT will delete nothing.

- * The DL ("Deletion Limit") command may be used to limit the number of lines that will be deleted from the file by a DE command. The DL value will also limit the number of lines that will be deleted from the destination range specified by an MK or MD command. If the specified maximum number of lines to be deleted is exceeded, the operation will be aborted with a "CUTOFF at mmmm.mmm" message.
- * The single-quote (') and double-quote (") characters may be used to delimit EDIT strings in the same way that the slash character is used. Each individual string must begin and end with the same delimiter; however, strings with different delimiters may be freely intermixed within an EDIT command.

1.2.8 PCL enhancements

- * The NF ("no formatting") option may be used when copying files to a device - it indicates that PCL is not to print the usual header record (which consists of the date and time, and the identity of the file being copied).
- * The UC and LC options may be used to have PCL convert any lower-case letters in the data being copied into the corresponding upper-case letters, or vice versa.
- * The JOB option may be used on the COPY, COPYSTD, COPYALL, LIST, and DELETE commands; it specifies that the indicated file should be opened in (JOB) mode rather than in (SAVE) mode.
- * The standard file input to a COPYSTD command may be from a device (CR or ME, for example).
- * PCL normally considers lower-case letters to be unprintable; it prints any filenames containing lower-case letters in hexadecimal, and represents lower-case characters in hexadecimal-format COPYs with the '.' character. If any command input to PCL contains a lower-case letter, PCL will recognize that fact and will (for the remainder of the PCL session) treat lower-case letters as printable characters.
- * The LIST command may now be used to list the contents of an ANS tape set. Data displayed will include the file formats, volume serial numbers, block counts, and file names.
- * When PCL is run in batch and is commanded to copy a file to the line printer, it will skip two lines before and after the file to improve readability. This line-skipping may be suppressed with the NF option mentioned above.
- * The list of filenames output during COPYALL, COPYSTD, and DELETEALL processing is now tabular (like the output from a simple LIST command). If a file cannot be copied or deleted as requested, its name will be printed on a separate line with the error code and one of the indicators "IN" or "OUT".

1.2.9 Operator-visible enhancements

- * Console messages from ghost jobs are preceded by the ghost's user number and name, rather than by the user number and account number. For example, a message from the system initialization ghost might appear as

```
4:(GHOST1)      ANSFORT NOT IN :SYS
```

rather than as

```
4::SYS         ANSFORT NOT IN :SYS
```

- * The post-handler for the operator's console has been enhanced to permit the use of the underscore (" " - pronounced "zot") character as a "rubout" key. Each zot encountered in the buffer will cause the rightmost unerased character to the left of the zot (and the zot itself) to be erased from the buffer; the "actual record size" value passed back to the user's DCB (or to the TEXTC string via M:KEYIN) is adjusted to reflect the deletions. Due to this enhancement, there is no way for the operator to actually include a zot character in the text of a key-in.
- * When CP-V is booted on a Xerox 560 system, it will output a sequence of characters to the operator's console that will set the console's tab stops to the values expected by the CP-V software.
- * During a boot from tape, if the operator depresses the console interrupt key (control-Y or control-Z "I" on a 560) to cancel the boot process, CP-V will automatically rewind the boot tape in preparation for another boot operation.
- * During the system initialization process, GHOST1 will store into locations X'27' and X'28' the instruction sequence necessary to invoke an operator recovery. If an operator recovery becomes necessary, the operator can simply halt the CPU, depress CPU RESET, increment the PSD (once on a Sigma 9, twice on a Sigma 5, 6, or 7) and put the CPU in RUN. This method of invoking an operator recovery has the advantage that registers 0 and 1 are not destroyed. The time-honored method of booting from RAD with sense switch 3 set is still available.
- * The !SEND,ALL key-in no longer affects the 55-character online page heading; only the !HEADING command changes the header. !SEND keyins may be used to send messages of up to 72 characters; if a !SEND (or !HEADING)

command specifies a message of greater than 72 (55) characters, the message "MESSAGE TRUNCATED" will be typed on the console, and as much of the message as possible will be sent.

- * The key-in "!DISPLAY" (in all of its various forms) may be abbreviated "!DI". The "!MOUNT" key-in may be abbreviated "!M". The longer forms of both keyins may still be used.

1.2.10 ANLZ enhancements

- * The display produced by the "ALL" command (and by the standard ANLZ sequence performed after a recovery) now includes two new displays: the T:P2SI file and the UMOV data area. The T:P2SI file contains a copy of all SYSGEN control commands used during PASS2 processing. The UMOV data display includes the data portion of the UMOV overlay, running from symbol SSDATU: through TOPUMVDTA.
- * The DCT displays have been altered slightly. DCT9 is now displayed as a 32-bit field instead of a 16-bit field. Tables DCT26, DCT27, DCT28, and DCT29 are displayed in the appropriate formats.
- * When displaying current or in-core users, ANLZ will now dump the users' spare file management buffers.
- * Each of the ANLZ overlays now has a patching DEF defined at the beginning of the overlay's procedure. Overlay ANALZ01 has the symbol PP01, ANALZ02 has the symbol PP02, and so on.

1.2.11 FIX enhancements

Several new features have been added to the FIX program, affecting both HGP reconstruction and interactive functions:

- * During an HGP reconstruction, the F ("Filenames") option may be requested. This option is identical to the A option except that granules in error will not be dumped to the line printer.
- * FIX now has the ability to dump to the line printer the content of any granules recovered during an HGP

reconstruction (that is, any granules that were not listed as "available" but which were not part of any valid directory or file). At the end of an HGP reconstruction, if the "A" printout mode is in effect, FIX will ask the operator if recovered granules are to be dumped. The dump may be terminated at any time by interrupting FIX and changing the printout mode to "F", "E", or "N". This option should not be used if there have been many 75-type file errors or if the system has ever been rebooted without being properly !ZAP'ed, as these situations will lead to a large number of granules being recovered.

- * The commands "DUMP fid CFU" and "FIX fid CFU" may be used to display or delete, respectively, any CFU (Current File Usage) table entries for a specified file. "FIX fid CFU" may be used to "un-busy" files that were in use by a user who was aborted from the system and not run down properly (for instance, if a fatal JIT swap error occurred); it should be used with extreme caution to avoid damage to the CFU tables and file system.
- * The "FIX da" and "CHECK da" commands (where "da" is a six-digit hexadecimal disk address) may be used to examine and modify granules on any RAD or disk device. These commands should be used only online and should be used with *extreme* caution; they cause FIX to read in the indicated granule and associate DELTA which may then be used to examine and modify the granule. The content of the granule is available at locations .0 through .1FF; when the user types ";G" the granule is re-written with the (possibly) changed data.
- * At boot time, if FIX determines that the primary and secondary (dual) copies of ALLOCAT's data do not match, it will display on the operator's console the time stamp contained in each copy of the data, and will then ask if the secondary copy of the data is to be used. The display is of the form:

```
DATA(N)TIME=yymmddhhmmqqqqq  
DUAL(Y)TIME=yymmddhhmmqqqqq  
DO YOU WANT ALLOCAT DUAL DATA(Y/N)
```

where "yymmddhhmmqqqqq" is the date and time (down to the millisecond level) that the ALLOCAT data was written.

1.2.12 COC enhancements

Several enhancements have been made to terminal (COC) I/O capabilities:

- * The M:TS3 CAL now returns the current value of the "blank lines before page heading" and "blank lines after page heading" system variables.
- * The M:STA CAL may be used to set the values of the "lines before/after page heading" variables, as well as the value of the "current cursor position" variable. The "current cursor position" may also be set by a new COC suboption on the M:WRITE CAL.
- * Vertical format control (VFC) handling has been expanded to properly handle the X'Dx' and X'Ex' series VFC codes, thus permitting COBOL programs that specify "PRINT AFTER ADVANCING" to function properly when outputting to an online terminal.
- * The GETBUF and RELBUF routines are now executed with interrupts inhibited, thus solving some rare re-entrancy problems.
- * The COC interrupts are now cleared by means of an appropriately coded WD instruction rather than by an LPSD, thus curing an undesirable interaction with some user real-time routines.
- * Autosave (line disconnect) handling has been improved. Under CP-V E01, if a disconnected user's autosave image timed out, the program's exit control routine would be entered; if the program attempted to issue an M:READ to the terminal it would be unconditionally terminated. Under CP-V F00, the program's exit control routine will still be entered; if the program issues an M:READ to the terminal, the read will be aborted with an I/O error code 5B-00 ("Line hung up"). This change permits the APL processor to simulate a ")CONTINUE" command if a user authorized for auto-save becomes disconnected and does not reconnect within the installation-defined time.
- * The Escape-W character sequence now toggles the "di output" mode instead of unconditionally turning it off.
- * The algorithm used to determine the point at which terminal should be blocked (placed in state STOP) has been improved. If two terminals of different speeds are !COUPLED and the slower terminal cannot keep up with output being generated on the faster terminal, the slower routines will discard the "overflowing" output.

send it to the slower terminal, rather than permitting the slower terminal to collect several minutes of potential output and thus hog most of the available COC buffers.

1.2.13 Sigma 5 speedups

On Sigma 5 systems, a significant increase in CP-V monitor performance has been achieved by the identification of several frequently-used byte-string instruction sequences in the monitor and loader that were forming "hot spots" during normal system operations. Under CP-V E01, execution of these (or any) byte-string instructions on a Sigma 5 causes a "Nonexistent Instruction" trap which is intercepted and interpreted by the CP-V byte-string instruction simulators, which then simulate the requested instruction. Under CP-V F00, the monitor initialization process on Sigma 5s will replace these "hot spot" instruction sequences with branches to special entry points in the byte-string simulation routines, thus saving the overhead involved in intercepting the trap and acquiring scratch space in the user's TSTACK. The special entry points into the byte-string simulators can also make certain assumptions about the current values of the registers, thus permitting the simulation process for the "hot spot" instructions to be significantly faster than the standard, highly generalized simulation.

One "hot spot" has also been identified in the CP-V loader, and similar measures have been taken to decrease the overhead involved. A small byte-string simulation routine has been added to the loader's source code, and a GENMD (which will install itself automatically on Sigma 5s) will cause the loader to branch to the simulation routine at the appropriate point.

The degree of performance improvement to be expected on Sigma 5 systems is highly dependent upon the type of workload that the system is exposed to. The monitor speedups will be most obvious to programs performing large amounts of keyed file I/O; the loader speedups will be greatest when the loader's REF/DEF stack becomes large (for example, when loading with a public library or with :J0 or :J1). Tests performed on a 128K Sigma 5 system at LADC under varying workloads showed the following reductions in monitor service time:

<u>Function performed</u>	<u>Approximate improvement</u>
PCL - COPYALL of LT to public DP - 7500 granules of consecutive files.	7%
PCL - COPYALL of 7500 granules of consecutive files from one account in public DP to another.	1%
PCL - COPYALL of 3000 granules of keyed files (mixed LMNs and Edit files) from private DP to public DP.	11%
loader - !LYNX of a 12K program (mixed ANS FORTRAN and Metasymbol ROMs, loading with :P1 and :J0). The improvement was in processor execution time rather than in monitor service time.	34%

1.2.14 Spill/Fill

CP-V's code for the symbiont file Spill/Fill capability has been substantially rewritten for F00. A new appendix (I) has been added to the CP-V System Programming Reference Manual describing the necessary FPTs and coding conventions. Due to the delicacy of the FPTs necessary for Spill/Fill operations the M:LDEV procedure may not be used to assemble these FPTs - they **must** be hand-coded.

- * It is possible to spill a symbiont file ("symfile") in either Save or Delete mode; the mode is specified by the ASAVE and DELETE bits in the M:LDEV FPT.
- * When a symfile is spilled in the Delete mode, it is deleted from RBBAT's queues by the initial M:LDEV request. The symfile's granules are returned to the system when they are read by the spilling program; if the program is aborted for any reason, any unspilled granules remaining in the symfile will be lost to the system.
- * When a symfile is spilled in the Save mode, it is deleted from RBBAT's queues when initially opened by the spilling user. It is normally re-entered into RBBAT's queues when released by the user; however, the user may specify the DELETE bit in the M:LDEV FPT that releases

the symfile to indicate that the symfile is to be purged from RBBAT's queues and its granules returned to the system. If the spilling program is aborted, the symfile will be re-entered into RBBAT's queues as though the user had specified SAVE. When the initial save-mode spill request is issued there must be a symfile slot of the appropriate type available - if there is none, the spilling user will be queued for access to RBBAT (placed in state SQR) until a slot becomes available.

- * Spill/Fill may be used to spill and restore JCL symfiles, non-control input (NCTL) symfiles, and most output symfiles. Running jobs cannot be spilled; neither can concurrent output (COMODE) symfiles.
- * Certain precautions **must** be observed when using Spill/Fill: (1) The FPARAM data passed by the M:OPEN of a Spill stream must be used as the FPT of the M:LDEV CAL that requests a Fill operation. (2) The data read during a Spill operation should be used as the data written during a Fill operation. No modifications **of*any*sort** should be made to either the FPARAM data or spilled data - such modifications can easily lead to the loss of part or all of a filled symfile. (3) To ensure that all symfiles are filled with the proper priorities, the fill operation should be performed only after the operator keys in !ONB 0 and locks all of the symbiont output devices. (4) When spilling JCL symfiles in the Save mode, the operator should key in "!ONB 0" to preserve the proper priorities of the spilled symfiles. (5) The stream used for spilling or filling symfiles should not be used for any other purpose. Note that the ASAVE and DELETE options function differently for Spill/Fill streams than they do for normal co-operative streams. (6) CP-V F00 Spill/Fill files are not compatible with files spilled under previous versions of CP-V.
- * When a JCL symfile is re-inserted into RBBAT's queues following a save-type Spill operation, the operator is notified by a "PROCESSOR JOB" message specifying the job's account number and SYSID. The message will appear to originate from user 66xx, where xx indicates the workstation number of the job just spilled. When a JCL symfile is filled, a similar message seeming to originate from user 77xx will appear.
- * NOTE: While the SYSID of symfiles spilled in Save mode is not modified, the system assigns new SYSIDs to newly-filled JCL and non-control input symfiles to ensure that input job IDs remain unique. If jobs that specified (ORDER) on their !LIMIT cards are spilled and

then filled they will run in the order in which they are filled, which may not be the same as the order in which they were originally submitted (if, for example, they were not all submitted at the same priority). By examining the FPT returned in the spill DCB's FPARAM area, the spilling program can detect JCL symfiles that specified (ORDER); the program might then parse the !JOB command of such symfiles and maintain a table of jobs and their accounts and SYSIDs, so that they could be filled in the proper sequence.

- * Access to the Spill/Fill feature is controlled by the user's privilege level. A user with privilege X'AO' may spill output files in the Save mode and may fill output files. A user with privilege X'BO' may spill any symfile in Save mode, and may fill output files. A user with privilege X'CO' may spill any symfile in either Save or Delete mode, and may fill any symfile.
- * Two unsupported programs in the X account called DMPQ and RESQ may be used to manage the Spill/Fill process. See section 4.1.9 for details.

1.2.15 Volume Initialization programs

The chart below describes which programs may be used to perform disk pack initialization operations for CP-V disk packs. Note that MPCD, the diagnostic program for MPC disk systems, may be run either in a stand-alone environment or in an on-line CP-V environment. The on-line version is distributed with CP-V F00 and is loaded as a segment of OLMON (706497B00) during system generation (see section 4).

	<u>Write Headers</u>	<u>Surface Test and Assign Alternates</u>	<u>Write Single Account</u>	<u>VTOC Multiple Accounts</u>
CP-V On-line VOLINIT	X	X	X	X
Stand-alone VOLINIT (706226E00)	X	X	X	-
INITVOL.X	-	-	X,M	-
MAPINIT.X	-	-	X,M	X,M
MPCD Disk Diagnostic (730038A00)	M	M	-	-

where

X = applicable to Xerox disk system models 3275, 7242, 7260, 7270, and 7275.

M = applicable to Honeywell MPC disk system model 9210.

1.2.16 Miscellaneous enhancements

- * Pages-printed accounting now functions properly when VFC codes in the X'60', X'Dx' and X'Ex' series are used.
- * If a program attempts to print more lines on a page than the LDEV definition (default or user-specified) permits, the output routines will insert a page eject at the proper point to ensure that the number of pages charged to the user is the same as the number of pages physically printed. If it is desirable to override this feature and print a stream of continuous output (for example, when generating line-printer graphs) the user may issue an !LDEV command (or M:LDEV CAL) specifying (LINES,0); in this case the system will assume (for accounting purposes) that there are 32 printable lines on each page, but will not force a page eject at end-of-page.

- * When a ghost user aborts, the snapshot of the program's PSD and registers is preceded by several blank lines instead of a page feed, thus (usually) saving a page of paper. This is also true for batch jobs that have not specified !PMDs.
- * The "hot card reader" feature previously contained in the CLOCK4 module and activated by a patch has been moved to a separate module in UMCV which is included in the system by the presence of the "(HOTCARD)" option on the :MON command input to the PASS2 processor.
- * A "hot AVR" feature has been developed, and may be included in a system by use of the "(HOTAVR)" option on the :MON card. This feature, called once per second by the CLOCK4 routine, will automatically AVR (mount) any Xerox or ANS labeled tapes that are brought to "ready" status on a write-protected tape drive; it will also AVR any private disk packs that are brought to "ready" on a disk drive that does not generate an interrupt at such times (disk packs that do generate interrupts are AVR'ed automatically by the system whether HOTAVR is included or not).
- * When a user issues a "MOUNT" request for a tape or disk pack that is not satisfied within one minute, the system will sound the audio alarm for several seconds each time the MOUNT message is output to the console. This feature may be disabled at installation option by setting the X'8' bit of S:OPTION (in the LITERALS module).
- * If a user (batch or online) issues an "execute load module" request for a file that is either consecutive or Edit keyed (KEYM=3), the FETCH routines in STEPOVR will cancel the load module fetch, construct an !XEQ command of the appropriate format in the user's command buffer, and pass the command back to TEL or CCI for processing. Users may thus (in most cases) invoke command files by calling them as load modules; they may be invoked from TEL (via "!filename."), from within a program (via M:LDTRC), or from LOGON (by declaring "CALL=filename" when the user's account is authorized). This feature may be disabled by the system manager by setting the X'2' bit of S:OPTION.
- * The !ERROR facility for online users has been enhanced. Users specifying !ERROR will now see "MOUNT" requests, error messages, and operator key-ins associated with disk packs as well as with tapes (but may not use Control-Y to force an error return from a disk pack error requiring operator intervention). Errors

occurring on system disk packs will be reported to the user who issued the I/O request, with a serial number of "PUBLIC" appearing in the message. Users who have MOUNT requests outstanding will see the message produced by the AVRing of their pack or tape if AVR is used to mount the volume.

- * PIGEON has been upgraded for better response and responsibility. Messages from the operator to a user (or all users) will be preceded by a bell character to alert the user (operator !MOUNT key-ins echoed to users specifying !ERROR also include a bell). If the user's terminal is at the left side of the platen (column 1) PIGEON will not send an initial CR/LF sequence, reducing paper use. FOO PIGEON is much less likely to either hog COC buffers or get hung waiting for a disconnected or inactive line than was E01 PIGEON.
- * The M:KEYIN CAL no longer demands the presence of the REPLY, SIZE, and ECB parameters. If REPLY is omitted, the operator's (or on-line user's) response will be placed in the buffer specified by the MESS parameter (i.e., replacing the message sent to the operator). If SIZE is omitted, a maximum size of 50 characters (not including the byte count) will be assumed. If ECB is omitted, no ECB processing will be done. It should be noted that M:KEYIN always performs wait I/O; even if the CAL specifies an ECB, the user's program will never regain control until the operator (or on-line user) has responded to the request.
- * Code has been added to the scheduler to ensure that when the operator enters !ZAP the system does not actually SCREECH until: all users except RBBAT and ALLOCAT have been logged off; ALLOCAT's data stacks have been cleared and the HGP tables updated; RBBAT and ALLOCAT are asleep; no I/O of any sort is in progress. This change will permit all messages generated after the !ZAP command is entered to be successfully printed on the console, and will reduce the number of mis-matches between ALLOCAT's primary and dual data when the system is re-booted after being !ZAP'ed. CP-V F00 takes somewhat longer to terminate after a !ZAP command than did previous systems (usually 10-15 seconds longer).
- * There are now very few situations that can induce a software check 3B ("COOP sent OUTSYM bad data"). Most of the situations that previously caused 3B's will now cause OUTSYM to abort processing of the erroneous file, send a message to the operator, generate an entry in the system error log, and continue.

- * DELTA's interface with user exit control routines has been changed. Typing ";"E" will cause DELTA to exit to TEL without going to the user's exit control logic. Typing ";"X" will cause DELTA to go to the user's exit control routine - registers 0 and 1 (TCB address and PSD address in TCB) will be set up properly, but the contents of registers 8 through 12 will be arbitrary.
- * The Loader no longer deletes duplicate internal symbols during a multi-ROM !LOAD (or !LYNX).
- * If an symbol DEFed within a load module has the same name as a DEFed symbol in a library included in the load module, the loader will list the symbol name in the "Doubly Defined Symbols" area in the load map. This condition is not considered an error and will not result in an increase in the severity level of the load module.
- * Boot-time reconfiguration (:REMOVE and :PART) has been updated to function properly. Both single- and dual-access controllers may be partitioned and removed at boot time. Removing or partitioning devices at boot time will cause the resource counts for the appropriate device types to be updated properly.
- * The private pack file management logic has been augmented to partially remove a restriction on the replacement of private pack files. Under CP-V E01 and prior systems, it was impossible to replace a file on a private disk pack with a file of a different organization without first deleting the existing file. Under CP-V F00, a consecutive file on a single volume pack set (only!) can be replaced by a keyed file of the same name without pre-deletion being required, and vice versa. The restriction remains in effect for files on multi-volume private pack sets, and for all operations involving random files.
- * The text and meaning of error codes 5600 and 5700 has been altered somewhat. Error 5600 now applies strictly to tapes; its message reads "5600 NO MORE ROOM ON THIS TAPE OR IN THIS TAPE SET". Error 5700 now applies strictly to disk and RAD operations; its message reads "5700 GRANULE LIMIT EXCEEDED OR SPACE EXHAUSTED".

1.3 Supporting Publications

The following table identifies the CP-V Operating System reference manuals. An asterisk (*) following the Xerox publication number indicates that a new revision package has been made available for the F00 version of CP-V. The Honeywell Order Numbers indicate the manual and revisions to request when ordering a manual for use with CP-V F00.

	<u>Xerox Pub. #</u>	<u>Honeywell</u>	
		<u>order #</u>	<u>addendums</u>
CP-V BP Ref. Manual	90 17 64H-1 *	XL 89	A
CP-V OPS Ref. Manual	90 16 75H-2 *	XL 23	A, B
CP-V SP Ref. Manual	90 31 13B-2 *	XQ 63	A, B
CP-V SM Ref. Manual	90 16 74H-2 *	XL 21	A, B
CP-V TS Ref. Manual	90 09 07H-1 *	XG 15	A
CP-V TS Users' Guide	90 16 92D-4	XL 34	-
CP-V RP Ref. Manual	90 30 26C-2 *	XP 94	A, B {1}
CP-V TP Ref. Manual	90 31 12A-4 *	XQ 61	A, B, C, D
CP-V DB Tech. Manual	90 19 95D-3 *	XN 15	A, B, C
CP-V Pocket Guide	90 31 31C	XQ 77	-
CP-V Common Index	90 30 80C	XQ 37	-

Last-minute revisions to the CP-V F00 reference manuals are not contained in a -91 document in the release materials. Instead, revisions and corrections will be included in the monthly Software Support Tape (SST) in the form of CHRONO files in the PATCH account. The filenames take the form "CHRONO-xxxx" where "xxxx" indicates the manual to which the revisions apply - "CHRONO-TSRF" applies to the Timesharing Reference manual, "CHRONO-DBTC" applies to the Data Base Technical manual, etc.

{1} When installing revision packet B in the RP Reference manual, do not install the update for pages 11 and 12 as is indicated by the cover sheet - the update for these pages is in error. Retain the copy of pages 11 and 12 provided in revision packet A (CP-V E00 updates dated 11/76).

2.0 HARDWARE CONFIGURATION

CP-V runs in a minimum of 64K words of memory; however, the minimum requirements are dependent upon the options selected (for example, the TP option requires a minimum of 80K memory). Combinations of options may require more than the standard minimum for CP-V.

CP-V supports configurations of greater than 128K of memory on Xerox 560 and Sigma 9 systems, and on extended Sigma 6/7 systems. The maximum amount of memory supported on these systems is limited only by the CPU's addressing capability or physical memory configuration limits.

CP-V multiprocessing support is provided for extended Sigma 6/7, Xerox 560, and Sigma 9 systems. Up to four CPUs are supported in Sigma 9 systems, and dual processor support is provided for Sigma 6/7 and Xerox 560 systems.

3.0 SIDRs closed in F00

The following is a list of SIDRs closed by the release of F00 CP-V.

22420	Severity 3	against A01	DEBUG tools
23178	Severity 3	against B00	Symbionts
24666	Severity 2	against B00	Symbionts
26932	Severity 2	against C00	Utility Processors
27189	Severity 2	against C01	Monitor Services
27211	Severity 2	against C01	CP-V in general
27345	Severity 5	against C01	System Management
27346	Severity 2	against C01	System Management
27354	Severity 4	against D00	Recovery
27394	Severity 3	against D00	System Management
27458	Severity 3	against D00	Symbionts
27499	Severity 3	against C01	System Management
27556	Severity 3	against D00	Communications
27770	Severity 2	against C01	Symbionts
27795	Severity 5	against C01	Utility Processors
27848	Severity 3	against D00	Miscellaneous
27915	Severity 5	against C01	Miscellaneous
27918	Severity 2	against D00	System Management
27963	Severity 3	against D00	Operator Communications
27969	Severity 2	against D00	Symbionts
27990	Severity 3	against D00	Communications
28078	Severity 5	against C01	Utility Processors
28080	Severity 3	against C01	Job Processors
28100	Severity 3	against C01	Symbionts
28239	Severity 2	against D00	Software Checks
28245	Severity 3	against D00	Utility Processors
28390	Severity 3	against C01	Symbionts
28484	Severity 2	against D00	Recovery
28491	Severity 5	against D00	Operator Communications
28521	Severity 3	against D00	System Management
28556	Severity 2	against E00	System Management
28557	Severity 2	against E00	System Management
28558	Severity 5	against D00	Utility Processors
28601	Severity 2	against D00	System Management
28634	Severity 2	against C01	Recovery
28652	Severity 2	against C01	CP-V in general
28663	Severity 3	against D00	Communications
28691	Severity 3	against E00	Utility Processors
28715	Severity 5	against C01	Operator Communications
28736	Severity 3	against C01	System Management
28832	Severity 2	against E01	File Management
28835	Severity 3	against E01	System Management
28844	Severity 2	against D00	Software Checks
28853	Severity 3	against D00	System Management
28871	Severity 2	against E00	Symbionts
28888	Severity 3	against E00	Utility Processors
28936	Severity 2	against D00	Software Checks

29046	Severity 5	against D00	Communications
29067	Severity 3	against E00	Utility Processors
29073	Severity 3	against C01	Reliability
29123	Severity 1	against E00	System Management
29128	Severity 3	against D00	System Management
29129	Severity 3	against D00	Software Checks
29161	Severity 2	against D00	Communications
29215	Severity 3	against D00	File Management
29249	Severity 3	against E00	System Management
29252	Severity 2	against E00	Operator Communications
29255	Severity 2	against D00	Communications
29267	Severity 2	against E00	Monitor Services
29271	Severity 5	against D00	Recovery
29279	Severity 3	against D00	Software Checks
29345	Severity 3	against E00	Recovery
29352	Severity 3	against E00	Utility Processors
29358	Severity 3	against E00	Utility Processors
29378	Severity 2	against D00	Reliability
29379	Severity 3	against D00	Communications
29404	Severity 3	against D00	File Management
29414	Severity 2	against E00	Software Checks
29431	Severity 3	against E00	DEBUG tools
29435	Severity 3	against D00	System Management
29451	Severity 3	against E00	System Management
29495	Severity 3	against E00	File Management
29552	Severity 2	against D00	System Management
29573	Severity 3	against D00	Communications
29577	Severity 3	against D00	Recovery
29578	Severity 3	against D00	Recovery
29611	Severity 3	against E00	DEBUG tools
29622	Severity 3	against E00	Job Processors
29633	Severity 3	against E00	System Management
29636	Severity 2	against E00	Loaders
29674	Severity 5	against E00	Utility Processors
29683	Severity 2	against D00	System Management
29732	Severity 2	against E00	Software Checks
29741	Severity 3	against E00	Symbionts
29744	Severity 2	against E00	DEBUG tools
29752	Severity 3	against C01	DEBUG tools
29766	Severity 2	against E00	System Management
29778	Severity 2	against E00	Recovery
29783	Severity 3	against E00	Utility Processors
29827	Severity 3	against E00	Loaders
29828	Severity 2	against E00	System Management
29835	Severity 2	against E00	File Maintenance
29839	Severity 2	against E00	File Maintenance
29841	Severity 3	against E00	Recovery
29845	Severity 3	against E00	TP
29850	Severity 3	against E00	Symbionts
29876	Severity 3	against E00	System Management
29886	Severity 1	against E00	File Management
29911	Severity 2	against E00	Utility Processors

29921	Severity 3	against E00	Communications
29922	Severity 3	against E00	Utility Processors
29925	Severity 2	against E00	Utility Processors
29935	Severity 3	against E00	SYSGEN
29948	Severity 3	against E00	File Management
29952	Severity 3	against E00	Loaders
29970	Severity 3	against E00	File Management
29973	Severity 2	against E00	Loaders
29976	Severity 5	against E00	Miscellaneous
29983	Severity 3	against E00	Symbionts
29985	Severity 3	against E00	Monitor Services
29987	Severity 2	against E00	TP
29996	Severity 5	against E00	Communications
29997	Severity 5	against E00	File Management
29998	Severity 3	against E00	Loaders
30032	Severity 4	against E01	File Maintenance
30055	Severity 3	against E01	Reliability
30056	Severity 3	against E01	Recovery
30057	Severity 3	against E01	Recovery
30059	Severity 2	against E01	Job Processors
30061	Severity 4	against E01	CP-V in general
30065	Severity 2	against E01	System Management
30067	Severity 2	against E01	DEBUG tools
30074	Severity 2	against E01	SYSGEN
30075	Severity 2	against E01	File Management
30076	Severity 2	against E01	File Management
30077	Severity 2	against E01	File Management
30078	Severity 2	against E01	Recovery
30079	Severity 2	against E01	File Management
30080	Severity 2	against E01	Recovery
30083	Severity 3	against E01	System Management
30084	Severity 5	against E01	CP-V in general
30085	Severity 2	against E01	CP-V in general
30086	Severity 5	against E01	CP-V in general
30087	Severity 2	against E01	File Management
30090	Severity 5	against E01	CP-V in general
30091	Severity 3	against E01	File Management
30092	Severity 2	against E01	System Management
30093	Severity 3	against E01	Recovery
30095	Severity 2	against E01	Initialization
30096	Severity 3	against E01	Recovery
30097	Severity 2	against E01	CP-V in general
30099	Severity 3	against E01	File Maintenance
30100	Severity 2	against E01	Recovery
30101	Severity 3	against E01	CP-V in general
30102	Severity 2	against E01	SYSGEN
30103	Severity 2	against E01	Initialization
30104	Severity 2	against E01	Initialization
30105	Severity 2	against E01	SYSGEN
30106	Severity 5	against E00	Recovery
30108	Severity 2	against E00	Monitor Services
30110	Severity 5	against E00	TP

30155	Severity 2	against E00	SYSGEN
30159	Severity 3	against E00	File Maintenance
30163	Severity 5	against E00	Job Processors
30171	Severity 4	against E00	Symbionts
30181	Severity 3	against E01	File Management
30182	Severity 3	against E01	File Management
30185	Severity 3	against E01	DEBUG tools
30194	Severity 3	against E01	DEBUG tools
30196	Severity 3	against E00	Loaders
30208	Severity 3	against E01	SYSGEN
30211	Severity 2	against E00	Loaders
30214	Severity 2	against E00	Loaders
30215	Severity 2	against E00	Loaders
30218	Severity 2	against E00	Job Processors
30233	Severity 2	against E00	CP-V in general
30236	Severity 3	against E00	File Maintenance
30237	Severity 3	against E00	Utility Processors
30238	Severity 2	against E00	File Maintenance
30243	Severity 3	against E01	Communications
30244	Severity 3	against E01	CP-V in general
30245	Severity 5	against E01	SYSGEN
30246	Severity 3	against E01	SYSGEN
30253	Severity 2	against E01	Recovery
30254	Severity 2	against E00	Recovery
30255	Severity 3	against E01	File Management
30256	Severity 2	against E01	File Management
30257	Severity 2	against E00	Symbionts
30262	Severity 3	against E00	File Management
30263	Severity 3	against E00	Software Checks
30268	Severity 5	against E00	Operator Communications
30273	Severity 2	against E01	TP
30284	Severity 2	against E00	Symbionts
30293	Severity 2	against E00	File Maintenance
30296	Severity 3	against E00	Utility Processors
30297	Severity 3	against E00	Monitor Services
30298	Severity 2	against E00	System Management
30299	Severity 2	against E01	File Management
30300	Severity 3	against E01	Miscellaneous
30301	Severity 2	against E00	System Management
30304	Severity 2	against D00	Software Checks
30311	Severity 2	against E00	Monitor Services
30314	Severity 3	against E01	File Management
30319	Severity 2	against E00	File Management
30322	Severity 2	against E00	Utility Processors
30330	Severity 3	against E00	Operator Communications
30333	Severity 3	against E01	Utility Processors
30334	Severity 2	against E01	Utility Processors
30338	Severity 3	against E01	TP
30340	Severity 3	against E01	TP
30342	Severity 2	against E00	File Maintenance
30343	Severity 5	against D00	System Management
30345	Severity 2	against E00	TP

30346	Severity 2	against	E01 Recovery
30347	Severity 2	against	E01 Accounting/Performance
30358	Severity 3	against	E00 File Maintenance
30364	Severity 2	against	E01 Utility Processors
30369	Severity 3	against	E01 Utility Processors
30373	Severity 3	against	E00 Recovery
30374	Severity 3	against	E01 Recovery
30375	Severity 3	against	E01 Recovery
30382	Severity 3	against	E01 Utility Processors
30383	Severity 5	against	E01 System Management
30389	Severity 2	against	E00 Communications
30398	Severity 3	against	E00 Software Checks
30399	Severity 2	against	E00 System Management
30400	Severity 4	against	E00 Accounting/Performance
30403	Severity 3	against	E00 Utility Processors
30404	Severity 5	against	E00 Utility Processors
30412	Severity 5	against	E00 Monitor Services
30415	Severity 4	against	E01 Communications
30416	Severity 4	against	E01 Communications
30418	Severity 1	against	E00 Communications
30419	Severity 2	against	E00 Loaders
30420	Severity 2	against	E00 Loaders
30421	Severity 2	against	E00 Loaders
30425	Severity 2	against	D00 Loaders
30471	Severity 3	against	E00 Monitor Services
30472	Severity 3	against	E00 Utility Processors
30473	Severity 2	against	E01 TP
30475	Severity 2	against	E00 Recovery
30481	Severity 5	against	E01 CP-V in general
30482	Severity 2	against	E01 TP
30487	Severity 2	against	E01 Utility Processors
30495	Severity 5	against	E00 Operator Communications
30498	Severity 3	against	E00 Utility Processors
30500	Severity 3	against	E00 DEBUG tools
30503	Severity 3	against	E00 Utility Processors
30508	Severity 4	against	E01 SYSGEN
30509	Severity 4	against	E01 File Management
30511	Severity 4	against	E01 Software Checks
30517	Severity 2	against	E00 File Maintenance
30520	Severity 2	against	E01 Miscellaneous
30521	Severity 2	against	E01 Utility Processors
30523	Severity 2	against	E00 Utility Processors
30525	Severity 5	against	E01 DEBUG tools
30528	Severity 2	against	E00 DEBUG tools
30529	Severity 3	against	E00 Loaders
30533	Severity 2	against	E00 File Management
30534	Severity 3	against	E00 System Management
30536	Severity 3	against	E01 Utility Processors
30545	Severity 3	against	E00 Utility Processors
30557	Severity 3	against	E01 DEBUG tools
30562	Severity 3	against	E01 Utility Processors
30565	Severity 3	against	E01 Loaders

30571	Severity 3	against E01	SYSGEN
30574	Severity 5	against E01	Recovery
30587	Severity 2	against E00	Utility Processors
30590	Severity 2	against E01	SYSGEN
30602	Severity 2	against E01	File Management
30608	Severity 2	against E01	Utility Processors
30612	Severity 3	against E00	Recovery
30634	Severity 2	against E01	Utility Processors
30640	Severity 2	against E01	Recovery
30655	Severity 5	against E00	File Maintenance
30656	Severity 3	against E01	File Maintenance
30657	Severity 3	against E00	File Maintenance
30669	Severity 2	against E01	CP-V in general
30672	Severity 3	against E01	Utility Processors
30684	Severity 3	against E01	System Management
30686	Severity 5	against E00	Operator Communications
30688	Severity 2	against E00	Operator Communications
30689	Severity 3	against E01	Utility Processors
30694	Severity 2	against E01	Utility Processors
30695	Severity 5	against E01	DEBUG tools
30696	Severity 2	against E01	Reliability
30698	Severity 3	against E00	System Management
30716	Severity 2	against E01	Symbionts
30717	Severity 5	against E00	Utility Processors
30718	Severity 3	against E01	Recovery
30719	Severity 3	against E01	Monitor Services
30734	Severity 5	against E01	CP-V in general
30736	Severity 2	against E01	Recovery
30745	Severity 3	against E01	File Maintenance
30746	Severity 3	against E01	Utility Processors
30749	Severity 3	against E01	System Management
30752	Severity 3	against E01	System Management
30753	Severity 2	against E01	File Management
30754	Severity 5	against E01	System Management
30757	Severity 3	against E01	Operator Communications
30762	Severity 3	against E01	Utility Processors
30769	Severity 2	against E01	File Management
30770	Severity 2	against E00	File Maintenance
30771	Severity 3	against E00	File Maintenance
30772	Severity 3	against E00	CP-V in general
30775	Severity 5	against E00	Utility Processors
30783	Severity 2	against E00	Accounting/Performance
30785	Severity 3	against E01	CP-V in general
30786	Severity 5	against E01	Monitor Services
30790	Severity 2	against E01	Software Checks
30793	Severity 5	against E00	CP-V in general
30794	Severity 2	against E00	Symbionts
30795	Severity 1	against E00	System Management
30798	Severity 2	against E00	Utility Processors
30810	Severity 3	against E01	Utility Processors
30812	Severity 5	against E00	Utility Processors
30823	Severity 2	against E01	Utility Processors

30833	Severity 3	against E01 System Management
30841	Severity 2	against E01 Reliability
30842	Severity 2	against E01 Utility Processors
30844	Severity 2	against E01 Utility Processors
30846	Severity 3	against E01 File Maintenance
30848	Severity 3	against E00 File Maintenance
30858	Severity 3	against E01 File Maintenance
30863	Severity 2	against E01 DEBUG tools
30870	Severity 3	against E00 File Maintenance
30871	Severity 2	against E00 File Maintenance
30874	Severity 3	against E00 Symbionts
30875	Severity 5	against E00 Software Checks
30893	Severity 5	against E01 Initialization
30894	Severity 5	against E01 Operator Communications
30895	Severity 5	against E01 CP-V in general
30896	Severity 5	against E00 CP-V in general
30897	Severity 2	against E01 File Management
30899	Severity 2	against E01 Recovery
30901	Severity 2	against E01 Operator Communications
30904	Severity 5	against E01 Initialization
30905	Severity 4	against E00 CP-V in general
30906	Severity 2	against E01 Job Processors
30908	Severity 5	against E01 System Management
30942	Severity 2	against E00 File Management
30949	Severity 5	against E01 SYSGEN
30967	Severity 3	against E00 Communications
30971	Severity 2	against E01 Reliability
30977	Severity 2	against E01 Utility Processors
30979	Severity 3	against E00 Communications
30982	Severity 3	against E01 SYSGEN
30985	Severity 5	against E01 Loaders
30991	Severity 2	against E01 File Maintenance
30992	Severity 2	against E01 File Maintenance
30993	Severity 2	against E01 Software Checks
31007	Severity 3	against E01 Operator Communications
31010	Severity 2	against E01 Monitor Services
31023	Severity 3	against E01 File Management
31037	Severity 3	against E01 Reliability
31044	Severity 2	against E01 File Management
31089	Severity 4	against E00 Operator Communications
31105	Severity 2	against E01 Communications
31110	Severity 3	against E01 TP
31111	Severity 3	against E01 TP
31112	Severity 3	against E01 TP
31116	Severity 3	against E01 CP-V in general
31119	Severity 5	against E01 System Management
31128	Severity 2	against E01 Utility Processors
31133	Severity 3	against E01 Loaders
31134	Severity 5	against E01 CP-V in general
31136	Severity 5	against E01 Miscellaneous
31137	Severity 2	against E01 System Management
31139	Severity 5	against E01 File Maintenance

31140	Severity 5	against E01 File Maintenance
31141	Severity 2	against E01 Utility Processors
31148	Severity 2	against E01 Loaders
31156	Severity 2	against E01 File Management
31170	Severity 2	against E01 File Maintenance
31177	Severity 5	against E01 Recovery
31179	Severity 3	against E01 File Management
31191	Severity 5	against E01 File Maintenance
31194	Severity 2	against E01 File Management
31202	Severity 3	against E01 Utility Processors
31215	Severity 2	against E01 Utility Processors
31227	Severity 3	against E01 Utility Processors
31239	Severity 3	against E01 Utility Processors
31243	Severity 4	against E00 Utility Processors
31245	Severity 4	against E00 Loaders
31254	Severity 3	against E01 File Management
31263	Severity 2	against E01 Software Checks
31265	Severity 2	against E00 Loaders
31277	Severity 2	against E01 CP-V in general
31280	Severity 5	against E01 File Maintenance
31284	Severity 2	against F00 File Management
31289	Severity 5	against F00 System Management
31299	Severity 2	against E01 CP-V in general
31313	Severity 3	against E01 CP-V in general
31316	Severity 3	against E01 File Management
31325	Severity 3	against E01 System Management
31326	Severity 3	against E01 Job Processors
31327	Severity 3	against E01 Job Processors
31328	Severity 3	against E01 Communications
31340	Severity 2	against E01 Miscellaneous
31354	Severity 5	against E01 Operator Communications
31355	Severity 3	against E01 Accounting/Performance
31356	Severity 2	against E01 CP-V in general
31362	Severity 3	against E00 File Maintenance
31364	Severity 2	against E01 File Management
31390	Severity 3	against E01 CP-V in general
31416	Severity 2	against E01 Software Checks
31428	Severity 2	against E01 System Management
31438	Severity 2	against E01 Recovery
31457	Severity 3	against E01 File Management
31462	Severity 3	against E01 Monitor Services
31470	Severity 3	against E01 Accounting/Performance
31516	Severity 2	against E01 TP
31518	Severity 3	against E00 SYSGEN
31582	Severity 3	against E01 Utility Processors
31588	Severity 3	against E01 File Management
31601	Severity 2	against E01 CP-V in general
31603	Severity 3	against E01 Utility Processors
31605	Severity 4	against F00 CP-V in general
31671	Severity 2	against E01 Utility Processors
31673	Severity 3	against E01 Utility Processors
31691	Severity 2	against E01 Reliability

31707	Severity 3	against E01 Utility Processors
31710	Severity 3	against E01 Utility Processors
31712	Severity 3	against E01 Utility Processors
31720	Severity 3	against E01 Utility Processors
31740	Severity 2	against E01 Utility Processors
31750	Severity 2	against E01 Communications
31769	Severity 3	against E01 File Maintenance

4.0 RELEASE CONTENTS

4.1 F00 RELEASE TAPES - 707000-26/46/66

Three single volume FSAVE tape sets contain all the input necessary to generate a CP-V F00 system. These tapes contain the following accounts which will be described separately.

FSAVE tape SN#00F0 contains the following accounts:

:FOOBO	Relocatable binary
CPVPROC	Standard processor load modules

FSAVE tape SN#00F1 contains the following accounts:

:FOOCI	Compressed source
:SYSRT	Real Time Library
CDBGLIB	COBOL Debug Library
COBLIB	COBOL Library
RPGLIB	RPG Library
SORTLIB	SORT Library

FSAVE tape SN#00F2 contains the X account. The X account consists of non-supported utility programs.

4.1.1 :FOOBO

Binary files for all CP-V modules. In addition, all load modules and control files needed to perform an F00 SYSGEN are included. The files whose names begin with '\$\$' are load modules used during SYSGEN. Files whose names begin with '\$' are control files used during SYSGEN. All CP-V assembly SYSTEMS (BPM, RTPROCS, etc.) are included here in compressed format. Also included on the F00 release binary tape are the modules MPC9210 and MPC9310 - the firmware for the MPC disks and MPC tapes.

DATADef is included in :FOOBO for assembling the module PART in the CONTROL processor. This is not a standard CP-V release element and no development support of DATADef is implied.

4.1.2 CPVPROC

FILE NAME	VERSION	DESCRIPTION
\$:STDDEF		Standard DEF file for AP
‡:STDMET		Standard DEF file for META
:BLIB	G08	Non-shared library for LINK
:LIB	G08	Non-shared library for LYNX or LOAD
:PO	G08	Shared FDP library - REF'S/DEF'S
:POO	G08	Shared FDP library - Code
:P1	G08	Shared library - REF'S/DEF'S
:P11	G08	Shared library - Code
:P4	G08	Shared real-Time library - REF'S/DEF'S
:P44	G08	Shared Real-Time library - Code
ANSFORT	B08	ANSI FORTRAN Compiler
AP	C01	AP Assembler
APL	D05	APL Processor
APLTRMSB	D05	Translate table for APL
BASIC	D03	BASIC Processor
CDD6	A01	OLTEST ROM (Note 2)
COBOL	F03	COBOL Compiler
CRPD	A01	OLTEST RCM (Note 2)
EASY	B02	EASY Subsystem
ERRNOTES	C00	RPG (Note 1)
FLAG	D00	FORTTRAN Compiler (Note 1)
FORT	F02	Extended FORTRAN Compiler (Note 3)
JIT		
FORTLIB	A01	System FORTLIB
MERGE	F03	MERGE Processor
METASYM	H01	METASYMBOL Assembler
MPCD	A00	OLTEST RCM (Note 2)
MSMT	A04	OLTEST ROM (Note 2)
NSLP	A03	OLTEST ROM (Note 2)
OLMON	A02	OLTEST ROM (Note 2)
RDC6	A01	OLTEST ROM (Note 2)
RMC6	A01	OLTEST ROM (Note 2)
RMP6	A02	OLTEST ROM (Note 2)
RPG	C00	RPG Processor (Note 1)
SILP	A01	OLTEST ROM (Note 2)
SIML		1400 Simulator (Note 1)
SIMT	A01	OLTEST ROM (Note 2)
SORT	F03	SORT
TAPECVT		SIML Tape Converter
TEXT	XC0	TEXT (Note 1)

1. These processor file names were excluded from the \$DEFJOB file and should be added to the :INCLUDE cards if desired on the PO tape.

2. These ROM's are used to load the program OLTEST for CP-V on-line Diagnostic Programming System (on-line DPS). For further information refer of document number 705497-11A02.

3. In past versions of CP-V this ROM was included for sites that did not want to include password scrambling. This copy of JIT has the ADEF SEED = 0, i.e., password scrambling is disabled. If a site wants password scrambling disabled in F00, follow the procedure in Step 9, Sec. 5.4. This ROM is included only for those sites which for some reason can not follow the new procedure. The SEED specified in F00 is the same as the value for E01 and E00; if password scrambling is currently in use, no change is required unless SEED was changed from its previous value.

4.1.3 :FOOCI

Compressed files for all CP-V modules. DATADEF is included in :FOOCI for assembling module PART in the CONTROL processor. It is not a Standard CP-V release element and no development support of DATADEF is implied. SUM is a compressed ANSFORT source file.

4.1.4 :SYSRT

Account :SYSRT contains the following files which make up the Real-Time library:

:BLIB	:LIB
-------	------

4.1.5 CDBGLIB

Account CDBGLIB contains the following files which make up the COBOL DEBUG library:

:LIB	BLIB:	C:DBGR
------	-------	--------

4.1.6 COBLIB

Account COBLIB contains the following files which make up the COBOL library:

:LIB	BLIB:	S:SRT
------	-------	-------

VIP	These ROMS supply the user with Fortran-callable routines that give the user cursor control on Honeywell VIP 7200 terminals.
FUTILITY	A file maintenance utility similiar to ELIXER. Special capabilities include CLOSE with Rename/Attribute abilities and the ability to examine keyed files (with KEYM not 3) in hex.
LIBXREF	A program which examines library load modules or ROM libraries and prints a cross-reference listing of the REF's and DEF's.
MOD	A program to modify files using M:CLOSE with RENAME feature, accepting commands in a PCL-like format.
9\$CSEINFO	This file tells how to use 9\$CSE9CI which will allow a large Sigma 9 mono-processor with core memory to handle intermittent parity errors. It narrows core errors down to the affected user and logs only that user off. If the affected user is RBBAT, ALLOCAT, or KEYIN, a crash results. A monitor I/O parity error results in a crash. It presents a readable message on the operator's console which will show failing bits and LMS status words, depending on the severity of the problem. This file is not affected by JOBMNSTK.X and not compatible with DUMP.X.
DMPQ	This program will 'spill' the symbiont queue to a labeled tape (or tapes).
RESQ	This program will 'fill' tapes produced by DMPQ back into the symbiont queue.
DUMP	This is a stand-alone program to perform a console dump after a CSE stop. It is intended to be booted from cards or from a tape.

4.2 707000-11 Program Description

This document contains a description of the new features of CP-V F00, a list of SIDR's closed, SYSGEN procedures, release contents, etc.

4.3 707000-76 Quality Assurance and Control Test Tape

The QUAC Test Tape contains the CP-V F00 Test Case Library. Section 10.0 of this document describes the test procedures. The QUAC Test Tape is an FSAVE tape with an INSN=00A0 and several accounts including C7308398, C7308399, CONTROL, and :TSS.

4.4 707000-56 Compressed Listing Tape

The compressed listing tapes contain listings of all supported modules of CP-V; the tapes, which represent the contents of the :FOOLO account, also contain the CP-V F00 technical documentation. There are four single volume tapes in the set, all created under PCL; three contain the listings and the fourth contains the technical documentation.

The contents of the first three tapes are:

SN/ACCOUNT	CONTENTS
F0L0.:FOOLO	Files APPL to FRGD
F0L1.:FOOLO	Files FSAVE to RDF
F0L2.:FOOLO	Files RDL to 7TAP

The fourth tape is SN#F0L3, account :FOOLO. This tape contains a group of files used to produce the technical documentation that is also released on the microfiche. These files are made available to the user to produce documentation tailored to his needs. Included are the EXTRACT load module, its compressed source and the complete CP-V F00 comment data base. See Appendix A for instructions on the use of EXTRACT:

\$\$EXTRACT	The documentation program load module.
\$\$EXTRACTCI	Compressed source for EXTRACT
\$\$DB	The complete F00 data base for EXTRACT as taken from :FOOLO.

Also included is a series of control files which can be used with EXTRACT to produce reports of special interest. These reports are included on the microfiche but not on the listing tapes.

\$CCI	All CCI modules
\$CENTSYS	Central system modules
\$DEBUG	Debug modules
\$DISKFM	File management modules
\$FILEMAINT	FILL,FSAVE,FRES
\$HANDLER	Handler modules
\$INITREC	Initialization and recovery modules
\$LOADER	Loader modules
\$PCL	PCL modules
\$REMOTE	Remote processing modules
\$SYMCOOP	Symbionts and cooperative modules
\$TAPEFM	Tape file management.

4.5 707000-59 Microfiche

This element consists of the listings of all CP-V modules as well as technical documentation produced from the listing commentary by the EXTRACT processor.

A cross-reference listing (XREF) of all REF's and DEF's in the monitor is also included on the microfiche.

The CP-V F00 microfiche is not included in the standard release contents. It may be ordered separately from Honeywell Publications Services in Brighton, Massachusetts, referencing Honeywell order number XU21.

4.6 707000-86 Starter PO Tape

This is a bootable PO tape for sites without CP-V currently running. This system is a minimal system and is designed to do an initial SYSGEN only. See Section 5.4 of this document for further explanation.

5.0 SYSGEN CONSIDERATIONS

5.1 Introduction

This section describes changes to the SYSGEN processors for F00 and the step by step procedures to follow to build an F00 system.

5.2 PASS2 Changes

5.2.1 MPC Tape Changes

The PASS2 command to include MPC tapes in a system is the :DEVICE command.

Model numbers for MPC tape devices are 9313 and 9314. The controller is a 9310. Default values supplied by PASS2 for MPC tapes are:

```
T  TAPE
DD DUAL DENSITY
R  READ REVERSE
IO  INPUT and OUTPUT
```

5.2.2 Other MPC Changes

The :HANDLERS2 command is no longer a PASS2 requirement for sites with an MPC, either tape or disk.

The unit address of an MPC device cannot be 0 (zero).

5.2.3 SYSGENing tape devices

Two precautions must be observed when defining (via :DEVICE commands) the tape device configuration for a target system.

First: if the target system is to include tape drives with differing physical characteristics (e.g., NS and MPC tape drives), each type of physical device must be defined as a separate resource. Disobeying this restriction (e.g., by defining both MPC and NS tape drives as '9T' drives) can cause the device handlers to attempt to perform unimplemented functions on some of the drives.

Second: the tape drives that are to be considered the default tape resource must be the first units defined.

5.2.4 Level 6 Front End

The :COC command has a new option to accommodate Level 6 code. The option is:

L6 Specifies that the preceding COC keyword and all subsequent options pertain to a Level 6 Front End Processor. Only two L6 options may be specified.

One additional double word has been added to the M:COC load module for non-L6 systems. For L6 systems, 16 additional words will be generated for each L6 specified.

5.2.5 Other

To provide working space for the deferred I/O feature, three new DCT tables have been added; these increase the size of each device's DCT table entry by one halfword plus two bytes.

5.3 PASS3 Changes

The Loader has been changed to flag as zero severity DOUBLE DEFs any DEFs in a ROM that are also in a library associated with the load module. This change will result in the appearance of several doubly-defined symbol diagnostics in system programs loaded with :MONSTK (RBBAT, for example) that did not appear in previous systems. This is not cause for concern.

5.4 How to SYSGEN CP-V F00

CP-V F00 may be generated under any currently supported CP-V system. If a 64K system does not have enough core available, the F00 starter system may be used as the host for doing the SYSGEN. The starter system will run on any standard CP-V configuration that contains Xerox disk systems (3275, 7240, 7270, or 7275 disk systems). All of the F00 processors required to do a SYSGEN are in the :F00B0 account and will be executed from there; processors in the :SYS account of the running system need not be replaced. Note: the F00 starter system has limited capabilities and is not recommended as a "model" system.

All of the control files needed to perform a SYSGEN are included in the :FOOBO account with names beginning with "\$". Files whose names begin with "\$\$" are load modules used during the SYSGEN. A PCL range copy may be used to obtain listings of all job control files and sample PASS2 command files, e.g.,

COPYALL DC.:FOOBO/\$A,\$9 TO LP(K)

The control files in :FOOBO are:

\$SUPERJOB	Job that authorizes the :FOOSGEN,CPV account for running the SYSGEN jobs.
\$LOCCTS	Job that builds the F00 LOCCT tables for SYSGEN PASS2.
\$INSERT	EDIT XEQ file to be used when doing a SYSGEN on a system which does not have communication equipment for timesharing.
\$PATCH	Pre-release F00 patch file. It is superseded by the F00 patch files on SST tapes.
\$P2BIG9	PASS2 job for a Sigma 9 with a 7212 rad swapper and 512K MOS memory.
\$P2DUALBIG9	PASS2 job for a dual Sigma 9 with 7212 Rad swapper and 512K MOS memory.
\$P2DUAL560	PASS2 job for a large dual 560 multi-processing system with dual access MPC disks, and remote processing.
\$P2DUAL7	PASS2 job for a dual Sigma 7 with MPC tapes and MPC disks. It also has Real-Time.
\$P2MINI	The PASS2 job which was used to create the F00 starter PO tape.
\$P2NOCOC	PASS2 and LOCCT job for a Sigma 5 system that does not have timesharing (COC) capability.
\$P2SIG5PAK	PASS2 job for Sigma 5 with a 7270 pack swapper, MPC disk drives, and real-time.
\$P2SIG5RAD	PASS2 job for Sigme 5 with a 7232 RAD swapper, MPC disk drives, and real-time.
\$P2SIG9RAD	PASS2 job for a Sigma 9 with a 7212 Rad swapper.

\$GENJOB1 Job that copies required files into the SYSGEN account, performs initial PASS3 (loads), and batches \$GENJOB2.

\$GENJOB2 Jobs that performs the remaining PASS3s and create the sorted symbol table for the analyze processor.

\$DEFJOB Job that writes two PO tapes.

\$XREFJOB Optional job that produces a cross-reference of the M:MON load module. Use requires that the X account be restored.

\$GHOSTSI Control file for running STATS as a ghost.

\$ALISTFILE F00 control file used to BATCH assemblies with METAFUM.

\$ERRTEXT F00 file of error message text records.

Additionally, the :FOOBC account includes the following special files:

MPC9210/MPC9310 The MPC9210 and MPC9310 files contain firmware for the MPC's in the CP-V library load module format for direct use in the M:MON PASS2. These files are the default firmware selected when \$GENJOB1 is executed. Both files are from Rev. AJ of the Firmware Tape that is distributed with each MPC controller.

MPC9210 firmware was built by the FIRMLDR program from the XER1,REV. B1 (02/28/78), segment of the MSP450AA1-0A firmware.

MPC9310 firmware was built by the FIRMLDR program from the M601, Rev. G1 (02/16/78), segment of the MTP601AA1-0A firmware.

DEVDMF

DEVDMF is a stand alone program that will make a device copy of any Xerox RAD, Xerox disk pack, or MPC disk on magnetic tape. Read section 1.2.4, as there are new Sense Switch options. A description of DEVDMF is in the CP-V Operations Reference Manual 901675. To make a bootable copy use the following commands:

```
{online}      !SET F:BOOT FT#BOOT-9T
              !RUN DEVDMF.:FOOBO,MPC9310.:FOOBO
```

or

```
{batch}      !SET F:BOOT FT#BOOT-9T
              !LYNX DEVDMF.:FOOBO,MPC9310.:FOOBO
              !RUN
```

Perform the following steps to do an F00 SYSGEN.

Step 1. - (optional) The F00 starter tape has the following device addresses assigned:

NAME	ADDRESS	MODEL
TY	A01	7012
LP	A02	7441
LP	A06	3465 (NS or 7446)
CR	A03	7122
9T	B80	7323 (Wang)
9T	B90	7323 (Wang)
XT	DF1	7333 (Potter)
XT	DF2	7333 (Potter)
ZT	AC0	3345 (NS)
ZT	AC1	3345 (NS)
BT	BE1	9314 (MPC)
BT	BE2	9314 (MPC)
DP	ACE	9210 (MPC)
DP	ACF	9210 (MPC)
DP	AEO	7271
DP	AE1	7271
ME	A05	7611

Prior to booting the starter PO tape prepare the :TYPE cards which will change the configuration to the appropriate addresses. It is recommended

that :TYPE cards be used for each device type available and that the complete starter system configuration be defined without using the :SAVE command.

Example 1 - Reconfiguration Deck for Starter Tape on a 560:

```
:TYPE TY7012,A01
:TYPE LP3465,A02
:TYPE CR7140,A03
:TYPE 9T3345,A80,A81
:TYPE DP7271,EFO,EF1
:TYPE ME7611,A05
:END
*
!EOD
```

Note that the :TYPE card for the disk devices specifies 7271, even though the device is actually a 3275. This is because the system was SYSGENed for 7271 disk devices. Special code enables a 7271 pack swapper system to boot on any kind of disk drive. In this system it is normal for the message "HGP TRUNCATED - TOO BIG FOR ALLOCATION DATA" to be typed on the operator's console during system initialization.

. Boot the starter PO tape, keying in 'IPFTC' on request. Do not use XDELTA.

Change the address of the swapper, card reader, and printer (if necessary):

```
C/LL/DC ASSIGN OK (YES/NO)  NO
CRA03 = CRndd
LPA02 = LPndd
DPAE0 = DPndd
```

Step 2 - From the operator's console, initiate FRES as a ghost job (!GJOB FRES) and enter the following commands:

```
+VOL
OCFO
+SELECT
:FOOBO
CPVPROC
+END
```

This will restore all files necessary to perform the target SYSGEN.

Keyin !ONB 1 at the operator's console.

- Step 3 - LOGON under :SYS,LBE and BATCH the \$SUPERJOB.:FOOBC This will create the :FOOSGEN,CPV account. The target SYSGEN will be performed in this account.
- Step 4 - If there are to be no MPC's in the target system remove the following from \$GENJOB1.:FOOBO (lines 9 and 10)
- ```
COPY MPC9210.:FOOBO OVER MPC9210 (copies in
 disk firmware)

COPY MPC9310.:FOOBO OVER MPC9310 (copies in
 disk firmware)
```
- If there is one MPC in the target system, remove just the appropriate COPY command.
- Step 5 - LOGON to account :FOOSGEN,CPV and BATCH \$LOCCTS.:FOOBO. This job will create all the needed LOCCT's in account :FOOSGEN. The LOCCT for SUMMARY specifies UNSAT(CPVPROC); if that account is not restored, the LOCCT must be modified to point to the account which contains the copy of :LIB.
- Step 6 - In account :FOOSGEN, copy the PASS2 control file from :FOOBO which most closely matches your installation. Use EDIT to modify the file to match the installation. Either BATCH the job or run it on-line. Verify the results.
- Check the output from the PASS2 jobs for any fatal diagnostics or unexpected warnings.
- Step 7 - In account :FOOSGEN, BATCH \$GENJOB1.:FOOBO. This GENJOB will terminate by batching a subsequent GENJOB. Verify all the GENJOB output.

## Items to watch for:

- o The end of the monitor root (which is mapped one to one) must be below the beginning of the monitor overlays (X'8000'), and the top of the unmapped monitor root must lie below the monitor JIT. Examine the M:MON map produced by PASS3 - the symbol SUSPTERM must have a value of X'7FFF' or less, and the symbol TOPROOT must have a value of X'8BFF' or less.
- o Each monitor overlay (with the exception of UMOV, MPC9210, and MPC9310) must be less than 3K in size - the ending value for the overlay must lie at or below X'8BFF'.
- o There will be one severity 4 error in TPG due to 5 doubly defined symbols.
- o There will be 11 PREFs in MOOSE on mono-processor systems.
- o There will be 3 PREFs in RBBAT on non-remote-processing systems.
- o There will be 1 PREF in GHOST1 on systems not SYSGENed for MOS memory.

Step 8 - At this point, the :FOOSGEN account will contain everything necessary to generate a CP-V F00 PO tape. If other processors are desired on the PO tape by installations, they should be added to the \$DEFJOB INCLUDE list and !ASSIGN F:INCLUDE account list prior to DEFing the tape. (Note: All pre-B00 loaded processors and user programs must be reloaded before they will execute under the F00 version of CP-V).

Step 9 - If the installation desires the patch deck to be included on the PO tape, restore the F00 patch file from the most recent SST tape to the :FOOSGEN account. EDIT the file \$DEFJOB to include an ASSIGN command at lines 4.5 and 19.5:

```
!ASSIGN M:PATCH,(FILE,filename)
```

In account :FOOSGEN, BATCH \$DEFJOB.:FOOBO. This will create two PO tapes with serial number CPF0.

The mechanism for setting the ADEF SEED=0 has been modified. If the site desires to have ADEF SEED=0 then the following GENMD's must be added to the site's patch deck:

```
GENMD CCI
:GENMD SCRSEED,0.
GENMD LOGON
:GENMD SCRSEED,0.
GENMD SUPER
:GENMD SCRSEED,0.
GENMD TEL
:GENMD SCRSEED,0.
```

\$DEFJOB uses 9T as the resource type for the PO tape. If the site does not have 9T's, use EDIT to change lines 2, 4, 17, and 19.

Step 10 - After booting the new CP-V PO tape, restore the library accounts from FSAVE Tape 00F1. Also restore account X from 00F2. See Section 4 for the libraries supplied with the system.

## 5.5 How to do a SYSGEN on a COC-less System

EDIT, BATCH, and FRES are to be run as ghost jobs from the operator's console.

Step 1 - See Step 1, Section 5.4 for instructions on booting the starter PO tape. In addition, if the starter tape is used add a reconfiguration command to partition out the COC (i.e., :REMOVE A05).

Step 2 - Same as Step 2, Section 5.4.

Step 3 a) BATCH \$\$SUPERJOB.:FOOBO. This will create the :FOOSGEN account.

b) !GJOB EDIT. Enter the command "XEQ \$INSERT.:FOOBO". This will insert the proper account number, name, and priority fields into the !JOB commands in the files to be executed in the following steps.

Step 4 - Same as Step 4, Section 5.4.

Step 5 - BATCH \$LOCCTS.:FOOBO. Note Step 5, Section 5.4

Step 6 - Select the PASS2 control job \$P2NOCOC.:FOOBO and, using EDIT, modify it to match the installation desired. Modify the !JOB command so that the job will run in the appropriate SYSGEN account (i.e., :FOOSGEN,CPV). Note that the file contains a modified LOCCT for M:MON, the CP-V monitor. BATCH \$P2NOCOC.:FOOBO and verify the results; check the output from the PASS2 for any fatal diagnostics.

Step 7 - BATCH \$GENJOB1.:FOOBO. Verify all the GENJOB output; also note the error messages in Step 7, Section 5.4.

Note that the symbol COCII will not be found by SYMCON when library :J3 is built.

Step 8 - Same as Step 8, Section 5.4.

Step 9 - BATCH \$DEFJOB.:FOOBO. If the installation desires to include the patch deck on the PO tape or to set ADEF SEED=0 see the instructions in Step 9, Section 5.4.

\$DEFJOB uses 9T as the resource type for the PO tapes. If your site does not have 9T's, use !GJOB EDIT to change lines 2, 4, 17, and 19.

Step 10 - Same as Step 10, Section 5.4.

## 6.0 INCOMPATIBILITIES

Files dumped via Spill/Fill under previous versions of CP-V are not compatible with CP-V F00.

## 7.0 RESTRICTIONS / KNOWN PROBLEMS

The patch file on the release tape contains a patch (for SIDR 31611) which has an undesirable side effect. If this patch file is used, systems SYSGENed for MOS memory will be unable to perform a successful power failure recovery sequence - the system will crash with a Software Check 7E-40 when the Power On interrupt is triggered. The October 1978 Software Support Tape contains a corrected version of the patch for SIDR 31611 that will not cause this problem.

The print-across-the-perforation feature of !LDEV (and M:LDEV) described in section 1.2.16 does not always function properly when the output stream is directed to a remote workstation's line printer. For it to function properly, two !LDEV commands must be issued:

```
!LDEV L1,(DEV,LP),(WSN,wsn)
!LDEV L1,(ASAVE),(LINES,0)
```

The (LINES,0) specification will be ignored if placed on the first !LDEV command, and the default lines-per-page specification for the requested device will be used.

## 8.0 MAINTANENCE PROCEDURES

## 8.1 Patch Deck

In CP-V, corrections to problems are implemented by means of patches. These patches are distributed monthly to field offices on the System Support Tape (SST). The file FOOPATCH contains a current set of F00 patches; each patch contains the SIDR number, patch date, and card sequence number. New patches are also added to the CHRONO-F00 file, which contains all F00 patches (including old versions that may have been superceded) in reverse chronological order. All patches in the FOOPATCH and CHRONO-F00 files have been tested in a production environment. The first F00 patch files are available on the October 1978 SST.

## 8.2 Problem Reporting

Difficulties encountered in CP-V F00 should be reported through the SIDR system. Use of the SIDR system is described in the PAL (Program Availability List) Manual.

The system catalog number for CP-V is 707000. Program catalog numbers to be used in submitting SIDR's should reflect the following functional areas:

| <u>Program<br/>Catalog<br/>Number</u> | <u>Area Name</u>  | <u>Included Functions</u>                                                                                     |
|---------------------------------------|-------------------|---------------------------------------------------------------------------------------------------------------|
| 707001                                | File Maintenance  | BACKUP/FILL, FSAVE/FRES                                                                                       |
| 707002                                | File Management   | All File Management functions for public and private files, ALLOCAT and file inconsistencies.                 |
| 707003                                | System Management | Scheduler, STEP, Memory Management, Swapper, IOQ, device handlers, SEGLOAD, LDLNK, RBBAT, GERM, and Real-Time |
| 707004                                | Communications    | COC and Remote Processing                                                                                     |
| 707005                                | Recovery          | RECOVERY, ANLZ, FIX                                                                                           |
| 707006                                | Software Checks   | All software checks                                                                                           |
| 707007                                | Operator Comm.    | KEYIN'                                                                                                        |



|        |                   |                                                                        |
|--------|-------------------|------------------------------------------------------------------------|
| 707008 | SYSGEN            | PASS2, PASS3, LOCCT, and DEF                                           |
| 707009 | Debug Tools       | DELTA, XDELTA, PMD, snaps and user dump facilities                     |
| 707010 | Loaders           | LOAD and LYNX                                                          |
| 707011 | Symbionts         | Symbionts, streams, cooperatives, and LDEV                             |
| 707012 | Acctg. and Perf.  | SUPER, ACCTSUM, LOGON, RATES, CONTROL, STATS, and SUMMARY              |
| 707013 | Monitor Services  | PROC's and miscellaneous CAL's                                         |
| 707014 | Initialization    | SYSDAK, GHOST1, DRSP, RECONFIG, and SYSCON                             |
| 707015 | Reliability       | ELLA, ERR:FIL, error logging                                           |
| 707016 | Command Proc.     | CCI and TEL                                                            |
| 707017 | Utility Proc.     | PCL, EDIT, DEFCOM, SYMCON, ERRMWR, and online VOLINIT                  |
| 707018 | Miscellaneous     | Error message file, Mailbox, and JIT                                   |
| 707019 | Transaction Proc. | TP Terminal control, TP Queue initialization, management, and recovery |
| 707020 | Front End         | L6G                                                                    |

## 9.0 MONITOR SIZING

## 9.1 General Memory Requirements

The optional features of CP-V F00 are listed below with their resident monitor core requirements.

|      |                                                                                               |                                                                |
|------|-----------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| IRBT | IRBT Support                                                                                  | 3 pages + 1 page {1} per IRBT device                           |
|      | 2780/3780 & IRBT support                                                                      | 4-1/2 pages + 1 page {1} per 7605 device                       |
|      | 7670 & IRBT Support                                                                           | 4-1/2 pages + 1 page {1} per IRBT device                       |
|      | 2780/3780 & 7670 & IRBT support                                                               | 5-3/4 pages + 1 page {1} per IRBT device                       |
|      | 2780/3780 support                                                                             | 2-1/2 pages + 1/2 page (2780) or 1 page (3780) per 7605 device |
| MP   | Multi-Processing Support                                                                      | 1-1/2 pages + 1 page per active slave CPU                      |
| TP   | TP modules                                                                                    | 2-1/2 pages                                                    |
|      | Additional for Message mode lines                                                             | 1-1/2 pages + 1 buffer page {2} per line                       |
|      | Additional for Queue                                                                          | 5 pages {1}                                                    |
|      | Additional for TIC and TPC modules that may be temporarily locked in memory during processing | 2-5 pages                                                      |
| RA   | Read Ahead                                                                                    | 1 page                                                         |
|      | For table size, see RASIZE description of :IMC option.                                        |                                                                |
| RT   | Real-Time modules                                                                             | 1-1/2 pages                                                    |

|       | Additional for<br>RESDF              | # of pages specified during<br>SYSGEN     |
|-------|--------------------------------------|-------------------------------------------|
|       | Additional for<br>DYNRESDF           | # of pages specified during<br>SYSGEN {3} |
| S5SIM | Sigma 5<br>Instruction<br>Simulators | 2 pages                                   |

{1} These pages are subtracted from the maximum possible user size, but not from the available swap space when the line is not logged on. Note that on large-memory systems the maximum user size is not affected by the loss of these pages as it is limited by other factors.

{2} These pages are required only when TP is active.

{3} These pages are subtracted from the maximum user size, but are not actually acquired until they are needed.

## 9.2 Monitor Table Sizes based on SYSGEN parameters

Keyword

|         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| :SPROCS | 9-1/2 words per shared processor entry<br>+ 1/2 word per entry if disk pack swapper<br>+ 1/2 word per entry if (BIG) specified<br>(Maximum 10-12-1/2 words per entry)                                                                                                                                                                                                                                                                                                                                                                                                                  |
| :IMC    | 1 word per physical work page {1}<br>8-1/4 words per user (n+m+p) (MAXOL,n) + (MAXB,m)<br>+ 4-1/3 words per ghost job + (MAXG,p)<br>22 words initially + 3 words per entry (RASIZE,n)<br>+ 1/4 word per entry if (BIG) specified                                                                                                                                                                                                                                                                                                                                                       |
| :COC    | 4 words per buffer (BUFFERS,n)<br>7 words per line (LINES,n)<br>1 word per buffer (RING,n)<br>4 words per ECB (ECB,n)<br>96 words per Translate Table<br>1 byte per COC line (COUPLE)                                                                                                                                                                                                                                                                                                                                                                                                  |
| :MON    | 2 words per entry (ENQ,n)<br>34 words per MPOOL (MPOOL,n)<br>40 words per CPOOL (CPOOL,n)<br>9 words per IOQ (QUEUE,n)<br>19 words per CFU (CFU,n)<br>Patch space (n words) (MPATCH,n)<br>1/4 word per physical page (CORE,n)<br>+ 1/4 word per physical page if (BIG) specified<br>(m-X'62') words (ORG,m)<br>308 words for Sigma 9 traps (SIG9)<br>444 words for X560 traps (X560)<br>45 words for Sigma 7 traps (SIG7) or (SIG6)<br>2 pages for S5SIM (SIG5)<br>1961 words for MINICOC (MINICOC)<br>2718 words for COC (neither (TP) nor (MINICOC))<br>3119 words for TPOC (TP) {1} |
| :INTBL  | 1-1/4 words for every label (label,n,m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| :FRGD   | 12 words per entry (NINT,n)<br>See RT size for RESDF and DYNRESDF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| :SCPU   | 7 words per CPU {2}                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

{1} TP systems only.

{2} MP systems only.

Keyword

:CHAN            2 words per CHANNEL (CIT entry)

:DEVICE          16 words per DEVICE (DCT entry)  
                   + 3-1/2 words per tape device (AVR tables)  
                   + 3-1/2 words per (PRIV) disk pack (AVR tables)  
                   + 8 words per public RAD or pack (HGP tables)  
                   + n words per private pack

                  n = 20 for 7274  
                       20 for 7271  
                       35 for 7275

                  assuming default  
                   logical cylinder sizes

                  + 5 words per RBT device  
                   + 7 words per RAD or disk pack model  
                   + 7 - 74 word CLIST per device

                  PUNCH = 74 words  
                   DP        = 12 words  
                   other = 6-8 words

                  non-standard device-variable

                  + 4 words per non-standard device type

:RES             1/2 word per specified RES  
                   + 6-1/4 words per RES option  
                   + 1/4 word per ((RES option) \* (number of partitions))

:PART            6-3/4 words per partition

:LDEV            3/4 word per entry

:OPL             1-1/4 words per non-standard entry

:SDEVICE        3 words per symbiont device  
                   + (4-1/2 words) \* (MXSTRM value) {1}

{1}            TP systems only.

## 10.0 CP-V F00 TEST PROCEDURES

## 10.1 The Test Tape

The QUAC TEST tape (707000-76F00) is an FSAVE tape, INSN 00A0, containing the F00 test case library in account C7308398 and \$\$\$\$FILL. The test case library consists of job sequences and the files necessary to run them. Test cases are organized in groups which exercise a particular area of the system. These groups are described below.

|            |                                   |
|------------|-----------------------------------|
| 88TPDMS    | TP-DMS Sample Application         |
| 88TPSIM    | TP-Simulator Tests                |
| 88TPTIC    | TP-TIC/Queue Tests                |
| 88TPTPC    | TP-TPC/Queue Tests                |
| 88TPPFM    | TP-Performance tests              |
| 99GROUP1   | General Exerciser                 |
| 99GROUPEB  | Job Step Control                  |
| 99GROUPEE  | Multibatch Scheduler (partitions) |
| 99GROUPEE1 | Multibatch Scheduler (resources)  |
| 99GROUPG   | Swapper                           |
| 99GROUPGA  | LDEV                              |
| 99GROUPIA  | Monitor CAL's                     |
| 99GROUID   | Shared Processors                 |
| 99GROUPJ   | File Management                   |
| 99GROUPJA  | ANS Tapes                         |
| 99GROUPJB  | Private Pack Tests                |
| 99GROUPKA  | BACKUP, FILL, PURGE               |
| 99GROUPLH  | DRSP                              |
| 99GROUPNQ  | ENQUEUE/DEQUEUE                   |
| 99GROUPPA  | CCI                               |
| 99GROUPOP  | SUPER, CONTROL, SHOW              |
| 99GROUPOB  | LOADER                            |
| 99GROUOPMA | SYSCON/RMA                        |
| 99GROUOPRP | Restricted Processors             |
| 99GROUOPRT | Real Time                         |
| 99GROUOPSA | PCL                               |
| 99GROUOPSC | BATCH                             |
| 99GROUOPT  | Language Processors               |

A file 'LIBLIST' on the QUAC TEST tape contains the names and descriptions of the individual tests within each group. The test cases are identified by using the test name as the extended accounting information of the !JOB command. Tests that should abort are designated as such in the 'LIBLIST' file.

Most test cases are self-sufficient and rely on operator intervention only for tape mounting and key-in responses. Where operator intervention is required (as in the TP and RT tests), comprehensive instructions are displayed on the operator's console.

## 10.2 Use of the Test Tape

The following job is used to restore the QUAC TEST tape library, to authorize accounts, and initialize the system controls.

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

Due to the special system control parameters necessary for certain tests, only one group should be run at a time. A group is entered into the batch stream with a

```
!BATCH groupname.C7308398
```

command. For example, to enter the PCL test cases use:

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

Test cases can be run selectively from within groups by using the DUCK program on-line. A description of how to use DUCK is in the file 'DUCKHELP' on the QUAC TEST tape. To run DUCK, copy it from account C7308398 into account :SYS and then !DUCK will start the program on-line.

## 10.3 Updating the Test Tape

Test cases can be added or deleted by editing the relevant 88 or 99 GROUP. See the Time-Sharing Reference Manual (90-09-07) for Edit procedures. A new test tape can be generated by the following commands:

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

Some tests require processors and libraries which are not distributed with the CP-V releases. A list of the processors and libraries included in the F00 release can be found in Section 4. The installation can create a test tape containing all necessary processors by restoring the QUAC tape under its present system and running the following (sample) job:

```
!JOB
!LIMIT (9T,1)
!MESSAGE **USE OUTPUT TAPE #XXXX, RING IN**
!FSAVE
+DUMP
+VOL
OOAC
+SELECT
$$$$FILL
:SYS DICTNARY (required for MANAGE)
:SYS DMSDUMP
:SYS DMSINIT DMS Modules
:SYS DMSLOAD
:SYS EDMSDUMP
:SYS EDMSFDP
:SYS EDMSINIT EDMS Modules
:SYS EDMSLOAD
:SYS EDMSSUMS
:SYS FILEUP (required for MANAGE)
:SYS MANAGE
:SYS REPORT (required for MANAGE)
:SYS RETRIEVE (required for MANAGE)
C7308398
COBLIB
DMSLIB
EDMSLIB
+END
```



## Appendix A

EXTRACT

EXTRACT is a processor designed to produce tech manual type documentation and reports using specially formatted comments embedded in the assembly listings. These special comments are all comment lines with a code letter in column two and asterisks in columns one and three as well as all REF's, DEF's and SREF's that have a non-blank comment field. A \*,\* is used for continuation.

The codes are:

- \*M\*      A one line description of each module.
- \*P\*      A paragraph or two describing in brief the purpose of a module and giving an overview of its operation.
- \*F\*      A brief description of each major function within a module.
- \*D\*      A detailed description of a routine in terms of such things as register usage, input, output, interfaces, etc.
- \*E\*      A description of an error condition at the point where it is called.
- \*S\*      A description of a Screech Code at the point it is called.
- \*O\*      An explanation of some communication with the operator at the point where it is sent.
- \*C\*      A description of what has changed for this version of the operating system.
- \*K\*      A description of some concept or term that is useful in understanding the operation of a module.
- \*X\*      X-type comments are all REF's, DEF's and SREF's.

EXTRACT performs two major tasks; first, it collects all of the special comments from UTILIST compressed files of the assembly listings to form a data base, then it produces reports on the desired modules and codes from this data base.

EXTRACT commands have the form:

COMMAND (OPTION), (OPTION)...

The command may be continued at any point except within a word by ending the command with a semi-colon (;). Anything after the semi-colon will be ignored. The commands may be abbreviated to two letters and are:

EXTRACT create data base from UTILIST compressed files. The legal options are CODES, MODULES, DATA and SOURCE (see option descriptions to follow).

REPORT generate a report from the data base. The legal options are DATA, CODES, MODULES, SORT, ORDER, HEADING, LINES and FORMAT.

DELETE remove specified comments from data base. The smallest unit that can be deleted is all of one type from one module. The legal options are DATA, CODES and MODULES.

ADD add specified comments to an already existing data base. Due to the structure of the data base, it may be more efficient to EXTRACT the comments to be added into a second data base and use PCL to concatenate the two files. The legal options are DATA, CODES, MODULES, and SOURCE.

The options are as follows:

- o (DATA, name, account, password) - specifies the name of the data base. The running account is the default.
- o (CODES, code letter [,code letter]...) or (CODES, GLOSSARY) or (CODES,ALL - specifies which types of special comments are selected for this command. The legal code letters are M,P,F,D,E,S,C,K,O,X. GLOSSARY is used only in selecting codes for the report command and causes all DEF's, M's and K's to be reported. ALL is the default.
- o (MODULES, name or range [,name or range]...) or (MODULES, EXDATA) or (MODULES,ALL) - specifies which modules are selected for this command. A maximum of ten names or ranges may be specified where a name is simply the name of a module and range is two module names separated by a dash (-), e.g., FILE1-FILE4. EXDATA implies that a file EXDATA exists in the running account and it contains a list of the modules to be used. ALL is the default.
- o (SOURCE,account) or (SOURCE,LT# xxxx,account) - gives the labeled tape serial number and account or simply the

account of the UTILIST compressed LO files to be searched for comments.

- o (SORT, sort parameter [,sort parameter]...) - specifies the order for the selected comments to be reported. The four legal sort parameters are:

|        |                                                                                         |
|--------|-----------------------------------------------------------------------------------------|
| CODE   | special comment type                                                                    |
| MODULE | module name                                                                             |
| LINE#  | line number within the module                                                           |
| NAME   | name of the module, routine, screen code or other item being described by the comments. |

The first parameter given is the primary sort key, the second one given is secondary, etc. SORT is required for all report commands.

- o (ORDER, code letter [,code letter]\_) - specified the order in which the requested codes are to be sorted. The default is alphabetical (C,D,E,F,K,M,O,P,S,X) and any codes specified in the CODES option but not in the ORDER option will be ordered alphabetically after all those specified.
- o (HEADING, text1, sort parameter, text2) - gives a heading to appear at the top of each page of output. Text1 is a 1-8 character field that appears at the far left of the heading. The first four characters of the current value of the sort parameter that is requested will appear in columns 10-13 of the heading. Text2 is a 1-80 character field that begins in column 15 and makes up the main body of the heading.
- o (LINES,xxx) - specifies the number of lines per page in the report.
- o (FORMAT, sort parameter [, sort parameter]...) - specifies that a top of form is to be issued when the value of the specified sort parameter changes.

EXAMPLES

● create a data base file named DATA..SAFE containing all comments from all the files in the running account:

```
>EX (DATA, DATA,,SAFE)
```

To create a data base DATA containing selected codes and modules from UTILIST compressed files on labeled tape #LIST:

```
>EX (DATA, DATA), (CODES,M,P,X),(MODULES,;
>FILE1,FILE3-FILE7), (SOURCE, LT#LIST)
```