

Type III Class A Program

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**Control Program-67/Cambridge Monitor System  
(CP-67/CMS) Version 3  
Program Number 360D-05.2.005  
CP-67 Operator's Guide**

CP-67 is a multiaccess system which allows multiple System/360 operating systems to run under it concurrently in a time-shared mode. These operating systems run in the same manner as they do on a dedicated System/360 computer. Some systems that have run under CP-67 are CMS, CMS Batch, OS, DOS, APL\360, RAX, and CP-67.

This publication is intended to present to the operations staff responsible for the operation of CP-67, the facilities and responsibilities of the systems operator and administrator. It is divided into two basic parts: (1) the operator's guide, including instructions for system startup, shutdown, and emergency recovery procedures, and (2) instructions on the utilities included with the system, including device-formatting, allocation, and user definition.

## REFERENCES

The following publications provide additional information on CP-67/CMS:

CP-67/CMS System Description Manual GH20-0802-1

CP-67/CMS User's Guide GH20-0859-0

CP-67 Program Logic Manual GY20-0590-0

CMS Program Logic Manual GY20-0591-0

CP-67/CMS Installation Guide GH20-0857-0

CP-67/CMS Hardware Maintainability Guide GH20-0858-0

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This Type III Program performs functions that may be fundamental to the operation and maintenance of a system.

It has not been subjected to formal test by IBM.

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This edition applies to Version 3, Modification Level 0, of Control Program-67/Cambridge Monitor System (360D-05.2.005) and to all subsequent versions and modifications until otherwise indicated in new editions or Technical Newsletters.

Changes are continually made to the information herein. Therefore, before using this publication, consult the latest System/360 SRL Newsletter (GN20-0360) for the editions that are applicable and current.

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## SYSTEM STARTUP

### INITIATING CP-67

CP-67 and CMS, with the exception of the utilities, are entirely disk-resident systems. Each of the disks may or may not be labeled. If they are to be used for CMS file residence or paging and spooling (temporary use) by CP, they must be labeled with a six-character label in real cylinder 0 track 0 record 3 by using the utility program FORMAT.

The CP system is device-independent and each of the volumes which have CP labels may reside on any 2311, 2301, 2303, or 2314 direct access storage device available and defined to it. The systems residence volume (a 2311 or 2314) must be IPL'ed to bring up the system. All resident volumes should be ready at system startup time, although they can be attached to the system while it is in operation. This can cause inconvenience to the users residing on those volumes, however, and should be avoided if possible. If the IPL device is not recognizable to the CP-67 I/O configuration, the following message is printed on the operator's console:

**\*\* UNDEFINED IPL DEVICE \*\***

The CP-67 sysres volume must be mounted on a defined device address (that is, one defined in the REALIO configuration).

The console switches should be in a normal position for CP-67 operation and not in the stop position. If a cold start is desired, the operator should clear core before IPL'ing.

If a hardware machine check occurs during CP-67 initialization (that is, while the CPINIT module is in control), the following message is printed:

**\*\* MACHINE CHECK DURING CP-67 INITIALIZATION \*\***

The operator of the CP-67 system is defined as the first user to log in to CP-67 with privilege class A; consequently, this unique operator is called the systems operator. There may be any number of users defined with privilege class A, but there is only one systems operator in CP-67.



where the response is

hh.mm.ss

If errors are made in the date and time, the request is reissued. After replying successfully to the SET TIME request, the system replies with

START ((COLD|SHUT)(REQ)):

where the response is

COLD

if a cold start (one with no spool files or accounting information) is desired,

'null'

if a warm start (retrieve saved spool files and accounting) is required, or

SHUT

if no action is to be taken, and spool files and accounting information are preserved on disk for a warm start when the system is re-IPL'ed some time later.

The REQ option specifies that no spooling output will commence until a START command is issued. The spooling readers, punches, and printers are essentially in a drained status. This is useful if the operator wishes to change forms, etc., before printing commences. The users are not aware that output has temporarily ceased (see "Appendix A: Operator Console Functions" for details).

The system responds to a START request with one of the following:

**\*\* WARM START \*\***

for a warm start request;

**\*\* COLD START \*\***

for a cold start request;

**\*\* SYSTEM ACCOUNTING AND SPOOL FILES SAVED \*\***

**\*\* SYSTEM SHUTDOWN COMPLETE \*\***

for a shut request.

After a warm or cold start the system again responds with a message stating the number of current spool files. The message has the same format as the QUERY FILES response.

#### OWNED VOLUMES, CORE, CECYL

The system may alert the operator during initialization time to abnormal system conditions encountered. The system is generated with an expected core size (see CP-67/CMS Installation Guide for details). If that amount of core is not available at IPL time, the operator receives the message

**\*\* xxxxK STORAGE SIZE \*\***

where xxxx is filled in with the actual storage size at IPL. The alarm is also rung. The system will continue with the core available.

If, during IPL time, the system determines that volumes in the DIRECTORY "OWNED" list are not available, the operator receives the message

**\*\* SYSTEM VOLUME xxxxxx NOT MOUNTED \*\***

where xxxxxx is the device VOLID. The alarm is also rung.

Part of CP-67 initialization involves setting up the error-recording control information. If it is determined at IPL time that the error-recording cylinder (CECYL) is full, the message is printed to the operator

**\*\* CECYL FULL; xxx ERRORS NOT RECORDED \*\***

where xxx is either I/O or M/C, depending upon which error recording is suppressed. The alarm is also rung.

At this point the system is ready for normal use. The operator has the responsibility of establishing a "message of the day" to be issued to users at the time they log in, if desired. If not, the operator must enable the communication lines to permit users to enter the system. Also, at this time, the operator may elect to make modifications to some of the operating parameters of the system (for example, the maximum number of users permitted to log in). The use of the SET and ENABLE commands should be reviewed for these functions.

## AUTODUMP and RE-IPL

Unless it is changed by the operator's issuing the SET DUMP command, the dump unit for system failures is automatically selected from available disk spooling space at IPL time. In the event of a system failure, the dump program dumps selected parts of core storage on to the selected disk and then it automatically re-IPL's the CP-67 system. Upon re-IPL, the checkpoint program is first brought in to preserve all accounting information and spool file data on disk. When this is complete, the CP-67 initialization program is started. The operator is automatically logged in, and, since it is a restart after a failure, a warm start is also automatically initiated. The system LOGMSG that may have been set up by the operator is preserved and restored. The decimal clock maintained by the system is updated and system operation continues by allowing the users to re-log in. It is not necessary to reenale the lines, since none of the lines, during dump and re-IPL, have been disturbed. When the system re-IPL's, a special restart message is printed on the 1052 console,

\*\*\*\*\*

CP-67 SYSTEM RESTART IN PROGRESS

\*\*\*\*\*

and the alarm is rung twice. The total elapsed time from system abend to restart in progress is from two to ten seconds, depending upon the amount of core storage dumped.

The fact that the system has failed and restarted should be brought to the attention of the responsible system programmer. The dump that is on disk is accessible to a specific user (see CP-67/CMS Installation Guide for details) to be printed from his virtual machine under regular system operation.

Once the system has been restarted and the operator has logged in, the punch may be started to retrieve the accounting cards. If certain devices were attached to users, they will have to be reattached, at the user's request, after he has logged in.

If the operator sets the dump unit to a printer or tape unit, then system failures will dump to these units. When

the dump is complete, the system re-IPL's to preserve system spooling and accounting information, and then stops. The message appears

**\*\* SYSTEM ACCOUNTING AND SPOOL FILES SAVED \*\***

**\*\* SYSTEM SHUTDOWN COMPLETE \*\***

and the alarm is rung twice. When shutdown is complete after the dump, the operator can re-IPL the system to commence operation. The LOGMSG is preserved, but communication lines have to be reenabled.

If the DSKDUMP program fails during a system abend, whether dumping to disk, tape, or printer, the message is printed,

**\*\* system CHECK \*\* SYSTEM DUMP FAILURE \*\***

where system is PROGRAM, MACHINE or DUMPDISK depending upon the nature of the failure. The system then reIPL's to shutdown the system; no restart is attempted.

If the CHKPT program fails during a system restart, the messages are printed,

**\*\* system CHECK; SYSTEM RECOVERY FAILURE \*\***

**\*\* CLEAR CORE; COLD START \*\***

**\*\* RE-IPL FOR RE-TRY \*\***

where system is PROGRAM, MACHINE or SYSDISK depending upon the nature of the failure. The operator can retry by simply re-IPL'ing the system disk, but in most cases the same error occurs. The only recourse is to clear core and re-IPL. This must be followed by a cold start, since if a warm start is attempted checkpointing is incomplete and can cause further system failures.

System dump and recovery failures of this nature are rare and are usually the result of serious machine malfunctions or a system failure resulting in the destruction of vital information.

#### EMERGENCY CONSOLE

Should the 1052 online console be inoperative, an emergency console can be used to bring up CP-67. To do

this, place the 1052 in a non-ready status, (NON-READY button).

IPL the CP-67 system in the normal fashion. If the 1052 malfunctions (which it now will), CPINIT, the startup module will ring the bell and then enable one 2702 or 2703 line \* so that the operator may log in. The 2702 or 2703 line address must be defined in the RIO module SYSGEN macro. (See CP-67/CMS Installation Guide for the definition of the line address.)

The operator may now establish a link with the computer through a terminal connected to the enabled line. Once the terminal has been identified in the normal procedure, the operator presses the BREAK key. The CP-67 system then proceeds through auto-login.

#### EMERGENCY LOGOUT

If the 1052 console becomes completely inoperative during operations such that the operator cannot even log out, depressing the System 360/Model 67 'external' interrupt button will force a DISCONNECT of the operator and thus allow him to login and RECONNECT on any other terminal that has been previously enabled.

\* Support for non-IBM terminals: Terminals which are equivalent to those explicitly supported may also function satisfactorily. The customer is responsible for establishing equivalency. IBM assumes no responsibility for the impact that any changes to the IBM-supplied products or programs may have on such terminals.

#### SYSTEM OPERATION

The operator's duties while the system is in operation are the following:

- a. Routine handling of spooled input and output
- b. Handling of accounting cards
- c. Attaching and detaching of user and system volumes

#### GENERAL OPERATING PRINCIPLES

The operator of CP is like any other user of the system, but with some important differences:

- a. He is allowed to exercise certain console functions which the normal user cannot.
- b. His terminal normally stays in console function mode and is usually dormant in a mode to receive messages from the system and other users.

In order to type a command into the system, the operator must depress the REQUEST button on the 1052 console. The system responds with the time and a read to the console. Commands may then be entered into the system.

All commands (which are described in full in Appendix A) may be entered in lowercase or uppercase, or a mixture of both. The arguments are generally separated by one or more blanks. All responses from the system are prefixed with the time of stacking for the operator's terminal.

Commands are terminated by the FOB signal (alternate code and 5 pushed simultaneously), while a CANCEL response (alternate code and 0 pushed simultaneously) reestablishes the read function and ignores the line. In addition, two editing features are provided to improve interaction with the operator. The  $\backslash$  key serves as a logical backspace, and the  $\#$  key (the uppercase  $\#$ ) serves as a logical line-delete. Thus,

```
attcksl $\backslash$ attach 183 to jones as 18x $\#$  $\#$  $\#$ 281
```

is functionally equivalent to

```
attach 183 to jones as 281
```

where the  $\backslash$  sign has erased the errors at the beginning of the line and  $\#$  $\#$  $\#$  erased the erroneous three characters 18x. Note here that the  $\backslash$  character and the CANCEL key perform the same logical function.

#### SPOOLED OUTPUT

Output for the printer generated by users is preceded by the time and date of printing and the external userid (eight characters) for which the printing was done. A

message also appears on the operator's terminal describing the output. Output for the punch is preceded by similar information on the first card. Punch output is directed to the second stacker. Cards on which errors are detected during the punching operation are selected to stacker 1 and repunched correctly into stacker 2. All cards in stacker 1 can be considered rejects.

To facilitate separation of punched output, the system pauses between the punch operations for each file and waits for the operator to remove the cards from the punch. It is not necessary to run-out the cards since CP-67 spooling will send a blank card into pocket P1 ensuring that the complete deck is in pocket P2. When the punch is readied, the system continues and punches the next pending file, if any. Smooth operation of the system is accomplished by depressing the punch STOP and START buttons after collecting punched output, and thereby enabling the system to initiate punching when required without operator intervention. Appropriate prompting messages, as well as the regular message describing the output and for whom it is intended, are issued.

#### ABEND OF SPOOLED OUTPUT

If it is desired to terminate a user's spooling output on the printer or punch, the TERM command may be used (see "Appendix A: Operator Console Functions").

#### SPOOLED INPUT

Decks to be read into the system are preceded by a card giving the external user identification for the deck in the reader. The format of the identification card is

Columns 1-10 CP67USERID  
Columns 13-20 userid (left-justified)

or the alternate format of

Columns 1-2 ID  
Columns 10-17 userid

All decks must be separated by a physical end of file and, as such, must be loaded into the reader separately. The system handles multiple card readers. A confirming message is typed on the operator's terminal when card reading commences. If no user identification card precedes the deck, the operator is so notified.

The user does not have to be logged in at the time, but the directory is scanned to confirm that the userid is valid.

#### ACCOUNTING INFORMATION

Accounting cards are punched and selected to the center stacker (pocket RP3) when a user logs out of the system. These should be kept for systems accounting purposes. In the distributed system, one card is punched for each user when he logs out. The information on this card is as follows:

Column	1 - 8	userid
Column	9 -16	Account Number
Column	17-28	Date and Time of Logon mmddyyhhmmss
Column	29-40	Date and Time of Logoff mmddyyhhmmss
Column	41-48	Time used by userid in milliseconds (CPU cycle time in problem state, plus the supervisor time required for userid)
Column	49-80	hex 'F'

#### ACCOUNTING CARDS FOR DEDICATED DEVICES

Accounting cards are also punched and selected to pocket RP3 when a previously dedicated device is released from a user by DETACH or LOGOUT or releasing from DIAL. A dedicated device is any device assigned to a virtual machine for that machine's exclusive use. These include devices dedicated by the ATTACH command, being assigned at login by directory entries, or by a user DIAL'ing a system with virtual 2702 or 2703 lines. The information on this card is as follows:

Column	1 - 8	userid
Column	9 -16	Account number
Column	17 -28	Attached time mmddyyhhmm00
Column	29 -40	Detached time mmddyyhhmmss
Column	41 -48	CP-67 device type in decimal
Column	49 -50	Identifier 'RD'
Column	51 -80	hex 'FF'

Installations which desire to perform additional functions for accounting purposes should modify the following CP modules:

ACCTON for action at logon time

ACNTOFF for action at logoff time

## ATTACHED DEVICES

A user may request the operator (via the MSG command) to attach input/output units (for example, tapes, disk drives, display devices, printer, punch, card reader, communication lines) to him on a dedicated, nonshared basis. When doing this, the user specifies a device address. This is a virtual device address and bears no relation to the actual address of the device to be assigned. Any device in the system can be readdressed when attached to a user by the operator. The operator can also attach a spooling card reader, punch, or printer to a user or change the user's virtual console address. The device is not dedicated and can also have any desired virtual address.

When a user requests an attachment by the operator, it is the operator's duty to determine if there is a device of the appropriate type free to dedicate to the user. If there is, he must mount the requested volume and type the ATTACH command into the system. (See "Appendix A--ATTACH"). The system responds with a confirming message both to the operator and to the user indicating that the device is attached. If the device is not ready or is currently in use by another user, the operator is so notified and he must find another device or wait until the device becomes ready.

The user may detach the unit at any time he wishes before logging out of the system. If he has not detached the device before logging off, the system automatically detaches it when he does. The operator and the user get messages indicating that the device is now free and, if the device is a tape drive, the volume is unloaded.

## I/O ERROR RECORDING

The CP-67 system is capable of detecting errors on most devices being used on the system both for CP-67 usage (paging, spooling) and for user files. These errors are recorded on a special cylinder called CECYL on the system residence volume. The cylinder must be allocated as permanent (see "Allocation") and the cylinder number is specified as part of the SYSGEN procedure. (See CP-67/CMS Installation Guide for details.) During the process of error recording, certain messages appear on the operator's console to alert him to various conditions. If an excessive number of errors occur in a particular device,

the message is printed

```
** IOERROR DEV- xxx; ERR CNT = nnn; SENSE -  
      ssssssssssss STATUS - zzzz; USERID = uuuuuuuu **
```

where xxx is the device address that has the error condition; nnn is a count of the number of errors that have occurred on this device since system IPL; sss are six-sense bytes from the device; zzz is the CSW status bytes for the current error, and uuu is the user for whom the error occurred. The message should be brought to the attention of the local IBM customer engineer for his consideration.

If a nonrecoverable error occurs for CP initiated I/O operations (paging or spooling), the message is printed (in addition to the error message described above)

```
** SYSTEM IOERROR ** USERID = userid
```

where userid is the identification of the user for whom the CP operation failed. In addition, the userid receives the following message:

```
** SYSTEM IOERROR ** CP ENTERED, REQUEST, PLEASE
```

Once these messages have been printed, the system usually abends, since it cannot continue after permanent failures for paging or spooling. The error condition must be brought to the attention of the local IBM customer engineer, since it indicates possible hardware malfunctions on the paging or spooling devices or core storage.

If, in the process of recording an I/O error, the system is unable to complete the recording successfully, the message is printed

```
** IOERROR RECORDING FAILURE ON DEV - xxx **
```

where xxx is the device (system residence) where errors are being recorded. This should be brought to the attention of the local IBM customer engineer and/or the systems programmer, since it indicates serious trouble with the error-recording mechanism.

Only one cylinder may be used to record machine-check and I/O errors. If this cylinder is filled during system operation, the message is printed

```
** CECYL FULL; xxx ERRORS NOT RECORDED **
```

where xxx is either I/O or M/C, depending upon whether I/O or machine-check errors are suppressed.

The local IBM customer engineer should be notified so the error-recording cylinder can be printed and cleared to continue error recording. The system continues to operate, and error messages may also print on the operators console; however, no permanent disk record is made of the error. (See CP-67/CMS Hardware Maintainability Guide for details.)

When the error-recording cylinder is formatted, the message is printed

**\*\* CECYL FORMATTED BY userid; xxx ERROR RECORDING INITIATED \***

where userid is the id of the user who initiated the format and xxx is I/O or M/C, depending upon which is formatted. The alarm is also rung.

This same message (with the operator as the userid) is printed at system initialization time if the first access to the error-recording cylinder indicates that it has not yet been initialized.

If, for some reason, one of the CP-67 owned volumes (used for paging or spooling) becomes nonready, the message is printed

**\*\* SYSTEM DEV - xxx ATTENTION \*\***

where xxx is the device address requiring intervention. This message is immediately followed by

**\*\* REPLY "GO" WHEN AVAILABLE OR "FAIL" IF NOT AVAILABLE \*\***

whereupon a read is issued to the operator's console for a reply. If the operator replies "GO" after readying the device, the system continues normally. If it cannot be fixed and the reply is "FAIL", a permanent system I/O error is assumed, and the messages associated with this condition (as described above) are printed.

#### MACHINE CHECK ERROR RECORDING

The CP-67 system has a mechanism for recording hardware machine checks in a manner similar to I/O errors. The errors are recorded on the same predefined cylinder as the

I/O errors. If a machine check occurs while CP-67 is running a user, the operator receives the message

**\*\* MACHINE CHECK PROBLEM MODE\*\* USERID=userid \*\***

where userid is the name of the user running at the time of the failure. The alarm is rung. The user (userid) receives the message

**\*\* MACHINE CHECK \*\* CP ENTERED, REQUEST, PLEASE \*\***

If the virtual machine PSW is not enabled to receive machine checks, none is presented nor is the machine check held pending. Instead, the user receives the message

**\*\* MACHINE CHECK \*\***

and his virtual machine continues to run.

The machine-check error is recorded on disk, and the system continues to run.

If a machine check occurs while in CP-67 supervisor mode, the operator receives the message

**\*\* MACHINE CHECK CP-67 SUPERVISOR MODE \*\***

The alarm is rung. The error is recorded on disk and the CP-67 system then forces an abend dump to the dump device.

If in the process of recording a CP-67 machine check, and so informing the operator, another machine check occurs, the message is printed on the system console

**\*\* MULTIPLE MACHINE CHECKS \*\* RUN SEREP AND RE-IPL \*\***

and the alarm is also rung. The CP-67 system then goes into a hard wait with X'FFFFFF' in the address register.

## SYSTEM SHUTDOWN

The system shuts down in one of two ways:

- a. An abnormal termination where the system may elect to dump; or
- b. An operator-initiated shutdown.

The normal system shutdown is initiated by entering the command

shutdown

from the operator's terminal.

The SHUTDOWN command has immediate effect. No messages are sent to any users, and no attempt is made at any draining of I/O activity. The SHUTDOWN command essentially causes a programmed re-IPL of the system. This brings in the CHKPT program that saves all accounting information, the OGMSG, and all spool file data. Upon completion of the CHKPT program, the message is printed

\*\* SYSTEM ACCOUNTING AND SPOOL FILES SAVED \*\*

\*\* SYSTEM SHUTDOWN COMPLETE \*\*

and the alarm is also rung.

The CP-67 system can now be restarted, using warm start, at a later time. The system directory and the CP-67 nucleus can be rewritten if wanted and it will not disturb the saved data for a warm start.

Note that the operator has the additional facility of forcing a logoff of any user in the system. This is performed by use of the KILL console function (see "Appendix A").

## UTILITY OPERATION

Five stand-alone utilities are distributed with CP-67:

BUZZARD	To preserve spooling and accounting information for warm start.
DIRECT	To create user directory and allocate DASD space.
FORMAT	To format direct-access volumes for CP file residence.
SAVESYS	To save the nucleus of a system for IPLing by name.
VDUMP	To print a dump of a system crash from a spooled file after an automatic re-IPL of the system.

A self-loading relocating loader must be used to load BUZZARD, DIRECT, FORMAT, and SAVESYS. After the card load is complete, the programs go into wait state with all channels unmasked, and the request key on the operator's console should be pushed so that it may be identified.

Note: The default value for the operator's console is assembled as X'0009'; if the installation has that address, the console request key does not have to be pushed.

### BUZZARD

The BUZZARD utility has three functions:

- a. It saves accounting records on disk after abnormal system failure. The records are in the format described under "Accounting Information". These cards are punched during normal system operation if the system is warm-started at a later time.
- b. It preserves the system LOGMSG which may have been set up by the operator.
- c. It saves DASD pointers for all files for the virtual readers, printers, and punches. User printer or punch spooling functions (virtual devices) in operation (that is, not closed) at the time of system termination are not saved. User's active reader files are saved. Pending user-spooled

input and output and any currently active real printer or punch output is saved. Real reader operations proceeding at the time of termination are not saved and must be restarted. This information is saved on the CP-67 system residence volume. At system IPL time, if the warm start option is chosen, this information is used to create the necessary in-core blocks and restart the spooled output.

Note: For warm start the spooling disks have to be mounted on the same devices used when the BUZZARD utility was run. BUZZARD performs the same function as the CHKPT program performs in the CP-67 IPL sequence. Therefore, BUZZARD should only be run if a hardware malfunction does not permit automatic re-IPL of the system disk following an abnormal system termination. However, the system disk must be accessible for writing if the spooled file pointers and accounting records are to be preserved by BUZZARD. The system disk may be moved to another physical disk drive (2314) so long as the physical address of the disk is not changed.

## DIRECT

The DIRECT utility is used to write the allocation tables on each of the volumes designated as CP-owned, and to write the user directory on the CP system residence disk. The format of the data cards required is described under "Directory Allocation and Creation."

The format of the DIRECT load deck is as follows:

```
Loader
DIRECT
'LDT' card (12-2-9 punch in column 1;
           'LDT' in columns 2-4)
Allocate and Directory deck
```

After the load deck is IPL'ed from the 2540 card reader, and the console is identified, DIRECT asks for the input device address

ENTER INPUT DEVICE ADDRESS - CCU:

where the response is three hexadecimal characters giving the unit address of the appropriate reader. The specified unit must be ready.

Note that the Directory program can be run in a virtual

machine if the user has read/write privileges to the system disk set up in the directory beforehand. The Directory can be loaded and run by CMS after making the ALLOCATE and/or DIRECTORY deck available to the user through his virtual card reader.

## FORMAT

The FORMAT utility is used to initialize direct-access volumes for paging, spooling, and CP file residence.

After the operator's console has been identified, it types

CP/67 DASD FORMAT PROGRAM

Then it requests the type of device being formatted by typing

DEVICE TYPE

where the response may be four digits indicating the type of device (that is, 2301, 2303, 2311, 2314) and an optional fifth character p which causes only partial formatting to take place (that is, 2314P).

If the device type is recognized, the system requests the unit address

DASD ADDRESS =

where the response is the channel and unit address as three hexadecimal digits (for example, 100, 1C0, 230, A30, 9C0).

If the device is ready, the system asks for the new label to be written by typing

VOLUME LABEL =

where the response is six characters (uppercase or lowercase) written on the label record of the volume.

If p was specified when indicating device type, the system now asks the operator to define the area to be formatted by typing

START CYL.(HEX) =

where the response is null for cylinder 0, "10" if only the label is to be written, or two hexadecimal digits specifying the starting cylinder. The system then requests the ending cylinder by typing

END CYL.(HEX) =

where the response is null for the entire volume (whose actual value differs with the device type) or two hexadecimal digits for a specific cylinder.

The system indicates that the format operation has commenced when its data is complete. At termination, the program will so indicate and may be restarted by pushing REQUEST.

SAVESYS

The SAVESYS utility is used to save the nucleus of a system which is normally used under CP (such as CMS). This nucleus is saved on a disk in pageable form and allows the user to IPL that system by name, for example,

IPL CMS

in CP console function mode.

The SAVESYS utility accepts a control card with the format

SAVE VOLID=cccccc,UNIT=ccc,FP=nn,LP=mm,CYL=ppp,DISK=tttt

where:

SAVE begins in column 1;

VOLID begins in column 6;

cccccc is the volume label of the receiving DASD volume;

ccu is the channel, control unit, and device address of the receiving volume;

nn is the page number of the first page to be written (in hexadecimal);

mmm is the page number of the last page to be written (in hexadecimal);

ppp is the starting cylinder of the image;

tttt is the device type (either 2311 or 2314).

An example of a SAVESYS control card is

```
SAVE VOLID=CPDSK1,UNIT=230,FP=00,LP=11,CYL=200,DISK=2314
```

The space indicated on the card must have been allocated previously as permanent space on the volume when DIRECT was run. The information on the control card must match that information provided in the SYSTEM module assembled and loaded with the system. (See CP-67/CMS Installation Guide for details.) In that module, the system name, location, shared pages (if any) and operating conventions are established. In the distributed SYSTEM module, the system name is CMS, seventeen pages are saved beginning at page 0, up to and including page X'11'. In the distributed system, the saved copy of CMS is written on the disk volume labeled CPDSK1 and is 2314 resident at cylinder 200.

The number of cylinders required to contain a saved named system depends upon the number of pages saved and the device type where it is saved. For a 2314, one cylinder can hold 30 (decimal) pages; for a 2311, one cylinder can hold 8 (decimal) pages.

When SAVESYS saves a copy of the system, it saves from FP to LP. If LP is greater than X'20', the SAVESYS module must be loaded into higher core, as it normally loads into 20000. To load SAVESYS into higher core, change the address in the SLC 20000 card at the front of the SAVESYS text deck.

The procedure for running SAVESYS is as follows:

1. IPL the system to be saved, with the address stop switches set to a location within that system, where execution may be resumed without the system assuming any previous state in the machine (registers, lower core locations, etc.). For CMS, the address stop location is F0.
2. When the system has entered manual state (that is, the address has been reached), load the SAVESYS deck into the system card reader and IPL the reader. The format

of the SAVESYS deck must be as follows:

High core loader  
SLC 20000 card  
SAVESYS program  
LDT card  
SAVESYS control card

3. If the save was successful, the following message appears on the operator's console:

NORMAL TERMINATION OF SAVE FUNCTION

#### VDUMP

The VDUMP program runs under the control of the Cambridge Monitor System. When a system crash occurs, a spool file is created for the virtual machine whose USERID is specified at SYSGEN time (see CP-67/CMS Installation Guide). The spool file then may be printed as a CP-67 system dump by issuing the CMS command VDUMP to the designated virtual machine (see section on AUTODUMP and RE-IPL).

In order to create the CMS command called VDUMP on the appropriate virtual machine, this procedure may be followed:

- a. Read the punched card deck for VDUMP TEXT into the appropriate virtual machine (attach a USERID card to the front of the deck).
- b. IPL CMS
- c. offline read \*
- d. load VDUMP
- e. genmod VDUMP

The virtual machine which has access to the system dump created by the autodump feature must have the standard CMS virtual device addresses. In addition, this machine must contain the following directory entry for a special virtual device which reads the spooled file for the dump:

UNIT 0F1,RPRT

As the dump is being printed, the following message appears at the virtual machine's terminal:

PRINTING STORAGE LOCATION xxxx

When the dump is finished, the message END OF DUMP is printed at the terminal and control returns to CMS.

The VDUMP printed output is preceded by a header page giving the date and time of system crash

CP-67 SYSTEM ABEND DATE mm/dd/yy TIME hh.mm.ss

If the default (CP) is in effect for the SET DUMP command, or if CP is specified as an option, the following is printed in the dump: general-purpose registers 0-15, control registers 0-15, and all of CP nucleus and free storage. If ALL is specified as an option, the dump includes all of real core.

## DIRECTORY ALLOCATION AND CREATION

The DIRECT utility performs two distinct and somewhat separate functions: (1) the allocation of space on direct-access volumes to indicate to the system which areas are utilized for user and CP file residence and which are to be used for temporary use by paging and spooling functions of the system, and (2) the creation of a directory that contains descriptions of the users and their virtual machines.

### ALLOCATION

CP-67 requires an allocation record to be written behind the volume label on cylinder 0 head 0 record 3 of each disk that is to contain space for the directory, paging, and spooling. The allocation record specifies which cylinders on the disk are used as permanent space and which are temporary space. Permanent space on a volume consists of the areas reserved for user files and system residence. Temporary space consists of those areas used for paging and spooling by CP-67.

There are five types of allocation control cards: ALLOCATE, DRCT, TEMP, TDSK, and PERM. The format of the ALLOCATE card is

```
ALLOCATE UNIT=ccu,VOLID=xxxxxx
```

ccu is the address of the device to be allocated.

xxxxxx is the six-character label of the volume to be allocated.

ALLOCATE must start in column 1 and UNIT in column 11.

DRCT space is used for CP-67 directory residence.

TEMP space is used for CP-67 spooling and paging.

PERM space is for user direct-access files.

TDSK is for DASD units in the user machine descriptions that are to be allocated at login time from a pool of temporary disk space. The TDSK area is not used by CP for spooling or paging.

The control cards for the allocation of space are

```
DRCT   xxx,yyy
TEMP   xxx,yyy
PERM   xxx,yyy
TDSK   xxx,yyy
```

where DRCT, TEMP, PERM and TDSK start in column 10, and the cylinder designations in decimal form (with leading zeros to make three characters each) start in column 16. xxx is the first cylinder and yyy is the last cylinder.

There must be one ALLOCATE card for the CP residence volume and for each disk that contains temporary space. Each ALLOCATE card must be followed by the control cards for that volume. When all the allocation for a device has been specified, the following card is used to indicate the end of allocation cards for the volume:

```
*EOA*
```

The \*EOA\* begins in column 10. The \*EOA\* card is then followed by another ALLOCATE card or a DIRECTORY card.

Note that the system always makes cylinder 0 permanent for the volume label and allocation table residence. Therefore, do not begin user files on real cylinder 0 of those disks that are being allocated. Checks are also made for exceeding device limits on the device address specified.

The allocation of volumes can be a separate run from that of the directory. Also, each volume can be allocated independently of the others.

Note: Do not ALLOCATE space on the 2301 or 2303 drums since the FORMAT program sets the allocation such that all space is formatted for dynamic paging allocation.

## DIRECTORY CREATION

The CP system residence volume must contain a directory that describes the users and their virtual machine. The directory portion of this utility accepts the descriptions of the users and their virtual machines from the card reader

specified at the operator's console and writes the directory in the temporary space previously allocated on the system residence volume (initially the disk must be formatted before ALLOCATE'ing and DIRECTORY take place). Depending upon the size of the directory and the device type of the system residence volume (that is, 2311 or 2314), at least the first two or three cylinders should be allocated as DRCT space on the CP system residence volume. Estimates on space requirements for the system directory are as follows:

2314-- 150 USER virtual machine  
descriptions per cylinder

2311-- 40 USER virtual machine  
descriptions per cylinder

These space requirements are in addition to cylinder 0 of the residence volume, which is used as the master directory. Thus, the directory allocation control card,

```
DRCT 000,003
```

is sufficient to provide space on three cylinders (1, 2, and 3) for virtual machine descriptions.

Every user who is to be permitted to log in to CP-67 must be described in the directory, including the system operator.

The directory description must begin with the following control card:

```
DIRECTORY UNIT=ccu,VOLID=xxxxxx
```

ccu is the real address of the CP system's residence volume on which the directory is to be written.

xxxxxx is the six-character void of the disk on which the directory is written.

DIRECTORY must start in column 1 and UNIT in column 11.

After the DIRECTORY control card comes the OWN card. Its format is

```
OWN aaaaaa,bbbbbb, ... ,hhhhh
```

where "aaaaaa,bbbbbb, ... ,hhhhh" are the volume labels of disks that contain allocation tables. OWN must start in column 10 and the volume labels in column 16. Only eight

labels can be specified in one card. To name more than eight, use multiple OWN cards.

Note that the only volumes specified in the owned list are those that CP can use for paging and spooling, such as drums, and the system residence volume. Volumes that have no TEMP, DRCT, or TDSK space (for instance, OS, DOS, CMS volumes) must not be in the owned list. It is obviously not necessary to allocate volumes that are all PERM space.

Next are the cards that describe a user and his virtual machine. These cards are described below. (Note that the label field always starts in column 1, the operand field, that is, card type, in column 10, and the arguments in column 16.)

userid        USER    password,account,priv-class,priority,options

The USER card initiates a new machine description file and creates a user directory entry for the specified user.

"Userid" is the eight-character external name by which the user and all spooling output are labeled; it must be left-justified and trailing blanks included if userid is not eight characters.

"Password" is the key by which the user must respond when trying to log on in order to be permitted into the system. The password must be specified as eight characters, left-justified, with trailing blanks if eight characters are not specified. Note that if the terminal has the print inhibit feature, the system turns off the printing mechanism to maintain the security of the password.

"Account" is any eight-character identification for installation accounting uses.

"Priv-class" is the user's privilege class: A for system operator, B for system administrator, C for IBM customer engineering use, and D for normal users. This privilege class determines what console functions in the system the user may exercise. (See Appendix B for a table of console functions available to each privilege class.)

Note: Users with privilege class C do not have I/O errors recorded for them by CP-67. Use of this class should therefore be carefully restricted. Privilege class C can also execute certain DIAGNOSE functions to maintain the error-recording cylinder.

"Priority", in the current system, is not used and has no bearing on dispatching or scheduling. The single decimal number may range from 1 - 9.

"Options" is a hexadecimal number that selects specific options available to users at login time and execution time. There are currently three options available. They, and their hex values, are:

REAL timer support	X'80'
ISAM support	X'40'
VIRTUAL 360/67 support	X'20'

Note: ISAM support means support of dynamic channel modified CCW strings for DASD.

Multiple options can be selected by combining the values. For instance, real timer and virtual 67 would be specified as

```
... USER .....,X'A0'
```

The core card specifies the size of the user's virtual memory.

```
CORE | dddd |
      | dddK |
      | dddM |
```

It may be specified as dddd where dddd is a decimal number that is a multiple of 8192 bytes, or by one or more decimal digits followed by K or M, indicating a multiplier of 1024 bytes or 1,048,576 bytes respectively. The core size must be a multiple of 8K, where 8K is the minimum. When a user logs in to CP-67, he receives a virtual machine of this size. Paging space is not selected for this virtual machine until the user references core storage; space on the paging device is then selected one page at a time. If a user does not need a large core space, allocate him a small one--for example, give the operator 8K core.

```
UNIT ccu,devtype
```

```
|,<xxxxxx,(TEMP),REM=IDccu,CON=YES,DED=IDccu>|
```

```
|,<relno,zzz>|
```

```
|,last|
```

```
|,RDONLY|
```

|,RDSHAR=password|

|,WRMULT|

|,WRSHAR=password|

The UNIT card is used to specify the input/output units available to a user and where and on which volumes his permanent files reside.

ccu is the virtual address of the device.

devtype is the device type, which may be one of the following:

1052  
2540P  
2540R  
1403  
2250  
2311 or 2312  
2314  
2400  
2701  
2702  
2703  
TIMR  
RPRT  
RPUN

where a 2312 is used to designate the bottom half of a 2314 drive used as a virtual 2311.

A 2312 device type is treated as a 2311 by CP-67. User seek commands issued to the pseudo 2311 have the head address relocated (by adding decimal 10) to access the bottom half of the 2314 disk. It should be noted that 2311 device types supported on the top half of a 2314 pack may experience difficulties if multitrack operations are attempted; however, multitrack operations on the 2312 (pseudo 2311) device type should work correctly since a physical end-of-cylinder condition is recognizable.

TIMR is a pseudo-chronolog device which can provide the time of day, date, virtual CPU time, and total CPU time to a virtual machine. It should be specified for every CMS user. Its format is

UNIT OFF,TIMR

RPRT and RPUN are special device types that allow the user to access the disk dump created by a CP-67 system abend. For the desired userid to receive the dump (see CP-67/CMS Installation Guide) specify

UNIT 0F1,RPRT

xxxxxx is the volume label of the disk that is being described.

(TEMP) specifies that the disk space is to be obtained at logon time from that allocated as TDSK space and then removed from the user at CP-67 logoff.

REM=IDccu specifies a remote device with real address ccu that is to be used for spooled output from this defined user. It has the same function as the SPOOL console commands for directing spooled output. See CP-67/CMS User's Guide for details. The only device types supported as remote devices are the 2540P and the 1403.

DED=IDccu specifies a device with real address ccu that is dedicated to this user at login time and unavailable to other users. The device types supported are the 1403, 2540R, 2540P, 2250, 2400, 2701, 2702, and the 2703. If the specified device is not available or in use when the user logs in, he is so informed and the device is not attached to him. Note that a 2250 or 2400, if specified, must be defined as a dedicated device.

CON=YES specifies that continuous spooled input is desired for this virtual card reader; that is, if there is more than one spooled input file for the card reader, they are read as one continuous file before end-of-data is given. This has the same function as the SPOOL console function (see CP-67/CMS User's Guide for details).

relno is a three-digit decimal cylinder relocation factor to be applied to this device; for example, if a user's permanent files started at cylinder 54 of the specified volume, relno would be specified as 054.

zzz is a three-digit decimal number specifying the number of temporary cylinders to be obtained at logon. zzz is used only if (TEMP) was

specified.

last is a three-digit decimal number specifying the last cylinder of the user's file space. If relno is 054 and the user is allowed 20 cylinders of space, last would be specified as 073.

RONLY specifies that the virtual direct-access volume can only be read and not written upon. If RONLY is not specified, the user has read/write access to the volume by himself, and no other user can read or write that volume unless WRMULT is specified for those users. (See WRMULT.) If the volume being described is the CMS system disk, RONLY should be specified for each user.

RDSHAR=password is a one to eight-character password that allows this volume to be shared for reading by users knowing the proper password. If ALL is specified as a password, all users have access to the volume for read-sharing. RDSHAR is only used for permanent volumes and not temporary ones. If either WRSHAR or WRMULT is specified, but not RDSHAR, a comma must be used to show that RDSHAR is omitted.

WRMULT allows the user to have access to the volume regardless of other users. If WRMULT and RONLY are both specified for a user's volume, he will have read-only access to that volume, regardless of other users. If only WRMULT is specified, he has read/write access regardless of other users on that same volume. This parameter is intended for use by users using operating systems which provide an interlocking mechanism to protect files or for systems programmers who know what they are doing. CMS does not have an interlocking mechanism.

WRSHAR=password is a one to eight-character password that allows the volume to be shared for writing as well as reading, but only one user can have access to the volume at a time. The volume is shared among users knowing the proper password. If ALL is specified as a password, all users have write-sharing privileges on the volume.

Note. RONLY is inconsistent with WRSHAR and consequently they may not be specified together. If RONLY is specified on a volume for all users but one, and that one user logs in first, he will use the volume in a read/write status and other users will have no access to that volume unless they have the WRMULT parameter. When the RONLY users log in,

they receive the message

DEV ccu IN USE BY userid; NOT ATTACHED

The RONLY users should either log out and then log back in or issue LINK console function after userid logs out or userid detaches that device from his virtual machine. If that read/write user logs in after a RONLY user, he will receive the message

DEV ccu IN USE BY userid; SET TO R/O

and he will have read-only access to that volume. The userid will be one of the RONLY users who logged on first.

If a read/write WRMULT user logs in after a RONLY or a read/write user, the WRMULT user will have read/write access regardless of the other users on that volume, and he will receive the message

DEVICE ccu IN USE BY userid

If a RONLY, WRMULT user logs in after any other user, he has read-only access to the volume, regardless of other users, and he receives no message.

The parameters specified with the UNIT control card are positional, therefore they must be specified in order and a comma must be used for each parameter omitted.

Each user's machine description is terminated by a card with

\*EOU\*

beginning in column 10. At the end of all user directory descriptions, a card with

\*EOD\*

beginning in column 10 is used to terminate the directory creation process and to return to the ALLOCATE and DIRECTORY card-scan routine. If there are no additional ALLOCATE or DIRECTORY cards, DIRECT is terminated; if there are additional ALLOCATE or DIRECTORY cards, DIRECT is executed again.

A sample allocation and directory deck are as follows:

```
ALLOCATE UNIT=230,VOLID=CPDSK1
  DRCT 000,003
  PERM 004,004
  TEMP 005,197
  PERM 198,202
  *EOA*
ALLOCATE UNIT=235,VOLID=CPDSK5
  PERM 000,000
  PERM 001,075
  TDSK 076,165
  PERM 166,202
  *EOA*
DIRECTORY UNIT=230,VOLID=CPDSK1
  OWN CPDSK1,CPDR01,CPDSK5
OPERATOR USER CSC ,A1234 ,A,8
  CORE 8K
  UNIT 009,1052
  *EOU*
USER1 USER PASS1 ,222 ,D,3
  CORE 256K
  UNIT 009,1052
  UNIT 00E,1403
  UNIT 00C,2540R
  UNIT 00D,2540P
  UNIT OFF,TIMR
  UNIT 190,2311,CMS190,000,202,RDONLY
  UNIT 191,2311,CPDSK5,166,175
  *EOU*
USER2 USER PASS2 ,A590 ,C,3,X'80'
  CORE 256K
  UNIT 00E,1403,DED=ID030
  UNIT 009,1052
  UNIT 00C,2540R
  UNIT 00D,2540P
  UNIT 106,2250,DED=ID106
  UNIT OFF,TIMR
  UNIT 190,2311,CMS190,000,202,RDONLY
  UNIT 191,2312,CPDSK6,148,152,,,WRMULT
  UNIT 193,2311,KVR999,000,202
  *EOU*
USER3 USER PASS3 ,X3214567,C,3,X'C0'
  CORE 256K
  UNIT 009,1052
  UNIT 00E,1403
  UNIT 00D,2540P
  UNIT 00C,2540R
  UNIT 190,2311,CMS190,000,202,RDONLY
  UNIT 191,2314,CPDSK3,050,060,,RDSHAR=RDXX ,WRMULT
  UNIT 192,2314,CPDSK5,001,075,,,,WRSHAR=MYPASS
  *EOU*
  *EOD*
```

## APPENDIX A: OPERATOR CONSOLE FUNCTIONS

Depressing the attention button on the online 1052 keyboard causes the system to turn on the proceed light awaiting an operator console function request to be issued. The operator may choose from (1) any console functions that another user may choose from (although this may not be particularly appropriate) or (2) issue one of the commands reserved for a user of privilege class A, or (3) issue one of the commands exclusively reserved for the system operator. The commands listed below are those which are restricted to privilege class A or B as well as the system operator, except where noted. Several commands are included which facilitate debugging of the Control Program and its algorithms. A complete set of all console functions and their relationship to user privilege classes are in Appendix B.

ACNT - punch and reset accounting information  
ATTACH - attach a device to a user or the system  
DCP - display contents of CP-67 memory  
DETACH - release a device from a user or the system  
DIRECT - control access to the system directory  
DISABLE - disable 2702 or 2703 lines for access to system  
DMCP - dump contents of CP-67 memory  
DRAIN - cease spooled operation upon current completion  
D\_U\_M\_P - force a system abend  
ENABLE - enable 2702 or 2703 lines for access to system  
KILL - log a user off the system  
LOCK - lock certain user pages in core  
MSG - send a message to the user(s)  
QUERY - query status of system  
REPEAT - cause current spool output to be repeated  
          upon termination  
SET - establish system parameters  
SHUTDOWN - terminate all system operation  
SPACE - cause printed output to revert to single spacing  
          for current output  
START - commence spooled operation on specific devices  
STCP - store into real core  
TERM - terminate current unit record operation  
UNLOCK - opposite of lock  
WNG - issue a warning message to user(s)

The following conventions are used throughout this description: (1) variable information is indicated in lowercase letters and system keywords are indicated in uppercase letters, whereas either case may be used when

communicating with the system; (2) < and > are used to bracket choices when applicable in the description (for example, MSG <userid,ALL> would be used to indicate that MSG userid or MSG ALL could be used) whereas the brackets are not typed when communicating with the system.

#### ACNT (ACNT)

This command punches an accounting card for all active users and resets their accounting information to new values. A message is sent to all users informing them of their connect time and CPU time in a format identical to the QUERY TIME response. The command is useful to reset accounting information at certain times if installation rates change.

#### ATTACH (A)

The ATTACH command allows the operator to dynamically add to a user's configuration any device in the real system (for example, 2400 tape unit, 2314 module or 2250 display unit). This is customarily done in response to a user's request via the MSG command.

The ATTACH command can be used to attach a multiplexor device (that is, printer, punch, or card reader) to a user in a dedicated status. The user cannot already have a virtual device with the indicated address. (If he does, he must DETACH it beforehand.) The format is

```
ATTACH ccu TO userid AS yyy
```

where ccu is the channel and unit designation of a device in the real configuration; userid is the external user identification of the virtual machine which is to receive the unit; and yyy is the virtual channel and unit address to be assigned to the unit.

ATTACH may also be used to add a spooling device to a virtual machine, or to change the user's virtual console address. The format is

```
ATTACH xxx TO userid AS yyy
```

where yyy is the user's (userid) virtual address and xxx is RDR, PRT, PUN, or CON for the desired device, card reader, printer, punch, or console, respectively.

The following form of the ATTACH command is used to add to the system a direct-access device which was not available

at system initialization time:

ATTACH ccu TO SYSTEM AS valid

where ccu is the channel and unit address of the device containing the pack to be added and valid is the volume label of the pack which is verified before incorporation into the system.

Note. TO may be abbreviated as T, and AS may be abbreviated as A.

#### DCP (D)

The DCP command is used to type out on the console the contents of CP-67 real core locations. The format is

DCP item item item ...

where each item is a request for a memory location or group of memory locations, as follows:

124-13F types out the contents of memory locations 124(16) through 13F(16) inclusive, and

78 types out the contents of the fullword containing 78(16).

#### DETACH (DE) -- privilege class A only

The format is

DETACH Rcuu

The DETACH command is used to remove a real device from a user or the system. The ccu is the real channel and unit address of the device to be detached. If the device was attached to a user, any user with the operator privilege class can detach it. If the device is attached to SYSTEM, only the system operator can detach it. CP owned volumes cannot be detached.

#### DIRECT (DIR)

DIRECT <lock,unlock>

This command is used to control user access to the

system directory for certain functions. It is normally used when the directory is changed online.

lock--prevents users from being able to LOGIN, XFER, or LINK, since these commands access the DIRECTORY. If the DIRECTORY is in use (user LOG'ing or LINK'ing, for example), the following message is printed:

DIRECTORY IN USE

Attempt the LOCK again in a while.

If the DIRECTORY was already locked, the following message is printed:

ALREADY LOCKED

unlock--allows users to have access to the DIRECTORY for LOGIN, XFER, and LINK. If the DIRECTORY was not locked before, the following message is printed:

NOT LOCKED

#### DISABLE (DISA)--system operator only

The DISABLE command allows the operator to selectively or collectively inhibit 2702 or 2703 lines for access to the system. If the line (or lines) is (are) inactive (no user logged in or dialed), the line is immediately disabled. If the line is active, it is disabled when the user has completed his terminal session. The format is

DISABLE <linelist,ALL>

where linelist and ALL are as described in the ENABLE command.

Note. If a line is active when a DISABLE command is issued to it, and then an ENABLE is issued to the line before the user completes his session, the line will not be disabled but will reenable for system communication.

#### DMCP (DMCP)

This command dumps selected parts of real core onto a virtual spooling printer. The arguments are identical to the DCP command. The operation and output is similar to the DUMP command.

DRAIN (DR)--system operator only

The DRAIN command is used to suspend output or input upon completion of the current file until a START command is issued. The format is

DRAIN xxx ... xxx|null

where xxx are spool devices. A confirmation message is provided when the device is actually drained (that is, stopped after completing the current file):

DEV xxx DRAINED.

Note. If a card reader is drained, a START command and actual start button operation are required to initiate spooling input.

D\_U\_M\_P (D\_U\_M\_P)--system operator only  
-----

The D\_U\_M\_P command allows the operator to take a system abend dump (followed by software re-IPL).

ENABLE (EN)--system operator only

The ENABLE command allows the operator to selectively enable the lines on the 2702 or 2703 Transmission Control for access to the system. The format is

ENABLE <linelist,ALL>

where linelist is a set of line numbers (in hexadecimal ccu form) to be enabled with each line number separated by one or more spaces. If ALL is specified, all 2702 lines configured into the system in the REALIO module are enabled with their specified SAD commands. The ENABLE command does not affect lines already enabled.

KILL (KI)--system operator only

The KILL command is used to log a user off the system if desired. The format is

KILL <userid>

where userid is the eight-character (or less) external identification of the user to be logged off. The user receives the message

LOGOUT AT ... \*\*BY OPERATOR\*\*

and is logged out from the system.

LOCK (LOCK)--system operator only

The LOCK command should not be used except with the express knowledge of the CP-67 systems programmer. It seriously affects systems performance under certain conditions. The command locks certain user pages in core. The format is

LOCK userid xxx yyy

where userid is a logged-in user, xxx is the first user page desired to be locked, and yyy is the last user page to lock. xxx and yyy are hexadecimal values.

MSG (M)--any user

The MSG command may be used to send messages to the operator or other users. These commands are stacked and issued to the user when there is no read up to the console, to avoid interrupting his output. If the user has issued the command SET MSG OFF, any MSG sent to him will not be received or saved. A message ('USERID' NOT RECEIVING) indicating that a user is not receiving is output. The format is

MSG <userid,ALL> message

where userid is the eight-character (or less) external user identification by which the user is known to the system. ALL (privilege class A or B, only) causes the message to be sent to all logged-in users. If the user to which the message is being sent is not logged into the system, an appropriate message is issued and the request is ignored.

QUERY (Q)

The QUERY command may be used to ascertain the status

of the system (for example, which users are logged on, what form of the paging algorithm is in use, what is the maximum number of users allowed on). The format is

```
QUERY <USERS, Q2, MAX, LOGMSG, FILES, TIME, NAMES,  
'userid', DEVICE, PORT, DUMP>
```

where

USERS returns the number of logged-in users and the number of users dialed to other virtual machines.

\* Q2 returns the maximum number of users in QUEUE2.

LOGMSG returns the message of the day.

\* MAX returns the maximum user load permitted.

FILES returns the spooled file count for the system.

TIME gives the connect and CPU time since login.

NAMES prints a list (four-up) of all users currently logged in and their associated line address, if applicable. If the user is DISCONNECT'ed the line location is given as DSCON. If the user is in the LOGIN process, the userid is given as (LOGIN).

userid gives the device where the user is logged in or shows he is not on system.

\* DEVICE (xxx) prints a list showing the status (ATTACHED, etc.) of all DASD and TAPE devices on the system, or the status of device xxx, only (if specified).

\* PORT (xxx FREE ALL) prints a list (four-up as in NAMES) showing the status of all active communication lines (no parameter), the status of line xxx, all the lines currently not in use (logged in or dialed), or the status of all lines, respectively.

\* DUMP prints the address of theabend dump unit.

\* indicates privilege class A or B, only; others are any user.

Note. Most of the above operands may be abbreviated to one character (that is, Q N for Query Names).

## REPEAT (REP)--privilege class A only

This command is used to repeat the entire output of the currently active file. A message is given when the repeat starts or if the device is not active now. A repeat of up to ten per command is allowed; however, when output is on the tenth repeat, another repeat can be issued to a maximum of ten again. The format is

```
REPEAT xxx y|null
```

where xxx is the output device (printer or punch) and y is the count (up to ten). If no count is specified, one repeat is assumed.

```
DEV xxx REPEATED userid
```

is given when the file is repeated.

```
DEV xxx IDLE
```

is given if the device is not busy. If the operator terminates a repeated file, using TERM, only that repetition is deleted. The file repeats again after termination until the repeat count is zero.

Thus, if some current output is damaged, or if forms alignment has been performed, the following sequence restarts the output:

```
REPEAT 30--command  
TERM 30--command  
DEV 30 REPEATED USERID--response
```

## SET (S)

The SET command allows the operator to establish some of the operating considerations and functions of the session. The format is

```
SER <Q2= nn,MAX= nn,LOGMSG,LOGMSG NULL,LOGMSG n,DUMP xxx>
```

where

Q2= nn establishes the maximum number of users allowed in QUEUE2 (the queue for those not doing heavy interactive work at the terminal).

MAX= nn establishes the maximum number of users allowed on the system to nn.

LOGMSG and LOGMSG n responds with a message LOGMSG: immediately followed by a read to enter the line. LOGMSG with no parameter sets up or adds to a log message. The LOGMSG n specification changes the LOGMSG line number n. A null line entered (EOB after LOGMSG:) terminates LOGMSG entry (for adding or initial setup) or deletes line n if that option was used. Each line of the LOGMSG is limited to a maximum of 74 characters.

LOGMSG NULL deletes the entire LOGMSG that may have been set up, allowing a new message to be set.

DUMP xxx sets the CP-67 system abend dump unit, where xxx is the printer or tape address or AUTO to set the dump to DISK. The command can also be used to control the amount of core dumped. xxx is CP for a dump of the CP-67 nucleus and FREE storage pages only, or xxx is ALL to dump all of real core. If this command is not issued, the system uses the default of dumping CP core only to the assigned disk area.

SHUTDOWN (SHUTDOWN)--system operator only

This command saves all spool files and accounting information, terminates all system operation, and enters a disabled wait state.

SPACE (SPA)--privilege class A only

This command is used in case printed output is doing excessive forms skipping. The output is not deleted but is forced to singlespace. The command is in effect only for the current file.

START (STA)--system operator only

The START command is used to initiate spooling functions on the specific devices xxx. More than one may be started in one command. If no operand is specified, all spool devices are started. The format is

START xxx .... xxx | 'null'

where xxx are spool devices. A confirmation message is

provided of the form

DEV xxx STARTED

### STCP (STCP)

This command is used to store into real memory. The format is

STCP location value value value ...

where location is a real memory address (fullword), and value is the hexadecimal word to be stored. The function is similar to the user STORE command for virtual storage locations. The real PSW and REGISTERS cannot be changed.

Note. Extreme caution is advised when using this function since indiscriminate use causes system errors and/or failure.

### TERM (T)--system operator only

The TERM command is used by the operator to flush the remaining spooling output of the file currently in process on the indicated unit. This would normally be used if it was obvious the user involved had an error and it was not worth processing the rest of his offline output. The format is

TERM ccu

where ccu is the channel and unit address of the real device on which the output is being processed.

### UNLOCK (UN)--system operator only

The same restrictions for LOCK apply to this command. This command can only be issued after a LOCK command, and can only be used to UNLOCK those pages that were originally locked. The format

UNLOCK userid xxx yyy

where the arguments are the same function as in LOCK.

## WNG (W)

The WNG command is used to inform a user, or users, of information which is of immediate importance and cannot wait for them to enter a mode where they can receive messages via the MSG command. The WNG message comes immediately out on the typewriter, regardless of its status, and thus should be used sparingly by the operator. The format is

WNG <userid,ALL> message

where userid is the external identification of the user to whom the message is being sent. ALL may be specified if the message is of general importance.

For other CP console functions that are not in the operator's privilege class, refer to CP-67/CMS User's Guide.

APPENDIX B: RELATIONSHIP OF CONSOLE  
FUNCTIONS TO PRIVILEGE CLASS

The following is a list of console functions and the privilege class(es) from which they can be issued. The privilege classes are A for operator privilege, B for system administrator, C for IBM customer engineers, and D for a normal user. The first user with privilege class A to log in to CP-67 is known as the system operator, of which there is only one. For the definition of privilege class, refer to the USER card in "Directory Allocation and Creation".

Console Function -----	Privilege Classes -----				
	<u>Sys. Op.</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>
ACNT	X	X	X		
ATTACH	X	X	X		
BEGIN	X	X	X	X	X
CLOSE	X	X	X	X	X
DCP	X	X	X		
DETACH ccu	X	X	X	X	X
DETACH Rccu	X	X			
DIRECT	X	X	X		
DISABLE	X				
DISCONN	X	X	X	X	X
DISPLAY	X	X	X	X	X
DMCP	X	X	X		
DRAIN	X				
DUMP	X	X	X	X	X
D_U_M_P	X				
ENABLE	X				
EXTERNAL	X	X	X	X	X
IPL	X	X	X	X	X

IPLSAVE	X	X	X	X	X
KILL	X				
LINK	X	X	X	X	X
LOCK	X				
LOGIN	X	X	X	X	X
LOGOUT	X	X	X	X	X
MSG userid	X	X	X	X	X
MSG ALL	X	X	X		
PURGE	X	X	X	X	X
QUERY users, names,userid, logmsg,time,files	X	X	X	X	X
QUERY port,dump,max, Q2,device	X	X	X		
READY	X	X	X	X	X
REPEAT	X	X			
RESET	X	X	X	X	X
SET cardsave,msg, run,wng	X	X	X	X	X
SET max,logmsg, Q2,dump	X	X	X		
SHUTDOWN	X				
SLEEP	X	X	X	X	X
SPACE	X	X			
SPOOL	X	X	X	X	X
START	X				
STCP	X	X	X		
STORE	X	X	X	X	X
TERM	X				

UNLOCK	X				
WNG userid	X	X	X		
WNG ALL	X	X	X		
XFER	X	X	X	X	X

APPENDIX C: RUNNING CP-67 IN A  
VIRTUAL MACHINE

DEFINING THE VIRTUAL 67

To be able to run in extended (PSW) mode (that is, in 67 mode) a virtual machine must have the first bit of the option byte in the USER card (see "Directory Allocation and Creation") set to on, and preferably, must have a real timer. The option byte is X'A0' or X'20'.

Some 2702 or 2703 lines must appear in the directory of the virtual machine running CP.

Figure 1: Directory Entry for V67 Machine

```
CP67      USER  HGFEDCBA,A6230  ,A,7,X'A0'  <----the 'A0' is a 67 optio
          CORE  768K
          UNIT  009,1052
          UNIT  010,1403
          UNIT  011,2540R
          UNIT  012,2540P
          UNIT  030,2703
          UNIT  050,2703
          UNIT  051,2703
          UNIT  052,2703
          UNIT  230,2314,SRG001,000,060
          UNIT  231,2314,CMS190,000,053,RONLY
          UNIT  232,2314,19ASYS,000,053,RONLY
          UNIT  233,2314,CPCMS2,050,08F
          UNIT  234,2314,CPCMS4,102,134
          *EOU*
```

## OPERATING CONSIDERATIONS FOR THE VIRTUAL CP-67

---

Running CP-67 under CP-67 does not present special difficulties. A few points will be emphasized here.

a. If a minidisk is used as the CP residence volume, the RIO module must be altered to reflect the nucleus residence location and other factors, such as disk label (avoid CPDSK1), warm start cylinder, etc.

b. When creating allocation tables for the virtual CP residence volume if it is a minidisk (and, more generally, for any minidisk when an allocation table is needed), to prevent CP from trying to use the cylinders out of the minidisk, those cylinders should be declared permanent--not temporary. For example, if the CP residence volume is a 60-cylinder disk, when the allocation for that unit is being run, cylinders 60-202 must be declared permanent (see Figure 4).

c. Creating the Virtual Directory. All the virtual disks used in the virtual directory must appear in the real directory for the (virtual) machine running CP. It is necessary, in that real directory, to use the addresses which are in the REALIO deck. For example, the CMS S-disk (CMS190 cylinders 000-053) is specified in the real directory as virtual device 231.

Note that the defined disk devices for user CP67 (Figure 1, the virtual 67) are minidisks and that two of them, 233 and 234, are not physically at cylinder zero. Because of this, these user P-disk areas must be labeled with a unique label so that they may be located in the virtual directory. For example, in the virtual directory (see Figure 4), the user VSRGA has a 191 disk defined as residing on volume VCPCM2, cylinders 000-03F. The label VCPCM2 is physically on cylinder 050 of the physical volume labeled CPCMS2, as defined in the directory for user CP67, the virtual 67 system. Because the label SRG001 is physically located on cylinder 000, that label is used in both the real and virtual system directories and should not be changed.

d. CP cannot run correctly if, at IPL time, two disk packs have the same label. If the residence volume of the virtual CP begins at a real cylinder 0 (minidisks or complete disks), it must be given a name different from the name of the real CP residence volume (which is normally CPDSK1). The label of the pack is specified in the RIO module in the SYSRES macro.

Figure 2. EXEC Procedure for Generating a LOAD Deck

cpsys exec

```
&TYPE OFF
&ERROR &GOTO -EXIT
OFFLINE PUNCH &1 LOADER
OFFLINE PUNCHCC PSA TEXT
OFFLINE PUNCHCC ACCTON TEXT
OFFLINE PUNCHCC ACNTOFF TEXT
OFFLINE PUNCHCC ACNTIME TEXT
OFFLINE PUNCHCC CCWTRAN TEXT
OFFLINE PUNCHCC CFSCOM TEXT
OFFLINE PUNCHCC CFSDBG TEXT
OFFLINE PUNCHCC CFSIPL TEXT
OFFLINE PUNCHCC CFSMAIN TEXT
OFFLINE PUNCHCC CFSPRV TEXT
OFFLINE PUNCHCC CFSQRY TEXT
OFFLINE PUNCHCC CFSSET TEXT
OFFLINE PUNCHCC CFS SPL TEXT
OFFLINE PUNCHCC CFSTACH TEXT
OFFLINE PUNCHCC CHKUACT TEXT
OFFLINE PUNCHCC CONSINT TEXT
OFFLINE PUNCHCC CONVRT TEXT
OFFLINE PUNCHCC CPFILE TEXT
OFFLINE PUNCHCC CPLOCS TEXT
OFFLINE PUNCHCC CPSTACH TEXT
OFFLINE PUNCHCC CPSYM TEXT
OFFLINE PUNCHCC DEDICATE TEXT
OFFLINE PUNCHCC DIAL TEXT
OFFLINE PUNCHCC DISPATCH TEXT
OFFLINE PUNCHCC DSKDUMP TEXT
OFFLINE PUNCHCC EXTEND TEXT
OFFLINE PUNCHCC FREE TEXT
OFFLINE PUNCHCC IOINT TEXT
OFFLINE PUNCHCC IOERROR TEXT
OFFLINE PUNCHCC LINK TEXT
OFFLINE PUNCHCC LOGON TEXT
OFFLINE PUNCHCC LOGFILES TEXT
OFFLINE PUNCHCC MRIOEXEC TEXT
OFFLINE PUNCHCC MVIOEXEC TEXT
OFFLINE PUNCHCC PACK TEXT
OFFLINE PUNCHCC PAGTRANS TEXT
OFFLINE PUNCHCC PAGEGET TEXT
OFFLINE PUNCHCC PLACE TEXT
OFFLINE PUNCHCC PROGIN T TEXT
OFFLINE PUNCHCC QUEVIO TEXT
OFFLINE PUNCHCC RDCONS TEXT
OFFLINE PUNCHCC RDSCAN TEXT
OFFLINE PUNCHCC RECFREE TEXT
OFFLINE PUNCHCC RESINT TEXT
OFFLINE PUNCHCC RIOCS C TEXT <-----Virtual 67 RIO module
```

OFFLINE PUNCHCC SCANUNIT TEXT  
OFFLINE PUNCHCC SLTSIN TEXT  
OFFLINE PUNCHCC STCONS TEXT  
OFFLINE PUNCHCC TMPSPACE TEXT  
OFFLINE PUNCHCC UNSTIO TEXT  
OFFLINE PUNCHCC UNTRANS TEXT  
OFFLINE PUNCHCC USERLKP TEXT  
OFFLINE PUNCHCC USEROFF TEXT  
OFFLINE PUNCHCC VIOEXEC TEXT  
OFFLINE PUNCHCC VSERCH TEXT  
OFFLINE PUNCHCC WRTCONS TEXT  
OFFLINE PUNCHCC IPL TEXT  
OFFLINE PUNCHCC SYSTEM TEXT  
OFFLINE PUNCHCC CHKPT TEXT  
OFFLINE PUNCHCC CPINIT TEXT  
OFFLINE PUNCHCC SAVECP TEXT  
OFFLINE PUNCHCC LDT SAVENUC  
&PRINT CP-67 CARD GEN COMPLETE  
&EXIT  
-EXIT &PRINT CP-67 CARD GEN ERROR \*\*\*\*\*  
&EXIT

Figure 3: Generating CP-67 from CMS

Example of EXEC Procedure to Create a Virtual CP-67 Nucleus

---

LOADVCP EXEC

```
CP CLOSE C
CP CLOSE D
CP PURGE READER
CP PURGE PUNCH
CP XFER D TO * <-----XFER to "self"
CLOSIO PUNCH OFF
EXEC CPSYS RELDR010
CLOSIO PUNCH ON
CP XFER D OFF
CP IPL C
```

Execution of Above Procedure--LOADVCP

---

```
loadvcp
11.07.17 CP CLOSE C
11.07.19 CP CLOSE D
11.07.21 CP PURGE READER
NO FILES PURGED
11.07.23 CP PURGE PUNCH
NO FILES PURGED
11.07.27 CP XFER D TO *
11.07.31 CLOSIO PUNCH OFF
11.07.33 EXEC CPSYS RELDR010
CP-67 CARD GEN COMPLETE
11.08.23 CLOSIO PUNCH ON
** CARDS XFERED BY CP67 **
11.08.25 CP XFER D OFF
11.08.30 CP IPL C
```

```
DISK LOAD OK
CP ENTERED, REQUEST, PLEASE.
CP
```

Figure 4. Example of a Virtual CP-67 Directory

VDIRECT DIRECTOR

```

ALLOCATE UNIT=230,VOLID=SRG001
        DRCT 000,001
        TEMP 002,003
        PERM 004,004
        TEMP 005,019
        PERM 020,202
        *EOA*
DIRECTORY UNIT=230,VOLID=SRG001
        OWN CPDRM1,SRG001
OPERATOR USER CSC ,A6230 ,A,5
        CORE 256K
        UNIT 009,1052
        UNIT 00C,2540R
        UNIT 00D,2540P
        UNIT 00E,1403
        UNIT 0FF,TIMR
        UNIT 190,2314,CMS190,000,053,RDONLY
        UNIT 191,2314,SRG001,020,022
        UNIT 19A,2314,19ASYS,000,053,RDONLY
        *EOU*
VSRG67 USER HGFEDCBA,A6230 ,A,7
        CORE 512K
        UNIT 009,1052
        UNIT 00E,1403
        UNIT 00C,2540R
        UNIT 00D,2540P
        UNIT 0FF,TIMR
        UNIT 190,2314,CMS190,000,053,RDONLY
        UNIT 191,2314,SRG001,023,027,RDSHAR=HGFEDCBA
        UNIT 19A,2314,19ASYS,000,053,RDONLY
        *EOU*
VSRGA USER HGFEDCBA,A6230 ,D,1
        CORE 256K
        UNIT 009,1052
        UNIT 00E,1403
        UNIT 00C,2540R
        UNIT 00D,2540P
        UNIT 0FF,TIMR
        UNIT 190,2314,CMS190,000,053,RDONLY
        UNIT 191,2314,VCPCM2,000,03F
        UNIT 195,2314,SRG001,033,042
        UNIT 196,2314,SRG001,043,047
        UNIT 19A,2314,19ASYS,000,053,RDONLY
        *EOU*
VSRGB USER HGFEDCBA,A6230 ,D,1
        CORE 512K
        UNIT 009,1052
    
```

UNIT 00E,1403  
UNIT 00C,2540R  
UNIT 00D,2540P  
UNIT 0FF,TIMR  
UNIT 190,2314,CMS190,000,053,RDONLY  
UNIT 191,2314,VCPCM4,000,032  
UNIT 195,2314,SRG001,033,042,RDONLY  
UNIT 196,2314,SRG001,043,047,RDONLY  
UNIT 19A,2314,19ASYS,000,053,RDONLY  
\*EOU\*  
\*EOD\*

Figure 5. Example of EXEC Procedure to Create a Virtual Directory

VDIRECT EXEC

```
&TYPEOUT OFF
CP CLOSE C
CP PURGE READER
CP XFER D TO * <-----XFER TO "self"
OFFLINE PUNCH &1 DIRECTOR
CP XFER D OFF
LOAD DIRECT (XEQ)
```

Execution of Above Procedure--VDIRECT

```
direct vdirect
NO FILES PURGED
** CARDS XFERED BY CP67 **
EXECUTION BEGINS...
CP/67 ALLOCATION/DIRECTORY PROGRAM
ENTER INPUT DEVICE ADDRESS - CUU :00c
ALLOCATION STARTED FOR VOLUME SRG001
END OF ALLOCATION ON ABOVE UNIT.
FORMING DIRECTORY ON VOLUME SRG001
END OF DIRECTORY CREATION ON THIS UNIT
```

## RUNNING VIRTUAL CP-67

---

Running CP-67 under CP-67 presents the same characteristics as running on another system, such as OS/360 - CMS, under CP; that is to say, only one main difference exists from the operator's point of view between running CP-67 on a real 360/67 and on a virtual machine: it is necessary to hit ATTN twice to obtain control under the virtual CP.

Note. It is possible to display some location of virtual memory, by using the Display console function under the real (first level) CP, or the DCP console function under the virtual (second level) CP.

The same is true for Store and STCP.

## RUNNING A VIRTUAL MACHINE UNDER VIRTUAL CP-67

---

First of all, it is necessary to Dial the virtual machine running CP. Afterwards, there is no difference between running under the first or the second level CP until DISCONNECT or LOGOUT; if one of these commands is issued without a parameter, control is returned to the first level CP; if it is issued with a parameter, control remains in second level CP.

Figure 6. Running CP-67 from a Virtual Machine

```
i 230      <----230 is CP sysres volume

CP-67 VERSION 3 LEVEL 0      <----virtual CP-67 message

READY AT 00.00.00 ON 00/00/00
00/00/00  DEV  009 LOGIN  AS OPERATOR USERS = 01
00.00.04

** SYSTEM VOLUME CPDRM1 NOT MOUNTED **

RRRR....RING....GGGG  <----virtual bell ringing because drums not ready
00.00.08  SET DATE MM/DD/YY : 02/11/70
12.10.00  SET TIME HH.MM.SS : 12.10.00
12.10.00  START ((COLD|SHUT)(REQ))  cold

      ** COLD START **

12.10.08  FILES:- NO RDR, NO PRT, NO PUN
cp        <----hit ATTN once for real CP
          <----hit ATTN second time for virtual CP
12.10.14  en 50 51
cp

12.10.23  set logmsg
12.10.28  LOGMSG: hello
12.10.35  LOGMSG:

cp

12.10.44  ipl 190  <----IPL'ing CMS from the virtual CP operator's
                  console
CMS..VERSION 3  LEVEL  0

listf aaa bbb
FILE NOT FOUND
E(00002); T=0.06/0.34 12.11.23

listf
FILENAME FILETYPE MODE NO.REC. DATE
CALLUSE3 TEXT  "CP

12.11.53  CP

12.11.58
```

```
kt
R; T=0.04/0.18 12.12.04

CP <----hit ATTN once for real CP
q u <----querying users in real CP
13 USERS, 06 DIALED

<----hit ATTN again for virtual CP

12.12.12 q u <----querying users in virtual CP
12.12.16 01 USERS, 00 DIALED
12.12.16 CP
q u
13 USERS, 05 DIALED

12.12.23
CMS
erase aaaaaaa bbbbbbb
E(00002); T=0.03/0.10 12.12.53

logout <----logout of CMS
T=0.37/3.28 12.13.02
<----hit ATTN once for real CP

cp
disconnect
DISCONNECT AT 12.14.52 ON 02/11/70 <----virtual CP-67 still available

cp-67 online xdh65 qsyosu

dial cp67 <----dialing into real machine to connect with virtual 67
.. connected .. machine in order to login to virtual CP

cp-67 online xdh65 qsyosu <-----Virtual CP-67 identification

login vsrga
ENTER PASSWORD:

HELLO !
READY AT 12.14.05 ON 02/11/70
CP

i 190
CMS..VERSION 3 LEVEL 0

login noprofile
R; T=0.04/0.25 12.14.48

listf asdfg zxcvb
FILE NOT FOUND
E(00002); T=0.03/0.17 12.15.01
```

```
l * maclib sy
FILENAME FILETYPE MODE NO.REC. DATE
BATCHLIB MACLIB SY 37
SPL1MAC MACLIB SY 51
SYSLIB MACLIB SY 94 12/18
AEDLIB MACLIB SY 16
CPMACS MACLIB SY 264 9/03
OSMACRO MACLIB SY 910 8/12
BRUINLIB MACLIB SY 8 6/13
R; T=0.03/0.07 12.15.18
```

CP

b

CMS

logout

T=0.35/2.72 12.16.08

CP ENTERED, REQUEST, PLEASE.

CP

log aaa <----logging out virtual CP but holding the line

CONNECT= 00.02.12 VIRTCPU= 000.00.36 TOTCPU= 000.02.87

LOGOUT AT 12.16.17 ON 02/11/70

cp-67 online xdh65 qsyosu <----virtual CP identification message

l vsrg67

ENTER PASSWORD:

HELLO !

READY AT 12.25.54 ON 02/11/70

CP

q user

03 USERS, 00 DIALED

q names

OPERATOR - 009, VSRG67 - 051, VSRGB - 050

ipl 190

CMS..VERSION 3 LEVEL 0

printf aaa zzz

FILE NOT FOUND.

E(00003); T=0.06/0.34 12.27.00

logout

T=0.26/2.26 12.27.10

CP ENTRED, REQUEST, PLEASE.

CP

logout <----logout of virtual CP without holding the line

CONNECT= 00.01.24 VIRTCPU= 000.00.27 TOTCPU= 000.02.36

LOGOUT AT 12.27.18 ON 02/11/70

#

cp-67 logoff <----- 'real' CP-67 disconnect  
cp-67 online xdh65 qsyosu <----real CP identification message  
l cp67 <----reconnecting to virtual 67 machine  
ENTER PASSWORD:  
  
CP67 WILL RUN UNTIL 24:00  
FOR CMS UPDATES TYPE "PRINTF INFO MEMO" UNDER CMS  
FILES:- 01 RDR, NO PRT, NO PUN  
RECONNECT AT 12.30.21 ON 02/11/70  
CP  
  
12.27.56 q n  
12.28.03 OPERATOR - 009  
cp  
  
12.28.08 logout <----logging out the operator of virtual CP  
CONNECT= 00.18.05 VIRTCPU= 000.00.38 TOTCPU= 000.03.91  
LOGOUT AT 12.28.13 ON 02/11/70  
cp  
log <----logging out the virtual 67 machine  
CONNECT= 02.19.39 VIRTCPU= 001.08.54 TOTCPU= 004.23.83  
LOGOUT AT 12.32.14 ON 02/11/70  
  
cp-67 online xdh65 qsyosu

## Appendix D

### ----- SELECTIVE RELOCATING LOADER -----

The loader distributed with CP-67 will accept special control cards to allow selective skipping and loading from cards and tape. These cards control the module name to be skipped, the device address to load from and the printing or suppression of invalid cards.

1. To control skipping:

card column	1	2	6	11
	X	CTL	SKIP	name

where:

X is the control (12-2-9) punch,  
CTL is the control command,  
SKIP is the control function, and  
name is the module name to be skipped on the input device.

2. To control reading:

card column	1	2	6	10
	X	CTL	RDR	CCU

where:

X is the control (12-2-9) punch,  
CTL is the control command,  
RDR is the control function, and  
CCU is the device address for the loader to resume loading.

3. To control printing:

card column	1	2	6	10
	X	CTL	SINV PINV WTR	CCU

where:

X is the control (12-2-9) punch,  
CTL is the control command,  
SINV is to suppress the printing of invalid card, or  
PINV is to print invalid cards, and  
CCU is the device address for loadmap printing.

To create the selective loading tape, place the standard CP-67 nucleus (with or without loader) in 80-80 card image format on a tape using any utility such as OS/360 IEBGENER or the CPTGEN EXEC procedure. Note: The last card of the CP-67 deck placed on tape must be:

```
card column  1  2    17
              X  LDT  SAVENUC
```

where:

X is the control (12-2-9) punch,  
LDT is the control command, and  
SAVENUC is the name of the module to execute upon completion of loading.

The CP-67 nucleus saved on tape can, of course, contain modified or updated versions of some modules. Once the normal nucleus has been saved on tape, the following steps are taken to perform a selective load. Assume that 2 modules, CCWTRAN and DISPATCH are to be loaded from a newer card deck, skipped on the tape, but loaded with all the other modules on the tape. The card deck should have the following format:

```
9.  X CTL RDR CCU
8.  "DISPATCH TEXT" DECK
7.  X CTL RDR CCU
6.  X CTL SKIP DISPATCH
5.  "CCWTRAN TEXT" DECK
4.  X CTL RDR CCU
3.  X CTL SKIP CCWTRAN
2.  X CTL SINV
1.  "RELDXXXX LOADER"
```

where:

- 1 is the relocating loader for the desired printer (xxx) address for the load map.
- 2 is to suppress printing while skipping the desired decks.
- 3 is to prime the loader to skip CCWTRAN.

- 4 is to commence loading from the tape mounted at CCU.
- 5 is the newer version of the CCWTRAN module that is to be loaded instead of the one on tape.
- 6 is to prime the loader to skip DISPATCH.
- 7 is to resume loading from the tape mounted at CCU.
- 8 is the newer version of the DISPATCH module that is to be loaded instead of the one on tape.
- 9 is to complete the loading from the tape mounted at CCU.

Place the card deck in an available card reader and IPL that deck.

The loading process will commence (make sure the tape and printer are ready and the timer is OFF). The loading process is complete when the message "DISK LOAD OK" is printed on the 1052. The SAVECP program will write the nucleus on drive 230 unless otherwise specified by the SYSRES macro in the REALIO generation.

Note: If a loader is the first module on the tape, an unresolved symbol may occur in the load map. This can be ignored. It is advantageous to have a loader at the front of the tape since then the tape is directly IPLable to load (without selection) the normal nucleus following it on tape.

Obviously, for selective loading, the decks must be in the card reader in the order in which they appear on tape. If new modules are to be added, they can be placed with replacement decks. For instance, if it was desired to add a module "TEST TEXT" the deck could be placed between "CCWTRAN TEXT" DECK (last card) and the control card (cards 5 and 6).

Selective loading is a useful but sometimes awkward way of changing the nucleus. The best and easiest method is to create iplable tapes using the CPTGEN EXEC procedure. Make one tape that is the master backup system. When modules are changed, create a new tape using CPTGEN and ipl that to write a new nucleus. The CP-67 nucleus can be rewritten while the system is running from a virtual machine if that virtual machine is given write access to the system disk. A re-ipl of the disk after shutdown will load the new nucleus.

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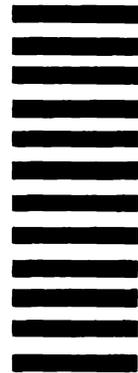
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