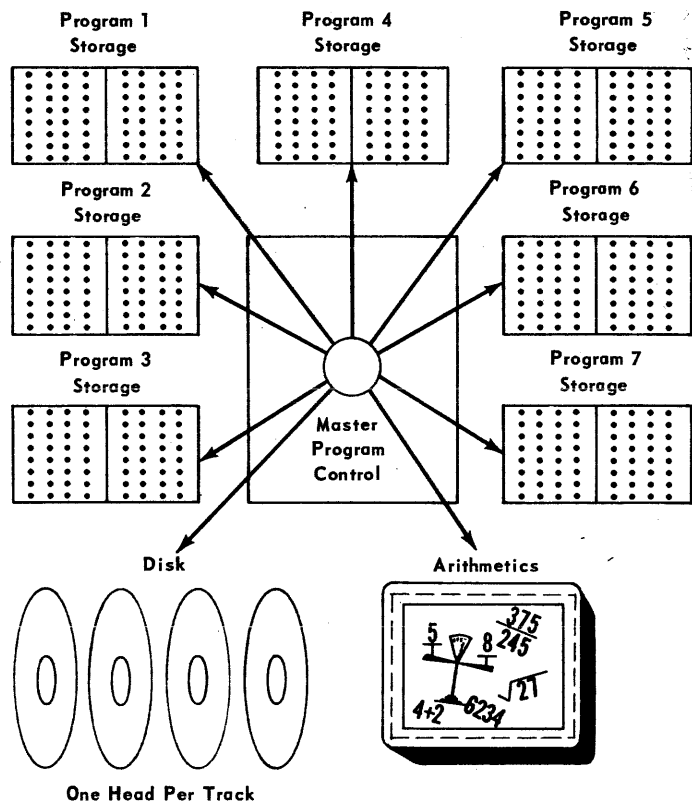




Burroughs

B 2500 and B 3500



SIMULTANEITY

MASTER CONTROL PROGRAMS
INFORMATION MANUAL

Burroughs

B 2500 AND B 3500

MASTER CONTROL PROGRAMS

INFORMATION MANUAL

APRIL 15, 1969



Burroughs Corporation

Detroit, Michigan 48232

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AA 924959 AA 47684

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**This printing incorporates the information
released under the following PCN
1031218-001, February 20, 1969**

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MCP - GENERAL DESCRIPTION.

DESCRIPTION OF THE B2500/3500 MASTER CONTROL PROGRAMS.

INTRODUCTION

A MASTER CONTROL PROGRAM (MCP) IS A MODULAR SUPERVISORY COMPUTER PROGRAM WHICH TAKES OVER REPETITIVE FUNCTIONS (SOME BEING LOGICALLY COMPLEX) TO MAKE COMPUTER PROGRAMMERS AND COMPUTER OPERATIONS MORE PRODUCTIVE AND COMPUTER OPERATIONS MORE EFFICIENT.

THE B2500/3500 MCP IS PROVIDED IN AN MCP LIBRARY IN THE VERSIONS LISTED BELOW, FROM WHICH THE REQUIRED ONE MAY BE SELECTED.

CP14S	14-CHANNEL, STANDARD PERIPHERAL EQUIPMENT
CP20S	20-CHANNEL, STANDARD PERIPHERAL EQUIPMENT
CP20M	20-CHANNEL, MICR PERIPHERALS
CP14D	14-CHANNEL, DATA COMMUNICATIONS PERIPHERALS
CP20D	20-CHANNEL, DATA COMMUNICATIONS PERIPHERALS
CP20C	20-CHANNEL, DATA COMM + MICR PERIPHERALS
CP40D	40-CHANNEL, DATA COMMUNICATIONS PERIPHERALS
CP56D	56-CHANNEL, DATA COMMUNICATIONS PERIPHERALS
CP56C	56-CHANNEL DATA COMM + MICR PERIPHERALS

ALL VERSIONS OF MCP HANDLE THE PRIMARY FUNCTIONS OF CONTROL PROGRAMS: LOADING, INTERRUPTS, I/O CONTROL, SELECTION AND INITIATION OF PROGRAMS I/O ERROR CONDITIONS, SYSTEM LOG, STORAGE ALLOCATION, OVERLAY, AND MULTIPROGRAMMING.

STANDARD PERIPHERAL EQUIPMENT INCLUDES ON-SITE PERIPHERALS FROM THE FOLLOWING LIST:

CARD READER	SYSTEMS MEMORY
LINE PRINTER	1 DISK SUB-SYSTEM
CARD PUNCH	PAPER TAPE READER
MAGNETIC TAPE	PAPER TAPE PUNCH.
CONSOLE KEYBOARD/MESSAGE PRINTER	

ONE DISK SUB-SYSTEM CONSISTS OF ONE OR MORE DISK FILE CONTROLS, WITH

MCP - GENERAL DESCRIPTION.

THE RESTRICTION THAT TWO OR MORE DISK FILE CONTROLS REQUIRE A DISK FILE EXCHANGE.

THE FOLLOWING TABLE FURNISHES THE TYPE OF PERIPHERALS, THE NUMBER OF DEVICES, THE NUMBER OF CONCURRENT PROGRAMS, AND THE NUMBER OF CONCURRENT I/O REQUESTS HANDLED BY EACH CONTROL SYSTEM:

MCP VERSION:	TYPE PERIPHERALS:	# DEVICES:	# PROGRAMS:	QUEUE SIZE	
CP14S	STANDARD	20	4	20	
CP20S	STANDARD	40	10	40	
CP20M	STANDARD MICR	40	10	40	
CP14D	STANDARD DATA COMM SINGLE LINE	20	4+	20	
CP20D	STANDARD DATA COMM SINGLE LINE	40	10+	40	
CP20C	STANDARD DATA COMM SINGLE LINE MICR	40	10+	40	* * * *
CP40D	STANDARD DATA COMM MULTI-LINE	40	10+	40	
CP56D	STANDARD DATA COMM MULTI-LINE	80	15+	80	
CP56C	STANDARD DATA COMM MULTI-LINE	80	15+	80	

MCP - GENERAL DESCRIPTION,

MICR

THE CORE REQUIREMENTS OF THE ABOVE LISTED MCP-S ARE:

MCP VERSION	CORE IN BYTES
CP14S	13000
CP20S	15000
CP20M	19000
CP14D	20500
CP20D	22500
CP20C	26500
CP40D	23000
CP56D	30000
CP56C	34000

1000 BYTES ADDITIONAL CORE IS REQUIRED BY EACH OF THE ABOVE LISTED MCP-S, IF THE CORE TO CORE TRANSFER FUNCTION IS TO BE USED. THE NON-OVERLAYABLE TRACE REQUIRES 15000 BYTES OF ADDITIONAL CORE.

HARDWARE REQUIREMENTS OF THE MCP.

THE USE OF THE MCP REQUIRES THE PRESENCE OF CERTAIN MINIMUM PERIPHERAL EQUIPMENT, WHICH IS DESCRIBED BELOW. THIS EQUIPMENT DOES NOT INCLUDE THE NEEDS OF ANY OBJECT PROGRAM.

HARDWARE TYPE -----	QUANTITY -----	REMARKS -----
MAGNETIC TAPE	1	FOR LOADING
KEYBOARD/SPO	1	FOR OPERATOR COMMUNICATION
CARD OR PAPER TAPE READER	1	FOR CONTROL INPUT
DISK UNIT OR SYSTEM	1	FOR AUXILIARY STORAGE. THE

MCP - GENERAL DESCRIPTION.

MEMORY

SYSTEM MEMORY IS A MAGNETIC DISK DEVICE CAPABLE OF STORING UP TO TWO-MILLION CHARACTERS OF INFORMATION. THIS INFORMATION MAY BE RETAINED INDEFINITELY WITHOUT REGENERATION. THE PRIMARY USE OF SYSTEM MEMORY IS TO HOUSE THE SOFTWARE PACKAGE AND THE USER PROGRAM LIBRARY; IN ADDITION, IT MAY BE USED FOR ANY TYPE OF WORKING OR GENERAL STORAGE FUNCTION.

THE DISK.

AS COULD BE SEEN IN THE PRECEDING SECTION, A DISK FILE OR SYSTEM MEMORY IS A PREREQUISITE TO THE USE OF THE MCP.

THE DISK FILE IS USED BY THE MCP AS AN AUXILIARY STORAGE AREA AND THEREFORE IT IS NECESSARY TO BE ACQUAINTED WITH ITS ORGANIZATION. THE DISK STORAGE IS DIVIDED INTO TWO CATEGORIES:

1. SYSTEM DISK,
2. USERS DISK.

THE SYSTEM DISK IS RESERVED FOR THE USE OF THE DISK DIRECTORY, THE AVAILABLE DISK TABLE AND THE MCP.

THE USER-S DISK IS USED TO STORE DATA FILES, PROGRAM FILES, AND THE LOG FILE, INCLUDING THE PROBLEM-ORIENTED COMPILERS (FORTRAN, COBOL). THE USERS DISK IS ALSO DIVIDED INTO TWO CATEGORIES:

1. PERMANENT FILES,
2. TEMPORARY FILES.

A PERMANENT FILE IS ONE LISTED IN THE DISK DIRECTORY.

A TEMPORARY FILE IS ONE THAT IS DECLARED BY THE PROGRAM USING IT, AND IS NOT MAINTAINED IN THE DISK DIRECTORY .

A PROGRAM CAN CAUSE ITS TEMPORARY FILE TO BE MADE PERMANENT BY

MCP - GENERAL DESCRIPTION.

PERFORMING A CLOSE WITH LOCK OR A CLOSE WITH RELEASE ON IT.
 NORMALLY PROGRAM FILES (I.E., LIBRARY PROGRAMS) ARE PERMANENT FILES.

FORMAT OF FILES ON DISK.

EVERY PROGRAM MUST SPECIFY THE MAXIMUM AMOUNT OF DISK REQUIRED FOR A PARTICULAR FILE. THE NEED FOR THIS SPECIFICATION IS EVIDENT FROM THE FACT THAT A SIZE FACTOR IS NEEDED WHEN RESERVING DISK SPACE. TO RESERVE A SINGLE LARGE AREA OF DISK WOULD BE IN SOME CASES IMPRACTICABLE. FOR EXAMPLE SOME FILES ARE INITIALLY SMALL BUT MAY GROW LARGE; TO RESERVE AN AREA OF MAXIMUM SIZE IN A CASE SUCH AS THIS WOULD RESULT IN THE MAJOR PART OF THE AREA, AT LEAST INITIALLY, LYING IDLE. ALSO, IF DISK WERE TO BECOME "CHECKERBOARDED", DUE TO THE SEQUENCE IN WHICH FILES WERE ASSIGNED AND RETURNED, A NEW AREA FOR A LARGE FILE MIGHT BE AVAILABLE, BUT NOT CONTIGUOUSLY. TO RESERVE A LARGE AREA EXPLICITLY WOULD REQUIRE THAT EXISTING FILES FIRST BE REARRANGED. TO AVOID SUCH SITUATIONS, THE MCP ALLOWS A SINGLE FILE TO OCCUPY FROM ONE TO TWENTY SEPARATE AREAS ON DISK. THE PROGRAM THAT ESTABLISHES A FILE SPECIFIES THE NUMBER OF AREAS IN THE FILE AND THE SIZE OF THE AREAS IN THE FOLLOWING WAY:

1. THE NUMBER OF LOGICAL RECORDS PER AREA,
2. THE NUMBER OF AREAS.

THE SIZE OF THE DISK FILE IS BROKEN INTO TWO DIMENSIONS SO THAT THE MCP WILL ALLOCATE DISK SPACE ONLY AS REQUIRED DURING THE CREATION OF THE FILE OR THE LENGTHENING OF AN EXISTING FILE.

FOR EXAMPLE, DISK SPACE IS REQUIRED FOR A FILE THAT WOULD EVENTUALLY GROW TO A MAXIMUM OF 10,000 RECORDS. THE FILE MIGHT BE DECLARED IN THE FOLLOWING MANNER:

NUMBER OF RECORDS PER AREA = 500
 NUMBER OF AREAS = 20

MCP WOULD ALLOCATE DISK SPACE IN PIECES LARGE ENOUGH TO CONTAIN 500 LOGICAL RECORDS, BUT THESE PIECES WOULD BE ALLOCATED ONLY AS NEEDED.

EACH AREA IS MADE UP OF ONE OR MORE 100 CHARACTER DISK SEGMENTS. EACH DISK SEGMENT HAS AN ABSOLUTE ADDRESS, AND THE MCP CAN READ OR WRITE ONE OR MORE SEGMENTS WITH ONE I/O OPERATION.

MCP - GENERAL DESCRIPTION.

THE FORMAT OF ALL FILES ON DISK IS BASICALLY THE SAME, A FILE ON DISK CONSISTS OF A NUMBER OF PHYSICAL RECORDS, EACH PHYSICAL RECORD STARTS AT THE BEGINNING OF A DISK SEGMENT.

A PHYSICAL RECORD CONSISTS OF ONE OR MORE LOGICAL RECORDS, IF THE PHYSICAL RECORDS IN A FILE CONSIST OF MORE THAN ONE LOGICAL RECORD, THE FILE IS TERMED "BLOCKED"; IF THE PHYSICAL RECORDS IN A FILE ARE EQUAL IN LENGTH TO THE LOGICAL RECORDS (I.E., ONE LOGICAL RECORD PER PHYSICAL RECORD), THE FILE IS TERMED "UNBLOCKED".

THE PHYSICAL RECORD IS AN MCP CONCEPT, WHEREAS THE LOGICAL RECORD IS A B2500/3500 OBJECT PROGRAM CONCEPT, CONSEQUENTLY, THE ACTUAL PHYSICAL RECORDS ARE READ OR WRITTEN BY THE MCP; THE B2500/3500 OBJECT PROGRAM IS CONCERNED WITH LOGICAL RECORDS ONLY.

CAPACITY OF DISK FILES.

*

THE OBJECT PROGRAM MAY DECLARE A MAXIMUM OF 20 AREAS. MAX. SIZE OF ONE AREA IS 999999 SEGMENTS. THIS ALLOWS 19,999,980 RECORDS, IF THE SIZE OF THE RECORD IS EQUAL TO THE SIZE OF ONE SEGMENT, I.E., 100 CHARACTERS.

*

*

*

LOGICAL RECORDS.

TO A B2500/3500 OBJECT PROGRAM, A FILE IS A CONTIGUOUS STRING OF LOGICAL RECORDS. THE CONTIGUOUSNESS OF THIS STRING IS BASED ON THE CONTINUITY OF THE ADDRESSES OF THE LOGICAL RECORDS IN THE STRING, THE NUMBER OF AREAS IN WHICH THE FILE EXISTS DOES NOT IN ANY WAY AFFECT THE WAY IT IS ADDRESSED BY A PROGRAM.

EACH LOGICAL RECORD IN A FILE ON DISK HAS A RELATIVE ADDRESS BASED ON THE POSITION OF THE RECORD WITH RESPECT TO THE BEGINNING OF THE FILE. FILES ARE REFERENCED BY NAME (I.E., DISK FILE IDENTIFICATION); RECORDS WITHIN A FILE ARE ADDRESSED ONLY THROUGH USE OF RELATIVE ADDRESSES. THE FIRST RECORD IN A FILE HAS RELATIVE ADDRESS ONE (1).

THE SYSTEM DISK.

MCP - GENERAL DESCRIPTION.

THE SYSTEM DISK IS LOCATED IN THE FIRST MODULE OF DISK, OR THE SYSTEM MEMORY, STARTING AT DISK SEGMENT 0. ONE SEGMENT OF DISK IS 100 CHARACTERS LONG AND ONE DISK MODULE CONTAINS 100,000 SEGMENTS.

A. DISK DIRECTORY.

THE MCP MAINTAINS, ON DISK, A DISK DIRECTORY, WHICH PROVIDES INFORMATION ABOUT ALL PERMANENT FILES ON DISK. THE DISK DIRECTORY IS COMPOSED OF ONE OR MORE "DIRECTORY SECTIONS", DEPENDING UPON THE NUMBER OF FILES ON DISK.

EACH DIRECTORY SECTION IS COMPOSED OF 17 SEGMENTS AND CAN CONTAIN THE DIRECTORY INFORMATION FOR AS MANY AS 16 FILES.

THE FIRST SEGMENT OF A DIRECTORY SECTION CONTAINS THE FILE IDENTIFICATIONS OF EACH FILE DEFINED IN THAT SECTION. THE REMAINING 16 SEGMENTS ARE REFERRED TO AS FILE HEADERS. THERE IS ONE FILE HEADER FOR EACH FILE DEFINED IN THE SECTION. EACH FILE HEADER ALSO SPECIFIES THE NUMBER OF AREAS ASSIGNED TO THE FILE, THE SIZE OF THE AREAS, AND THE ABSOLUTE DISK ADDRESS OF EACH AREA.

WHEN A PROGRAM IS USING A FILE, THE FILE HEADER FOR THAT FILE IS READ INTO CORE AND REMAINS THERE WHILE THE FILE IS BEING USED.

B. AVAILABLE DISK TABLE.

THE AVAILABLE DISK TABLE CONTAINS AN ENTRY FOR EACH AREA OF AVAILABLE DISK STORAGE. AS NEW AREAS OF DISK SPACE ARE REQUIRED, THE NECESSARY SPACE IS REMOVED FROM THE AVAILABLE LIST AND ASSIGNED TO THE FILE REQUIRING STORAGE. CONVERSELY, AS A FILE IS REMOVED FROM THE DISK, THE STORAGE ASSIGNED TO THAT FILE IS ADDED TO THE AVAILABLE LIST.

THE AVAILABLE LIST IS MAINTAINED IN AN ASCENDING SEQUENCE OF DISK ADDRESSES. WHEN SPACE IS REMOVED FROM THE AVAILABLE LIST FOR ASSIGNMENT TO A FILE, THE PARTICULAR SPACE CHOSEN IS THE FIRST PORTION IN THE AVAILABLE LIST WHICH IS LARGE ENOUGH. CONSEQUENTLY, THE AREAS DECLARED FOR A FILE MAY OR MAY NOT BE CONTIGUOUS.

MCP - GENERAL DESCRIPTION.

THE TABLE IS COMPOSED OF ONE OR MORE DISK SEGMENTS,
DEPENDING UPON THE NUMBER OF AVAILABLE AREAS. EACH SEGMENT CONTAINS
FROM 0 TO 12 ENTRIES. EACH ENTRY SPECIFIES THE ABSOLUTE ADDRESS
AND SIZE OF AN AVAILABLE DISK AREA.

MCP - GENERAL DESCRIPTION,
--- - - - -THE STRUCTURE OF THE STANDARD MCP,
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THIS SECTION IS A DESCRIPTION OF THE STANDARD MCP. THE STANDARD MCP IS A PROGRAM MADE UP OF A NUMBER OF TABLES AND ROUTINES, INCLUDING CODING TO HANDLE THE VARIOUS INTERRUPTS.

THIS SECTION IS SUBDIVIDED INTO THE FOLLOWING PARTS:

1. THE MCP'S INFORMATION STORAGE SYSTEM.

THIS CONTAINS THE DESCRIPTION OF THE MCP TABLES AND OBJECT PROGRAM TABLES, WHERE THE INFORMATION USED BY MCP IN EXECUTING ITS FUNCTIONS IS STORED AND MAINTAINED.

2. LOADING.

3. INITIALIZATION OF THE SYSTEM.

4. SYSTEM SUPERVISORY FUNCTIONS.

INCLUDED UNDER THIS HEADING ARE: MCP STATUS (N-SECOND) ROUTINE; SCANNING FOR JOBS; THE PROCESSING OF CONTROL CARDS; PROGRAM SCHEDULING; PROGRAM PRIORITY; CORE ALLOCATION; INITIAL LOADING OF PROGRAMS.

5. PROGRAM SUPERVISORY FUNCTIONS.

INCLUDED HERE ARE: SEGMENTATION AND OVERLAY; DISK ALLOCATION; LOG AND TIME; END OF JOB PROCESSING; DEBUGGING AIDS.

6. I/O CONTROL - GENERAL.

7. PROCESSING OF I/O REQUESTS.

8. INDEPENDENT INTERRUPTS.

INCLUDES PROCESSOR INTERRUPTS; INTERVAL TIMER INTERRUPTS; I/O COMPLETE

MCP - GENERAL DESCRIPTION.

PROCESSING AND I/O ERROR PROCESSING.

9. A SHORT DESCRIPTION OF THE INDIVIDUAL MCP ROUTINES,

1. THE MCP-S INFORMATION STORAGE SYSTEM,

THE MCP MUST HAVE CERTAIN INFORMATION ABOUT THE OBJECT PROGRAMS IT IS RUNNING AND THE EQUIPMENT IT IS CONTROLLING. THIS INFORMATION IS STORED IN VARIOUS TABLES AND IS UPDATED DURING EXECUTION TIME.

FOLLOWING IS A BRIEF DESCRIPTION OF THE TABLES AND THEIR CONTENTS.

1A. TABLES MAINTAINED IN MCP.

1. JOB REFERENCE TABLE. (JRT).

THIS IS THE FIRST TABLE ENTERED AT THE TIME A REQUEST IS MADE TO RUN A PROGRAM. MOST OF THE INFORMATION THE MCP CONSIDERS WHEN DECIDING WHETHER IT CAN RUN A PROGRAM COMES FROM THIS TABLE.

A SKELETON ENTRY IS MADE IN THE JRT AT THE TIME THE MCP READS THE CONTROL CARD REQUESTING TO RUN A PROGRAM. THIS ENTRY CONTAINS THE FOLLOWING INFORMATION:

- A. PROGRAM IDENTIFICATION
- B. PRECEDENCE LINK
- C. PRIORITY

DURING LATER PHASES OF PROCESSING, THE FOLLOWING DATA ARE ENTERED IN THE TABLE:

- D. CORE MEMORY REQUIRED
- E. LINK TO SEGMENT DICTIONARY
- F. LINK TO JOB MIX TABLE
- G. STATUS CODE.

MCP - GENERAL DESCRIPTION.

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THERE IS ONE SUCH ENTRY CREATED FOR EACH PROGRAM REQUESTED.

2. JOB MIX TABLE. (MIX).

IN GENERAL, THIS TABLE CONTAINS INFORMATION ABOUT ALL USER PROGRAMS WHICH ARE IN PROCESS IN THE SYSTEM.

THE TABLE CONTAINS ONE ENTRY FOR EACH PROGRAM FURNISHING IDENTIFICATION, REGISTER SETTINGS WHILE THE PROGRAM IS INTERRUPTED, PROGRAM STATUS, AND PRIORITY LINKS.

THE MIX IS MAINTAINED IN PRIORITY SEQUENCE. CONSEQUENTLY, THE MCP NEED NOT INTERRUPT PRIORITY ONCE A PROGRAM IS STARTED, BECAUSE IT WILL FIND IT IN PRIORITY SEQUENCE.

THE MIX CONTAINS THE FOLLOWING INFORMATION:

- A. REINSTATE AND OVERLAY INFORMATION,
- B. NEXT INSTRUCTION REGISTER,
- C. BASE REGISTER,
- D. LIMIT REGISTER,
- E. COMPARE/OVERFLOW TOGGLE,
- F. EBCDIC/ASCII FLAG,
- G. IOQT INDEX OF REQUESTING PROGRAM,
- H. WAIT CODE,
- I. READY CODE.

THE DATA LISTED FROM B. THROUGH E. IS DEFINED AS REINSTATE CONTROL WORD.

3. THE I/O ASSIGNMENT TABLE (IOAT).

THERE IS ONE ENTRY IN THIS TABLE FOR EACH PERIPHERAL UNIT ON THE SYSTEM, AND ALL OF THE INFORMATION PERTINENT TO EACH UNIT IS MAINTAINED IN THIS TABLE.

MCP CREATES LINKS FROM THIS TABLE TO THE FILE INFORMATION BLOCK (FIB) IN THE OBJECT PROGRAM, TO THE I/O QUEUE TABLE AND TO THE MIX.

MCP - GENERAL DESCRIPTION.

CONTENTS OF THE IOAT:

- A. FILE IDENTIFICATION,
- B. LINK TO FILE INFORMATION BLOCK,
- C. PERIPHERAL UNIT TYPE,
- D. RECORDING MODE CODE,
- E. CHANNEL/UNIT NUMBERS,
- F. LINK TO MIX,
- G. I/O TRANSACTION COUNT,
- H. AVAILABILITY INDICATOR,
- I. LOCK-OUT INDICATOR,
- J. UNIT REWINDING INDICATOR,
- K. RECOVERY IN PROCESS INDICATOR,
- L. END OF FILE SENSED INDICATOR,
- M. WAIT INDICATOR,
- N. LABEL INDICATOR,
- O. SUBSTITUTION CODE,
- P. INPUT/OUTPUT CODE,
- Q. OPEN/CLOSE CODE,
- R. LINK TO I/O QUEUE TABLE.

4. THE I/O QUEUE TABLE (IOQT).

THIS TABLE CONTAINS AN ENTRY FOR EACH I/O CHANNEL, AN ENTRY FOR EACH I/O OPERATION IN PROCESS, AND AN ENTRY FOR EACH WAITING I/O REQUEST. THIS IS PRIMARILY A LINKED LIST, EACH I/O REQUEST IS LINKED TO ITS DESCRIPTOR, TO THE IOAT, TO THE MIX, AND TO THE NEXT I/O REQUEST. THERE IS ONE ENTRY FOR EACH CHANNEL AND ONE ENTRY FOR EACH I/O REQUEST.

THE IOQT CONSISTS OF TWO PARTS:

THE FIRST PART CONTAINS INFORMATION ABOUT EACH I/O CHANNEL. IN ESSENCE IT LINKS THE REQUESTS ON THE PARTICULAR CHANNEL.

THE SECOND PART CONTAINS INFORMATION ABOUT THE REQUESTS AND IT LINKS THE REQUESTS TO THE OTHER TABLES IN THE MCP. IT ALSO MAINTAINS CERTAIN INDICATORS, LIKE THE CONTROL STATE, KBD RESPONSE, ENABLE REQUEST, ETC.

5. SYSTEM ENVIRONMENT TABLE.

DESCRIBES CURRENT SYSTEM CONFIGURATION.

MCP - GENERAL DESCRIPTION,

6. AVAILABLE SPACE LIST

THE MCP KEEPS A LIST OF AVAILABLE CORE MEMORY SPACE FOR OBJECT PROGRAMS IN A LINKED LIST,

7. DISK DIRECTORY.

THERE IS ONE ENTRY FOR EACH DATA FILE AND PROGRAM FILE IN THE DISK DIRECTORY.

EACH ENTRY CONTAINS PROGRAM IDENTIFICATION, SIZE, AND NUMBER OF BLOCKS AND ADDRESS OF FIRST BLOCK.

8. MCP SEGMENT DICTIONARY

CONTAINS DISK ADDRESS, AND PRESENCE INDICATOR FOR THE PROGRAM SEGMENTS WHICH ARE NOT ALWAYS IN CORE.

9. SUPERVISORY PRINTER WORD DICTIONARY.

CONTAINS WORDS AND RELATED DATA TO ENABLE CONSTRUCTION OF OUTPUT MESSAGES.

10. I/O DESCRIPTOR TABLE.

CONTAINS CODED DATA TO PERMIT CONSTRUCTION OF I/O DESCRIPTORS BY THE MCP WHEN FILES ARE OPENED.

11. LOG MAINTENANCE FILE.

THE TABLE CONSISTS OF SEVERAL PARTS: 1. SCHEDULE RECORDS;
2. BOJ AND EOJ RECORDS;
3. FILE OPEN AND FILE CLOSE RECORDS;
4. IDLE AND HALT/LOAD RECORDS;

ONE SCHEDULE RECORD, BOJ RECORD AND EOJ RECORD IS WRITTEN FOR EVERY

MCP - GENERAL DESCRIPTION.

PROGRAM, AND ONE FILE OPEN AND ONE FILE CLOSE RECORD IS WRITTEN EVERY TIME A FILE IS OPENED OR CLOSED BY THE PROGRAM USING THESE FUNCTIONS. IDLE TIME RECORDS ARE WRITTEN AT THE END OF AN IDLE PERIOD, HALT/LOAD RECORDS AFTER A HALT/LOAD.

1B. TABLES IN THE OBJECT PROGRAM UNDER MCP CONTROL.

1. FILE INFORMATION BLOCK (FIB).

THE FILE INFORMATION BLOCK IS PART OF THE OBJECT PROGRAM, IS LOCATED IN THE OBJECT PROGRAM AREA AND DESCRIBES THE TYPE OF PERIPHERAL EQUIPMENT, THE NUMBER OF BUFFERS AND BUFFER ACCESS TECHNIQUES, AND THE NUMBER OF RECORDS PER BLOCK, ETC.

THERE IS ONE FILE INFORMATION BLOCK FOR EACH FILE.

2. PROGRAM PARAMETER BLOCK (PPB).

THE PROGRAM PARAMETER BLOCK IS GENERATED BY THE COMPILER OR ASSEMBLER DURING THE COMPILATION OR ASSEMBLY RUN.

IT CONTAINS THE FOLLOWING INFORMATION FOR USE OF THE MCP:

PROGRAM IDENTIFIER
 NUMBER OF SEGMENTS
 RELATIVE ADDRESS OF THE FIRST EXECUTABLE INSTRUCTION
 TOTAL CORE REQUIRED FOR THE PROGRAM
 CORE ADDRESS OF THE SEGMENT DICTIONARY.

3. SEGMENT DICTIONARY.

THERE IS A SEGMENT DICTIONARY WITH EACH PROGRAM WHICH USES SEGMENTS AND OVERLAYS, MCP ITSELF HAS A SEGMENT DICTIONARY.

THE SEGMENT DICTIONARY CONTAINS A COMMUNICATE ADDRESS TO THE OVERLAY ROUTINE, THE ADDRESS OF THE FIRST EXECUTABLE INSTRUCTION OF THE SEGMENT, AND THE ADDRESS OF THE SEGMENT IN CORE AND ON DISK.

MCP - GENERAL DESCRIPTION.

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THE SEGMENT DICTIONARIES OF THE OBJECT PROGRAMS ARE SET UP BY THE ASSEMBLERS AND COMPILERS AND MAINTAINED BY MCP DURING THE EXECUTION OF THE PROGRAM.

EVERY SEGMENT DICTIONARY HAS A HEADER ENTRY AND AN ENTRY FOR EACH PROGRAM SEGMENT, EACH 32 DIGITS IN LENGTH.

THE LAST 8 DIGITS OF THE PROGRAM PARAMETER BLOCK CONTAIN THE NUMBER OF FILES AND THE SIZE OF THE MAIN BLOCK.

4. THE FILE PARAMETER BLOCK (FPB).

THE FILE PARAMETER BLOCK IS USED BY THE MCP IN THE PROCESSING OF FILE (LABEL EQUATION) CARDS. IT CONTAINS THE FILE IDENTIFIER, BY WHICH THE SYSTEM IDENTIFIES THE FILE, THE FILE NAME, BY WHICH THE PROGRAM IDENTIFIES THE FILE, AND CODES RELATING TO THE OPTIONAL OUTPUT MEDIA.

2. LOADING OF THE SYSTEM.

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TWO PREREQUISITES TO THE OPERATION OF THE B2500/3500 MCP ARE:

THE MCP MUST BE ON DISK AND

THE DISK DIRECTORY MUST BE ON DISK.

THE SYSTEM LOADER IS USED TO ESTABLISH THESE CONDITIONS. THERE ARE TWO DIFFERENT SYSTEM LOADERS, DESIGNED TO PERFORM THE LOADING OPERATION UNDER DIFFERENT CONDITIONS.

1. THE "COLD START ROUTINE" SYSTEM LOADER IS USED WHEN

A. NEITHER AN MCP, NOR A DISK DIRECTORY EXISTS ON DISK, OR

B. IT IS DESIRABLE TO WIPE OUT THE EXISTING DISK DIRECTORY, OR

MCP - GENERAL DESCRIPTION.

C. WHEN A DIFFERENT VERSION OF THE MCP IS TO BE LOADED.

2. IF THE MCP AND THE DISK DIRECTORY ARE ALREADY ON DISK, AND ONLY THE MCP IS TO BE REPLACED BY ANOTHER VERSION OF THE MCP, THEN ONE OF TWO SIMPLER SYSTEM LOADERS SHOULD BE USED. ("MCPLDR" OR "DKDKLD",)

"MCPLDR" SHOULD BE USED WHEN THE MCP TO BE LOADED IS ON TAPE, "DKDKLD" WHEN THE NEW MCP IS ON DISK.

IT IS NOT POSSIBLE TO CHANGE THE CHANNEL CONFIGURATION OF THE SYSTEM WITH "MCPLDR" OR "DKDKLD". FOR EXAMPLE, A 14 CHANNEL MCP MAY NOT BE LOADED IF THE SYSTEM WAS SET UP AT COLD START TIME WITH A 20 CHANNEL MCP.

BOTH SYSTEM LOADERS CONSIST ESSENTIALLY OF TWO PARTS:

1. THE MCP LOADER, AND
2. THE SYSTEM LOADER CONTROL DECK.

THE MCP LOADER IS SUPPLIED ON PUNCHED CARDS FOR BOTH VERSIONS. TO SPEED UP THE "COLD START" LOADING, THE "COLD START" (CSTRT) PROGRAM IS AVAILABLE ON THE "SYSTEM" TAPE, AND ONLY A MUCH SMALLER PROGRAM, THE TAPESTART (TSTRT) CARD DECK AND THE SYSTEM LOADER CONTROL DECK NEED TO BE READ FROM THE CARD READER. *

THE FUNCTION OF THE MCP LOADER IS TO LOCATE THE SYSTEM TAPE, READ THE REQUIRED MCP VERSION FROM THE SYSTEM TAPE AND WRITE IT INTO THE RESERVED AREA AT THE BEGINNING OF THE DISK. ("DKDKLD" FINDS THE REQUIRED MCP VERSION BY SCANNING THE DISK DIRECTORY.) *

THE SYSTEM TAPE IS A LIBRARY TAPE NAMED "SYSTEM", THIS TAPE NORMALLY CONTAINS, IN ADDITION TO THE VERSIONS OF THE MCP, THE R2500/3500 SYSTEM PROGRAMS AND ANY OTHER PROGRAMS AS MAY BE DESIGNATED BY THE USER. *

THE INFORMATION REGARDING THE LOCATION OF THE SYSTEM TAPE AND THE PROGRAM NAME OF THE REQUESTED MCP VERSION ARE COMMUNICATED TO THE MCP LOADER VIA CONTROL CARDS IN THE SYSTEM LOADER DECK. *

SINCE THE SIMPLE SYSTEM LOADER DOES NOTHING MORE, THE SYSTEM LOADER

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CONTROL DECK OF THE "MCPLDR" VERSION CONSISTS OF THE FOLLOWING CARD(S):

- 1, SYSTEM TAPE SPECIFIER CARD, (OPTIONAL)
- 2, MCP SPECIFIER CARD, (OPTIONAL)
- 3, STOP CARD,

THE SYSTEM LOADER CONTROL DECK OF THE "DKDKLD" VERSION DOES NOT REQUIRE THE SYSTEM TAPE SPECIFIER CARD.

THE COLD START ROUTINE, IN ADDITION TO THE ABOVE, CONSTRUCTS THE INITIAL DISK DIRECTORY, INITIALIZES THE CURRENT DATE FIELD AND "OPTION" CODES, AND HANDLES THE RESERVING OF DISK FOR DATA AND PROGRAM STORAGE. THIS IS REQUIRED, BECAUSE THE DISK DIRECTORY IS CONSIDERED TO BE A PERMANENT RECORD ON DISK. WHEN DIRECTORY INFORMATION IS NEEDED, THE MCP SEEKS THE INFORMATION, INITIALLY BY READING THE FIRST SEGMENT OF THE FIRST SECTION OF THE DIRECTORY. CONSEQUENTLY, THIS FIRST SECTION MUST BE ON DISK TO BE READ. THE SPECIAL ROUTINE CREATES A DIRECTORY AND PLACES IT ON DISK FOR THE "COLD START"; THEREAFTER, THE DIRECTORY IS MAINTAINED BY THE MCP (I.E., THEREAFTER THE MCP MAKES ENTRIES IN THE DIRECTORY WHEN PERMANENT FILES ARE INITIALLY COMPLETED AND REMOVES ITEMS UPON NOTIFICATION.)

ACCORDINGLY, THE SYSTEM LOADER CONTROL DECK OF A "COLD START ROUTINE" CONSISTS OF REQUIRED AND OPTIONAL CARDS, AS LISTED BELOW:

- 1, SYSTEM TAPE SPECIFIER CARD,
- 2, DATE CARD (OPTIONAL),
- 3, MCP SPECIFIER CARD, SHOWING THE <P-N> OF THE PARTICULAR MCP VERSION TO BE USED,
- 4, CHANNEL CARDS, ONE CARD MUST BE INCLUDED FOR EACH CHANNEL OR CHANNEL EXCHANGE ON THE SYSTEM,
- 5, UNIT CARDS, ONE CARD MUST BE INCLUDED FOR EACH PERIPHERAL UNIT WHICH IS TO BE HANDLED BY THE SYSTEM,
- 6, DISK SPECIFICATION CARDS, ONE OR MORE CARDS, AS REQUIRED, MUST BE INCLUDED TO SPECIFY THE CONFIGURATION OF DISK TO BE MAINTAINED BY THE SYSTEM. NOTE THAT ONE DISK OR SYSTEMS MEMORY MUST BE INCLUDED WHICH IS

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ASSIGNED ELECTRONICS UNIT ZERO (0), A PORTION OF THIS FIRST DISK OR SYSTEMS MEMORY IS USED TO MAINTAIN THE RUNNING MCP AND FOR DISK STORAGE DIRECTORIES AND DATA.

7. LOAD CARD (OPTIONAL).
8. PARAMETER AND OPTION CARDS.
9. "INSTALLATION LABEL" FORMAT CARD (OPTIONAL). *
10. FILE CARD GROUPS IF ANY ARE TO BE INCLUDED.
11. THE STOP CARD.

THE SYSTEM LOADER CONTROL DECK MUST BE FOLLOWED BY A DECK OF PROGRAM CONTROL CARDS FURNISHING PARAMETRIC INFORMATION TO THE MCP.

THE SYSTEM LOADER GENERATES ITS OWN ERROR MESSAGES IF ERROR CONDITIONS ARE ENCOUNTERED DURING EXECUTION OF THE LOAD ROUTINE.

IT SHOULD BE NOTED, THAT OTHER PROGRAMS, COMPILERS AND FILES MAY BE LOADED INTO THE SYSTEM DYNAMICALLY VIA NORMAL LOAD CARDS (SEE SECTION "CONTROL INFORMATION"), AND ONLY THOSE REQUIRED AT START-UP TIME FOR OPERATION NEED BE LOADED WITH THE SYSTEM LOADER.

IF ONE OF THE COMPILERS MAY NOT BE REQUIRED INITIALLY, IT NEED NOT BE LOADED UNTIL JUST PRIOR TO SCHEDULING THE PARTICULAR COMPILER RUN.

THE WARM START ("WSTRT") PROGRAM SERVES TO ALLOW A NEW SPECIFICATION OF THE DISK ELECTRONICS UNITS AND THEIR ADDRESS RANGES, AND TO CHANGE THE CHANNEL ASSIGNMENTS OF THE SYSTEM WITHIN THE LIMITS OF THE OPERATING MCP. IT ALSO ALLOWS "INSTALLATION LABEL" DEFINITIONS TO BE CHANGED. THE "WSTRT" DOES NOT DISTURB THE DISK DIRECTORY, AND DOES NOT LOAD ANOTHER MCP.

THE SAME CONTROL DECK MAY BE USED AS WITH THE COLD START ROUTINE. ANY CARDS NOT APPLICABLE TO "WSTRT" ARE DISREGARDED.

INSTALLATIONS, IN WHICH MULTIPLE B3500 SYSTEMS (EACH WITH ITS OWN MCP) *

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AND DISK TABLES) ARE OPERATING IN A COMMON DISK SUBSYSTEM, HAVE THE CAPABILITY TO LOAD THE MCP TO ANY ELECTRONICS UNIT IN THE SUBSYSTEM. EACH PROCESSOR HAS ONLY ACCESS TO ITS OWN MCP-S DISK TABLES AND THE MULTIPLE PROCESSORS CAN ONLY COMMUNICATE WITH EACH OTHER VIA DISK FILES WHICH ARE PREDEFINED FOR ALL PROCESSORS AT COLD START TIME. THIS FEATURE IS CALLED "FLOATABLE MCP DISK RESIDENCE", AND OPERATING DETAILS ARE GIVEN IN THE "SYSTEM LOADER" SECTION OF THIS MANUAL.

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THE CONTENTS AND FORMAT OF THE SYSTEM CONTROL DECK AND THE ERROR MESSAGES GENERATED BY THE SYSTEM LOADER ARE DESCRIBED IN THE "SYSTEM LOADER" SECTION, THE PROGRAM CONTROL CARDS IN THE "CONTROL INFORMATION" SECTION OF THIS MANUAL.

3. INITIALIZATION.

INITIAL OPERATIONS CALL THE INITIALIZE ROUTINE INTO ACTION. THIS ROUTINE IS EXECUTED ONCE AFTER EVERY HALT/LOAD OPERATION.

THE ROUTINE READS FROM DISK INTO CORE THE INFORMATION WHICH WAS ENTERED INTO THE SYSTEM THROUGH THE SYSTEM CONTROL DECK AND STORED ON DISK BY THE COLD START ROUTINE. THIS INFORMATION IS PLACED IN VARIABLES. THE ROUTINE INITIALIZES AND UPDATES THE TABLES USED BY MCP (JRT,IGAT) AND PERFORMS THE FIRST ORGANIZATION AND CLASSIFICATION OF CORE STORAGE. IT ALSO RECREATES THE AVAILABLE DISK TABLE.

AFTER THESE OPERATIONS, THE MCP PRINTS ON THE SPO THE HALT/LOAD MESSAGES AND LISTS ALL THE PROGRAMS WHICH WERE DISCONTINUED DUE TO THE HALT/LOAD OPERATION. THE TEXT OF THESE MESSAGES IS DESCRIBED IN THE "SPO OUTPUT MESSAGES SECTION" OF THIS MANUAL.

DURING INITIALIZATION, THE FIELD USED TO MAINTAIN THE READY OR NOT READY STATUS OF THE PERIPHERAL UNITS IS SET TO INDICATE THAT ALL UNITS ARE IN NOT READY STATUS. THE FIRST EXECUTION OF THE N-SECOND ROUTINE SETS THE INDICATORS PROPERLY.

NEXT THE ROUTINE EXAMINES THE MCP VERSION TO SEE IF THE ONE IN CORE IS THE MICR MCP, THE COMBINED MCP, OR THE DC MCP. IF IT FINDS ANY OF THE ABOVE MENTIONED MCP VERSIONS IN CORE, IT CALLS IN THE RESPECTIVE SEGMENTS OF THE MCP AND MODIFIES THE MEMORY AVAILABILITY LIST BY THE AMOUNT OF CORE REQUIRED BY THE ADDITIONAL MCP SEGMENTS.

MCP - GENERAL DESCRIPTION.

3A. MCP CLASSIFICATION AND ORGANIZATION OF CORE STORAGE.

IT IS NECESSARY AT THIS POINT TO DISCUSS THE CLASSIFICATION AND ORGANIZATION OF THE CORE STORAGE, SINCE THE FIRST STEPS IN THIS RESPECT ARE TAKEN BY THE INITIALIZE ROUTINE.

B2500/3500 PROGRAMS ARE INDEPENDENT OF ABSOLUTE ADDRESS AND CONSEQUENTLY NOT RESTRICTED TO PARTICULAR AREAS OF CORE. IT IS EVIDENT, THAT IF CORE STORAGE IS TO BE PUT TO USE EFFICIENTLY, IT MUST BE CLASSIFIED AND ORGANIZED. BASICALLY, STORAGE IS ORGANIZED THROUGH THE USE OF "MEMORY LINKS".

3B. NON-OVERLAYABLE STORAGE.

THERE IS A NEED FOR CERTAIN INFORMATION TO REMAIN IN CORE AT ALL TIMES. FOR EXAMPLE THE MCP HAS ROUTINES AND TABLES THAT MUST FREQUENTLY BE USED WHEN HANDLING INTERRUPT CONDITIONS AND OTHER CONTROL FUNCTIONS; THE SPACE THAT WOULD BE MOMENTARILY GAINED BY OVERLAYING SUCH INFORMATION WOULD NOT BE WORTH THE TIME REQUIRED TO MAKE THE INFORMATION PRESENT WHEN NEEDED AGAIN.

THERE IS ALSO A NEED FOR CERTAIN OBJECT PROGRAM INFORMATION TO REMAIN IN FIXED LOCATIONS WHILE A PROGRAM IS BEING PROCESSED. THIS REQUIREMENT HOLDS FOR ALL INFORMATION WHICH WILL BE REFERENCED BY THE MCP THROUGH THE USE OF ABSOLUTE ADDRESSES. FOR EXAMPLE, CONTROL FIELDS WHICH CONTAIN ABSOLUTE ADDRESSES OF PROGRAM SEGMENTS.

THE MCP CLASSIFIES CORE AREAS CONTAINING INFORMATION WHICH MUST REMAIN IN PLACE AS NON-OVERLAYABLE STORAGE.

3C. OVERLAYABLE STORAGE.

IT IS OFTEN THE CASE, THAT ALL INFORMATION PERTAINING TO A PROGRAM CANNOT BE IN CORE AT THE SAME TIME. THIS IS MOST OFTEN THE CASE WHEN PROGRAMMING FOR OPERATING SYSTEMS WITH LESS THAN MAXIMUM CORE, HOWEVER, THE MAJORITY OF INFORMATION RELATED TO OBJECT PROGRAMS, AND MOST INFORMATION IN THE MCP, MAY BE USED RELATIVELY INFREQUENTLY. IN REGARD

MCP - GENERAL DESCRIPTION.

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TO SUCH INFORMATION AS THIS, THERE IS ONLY ONE MAJOR FACTOR DETERMINING ITS NECESSITY TO BE PRESENT IN CORE -- IT MUST BE PRESENT WHEN NEEDED.

3D. OVERLAYABLE PROGRAM SEGMENT AREAS.

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8 2500/3500 PROGRAMS ARE ALWAYS STORED ON DISK DURING THE TIME THEY ARE PROCESSING. INDIVIDUAL PROGRAM SEGMENTS ARE READ INTO CORE AS THEY ARE NEEDED. IF THE AREA USED BY THE PROGRAM SEGMENT IS TO BE OVERLAID, THERE IS ALWAYS AN EXACT COPY OF IT ON DISK. THE MCP HAS ONLY TO MARK THE SEGMENT ABSENT IN APPROPRIATE PLACES, AND THE AREA IT OCCUPIED CAN BE USED FOR OTHER SEGMENTS. IF THE SEGMENT IS NEEDED AGAIN, IT CAN BE READ INTO CORE FROM DISK.

3E. AVAILABLE STORAGE.

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AVAILABLE STORAGE IS MERELY STORAGE CURRENTLY NOT IN USE. SUCH STORAGE CAN BE ASSIGNED AS NEEDED, TO PREVENT THE CORE STORAGE FROM BECOMING CHECKERBOARDED, WHEN A PROGRAM IN LOW CORE GOES TO END-OF-JOB, THOSE ABOVE IT ARE "PUSHED DOWN" IN CORE.

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3F. MEMORY LINKS.

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MEMORY LINKS ARE USED BY THE MCP TO KEEP TRACK OF THE ASSIGNMENT OF CORE AREAS. THERE IS AN AVAILABLE MEMORY LINK IN EVERY UNASSIGNED AREA. A MEMORY LINK FOR AVAILABLE STORAGE OCCUPIES TWO FIELDS. THESE FIELDS PROVIDE THE FOLLOWING INFORMATION:

1. IT SPECIFIES THAT THE AREA IS AVAILABLE.
2. IT SPECIFIES THE SIZE OF THE AREA.
3. IT PROVIDES THE ADDRESS OF THE FOLLOWING AVAILABLE AREA.

WHEN CORE STORAGE IS CLASSIFIED AND ORGANIZED FOR THE FIRST TIME AFTER A LOAD, THE MCP PERFORMS OPERATIONS TO DETERMINE WHAT MEMORY MODULES ARE

MCP - GENERAL DESCRIPTION.

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AVAILABLE ON THE SYSTEM IN A CONTIGUOUS AREA FROM MEMORY ADDRESS 0. LINKS ARE SET UP SO THAT THE AREAS IN THOSE MODULES, WHICH ARE NOT AVAILABLE, ARE NEVER ASSIGNED AND CONSEQUENTLY NEVER ADDRESSED, PERMANENT MCP SEGMENTS READ IN DURING INITIALIZATION ARE NON-OVERLAYABLE, OTHER MCP PROGRAM SEGMENTS RELATED TO INITIALIZATION ROUTINES MAY BE IN CORE AFTER INITIALIZATION, BUT THEY ARE OVERLAYABLE; ALL OTHER CORE IS MARKED AVAILABLE.

3G. CREATING THE AVAILABLE DISK TABLE,

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THE AVAILABLE DISK TABLE IS CREATED AND WRITTEN ON DISK AT EACH HALT/LOAD. TO CREATE THE AVAILABLE DISK TABLE, THE MCP FIRST DETERMINES THE TOTAL AMOUNT OF DISK ON THE SYSTEM, AND COMPUTES THE AMOUNT OF AVAILABLE DISK BY DEDUCTING THE AREAS RESERVED IN THE DISK DIRECTORY. THE AVAILABLE DISK TABLE THUS FORMS THE COMPLEMENT OF THE DISK DIRECTORY.

THE NEED TO CREATE THE AVAILABLE DISK TABLE AT EACH HALT/LOAD FOLLOWS FROM THE FACT THAT WHEN A PERMANENT FILE IS CREATED ON DISK, IT IS NOT ENTERED IN THE DISK DIRECTORY UNTIL THE PROGRAM HAS COMPLETED ITS CREATION, AND CLOSED THE FILE WITH LOCK.

THIS PROCEDURE MUST BE FOLLOWED FOR INSURANCE AGAINST EVENTS WHICH MIGHT CAUSE A PROGRAM CREATING A FILE TO BE TERMINATED, LEAVING THE FILE CREATION AT AN INDETERMINABLE POINT. FOLLOWING THIS PROCEDURE, ONLY VALID FILES ARE MAINTAINED IN THE DISK DIRECTORY. DURING THE CREATION OF A FILE, THE FILE-S AREA IS RESERVED BY REMOVING THE DISK AREA FROM THE AVAILABLE DISK TABLE.

4. SYSTEM SUPERVISORY FUNCTIONS.

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THIS SECTION DISCUSSES THE SUPERVISORY FUNCTIONS OF THE MCP, I.E., THE SCANNING FOR NEW JOBS, THE PROCESSING OF CONTROL CARDS, PROGRAM SCHEDULING AND PROGRAM PRIORITY, CORE ALLOCATION AND LOADING.

IT WILL BE RECALLED, THAT DURING INITIALIZATION THE INDICATORS OF ALL PERIPHERAL UNITS WERE SET TO NOT READY.

MCP MAKES USE OF THE INTERVAL TIMER INTERRUPT HARDWARE FEATURE AND

MCP - GENERAL DESCRIPTION,

INVOKES THE ROUTINE WHICH EXECUTES A TEST OF THE STATUS OF ALL PERIPHERAL UNITS. MORE SPECIFICALLY, IT EXAMINES IF A STATUS CHANGE OCCURED FROM NOT READY TO READY. IF YES, IT DETERMINES THE KIND OF PERIPHERAL UNIT IN QUESTION AND CALLS ON THE SPECIAL ROUTINES PROVIDED FOR THIS KIND OF PERIPHERAL UNIT TO READ THE INPUT.

IF THE UNIT IN READY STATUS IS THE CARD READER, THE ROUTINE CHECKS TO SEE IF THE INPUT CONSISTS OF CONTROL CARDS. IF SO, THE CONTROL CARD PROCESSOR ROUTINE IS CALLED INTO ACTION, WHICH EXAMINES THE CONTENTS OF THE CARDS, CHECKS THE SYMBOLS AGAINST THE LIST OF RESERVED WORDS, AND IF THE SYMBOL IS NOT FOUND, AN ERROR MESSAGE IS PRINTED ON THE SPO. IF THE CONTROL CARDS ARE FOUND TO CONTAIN A VALID PROGRAM SCHEDULE RECORD, AN ENTRY IS MADE IN THE JRT.

THE ROUTINE ALSO HANDLES PARAMETRIC CONTROL CARDS AND CERTAIN DYNAMICALLY INTRODUCED PERIPHERAL CONTROL CARDS. THE LATTER WOULD NORMALLY BE PART OF THE SYSTEM LOADER DECK, BUT OCCASIONALLY IT MAY BE NECESSARY TO MAKE CHANGES IN THE PERIPHERAL EQUIPMENT, MCP ALLOWS THIS WITHOUT REQUIRING A SYSTEM LOAD OPERATION.

CONTROL CARDS ARE DISTINGUISHED FROM PROGRAM OR DATA CARDS BY AN INVALID CHARACTER IN COLUMN 1. THE CONTROL CARD PROCESSOR IS CALLED INTO ACTION ONLY IF THIS INVALID CHARACTER HAS BEEN SENSED. AS MAY BE SEEN FROM THE ABOVE DESCRIPTION, THE UPDATING OF THE EXISTING TABLES IS CARRIED ON ALMOST CONTINUOUSLY BY THE MCP, I.E. AT EVERY TIMER INTERVAL.

WHEN THE PROCESSING OF ONE SET OF SCHEDULE CARDS IS FINISHED, THE JRT CONTAINS THE IDENTIFIER, AND PRIORITY NUMBER OF THE PROGRAM, WHICH HAS BEEN INTRODUCED FOR EXECUTION.

THE MCP ALLOWS 40 PROGRAMS TO BE SCHEDULED SIMULTANEOUSLY IN THE JRT. THE PROGRAMS WAITING FOR EXECUTION MUST BE ON DISK. THE PRECEDENCE LINK IS REQUIRED ONLY IF THE PROGRAM IS DEPENDENT ON COMPLETION OF ANOTHER PROGRAM.

PROGRAM PRIORITY IS A ONE DIGIT NUMBER: ONE DENOTES THE LOWEST, NINE THE HIGHEST PRIORITY. (SEE "PRIORITY CARD" IN "CONTROL INFORMATION" SECTION,)

WHEN MCP REQUIRES WORK, IT EXAMINES THE JRT AND SELECTS THE PROGRAM OF THE HIGHEST PRIORITY THAT CAN BE PROCESSED. IT FINDS IN THE DISK DIRECTORY THE ADDRESS OF THE PPB OF THE SELECTED PROGRAM. MCP THEN DETERMINES HOW MUCH CORE IS REQUIRED TO EXECUTE A PROGRAM.

MCP - GENERAL DESCRIPTION.

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ON THE BASIS OF THIS INFORMATION, MCP IS NOW IN A POSITION TO DETERMINE IF THE JOB CAN BE EXECUTED.

THE DECISION IS BASED ON THE EXAMINATION OF THE AVAILABLE SPACE LIST, EVERY AVAILABLE CORE AREA HAS A LINKWORD IN ITS FIRST WORD DESCRIBING ITS SIZE. IF THE MCP FINDS ENOUGH CORE TO EXECUTE THE PROGRAM, IT CONSTRUCTS AN ENTRY IN THE MIX TABLE.

PROGRAMS THAT ARE SELECTED FROM THE JRT AND PUT IN PROCESS ARE CONSIDERED TO BE IN THE MIX. EVERY PROGRAM IN THE MIX HAS BEEN ASSIGNED A MIX INDEX. A PROGRAM-S MIX INDEX IS AN INDEX INTO THE MIX TABLE. USING THE MIX TABLE, THE MCP CAN DETERMINE THE STATUS OF ANY PROGRAM UNDER ITS CONTROL.

A MAXIMUM OF FOUR PROGRAMS MAY BE IN THE MIX TABLE AT ANY ONE TIME WITH A STANDARD 14 CHANNEL MCP.

MCP NOW EXTRACTS FROM THE PPR THE ADDRESS OF THE SEGMENT DICTIONARY, AND FROM THE SEGMENT DICTIONARY THE DISK ADDRESS OF THE 0 (ZERO) SEGMENT OF THE PROGRAM WHICH IS TO BE LOADED. MCP ROUTINES READ THE PROGRAM-S SEGMENT NO. 0 (MAIN BLOCK) INTO THE CORE MEMORY AREA SELECTED FOR THIS PROGRAM.

BEFORE STARTING THE EXECUTION OF THE PROGRAM, MCP HAS SOME FURTHER PREPARATORY WORK TO DO.

IT FILLS IN THE DATA IN THE REINSTATE CONTROL WORD PART OF THE MIX TABLE (SEE MCP INFORMATION STORAGE SYSTEM SECTION, MIX TABLE), THE SETTINGS OF THE BASE AND LIMIT REGISTERS, WHICH ARE KEPT IN THE REINSTATE CONTROL WORD, ARE VITALLY IMPORTANT IN CONTROLLING THE CORE ALLOCATION OF THE PROGRAM.

THE ABOVE DESCRIBED ACTIONS LEAD TO THE POINT WHERE PROGRAM EXECUTION BEGINS. MCP TYPES A MESSAGE ON THE SPO NOTIFYING THE OPERATOR OF THE BEGINNING OF THE PROGRAM EXECUTION (SEE SPO MESSAGES) WITH THE STARTING TIME, AND CALLS ON A SPECIAL ROUTINE TO BUILD AN ENTRY IN THE LOG FOR THIS PROGRAM.

MCP NOW GIVES CONTROL TO THE OBJECT PROGRAM AND THE NORMAL STATE EXECUTION BEGINS.

4A. STATUS (N-SECOND) ROUTINE.

THE INTERVAL TIMER CAUSES AN INTERRUPT AT PREDETERMINED INTERVALS. THE INTERRUPT CONTROL THEN CALLS THE STATUS ROUTINE, WHICH EXECUTES A CHECK OF EVERY PERIPHERAL UNIT AND SENSES CHANGES IN THEIR STATUS. A PERIPHERAL UNIT MAY BE IN READY OR NOT READY STATUS. THIS MEANS THAT THE UNIT IS PHYSICALLY ACTIVATED OR DEACTIVATED.

FROM THE MCP-S POINT OF VIEW, A UNIT MAY BE "AVAILABLE" OR "NOT AVAILABLE". SEVERAL FACTORS MAY BE CONSIDERED BEFORE A UNIT IS MARKED AVAILABLE OR NOT. IF IT IS IN READY STATUS AND ASSIGNED TO A PROGRAM, IT IS AVAILABLE, BUT THERE ARE CERTAIN CASES WHEN IT IS TEMPORARILY NOT AVAILABLE (I.E., A TAPE DURING REWINDING IS NOT AVAILABLE). IF IT IS IN READY STATUS AND NOT ASSIGNED TO A PROGRAM, IT MAY OR MAY NOT BE AVAILABLE.

MCP KEEPS A RECORD OF THE AVAILABILITY OF THE PERIPHERAL UNITS IN THE IOAT; THE STATUS, IDENTIFICATION AND OTHER INFORMATION ARE ALSO MAINTAINED.

THE STATUS ROUTINE EXAMINES EVERY PERIPHERAL UNIT FOR EVENTUAL STATUS CHANGE. THIS CHECK IS DONE THROUGH USE OF THE TEST DESCRIPTOR, WHICH PRODUCES A RESULT FIELD IN CORE. THE RESULT FIELD IS THEN COMPARED WITH THE ENTRIES IN THE IOAT WHICH REFLECT THE PREVIOUSLY NOTED STATUS OF THAT PARTICULAR UNIT.

IF A CHANGE FROM NOT READY TO READY STATUS ON AN INPUT UNIT IS SENSED, THE ROUTINE CAUSES THE FIRST RECORD TO BE READ. IF THE UNIT IS THE CARD READER, THE ROUTINE RECOGNIZES THE CONTROL CARD BY THE INVALID CHARACTER IN COLUMN 1 AND CALLS ON THE CONTROL CARD ROUTINE FOR FURTHER PROCESSING. THIS WAY NEW JOB REQUESTS ARE AUTOMATICALLY FOUND AND INTRODUCED TO THE SYSTEM BY THE STATUS PROCEDURE.

IF THE UNIT IS A MAG, TAPE, STATUS ROUTINE EXAMINES THE LABEL OF THE FILE AND ENTERS THE PERTINENT INFORMATION IN THE IOAT, OR SPECIFIES THAT THE FILE IS A SCRATCH FILE, ETC. UNITS WHICH HAVE CHANGED FROM READY TO NOT READY ARE MARKED "NOT AVAILABLE" IN THE IOAT.

AT EACH RUNNING OF THE STATUS ROUTINE, THE ORDER OF SELECTION OF JOBS IN THE MIX TABLE ARE PERMUTED THROUGH ONE POSITION WITHIN

MCP - GENERAL DESCRIPTION.
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EACH PRIORITY, THUS, JOBS IN THE MIX WITH EQUAL PRIORITIES WILL BE AT THE TOP OF THOSE OF EQUAL PRIORITY ON A CYCLIC BASIS.

5. PROGRAM SUPERVISORY FUNCTIONS.
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5A. SEGMENTATION AND OVERLAY.
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A PROGRAM MAY BE TOO LARGE FOR THE AVAILABLE CORE MEMORY. TO ALLOW THE PROGRAMMER TO BREAK UP HIS PROGRAM INTO SMALLER PARTS, THE ASSEMBLERS AND COMPILERS OF THE SYSTEM PROVIDE FOR THE SEGMENTATION OF THE PROGRAMS, AND GENERATE APPROPRIATE MACHINE LANGUAGE CODE FOR THE COMMUNICATION WITH THE MCP TO PERFORM THE NECESSARY OVERLAY OPERATIONS, I.E., TO BRING NEW SEGMENTS OF THE PROGRAM INTO CORE AND PLACE THEM IN THE CORE AREA OCCUPIED BY A SEGMENT NO LONGER NEEDED.

SEGMENTATION OF THE PROGRAMS IS A FUNCTION OF THE ASSEMBLERS AND COMPILERS AND THEREFORE NOT A SUBJECT OF THIS MANUAL. WE NOTE, HOWEVER, THAT THE MACHINE LANGUAGE PROGRAMS CONTAIN A SEGMENT DICTIONARY, WHICH IS THE MAIN SOURCE OF INFORMATION FOR THE MCP IN HANDLING OVERLAY OF PROGRAM SEGMENTS. THE FORMAT OF THE SEGMENT DICTIONARY IS DESCRIBED IN "THE MCPS INFORMATION STORAGE SYSTEM" SECTION.

THE MAIN SEGMENT (NO. 0) OF A PROGRAM SCHEDULED FOR EXECUTION IS LOADED INTO CORE MEMORY BY MCP BEFORE CONTROL IS TRANSFERRED TO THE NORMAL STATE PROGRAM. AS THE PROGRAM CONTINUES PROCESSING, ADDITIONAL PROGRAM SEGMENTS MAY BE NEEDED WHICH ARE NOT IN CORE MEMORY.

IF A PROGRAM ATTEMPTED TO EXECUTE AN "OVLY" OR A "GO TO " TO A SEGMENT DESCRIBED BY AN ENTRY MARKED "NOT PRESENT", AN OVERLAY COMMUNICATE INTERRUPT OCCURS. THE PROCESSOR ADDRESS REGISTER IS SET TO THE ADDRESS OF THE INSTRUCTION WHICH IS TO BE EXECUTED FOLLOWING THE OVERLAY COMMUNICATE.

THE MCP-S JOB AT THIS POINT IS TO LOCATE THE REQUIRED PROGRAM SEGMENT ON DISK, READ IT INTO CORE MEMORY AND MARK THE PROGRAM SEGMENT PRESENT. FIRST, THE DISK ADDRESS OF THE REQUIRED SEGMENT MUST BE LOCATED. TO DO THIS, MCP MUST EXAMINE THE SEGMENT-S ENTRY IN THE SEGMENT DICTIONARY. MCP ACCESSES THE JOB MIX TABLE ENTRY OF THE PROGRAM WHICH IS REQUESTING THE SEGMENT USING THE MIX INDEX. FROM THE JOB MIX TABLE, THE ADDRESS OF THE SEGMENT DICTIONARY IS RETRIEVED.

MCP - GENERAL DESCRIPTION,
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NOTE: THE ADDRESS OF THE SEGMENT DICTIONARY IS NOT A PERMANENT ENTRY IN THE MIX TABLE, IT IS STORED THERE ONLY AT THE TIME OF THE OVERLAY COMMUNICATE.

USING THE ADDRESS OF THE SEGMENT DICTIONARY, AND THE REQUESTED SEGMENTS INDEX NUMBER, ENTERED IN THE SEGMENT DICTIONARY BY THE OBJECT PROGRAM PRIOR TO THE OVERLAY COMMUNICATE INTERRUPT, MCP IS IN A POSITION TO ACCESS DIRECTLY THE ENTRY OF THE SEGMENT IN THE SEGMENT DICTIONARY. FROM THE ENTRY OF THE SEGMENT, MCP CAN PICK UP THE DISK ADDRESS AND THE SIZE OF THE SEGMENT.

NEXT, MCP INITIATES A DISK READ OPERATION, TO TRANSFER THE PROGRAM SEGMENT INTO THE SPECIFIED AREA IN CORE.

SUBSEQUENTLY THE ENTRY FOR THE REQUESTED SEGMENT IS SET, DENOTING ITS PRESENCE IN CORE, AND SPECIFYING NOT TO RETURN CONTROL UNTIL THE DISK I/O IS COMPLETED. WHEN THE DESIRED DISK READ IS COMPLETE, THE REQUESTED PROGRAM SEGMENT IS IN THE PROGRAM AREA.

AFTER THE SEGMENT HAS BEEN MADE PRESENT BY THE DISK READ, THE PROGRAM IS MARKED "READY TO RUN" AND IS A CANDIDATE FOR REINSTATE AT THE REQUESTED SEGMENT.

5B. DISK ALLOCATION,
--- -----

AS INDICATED IN THE "DISK" SECTION OF THIS MANUAL, MCP RESERVES AN AREA ON DISK ONLY WHEN THE PROGRAM WRITING A FILE ADDRESSES A RECORD WITHIN THE AREA.

MOST FREQUENTLY DISK AREAS MUST BE RESERVED:

WHEN THE OBJECT PROGRAM CALLS UPON THE MCP
TO WRITE AN OUTPUT FILE ON DISK;

WHEN THE OBJECT PROGRAM USES A SEEK MACRO TO INSTRUCT MCP TO ACCESS A RECORD IN RANDOM MODE TO WRITE AN OUTPUT.

THERE ARE SEVERAL OTHER CASES WHEN THE RESERVING OF DISK AREAS BECOMES NECESSARY, E.G., WHEN A DISK DIRECTORY SECTION IS FILLED AND MCP MUST

MCP - GENERAL DESCRIPTION.

FIND AN AREA ON USERS DISK TO ACCOMODATE 17 SEGMENTS OF A NEW DISK DIRECTORY.

WHENEVER ANY OF THE ABOVE SITUATIONS OCCUR, AN MCP ROUTINE IS CALLED UPON TO SEARCH THE DISK AND SECURE THE REQUIRED AREA. THE SEARCH IS DONE BY SCANNING THE AVAILABLE DISK TABLE, CHECKING THE SIZES OF THE AVAILABLE DISK AREAS UNTIL THE REQUEST OF THE PROGRAM CAN BE MET. IF ENOUGH DISK IS AVAILABLE THE AVAILABLE DISK TABLE IS UPDATED BY REDUCING THE AVAILABLE AREA BY THE SIZE OF THE NEWLY RESERVED AREA.

IF THE OBJECT PROGRAMS REQUIREMENT COULD NOT BE SATISFIED, THE PROGRAM IS MARKED "NOT READY" AND IS KEPT WAITING UNTIL OTHER PROGRAMS RETURN THE DISK AREAS NO LONGER NEEDED BY THEM. A SPECIAL ROUTINE PROCESSES THE RETURN OF DISK AREAS. THIS AGAIN INVOLVES UPDATING THE AVAILABLE DISK TABLE. THE RETURNED DISK AREAS ARE FITTED INTO THE AVAILABLE DISK TABLE, I.E., EXISTING ADDRESSES IN THE TABLE ARE MODIFIED TO INCLUDE THE NEW AREAS IF THEY ARE CONTIGUOUS TO AN AVAILABLE AREA, OR TO INCLUDE THE WHOLE AREA, WHERE TWO PREVIOUSLY SEPARATE AREAS HAVE BEEN CONNECTED BY A RETURNED AREA.

IF MORE THAN ONE ELECTRONICS UNIT IS CONTAINED IN THE SYSTEM, THE OBJECT PROGRAM MAY REQUIRE THAT A PARTICULAR FILE BE WRITTEN IN THE STORAGE AREA OF A SPECIFIED ELECTRONICS UNIT.

50. DATE/TIME ROUTINE.

MCP ALLOWS THE USER TO ENTER AT HALT/LOAD TIME VIA SPO INPUT MESSAGES THE DATE AND TIME TO WHICH THE RESPECTIVE FIELDS OF THE MCP ARE TO BE INITIALIZED.

THE TIME IS MEASURED BY THE SYSTEM CLOCK AND THE MCPS TIME FIELD IS UPDATED PERIODICALLY.

UPON REQUEST BY THE OPERATOR, COMMUNICATED TO THE SYSTEM THROUGH SPO INPUT MESSAGES, THE MCP WILL FURNISH THROUGH SPO OUTPUT MESSAGES, THE FOLLOWING INFORMATION:

1. THE VALUE OF THE CURRENT DATE FIELD USED BY THE SYSTEM,
2. THE AMOUNT OF THE PROCESSOR TIME THE SUBJECT PROGRAM HAS USED UP TO

MCP - GENERAL DESCRIPTION.
--- - -----

THE TIME THE REQUEST WAS ENTERED,

3. THE VALUE OF THE TIME FIELD USED BY THE SYSTEM ON A 24 HOUR CLOCK (MILITARY TIME) BASIS.

MCP ALSO ALLOWS THE OPERATOR TO CHANGE THE VALUE OF THE TIME WORD AND THE VALUE OF THE CURRENT DATE THROUGH THE USE OF SPO INPUT MESSAGES, BUT ONLY WHEN NO PROGRAM IS RUNNING.

THE TIME AND DATE INFORMATION MAY ALSO BE REQUESTED PROGRAMMATICALLY. IN THIS CASE, THE PROGRAM HAS THE OPTION OF SPECIFYING THE GREGORIAN DATE (MMDDYY) OR THE JULIAN DATE (YYDDD). (SEE APPENDIX 2. FOR COMMUNICATION FORMAT.)

5D. THE SLEEP FUNCTION.
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THE SLEEP FUNCTION ALLOWS THE USER TO SUSPEND PROGRAMMATICALLY THE PROCESSING OF A PROGRAM FOR A GIVEN TIME. (MAXIMUM TIME IS 23 HOURS 59 MINUTES 59 SECONDS.) THE TIME IS OBTAINED FROM THE TIME VARIABLE WHICH MUST BE 5 DIGITS LONG, AND ITS VALUE IS ASSUMED TO BE IN SECONDS. THE PROGRAM IS NOT REMOVED FROM CORE.

THIS FUNCTION CAN NOT BE INITIATED FROM THE SPO KEYBOARD AND HAS NO CONNECTION WITH THE ST AND GO KEYBOARD INPUT MESSAGES.

5E. THE CORE FUNCTION.
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UPON REQUEST BY THE OBJECT PROGRAM, MCP STORES THE CORE SIZE USED BY THE REQUESTING PROGRAM, IN THE DESIGNATED AREA.

5F. THE SYSTEM LOG.
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MCP MAINTAINS A COMPUTER LOG RECORDING THE SYSTEM TIME AND OTHER INFORMATIONS CONCERNING THE PROGRAM.

MCP - GENERAL DESCRIPTION,

THE MAINTENANCE OF THE LOG MUST BE REQUESTED BY THE OPERATOR BY INTRODUCING THE "USE LOG" CONTROL CARD AT THE TIME THE SYSTEM LOADER IS RUN.

RECORDS ARE WRITTEN ON THE LOG FILE IN THE ORDER IN WHICH THE INFORMATION BECOMES AVAILABLE.

THE LOG INFORMATION IS WRITTEN IN A FILE ON USER DISK. THE SYSTEM LOADER PROVIDES FOR 400 LOGICAL RECORDS AS STANDARD IN THE LOG FILE ON USER DISK. THE CONTROL CARD MAY SPECIFY A SMALLER OR LARGER LOG FILE, UP TO A MAXIMUM OF 9980 RECORDS.

THE ENTRIES OF ANY GIVEN JOB WITHIN THE LOG FILE DO NOT NECESSARILY OCCUPY A CONTIGUOUS DISK AREA.

THE FIRST RECORD IN THE LOG IS USED BY THE MCP. THE VALUE OF THE FIRST FIELD IN THIS RECORD SPECIFIES THE NUMBER OF RECORDS WRITTEN IN THE LOG. THE VALUE OF THE SECOND FIELD SPECIFIES THE RECORD CAPACITY OF THE LOG. THE THIRD AND FOURTH FIELDS ARE USED IN CONJUNCTION WITH THE WARNING MESSAGES SUPPLIED BY THE MCP WHICH SPECIFY WHEN THE LOG IS HALF FULL OR FULL. THE FIFTH FIELD CONTAINS THE WORD "OSKLOG".

THE USER MAY ASSIGN HIS OWN CHARGE NUMBER TO THE LOG RECORDS OF HIS PROGRAM VIA THE CHARGE PROGRAM PARAMETER CARD. THIS NUMBER WILL APPEAR IN THE SCHEDULE AND BOJ RECORDS.

THE MCP WRITES SEVERAL TYPES OF RECORDS FOR EVERY JOB. THESE ARE:

1. SCHEDULE CARD RECORD.

THIS RECORD CONTAINS THE TEXT OF THE SCHEDULE CARD AND VARIOUS CONTROL AND IDENTIFICATION CODE NUMBERS, FURTHER INFORMATION ABOUT THE CORE AND DISK REQUIREMENTS OF THE PROGRAM.

IN CASE OF A "COMPILE AND GO" SCHEDULE CARD, IF THE COMPILATION WAS SUCCESSFUL, A SCHEDULE RECORD IS CREATED FOR THE EXECUTE RUN TOO. SINCE THE EXECUTE RUN DOES NOT REQUIRE A SEPARATE SCHEDULE CARD, THIS SCHEDULE RECORD DOES NOT CONTAIN A SCHEDULE CARD TEXT. (SHORT SCHEDULE RECORD.)

MCP - GENERAL DESCRIPTION.
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THE SCHEDULE CARD RECORD OF EVERY JOB IS ASSIGNED A LOG IDENTIFICATION NUMBER. THIS NUMBER PROVIDES A LINK TO ALL THE OTHER RECORDS PERTAINING TO THIS PARTICULAR JOB.

2. BOJ AND EOJ RECORDS.

ONE OF THESE RECORDS IS WRITTEN FOR EVERY PROGRAM, IN CASE OF A COMPILE AND GO RUN, SEPARATE RECORDS ARE KEPT FOR THE COMPILE RUN AND FOR THE EXECUTE RUN.

IF THE EXECUTION IS NOT REQUESTED (COMPILE FOR SYNTAX), OR NOT EXECUTED ON ACCOUNT OF SYNTAX ERRORS DISCOVERED DURING THE COMPILATION, ONLY THOSE LOG ENTRIES WILL BE MADE WHICH PERTAIN TO THE COMPILE RUN. SIMILARLY, IF ONLY EXECUTION IS REQUESTED (THROUGH AN EXECUTE CARD), ONLY THE INFORMATION PERTAINING TO THE EXECUTE RUN WILL BE RECORDED IN THE EOJ RECORD.

3. FILE RECORDS.

TWO TYPES OF FILE INFORMATION RECORDS ARE MAINTAINED FOR EVERY FILE: THE FILE OPEN AND THE FILE CLOSE RECORDS. THE NUMBER OF FILE RECORDS VARIES PER PROGRAM, SINCE ONE FILE OPEN AND ONE FILE CLOSE RECORD IS WRITTEN FOR EVERY SUCH FUNCTION EXECUTED BY THE PROGRAM. THE FILE RECORDS CONTAIN ALL THE NECESSARY INFORMATION PERTINENT TO THE PARTICULAR FILE. THE DATE AND THE TIME WHEN THE FILE WAS OPENED AND CLOSED, AND THE ELAPSED OPEN TIME ARE RECORDED HERE.

4. THE IDLE TIME AND HALT/LOAD RECORDS.

THE IDLE TIME RECORD REGISTERS THE IDLE TIME OF THE SYSTEM IN MILLI-SECONDS.

THE HALT/LOAD RECORD SHOWS THE TIME WHEN A HALT/LOAD OCCURRED AND THE ELAPSED TIME SINCE THE PREVIOUS HALT/LOAD. DURING PROCESSING, THE MCP KEEPS TRACK OF THE NUMBER OF AVAILABLE SEGMENTS ON THE LOG FILE. WHEN THE LOG FILE IS HALF FILLED WITH INFORMATION, IT NOTIFIES THE OPERATOR VIA SPO MESSAGE THAT THE LOG IS HALF FILLED.

ANOTHER WARNING MESSAGE IS GIVEN WHEN ONLY 10 MORE RECORDS ARE LEFT FOR LOG RECORDING PURPOSES. IF NO ACTION IS TAKEN, AND THERE IS NO SPACE LEFT TO RECORD NEW LOG INFORMATION, MCP SAVES THE CONTENTS OF THE LOG FILE IN A FILE NAMED "LOG1" AND PURGES THE LOG FILE.

MCP - GENERAL DESCRIPTION,

TO OBTAIN THE CONTENTS OF THE "LOG" AND/OR "LOG1" FILES, THE OPERATOR
CAN DO THE FOLLOWING: *

1, HE MAY ENTER FROM THE SPO THE "TL" MESSAGE. THIS WILL TRANSFER THE
CONTENTS OF THE "LOG" FILE TO THE FILE "LOG1", THE PREVIOUS CONTENTS OF
"LOG1" ARE NATURALLY WIPED OUT IN THE PROCESS. *

2, HE MAY ENTER FROM THE SPO THE "LN" MESSAGE. THIS WILL PERFORM THE
SAME TRANSFER AS THE "TL", AFTER WHICH THE CONTENTS OF THE "LOG1" FILE
ARE PRINTED. *

IF THE USER SUPPLIES HIS OWN PRINTER PROGRAM, WHICH MUST HAVE THE
PROGRAM NAME "LOGGER", MCP WILL EXECUTE THIS. IN THE ABSENCE OF
"LOGGER" IN THE DISK DIRECTORY, MCP EXECUTES ITS OWN PRINTER ROUTINE
"LOGOUT". *

"LOGOUT" IS NOT A SYSTEMS LIBRARY PROGRAM, BUT AN INTERNAL MCP FUNCTION.
MCP-S DESIGN ALLOWS USERS TO EXECUTE THIS INTERNAL PROCEDURE AS IF IT
WERE A FREE-STANDING SOFTWARE PROGRAM, THE REQUEST *

CC EXECUTE LOGOUT *

PRINTS THE INFORMATION ACCUMULATED IN FILE "LOG1". IF THE USER NEEDS
THE INFORMATION IN FILE "LOG1", "LOGOUT" SHOULD BE EXECUTED EACH TIME
BEFORE THE CONTENTS OF "LOG1" ARE DESTROYED EITHER BY THE "TL" OR "LN"
KEYBOARD INPUT REQUESTS, OR BY MCP-S AUTOMATIC TRANSFER OF THE "LOG"
FILE. *

FOR FORMATS AND CONTENTS OF THE LOG RECORDS SEE APPENDIX 1.

5G. RUN TYPES AND END OF JOB PROCESSING.

A PROGRAM MAY TERMINATE THROUGH VARIOUS WAYS. IN ANY CASE, MCP MUST
PERFORM CERTAIN FUNCTIONS WHICH SERVE TO RELEASE THE SYSTEM TO ACCEPT
NEW WORK AND SECURE THE RESULTS OF A PROPERLY FINISHED PROGRAM. IN
ADDITION, MCP KEEPS THE LOG RECORDS UPDATED FOR EVERY PROGRAM.

MCP - GENERAL DESCRIPTION.

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A SCHEDULE CARD MAY REQUEST THE SYSTEM TO DO ANY OF THE FOLLOWING TYPES OF JOB:

1. COMPILE AND GO (I.E., COMPILE A PROGRAM WRITTEN IN SOURCE LANGUAGE AND EXECUTE IT);
2. COMPILE FOR SYNTAX (I.E., COMPILE A PROGRAM WRITTEN IN SOURCE LANGUAGE, BUT DO NOT SAVE THE COMPILED PROGRAM AND DO NOT EXECUTE IT);
3. COMPILE FOR LIBRARY (I.E., COMPILE A PROGRAM WRITTEN IN SOURCE LANGUAGE AND SAVE THE COMPILED PROGRAM, BUT DO NOT EXECUTE IT);
4. COMPILE FOR LIBRARY AND GO (I.E., COMPILE A PROGRAM WRITTEN IN SOURCE LANGUAGE, SAVE THE COMPILED PROGRAM AND ALSO EXECUTE IT);
5. EXECUTE A MACHINE LANGUAGE PROGRAM.

A NORMAL END OF JOB OCCURS IF THE JOB WAS EXECUTED AS REQUESTED. AN ABNORMAL TERMINATION OCCURS WHEN A JOB IS ABORTED BEFORE REACHING ITS NORMAL ENDING, BECAUSE PROGRAM ERRORS MAKE THE CONTINUATION OF THE JOB IMPOSSIBLE.

IN ANY CASE, MCP CLOSES THE FILES WHICH ARE STILL OPEN. TO DO THIS, MCP CHECKS EVERY FILE IN THE IOAT WHICH IS "OPEN" TO THE MCP. NEXT, IT EXAMINES WHETHER THE EOJ IS NORMAL, OR AN ERROR FINISH, AND IF IT IS FOUND TO BE NORMAL, THE TYPE OF REQUEST THAT INITIATED IT. THE COMPILE AND GO REQUEST CALLS ON THE END OF JOB PROCESSING TWICE:

1. WHEN THE COMPILATION IS FINISHED.
2. WHEN PROGRAM EXECUTION IS FINISHED.

IN CASE 1, MCP MAKES PREPARATIONS TO EXECUTE THE COMPILED PROGRAM; SETS UP ENTRIES IN THE JRT FOR THE EXECUTE PHASE, AND MAKES NEW ENTRIES IN THE LOG TABLE. SIMULTANEOUSLY, IT RETURNS THE CORE AND DISK AREAS USED BY THE COMPILATION, CLOSES DOWN AND CALCULATES THE LOG INFORMATION, REMOVES FROM THE JRT AND MIX TABLES THE ENTRIES REFERRING TO THE FINISHED JOB, AND DISPLAYS ON THE SPD THE APPROPRIATE JOB ENDING MESSAGES.

MCP - GENERAL DESCRIPTION.
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IN CASE 2., MCP RETURNS THE ASSIGNED CORE AND DISK AREA TO MCP,
 COMPLETES THE LOG, REMOVES THE PROGRAM ENTRIES FROM THE SCHEDULE TABLES
 AND DISPLAYS ON THE SPO THE APPROPRIATE END OF JOB MESSAGES.

THERE ARE TWO CALLS ON THE END OF JOB ROUTINE IN CASE OF A COMPILE TO
 LIBRARY RUN ALSO, DURING THE FIRST CALL THE MCP CHANGES THE IDENTIFIER
 OF THE FIB FROM THE CODE FILE IDENTIFIER TO THE LIBRARY NAME AND THEN
 CALLS ON THE CLOSE ROUTINE TO CLOSE AND LOCK THE CODE FILE,
 (THE CODE FILE IS A GENERATED MACHINE LANGUAGE PROGRAM.)
 DURING THE SECOND CALL ON THE END OF JOB PROCESSING ROUTINE,
 MCP EXECUTES THE SAME STEPS AS DESCRIBED IN THE PRECEDING PAR, UNDER
 CASE 2.

THE COMPILE FOR SYNTAX IS TERMINATED IN THE SAME MANNER AS ANY PROGRAM
 WHICH MUST BE TERMINATED BECAUSE OF IRRECOVERABLE ERROR SITUATIONS. IN
 SUCH CASES, THE PROGRAM DISK AREA IS RETURNED TO THE SYSTEM, AND
 OTHERWISE THE SAME STEPS ARE EXECUTED AS IN THE CASE OF A SUCCESSFULLY
 COMPLETED EXECUTE RUN.

5H. DEBUGGING AIDS.
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A. DUMP
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INFORMATION CONCERNING THE STATUS OF A PROGRAM, THE PERIPHERAL DEVICES
 ASSIGNED TO IT AND THE CORE AREA DEFINED BY THE BASE AND LIMIT REGISTERS
 ARE PRINTED ON THE LINE PRINTER.

THE ABOVE INFORMATION FOR ALL PROGRAMS MAY BE DUMPED BY THE
 APPROPRIATE KEYBOARD INPUT MESSAGE.

B. TRACE
 -- ----

THE TRACE ROUTINES TRACE THE OBJECT PROGRAM AND PRINT THE TRACE
 INFORMATION ON THE LINE PRINTER. TRACING MAY BE INITIATED AND DIS-
 CONTINUED AT ANY POINT IN THE PROGRAM.

TWO TRACE ROUTINES ARE MADE AVAILABLE TO THE USER BY THE MCP: AN
 OVERLAYABLE AND A NON-OVERLAYABLE TRACE.

MCP - GENERAL DESCRIPTION.

THE NON-OVERLAYABLE TRACE REQUIRES EXTRA MEMORY AND IS USED WHENEVER IT HAS BEEN LOADED INTO MEMORY BY THE "USE TRACE" CARD (SEE "SYSTEM LOADER CONTROL DECK" SECTION), OR A "SO TRAC" KEYBOARD INPUT MESSAGE. IT CAN BE USED TO TRACE EITHER NORMAL STATE, OR CONTROL STATE INSTRUCTIONS, OR BOTH, IN ALPHA MODE OR IN DIGIT-EQUIVALENCE OF THE ALPHA CHARACTERS, OR TO TRACE ONLY THE BCT, IID, AND BRE INSTRUCTIONS, AS INDICATED BY A PARAMETER.

THE OVERLAYABLE TRACE REQUIRES NO EXTRA MEMORY, AND TRACES NORMAL STATE INSTRUCTIONS ONLY, IN ALPHA MODE OR IN THEIR DIGIT EQUIVALENCE. THE NON-OVERLAYABLE TRACE IS CONSIDERABLY FASTER.

THE NORMAL OUTPUT OF A PROGRAM, I.E., THE PROGRAM LISTING OR DATA, APPEAR IN THE PRINTING INTERSPERSED WITH THE OUTPUT OF THE TRACING.

EXAMPLE OF THE TRACE OUTPUT:

1	2	3	4	5	6	7	8	9	10	11	12	13
N	15036	GEQ		16900						<		
N	15044	MVN	0705	10004	1S	12010	2S			<	0	+12345
N	15062	OFL		16024						<		
N	16024	BCT	0354							<		
	10000	MVA	0202	25	AL	10000	A			>	25	

COLUMN NUMBER

EXPLANATION

01	NORMAL STATE = N
	CONTROL STATE = BLANK
02	ADDRESS OF INSTR. IN MEMORY
03	OP CODE. IF OP CODE INVALID, THE NUMBER IS
03	PRINTED
04	AF-BF FIELD
05	A-ADDRESS
06	AI-AC FIELD:
	AI - 1,2,3 = INDEX REGISTER
	AC - S = SIGNED NUMERIC DATA
	A = ALPHANUMERIC DATA
	I = INDIRECT ADDRESS
	BLANK = UNSIGNED NUMERIC

FOR LITERAL TYPES OF DATA IN THE
A-ADDRESS FIELD THE FOLLOWING
DESCRIPTIONS APPEAR IN THE COMBINED
AI-AC FIELDS:

AL = ALPHANUMERIC LITERAL
NL = NUMERIC LITERAL
SL = SIGNED NUMERIC LITERAL
FL = FLOATING POINT LITERAL

B-ADDRESS

BI-BC FIELD

BI - 1,2,3 = INDEX REGISTER
BC - S = SIGNED NUMERIC DATA
A = ALPHANUMERIC DATA
I = INDIRECT ADDRESS
BLANK = UNSIGNED NUMERIC

C-ADDRESS

CI-CC FIELD

CI - 1,2,3 = INDEX REGISTER
CC - S = SIGNED NUMERIC DATA
A = ALPHANUMERIC DATA
I = INDIRECT ADDRESS
BLANK = UNSIGNED NUMERIC

STATUS OF COMPARE TOGGLE

STATUS OF OVERFLOW TOGGLE: BLANK = NO OFL,
O = OVERFLOW

CONTENTS OF RESULT FIELD IN MEMORY, TO A
MAXIMUM OF 68 CHARACTERS.

THE RESULT FIELD IN MEMORY IS DEFINED FOR THE VARIOUS OPERATORS SHOWN
IN THE TABLE BELOW.

OP	MNE	-MEMORY-	OP	MNE	-MEMORY-
--	----	-----	--	----	-----
01	INC	B	40	BZT	A
02	ADD	C	41	BGT	A
03	DEC	H	42	AND	C
04	SUB	C	43	ORR	C
05	MPY	C	44	NOT	C
06	DIV	C	45	CPA	B
09	MVL	C			
10	MVA	B	46	CPN	B
11	MVN	B	49	EDT	C
12	MVW	B	60	FAD	C
13	MVC	B	81	FSU	C
14	MVR	B	82	FMP	C
15	TRN	C	83	FDV	C

MCP - GENERAL DESCRIPTION.

16 SDE	B	91 SRD	IX1 (MCP)
17 SDU	B	92 RAD	A-SHOW 6
18 SZE	B	94 IIG	A-SHOW 18
19 SZU	B	95 RDT	A-SHOW 6
31 NTR	STK[IX3]	96 RCT	A-SHOW 6
		97 STT	A-SHOW 6

THE OPERATORS NOT LISTED IN THE TABLE HAVE NO RESULT FIELD.

IF THE BIT CONFIGURATION IN THE AF-BF FIELD REPRESENTS AN UNDIGIT, I.E., NUMBERS HIGHER THAN 9, THE ROUTINE WILL PRINT:

NUMBER	PRINTED CHARACTER
-----	-----
10	A
11	B
12	C
13	D
14	E
15	F

C. BREAKOUT/RESTART

THE BREAKOUT ROUTINE PROVIDES FACILITIES TO INTERRUPT THE EXECUTION OF OBJECT PROGRAMS AT A SPECIFIED POINT (THE BREAKOUT POINT), WRITE THE UNPROCESSED DATA ON A SCRATCH TAPE AND RESUME PROCESSING AT A LATER TIME THROUGH USE OF THE RESTART ROUTINE FROM THE BREAKOUT POINT.

THE BREAKOUT POINT MAY BE ESTABLISHED BY APPROPRIATE RERUN CONTROL STATEMENTS (RERUN EVERY N RECORDS) IN THE OBJECT PROGRAM OR BY THE "BR" SPO INPUT MESSAGE. THE BREAKOUT ROUTINES WILL ABSTRACT DATA FROM THE PROGRAM AREA, THE MCP TABLES, AND THE DISK TO A SCRATCH TAPE. THE BREAKOUT TAPE WILL HAVE A STANDARD LABEL WHOSE <F-ID> IS THE PROGRAM <P-N>.

THE RESTART IS REQUESTED BY THE OPERATOR USING THE "RB" SPO INPUT MESSAGE, OR RESTART CONTROL CARD. THE FILES IN USE BY THE OBJECT PROGRAM AT THE TIME OF BREAKOUT MUST BE ON THE SYSTEM. CARD FILES MAY BE IDENTIFIED BY THE NORMAL LABEL OR DATA CONTROL CARD OR BY A "RESTART <P-N> DATA <F-ID> CONTROL CARD. SINCE RESTART POSITIONS CARD FILES TO

MCP - GENERAL DESCRIPTION.

THE BREAKOUT POINT, THE ENTIRE CARD FILE MUST BE PRESENT AT THE RESTART INITIATION.

THE FOLLOWING RULES AND/OR CONDITIONS ARE OBSERVED BY THE BREAKOUT/RESTART PROCEDURES:

1. ALL FILES MUST BE IN THE SYSTEM PRIOR TO THE "RB"
2. PRINTER OUTPUT FILES WILL NOT BE POSITIONED.
3. PROGRAMS WHICH HAVE OPENED DISK FILES OTHER THAN INPUT ARE NOT CANDIDATES FOR RESTART.
4. THE OBJECT PROGRAM MUST BE ON DISK AT "RB" .

51. CORE-TO-CORE TRANSFER.

A PROGRAM MAY TRANSFER INFORMATION (SENDING PROGRAM) TO ANOTHER PROGRAM (RECEIVING PROGRAM), IF BOTH ARE CONCURRENTLY IN THE MIX TABLE. IF THE SENDING AND THE RECEIVING PROGRAMS SPECIFY A DIFFERENT NUMBER OF CHARACTERS TO BE TRANSFERRED, THE SMALLER NUMBER WILL BE SENT. (SEE APPENDIX 2.)

AFTER THE TRANSFER HAS BEEN COMPLETED, THE PROGRAM WITH HIGHER PRIORITY IS REINSTATED FIRST, AND IF BOTH PROGRAMS ARE OF EQUAL PRIORITY, THE RECEIVING PROGRAM IS REINSTATED FIRST.

6. I/O CONTROL.

THE HANDLING OF OBJECT PROGRAM I/O FACILITIES IS A FUNCTION OF THE MCP AS WELL AS THE OBJECT PROGRAM.

IT IS THE RESPONSIBILITY OF THE OBJECT PROGRAM TO SPECIFY, FOR EACH FILE USED BY THE PROGRAM, SUCH INFORMATION AS:

THE FILE ID;
 WORK-TYPE FILE DESIGNATION;
 THE TYPE OF PERIPHERAL EQUIPMENT TO WHICH THIS FILE IS TO BE ASSIGNED;
 THE RECORDING MODE OF THE EXTERNAL MEDIUM;
 THE NUMBER OF BUFFER AREAS DESIRED;
 RETENTION PERIOD OF THE FILE;
 BLOCKING TECHNIQUE;

MCP - GENERAL DESCRIPTION.

BUFFER ACCESS TECHNIQUE;
 RANDOM OR SERIAL ACCESS OF DISK FILES;
 NUMBER OF AREAS FOR DISK FILES;
 LOCATION OF THE ACTUAL KEY FOR RANDOM DISK FILES;
 CODE TRANSLATE OR NOT;
 LABEL HANDLING ROUTINE ADDRESS;
 ADDRESS OF ERROR-ROUTINE.

THE ABOVE IS BY NO MEANS A COMPLETE LISTING OF THE INFORMATION REQUIRED BY THE MCP, ONLY A DELINEATION OF THE AREAS IN WHICH MCP IS DEPENDENT UPON THE INSTRUCTIONS OF THE OBJECT PROGRAM.

THE OBJECT PROGRAM ALSO REQUESTS THE MOVEMENT OF DATA TO AND FROM THE BUFFER AREAS.

ONCE IN POSSESSION OF THE NECESSARY INFORMATION, IT IS MCP'S RESPONSIBILITY TO HANDLE THE BUFFER AREAS; TO PERFORM BLOCKING AND RECORD ACCESSING; AND TO EXECUTE I/O OPERATIONS TO READ AND WRITE FILES.

6A. FILE IDENTIFIERS.

THERE ARE TWO TYPES OF FILES IN THE B2500/3500 SYSTEM: STANDARD FILES AND NON-STANDARD FILES. A STANDARD FILE IS A FILE WHICH HAS A FILE IDENTIFIER PHYSICALLY ASSOCIATED WITH IT. A NON-STANDARD FILE IS A FILE THAT REQUIRES OUTSIDE INTERVENTION TO HAVE A NAME ASSOCIATED WITH IT.

ALL PERMANENT FILES ON DISK ARE STANDARD. IDENTIFIERS ARE ASSOCIATED WITH THESE FILES THROUGH THE DISK DIRECTORY. IDENTIFIERS ARE ASSOCIATED WITH OTHER STANDARD FILES THROUGH "LABELS". A LABEL CONSISTS OF ONE OR MORE RECORDS WITH A GIVEN FORMAT THAT APPEARS AS THE FIRST (AND CONSECUTIVE) RECORD(S) IN A FILE. ONE OF THE ENTRIES IN A LABEL IS THE FILE IDENTIFIER.

MCP HANDLES THE FOLLOWING LABEL TYPES:

"STANDARD LABEL", DEFINED BY BURROUGHS CORP.; THE FORMAT OF THE LABEL IS DESCRIBED IN APPENDIX 4.

MCP RECOGNIZES ON MAGNETIC TAPE ALSO THE "USA STANDARD LABEL" AND

MCP - GENERAL DESCRIPTION.

OBTAINS THE NECESSARY INFORMATION FROM THE "HDR1" LABEL. IF A "VOL" LABEL IS PRESENT AND A "HDR1" LABEL IS NOT, THE TAPE IS TREATED AS UNLABELED. THE "PG" KEYBOARD INPUT MESSAGE RECOGNIZES THE PRESENCE OF THE USA STANDARD LABEL AND PURGES ONLY THE "HDR1" LABEL.

WITHIN AN ENVIRONMENT OF MIXED LABEL TYPES (I.E., STANDARD AND USA STANDARD LABELS), SPECIAL PRECAUTION IS TAKEN BY MCP TO PRESERVE, AS MUCH AS POSSIBLE, THE LABEL TYPE ALREADY ASSOCIATED WITH A SCRATCHED TAPE.

THE USERS OF THE SYSTEM MAY DEFINE LABELS ACCORDING TO THEIR SPECIFIC NEEDS. THESE LABELS ARE CALLED "INSTALLATION LABELS" AND THEIR FORMATS MUST BE DEFINED AT COLD START TIME IN THE LOADER CONTROL DECK. THE FORMAT IS DEFINED BY A SINGLE CARD AND THE CONTENTS OF THE DESIGNATED AREAS ARE FILLED IN BY MCP WITH DATA EXTRACTED BY MCP FROM ITS OWN STORED INFORMATION.

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FILES THAT DO NOT HAVE LABELS ARE NON-STANDARD FILES. AN EXAMPLE OF A NON-STANDARD FILE WOULD BE A MAGNETIC TAPE WITHOUT A LABEL. TO ASSOCIATE A FILE NAME WITH A NON-STANDARD FILE REQUIRES THAT SPECIAL INFORMATION BE PROVIDED TO ASSOCIATE THE FILE NAME WITH THE I/O UNIT WHERE THE FILE IS LOCATED. THE INFORMATION MAY BE SUPPLIED THROUGH USE OF A SPO MESSAGE.

6B. FILE HANDLING TECHNIQUES.

FILE HANDLING TECHNIQUES FOR OBJECT PROGRAM FILES ARE SPECIFIED IN THE SOURCE LANGUAGE OF THE PROGRAM. IN THE SOURCE PROGRAM, BEFORE THE FILE IDENTIFIERS ARE USED IN I/O STATEMENTS, EACH FILE IDENTIFIER IS ASSOCIATED WITH THE FILE HANDLING TECHNIQUE TO BE USED WITH THAT FILE. THE FILE NAME IS ALSO ASSOCIATED WITH THE FILE IDENTIFIER OF THE FILE CONCERNED. AT RUN TIME, IT IS POSSIBLE TO ASSOCIATE A FILE IDENTIFIER WITH A DIFFERENT FILE NAME. (SEE LABEL EQUATION RECORDS.)

6C. THE FILE SECURITY SYSTEM.

THE PURPOSE OF THIS SYSTEM IS TO PROHIBIT UNAUTHORIZED USERS FROM HAVING ACCESS TO THE SYSTEM OR TO ANY FILE BELONGING TO AUTHORIZED USERS.

MCP - GENERAL DESCRIPTION.

THIS SECURITY SYSTEM, AND THE "UPUSER" PROGRAM, WHICH IS A SYSTEM PROGRAM DESIGNED TO SERVICE THE SECURITY SYSTEM HAVE NOT BEEN IMPLEMENTED YET.

6D. LOGICAL CLASSIFICATION OF I/O CONTROL.

THE I/O CONTROL FUNCTIONS OF THE MCP CAN BE LOGICALLY DIVIDED INTO TWO PARTS:

1. PROCESSING OF I/O REQUESTS MADE BY THE OBJECT PROGRAM;
2. PROCESSING OF SITUATIONS RESULTING FROM A HARDWARE ACTION, I.E., AN INDEPENDENT INTERRUPT.

THE FIRST PART COVERS OPENING THE FILES, READING AND WRITING FILES, WITH SPECIAL REGARD TO PROBLEMS OFFERED BY THE DISK FILES, AND CLOSING THE FILES.

THE SECOND PART DESCRIBES THE PROCESSING OF I/O RESULTS, HARDWARE ERRORS, ERROR-ROUTINES.

7. PROCESSING OF I/O REQUESTS MADE BY THE OBJECT PROGRAM.

7A. OPENING OF FILES.

THE FIRST STEP OF MCP IN THIS CHAIN OF ACTIONS IS TO OPEN THE FILES.

FILES ARE CLASSIFIED AS:

INPUT FILES,
 OUTPUT FILES,
 DISK I/O (INPUT AND OUTPUT) FILES,
 DISK O/I (OUTPUT AND INPUT) FILES.

MCP - GENERAL DESCRIPTION.

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A DISK I/O FILE IS DEFINED TO BE A DISK FILE IN WHICH THE NORMAL SEQUENCE OF ACTIONS IS TO READ A RECORD, UPDATE IT, AND WRITE IT BACK TO THE SAME RECORD ON DISK.

THE DISK O/I CONSTRUCT ALLOWS A FILE TO BE OPENED AS OUTPUT, AND THE NEW FILE TO BE HANDLED FROM THEREON AS IF IT HAD BEEN OPENED AS I/O.

EVERY FILE MUST BE OPENED BEFORE THE OBJECT PROGRAM-S READ OR WRITE REQUESTS CAN BE EXECUTED.

THE OPENING OF FILES IS HANDLED UNDER COBOL RULES, REGARDLESS WHETHER THE SOURCE PROGRAMS LANGUAGE RULES PRESCRIBE AN EXPLICIT STATEMENT FOR THE REQUEST OF OPENING THE FILES (ASSEMBLER, COBOL), OR NOT (FORTRAN), AT CERTAIN POINTS IN THE MACHINE LANGUAGE, APPROPRIATE CODE IS GENERATED TO INVOKE THE OPEN ROUTINE OF THE MCP.

TO ALLOW MULTIPROCESSING OF SUCH DUPLICATE PROGRAMS WHICH HAVE "WORK" TYPE FILES DECLARED, MCP INSERTS THE MIX NUMBER IN THE SECOND AND THIRD CHARACTER POSITIONS IN THE FILE IDENTIFIER, THEREBY CREATING UNIQUE FILE IDENTIFIERS FOR EACH PROGRAM-S WORK TYPE FILES.

THE PURPOSE OF THE OPENING PROCEDURE IS TO FIND AND RESERVE THE REQUIRED PERIPHERAL UNIT AND, HAVING ACCOMPLISHED THIS, TO PREPARE IT TO READ OR WRITE THE SPECIFIED FILE. THUS, MCP LOCATES AND RESERVES THE REQUIRED HARDWARE PERIPHERAL EQUIPMENT FOR THE PROGRAM. IF SOME OF THE REQUIREMENTS ARE NOT MET, IT INFORMS THE OPERATOR THROUGH SPO MESSAGE OF THIS.

IT VERIFIES THAT THE FILE SPECIFIED IN THE OPEN REQUEST IS A FILE READY TO BE OPENED. THIS MEANS THAT THE FILE IS PRESENT AND CLOSED.

A DISK INPUT OR I/O FILE IS CONSIDERED TO BE PRESENT, IF IT IS PRESENT IN THE I/O ASSIGNMENT TABLE AS A RESULT OF A PREVIOUS OPEN AND CLOSE BY THE CURRENT PROGRAM, OR IT IS PRESENT IN THE DISK DIRECTORY.

A DISK OUTPUT FILE IMPLIES THAT A NEW FILE IS TO BE CREATED; HOWEVER, IF THE FILE IS ALREADY PRESENT IN THE I/O ASSIGNMENT TABLE AS A RESULT OF A PREVIOUS OPEN AND CLOSE BY THE CURRENT PROGRAM, THEN THIS BECOMES THE "NEW" OUTPUT FILE. A FILE IN THE DISK DIRECTORY WITH THE SAME FILE IDENTIFIER CAUSES NO PROBLEM AT OPEN TIME, SINCE THE FILE JUST OPENED IS CONSIDERED TEMPORARY UNTIL SUCH TIME AS IT IS CLOSED AND LOCKED.

MCP - GENERAL DESCRIPTION.

IT CREATES LABELS FOR OUTPUT FILES AND CHECKS THE INFORMATION CONTAINED IN THE LABELS OF INPUT FILES. IF "USE" ROUTINES ARE REQUESTED, IT SETS UP THE LINKAGES TO ACTIVATE THE REFERENCED ROUTINES.

IN CASE OF OUTPUT DISK FILES IT CALCULATES THE SIZE OF THE DISK AREAS, FINALLY, IT FILLS THE BUFFERS, IF THE FILE WAS SERIAL AND INPUT.

IN EXECUTION OF THE ABOVE FUNCTION, MCP OBTAINS THE LINK TO THE OBJECT PROGRAMS FIB, WHICH IS SUPPLIED BY THE OBJECT PROGRAM. IT FINDS THE REQUIRED HARDWARE TYPE AND SEARCHES THE IOAT FOR THIS TYPE OF HARDWARE. ASSUMING AN AVAILABLE UNIT, THE IOAT ENTRY FOR THIS UNIT IS THEN LINKED TO THE FIB, MARKED UNAVAILABLE, RECEIVES FILE IDENTIFICATION, RECORDING MODE, AND IS LINKED TO THE JOB MIX TABLE.

ERRONEOUS INFORMATIONS COULD RESULT, IF TWO PROGRAMS WERE MULTIPROCESSING TOGETHER AND BOTH WISHED TO UPDATE THE SAME RECORD IN A DISK FILE. ONE PROGRAM WOULD READ THE RECORD AND THEN THE OTHER; THEN, AFTER AN AMOUNT OF PROCESSING, ONE PROGRAM WOULD WRITE ITS VERSION OF THE UPDATED RECORD ONLY TO HAVE IT OVERWRITTEN BY THE SECOND PROGRAMS VERSION OF THE UPDATED RECORD.

TO AVOID SUCH SITUATIONS, A DISK FILE MAY BE OPENED WITH "LOCK" OR "LOCKOUT". OPEN WITH "LOCK" ALLOWS A SOLE PROGRAM TO READ AND WRITE A FILE WHILE RESTRICTING SUBSEQUENT PROGRAMS TO READING ONLY. OPEN WITH "LOCKOUT" MAKES THE FILE COMPLETELY INACCESSIBLE TO EVERY OTHER PROGRAM UNTIL IT IS CLOSED BY THE SAME PROGRAM WHICH OPENED IT.

AT THIS POINT MCP IS READY TO EXECUTE THE OBJECT PROGRAMS INSTRUCTIONS FOR INPUT AND OUTPUT OPERATIONS.

7B. READING AND WRITING OF FILES.

WHEN THE PROGRAM IS READY TO READ OR WRITE, IT USES THE CODE PRODUCED BY THE OBJECT PROGRAM WHICH SPECIFIES FILE IDENTITY FOR "READ", OR RECORD IDENTITY FOR "WRITE". THIS IS CONSISTENT WITH THE MANNER IN WHICH COBOL READS FILES OR WRITES RECORDS. IN EITHER CASE, THE GENERATOR (COMPILER, ASSEMBLER, SORT GENERATOR OR REPORT GENERATOR) HAS PUT THE ADDRESS OF THE RELATED FIB AT THE DISPOSAL OF THE MCP.

MCP - GENERAL DESCRIPTION.

FROM THE FIB, THE MCP LINKS TO THE IOAT. THE MCP THEN FINDS SPACE IN THE IOQT AND SETS UP AN ENTRY FOR THIS OPERATION ON THE UNIT RESERVED FOR THIS FILE. NEXT IT LINKS THE IOAT ENTRY AND THE IOQT ENTRY TO EACH OTHER. THE IOQT ENTRY WILL LINK DIRECTLY TO THE I/O DESCRIPTOR FOR THIS OPERATION. (THERE IS A DESCRIPTOR FOR EACH BUFFER.)

THE CTL INDICATOR TELLS THE MCP IF THIS PROGRAM IS A NORMAL OBJECT PROGRAM, OR A SYSTEM PROGRAM. IF THE CHANNEL AND UNIT ARE NOT BUSY, THE AVAILABILITY INDICATOR WILL BE TURNED OFF, THE ADDRESSES FROM THE DESCRIPTOR WILL BE SENT TO THE ADDRESS MEMORY, AND THE OPERATION CODE AND VARIANTS WILL BE SENT TO THE I/O CHANNEL INVOLVED BY THE I/O INITIATE COMMAND. THEN MCP GOES TO THE NEXT OPERATION.

IF, DURING THE ABOVE PROCESSING, THE CHANNEL IS FOUND TO BE BUSY, BUT THE UNIT IS AVAILABLE, MCP TRIES TO EXECUTE THE OPERATION ON AN ALTERNATE CHANNEL. IF NONE IS AVAILABLE, THE PROGRAM IS MARKED "WAITING FOR I/O" AND MCP GOES TO THE NEXT OPERATION.

IF A PROGRAM SPECIFIES LINE PRINTER AS OUTPUT MEDIUM, AND NO LINE PRINTER IS AVAILABLE, THE MCP WRITES THE OUTPUT AUTOMATICALLY ON A PRINTER BACKUP TAPE, IF THE PBT OPTION IS SET. (A MAG. TAPE SPECIALLY FORMATTED FOR SUBSEQUENT PRINTING.) THE OUTPUT MAY BE DIRECTED PROGRAMMATICALLY TO A PRINTER BACKUP TAPE THROUGH USE OF THE FILE (LABEL EQUATION) CARD. (SEE "CONTROL INFORMATION" SECTION.) A PRINTER BACKUP TAPE MAY ALSO BE SPECIFIED BY THE "OU" KEYBOARD INPUT MESSAGE, IF THE PBT OPTION IS NOT SET. IN ANY EVENT, THE TAPE DESIGNATED AS A PRINTER BACKUP TAPE CONTINUES TO BE USED FOR THIS PURPOSE, AND MULTIPLE REEL BACKUP TAPES CAN BE CREATED BY SUCCESSIVE PROGRAMS, UNTIL THE "PB" REQUEST IS ENTERED, OR THE TAPE UNIT SET IN "NOT READY" STATUS WHILE NOT IN USE BY A PROGRAM. IF THE TAPE UNIT IS SET "NOT READY" WHILE ASSIGNED TO A PROGRAM, THE TAPE REMAINS A PRINTER BACKUP AND THE PROGRAM WILL STOP AND WAIT FOR THE TAPE TO BE SET READY AGAIN.

IF THE PROGRAM WANTS TO WRITE THE PRINTER OR PUNCH OUTPUT FILE ON BACKUP DISK, THE "PBD" OPTION SHOULD BE SET. IF THE OPTION IS NOT SET, THE "ODDK" KEYBOARD INPUT MESSAGE OR A LABEL EQUATION CARD MAY BE USED TO DIRECT THE OUTPUT TO BACKUP DISK.

IF AN IRRECOVERABLE PARITY ERROR IS DETECTED DURING PRINTING, THE RECORD IN ERROR IS PRINTED AND THE JOB CONTINUES.

THE PROCESSING OF DISK FILES REQUIRES SOME ADDITIONAL EXPLANATION.

MCP - GENERAL DESCRIPTION.

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DISK FILES CAN BE PROCESSED IN ONE OF TWO WAYS: 1. SERIAL; 2. RANDOM.

SERIAL PROCESSING: WHEN A FILE IS DECLARED SERIAL AND IS OPENED AS INPUT, THE RECORDS IN THE FILE ARE PROCESSED SEQUENTIALLY STARTING WITH RECORD #1 AND PROCEEDING UNTIL RECORD # N (WHERE N IS THE NUMBER OF RECORDS IN THE FILE.) ANY ATTEMPT TO READ BEYOND THE LAST RECORD CAUSES A BRANCH TO BE TAKEN TO THE END-OF-FILE LABEL FOR THE CURRENT READ.

AN INPUT FILE THAT MUST BE PROCESSED IN ANY OTHER WAY SHOULD BE DECLARED RANDOM.

WHEN A FILE IS DECLARED SERIAL AND OPENED AS OUTPUT, THE RECORDS ARE WRITTEN IN SEQUENTIAL ORDER STARTING WITH RECORD # 1 AND PROCEEDING UNTIL RECORD # N (WHERE N IS THE FINAL RECORD TO BE WRITTEN). ANY ATTEMPT TO WRITE BEYOND THE LIMITS OF THE FILE AS DECLARED (NUMBER OF RECORDS PER AREA, NUMBER OF AREAS) CAUSES A BRANCH TO BE TAKEN TO THE END-OF-FILE LABEL FOR THAT PARTICULAR WRITE.

AN OUTPUT FILE THAT MUST BE CREATED IN ANY OTHER WAY SHOULD BE DECLARED RANDOM.

RANDOM PROCESSING MEANS THAT FILES (INPUT, OUTPUT, OR DISK I/O) ARE PROCESSED IN A RANDOM FASHION IN ACCORDANCE WITH THE "KEY" WHOSE ADDRESS IS SUPPLIED AT FILE DECLARATION TIME AND WHOSE VALUE IS DYNAMIC THROUGHOUT THE EXECUTION OF THE PROGRAM. WHEN READING OR WRITING RANDOMLY, THE VALUE OF THE KEY MUST BE GREATER THAN 0 (ZERO) AND NOT GREATER THAN THE NUMBER OF RECORDS IN THE FILE, OR ELSE A BRANCH WILL BE TAKEN TO THE END-OF-FILE LABEL FOR THE CURRENT READ OR WRITE OPERATION.

7C. THE SEEK STATEMENT.

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THE SEEK STATEMENT MAY BE USED ONLY WITH RANDOM DISK FILES AND ITS PRIMARY PURPOSE IS TO ALLOW A BUFFER TO BE FILLED PRIOR TO THE TIME IT IS ACTUALLY NEEDED BY THE PROGRAM.

PROGRAMS WHICH UPDATE FILES ON DISK MAY READ A RECORD FROM DISK BEFORE REPLACING IT WITH AN UPDATED RECORD, THE PRACTICE OF READING BEFORE WRITING MAY BE DONE IN ORDER TO EXAMINE A CURRENT RECORD BEFORE WRITING AN UPDATED RECORD, BUT THIS IS OPTIONAL. READING BEFORE WRITING MUST BE DONE BY THE MCP, HOWEVER, IF A LOGICAL RECORD IN A BLOCKED FILE IS TO

MCP - GENERAL DESCRIPTION.

BE UPDATED, BECAUSE THERE IS A DANGER OF DESTRUCTION OF ADJACENT LOGICAL RECORDS. THIS IS SO BECAUSE A COMPLETE PHYSICAL RECORD MUST BE WRITTEN EACH TIME AN I/O OPERATION ON DISK IS PERFORMED.

THE ONLY WAY TO PRESERVE LOGICAL RECORDS COMMON TO THE PHYSICAL RECORD OF THE UPDATED RECORD IS TO:

1. TO READ THE PHYSICAL RECORD;
2. TO PUT THE UPDATED LOGICAL RECORD IN ITS PLACE;
3. TO WRITE THE PHYSICAL RECORD.

AS MAY BE SEEN FROM THE ABOVE, NO HARM CAN BE DONE TO THE EXISTING RECORDS, IF THE FILE IS UNBLOCKED, THERE IS NO NEED TO READ THE RECORD BEFORE WRITING, BECAUSE THERE ARE NO ADJACENT RECORDS THAT COULD BE DESTROYED.

HOWEVER, IF THE FILE IS "BLOCKED", THE PROGRAMMER MAY USE THE SEEK STATEMENT TO READ THE FULL PHYSICAL RECORD INTO THE NEXT BUFFER, WHILE THE CURRENT RECORD IS BEING PROCESSED.

IN CERTAIN CASES, WHEN AN EXPLICIT "SEEK" HAS NOT BEEN GIVEN IN THE PROGRAM, THE MCP INITIATES AN IMPLICIT "SEEK". FOR EXAMPLE, IF NO SEEK HAS BEEN GIVEN PRECEDING A READ FOR A FILE, THEN MCP INITIATES A SEEK IN ORDER TO READ THE APPROPRIATE RECORD INTO THE BUFFER ACCORDING TO THE VALUE OF THE KEY.

LIKewise, IF NO SEEK HAS BEEN GIVEN PRECEDING A WRITE OF A BLOCKED RECORD, THEN MCP INITIATES AN IMPLICIT SEEK IN ORDER TO READ THE APPROPRIATE BLOCK INTO THE BUFFER ACCORDING TO THE VALUE OF THE KEY.

MCP WOULD NOT PROVIDE THE IMPLICIT SEEK IF THE UPDATED RECORD IS NOT TO BE WRITTEN INTO THE SAME AREA FROM WHERE IT HAD BEEN READ. IN SUCH CASE, THE PROGRAMMER MUST INSERT A SEEK STATEMENT JUST PRIOR TO THE WRITE STATEMENT.

RECAPITULATION:

1. THE SEEK INITIATES THE ACTUAL FILLING OF THE BUFFER;
2. THE READ GIVES ACCESS TO THE RECORD THAT WAS SOUGHT;
3. THE WRITE CAUSES THE CURRENT RECORD WRITTEN BACK ON DISK.

MCP - GENERAL DESCRIPTION.

7D. CLOSING OF FILES.

WHEN THE OBJECT PROGRAM FINISHED PROCESSING A FILE, IT MAY CALL ON THE MCP TO CLOSE THAT FILE. DURING THE END OF JOB PROCESSING, MCP EXAMINES EVERY FILE AND CLOSES THOSE WHICH ARE OPEN TO THE MCP, (A FILE MAY BE CLOSED TO THE PROGRAM, BUT OPEN TO THE MCP, E.G. A FILE CLOSED BY THE PROGRAM WITHOUT REWINDING.)

IT HANDLES THE FILES INDIVIDUALLY, SINCE DIFFERENT ACTIONS MAY BE REQUIRED BY EACH FILE.

THE CLOSE ROUTINE FIRST VERIFIES THAT A FILE IS READY TO BE CLOSED, I.E., THE FILE IS OPEN AT THIS TIME. THEN IT EXAMINES WHETHER THE FILE IS AN INPUT OR AN OUTPUT FILE.

IN CASE OF AN OUTPUT FILE, IT MAY BE NECESSARY TO WRITE A PARTIAL BLOCK, AND ON MAGNETIC TAPE A TAPEMARK; IT MAY BE NECESSARY TO EXECUTE "USE" ROUTINES, OR TO WRITE STANDARD LABELS. MCP SELECTS THE WORK TO BE DONE AND EXECUTES IT. THEN IT WAITS FOR THE I/O COMPLETE INTERRUPT ON THE FINAL I/O OPERATION.

IF THE I/O COMPLETE PROCESSING INDICATES THE SUCCESSFUL EXECUTION OF THE OPERATION, THE ACTUAL CLOSING OF THE FILES WILL BE EXECUTED BY THE CLOSE PROCEDURE.

IF THE FILE IS AN INPUT FILE, ALL WAITING I/O REQUESTS ARE PURGED FROM THE I/O.

DURING ACTUAL CLOSING OF THE FILES A CALL ON THE LOG ROUTINE IS MADE TO RECORD THE ELAPSED OPEN TIME.

MCP THEN RESETS ALL COUNTERS AND INDICATORS AND PROCEEDS TO EXAMINE WHAT THE FUTURE OF THE FILE SHOULD BE.

THE OBJECT PROGRAM MAY INSTRUCT THE MCP TO HANDLE THE FILE IN ANY OF THE FOLLOWING WAYS:

MCP - GENERAL DESCRIPTION.

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1. PURGE THE FILE;
 2. RELEASE THE FILE;
 3. RETAIN BY THE PROGRAM;
 4. RETAIN BY THE PROGRAM WITHOUT REWINDING;
 5. LOCK THE FILE.

THE PURGING OF A FILE ON DISK MEANS THE REMOVAL OF THE FILE FROM THE DISK. IF THE FILE IS MAGNETIC TAPE AND HAS A "WRITE RING", THE TAPE IS LABELED AS A SCRATCH TAPE. IF MORE THAN ONE PROGRAM IS USING THE SAME DISK FILE, AND ONE OF THEM CLOSES THE FILE WITH PURGE, MCP WILL WAIT BEFORE EXECUTING THE PURGE, UNTIL ALL THE OTHER PROGRAMS CLOSE THE FILE. (SEE ALSO "<J-S> WAITING CLOSE" SYSTEMS OUTPUT MESSAGE.)

LOCKING A DISK FILE CAUSES THE FILE IDENTIFIER TO BE ENTERED IN THE DISK DIRECTORY. CHECKING THE DISK DIRECTORY FOR A DUPLICATE IDENTIFIER IS DESCRIBED BELOW. IF THE FILE IS ON MAGNETIC TAPE, MCP REMOVES THE FILE IDENTIFIER FROM THE IOAT AND MARKS THE FILE IN THE FIB CLOSED AND IN THE IOAT AS LOCKED. THE OPERATOR IS NOTIFIED THROUGH AN SPO MESSAGE, THAT A FILE HAS BEEN LOCKED. (MAG, TAPE ONLY.)

IF THE FILE IS A MULTI-REEL FILE, CLOSING OF A REEL WILL AUTOMATICALLY INVOKE THE OPEN ROUTINE TO OPEN THE NEXT REEL.

A FILE THAT IS TO BE RETAINED IS MARKED CLOSED BY MCP IN THE FIB AND IOAT.

IF A DISK FILE IS LOCKED, MCP FIRST SEARCHES THE DISK DIRECTORY FOR AN IDENTICAL FILE IDENTIFIER. IF IT FINDS ONE, IT NOTIFIES THE OPERATOR VIA SPO MESSAGE ABOUT THE PRESENCE OF A DUPLICATE IDENTIFIER. THE OPERATOR MAY REMEDY THE SITUATION BY INSTRUCTING THE MCP TO REMOVE THE DUPLICATE FILE. MCP THEN ENTERS THE NEW FILE IN THE DISK DIRECTORY.

7E. LOAD CONTROL AND PSEUDO CARD READERS.

THE MCP PROVIDES A MEANS WHEREBY CARD DECK INFORMATION -- INCLUDING CONTROL INFORMATION -- CAN BE PLACED ON THE DISK AND THEN USED AS THOUGH IT WERE IN CARD READERS .

IT SHOULD BE NOTED THAT THE OPERATION OF LOAD CONTROL AND PSEUDO READERS

MCP - GENERAL DESCRIPTION,
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REQUIRES ADDITIONAL NON-OVERLAYABLE CORE DURING ITS USE. PSEUDO CARD READERS REQUIRE 1000 CHARACTERS OF CORE FOR PSEUDO READER MAINTENANCE OF TABLES AND POINTERS. THE LOAD CONTROL (LABELED: LDCNTL) PROGRAM IS UTILIZED AS A NORMAL STATE PROGRAM AND REQUIRES 3500 CHARACTERS OF CORE FOR ITS EXECUTION. THE LDCNTL PROGRAM FOR USE WITH REMOTE STATIONS REQUIRES 2500 CHARACTERS OF CORE FOR EXECUTION. TO PERFORM THESE FUNCTIONS, THE LDCNTL PROGRAM OPENS AND READS A FILE (WITH <F-ID>=CTLDCK) COMPOSED OF ONE OR MORE NORMAL CARD DECKS AND PLACES THE WHOLE FILE ON DISK. THE FILE MAY BE IN A CARD READER OR A FILE FROM A REMOTE DEVICE.

TO CLARIFY THE TERMINOLOGY, WE NOTE THAT THE FILE MENTIONED ABOVE IS REFERENCED AS "CTLDCK", THE NORMAL DECKS (ANALOGOUS TO A SINGLE CONTINUOUS CARD DECK SUCH AS WOULD BE PLACED IN A CARD READER) WITHIN THE FILE ARE REFERRED TO AS "PSEUDO CARD DECK"-S. THE NUMBER OF PSEUDO CARD DECKS IN THE FILE DEPENDS UPON THE NUMBER OF "? END" CONTROL CARDS WITHIN THE "CTLDCK", THE END OF THE "CTLDCK" ITSELF BEING SIGNALLED BY A SPECIAL END CARD, WHICH HAS THE FORMAT: "? ENDCTL".

LDCNTL PLACES THE PSEUDO CARD DECKS ON DISK AND ASSIGNS AN INTEGER IDENTIFICATION NUMBER TO EACH. AS THEY ARE PLACED ON DISK, EACH PSEUDO CARD DECK FOLLOWS THE PREVIOUS DECK SO THAT THE DECKS FORM A QUEUE WAITING TO BE USED. TO MAKE USE OF THEM, MCP CONTAINS LOGIC WHICH CAN SUPPLY THE SYSTEM WITH UP TO NINE PSEUDO CARD READERS. THESE PSEUDO CARD READERS IN MOST WAYS FUNCTION MUCH LIKE PHYSICAL PERIPHERALS. THAT IS, SYSTEM MESSAGES ARE TYPED FOR THEM AS THOUGH THEY WERE CARD READERS, AND KEYBOARD INPUT MESSAGES CAN REFERENCE THEM. NOTE, THAT EVERY PSEUDO CARD READER REDUCES BY ONE THE NUMBER OF DEVICES THE SYSTEM CAN HANDLE. (SEE TABLE ON PAGE 2.)

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WHEN THE PSEUDO CARD READERS ARE TURNED ON BY THE SYSTEM OPERATOR FROM THE SPO KEYBOARD, MCP SEARCHES FOR PSEUDO CARD DECKS TO SATISFY THE NEED OF THE SPECIFIED NUMBER OF PSEUDO CARD READERS. THEREAFTER, AS LONG AS THE PSEUDO CARD READERS ARE "ON" AND PSEUDO CARD DECKS ARE AVAILABLE, MCP KEEPS THE READERS LOADED.

AT HALT/LOAD TIME, ALL PSEUDO CARD READERS ARE TURNED OFF. THE OPERATOR MAY REINSTATE THEM FROM THE SPO KEYBOARD.

THIS FEATURE OF THE MCP IS VERY FLEXIBLE AND ALLOWS THE OPERATOR TO CALL OUT THE LDCNTL FOR EXECUTION, TO REMOVE PSEUDO CARD DECKS FROM DISK OR FROM THE PSEUDO CARD READERS, AND TO TURN ON OR OFF PSEUDO CARD READERS THROUGH KEYBOARD INPUT MESSAGES.

DETAILED DESCRIPTION OF LDCNTL PROGRAM AND THE PSEUDO CARD READERS

MCP - GENERAL DESCRIPTION,
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IS FURNISHED IN SECTION 9 OF THIS MANUAL; THE KEYBOARD INPUT MESSAGES ARE DESCRIBED IN DETAIL IN THE "KEYBOARD INPUT MESSAGES" SECTION.

8. INDEPENDENT INTERRUPTS.
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INTERRUPTS ARE INITIATED BY THE HARDWARE ITSELF WHEN THE COMPUTER IS OPERATING IN NORMAL STATE AND CERTAIN CONDITIONS ARE ENCOUNTERED. THE FOLLOWING ACTIONS TAKE PLACE:

1. A RESULT DESCRIPTOR IS GENERATED AND STORED IN THE RESERVED MEMORY LOCATION. (A FIXED LOCATION FOR EACH CHANNEL.)
2. THE INTERRUPT FLIP-FLOP IS TURNED ON (SET) AND THE PROGRAM RETURN POINT AND THE LOGICAL REGISTER SETTINGS ARE STORED.
3. AN AUTOMATIC BRANCH IS TAKEN TO THE ADDRESS SPECIFIED BY THE CONTENTS OF RESERVED MEMORY LOCATION 94. THE PROCESSOR STATE OF OPERATION IS CHANGED FROM NORMAL STATE TO CONTROL STATE.

IF THE COMPUTER IS OPERATING IN CONTROL STATE AT THE TIME WHEN A RESULT DESCRIPTOR IS GENERATED, THE INTERRUPT FLIP-FLOP IS TURNED ON, BUT INTERRUPT CANNOT OCCUR, SINCE THE COMPUTER IS ALREADY IN CONTROL STATE. THEREFORE, MCP CHECKS FOR NEW RESULT DESCRIPTORS WHENEVER IT IS OPERATING IN CONTROL STATE, PRIOR TO RETURNING CONTROL TO THE NORMAL STATE PROGRAM.

8A. PROCESSOR INTERRUPTS.
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1. INTERRUPT CAUSED BY ERROR CONDITIONS:

THE FOLLOWING ERROR CONDITIONS IN THE HARDWARE OR THE PROGRAM AUTOMATICALLY INTERRUPT THE PROCESSING:

MEMORY PARITY ERROR
ADDRESS ERROR
INSTRUCTION TIME EXCEEDED

MCP - GENERAL DESCRIPTION.

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INVALID INSTRUCTIONS, WHICH ARE:
 A. NON-ASSIGNED OPERATOR CODES
 B. OPERATOR CODES REQUIRING NON-PRESENT OPTIONS
 PRIVILEGED INSTRUCTIONS IN NORMAL STATE
 INVALID COMMUNICATE INSTRUCTION
 INVALID I/O DESCRIPTOR IN CONTROL STATE.

WHEN AN INDEPENDENT INTERRUPT OCCURS, MCP EXAMINES THE CAUSE OF THE INTERRUPT AND IF IT FINDS THAT THE CAUSE WAS ONE OF THE ABOVE MENTIONED ERROR SITUATIONS, IT TERMINATES THE PROGRAM AND NOTIFIES THE OPERATOR ABOUT THE ERROR AND THE TERMINATION OF THE PROGRAM.

2. INTERVAL TIMER INTERRUPT.

IF THE INTERRUPT WAS CAUSED BY THE INTERVAL TIMER, CONTROL IS TRANSFERRED TO THE MCP-S STATUS (N-SECOND) ROUTINE FOR FURTHER PROCESSING. THE FUNCTIONS OF THIS ROUTINE ARE DESCRIBED IN THE "STATUS (N-SECOND) ROUTINE" SECTION OF THIS MANUAL.

3. I/O COMPLETE INTERRUPTS.

AN INTERRUPT IN THE PROCESSOR IS CAUSED BY THE PERIPHERAL CONTROL UNIT WHEN AN I/O OPERATION IS COMPLETED.

BEFORE THE NEXT FETCH CYCLE IS STARTED, THE FACT THAT THE INTERRUPT FLIP-FLOP IS SET IS RECOGNIZED. THIS TRIGGERS THE INHIBITING OF THE FETCH CYCLE AND THE SAVING (IN RESERVED MEMORY) OF THE NEXT INSTRUCTION REGISTER, THE BASE AND LIMIT REGISTERS, AND THE COMPARE AND OVERFLOW FLIP-FLOPS. THE REGISTERS, WHERE CONTENTS HAVE BEEN STORED IN MEMORY, WILL BE CLEARED, EXCEPT FOR THE NEXT INSTRUCTION REGISTER WHICH WILL BE SET TO A FIXED ADDRESS AND THE LIMIT REGISTER WHICH IS SET TO MEMORY SIZE. THE CONTROL FLIP-FLOP WILL BE TURNED ON, AND AN INSTRUCTION WILL BE FETCHED FROM THE MCP. THIS IS THE METHOD BY WHICH CONTROL IS GIVEN TO THE MCP. THE MCP NOW HAS CONTROL AND SCANS FOR THE RESULT DESCRIPTOR WHICH CAUSED THE INTERRUPT. IT ASSOCIATES THE RESULT DESCRIPTOR WITH THE PROPER IOAT ENTRY.

IF THE INTERRUPT WAS CAUSED BY AN I/O COMPLETE RESULT DESCRIPTOR, THE EXCEPTION BIT IS EXAMINED. IF THE BIT IS ON, IT INDICATES THE PRESENCE OF SOME ERROR CONDITION, WHICH IS HANDLED BY THE I/O ERROR ROUTINE. IF THE EXCEPTION BIT IS OFF, THE RESULT DESCRIPTOR MAY INDICATE ANY OF THE FOLLOWING SITUATIONS:

MCP - GENERAL DESCRIPTION,

1. THE SPD HAS BEEN ACTIVATED AND IS NOW READY TO READ AN INPUT
2. THE SPD HAS SUCCESSFULLY FINISHED READING AN SPD INPUT MESSAGE
3. AN I/O OPERATION HAS BEEN SUCCESSFULLY EXECUTED.

IN CASE 1, THE MCP-S SPD READ ROUTINE TAKES CONTROL.

IN CASE 2, THE SPD INPUT MESSAGE MAY HAVE BEEN A CONTROL RECORD. IF YES, THE CONTROL RECORD PROCESSOR IS CALLED UPON TO PROCESS THE SPD INPUT. AS MAY BE SEEN, CONTROL INFORMATION MAY BE INTRODUCED INTO THE SYSTEM NOT ONLY THROUGH PUNCHED CARDS OR PAPER TAPE, BUT ALSO THROUGH SPD MESSAGES.

IN CASE 3, THE MCP LINKS DIRECTLY TO THE ASSOCIATED IOAT ENTRY AND TO THE PROPER I/O QUEUE ENTRY. FROM THE I/O QUEUE TABLE, THE MCP FINDS OUT WHERE TO STORE THE RESULT DESCRIPTOR WHICH GOES INTO THE RELATED FIB NEXT TO THE ORIGINATING DESCRIPTOR. IT NOW DELINKS THE ENTRY FOR THE COMPLETED I/O OPERATION, RETURNS THE IOQT SPACE AND INITIATES ANOTHER I/O OPERATION IF THERE IS ONE WAITING FOR THIS CHANNEL.

IN CERTAIN CASES OF "SPECIAL REQUESTS" THE ROUTINE WHICH REQUESTED THE I/O OPERATION HAS BEEN WAITING FOR THE RETURN OF THE RESULT DESCRIPTOR TO COMPLETE ITS PROCESSING. MCP CHECKS FOR THESE CASES AND GIVES CONTROL TO THEM, INSTEAD OF RETURNING CONTROL TO THE CALLING ROUTINE.

8B. I/O ERROR ROUTINE.

THE I/O ERROR ROUTINE TRIES TO RESOLVE VARIOUS CONDITIONS, WHICH RESULTED IN THE UNSATISFACTORY EXECUTION OF AN I/O OPERATION, EVIDENCED BY THE EXCEPTION BIT IN THE RESULT DESCRIPTOR.

THE POSSIBLE ERROR CONDITIONS AND THE ACTIONS TAKEN TO RESOLVE THEM ARE SHOWN IN THE FOLLOWING TABLE:

ERROR CONDITION

ACTION TAKEN:

UNIT NOT READY

UNIT MARKED "NOT AVAILABLE".
I/O REQUEST IS REINTRODUCED IN
THE WAITING LIST OF THE IOQT.

MCP - GENERAL DESCRIPTION.

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	OPERATOR NOTIFIED BY SPO MESSAGE.
PARITY ERROR ON MAG. TAPE READ	MAG. TAPE IS BACKSPACED. READ OPERATION IS REPEATED N TIMES. IF ERROR PERSISTS, THE UNIT IS LOCKED OUT, OPERATOR NOTIFIED OF PERSISTING ERROR BY SPO MESSAGE.
PARITY ERROR ON MAG. TAPE WRITE	MAG. TAPE IS BACKSPACED. INCORRECT REGRD IS ERASED. WRITING OF RECORD IS REPEATED N TIMES IN AREA FOLLOWING THE ERASED RECORD. IF ERROR PERSISTS, UNIT IS LOCKED OUT, OPERATOR NOTIFIED OF PERSISTING ERROR BY SPO MESSAGE.
PARITY ERROR ON PAPER TAPE READ	PAPER TAPE IS BACKSPACED. READ OPERATION REPEATED N TIMES. IF ERROR PERSISTS, UNIT IS LOCKED OUT, OPERATOR NOTIFIED OF PERSISTING ERROR BY SPO MESSAGE.
ERROR ON PAPER TAPE WRITE	THIS ERROR SITUATION IS UNDETECTABLE.
PARITY ERROR ON CARD PUNCH	FOR CORRECTIVE ACTIONS SEE " ** <UNIT SPECIFIER> CARD PUNCH PAR" SYSTEMS OUTPUT MESSAGE. IF THE ERROR PERSISTS, UNIT IS LOCKED OUT, OPERATOR NOTIFIED BY SPO MESSAGE.
PARITY ERROR ON SPO AND LINE PRINTER	THIS ERROR SITUATION IS IRRECOVERABLE. OPERATOR IS NOTIFIED BY SPO MESSAGE. UNIT IS NOT LOCKED OUT.
PARITY ERROR ON DISK READ	READ OPERATION REPEATED N TIMES. IF THE ERROR PERSISTS, OPERATOR IS NOTIFIED OF PERSISTING ERROR BY SPO MESSAGE.

MCP - GENERAL DESCRIPTION,
 --- - - - -

PARITY ERROR ON CARD READER

THE LOCATION OF THE SOURCE OF THE PARITY ERROR IS EXAMINED. IF IT WAS CAUSED BY AN INVALID CHARACTER IN COLUMN 1, THE CONTROL CARD ROUTINE IS CALLED IN.

IF THE PARITY ERROR WAS CAUSED BY A CHARACTER LOCATED IN ANY OTHER COLUMN, A MESSAGE IS PRINTED ON THE SPO INDICATING THE COLUMN NUMBER. THE UNIT IS MADE UNAVAILABLE.

MAG. TAPE UNIT IS REWINDING

MARKED NOT AVAILABLE TEMPORARILY

MAG. TAPE OVERSPACE (TAPE SPACED OVER 6 FT.)

UNIT MARKED UNAVAILABLE AND LOCKED OUT, OPERATOR NOTIFIED BY SPO MESSAGE.

9. DESCRIPTION OF THE MCP ROUTINES.
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9A. ROUTINES IN THE "LOADING" AND "INITIALIZATION" SECTIONS.
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1. BOOTSTRAP LOADER.

CALLS IN RESIDENT CORE PORTION OF MCP FROM DISK.

2. INITIALIZATION.

LABEL: EX-INI

THE ROUTINE CONSISTS OF TWO PARTS.

PART 1. READS IN TABLES AND VARIABLES FROM DISK WHICH WERE SET UP BY THE SYSTEM LOADER. IT UPDATES THE SYSTEM STATUS FROM THE LAST RUNNING

MCP - GENERAL DESCRIPTION.

OF MCP.

PART 2. THE LOG RECORDS ARE INITIALIZED AND THE DISK AND MEMORY AVAILABILITY TABLES BUILT. SETS UP THE INTERVAL TIMER AND THE 24 HOUR CLOCK. A HALT/LOAD MESSAGE AND THE SYSTEM STATUS IS PRINTED ON THE SPD. THE ROUTINE NOW EXAMINES THE MCP VERSION IN CORE AND IF IT IS THE MICR, DC OR COMBINED VERSION, IT CALLS IN THE SPECIAL SEGMENTS OF THE MCP PERTAINING TO THESE VERSIONS AND MODIFIES THE MEMORY AVAILABILTY TABLE ACCORDINGLY.

RETURN FROM THIS ROUTINE IS TO TESTR.

9B. ROUTINES IN THE "SYSTEM SUPERVISORY FUNCTIONS" SECTION.

1. STATUS (N-SECOND) ROUTINE.

LABEL: NSEC

THIS ROUTINE CHECKS EACH ENTRY IN THE IOAT FOR STATUS CHANGE. STATUS CHANGE MEANS THAT A PERIPHERAL DEVICE HAS JUST BECOME READY OR NOT READY. IF THERE IS A STATUS CHANGE FROM NOT READY TO READY, THE ROUTINE ESTABLISHES THE TYPE OF THE HARDWARE AND CALLS IN THE PROPER READ. IF IT IS A CARD READER, IT MAY BE A CONTROL CARD AND AFTER SEARCHING FOR AND SENSING THE INVALID CHARACTER IN THE FIRST COLUMN, THE CONTROL CARD PROCESSOR IS CALLED UPON TO PROCESS THE CONTROL CARD. IF THERE IS A STATUS CHANGE FROM READY TO NOT READY, AND THE UNIT IS NOT ASSIGNED, EVERY ENTRY RELATIVE TO THE LABEL OF THAT UNIT IS ERASED,

IF N-SECOND SENSES THAT THE FIRST RECORD OF A FILE ON A NEWLY READY UNIT HAS BEEN READ, IT EXAMINES IF THE FIRST RECORD WAS A LABEL. IF IT WAS A LABEL, IT MOVES THE LABEL IDENTIFICATION TO THAT UNITS IOAT ENTRY. IF THE FIRST RECORD WAS NOT A LABEL AND THERE WAS A WRITE RING IN THE REEL, OR IF THE RETENTION DATE IN THE LABEL HAS BEEN PASSED, THE UNIT IDENTIFICATION IS BLANKED OUT, I.E., IT BECOMES A SCRATCH TAPE.

N-SECOND IS INVOKED WHENEVER THE INTERVAL TIMER CAUSES AN INTERRUPT.

2. MCP CONTROL PROCEDURE.

LABEL: TESTR

MCP - GENERAL DESCRIPTION.
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THE ROUTINE FIRST CHECKS IF ANY I/O COMPLETES HAVE OCCURRED. IF YES, IT CALLS ON THE I/O COMPLETE ROUTINE TO PROCESS IT,

IF THERE WAS NO I/O COMPLETE OR AFTER HAVING PROCESSED THEM, IT CHECKS IF ANY OF THE PROGRAMS IN THE MIX IS READY TO RUN; IF YES, IT IS REINSTATED. IF NO PROGRAM IS IN THE CONDITION TO RUN, IT LOOKS FOR SCHEDULED PROGRAMS IN THE JRT; IF IT FINDS ONE, IT CALLS CALLPG TO LOAD IT AND STATUS TO UPDATE THE SYSTEM STATUS.

3. PROCEDURE TO LOAD OBJECT PROGRAM IN CORE.

LABEL: CALLPG

ROUTINE TESTS FOR ANY SCHEDULED PROGRAMS THAT ARE NOT RUNNING, IF THERE IS NONE, IT EXITS.

IF THERE IS SUCH A PROGRAM AND SUFFICIENT CORE TO EXECUTE IT, THE ROUTINE CONSTRUCTS AN ENTRY FOR THE PROGRAM IN THE MIX, READS THE PPB AND SEGMENT # 0 (ZERO) OF THE OBJECT PROGRAM INTO CORE, SETS UP THE BASE AND LIMIT REGISTERS, AND THE STARTING ADDRESS OF THE OBJECT PROGRAM IN THE REINSTATE CONTROL WORD PART OF THE MIX ENTRY.

IT TYPES THE BEGINNING OF JOB MESSAGE AND THE STARTING TIME ON THE SPO, AND BUILDS A LOG ENTRY FOR THIS PROGRAM.

4. CONTROL RECORD PROCESSOR.

LABEL: C-CORD

IT SCANS AND SEPARATES THE INPUT FIELDS AND CHECKS THE FIRST SYMBOL AGAINST THE LIST OF RESERVED WORDS. IT PRINTS AN ERROR MESSAGE IF THE SYMBOL IS NOT FOUND IN THE LIST OF RESERVED WORDS, ELSE IT PROCESSES THE REQUEST, MAKES THE NECESSARY ENTRIES IN THE TABLES.

5. CORE REQUEST.

LABEL: GETCOR

MCP - GENERAL DESCRIPTION,

THE ROUTINE PROCESSES A REQUEST FOR CORE MEMORY; THE AMOUNT OF CORE REQUIRED IS PASSED AS A PARAMETER.

6. TEST IF ANY PROGRAMS SCHEDULED BUT NOT RUNNING.

LABEL: NYSCHD

THE ROUTINE CHECKS IF THERE ARE ANY PROGRAMS SCHEDULED WHICH ARE NOT IN THE MIX FOR EXECUTION.

7. LOOK UP CONTROL RECORD WORD IN TABLE

LABEL: FINDKY

IDENTIFIES RESERVED WORDS FROM CONTROL INPUT RECORDS. CALLED BY CONTROL RECORD PROCESSOR.

8. SSMP

LABEL: SSMP

VERIFIES THAT PROGRAM SCHEDULED FOR EXECUTION IS IN MCP DISK DIRECTORY AND MAKES PERTINENT ENTRIES IN THE JRT.

9. SYSTEM ENVIRONMENT RECORD PROCESSOR.

LABEL: EPC

HANDLES CONTROL INPUT RECORDS WHICH DECLARE PERIPHERAL EQUIPMENT.

10. SET UP LINK IN MIX TABLE ENTRY.

LABEL: MAKMIX

ANALYZES THE PRIORITY OF THE NEW REQUEST; AND CONSTRUCTS MIX ENTRY INTO APPROPRIATE PRIORITY ORDER.

MCP - GENERAL DESCRIPTION,

11. GET CHANNEL AND UNIT FOR CONTROL RECORDS.

LABEL: GETCHU

ISOLATES AND IDENTIFIES CHANNEL AND UNIT NUMBERS FROM INPUT CONTROL RECORDS.

12. LIBRARY MAINTENANCE ROUTINE

LABEL: LOADMP

HANDLES LOAD AND DUMP FUNCTIONS.

13. ZIPPER ROUTINE.

LABEL: ZIPPER

MESSAGE ABOUT THE CONTENTS OF THE ZIP REQUEST.

14. MCP SEGMENT OVERLAY.

LABEL: MCPCLL

THE ROUTINE LOADS FROM DISK INTO CORE THE REQUESTED MCP SEGMENT.

15. UPDATE IOAT.

LABELS: ADDUNT
SUBUNT

THESE ROUTINES UPDATE THE IOAT TABLE BY ADDING TO, OR REMOVING FROM THE SYSTEM ENVIRONMENT A PERIPHERAL UNIT.

16. GET DISK FOR MCP.

MCP - GENERAL DESCRIPTION,

LABEL: GETMCP

GET ONE SEGMENT OF DISK FOR THE USE OF MCP.

17. RETURN DISK SPACE TO MCP.

LABEL: RTNMCP

RETURNS SEGMENT OF MCP DISK TO SYSTEM.

18. NO DISK.

LABEL: NODISK

THE ROUTINE GENERATES AN SPU MESSAGE AND ENTERS THE KX ROUTINE.

9C. ROUTINES IN THE "PROGRAM SUPERVISORY FUNCTIONS" SECTION.

1. OVERLAY ROUTINE.

LABEL: COVLY

THIS ROUTINE IS ENTERED FROM THE BRANCH ADDRESS IN THE SEGMENT DICTIONARY IF THE REQUIRED SEGMENT IS NOT PRESENT IN CORE, IF THE REQUIRED SEGMENT IS PRESENT IN CORE, THE SEGMENT DICTIONARY ENTRY CONTAINS THE ADDRESS OF THE FIRST EXECUTABLE INSTRUCTION OF THE SEGMENT; IF IT IS NOT IN CORE, IT CONTAINS THE ADDRESS OF THIS ROUTINE.

THE ROUTINE PICKS UP, FROM THE SEGMENT DICTIONARY, THE DISK ADDRESS OF THE REQUESTED SEGMENT, PLACES THE DISK READ DESCRIPTOR INTO THE IOQT TO INITIATE THE READING OF THE SEGMENT FROM DISK AND MARKS THE OBJECT PROGRAM AS "WAITING FOR OVERLAY".

MCP - GENERAL DESCRIPTION,
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2. GET USERS DISK SPACE.

LABEL: GETDSK

THE ROUTINE IS FURNISHED WITH TWO PARAMETERS: ONE INDICATES THE NUMBER OF SEGMENTS REQUIRED, THE OTHER IS TO RECEIVE THE ADDRESS OF THE DISK AREA ALLOCATED. THE ROUTINE CHECKS THE AVAILABLE DISK TABLE AND IF IT CANNOT FIND A DISK AREA OF THE REQUIRED SIZE, IT PUTS A ZERO INTO THE FIELD DESIGNATED TO RECEIVE THE DISK AREAS ADDRESS; OTHERWISE IT PLACES THE ADDRESS OF THE DISK AREA INTO THE FIELD.

IF DISK SPACE HAS BEEN FOUND, THE AVAILABLE DISK TABLE IS MODIFIED ACCORDINGLY.

3. RETURN USERS DISK.

LABEL: RTNDSK

RETURNS USERS DISK AREA AND MODIFIES THE AVAILABLE DISK TABLE TO INCLUDE THE RETURNED AREAS.

4. RETURN CORE.

LABEL: RTNCR

PARAMETERS SPECIFY THE ADDRESS AND THE LENGTH OF THE CORE AREA TO BE RETURNED.

AVAILABLE CORE AREA IS INCREASED ACCORDINGLY.

5. REMOVE FROM DISK DIRECTORY

LABEL: TKTOFF

ROUTINE REMOVES FILE HEADER FROM DISK DIRECTORY AND RETURNS ALL DISK STORAGE.

MCP - GENERAL DESCRIPTION,
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6. TIME-DATE COMMUNICATE.

LABEL: TM-DT

UPON REQUEST IT COMMUNICATES THE DATE OR THE TIME. DATE IS IN THE FOLLOWING FORMAT: MMDDYY, TIME IS COMPUTED IN THE FOLLOWING MANNER: THE REAL TIME CLOCK VALUE IS ADDED TO THE VALUE OF THE 24 HOUR CLOCK.

7. DATE IN YYDDD FORMAT.

LABEL: SETDAT

COMPUTES DATE IN YYDDD FORMAT FOR USE IN LABELS.

8. DATE UPDATE
 LABEL: SLDATE

SETS DATE FROM LDATE VARIABLE; UPDATES DAY, MONTH AND YEAR.

9. SYSTEM LOG ROUTINE.

LABEL: CABIN

MAINTAINS INFORMATION IN THE LOG ROUTINES SCHEDULE CARD, EOJ, FILE OPEN AND FILE CLOSE RECORDS. IT PUTS OUT WARNING MESSAGES IF THE LOG RECORDS ARE HALF FILLED; AGAIN, IF THE LOG RECORDS ARE ALMOST COMPLETELY FILLED. IF THE RECORDS GET FILLED AND NO ACTION HAD BEEN TAKEN, THE ROUTINE TRANSFERS THE CONTENTS OF THE LOG FILE TO THE FILE "LOG1" AND PURGES THE LOG RECORDS.

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 *
 *

10. TIME CHARGING PROCEDURE.

LABEL: TIMEMX

ROUTINE CHECKS IF OLD MIX INDEX IS SAME AS NEW; IF YES, NO ACTION IS TAKEN AND ROUTINE EXITS; IF DIFFERENT, IT SETS THE CURRENT VALUE OF THE TIMER IN THE NEW MIX ENTRY, COMPUTES ELAPSED TIME AND ADDS TO OLD MIX ENTRY VALUE.

MCP - GENERAL DESCRIPTION.

11. END OF JOB PROCESSOR. *

LABEL: TERM

ROUTINE ANALYZES THE TYPE OF JOB THAT WAS EXECUTED AND FINDS THE TERMINATION REQUIRED FOR THIS TYPE OF RUN. IT RETURNS CORE SPACE AND DISK AREA USED BY THE PROGRAM. CALLS ON LOG ROUTINE TO COMPLETE LOGGING FOR THAT PROGRAM. FINALLY, IT REMOVES SCHEDULE ENTRY FROM JRT, MIX ENTRY FROM MIX, AND PRINTS END OF JOB MESSAGE ON THE SPO.

12. DEBUGGING AIDS. *

1. DUMP.

LABEL: DMP

PRINTS THE FOLLOWING INFORMATION ON A LINE PRINTER ASSIGNED TO THE PROGRAM OR ON A LINE PRINTER THAT IS UNASSIGNED:

1. MIX TABLE DATA
2. IOAT DATA FOR EACH UNIT ASSIGNED TO THE PROGRAM
3. FIB DATA FOR EACH UNIT ASSIGNED TO THE PROGRAM
4. THE CONTENTS OF THE CORE AREA DEFINED BY THE BASE AND LIMIT REGISTERS.

IF THE ABOVE INFORMATION IS REQUESTED FOR ALL PROGRAMS, THEN THE ENTIRE MIX TABLE, IOAT, AND ALL OF CORE MEMORY IS DUMPED ON THE LINE PRINTER.

2. TRACE

LABEL: TRACEX

PERFORMS TRACE OF ALL INSTRUCTIONS EXECUTED FOR OBJECT PROGRAM IN NORMAL STATE. TRACE OUTPUT IS PRINTED ON LINE PRINTER. TRACING IS CONTINUED UNTIL A COMMUNICATE TO CONTROL STATE IS ENCOUNTERED; CONTROL STATE INSTRUCTIONS ARE SKIPPED; WHEN CONTROL STATE PROCESSING IS FINISHED, AND CONTROL RETURNED TO THE NORMAL STATE PROGRAM, TRACING IS RESUMED. TRACING CONTINUES UNTIL THE TRACE

MCP - GENERAL DESCRIPTION,
 --- - -----

OFF COMMUNICATE IS ENCOUNTERED.

LABEL: TRACEK

PERFORMS TRACE OF ALL INSTRUCTIONS EXECUTED IN NORMAL OR CONTROL STATE OR BOTH. TRACE OUTPUT IS PRINTED ON THE LINE PRINTER. THIS TRACE ROUTINE REQUIRES EXTRA MEMORY.

13. RETURN FROM USE ROUTINE.

LABEL: USERTN

HANDLES RETURN FROM USE ROUTINES.

9D. ROUTINES IN THE "I/O CONTROL" SECTION,
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1. OPEN ROUTINE,

LABEL: OPN
 BEFORE READING OR WRITING A FILE, THE FILE MUST BE OPENED. THE OPEN ROUTINE FIRST VERIFIES THAT THE FILE IS CLOSED. IN CASE OF INPUT FILES, EXCLUSIVE OF DISK, IT SEARCHES THE IOAT TO FIND THE FILE IDENTIFIER; IN CASE OF OUTPUT FILES, IT SECURES THE SCRATCH FILE, SETS UP LINKS IN FIB, IOAT, AND MIX TABLES, EXECUTES "USE" ROUTINES, IF REQUIRED. CREATES LABELS ON OUTPUT FILES IF REQUIRED, CHECKS LABELS ON INPUT FILES; FINALLY, ON INPUT FILES, IT FILLS THE BUFFERS.

2. READ/WRITE ROUTINE.

LABEL: REED
 WRIT

THE ROUTINE FIRST VERIFIES THAT THE FILE WHICH IS TO BE READ OR WRITTEN IS OPEN. THE ROUTINE THEN GIVES ACCESS TO THE NEXT LOGICAL RECORD. IN THE ACTUAL READING OR WRITING OPERATION THE ROUTINE ALWAYS READS OR WRITES A PHYSICAL RECORD, BUT TRANSMITS TO THE REQUESTOR ONLY THE LOGICAL RECORD THAT HAS BEEN REQUESTED. CONSEQUENTLY, A REQUEST FOR A NEW (LOGICAL) RECORD DOES NOT NECESSARILY CAUSE AN ACTUAL READ

MCP - GENERAL DESCRIPTION.

OPERATION ON PART OF THE MCP; IT MAY RESULT IN MAKING ACCESSIBLE TO THE REQUESTOR A LOGICAL RECORD FROM A PHYSICAL RECORD WHICH HAD BEEN READ DURING A PREVIOUS OPERATION.

ON THE OTHER HAND, IF THE REQUESTED LOGICAL RECORD IS NOT PART OF A PHYSICAL RECORD ALREADY IN POSSESSION OF THE MCP, A NEW READ OPERATION IS INITIATED. IN THIS CASE, THE IOQ ROUTINE IS USED TO PLACE THE REQUEST IN THE IOQT LIST OF WAITING I/O OPERATIONS, AND THE IWOR ROUTINE IS CALLED ON TO INITIATE THE I/O OPERATION. WRITE REQUESTS ARE HANDLED IN A SIMILAR MANNER; LOGICAL RECORDS ARE TRANSMITTED TO MCP AND COLLECTED IN BUFFERS UNTIL THE BUFFER IS FULL; AT THAT TIME, THE MCP WRITES THE PHYSICAL RECORD ON THE OUTPUT MEDIA, IF THE CHANNEL SPECIFIED IS BUSY, THE ROUTINE TRIES TO EXECUTE THE OPERATION ON AN ALTERNATE CHANNEL. IF NONE IS AVAILABLE, THE PROGRAM IS MARKED "WAITING FOR I/O".

3. CLOSE ROUTINE.

LABEL: CLOS

THE ROUTINE VERIFIES, THAT THE FILE IS OPEN. THE ROUTINE THEN CAUSES THE EXECUTION OF THE FINAL WRITE REQUESTS, WRITES TAPEMARK AND LABEL, IF NECESSARY, WRITES ANOTHER TAPEMARK AND BACKSPACES OVER IT, CALLS THE LOG ROUTINE TO FINISH THE LOG RECORDS FOR THIS FILE, RESETS ALL POINTERS AND COUNTERS, AND EXECUTES THE INSTRUCTIONS TO LOCK, SAVE, RELEASE, RETAIN OR PURGE THE FILE. FOR DISK FILES IT ENTERS THE FILE IDENTIFIER IN THE DISK DIRECTORY OR REMOVES IT FROM SAME, DEPENDING UPON THE PROGRAMS INSTRUCTION.

4. PUT NORMAL STATE REQUEST IN IOQT.

LABEL: PUTINQ

HANDLES SETTING UP CALL TO PLACE NORMAL STATE OBJECT PROGRAM RANDOM DISK I/O REQUEST INTO IOQT.

5. ROTATE BUFFERS.

LABEL: ROTATE

IT CYCLES THE BUFFERS.

MCP - GENERAL DESCRIPTION.
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6. SETUP FOR SPECIAL I/O OPERATIONS.

LABEL: SOP

HANDLES QUEUEING OF DESCRIPTOR AND CALL ON IOQ TO REQUEST I/O ON IT.

7. DELINK

LABEL: DLI

REMOVES I/O REQUEST FROM IOQT AND PERFORMS NECESSARY QUEUE LINK MAINTENANCE.

8. SCAN

LABEL: SCAN

ISOLATES AND IDENTIFIES SYMBOL STRING AT ADDRESS PASSED AS PARAMETER. ISOLATES IDENTIFIERS, NUMBERS AND SPECIAL CHARACTERS AS WELL AS THEIR LENGTH.

9. KEYBOARD INPUT ROUTINE

LABEL: KBDINP

PROCESSES KEYBOARD-INPUT MESSAGES.

10. KEYBOARD OUTPUT ROUTINE

LABEL: KBOUT

PROCESSES KEYBOARD OUTPUT MESSAGES.

11. KEYBOARD ENABLE

MCP - GENERAL DESCRIPTION,
--- - -----

LABEL: KBIN

ENABLES OR DISENABLES THE SPO UPON REQUEST.

12. PURGE IOQT

LABEL: PGQ
THE ROUTINE REMOVES FROM THE IOQT REQUESTS FOR THE UNIT SPECIFIED IN
VARIABLE ZATX.

13. IOQ ROUTINE.

LABEL: IOQ

THIS ROUTINE RECORDS PARAMETERS FROM I/O REQUESTS IN THE NEXT AVAILABLE
I/O QUEUE ENTRY, LINKS THE REQUEST ONTO THE LIST WAITING ON INDICATED
CHANNEL AND CALLS ON IWOR ROUTINE TO INITIATE THE I/O OPERATION.

14. INITIATE WAITING I/O REQUESTS.

LABEL: IWOR

THE ROUTINE SELECTS THE INDICATED CHANNEL AND UNIT, MARKS THEM "IN USE"
AND INITIATES THE I/O OPERATION.

IF THE REQUESTED CHANNEL IS IN USE, THE ROUTINE TRIES TO FIND AN
ALTERNATE CHANNEL.

15. ACCEPT AND DISPLAY

LABEL: AC-DIS

IF THE REQUEST IS AN ACCEPT, THE ROUTINE MARKS THE PROGRAM NOT READY
AND WAITING FOR KEYBOARD INPUT. IF THE REQUEST IS FOR DISPLAY, THE
ROUTINE CALLS THE KBOUT ROUTINE TO WRITE OUT THE DISPLAY MESSAGE ON THE
SPO.

MCP - GENERAL DESCRIPTION.

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16. POSITION,

LABEL: POSNIN

POSITIONS PRINTER, MAG. TAPE, AND SERIAL DISK FILES.
POSITIONING OF MAG. TAPES IS NOT OPERATIONAL YET.

17. WRITE TAPE MARKS.

LABEL: LABELER

WRITES TAPE MARKS AND LABELS ON OUTPUT MEDIA.

18. MULTI-FILE SEARCH,

LABEL: MULTIF

SEARCHES FOR REQUESTED IDENTIFIER ON MULTI-FILE TAPES.

19. SEARCH DIRECTORY,

LABEL: FNDFIL

SEARCHES THE DISK DIRECTORY TO FIND A FILE.

20. READ/WRITE DISK.

LABELS: RDASEG
WRASEG

READS ONE SEGMENT FROM DISK OR WRITES ONE SEGMENT ON DISK.

9E. ROUTINES IN THE "INDEPENDENT INTERRUPTS" SECTION,
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MCP - GENERAL DESCRIPTION.

1. CONTROL STATE ENTRY FROM NORMAL CAUSED BY HARDWARE INTERRUPT.

SAVES REGISTER VALUES AND TOGGLE SETTINGS IN APPROPRIATE MIX ENTRIES AND CALLS I/O COMPLETE PROCEDURE TO PROCESS INTERRUPT.

2. TEST INTERRUPTS.

SCANS FOR RESULT DESCRIPTOR. IF THE RESULT DESCRIPTOR WAS CAUSED BY A PROCESSOR INTERRUPT, THE RESULT DESCRIPTOR IS SAVED AND THE PROCESSOR INTERRUPT RESULT CLEARED.

IF THE INTERRUPT WAS AN I/O COMPLETE, THE ROUTINE MOVES THE HISTORY OF THE I/O INITIATION TO GLOBAL STORAGE FOR PROCESSING BY THE IOC ROUTINE.

3. I/O COMPLETE AND INTERRUPT PROCESSING.

CHECKS THE TYPE OF INTERRUPT. THE FOLLOWING 3 CASES MAY OCCUR:

A. PROCESSOR INTERRUPT. CALL PROCESSOR ERROR ROUTINE.

B. INTERVAL TIMER INTERRUPT. CALL STATUS (N-SECOND) TO PROCESS INTERVAL TIMER AND ENVIRONMENT CHECK.

C. I/O COMPLETE INTERRUPT.

IF THE EXCEPTION BIT IS NOT ON, THE RESULT DESCRIPTOR IS EXAMINED TO SEE IF THE INTERRUPT WAS CAUSED BY AN SPO INQUIRY OR SPO ANSWER. IF SO, KBDINP OR KBOUT ROUTINES ARE CALLED TO DO THE PROCESSING.

IF THE RESULT DESCRIPTOR DOES NOT REFERENCE THE SPO ROUTINES, THE RESULT OF THE OPERATION IS MOVED TO THE AREA OF THE PROGRAM WHICH REQUESTED THE I/O OPERATION, THE RESULT AREA IS CLEARED, THE REQUEST IS REMOVED FROM THE IOQT AND THE ROUTINE PROCEEDS TO INITIATE THE NEXT WAITING I/O OPERATION.

IF THE EXCEPTION BIT IS ON, I/O ERROR ROUTINE IS CALLED IN TO TRY TO CORRECT THE ERROR SITUATION.

MCP - GENERAL DESCRIPTION.

4. I/O ERROR ROUTINE.

IF POSSIBLE, THE ROUTINE REPEATS THE I/O OPERATION WHICH RESULTED IN A PARITY ERROR PREVIOUSLY AND CHECKS THE RESULT OF THE REPEATED OPERATION, IF THE ERROR PERSISTS, THE UNIT IS LOCKED OUT AND THE OPERATOR IS NOTIFIED BY SPO MESSAGE OF THE FAILURE OF THE I/O OPERATION.

IF THE UNIT, ON WHICH AN I/O OPERATION WAS TO BE EXECUTED, WAS NOT READY, THE UNIT IS MARKED "NOT AVAILABLE", AND THE I/O REQUEST IS INTRODUCED IN THE WAITING LIST OF THE IOQT.

IF THE MAG. TAPE IS REWINDING, THE UNIT IS MARKED "NOT AVAILABLE" TEMPORARILY. IF A MAG. TAPE OVERSPACE OCCURS, THE TAPE UNIT IS LOCKED OUT.

9F. THE LOAD CONTROL PROGRAM.

LABEL: LDCNTL

THE MCP SYSTEM PROGRAM LDCNTL IS A SPECIALLY CODED PROGRAM WHICH IS IN PART AN OBJECT PROGRAM MAINTAINED WITHIN THE MCP AND PART CONTAINED WITHIN THE MCP CONTROL STATE CODE .

LOADING A CONTROL DECK FILE TO DISK:

LDCNTL WILL OPEN AND READ A FILE COMPOSED OF ONE OR MORE NORMAL DECKS WITH THE <FILE IDENTIFIER> CTLDCK AND PLACE THAT FILE IN A SPECIAL FORMAT ON DISK AS ONE OR MORE "PSEUDO CARD DECKS".

IF A "CTLDCK" FILE IS TO BE READ FROM A CARD READER, THE FILE MUST BE PRECEDED BY A LABEL CARD TO IDENTIFY IT. ALSO, THE LAST CARD IN THE CONTROL MUST BE AN END CONTROL CARD CONTAINING THE INFORMATION:

? ENDCTL

MCP - GENERAL DESCRIPTION.

IF A "CTLDCK" FILE IS TO BE COPIED FROM A REMOTE DEVICE TO DISK, THE FILE MUST BE PROPERLY LABELED, AND - AS IN THE CASE WITH "CONTROL" CARD READER DECKS - THE LAST CARD IMAGE ON THE REMOTE FILE MUST BE AN END CONTROL CARD. IN ADDITION TO THESE SO THAT "QUESTION MARK CARDS" (I.E., CONTROL CARD AND PROGRAM PARAMETER CARDS) CAN BE RECOGNIZED, THE FILE MUST HAVE THE FOLLOWING CHARACTERISTICS:

1. THE FILE MUST BE UNBLOCKED
2. EACH CONTROL CARD RECORD MUST BE 80 CHARACTERS LONG - OF WHICH THE FIRST 72 MAY BE USED
3. EACH RECORD CONTAINING A CARD WHICH IS NOT A QUESTION MARK CARD MUST BE 80 CHARACTERS LONG.

NOTE: THE FORMAT AND OPERATING INSTRUCTIONS FOR EACH OF THE PERMISSIBLE REMOTE DEVICES ARE GIVEN IN THE PARAGRAPH IN THIS SECTION PERTAINING TO THAT DEVICE.

UNITY AND LIMITS OF PSEUDO DECKS ON DISK:

WHEN LDCNTL READS A CTLDCK FILE IT PLACES IT ON DISK AS ONE OR MORE PSEUDO CARD DECKS. THE NUMBER OF PSEUDO DECKS CREATED DEPENDS UPON THE NUMBER OF "? END" CARDS LOCATED WITHIN THE CONTROL DECK. THAT IS, EACH TIME AN END CARD IS ENCOUNTERED, IT IS TAKEN TO DENOTE THE END OF A DECK. ADDITIONAL CARDS WILL INITIATE CREATION OF ANOTHER PSEUDO DECK. AS EACH NEW PSEUDO DECK IS CREATED, IT IS GIVEN AN IDENTIFICATION OF THE FORM:

<INTEGER>

IT SHOULD BE NOTED THAT WHAT IS REFERRED TO AS PSEUDO DECK IS ANALOGOUS TO A SINGLE CONTINUOUS DECK SUCH AS WOULD BE PLACED IN A CARD READER. THEREFORE, IF A PSEUDO DECK CONTAINS MORE THAN ONE FILE, EACH FILE -- PAST THE FIRST -- WILL BE RECOGNIZED ONLY WHEN THE FILE PRECEEDING IT HAS BEEN PASSED.

IT SHOULD ALSO BE NOTED THAT THERE IS NO SET LIMIT TO THE NUMBER OF CARDS THAT MAY BE CONTAINED IN A CONTROL FILE, BUT A PSEUDO CARD DECK (THE END OF WHICH IS DENOTED BY THE END CARD) MAY CONTAIN NO MORE THAN 20,000 CARDS.

REMOVING PSEUDO DECKS FROM DISK:

MCP - GENERAL DESCRIPTION.

WHEN EACH PSEUDO CARD DECK IS PLACED ON DISK IT FOLLOWS THE PREVIOUS DECK SO THAT THE DECKS FORM A QUEUE WAITING TO BE USED BY A PSEUDO CARD READER.

BECAUSE OF THE QUEUE FEATURE, SPECIAL ACTION MUST BE TAKEN TO REMOVE PSEUDO DECKS FROM DISK WHEN THEY HAVE NOT BEEN USED BY THE PSEUDO CARD READER. THEREFORE, TO REMOVE PSEUDO DECKS FROM DISK, THE "RD" KEYBOARD INPUT MESSAGE MUST BE USED, (SEE SECTION ON KEYBOARD INPUT MESSAGES).

CALLING LDCNTL PROGRAM OUT FOR EXECUTION:

THE PROGRAM LDCNTL MAY BE CALLED OUT THROUGH USE OF A KEYBOARD INPUT MESSAGE "LD". (SEE SECTION ON INPUT KEYBOARD MESSAGES).

TRANSMISSION ERRORS ON REMOTE DEVICES:

IF A TRANSMISSION ERROR IS ENCOUNTERED IN A CONTROL DECK FILE BEING READ FROM A REMOTE DEVICE, AN ATTEMPT WILL BE MADE TO CAUSE THE ERRONEOUS MESSAGE TO BE RE-TRANSMITTED. SEE PARAGRAPHS ON EACH INDIVIDUAL REMOTE DEVICE FOR THE APPROPRIATE ACTION THAT MUST BE TAKEN.

PSEUDO READERS AND USE OF PSEUDO CARD DECKS:

TO MAKE USE OF PSEUDO CARD DECKS, THE MCP CONTAINS LOGIC WHICH CAN SUPPLY THE SYSTEM WITH UP TO NINE PSEUDO CARD READERS. THESE PSEUDO CARD READERS IN MOST WAYS APPEAR TO BE MUCH LIKE PHYSICAL PERIPHERALS. THAT IS, SYSTEM MESSAGES ARE TYPED FOR THEM AS THOUGH THEY WERE CARD READERS, AND KEYBOARD INPUT MESSAGES CAN REFERENCE THEM. THE PSEUDO CARD READERS ARE IDENTIFIED BY THE SYSTEM MEMORY OR DISK.

AT HALT/LOAD TIME, ALL PSEUDO CARD READERS ARE "TURNED OFF". THE SYSTEM OPERATOR MAY CAUSE THESE READERS TO BE "TURNED ON" THROUGH USE OF AN RN KEYBOARD INPUT MESSAGE. (SEE SECTION ON KEYBOARD INPUT MESSAGES).

THE RN MESSAGE TO TURN ON PSEUDO CARD READERS:

WHEN AN RN <INTEGER> MESSAGE IS INITIALLY ENTERED -- AND THE <INTEGER> IS NOT EQUAL TO ZERO -- THE MCP SEARCHES FOR PSEUDO CARD DECKS TO SATISFY THE NEED OF THE SPECIFIED NUMBER OF PSEUDO CARD READERS. THEREAFTER, AS

MCP - GENERAL DESCRIPTION.

--- - -----

LONG AS PSEUDO CARD READERS ARE "ON" AND PSEUDO DECKS ARE AVAILABLE, THE MCP WILL KEEP THE READERS "LOADED".

THE RN MESSAGE TO TURN OFF READERS:

IF THE SYSTEM OPERATOR WISHES TO "TURN OFF" PSEUDO CARD READERS, HE MAY TYPE IN AN RN MESSAGE THAT SPECIFIES THE NUMBER OF PSEUDO READERS HE WANTS LEFT ON. THE MCP WILL THEN TURN OFF SUFFICIENT NUMBER OF READERS TO MEET THE REQUIREMENTS AS SOON AS THE READERS COMPLETE PROCESSING THEIR CURRENT DECK.

REMOVING DECKS FROM PSEUDO CARD READERS:

IF IT IS DESIRED TO REMOVE A DECK FROM A PSEUDO CARD READER (E.G., A CARD FILE NEVER OPENED), THE REMOVAL CAN BE ACCOMPLISHED BY ENTERING THE ED KEYBOARD INPUT MESSAGE. (SEE KEYBOARD INPUT MESSAGES SECTION.)

HANDLING OF CONTROL CARD ERRORS ON PSEUDO DECKS:

IF AN ERROR IS DETECTED IN A CONTROL CARD OR PROGRAM PARAMETER CARD WHILE A PSEUDO CARD DECK IS BEING READ, THE MCP WILL REMOVE THE DECK RELATED TO THE ERRONEOUS CARD AND CONTINUE TO THE NEXT AVAILABLE PSEUDO DECK.

PSEUDO DECK IDENTIFICATION:

CONTROL DECKS NOT IN PSEUDO READERS ARE LISTED IN RESPONSE TO THE CD INPUT MESSAGE.

DECKS IN USE BY PSEUDO READERS APPEAR IN THE DISK DIRECTORY AS A BLANK AND A 5-DIGIT NUMBER. DECKS NOT IN USE APPEAR AS A # CHARACTER AND THE 5-DIGIT DECK IDENTIFICATION NUMBER.

9G. LDCNTL FROM A REMOTE IBM 1050,

--- - -----

DECKS WHICH ARE BEING READ FROM A REMOTE IBM 1050 CARD READER MUST BE IN THE SAME ORDER AND FORMAT AS DECKS HANDLED BY THE ON-SITE CARD READER WITH THE FOLLOWING IDENTIFICATION:

MCP - GENERAL DESCRIPTION,

1. INVALID CHARACTERS IN COLUMN # 1 OF CONTROL AND PROGRAM PARAMETER CARDS MUST BE REPLACED BY CARDS HAVING THE "AT" CHARACTER (@) IN COLUMN #1.

2. AN "EQUAL" CHARACTER (=) IN ANY COLUMN OF CONTROL AND PROGRAM PARAMETER CARDS MUST BE REPLACED BY THE "POUND SIGN" CHARACTER (#).

THE IBM 1050 MUST BE SET FOR "AUTO EOB" FROM THE CARD READER ,

DATA TRANSMISSION ERRORS THAT ARE DETECTED BY THE LDCNTL PROGRAM WILL RESULT IN THE PROGRAM SENDING A NAK TO THE 1050. DEPENDING ON THE 1050 HARDWARE OPTION, OPERATOR INTERVENTION WILL BE REQUIRED TO CORRECT THE CONDITION OR THE DATA WILL BE AUTOMATICALLY RE-SENT TWICE BEFORE REQUIRING OPERATOR INTERVENTION AT THE 1050 SITE.

DEFINITIONS OF SYNTAX FOR LANGUAGE

- <PROGRAM NAME> <IDENTIFIER> (NAME OF PROGRAM IN DIRECTORY),
 CONSISTING OF 6 OR LESS CHARACTERS EXCLUDING
 <RESERVED WORD>-S.
- <P=N> ABBREVIATION FOR <PROGRAM NAME>
- <FILE IDENTIFIER> NAME OR CONTENTS OF IDENTIFICATION FIELD ON
 FILE LABEL OR DISK DIRECTORY BY WHICH THE SYSTEM
 IDENTIFIES THE FILE. THE <FILE IDENTIFIER> CONSISTS
 OF 6 OR LESS CHARACTERS EXCLUDING <RESERVED
 WORD>-S.
- <F-ID> ABBREVIATION FOR <FILE IDENTIFIER>.
- <MULTIPLE FILE
IDENTIFIER> A <FILE IDENTIFIER>
- <FILE NAME> A FILE OR PROGRAM <IDENTIFIER> BY WHICH THE
 PROGRAM IDENTIFIES THE FILE. THE <FILE
 NAME> CONSISTS OF 6 OR LESS CHARACTERS
 EXCLUDING <RESERVED WORD>-S.
- <FILE LIST> <FILE IDENTIFIER> OR <FILE IDENTIFIER, FILE LIST>
- <INTEGER> DIGIT OR A DIGIT FOLLOWED BY A DIGIT CONTAINING ONLY
 THE CHARACTERS 0 1 2 3 4 5 6 7 8 9
- <MIX INDEX> INTEGER IDENTIFYING ASSIGNED NUMBER TO ACTIVE PROGRAM
 IN MCP MIX TABLE .
- <PRIORITY> AN <INTEGER> SPECIFYING THE RELATIVE WEIGHT TO BE
 ASSIGNED TO A PROGRAM IN THE SYSTEM, ONE (1) IS
 LOWEST IN THE SYSTEM AND NINE (9) IS THE HIGHEST
- <TERMINAL REFERENCE> AN <INTEGER> WHICH IS THE RELATIVE ADDRESS
 WITHIN THE PROGRAM OF THE NEXT INSTRUCTION TO BE
 EXECUTED OR THE LAST INSTRUCTION EXECUTED ON ERROR

LANGUAGE SYNTAX

CONDITIONS.

- <JOB SPECIFIER> <PROGRAM NAME> = <MIX INDEX>
- <J-S> ABBREVIATION FOR <JOB SPECIFIER>
- <LETTER> ANY LETTER OF THE ALPHABET OF THE ENGLISH LANGUAGE.
 (EBCDIC LOWER CASE LETTERS WILL APPEAR ON THE LINE
 PRINTER AS QUESTION MARKS.)
- <DIGIT> ANY ONE OF THE CHARACTERS LISTED BELOW:
- | | | | | |
|---|---|---|---|---|
| 0 | 1 | 2 | 3 | 4 |
| 5 | 6 | 7 | 8 | 9 |
- <SPACE> ONE OR MORE BLANK CARD COLUMNS, OR ONE OR MORE
 HORIZONTAL SPACE MOVEMENTS ON A TYPEWRITER, OR AN
 UNUSED POSITION ON A LINE PRINTER WHICHEVER IS
 RELEVANT.
- <SPECIAL CHARACTER> THOSE BIT-COMBINATIONS IN THE EBCDIC CODE SET
 WHICH DO NOT REPRESENT <LETTER>-S, <DIGIT>-S, AND ARE
 NOT UNASSIGNED, DENOTE <SPECIAL CHARACTER>-S. (SEE
 TABLE AT THE END OF THIS MANUAL.)
- <LEGITIMATE CHARACTER> A <LETTER> OR A <DIGIT> OR A <SPECIAL
 CHARACTER> OR A SINGLE <SPACE>.
- <ILLEGITIMATE CHARACTER> ANY CARD CODE THAT DOES NOT REPRESENT A
 <LEGITIMATE CHARACTER>. WHEN USED IN DESCRIPTIONS OF
 CONTROL CARDS AND PROGRAM PARAMETER CARDS, AN
 <ILLEGITIMATE CHARACTER> WILL BE REPRESENTED AS A
 QUESTION MARK (I.E., ?).
- <QUOTE> THE CHARACTER LISTED BELOW:
- "
- <STRING> ANY CONTIGUOUS STRING OF <LEGITIMATE CHARACTER>S --
 EXCLUDING <QUOTE>S -- THAT IS PRECEDED BY AND FOLLOWED
 BY A <QUOTE>.

LANGUAGE SYNTAX

<IDENTIFIER> ANY CONTIGUOUS STRING OF <LETTER>S OR <LETTER>S AND <DIGIT>S, THAT BEGINS WITH A <LETTER> AND IS NOT GREATER THAN 6 CHARACTERS IN LENGTH, OR ANY 6 CHARACTERS (<LETTER>-S, <DIGIT>-S, <SPECIAL CHARACTER>-S, <SPACE>) ENCLOSED IN PARENTHESES.

<RESERVED CHARACTER> ANY ONE OF THE SIX CHARACTERS LISTED BELOW:
" . = , # ;

<RESERVED WORD>* ANY ONE OF THE WORDS LISTED BELOW:

AFTER	BACK	CARD	CC		*
CHANGE	CHANNEL	CHARGE	COMPILE		*
COPY	CORE	CSTRT	DATA		*
DATAB	DIAL	DISC	DISK		*
DISPLAY	DKDKLD	DUMP	END	ENDCTL	*
ENTER	EXECUTE	FILE	FORM	FREE	*
INQ	INSERT	LABEL	LDDUMP	LIBRARY	*
LOAD	LOG	LOGOUT	LOADMP	LOGGER	*
LDCNTL	MCPLDR	MEMDUMP	NO	PAPER	*
PATCH	PCH=BK	PRINT	PRINTD		*
PRIORITY	PRN=BK	PUNCH	PUNCHD		*
PUBLIC	REMOVE	RESTART	RUN	SAVE	*
SM	SOLE	SPO	START		*
STOP	SYNTAX	TAPE	TEST		*
TIME	UNIT	USE	USER		*
VALUE	WITH	WSTRT			*

NOTE: A < RESERVED WORD> IS NOT RECOGNIZED AS SUCH, IF IT APPEARS AS A <STRING>.

<SEPARATOR> A SLASH (/) OR A SPACE.

<COMPILER NAME> COBOL, FORTRAN OR ANY OF THE STANDARD SYSTEM GENERATORS.

<LIBRARY TAPE IDENTIFIER> A <MULTIPLE FILE IDENTIFIER>

<UNIT SPECIFIER> A <CHANNEL NUMBER><SEPARATOR> <UNIT NUMBER>

<CHANGE ELEMENT> A <FILE IDENTIFIER> <FILE IDENTIFIER>

LANGUAGE SYNTAX

	OR A <PROGRAM NAME> <PROGRAM NAME>.
<CHANGE LIST>	<CHANGE ELEMENT> <CHANGE ELEMENT>, OR <CHANGE LIST> <CHANGE ELEMENT>
<TIME>	<INTEGER>:<INTEGER> OR <INTEGER>:<INTEGER>:<INTEGER>, THE FIRST INTEGER INDICATES THE HOURS, THE SECOND THE MINUTES, THE THIRD (WHEN USED) THE SECONDS.
<DATE>	<INTEGER> / <INTEGER> / <INTEGER> THE FIRST INTEGER IS THE MONTH, THE SECOND INTEGER IS THE DAY, THE THIRD INTEGER IS THE YEAR.
<HDWR>	NAMES FOR ANY OF THE PERIPHERAL DEVICES ALLOWABLE IN THE B2500/3500 MCP SYSTEMS.
<DIRECTORY NAME>	<F-ID> OR <P-N> ON DISK.
<INPUT TEXT>	<STRING>
<CLASS>	UN UR UA
<LENGTH>	NUMBER OF CHARACTERS IN STRING INCLUDING SPACES
<OPTION NAME>	ANY OF THE OPTIONS BEGINNING WITH THE WORD "USE" AND DESCRIBED IN THE "SYSTEM LOADER" SECTION OF THIS MANUAL.
<CONTROL INFORMATION>	ANY LEGAL CONTROL INFORMATION DESCRIBED IN THE "CONTROL INFORMATION" PART OF THIS MANUAL.
<LIBRARY MAINTENANCE>	LIBRARY MAINTENANCE IS DEFINED AS PERFORMING THE THE FOLLOWING CHANGES IN THE SYSTEM-S DISK DIRECTORY: 1. ADDITION OF FILES, 2. DELETION OF FILES, 3. ALTERATION OF IDENTIFIERS OF FILES,

<FILE MAINTENANCE>

FILE MAINTENANCE IS THE CREATION OR ALTERATION OF DATA WITHIN A DISK FILE.

<SECURITY FILE MAINTENANCE>

SECURITY FILE MAINTENANCE IS THE CREATION OR ALTERATION OF DATA WITHIN A SECURITY FILE, PERFORMING SECURITY FILE MAINTENANCE WILL ALTER THE LIST OF USERS WHO MAY HAVE ACCESS TO THE ASSOCIATED PRIVATE FILE.

AC → assign can → assign 5 digit number
AC <ch> [unit] to label.

KEYBOARD INPUT MESSAGES

KEYBOARD INPUT MESSAGES

KEYBOARD INPUT MESSAGES ARE FURNISHED TO THE MCP SYSTEMS BY THE OPERATOR DEPRESSING SIMULTANEOUSLY THE "CTRL" AND "WRU" KEYS ON THE CONSOLE KEYBOARD MESSAGE/PRINTER. WHEN THE "READ" LIGHT IS ON, THE OPERATOR MAY KEY IN THE DESIRED MESSAGE. MESSAGES ARE TERMINATED BY HITTING SIMULTANEOUSLY THE "CTRL" AND "C" KEYS.

IF, IN KEYING IN A MESSAGE TO THE MCP SYSTEM, A KEYING ERROR IS DETECTED, THE OPERATOR MAY PRESS SIMULTANEOUSLY THE "CTRL" AND "U" KEYS AND THE MCP WILL RESPOND WITH ANOTHER READ TO PERMIT RE-ENTERING THE MESSAGE.

AX (RESPONSE TO ** <J-S> ACCEPT)

THE AX MESSAGE IS USED TO RESPOND TO THE ** <J-S> ACCEPT MESSAGE PRODUCED WHEN AN OBJECT PROGRAM EXECUTES AN ACCEPT STATEMENT.

THE INPUT MESSAGE SHOULD START IN THE FIRST POSITION AFTER THE AX IN THE INPUT LINE.

THE AX PROCESSING ASSUMES AN ALPHANUMERIC FIELD IN THE OBJECT PROGRAM DATA AREA.

THE FORMAT FOR THE AX MESSAGE IS:

<MIX INDEX> AX <INPUT TEXT>

EXAMPLE:

4AXNOW IS THE TIME

BF (DISPLAY BACKUP FILES ON DISK)

THIS KEYBOARD INPUT MESSAGE CAUSES THE PRINT AND/OR PUNCH BACKUP FILES CURRENTLY ON DISK TO BE LISTED ON THE SPO. BOTH THE FILE NUMBER AND THE <F-ID> ARE DISPLAYED.

THE MESSAGE:

BF PRN

LISTS ONLY THE PRINTER BACKUP FILES.

THE MESSAGE

BF PCH

LISTS ONLY THE PUNCH BACKUP FILES.

EXAMPLES:

BF

BF PRN

BF PCH

BK (SET BREAKPOINT CONTROL BITS)

THE BK ORDER ENABLES THE OPERATOR TO SET BREAKPOINT CONTROL BITS FOR INDICATING BREAKPOINT HALT CONTROL. THE FIRST INTEGER IS THE MIX NUMBER

KEYBOARD INPUT MESSAGES

OF THE PROGRAM IN WHICH THE BREAKPOINT FACILITY IS TO BE MAINTAINED. A <MIX INDEX> OF ZERO (0) WILL INDICATE MCP PROGRAM.

THE RIGHTMOST CHARACTER INDICATES THE CHARACTER TO BE MOVED INTO THE BREAKPOINT CONTROL FIELD.

THE BK ORDER HAS THE FOLLOWING FORMAT:

<MIX INDEX> BK <MASK CHARACTER>

EXAMPLES:

1 BK 4

BR (INITIATE BREAKOUT)

THE BR MESSAGE IS USED BY THE SYSTEM OPERATOR TO INITIATE A BREAKOUT ON THE INDICATED PROGRAM. THE BREAKOUT PROCESSING WILL BE INITIATED WHEN ALL I/O OPERATIONS FOR THAT PROGRAM WHICH ARE CURRENTLY IN PROGRESS HAVE BEEN COMPLETED.

THE FORMAT OF THE BR MESSAGE IS:

<MIX INDEX> BR

EXAMPLE:

3 BR

CC (CENTER CONTROL INFORMATION)

THE CC LINE ALLOWS THE SYSTEM OPERATOR TO SUPPLY CONTROL INFORMATION TO THE MCP, VIA THE CONSOLE TYPEWRITER. THE INFORMATION FOLLOWING THE LETTERS CC, IN THE CC LINE, IS RECOGNIZED IN THE SAME FASHION AS THE INFORMATION FOLLOWING THE CHARACTER ? ON CONTROL CARDS AND PROGRAM PARAMETER CARDS.

WHEN A CC LINE IS ENTERED, AND THE "END OF MESSAGE" SWITCH IS PRESSED, THE MCP WILL ASSUME A PERIOD AT THE END UNLESS THE CC LINE CONTAINED END CARD INFORMATION. THE LAST CC LINE SHOULD ALWAYS BE AN END CARD LINE OR A PERIOD.

THE TERM <CONTROL INFORMATION>, USED BELOW, IS DEFINED AS ANY INFORMATION DEFINED VALID FOR USE ON CONTROL CARDS OR PROGRAM PARAMETER CARDS. PROGRAM PARAMETER CARD INFORMATION MUST BE ENTERED ON THE SAME CC LINE WITH THE COMPILE OR EXECUTE <CONTROL INFORMATION>.

THE CC LINE MUST HAVE THE FOLLOWING FORMAT:

CC <CONTROL INFORMATION>

EXAMPLES:

CC EXECUTE TESTX .

CC COMPILE IRP WITH COBOL

CC COMPILE A WITH COBOL A FILE CARD = XXXXXX

CD (LIST DECKS IN PSEUDO READERS)

THE CD INPUT MESSAGE ALLOWS THE SYSTEM OPERATOR TO GET A LIST OF THE

KEYBOARD INPUT MESSAGES

DECKS AND DECK NUMBERS OF CARD DECKS IN THE SYSTEM WHICH HAVE BEEN PLACED THERE BY LOAD CONTROL.

THE FORMAT FOR THE CD MESSAGE IS:

CD

CK (TEST STATUS OF PERIPHERAL UNIT)

THE CK REQUEST ALLOWS THE TESTING OF THE STATUS OF A PERIPHERAL UNIT BY USING THE "TEST" OPERATOR. THE RESPONSE TO THE INPUT REQUEST IS THE 4-CHARACTER RESULT DESCRIPTOR ON THE SPO.

THE FORMAT OF THE CK REQUEST IS:

CK <UNIT SPECIFIER>

EXAMPLE:

CK 06/8

CL (READY A PERIPHERAL UNIT)

THIS MESSAGE HAS THE SAME EFFECT AS THE RY MESSAGE. THE FORMAT FOR THE CL MESSAGE IS:

CL <UNIT SPECIFIER>

EXAMPLE:

CL 11/0

CN (DISPLAY PHYSICAL TAPE NUMBER)

THIS MESSAGE DISPLAYS ON THE SPO THE 5-CHARACTER PHYSICAL TAPE NUMBER CONTAINED IN THE TAPE LABEL. THE FORMAT OF THE MESSAGE IS:

CN <UNIT SPECIFIER>

THE <UNIT SPECIFIER> MUST REFERENCE A MAGNETIC TAPE UNIT.

CP (SET CHANNEL SCAN PRIORITY)

THE CP (SET CHANNEL SCAN PRIORITY) MESSAGE ALLOWS THE OPERATOR TO CHANGE THE ORDER OF SCANNING I-O COMPLETE RESULT DESCRIPTORS IN MEMORY. THE CHANGE IS MADE IN THE RESIDENT SCANNING LINKS ONLY, AND IS NOT CHANGED ON THE DISK COLD STARTED TABLES. THEREFORE, A HALT/LOAD WILL RESTORE THE SCANNING PRIORITY TO THAT ESTABLISHED BY THE COLD START PROGRAM.

THE OPERATOR MUST FURNISH A VALID CHANNEL NUMBER AND A PRIORITY NUMBER WITH THE CP REQUEST. THE PRIORITY NUMBERS PERMITTED ARE ONE (1) THROUGH

DD → Deletes Dump

KEYBOARD INPUT MESSAGES

THE NUMBER OF DECLARED CHANNELS IN THE SYSTEM, A PRIORITY OF ONE (1) INDICATES THAT THAT CHANNEL IS TO BE SCANNED FIRST IN THE SEQUENCE OF SEARCH FOR I-O COMPLETES.

THE FORMAT OF THE CP REQUEST IS :
CP < CHANNEL NUMBER > = < PRIORITY >
FOR EXAMPLE:
CP 7 = 2

DL (ELIMINATE A PERIPHERAL UNIT)

THE DL MESSAGE IS USED BY THE CONSOLE OPERATOR TO DELETE A PERIPHERAL DEVICE FROM THE LIST OF THOSE MAINTAINED BY THE MCP. DEVICES TO BE DELETED MAY NOT BE ASSIGNED TO AN OBJECT PROGRAM AT THE TIME OF THE DL MESSAGE.

THE FORMAT FOR THE DL MESSAGE IS :
DL <UNIT SPECIFIER >
EXAMPLE:
DL 09/1

DM (DUMP AND CONTINUE)

THE DM MESSAGE IS USED TO SPECIFY THAT A MEMORY DUMP OF THE INDICATED OBJECT PROGRAM IS TO BE PRODUCED ON THE LINE PRINTER. THE DESCRIPTION OF THE DP MESSAGE (SEE BELOW) APPLIES TO THE DM MESSAGE WITH THE DIFFERENCE THAT THE DM MESSAGE CAUSES THE EXECUTION OF THE OBJECT PROGRAM TO CONTINUE AFTER THE DUMP HAS BEEN TAKEN.

THE FORMAT OF THE DM MESSAGE IS:
<MIX INDEX> DM
EXAMPLE:
2 DM

DP (DUMP AND ABORT)

THE DP MESSAGE IS USED BY THE OPERATOR TO SPECIFY THAT A MEMORY DUMP OF THE INDICATED OBJECT PROGRAM IS TO BE PRODUCED ON THE LINE PRINTER. IF THE <MIX INDEX> IS 0 (ZERO), THEN INFORMATION ABOUT ALL NORMAL STATE PROGRAMS WILL BE DUMPED TOGETHER WITH ALL IOAT ENTRIES AND THE CONTENTS OF ALL OF MEMORY.

THE FORMAT OF THE DP MESSAGE IS:
<MIX INDEX> DP
EXAMPLE:
6 DP

THIS MESSAGE MAY BE USED AT ANY POINT AFTER THE "BOJ" MESSAGE FOR THE PARTICULAR PROGRAM HAS BEEN TYPED ON THE SPO. THE MESSAGE MAY ALSO BE USED IN RESPONSE TO THE "DS OR DP" MESSAGE WHEN AN ERROR OCCURS IN THE

KEYBOARD INPUT MESSAGES

OBJECT PROGRAM.

NOTE: THIS MESSAGE WILL TERMINATE THE OBJECT PROGRAM AFTER THE MEMORY DUMP HAS BEEN COMPLETED.

THE CONTENTS OF THE OBJECT PROGRAM WILL BE PRODUCED ON THE LINE PRINTER AS FOUND IN THE PERTINENT MEMORY AREA WITH THE FOLLOWING 0 SUBSTITUTIONS:

NON-DECIMAL DIGIT:	PRINTED:
10	A
11	B
12	C
13	D
14	E
15	F

DS (DISCONTINUE THE PROGRAM)

THE DS ORDER ALLOWS THE SYSTEM OPERATOR TO CAUSE A PROGRAM TO BE TERMINATED. THE FORM OF THE ORDER REQUIRES THAT THE PROGRAM TO BE TERMINATED BE IDENTIFIED THROUGH USE OF A <MIX INDEX> TERM.

THE DS ORDER HAS THE FOLLOWING FORMAT:

<MIX INDEX> DS

EXAMPLE:

2 DS

DT (CHANGE DATE)

THE DT LINE ALLOWS THE SYSTEM OPERATOR TO CHANGE THE VALUE OF THE CURRENT DATE WORD, USED BY THE MCP.

THE DT LINE MUST HAVE THE FOLLOWING FORMAT:

DT <DATE>

EXAMPLE:

DT 12/30/66 OR 12/2/66

ED (REMOVE DECK FROM PSEUDO READER)

THE ED MESSAGE PERMITS THE SYSTEM OPERATOR TO REMOVE DATA CARD DECKS FROM PSEUDO READERS WHEN THE FILE HAS NOT BEEN OPENED BY A PROGRAM.

DATA DECKS IN PSEUDO READERS ARE IDENTIFIED (IN RESPONSE TO THE "DL" INPUT MESSAGE) BY A TWO-DIGIT CHANNEL NUMBER AND A ONE-DIGIT PSEUDO UNIT NUMBER. THE FORMAT FOR THE ED MESSAGE IS:

ED <UNIT SPECIFIER>

THE MCP WILL RESPOND WITH A MESSAGE NOTING THE REMOVAL OF THE PSEUDO DECK.

EXAMPLES:

ED 00/1

KEYBOARD INPUT MESSAGES

ED 00/5EX (SET BREAKPOINT EXECUTION DIGIT IN MCP)

THE EX ORDER IS USED TO SET THE BREAKPOINT EXECUTION DIGIT IN THE MCP SECTION OF MEMORY. THE <INTEGER> GIVEN WILL BE USED TO REPLACE THE FORMER CONTENTS OF THE EXECUTION DIGIT.

THE FORMAT FOR THE EX ORDER IS:

EX <INTEGER>

EXAMPLE:

EX 1

FM (RESPONSE TO SPECIAL FORMS REQUEST)

THE FM LINE MUST BE ENTERED IN RESPONSE TO A "FM REQ" ADVICE. THE <MIX INDEX> IN THE MESSAGE MUST AGREE WITH THE <MIX INDEX> IN THE # FM REQ ADVICE, AND THE <UNIT SPECIFIER> MUST DESIGNATE THE UNIT TO BE USED FOR THE SUBJECT FILE.

THE FM LINE HAS THE FOLLOWING FORMAT:

<MIX INDEX> FM <UNIT SPECIFIER>

EXAMPLES:

1 FM 02/0

FR (SPECIFY LAST REEL OF UNLABELED FILE)

THE FR LINE ALLOWS THE SYSTEM OPERATOR TO SPECIFY THAT THE INPUT REEL, THE READING OF WHICH WAS JUST COMPLETED, WAS THE FINAL REEL OF AN UNLABELED FILE.

THE FR LINE HAS THE FOLLOWING FORMAT:

<MIX INDEX> FR

EXAMPLE:

3 FR

GO (CONTINUE STOPPED PROGRAM)

THE GO MESSAGE IS USED BY THE OPERATOR TO REQUEST RE-INITIATION OF A PROGRAM WHICH WAS STOPPED BY A PRIORITY CRASHOUT (SEE "THE PRIORITY CARD" IN THE "CONTROL INFORMATION" SECTION) OR OPERATOR ACTION.

THE FORMAT FOR THE GO MESSAGE IS:

<MIX INDEX> GO

EXAMPLE:

4 GO

KEYBOARD INPUT MESSAGES

GT (INITIATE TRACE)

THE GT MESSAGE IS USED TO INITIATE THE TRACE ROUTINE AND TO SPECIFY THE TYPE OF TRACE REQUESTED.

THE FORMAT OF THE MESSAGE IS:

GT <INTEGER>

EXAMPLE:

GT 3

THE <INTEGER> MAY HAVE THE FOLLOWING VALUES FOR THE NON-OVERLAYABLE TRACE:

- 1 = CONTROL STATE TRACE OFF, NORMAL STATE TRACE ON
- 2 = CONTROL STATE TRACE ON, NORMAL STATE TRACE OFF
- 3 = BOTH, CONTROL STATE AND NORMAL STATE TRACE ON
- 5 = SHOWS DIGIT EQUIVALENT OF ALPHA CHARACTERS FOR NORMAL STATE TRACE ONLY
- 6 = SHOWS DIGIT EQUIVALENT OF ALPHA CHARACTERS FOR CONTROL STATE TRACE ONLY
- 7 = SHOWS DIGIT EQUIVALENT OF ALPHA CHARACTERS FOR BOTH NORMAL AND CONTROL STATE TRACE
- 8 = SHOWS IIO, BCT, AND BRE INSTRUCTIONS ONLY

THE OVERLAYABLE TRACE MAY HAVE ONLY TWO PARAMETERS:

- 1 = CONTROL STATE TRACE OFF, NORMAL STATE TRACE ON
- 5 = DIGIT EQUIVALENT OF ALPHA CHARACTERS IN NORMAL STATE TRACE

IL (RESPONSE TO "NO FILE" ADVICE)

THE IL LINE IS USED IN RESPONSE TO A "NO FILE" ADVICE, AND ALLOWS THE SYSTEM OPERATOR TO DESIGNATE THE UNIT ON WHICH A PARTICULAR INPUT FILE IS LOCATED. THE UNIT DESIGNATED IN THE IL LINE MUST DENOTE THE LOCATION OF A LABELLED FILE. THE FILE ON THE UNIT DESIGNATED IN THE IL LINE WILL BE ASSUMED TO BE THE FILE REQUIRED IN THE RELATED "NO FILE" ADVICE.

A <MIX INDEX> TERM MUST BE USED WITH THE IL LINE SINCE, DURING MULTI-PROCESSING, MORE THAN ONE "NO FILE" ADVICE MAY BE IN EFFECT AT THE SAME TIME.

THE IL MESSAGE MUST HAVE THE FOLLOWING FORMAT:

<MIX INDEX> IL <UNIT SPECIFIER>

EXAMPLE:

1 IL 03/0

KEYBOARD INPUT MESSAGES

IN (SET DIGITS OR CHARACTERS IN A PROGRAM)

THE IN MESSAGE SETS DIGITS OR CHARACTERS IN A PROGRAM, AT THE ADDRESS SPECIFIED IN THE IN MESSAGE. THE FORMAT FOR THE IN MESSAGE MUST BE:

<MIX INDEX> IN <ADDRESS> <LENGTH> <CLASS> = <DATA STRING>

THE <LENGTH> MUST BE LESS THAN 100 CHARACTERS THE <CLASS> MUST BE UN OR UA FOR UNASSIGNED NUMERIC OR ALPHANUMERIC

EXAMPLE:

1 IN 60 2 UN = 01

THE EQUAL SIGN IS OPTIONAL.

KA (ANALYZE DISK)

THE KA MESSAGE IS USED BY THE SYSTEM OPERATOR TO CAUSE AN ANALYSIS OF THE DISK CONTENTS AND ASSIGNMENTS TO BE PRINTED ON A LINE PRINTER.

THE KA MESSAGE WILL PRINT THE ADDRESS AND SIZE OF SELECTED MCP TABLES. THE PROCEDURES WILL THEN PRINT AN ANALYSIS OF THE FILES IN THE DISK DIRECTORY. IDENTIFICATION, BLOCKING, AREA ADDRESSES, ETC ARE PRINTED FOR EACH FILE.

THE FORMAT FOR THE KA MESSAGE IS :

KA (GIVES ANALYSIS OF THE ENTIRE DISK DIRECTORY.)

OR

KA <F-ID> (GIVES ANALYSIS OF THE FILE <F-ID> ONLY.)

OR

KA DSKAVL (PRINTS AVAILABLE DISK ENTRIES ONLY.)

KP (PRINT FROM DISK)

THE KP MESSAGE ALLOWS THE SYSTEM OPERATOR TO PRINT SELECTED SEGMENTS FROM THE DISK SUB-SYSTEM ON A LINE PRINTER.

THE FORMAT FOR THE KP MESSAGE IS:

KP <STARTING SEGMENT ADDRESS> <NUMBER OF SEGMENTS>

THE STARTING ADDRESS AND THE NUMBER OF SEGMENTS MUST BE AN <INTEGER>. THE NUMBER OF SEGMENTS MUST BE LESS THAN 1000.

KX (CREATE USER DISK)

KEYBOARD INPUT MESSAGES

THIS MESSAGE MAY BE USED BY THE OPERATOR, IF THE NEED ARISES TO CREATE AVAILABLE USER DISK SPACE, IN RESPONSE TO A "*** NO USER DISK <F=N> <J-S>" MESSAGE.

THE MESSAGE CAUSES THE <F-ID> OF THE FIRST FILE ON DISK, AND THE NUMBER OF DISK SEGMENTS USED BY THIS FILE, TO BE DISPLAYED ON THE SPO. THE "ACCEPT" LIGHT WILL BECOME LIT AND THE OPERATOR HAS THREE CHOICES:

1. HE MAY DECIDE TO REMOVE THE FILE. THIS IS ACCOMPLISHED BY ENTERING RM ON THE KEYBOARD AND DEPRESSING THE "CONTROL" AND "C" KEYS.

THE MCP WILL DISPLAY THE NEXT DISK FILE IN THE DIRECTORY UNTIL ALL FILES HAVE BEEN READ OR THE FUNCTION IS STOPPED.

2. IF THE OPERATOR WANTS TO RETAIN THE FILE ON DISK, HE DEPRESSES THE "CONTROL" AND "C" KEYS. MCP PROCEEDS TO DISPLAY THE NEXT FILE.

3. TO TERMINATE THE KX FUNCTION, THE OPERATOR KEYS IN "END" AND DEPRESSES THE "CONTROL" AND "C" KEYS.

THE KX MESSAGE ALSO MAY HAVE THE FORMAT: KX <INTEGER>. THIS MESSAGE WILL DISPLAY ON THE SPO THE IDENTIFIERS OF THOSE FILES ONLY, WHICH OCCUPY A NUMBER OF SEGMENTS EQUAL OR GREATER TO THE <INTEGER> SPECIFIED IN THE INPUT REQUEST.

LD (INITIATE THE LOAD CONTROL PROGRAM)

THE LD MESSAGE IS USED BY THE SYSTEM OPERATOR TO INITIATE THE LDCNTL PROGRAM FOR LOAD CONTROL. THE LD MESSAGE IS USED TO INITIATE LDCNTL FOR ON-SITE LOAD CONTROL OR FOR LOAD CONTROL FROM A REMOTE DEVICE.

THE LD MESSAGE MUST HAVE THE FOLLOWING FORMAT:

LD

OR

LD <DEVICE TYPE>

<DEVICE TYPE> IS DEFINED AS THE CODE NUMBER ASSOCIATED WITH THE DEVICE IN THE "PERIPHERAL UNIT TYPE CODES" TABLE. (SEE APPENDIX 5.)

IF ON-SITE LOAD CONTROL IS TO BE USED, THE FIRST OPTION (LD) IS USED. IF LOAD CONTROL FROM A REMOTE DEVICE IS TO BE INITIATED, THE LD MESSAGE IS FOLLOWED BY A DEVICE TYPE DENOTING THE TYPE OF REMOTE DEVICE, FOR DEVICE TYPES SEE APPENDIX TO THIS MANUAL. FOR PERMISSIBLE REMOTE LOAD CONTROL DEVICES, SEE THE SECTION OF THIS MANUAL ON LOAD CONTROL.

KEYBOARD INPUT MESSAGES

LN (PRINT LOG)

THE LN ORDER CAUSES A USER LIBRARY PROGRAM WITH THE <P=N> "LOGGER" TO BE SCHEDULED FOR EXECUTION. IF THIS PROGRAM IS NOT ON DISK, THE STANDARD BURROUGHS "LOGOUT" PROGRAM IS SCHEDULED.

NOTE: LOGOUT IS NOT IN THE DISK DIRECTORY,
THE LN ORDER HAS THE FOLLOWING FORMAT:

LN

EXAMPLE:

LN

MCP FIRST TRANSFERS THE FILE "LOG" TO "LOG1" AND THEN "LOGGER" OR *
"LOGOUT" PRINTS THE CONTENTS OF "LOG1". THE PREVIOUS "LOG1" CAN BE *
PRINTED BY ENTERING "CC EXECUTE LOGOUT" FROM THE SPO, PRIOR TO THE "LN", *

MX (LIST PROGRAMS IN THE MIX)

THE MX QUERY ALLOWS THE SYSTEM OPERATOR TO DEMAND THAT THE MCP TYPE A LIST OF <PROGRAM NAME>=S DENOTING THE PROGRAMS IN THE MIX. THE <MIX INDEX> FOR EACH PROGRAM IS ALSO LISTED, SPECIFICALLY, EACH ITEM IN THE LIST TYPED BY THE MCP, IN RESPONSE TO THE MX QUERY, HAS THE FORMAT:

PR = <PRIORITY> <J-S>

THE MX QUERY MUST HAVE THE FOLLOWING FORMAT:

MX

EXAMPLE:

MX

THE MCP WILL RESPOND WITH THE FOLLOWING FORMATTED MESSAGES:

PR = 1 PRIMER = 01

NT (TERMINATE TRACE)

THE NT MESSAGE IS USED TO TERMINATE TRACING OF A PROGRAM.
THE FORMAT OF THE MESSAGE IS:

NT

OF (RESPONSE TO REQUEST OF OPTIONAL FILE)

THE OF MESSAGE IS USED IN RESPONSE TO THE "NO FILE" MESSAGE TO INDICATE TO THE MCP THAT THE "OPTIONAL" FILE WHICH IS BEING REQUESTED IS NOT TO BE USED FOR THIS RUN.

THE OF MESSAGE HAS THE FOLLOWING FORMAT:

<MIX INDEX> OF

EXAMPLE:

3 OF

OK (CONTINUE PROCESSING)

THE OK MESSAGE IS USED BY THE OPERATOR TO DIRECT THE MCP TO ATTEMPT TO CONTINUE PROCESSING OF THE SPECIFIED PROGRAM AFTER IT HAS BEEN SET WAITING FOR REASONS ADVISED BY ANY OF THE FOLLOWING OUTPUT MESSAGES:

1. ** NO FILE <F-ID> <J-S>
2. ** DUPLICATE FILE <F-ID> <J-S> <UNIT SPECIFIER LIST>
3. ** <J-S> NEEDS <INTEGER> SEGMENTS FOR <F-ID>
4. ** DUPLICATE LIBRARY <F-ID> <J-S>

THE OK MESSAGE SHOULD ONLY BE GIVEN AFTER THE NECESSARY CORRECTIVE ACTION HAS BEEN TAKEN, THE CORRECTIVE ACTIONS ARE DESCRIBED IN THE "SYSTEMS OUTPUT MESSAGES" SECTION, UNDER THE TITLES OF THE RESPECTIVE OUTPUT MESSAGES.

THE FORMAT FOR THE OK MESSAGE IS:

<MIX INDEX> OK

EXAMPLE: 3 OK

OL (DISPLAY STATUS OF PERIPHERAL UNIT)

THIS QUERY ALLOWS THE OPERATOR TO ASCERTAIN THE STATUS OF A PERIPHERAL UNIT ON THE SYSTEM.

THE OL QUERY HAS THE FOLLOWING FORMAT:

OL <UNIT SPECIFIER>

EXAMPLE:

OL 06/2

THE OL REQUEST MAY ALSO TAKE THE FOLLOWING FORMATS:

OL < CHANNEL NUMBER > A

OL < CHANNEL NUMBER > X

THE OL < CHANNEL NUMBER > A WILL PRINT THE STATUS OF ALL UNITS ON THE DESIGNATED CHANNEL.

THE OL < CHANNEL NUMBER > X WILL PRINT ON THE SPD THE LIST OF UNASSIGNED UNITS ON THE SPECIFIED CHANNEL.

THE REPLY SPECIFIES IN CASE OF MAG, TAPE UNITS THE LABEL TYPE ON THE TAPE, THE FOLLOWING ABBREVIATIONS ARE USED:

B = BURROUGHS STANDARD LABEL
I = INSTALLATION LABEL
D = LABEL OMITTED
U = USA STANDARD LABEL

KEYBOARD INPUT MESSAGES

OT (PRINT DATA FIELD FROM PROGRAM)

THE OT MESSAGE PRINTS ON THE SPO THE DESIGNATED DATA FIELD FROM THE INDICATED PROGRAM AREA.

THE FORMAT OF THE OT MESSAGE IS:

<MIX INDEX> OT <ADDRESS> <LENGTH> <CLASS>

NOTE: THE VALUE OF < LENGTH > MUST BE LESS THAN 28.

EXAMPLE:

1 OT 60 2 UN

EXAMPLE FOR THE ANSWER WOULD BE:

<PROGRAM NAME> = <MIX INDEX>:BASE + 60 = 01

OU (DIRECT OUTPUT TO BACKUP TAPE)

THE OU MESSAGE IS USED TO DIRECT A PRINTER OUTPUT FILE TO PRINTER BACK-UP TAPE. THE MESSAGE IS NORMALLY USED IN RESPONSE TO THE "PRINTER RQD" MESSAGE FROM THE OPEN PROCESSING

IT MAY ALSO BE USED IN RESPONSE TO A "***FM RQD <F-ID> <J-S>" MESSAGE, IF THE OUTPUT IS TO BE DIVERTED TO PRINTER BACKUP TAPE.

THE FORMAT FOR THE OU MESSAGE MUST BE:

<MIX INDEX> OU <UNIT SPECIFIER>

EXAMPLE:

3 OU 03/5

OUOK (DIRECT OUTPUT TO BACKUP DISK)

THIS MESSAGE IS USED TO DIRECT A PRINTER OR PUNCH OUTPUT FILE TO BACKUP-DISK.

THE FORMAT OF THE OUOK MESSAGE IS:

<MIX INDEX> OUOK

IN OTHER RESPECTS, THE OUOK MESSAGE FUNCTIONS IN A MANNER SIMILAR TO THE OU MESSAGE.

KEYBOARD INPUT MESSAGES

PB (PRINT BACK-UP FILE)

THE PB REQUEST ALLOWS THE SYSTEM OPERATOR TO SPECIFY THAT A PRINTER BACK-UP TAPE ON A PARTICULAR UNIT IS TO BE PRINTED. THE REQUEST MAY SPECIFY THAT ONLY A SELECTED FILE FROM A MULTI- FILE REEL IS TO BE PRINTED.

THE PB MESSAGE HAS THE FOLLOWING FORMAT:

PB <UNIT SPECIFIER>

EXAMPLE:

PB 06/4

TO PRINT ONLY ONE SELECTED FILE, THE FORMAT OF THE REQUEST IS:

PB <UNIT SPECIFIER> <F-ID>

EXAMPLE:

PB 06/4 DATCOM

PBD (PRINT DISK BACKUP FILE)

THIS INPUT MESSAGE CAUSES THE DISK BACKUP FILE PRINTER PROGRAM TO BE SCHEDULED FOR EXECUTION. IF THE USER PROVIDES HIS OWN PROGRAM FOR THIS PURPOSE, THE <P-N> MUST BE "PRINTD". OTHERWISE, MCP-S NORMAL STATE PROGRAM (<P-N> = PBDOUT) WILL BE SCHEDULED FOR EXECUTION. *

TWO PARAMETERS ARE ALLOWED WITH THIS INPUT MESSAGE: *

PBD/ = PRINT ALL FILES,

PBD <INTEGER> = PRINT ONLY THE FILES DESIGNATED BY THE <INTEGER>.

PBD/ SAVE

PBD <INTEGER> SAVE

INSTRUCTS THE MCP NOT TO PURGE THE FILE(S) DURING THE CLOSING PROCESSING.

NOTE: THE "SAVE" INSTRUCTION SAVES THE FILE ONLY IF "PBDOUT" IS USED. *
IF THE USER WRITES HIS OWN PRINT ROUTINE (<P-N> = PRINTD), IT BECOMES THE *
USER-S RESPONSIBILITY TO PROPERLY CLOSE THE FILES. *

PC (PUNCH DISK BACKUP FILE)

THIS INPUT MESSAGE SCHEDULES THE EXECUTION OF A PROGRAM TO PUNCH DISK BACKUP FILES. IF THE PROGRAM IS SUPPLIED BY THE USER, ITS <P-N> MUST BE "PUNCHD". IF NO USER PROGRAM EXISTS WITH SUCH <P-N>, MCP-S <P-N> = PCHOUT WILL BE SCHEDULED FOR EXECUTION.

THE SAME PARAMETERS ARE ALLOWED WITH THIS REQUEST, AS WITH THE "PBD" REQUEST. FOR DETAILS, REFER TO THE SECTION ON THE "PBD" INPUT MESSAGE.

PD (PRINT DIRECTORY)

THE PD ORDER ALLOWS THE SYSTEM OPERATOR TO DEMAND THAT THE MCP TYPE

KEYBOARD INPUT MESSAGES

A LIST OF <PROGRAM NAME>S AND <FILE IDENTIFIER>S DENOTING WHAT PROGRAMS AND FILES ARE LISTED IN THE DISK DIRECTORY OR ON THE LIBRARY TAPE.

THE PD MESSAGE MAY SPECIFY THAT ONLY THOSE <PROGRAM NAME>S AND <FILE IDENTIFIER>S BE TYPED WHICH BEGIN WITH THE CHARACTERS GIVEN IN THE MESSAGE ITSELF.

THE PD ORDER HAS THE FOLLOWING FORMAT:

PD

OR

PD <IDENTIFIER>

OR

PD <UNIT SPECIFIER>

EXAMPLE:

PD

OR

PD COB

OR

PD 01/3

PG (PURGE TAPE)

THE PG REQUEST ALLOWS THE SYSTEM OPERATOR TO PURGE A MAGNETIC TAPE ON A UNIT THAT IS READY, IN WRITE STATUS, AND NOT IN USE.

THE PG REQUEST HAS THE FOLLOWING FORMAT:

PG <UNIT SPECIFIER>

OR

PG <UNIT SPECIFIER LIST>

EXAMPLE:

PG 04/1

PG 04/1,04/3,04/4

(PM) *Print Memory Dump*

PR (ASSIGN PRIORITY)

THE PR LINE PROVIDES A MEANS WHEREBY THE SYSTEM OPERATOR CAN SPECIFY THE PRIORITY TO BE ASSIGNED A PROGRAM CURRENTLY IN THE MIX. THE PRIORITY TO BE ASSIGNED IS SPECIFIED BY THE TERM <PRIORITY>. THE PROGRAM TO WHICH THE PRIORITY IS TO BE ASSIGNED IS SPECIFIED BY THE <MIX INDEX>. (THE TERM <PRIORITY> MUST BE AN <INTEGER>.)

THE PR LINE HAS THE FOLLOWING FORMAT:

<MIX INDEX> PR = <PRIORITY>

EXAMPLE:

1 PR = 5

QT (STOP PRINTING OR PUNCHING A DISK BACKUP FILE)

THIS MESSAGE SERVES TO STOP THE PRINTING OR PUNCHING OF THE CURRENT *

KEYBOARD INPUT MESSAGES

DISK BACKUP FILE AND START ON THE NEXT FILE. THE MESSAGE CAN ONLY BE
ISSUED TO THE "PBDOUT" AND "PCHOUT" MCP PROGRAMS. THE FORMAT OF THE
MESSAGE IS: *

<MIX INDEX> QT *

RB (RESTART PROGRAM)

THE RB MESSAGE IS USED BY THE OPERATOR TO INITIATE A RESTART FROM
THE RESTART TAPE ON THE SYSTEM.

THE FORMAT FOR THE RB MESSAGE IS:

RB <P-N>

RC (REMOVE PUNCH FILE FROM DISK)

THIS MESSAGE CAUSES A PUNCH BACKUP FILE TO BE REMOVED FROM DISK.
ALLOWABLE FORMATS OF THE MESSAGE ARE:

RC/ = REMOVES ALL PUNCH BACKUP FILES FROM DISK,

RC <INTEGER> = REMOVES ONLY THE FILE DESIGNATED BY <INTEGER>.

RD (REMOVE CONTROL DECKS)

THE RD MESSAGE IS USED TO REMOVE CONTROL DECKS FROM DISK.
THE FORMAT FOR THE RD MESSAGE MUST BE AS FOLLOWS:

RD #<INTEGER>

OR

RD /

THE RD #<INTEGER> OPTION WILL REMOVE THE DECK WITH THE <INTEGER>
IDENTIFICATION. THE RD / OPTION WILL REMOVE ALL PSEUDO DECKS NOT
CURRENTLY IN USE.

RF (REMOVE PRINTER FILE FROM DISK)

THIS MESSAGE CAUSES A PRINTER BACKUP FILE TO BE REMOVED FROM DISK,
THE PARAMETERS ALLOWED WITH THIS MESSAGE ARE THE SAME AS DESCRIBED UNDER
THE "RC" INPUT MESSAGE.

RM (REMOVE DUPLICATE FILE)

THE RM ORDER CAN BE USED IN RESPONSE TO A "*** DUPLICATE LIBRARY <F=
ID> <J=S>" MESSAGE. THE RM ORDER CAUSES THE FILE ON DISK -- WITH A NAME
IDENTICAL TO THE FILE CREATED BY THE PROGRAM SPECIFIED IN THE "***

KEYBOARD INPUT MESSAGES

DUPLICATE LIBRARY <F-ID> <J-S>" -- TO BE REMOVED, AND THEN CAUSES THE SUBJECT PROGRAM TO RESUME PROCESSING.

THE RM ORDER HAS THE FOLLOWING FORMAT:

<MIX INDEX> RM

EXAMPLE:

1 RM

RN (SPECIFY NUMBER OF PSEUDO CARD READERS)

THE RN MESSAGE IS USED TO INDICATE TO THE MCP THE NUMBER OF PSEUDO CARD READERS DESIRED. THE <INTEGER> MUST HAVE THE VALUE 0 THROUGH 9. THE VALUE ZERO WILL HAVE THE EFFECT OF "TURNING OFF" ALL PSEUDO READERS. (THOSE IN USE WILL BE TURNED OFF AS SOON AS THEY COMPLETE PROCESSING THEIR CURRENT DECK.)

THE RN MESSAGE MUST HAVE THE FOLLOWING FORMAT:

RN <INTEGER>

RO (RESET SYSTEM OPTIONS)

THE RO MESSAGE IS USED TO RESET SYSTEM OPTIONS. THE OPTIONS, SUCH AS THAT OF PRINTING "BOJ" MESSAGES WHEN A JOB IS INITIATED, MAY BE RESET OR "TURNED OFF" BY USE OF THE RO MESSAGE.

THE FORMAT FOR THE RO MESSAGE IS:

RO <OPTION NAME>

NOTE: THE <OPTION NAME> COVERS THE USE OPTIONS DESCRIBED IN THE "SYSTEM LOADER" SECTION OF THIS MANUAL. THEIR FORMAT FOR USE WITH THIS KEYBOARD INPUT REQUEST IS:

BOJ, EOJ, UPN, TERM, DATE, TIME, TRAC, LIB, CMSG, PRT, AUTO, DCOM,
PBD, MICH, STGO, ZIPM, SCHM, CRCR,

*
*

EXAMPLES:

RO BOJ

RO EOJ

WHEN THE "TRAC" OPTION IS SPECIFIED, THE OPTION RESET WILL REMOVE THE CONTROL STATE TRACE PROCEDURES FROM CORE PROVIDING THE OPTION IS NOT BEING USED AT THE TIME.

THE RO OPTION REPLY IS A VERIFICATION THAT THE OPTION IN QUESTION HAS BEEN RESET.

EXAMPLE:

RO OPN

REPLY:

OPN = 0

KEYBOARD INPUT MESSAGES

RP (READY AND PURGE)

THE RP MESSAGE HAS THE COMBINED EFFECT OF THE "RY" AND THE "PG" MESSAGES, I.E., IT SETS A TAPE UNIT IN "READY" STATUS AND PURGES THE TAPE. THE RP MESSAGE HAS THE FOLLOWING FORMAT:

RP <UNIT SPECIFIER>

OR

RP <UNIT SPECIFIER LIST>

EXAMPLE:

RP 04/1

OR

RP 04/1, 04/2, 04/3

RS (REMOVE FROM SCHEDULE)

THE RS MESSAGE ALLOWS THE SYSTEM OPERATOR TO REMOVE A SCHEDULE REQUEST FROM THE SCHEDULE LIST, THE <SCHEDULE NUMBER> IS THE <INTEGER> SHOWN ON THE SCHEDULES MESSAGE OR ON THE "WS" REQUEST.

THE RS REQUEST HAS THE FOLLOWING FORMAT:

RS <SCHEDULE NUMBER>

EXAMPLE:

RS17

IF THE REQUEST IS REMOVED FROM THE SCHEDULE TABLE A NOTIFICATION WILL BE TYPED. IF THE REQUEST IS NOT REMOVED BECAUSE IT HAS BEEN INITIATED, AN INVALID KEYBOARD INPUT MESSAGE WILL BE TYPED .

RY (READY PERIPHERAL UNIT)

THE RY REQUEST ALLOWS THE SYSTEM OPERATOR TO CAUSE, BY ENTERING A KEYBOARD MESSAGE, AN EFFECT ANALOGOUS TO THE EFFECT CAUSED BY PLACING A MAGNETIC TAPE UNIT IN LOCAL AND THEN REMOTE, THAT IS, IF THE DESIGNATED UNIT IS NOT IN USE AND IN REMOTE, THE MCP WILL ATTEMPT TO READ A FILE LABEL.

THE RY REQUEST CAUSES ALL EXCEPTION FLAGS MAINTAINED BY THE MCP FOR THE SPECIFIED UNIT TO BE RESET AND "LOCKED" AND "SAVED" FILES TO BE MADE ACCESSIBLE.

THE RY REQUEST HAS THE FOLLOWING FORMAT:

RY <UNIT SPECIFIER>

OR

RY <UNIT SPECIFIER LIST>

EXAMPLE:

RY 10/2

OR

RY 10/2, 10/3, 10/4

SA → *Segment Analysis* → *@file #*
 @ = print
 * = punch

KEYBOARD INPUT MESSAGES

SO (SET SYSTEM OPTIONS)

THE SO MESSAGE IS USED BY THE SYSTEM OPERATOR TO SET SYSTEM OPTIONS. THESE OPTIONS INCLUDE THE "USE" CARD OPTIONS (EXCEPT THE USE LOG OPTION), WHICH ARE DEFINED IN THE "SYSTEM LOADER" SECTION OF THIS MANUAL. THE LIST OF THE OPTIONS IS:

BOJ, EOJ, UPN, TERM, DATE, TIME, TRAC, LIB, CMSG, PBT, AUTO, DCOM, PBD, MICR, STGO, ZIPM, SCHM, CRGR.
 THE OPTION NAMES, WHICH HAVE A DIFFERENT KEYBOARD INPUT FORMAT THAN "USE CARD" FORMAT, ARE:

SPU:	USE CARD:	*
TRAC	TRACE	*
CMSG	COMPMSG	*
LIB	LIBMSG	*
TERM	TERMINATE	*

THE DCOM AND MICR OPTIONS SERVE TO LOAD THE DATA COMM OR MICR SEGMENTS OF THE MCP FROM DISK INTO CORE IF THE OPERATING MCP IS A STANDARD MCP.

THE FORMAT FOR THE SO OPTION IS:

SO <OPTION NAME>

(SEE THE RO MESSAGE FOR THE FORMAT OF THE OPTION NAMES.)

EXAMPLES:

SO BOJ

REPLY OF MCP:

BOJ = 1

NOTE: WHEN THE TRACE OPTION IS SET, THE MCP WILL LOAD THE NON-OVERLAYABLE TRACE INTO CORE IF THE TRACE AREA OF CORE IS AVAILABLE. THIS OPTION SHOULD, THEREFORE, BE SET IMMEDIATELY AFTER THE "LOAD" OPERATION. THE LOG OPTION CAN NOT BE SET THROUGH THIS INPUT REQUEST.

THE SO MESSAGE UPDATES THE OPTION FLAG BOTH IN CORE AND IN THE DISK COPY OF THE OPTIONS AND IS THEREFORE RETAINED THROUGH THE SUBSEQUENT HALT/LOAD OPERATIONS.

SP (CHANGE PRIORITY IN SCHEDULE)

KEYBOARD INPUT MESSAGES

THE SP MESSAGE PERMITS THE OPERATOR TO CHANGE THE PRIORITY OF PROGRAMS WHICH ARE IN THE SCHEDULE AND NOT RUNNING. THE FORMAT OF THE SP MESSAGE IS:
 SP <SCHEDULE NUMBER> = <PRIORITY>

ST (SUSPEND PROCESSING)

THE ST MESSAGE IS USED BY THE OPERATOR TO SUSPEND PROCESSING OF A PROGRAM. THE MCP WILL SUSPEND EXECUTION OF THE DESIGNATED PROGRAM WHEN ALL I/O OPERATIONS IN PROGRESS FOR THAT PROGRAM HAVE BEEN COMPLETED. THE PROGRAM WILL BE REMOVED FROM CORE TO DISK DURING THE PERIOD OF SUSPENSION. A "GO" MESSAGE WILL RELOAD AND RESTART THE PROGRAM.

THE ST MESSAGE HAS THE FOLLOWING FORMAT:

<MIX INDEX> ST

EXAMPLE:

2 ST

THE MCP WILL RESPOND WITH A NOTIFICATION THAT THE PROGRAM HAS BEEN SUSPENDED WHEN THE ST PROCESSING IS COMPLETED.

SV (SAVE UNIT)

THE SV REQUEST MAY BE USED TO CAUSE A PERIPHERAL UNIT TO BE MADE INACCESSIBLE UNTIL A HALT-LOAD OPERATION OCCURS OR UNTIL AN RY REQUEST REFERENCING THE INACCESSIBLE UNIT IS ENTERED. IF, WHEN THE SV REQUEST IS ENTERED THE SPECIFIED UNIT IS NOT IN USE, THE REPLY: <UNIT SPECIFIER> SAVED WILL BE TYPED. IF A UNIT IS IN USE WHEN A SV MESSAGE REFERENCING IT IS ENTERED, THE REPLY: <UNIT SPECIFIER> TO BE SAVED WILL BE TYPED. THE UNIT WILL BE SAVED ONLY WHEN RELEASED BY THE PROGRAM.

UNTIL A RY REQUEST REFERENCING THE UNIT IS ENTERED OR A HALT-LOAD OCCURS, THE "SAVED" UNIT WILL APPEAR NOT READY.

THE SV REQUEST HAS THE FOLLOWING FORMAT:

SV <UNIT SPECIFIER>

OR

SV <UNIT SPECIFIER LIST>

EXAMPLE:

SV 01/8

OR

SV 01/8, 01/5, 01/4

TI (TYPE PROCESSING TIME)

THE TI QUERY CAUSES THE MCP TO TYPE OUT THE AMOUNT OF PROCESSOR TIME THAT THE SUBJECT PROGRAM HAS USED UP TO THE TIME THE TI QUERY WAS ENTERED. THE TIME IS PROVIDED AS THREE <INTEGER>-S SEPARATED BY <COLON>-S. FOR EXAMPLE:

KEYBOARD INPUT MESSAGES

01:48:07

THE FIRST <INTEGER> SPECIFIES HOURS, THE SECOND <INTEGER> SPECIFIES MINUTES, THE THIRD <INTEGER> SPECIFIES SECONDS.

THE TI QUERY HAS THE FOLLOWING FORMAT:

<MIJ INDEX> TI

EXAMPLE:

3 TI

TL (TRANSFER LOG INFORMATION TO "LOG1")

THE TL ORDER ALLOWS THE SYSTEM OPERATOR TO TRANSFER ALL INFORMATION CONTAINED IN THE CURRENT SYSTEM LOG TO THE FILE "LOG1".

THE FORMAT OF THE TL ORDER IS:

TL

EXAMPLE: TL

TO (TYPE SYSTEM OPTIONS)

THE TO MESSAGE IS USED BY THE SYSTEM OPERATOR TO REQUEST TYPING OF THE STATUS OF THE SYSTEM OPTIONS.

THE FORMAT FOR THE TO MESSAGE IS:

TO

THE REPLY FROM THE MCP WILL INCLUDE THE NAMES AND SETTINGS OF THE SYSTEMS OPTIONS. A VALUE OF ONE (1) INDICATES THAT THE OPTION IS SET AND A VALUE OF ZERO (0) DENOTES THAT THE OPTION IS INHIBITED.

TR (CHANGE TIME)

THE TR LINE ALLOWS THE SYSTEM OPERATOR TO CHANGE THE VALUE OF THE TIME WORD USED BY THE MCP. THE TIME, SPECIFIED BY THE <INTEGER> IN THE TR LINE, IS DESIGNATED ACCORDING TO A 24-HOUR CLOCK (I.E., MILITARY TIME).

THE TR LINE HAS THE FOLLOWING FORMAT:

TR <INTEGER>

EXAMPLE:

TR 0800

UL (ASSIGN UNLABELED FILE)

THE UL MESSAGE IS USED IN RESPONSE TO A "NO FILE" MESSAGE FROM THE MCP. IT ALLOWS THE SYSTEM OPERATOR TO DESIGNATE THE UNIT ON WHICH A PARTICULAR FILE IS LOCATED. THE UL MESSAGE IS USED IF THE UNIT CONTAINS AN UNLABELLED FILE. THE UNIT SPECIFIED IN THE UL MESSAGE WILL BE ASSUMED BY THE MCP TO CONTAIN THE REQUIRED FILE RELATED TO THE "NO FILE" MESSAGE.

KEYBOARD INPUT MESSAGES

THE UL MESSAGE MUST HAVE THE FOLLOWING FORMAT:
 <MIX INDEX> UL <UNIT SPECIFIER>

EXAMPLE: 2 UL 01/4

OPTIONALLY, THE SYSTEM OPERATOR MAY SPECIFY THAT MAGNETIC TAPES BE SPACED FORWARD <INTEGER> BLOCKS PRIOR TO READING THE FIRST DATA BLOCK INTO THE OBJECT PROGRAM BUFFER. THE SPECIFIED <INTEGER> MUST BE >0 AND <99. THE MCP WILL SPACE FORWARD THE SPECIFIED NUMBER OF BLOCKS ON THE TAPE OR TO A TAPE MARK, WHICHEVER OCCURS FIRST, AT THE TIME THE FILE OPEN IS PERFORMED.

THE OPTIONAL UL MESSAGE FORMAT IS:

<MIX INDEX> UL <UNIT SPECIFIER> <INTEGER>

EXAMPLE

3 UL 01/5 2

WC (TYPE IN DIGITS UNASSIGNED CORE SIZE)

THE WC MESSAGE ALLOWS THE OPERATOR TO ASCERTAIN DYNAMICALLY THE NUMBER OF DIGITS OF MEMORY (CORE) WHICH IS AVAILABLE (UNASSIGNED).

THE WC MESSAGE HAS THE FOLLOWING FORMAT:

WC

EXAMPLE:

WC

WD (TYPE DATE)

THE WD QUERY ALLOWS THE OPERATOR TO DEMAND THE VALUE OF THE CURRENT DATE FIELD USED BY THE SYSTEM.

THE WD QUERY MUST HAVE THE FOLLOWING FORMAT:

WD

THE DATE REPLY FROM THE MCP WILL HAVE THE FOLLOWING FORMAT:

DATE <DATE>

EXAMPLES:

WD

DATE 09/26/65

WS (TYPE SCHEDULE)

THE WS MESSAGE IS USED TO REQUEST A LIST OF THOSE PROGRAMS WHICH HAVE BEEN SCHEDULED FOR EXECUTION BY THE MCP, BUT HAVE NOT BEEN LOADED OR INITIATED. THE WS MESSAGE TYPES OUT THE SCHEDULE LIST AND THE CORE REQUIRED FOR EXECUTION OF THE PROGRAMS.

THE FORMAT FOR THE WS MESSAGE IS:

WS

EXAMPLE:

WS

KEYBOARD INPUT MESSAGES

WT (TYPE TIME)

THE WT QUERY ALLOWS THE OPERATOR TO DIRECT THE MCP TO FURNISH THE VALUE OF THE TIME FIELD USED BY THE SYSTEM. THE TIME, FURNISHED BY THE MCP REPLY TO THE WT QUERY, IS ON A 24-HOUR CLOCK BASIS (I.E., MILITARY TIME).

THE WT QUERY MUST HAVE THE FOLLOWING FORMAT:

WT

THE MCP REPLY HAS THE FOLLOWING FORMAT:

TIME <INTEGER> ; <INTEGER>

EXAMPLES:

WT

TIME 08:14

WY (TYPE STATUS OF PROGRAM)

THE WY (DISPLAY THE STATUS OF A PROGRAM IN THE MIX) MESSAGE ALLOWS THE OPERATOR TO DETERMINE THE STATUS OF A PROGRAM DURING THE TIME IT IS IN THE SYSTEM.

THE FORMAT OF THE WY REQUEST IS :

<MIX NUMBER > WY

FOR EXAMPLE:

2 WY

THE MCP WILL RESPOND WITH A DISPLAY OF THE CURRENT PROGRAM STATUS.

XD (REMOVE SEGMENTS FROM DISK AVAILABLE TABLE)

THE XD MESSAGE ALLOWS THE SYSTEM OPERATOR TO REMOVE DISK SEGMENTS FROM THE DISK AVAILABLE TABLE UNTIL THE NEXT HALT/LOAD.

THE XD MESSAGE HAS THE FOLLOWING FORMAT:

XD <INTEGER> <INTEGER>

WHERE THE FIRST <INTEGER> SPECIFIES THE ADDRESS OF THE FIRST SEGMENT TO BE REMOVED, THE SECOND <INTEGER> THE NUMBER OF SEGMENTS.

EXAMPLE:

XD 1000 500

XM (REMOVE CORE FROM SYSTEM)

THE XM MESSAGE ALLOWS THE SYSTEM OPERATOR TO REMOVE A SPECIFIED AREA OF CORE FROM THE SYSTEM IF THE SPECIFIED AREA IS NOT IN USE BY THE SYSTEM. THE XM MESSAGE DELETES THE SPECIFIED NUMBER OF DIGITS STARTING AT AND

*

*

KEYBOARD INPUT MESSAGES

INCLUDING THE SPECIFIED ADDRESS. IT SHOULD BE NOTED, THAT A HALT/LOAD OF THE MCP SUBSEQUENT TO THE XM MESSAGE REMOVE THE RESERVATION PLACED ON THE MEMORY BY THE MESSAGE.

THE XM MESSAGE MUST HAVE THE FOLLOWING FORMAT:

XM <ADDRESS>

OR

XM <ADDRESS> <INTEGER>

THE MCP WILL ACKNOWLEDGE THE REQUEST WITH AN INDICATION OF THE ACTION TAKEN. IN THE ABSENCE OF AN <INTEGER> LENGTH, MCP WILL ASSUME 1000 DIGITS.

SYSTEMS OUTPUT MESSAGES

SYSTEMS OUTPUT MESSAGES

INTRODUCTION

UNDER CERTAIN CONDITIONS THE MCP IS REQUIRED TO SUPPLY INFORMATION TO THE SYSTEM OPERATOR. THIS INFORMATION IS SUPPLIED IN "SYSTEM MESSAGES" VIA THE CONSOLE TYPEWRITER.

MANY SYSTEM MESSAGES MAY REQUIRE AN ACTION BY THE SYSTEM OPERATOR. TO ACCENTUATE THIS INFORMATION, SUCH SYSTEM MESSAGES ARE PREFIXED WITH THE CHARACTERS "***".

SYSTEM MESSAGES WHICH DENOTE THAT A PROGRAM WILL BE DISCONTINUED BEFORE "EOJ" ARE PRECEDED BY THE CHARACTERS "--".

OTHER MESSAGES ARE TYPED ON THE SPO JUST TO INFORM THE OPERATOR THAT CERTAIN INSTRUCTIONS OF THE PROGRAM OR SPO INPUT MESSAGE HAVE BEEN EXECUTED.

ACCORDINGLY, THE DESCRIPTION OF THE SYSTEMS OUTPUT MESSAGES IS GROUPED IN THE FOLLOWING MANNER:

A. MESSAGES WHICH REQUIRE ACTION BY THE OPERATOR AND ARE MARKED BY "***"

B. MESSAGES WHICH SIGNAL THE DISCONTINUATION OF THE PROGRAM AND ARE PREFIXED BY "--".

C. MESSAGES WHICH REPORT TO THE OPERATOR THE STATE OF PROCESSING AND HAVE NO PREFIX.

WITHIN THE ABOVE GROUPS, THE SYSTEMS OUTPUT MESSAGES ARE LISTED IN ALPHABETIC ORDER.

THE <MIX INDEX> PROVIDED IN A <JOB SPECIFIER> IS THE ONE TO BE USED IN ANY KEYBOARD INPUT MESSAGES REFERENCING THE SUBJECT PROGRAM, IF THE INPUT MESSAGE REQUIRES A <MIX INDEX>.

A. MESSAGES REQUIRING ACTION BY THE OPERATOR.

** CARD ERROR ADDR <INTEGER>

THIS MESSAGE INFORMS THE OPERATOR, THAT THE LAST CARD IN THE OUTPUT HOPPER CONTAINS AN INVALID CHARACTER IN COL. <INTEGER>.

SYSTEMS OUTPUT MESSAGES

<INTEGER> MAY NOT INDICATE COL. 1.
 OPERATOR MUST CORRECT THE CARD AND REINTRODUCE IT INTO THE
 CARD READER.

** CARD RDR READ CHK

-- ----

THIS MESSAGE IS TYPED TO INDICATE THAT THE LAST CARD IN THE
 OUTPUT HOPPER WAS NOT READ PROPERLY.

OPERATOR MUST REINTRODUCE IN THE INPUT FEED THE LAST CARD
 FROM THE OUTPUT HOPPER AND PRESS THE RESET AND START KEYS.

** CARD PUNCH RQD <F-ID> <J-S>

-- -----

THIS MESSAGE INDICATES THAT THE PROGRAM WAITS UNTIL A CARD
 PUNCH IS MADE AVAILABLE.

** CHARGE NUMBER REQUIRED

-- -----

** <P-N> SCHEDULED IGNORED --

-- -----

THIS MESSAGE IS GENERATED WHEN THE "USE CHARGE" OPTION IS
 SET AND A JOB REQUEST IS ENTERED WITHOUT A CHARGE NUMBER.

** DT PLEASE

-- --

THIS MESSAGE IS TYPED AT HALT/LOAD TIME IF THE "USE DATE"
 OPTION HAS BEEN SET.

THE SYSTEM OPERATOR IS REQUIRED TO ENTER A DT MESSAGE
 BEFORE PROCESSING CAN COMMENCE.

** DUPLICATE FILE <F-ID> <J-S> <UNIT SPECIFIER LIST>
** -----

THIS MESSAGE IS GENERATED WHEN THE PROGRAM OPENS A FILE, BUT THERE IS ANOTHER FILE WITH THE SAME <F-ID> ON LINE.

OPERATOR MAY REMOVE ONE OF THE FILES BY USING THE SV,PG,DL INPUT REQUESTS, OR PUT THE TAPE UNIT IN LOCAL.

THE OK INPUT MESSAGE SERVES TO INDICATE THAT PROCESSING MAY BE RESUMED.

** DUPLICATE LIBRARY <F-ID> <J-S>
** -----

THIS MESSAGE INDICATES THAT AN ATTEMPT HAS BEEN MADE TO ADD A FILE TO THE DISK LIBRARY, BUT A FILE WITH AN IDENTICAL NAME IS ALREADY IN THE DISK LIBRARY.

THE PROGRAM WHICH ATTEMPTED TO ADD THE FILE TO THE LIBRARY IS TEMPORARILY SUSPENDED UNTIL THE OPERATOR REMEDIES THE SITUATION BY TAKING ONE OF THE FOLLOWING ACTIONS:

- A. HE MAY CHANGE THE <F-ID> OF THE FILE IN THE DIRECTORY.
- B. HE MAY USE A "REMOVE" CARD OR A RM MESSAGE TO REMOVE THE FILE FROM THE DISK LIBRARY.
- C. HE MAY DS THE CURRENT PROGRAM.

***<F-ID> LIB MAINT IGNORED

THIS MESSAGE IS TYPED WHEN A REQUESTED CHANGE IN THE DISK LIBRARY COULD NOT BE EXECUTED, BECAUSE THE SPECIFIED FILE WAS NOT FOUND.

SYSTEMS OUTPUT MESSAGES

** FM RQD <F-ID> <J-S>

-- -- --- -----

THE OCCURENCE OF THIS MESSAGE INDICATES THAT A PROGRAM IS READY TO OPEN A FILE WHICH -- AS SPECIFIED IN THE FILE OPEN-- IS REQUIRED TO USE "SPECIAL FORMS". THE FM MESSAGE MUST BE ENTERED BEFORE THE SUBJECT PROGRAM CAN CONTINUE PROCESSING.

IF THE OUTPUT IS TO BE DIVERTED TO A PRINTER BACKUP TAPE, THE "QU" MESSAGE SHOULD BE ENTERED.

** INV FILE RQD <F-ID> <J-S>

-- --- -----

THIS MESSAGE INDICATES THAT THE MCP REQUIRES SOME HARDWARE UNIT OTHER THAN THOSE SPECIFIED BY NAME IN THE FOLLOWING MESSAGES, WHICH IS NOT AVAILABLE.

** INV KBD INPUT <INPUT TEXT>

-- --- -----

THIS MESSAGE IS TYPED IF THE MCP DOES NOT RECOGNIZE A MESSAGE ENTERED FROM THE KEYBOARD.

** INV MIX INPUT

-- --- -----

A REMOTE SPO HAS REQUESTED ACTION ON A PROGRAM NOT INITIATED FROM THAT SPO.

** INV TR INSTR

-- --- --- -----

THIS MESSAGE IS TYPED IF A REMOTE SPO HAS REQUESTED THAT THE SYSTEM TIME BE CHANGED.

SYSTEMS OUTPUT MESSAGES

THE "TR" IS NOT PERMITTED FROM A REMOTE SPO.

** <J-S> ACCEPT

--- -----

THIS MESSAGE IS TYPED AS THE RESULT OF THE EXECUTION OF AN ACCEPT STATEMENT BY THE OBJECT PROGRAM.

THE OPERATOR MUST RESPOND WITH AN AX SPO INPUT MESSAGE.

** <J-S> BREAKOUT IGNORED -- CORE SHARED

--- -----

THE <J-S> COULD NOT BE HANDLED BY THE BREAKOUT PROCEDURE SINCE THE PROGRAM IS BEING CORE SHARED .

** <J-S> MAG TAPE RQD -- BREAKOUT

--- -----

A SCRATCH OUTPUT TAPE IS REQUIRED BY THE BREAKOUT PROCEDURE ON WHICH TO COPY THE BREAKOUT DATA.

** <J-S> NEEDS <INTEGER> SEGMENTS FOR <F-ID>

--- -----

THIS MESSAGE IS GENERATED WHEN THE MCP IS UNABLE TO PROVIDE THE DISK SPACE REQUESTED BY THE PROGRAM, <INTEGER> INDICATES THE NUMBER OF SEGMENTS REQUIRED.

THE OPERATOR MAY CREATE DISK SPACE BY DUMPING A FILE FROM DISK TO TAPE AND THEN REMOVING THE DISK FILE, OR BY ENTERING THE KX ROUTINE. (SEE KEYBOARD INPUT MESSAGES.) THE "OK" INPUT MESSAGE SERVES TO RESUME PROCESSING.

** MAG TAPE RQD <F-ID> <J-S>

--- -----

THIS MESSAGE IS TYPED WHEN A PROGRAM REQUIRES A

SYSTEMS OUTPUT MESSAGES

A SCRATCH MAGNETIC TAPE .

OPERATOR MAY

A. MANUALLY SET A TAPE READY, IN WRITE STATUS, OR

B. HE MAY SET A TAPE IN READY STATUS BY USING THE RY
SPO INPUT MESSAGE, OR

C. HE MAY USE THE PG SPO INPUT MESSAGE TO PURGE A TAPE AND
THEREBY MAKE IT AVAILABLE FOR USE BY THE REQUESTING PROGRAM.

** NO FILE <F-ID> <J-S>

.. ..

THIS MESSAGE INDICATES THAT A PROGRAM HAS NEED FOR AN INPUT
FILE WHICH IS APPARENTLY NOT AVAILABLE. IF THE SUBJECT FILE
IS LABELED, THE SITUATION MAY BE REMEDIED BY MAKING THE
FILE AVAILABLE. IF THE FILE IS NOT LABELED, IT MAY BE
SPECIFIED THROUGH USE OF A "UL" MESSAGE. IF THE FILE IS AN
OPTIONAL FILE AND NOT REQUIRED FOR THIS RUN, AN OF MESSAGE MAY
BE ENTERED. IF A PROGRAM HAS READ THE FINAL REEL OF A MULTI-
REEL UNLABELED FILE, THE FR MESSAGE MAY BE ENTERED.

** NO FILE <F-ID> <REEL NUMBER> <J-S>

.. ..

THIS MESSAGE IS ESSENTIALLY THE SAME AS THE ** NO FILE <F-ID>
<J-S> MESSAGE AND IS GENERATED IF THE PROGRAM HAS NEED FOR THE
SECOND REEL AND ALL SUBSEQUENT REELS OF A FILE.

** NO MCP DISK. <INTEGER> SEGMENTS REQUIRED.

.. ..

** ENTERING "KX" ROUTINE.

.. ..

** PLEASE REMOVE ALL FILES WHICH ARE NOT CRITICAL, THANK YOU.

.. ..

SYSTEMS OUTPUT MESSAGES

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THIS MESSAGE IS GENERATED WHEN THE MCP NEEDS DISK SPACE FOR ITS OWN USE, AND NO DISK IS AVAILABLE. IF THE OPERATOR DOES NOT FREE SUFFICIENT DISK STORAGE AREA, MCP REPEATS THE MESSAGE AND RE-ENTERS THE ROUTINE. (THE "KX" ROUTINE IS DESCRIBED IN DETAIL IN THE "KEYBOARD INPUT MESSAGES" SECTION,)

** PAPER RDR RQD <F-ID> <J-S>
-- -----

THIS MESSAGE INFORMS THE OPERATOR THAT THE PROGRAM REQUIRES A PAPER TAPE READER.

** PAPER PUNCH RQD <F-ID> <J-S>
-- -----

THIS MESSAGE INFORMS THE OPERATOR THAT A PAPER TAPE PUNCH IS REQUIRED BY THE PROGRAM.

** PRINTER RQD <F-ID> <J-S>
-- -----

THIS MESSAGE IS TYPED WHEN THE MCP IS READY TO PRINT SOME OUTPUT AND NO PRINTER IS AVAILABLE.

THE OPERATOR MAY MAKE A PRINTER AVAILABLE OR USE THE DU SPO INPUT MESSAGE TO DIRECT THE PRINTER OUTPUT FILE TO A PRINTER BACK-UP TAPE.

** <P-N> DS OR DP
-- -----

WHEN THE TERMINATE OPTION IS NOT SET, THE MCP WILL ASK OPERATOR TO REQUEST A DUMP OR SIMPLY A DISCONTINUATION OF THE NOTED <P-N> WHEN IT IS ABORTED PRIOR TO NORMAL END OF JOB .

** REMOTE NOT LOG IN
-- -----

SYSTEMS OUTPUT MESSAGES

A REQUEST HAS BEEN RECEIVED OR ISSUED FOR A REMOTE SPO
WHICH HAS NOT LOGGED IN AS A VALID SYSTEM USER.

** TAPE LISTER RQD <F-ID> <J-S>

--- -----

THIS MESSAGE INFORMS THE OPERATOR THAT A LISTER IS
REQUIRED BY THE PROGRAM.

** TR PLEASE

--- -----

THIS MESSAGE IS TYPED AT HALT/LOAD TIME, IF THE "USE TIME"
OPTION HAS BEEN SET, THE SYSTEM OPERATOR IS REQUIRED TO ENTER
A TR MESSAGE BEFORE PROCESSING CAN CONTINUE.

** <UNIT SPECIFIER> CARD PUNCH PAR

--- -----

THIS MESSAGE IS TYPED IF A PARITY ERROR HAS OCCURRED IN THE
CARD PUNCH.

*** DELETION ***

*

MCP WILL TRY TO CORRECT THE ERROR BY EXECUTING STANDARD
RETRIES. THIS IS DONE ON EVERY CARD PUNCH MODEL. THE MESSAGE
IS TYPED ONLY IF THE ERROR PERSISTS AFTER SIX CARDS.

*

*

*

** <UNIT SPECIFIER> NOT RDY

--- -----

THIS IS TO INFORM THE OPERATOR THAT THE MCP TRIED TO
EXECUTE AN I/O OPERATION ON A PERIPHERAL DEVICE WHICH WAS NOT
IN READY STATUS. OPERATOR MUST SET THE DEVICE IN READY
STATUS AND MCP WILL REPEAT THE I/O OPERATION.

B. OUTPUT MESSAGES SIGNALING DISCONTINUATION OF THE PROGRAM.

-- ADDR ERROR <J-S> <ADDR> <SEGM.#>

THIS MESSAGE INDICATES THAT THE ADDRESS SHOWN IN THE MESSAGE IS OUTSIDE THE BOUNDS OF THE AREA DEFINED FOR THIS PROGRAM BY THE BASE AND LIMIT REGISTERS, OR NOT SYNCHRONIZED PROPERLY, E.G., MOD 4 FOR MVW, OR MOD 2 FOR MVA.

--EOF NO LABEL <F-ID> <ADDR.> <SEGM.#>

A READ WAS PERFORMED BY THE SUBJECT PROGRAM AT <ADDR> IN SEGMENT <SEGM.#>. AN END OF FILE CONDITION WAS SENSED BY THE MCP AND THERE IS NO BRANCH ADDRESS FURNISHED IN THE OBJECT PROGRAM FOR THE END OF FILE HANDLING.

-- INV CONTROL CARD <ADDR>

THE MCP HAS ATTEMPTED TO PROCESS A CONTROL RECORD AND HAS FOUND AN INVALID CHARACTER IN COLUMN <ADDR> .

-- INV CONTROL INSTR <CONTROL RECORD>

A CONTROL RECORD HAS BEEN PROCESSED BY THE MCP AND WAS FOUND TO CONTAIN INVALID CONTROL SYNTAX .

-- INV DESCR <J-S> <ADDR> <SEGM.#>

THE MCP HAS DETECTED AN INVALID I/O DESCRIPTOR AS A RESULT OF A REQUEST FROM <J-S> AT <ADDR> IN <SEGM#>.

-- INV FILE OPEN <F-ID> <ADDR> <SEGM.#>

THIS MESSAGE IS TYPED WHEN A PROGRAM ATTEMPTS TO OPEN A FILE

SYSTEMS OUTPUT MESSAGES

THAT WAS NOT CLOSED.

-- INV OPEN FILE <F-N> LOCKED

-- -----

THIS MESSAGE INDICATES THAT THE FILE SPECIFIED IN THE OPEN REQUEST HAS BEEN OPENED WITH LOCK OR LOCKOUT BY ANOTHER PROGRAM. THE REQUESTING PROGRAM IS MARKED WAITING DISK AND UPON RECEIPT OF AN OPERATOR "<MX> OK" MESSAGE WILL ATTEMPT TO OPEN THE FILE AGAIN.

-- INV FILE CLOSE <F-ID> <ADDR> <SEGM,#>

-- -----

THIS MESSAGE SIGNALS THAT A PROGRAM ATTEMPTED TO CLOSE A FILE THAT WAS NOT OPENED.

-- INV FILE READ <F-ID> <ADDR> <SEGM,#>

-- -----

THIS MESSAGE INDICATES THAT A PROGRAM ATTEMPTED TO READ A FILE THAT COULD NOT BE READ (E.G., IT WAS NOT OPENED, OR IT IS AN OUTPUT FILE).

-- INV FILE WRITE <F-ID> <ADDR> <SEGM,#>

-- -----

THIS MESSAGE SIGNALS THAT A PROGRAM ATTEMPTED TO WRITE A FILE THAT COULD NOT BE WRITTEN (E.G., IT WAS NOT OPENED OR IT IS AN INPUT FILE).

-- INV INSTR <P-N> <ADDR> <SEGM,#>

-- -----

AN INVALID INSTRUCTION WAS DETECTED BY THE SYSTEM AT <ADDR> IN SEGMENT <SEGM.#> .

-- INV I/O INSTR <ADDR> <F-ID> <SEGM,#>
-- ----

AN INVALID INPUT-OUTPUT OPERATION WAS REQUESTED AT THE NOTED
ADDRESS AND SEGMENT IN <P-N> .

-- INV I/O DESCR <CHANNEL #>
-- ----

AN INVALID I/O DESCRIPTOR HAS BEEN INITIATED BY THE MCP IN THE
NOTED CHANNEL .

-- I/O ERROR NO LABEL <F-ID> <P-N>
-- ----

NO LABEL WAS FURNISHED BY THE I/O REQUEST FROM THE NOTED
PROGRAM FOR AN I/O OPERATION WHICH RESULTED IN AN
IRRECOVERABLE ERROR.

-- INV I/O LIMIT <F-ID> <ADDR> <SEGM,#>
-- ----

A REQUEST WAS RECEIVED BY THE MCP TO INITIATE AN I/O OPERATION
ON A DESCRIPTOR WHOSE BEGIN-END ADDRESSES WERE OUTSIDE
THE BOUNDS OF THE REQUESTING PROGRAM .

-- <P-N> SCHEDULED IGNORED -- INV CORE REQ
-- ----

THIS MESSAGE IS TYPED WHEN THE MCP HAS ATTEMPTED TO
LOAD AN OBJECT PROGRAM FOR EXECUTION AND HAS FOUND THE
CORE REQUIREMENT SPECIFICATION FROM THE PROGRAM
PARAMETER BLOCK TO BE IN ERROR. THE SCHEDULE REQUEST
IS THEN REMOVED FROM THE SCHEDULE TABLE BY THE MCP.

-- MEM PAR <J-S> <ADDR>
-- ----

A MEMORY PARITY WAS DETECTED BY THE HARDWARE AT THE NOTED
ABSOLUTE ADDRESS. AFTER A HALT/LOAD OPERATION, THE MEMORY
AREA MAY BE LOCKED OUT FROM MCP USE BY THE "XM" KEYBOARD
REQUEST .

SYSTEMS OUTPUT MESSAGES

-- PAR NO LABEL <F-ID> <ADDR> <SEGM.#>

-- ----

NO BRANCH LABEL WAS PROVIDED WITH THE I/O REQUEST FROM THE
OBJECT PROGRAM ON WHICH THE MCP DETECTED AN IRRECOVERABLE
PARITY ERROR.

-- <P-N> NOT IN DIRECTORY

-- ----

A SCHEDULE REQUEST HAS BEEN RECEIVED BY THE MCP FOR A PROGRAM
WHICH WAS NOT IN ITS DISK DIRECTORY .

C. OUTPUT MESSAGES DURING NORMAL PROCESSING.

BK SET <DIGIT> <J-S>

-- ----

THIS MESSAGE CONFIRMS THAT THE EXECUTION OR BREAKPOINT
CONTROL DIGIT, SPECIFIED IN THE BK INPUT MESSAGE, HAS
BEEN SET.

<DIGIT> DENOTES THE EXECUTION OR BREAKPOINT CONTROL DIGIT,

BOJ <P-N> <TIME>

-- ----

THIS MESSAGE IS TYPED, WHEN AN OBJECT PROGRAM FIRST BEGINS
TO EXECUTE, PROVIDING THE "USE BOJ" OPTION IS SET.

CARD RDR NOT RDY

THE CARD READER IN THE SYSTEM HAS GONE "NOT READY"
BECAUSE OF AN EMPTY READ HOPPER OR A READER FAILURE .

SYSTEMS OUTPUT MESSAGES

CORE = <INTEGER>

THIS MESSAGE APPEARS ON THE SPO IN ANSWER TO A WC INPUT REQUEST. <INTEGER> DENOTES THE NUMBER OF DIGITS OF CORE MEMORY WHICH ARE UNASSIGNED.

DATE <DATE>

THIS MESSAGE APPEARS ON THE SPO IN ANSWER TO A WD INPUT INQUIRY, REQUESTING THE VALUE OF THE CURRENT DATE FIELD USED BY THE SYSTEM.

THE <DATE> IS GIVEN IN THE FOLLOWING FORMAT:
 MM/DD/YY

EXAMPLE: 07/28/66

EOJ <J-S> <TIME>

THIS MESSAGE IS TYPED WHEN AN OBJECT PROGRAM REACHES ITS NORMAL END, PROVIDING THAT THE "USE EOJ" OPTION IS SET.

EOJ <J-S> <TIME> ** SYNTAX ERROR

THIS MESSAGE IS TYPED AT THE END OF A COMPILE RUN IF THE COMPILER WAS NOT ABLE TO GENERATE THE MACHINE LANGUAGE CODE ON ACCOUNT OF ERRORS IN THE SOURCE LANGUAGE.

ERROR CARD

THE MCP HAS FOUND A CARD IN THE CARD READ DEVICE WHICH WAS NOT A CONTROL CARD, WHILE THE CARD READER WAS NOT BEING

SYSTEMS OUTPUT MESSAGES

USED BY THE PROGRAM,

FILE <F-ID> CHANGED TO <F-ID>

THIS MESSAGE IS TYPED TO CONFIRM THAT THE CHANGE OF A <F-ID> HAS BEEN EXECUTED IN ACCORDANCE WITH THE CONTROL INFORMATION SUPPLIED EITHER THROUGH A CHANGE CARD OR A CC SPO INPUT MESSAGE.

<F-ID> LIB MAINT IGNORED

THIS MESSAGE IS TYPED WHEN A REQUESTED CHANGE IN THE DISK LIBRARY COULD NOT BE EXECUTED, BECAUSE THE SPECIFIED FILE WAS NOT FOUND.

<F-ID> OPEN INPUT <UNIT SPECIFIER> <J-S>

THIS MESSAGE IS TYPED WHEN A NORMAL "OPEN" OPERATION ON AN INPUT FILE HAS BEEN PERFORMED, PROVIDING THAT THE "USE OPN" OPTION IS SET.

<F-ID> OPEN OUTPUT <UNIT SPECIFIER> <J-S>

THIS MESSAGE IS TYPED WHEN A NORMAL "OPEN" OPERATION ON AN INPUT FILE HAS BEEN PERFORMED, PROVIDING THAT THE "USE OPN" OPTION IS SET.

<F-ID> OPEN I/O <UNIT SPECIFIER> <J-S>

THIS MESSAGE IS TYPED WHEN A NORMAL "OPEN" OPERATION HAS BEEN PERFORMED ON A FILE WHICH HAS BEEN DECLARED INPUT/OUTPUT,

SYSTEMS OUTPUT MESSAGES

PROVIDING THAT THE "USE OPN" IS SET.

<F-ID> LOCKED UNIT <UNIT SPECIFIER>

THIS MESSAGE NOTIFIES THE OPERATOR THAT THE TAPE FILE HAS BEEN CLOSED AND LOCKED.

<F-ID> REMOVED

THIS MESSAGE NOTIFIES THE OPERATOR, THAT IN COMPLIANCE WITH AN RM INPUT MESSAGE, THE SPECIFIED FILE HAS BEEN REMOVED FROM THE DISK.

INV CONTROL

THIS MESSAGE IS TYPED IF THE CHARACTER IN COL. 1. OF A CONTROL CARD IS NOT AN INVALID CHARACTER (I.E., QUESTION MARK).

<J-S> : <ADDR> = <DATA>

THIS MESSAGE IS TYPED IN RESPONSE TO AN OT INPUT INQUIRY AND PRINTS THE ADDRESS AND THE CONTENTS OF THE DESIGNATED DATA FIELD, UP TO A MAXIMUM OF 20 CHARACTERS.

<J-S> DS-ED <TIME>

THE NOTED <J-S> HAS BEEN DISCONTINUED AT THE NOTED TIME .

<J-S> NOT RESUMED -- NO MEM

SYSTEMS OUTPUT MESSAGES

THE REQUEST TO CONTINUE A JOB WHICH WAS STOPPED HAS
BEEN IGNORED SINCE INSUFFICIENT MEMORY IS AVAILABLE FOR IT.

<J-S> PRIORITY CHANGED TO <INTEGER>

THIS MESSAGE CONFIRMS TO THE OPERATOR, THAT THE PRIORITY
NUMBER OF THE PROGRAM HAS BEEN CHANGED IN ACCORDANCE WITH HIS
PR INPUT MESSAGE.

<J-S> RESTART OK

PROGRAM RESTARTED.

<J-S> RESUMED

THIS MESSAGE INFORMS THE OPERATOR THAT THE GO INPUT
INSTRUCTION HAS BEEN EXECUTED.

<J-S> TIME -- <TIME>

THIS MESSAGE IS TYPED IN ANSWER TO A TI INPUT INQUIRY.
<TIME> IS THE PROCESSOR TIME, THAT THE OBJECT PROGRAM HAS USED
UP TO THE TIME THE TI QUERY WAS ENTERED.

THE FORMAT OF <TIME> IS: HOURS: MINUTES: SECONDS

<J-S> ZIP ** <CONTROL INFORMATION>

IF THE "USE ZIPM" OPTION IS SET, THIS MESSAGE INFORMS THE
OPERATOR THAT A ZIP STATEMENT HAS BEEN EXECUTED.

SYSTEMS OUTPUT MESSAGES

NOTE: THE FOLLOWING 19 MESSAGES BEGINNING WITH <J-S> ARE GENERATED

 IN RESPONSE TO THE WY INPUT INQUIRY.

<J-S> WAITING HDWR <HDWR TYPE>

THIS MESSAGE IS TYPED IN RESPONSE TO THE WY REQUEST WHEN THE
 PROGRAM IS WAITING FOR A PERIPHERAL UNIT.

THE <HDWR TYPE> IS SPECIFIED BY THE CODE NAME FROM THE
 FOLLOWING LIST:

MTP	7-TRACK MAG. TAPE
MT9	9-TRACK MAG. TAPE
CRD	CARD READER
CPU	CARD PUNCH
PRN	LINE PRINTER
DSK	DISK FILE
PTR	PAPER TAPE READER
PTP	PAPER TAPE PUNCH
SUR	MICR SORTER-READER
MTL	MULTIPLE TAPE LISTER
SPO	SUPERVISORY PRINTER
TYP	B9350 TELETYPEWRITER
OLB	ON-LINE BANKING TERMINAL
A3B	83B3 (TELETYPE MODEL 28) SYSTEM
TWX	TWX
T50	IBM 1050
T30	IBM 1030
D20	UNIVAC DCT-2000
B35	B3500 COMPUTER
B25	B2500 COMPUTER
8A1	8A1 SYSTEM
BTT	BURROUGHS TOUCH-TONE SYSTEM
BID	BURROUGHS INPUT & DISPLAY SUBSYSTEM
F73	FRIDEN 7311
TC5	BURROUGHS TC 500
B05	BURROUGHS B300 OR B500 COMPUTER

SYSTEMS OUTPUT MESSAGES

<J-S> NO FILE <F-ID>

THIS MESSAGE IS GENERATED IF THE PROGRAM IS WAITING FOR AN INPUT FILE.

<J-S> SUSPENDED.

THIS MESSAGE IS TYPED IN RESPONSE TO THE WY REQUEST WHEN THE PROGRAM IS SUSPENDED AND NOT IN CORE.

<J-S> WAITING I-O <UNIT SPECIFIER>

THIS MESSAGE IS TYPED IN RESPONSE TO THE WY REQUEST WHEN THE PROGRAM IS CURRENTLY WAITING THE COMPLETION OF AN I-O OPERATION. THIS SITUATION CAN OCCUR DURING NORMAL PROCESSING WHEN THE PROGRAM IS PROCESSING DATA FASTER THAN THE PERIPHERAL DEVICE CAN ACCOMODATE IT.

<J-S> WAITING OVLY.

THIS MESSAGE IS TYPED IN RESPONSE TO THE WY REQUEST WHEN A PROGRAM IS WAITING ON THE RECEIPT OF AN OVERLAYABLE SEGMENT.

<J-S> WAITING KBD IN

THIS MESSAGE IS TYPED IN RESPONSE TO THE WY REQUEST WHEN THE PROGRAM IS WAITING RESPONSE TO AN ACCEPT REQUEST.

<J-S> WAITING PUSHDOWN

SYSTEMS OUTPUT MESSAGES

THIS MESSAGE IS TYPED IN RESPONSE TO THE WY INQUIRY, WHEN THE MCP IS IN THE PROCESS OF REORGANIZING THE CORE ALLOCATIONS OF THE PROGRAMS.

<J-S> WAIT STATUS

THIS MESSAGE IS TYPED IN RESPONSE TO A WY REQUEST WHEN A PROGRAM IS WAITING REMOTE RESPONSE TO THE EXECUTION OF A "WAIT" STATEMENT

<J-S> TERM. RUNNING

THIS MESSAGE IS TYPED IN RESPONSE TO A WY REQUEST WHEN THE PROGRAM IS IN THE PROCESS OF BEING TERMINATED.

<J-S> OPERATOR ST-ED

THIS MESSAGE IS TYPED IN RESPONSE TO A WY REQUEST WHEN THE PROGRAM HAS BEEN STOPPED BY AN OPERATOR ST REQUEST.

<J-S> "BR" RUNNING

THIS MESSAGE IS TYPED IN RESPONSE TO A WY REQUEST WHEN THE PROGRAM IS IN THE PROCESS OF EXECUTING A BREAKOUT.

<J-S> PRIORITY ST-ED

THIS MESSAGE IS TYPED IN RESPONSE TO A WY REQUEST WHEN THE PROGRAM WAS STOPPED BECAUSE OF A DEMAND FOR RUNNING A HIGH PRIORITY PROGRAM. PROGRAM WILL BE RESUMED WHEN MEMORY IS

SYSTEMS OUTPUT MESSAGES

AVAILABLE.

<J-S> DUP FILE <F-ID>

THIS MESSAGE IS TYPED IN RESPONSE TO A WY REQUEST WHEN THE PROGRAM IS WAITING OPERATOR ACTION ON A "DUP FILE" NOTIFICATION.

<J-S> DUP LIBRARY <F-ID>

THIS MESSAGE IS TYPED IN RESPONSE TO A WY REQUEST WHEN THE PROGRAM IS WAITING OPERATOR ACTION ON A "DUP LIBRARY" NOTIFICATION.

<J-S> NO USER DISK <INTEGER> SEGMENTS

THIS MESSAGE IS TYPED IN RESPONSE TO A WY REQUEST WHEN THE PROGRAM IS WAITING AVAILABILITY OF DISK SPACE.

<J-S> COMPILING

THIS MESSAGE IS TYPED IN RESPONSE TO A WY REQUEST WHEN A COMPILER IS RUNNING OK.

<J-S> RUNNING

THIS MESSAGE IS TYPED IN RESPONSE TO A WY REQUEST WHEN THE PROGRAM IS BEING CORE SHARED AND IS CURRENTLY RUNNING IN CORE.

SYSTEMS OUTPUT MESSAGES

<J-S> EXECUTING

THIS MESSAGE IS TYPED IN RESPONSE TO A WY REQUEST WHEN THE PROGRAM IS IN CORE AND EXECUTING OK.

<J-S> WAITING CLOSE <F-ID>

THIS MESSAGE IS GENERATED IN RESPONSE TO A WY INPUT INQUIRY IN THE FOLLOWING CASE:

THE PROGRAM SPECIFIED IN THE INPUT MESSAGE REQUESTED THE MCP TO EXECUTE A "CLOSE WITH PURGE" ON A DISK FILE WHICH IS IN USE BY ANOTHER PROGRAM AS WELL. THE REQUESTING PROGRAM MUST WAIT FOR THE MCP TO PURGE THE FILE UNTIL THE OTHER PROGRAM CLOSES IT.

NOTE: A STALEMATE MAY DEVELOP, IF TWO PROGRAMS OPEN TWO FILES (FILES "A" AND "B"). AFTER PROCESSING, PROGRAM-1 ATTEMPTS TO CLOSE WITH PURGE FILE "A". SINCE PROGRAM-2 IS USING THE FILE, MCP WILL MARK PROGRAM-1 WAITING CLOSE. PROGRAM-2 NOW ATTEMPTS TO CLOSE FILE "B" WITH PURGE, BUT SINCE PROGRAM-1 HAS NOT YET CLOSED FILE "B", PROGRAM-2 WILL BE MARKED WAITING CLOSE. A STALEMATE NOW EXISTS AND NO FURTHER ACTION IS TAKEN BY MCP UNTIL ONE OF THE PROGRAMS IS DS-ED.

LOG FILE HALF FULL.

THIS MESSAGE INDICATES THAT THE LOG FILE IS HALF FILLED.

LOG FILE FULL.

THIS MESSAGE IS TYPED WHEN THE LOG FILE CONTAINS SPACE FOR ONLY 10 MORE RECORDS.

THE OPERATOR HAS THE OPTION TO USE THE LN INPUT REQUEST,

SYSTEMS OUTPUT MESSAGES

WHICH WILL CAUSE THE FILE TO BE SCHEDULED FOR PRINTING, OR
DISREGARD THE MESSAGE, IN WHICH CASE THE ACCUMULATED
INFORMATION IN THE FILE WILL BE LOST.

MEM <ADDRESS> IN USE BY SYSTEM

THIS MESSAGE IS TYPED IN RESPONSE TO AN XM INPUT REQUEST, IF
THE REQUEST COULD NOT BE EXECUTED.

MEM <ADDRESS> REMOVED

THIS MESSAGE IS TYPED IN RESPONSE TO AN XM INPUT REQUEST, IF
THE REQUEST HAS BEEN EXECUTED.

NO MIX

THIS MESSAGE IS TYPED IN ANSWER TO A MX INPUT INQUIRY, IF THE
MIX TABLE IS EMPTY, I.E., NO PROGRAM IS BEING PROCESSED.

NULL SCHEDULE

THIS MESSAGE IS TYPED IN RESPONSE TO A WS INPUT INQUIRY, IF NO
PROGRAM IS SCHEDULED FOR EXECUTION.

OPERATOR STOPPED <J-S>

THIS MESSAGE IS TYPED TO INFORM THE OPERATOR THAT A ST INPUT
REQUEST HAS BEEN EXECUTED.

SYSTEMS OUTPUT MESSAGES

PD = <P-N> OR <F-ID>

-- - - - -

THIS MESSAGE IS TYPED IN ANSWER TO THE PD INPUT REQUEST.
THE PD INPUT INQUIRY ALLOWS THREE FORMATS:

1. PD

ANSWER:

PD = <P-N> OR <F-ID> <LIST FROM DISK DIRECTORY>.

2. PD <IDENTIFIER>

ANSWER:

PD = <P-N> OR <F-ID>

WHERE <P-N> OR <F-ID> = <IDENTIFIER>

THE EQUALITY OF THE <P-N> OR <F-ID> IS BASED ON THE LENGTH OF
THE <IDENTIFIER>, I.E., ASMBLR = A, IF "A" IS THE REQUESTED
IDENTIFIER.

3. PD < UNIT SPECIFIER>

MAY GENERATE ANY OF THE FOLLOWING RESPONSES:

<UNIT SPECIFIER> ** INV KBD INPUT <INPUT TEXT>

THIS MESSAGE IS DESCRIBED IN "GROUP A" OF THIS SECTION.

<UNIT SPECIFIER> NOT LIB TAPE

<UNIT SPECIFIER> NOT AVAIL

<UNIT SPECIFIER> DIRECTORY = <P-N> OR <F-ID>

THE DETAILED DESCRIPTION OF THE ABOVE THREE MESSAGES APPEARS
IN THIS SECTION OF THE LIST OF MESSAGES IN THEIR ALPHA-
BETICALLY DESIGNATED PLACES.

<P-N> ABORTED

THIS MESSAGE IS TYPED AT HALT/LOAD TIME IF A SYSTEM HALT
OCCURRED BEFORE A JOB IN THE MIX TABLE WAS PROGRAMMATICALLY
DISCONTINUED. ONE SUCH MESSAGE IS TYPED FOR EACH PROGRAM THAT
WAS IN THE MIX TABLE WHEN THE HALT OCCURRED.

SYSTEMS OUTPUT MESSAGES

PROGRAM NOT IN MEM

AN ATTEMPT TO STOP OR TERMINATE THE NOTED PROGRAM CAN NOT BE PERFORMED.

PR = <PRIORITY> <J-S>
 -- - -----

THIS MESSAGE IS TYPED IN RESPONSE TO A MX INPUT INQUIRY AND LISTS ALL THE PROGRAMS CURRENTLY IN THE MIX TABLE.

PR = <PRIORITY> <J-S> CORE SHARED
 -- - -----

THIS MESSAGE IS TYPED IN RESPONSE TO THE "MX" INQUIRY WHEN THE SUBJECT PROGRAM IS BEING CORE SHARED .

<P-N> <INTEGER> SCHEDULED <INTEGER> DIGITS

THIS MESSAGE IS TYPED IN RESPONSE TO A WS INPUT INQUIRY, PRINTING OUT A LIST OF THOSE PROGRAMS WHICH HAVE BEEN SCHEDULED FOR EXECUTION, BUT HAVE NOT BEEN LOADED OR INITIATED.

THE FIRST <INTEGER> DENOTES THE SERIAL NUMBER OF THE PROGRAM IN THE SCHEDULE LIST.

THE SECOND <INTEGER> DENOTES THE SIZE OF CORE AREA NEEDED FOR EXECUTION OF THE PROGRAM.

<P-N> <INTEGER> SCHEDULED

IF THE "USE SCHM" OPTION OPTION IS SET, THIS MESSAGE IS TYPED IF A JOB IS SCHEDULED FOR EXECUTION.

SYSTEMS OUTPUT MESSAGES

<INTEGER> DENOTES THE SERIAL NUMBER OF THE JOB IN THE SCHEDULE LIST.

RESTART IGNORED MEM NOT AVAIL

RESTART COULD NOT BE PERFORMED - INSUFFICIENT MEMORY AVAILABLE.

RESTART IGNORED FILE <F-ID> NOT AVAIL

RESTART COULD NOT BE PERFORMED - NOTED FILE NOT AVAILABLE TO SYSTEM .

RESTART IGNORED DUP FILE <F-ID>

RESTART COULD NOT BE PERFORMED - TWO FILES IN SYSTEM WITH SAME FILE IDENTIFICATION .

RESTART IGNORED HDWR FOR <F-ID> NOT AVAIL

REQUIRED OUTPUT PERIPHERAL IS NOT AVAILABLE.

RESTART IGNORED FILE <F-ID> NOT IN DISK DIRECTORY

PROGRAM TO BE RESTARTED IS NOT IN THE DISK DIRECTORY.

RESTART IGNORED INV FILE <F-ID>

DISK FILE IS NOT A PERMANENT FILE OPENED AS INPUT OR FILE INFORMATION BLOCK IS NOT IN MEMORY.

SYSTEMS OUTPUT MESSAGES

RESTART IGNORED

RESTART COULD NOT BE PERFORMED BECAUSE MIX SPACE
WAS NOT AVAILABLE.

RESTART IGNORED NO FILE <F-ID>

RESTART COULD NOT BE PERFORMED - FILE <F-ID> REQUIRED BY
RESTART NOT IN SYSTEM.

STOPPED <P-N>

PROGRAM STOPPED BY CRASHOUT, (SEE "PRIORITY CARD" IN
"CONTROL INFORMATION" SECTION.)

TIME <TIME>

THIS MESSAGE APPEARS ON THE SPD IN ANSWER TO A WT INPUT
INQUIRY, IN THE FOLLOWING FORMAT:

<TIME> = <INTEGER>:<INTEGER>

WHERE THE FIRST INTEGER INDICATES THE HOURS, THE SECOND THE
MINUTES.

THE SAME MESSAGE APPEARS IN ANSWER TO THE TR INPUT MESSAGE
AFTER THE TIME HAS BEEN ENTERED.

TOO MANY FILES TO DUMP

NUMBER OF FILES IN DUMP REQUEST EXCEEDS PERMISSIBLE NUMBER FOR
SINGLE DUMP REQUEST. (MAX. 1980 FILES.)

TRAC LOADED

THIS MESSAGE INDICATES THAT THE TRACE ROUTINE HAS BEEN LOADED IN COMPLIANCE WITH THE REQUEST COMMUNICATED TO THE SYSTEM EITHER THROUGH A "USE TRAC" OPTION CARD, OR THROUGH AN SD INPUT REQUEST.

TRAC REMOVED

THIS MESSAGE INFORMS THE OPERATOR, THAT THE TRACE ROUTINE HAS BEEN REMOVED, IN COMPLIANCE WITH THE RO INPUT MESSAGE.

<UNIT SPECIFIER> DELETED

THIS MESSAGE IS TYPED IN RESPONSE TO A DL INPUT MESSAGE, CONFIRMING THAT THE SPECIFIED PERIPHERAL DEVICE HAS BEEN DELETED FROM THE LIST MAINTAINED BY THE MCP.

<UNIT SPECIFIER> DIRECTORY = <P-N> OR <F-ID>

THIS MESSAGE IS TYPED IN RESPONSE TO A PD <UNIT SPECIFIER> INPUT INQUIRY. IT LISTS THE DIRECTORY OF THE SPECIFIED LIBRARY TAPE, PRINTING A MAXIMUM OF 7 IDENTIFIERS PER LINE.

<UNIT SPECIFIER> L <F-ID>

THIS MESSAGE TYPES THE LABEL OF THE FILE ON THE <UNIT SPECIFIER> IN RESPONSE TO AN OL INPUT INQUIRY. THE LETTER "L" STANDS FOR THE LABEL TYPE, AS DESCRIBED UNDER THE "OL" KEYBOARD INPUT MESSAGE.

<UNIT SPECIFIER> <F-ID> IN USE BY <J-S>

SYSTEMS OUTPUT MESSAGES

THIS MESSAGE IS TYPED IN RESPONSE TO A RY INPUT REQUEST, IF
 THE PARTICULAR UNIT IS ALREADY ASSIGNED TO A PROGRAM.

<UNIT SPECIFIER> <F-ID> REEL <INTEGER> RET <DATE>

THIS MESSAGE IS PRINTED ON THE SPO, IF A TAPE HAS A WRITE RING
 AND THE RETENTION DATE HAS NOT EXPIRED. THE MESSAGE CONTAINS
 EXCERPTS FROM THE TAPE LABEL.

<UNIT SPECIFIER> I/O PAR ERROR

THIS MESSAGE INDICATES THAT AN IRRECOVERABLE PARITY ERROR
 HAS OCCURRED DURING A MAG. TAPE, PAPER TAPE, OR DISK I/O
 OPERATION.

<UNIT SPECIFIER> I/O PAR OK

<UNIT SPECIFIER> KBD PRINTER PAR

<UNIT SPECIFIER> LOCKED

THIS MESSAGE IS TYPED WHEN THE MCP HAS PROGRAMMATICALLY
 LOCKED THE NOTED FILE IN RESPONSE TO A CLOSE LOCK REQUEST

<UNIT SPECIFIER> LOGGED-IN <TIME>

THIS MESSAGE NOTES THE UNIT AND TIME AT WHICH A REMOTE SPO
 HAS LOGGED INTO THE SYSTEM.

<UNIT SPECIFIER> LOG-OUT <TIME>

THIS MESSAGE NOTES THE UNIT AND TIME THAT A REMOTE SPO
STATION HAS LOGGED-OUT OF THE SYSTEM.

<UNIT SPECIFIER> NO LABEL

THIS MESSAGE IS TYPED WHEN THE MCP STATUS PROCEDURE HAS BEEN
UNABLE TO RECOGNIZE A VALID LABEL ON A TAPE FILE WITHOUT A
WRITE RING.

<UNIT SPECIFIER> NO READ LABEL

THIS MESSAGE IS TYPED WHEN THE MCP STATUS PROCEDURE CANNOT
READ THE FIRST RECORD FROM A TAPE UNIT WITHOUT ENCOUNTERING
A PARITY ERROR.

<UNIT SPECIFIER> NOT AVAIL

THIS MESSAGE IS TYPED IN ANSWER TO A PD <UNIT SPECIFIER> INPUT
INQUIRY, IF THE FILE ON THE SPECIFIED UNIT IS IN USE.

<UNIT SPECIFIER> NOT LIB TAPE

THIS MESSAGE IS TYPED IN RESPONSE TO A PD <UNIT SPECIFIER>
INPUT INQUIRY, IF THE SPECIFIED UNIT IS NOT A TAPE UNIT OR
OR THE TAPE IS NOT A LIBRARY TAPE.

<UNIT SPECIFIER> UNASSIGNED ERROR <RES.DESCR.>

THIS MESSAGE IS TYPED WHEN THE MCP ERROR/RETRY PROCEDURE
DETECTS AN ERROR FOR WHICH IT HAS NO STANDARD CORRECTIVE
PROCEDURE. A COPY OF THE DESCRIPTOR IS TYPED WITH THE MESSAGE.

SYSTEMS OUTPUT MESSAGES
-----<UNIT SPECIFIER> NOT RDY

THIS MESSAGE IS TYPED IN RESPONSE TO AN "OL" REQUEST AND THE NOTED UNIT IS IN A "NOT READY" STATUS.

<UNIT SPECIFIER> NOT IN SYSTEM

THIS MESSAGE IS TYPED IN RESPONSE TO AN "OL" REQUEST AND THE SUBJECT UNIT IS NOT IN THE MCP ENVIRONMENT .

<UNIT SPECIFIER> NO UNIT

THIS MESSAGE IS TYPED IN RESPONSE TO A VARIANT TO THE "OL" REQUEST ASKING FOR UNASSIGNED UNITS ON THE NOTED CHANNEL. THIS MESSAGE NOTES NONE UNASSIGNED .

<UNIT SPECIFIER> PURGED

THIS MESSAGE IS TYPED IN RESPONSE TO THE "PG" REQUEST TO NOTE THAT THE SUBJECT UNIT HAS BEEN "PURGED" .

<UNIT SPECIFIER> LINE PRINTER PAR

THIS MESSAGE IS TYPED WHEN THE MCP DETECTS THAT A PARITY HAS OCCURRED ON THE NOTED LINE PRINTER .

<UNIT SPECIFIER> SAVED

THIS MESSAGE IS TYPED IN RESPONSE TO THE "SV" INPUT MESSAGE AND NOTES THAT THE SUBJECT UNIT IS PROGRAMMATICALLY LOCKED OUT.

<UNIT SPECIFIER> SORTER NOT RDY

THIS MESSAGE IS TYPED WHEN THE NOTED SORTER/READER GOES TO A
"NOT READY" STATUS .

<UNIT SPECIFIER> TAPE CONTROL ERROR

THIS MESSAGE IS TYPED IF A MAG. TAPE IS SPACED OVER 6 FT. OF
BLANK TAPE. THE TAPE UNIT IS MARKED UNAVAILABLE AND LOCKED OUT
BY THE MCP.

OPERATOR SHOULD MANUALLY SET THE TAPE UNIT INTO LOCAL STATUS,
THEN AGAIN INTO REMOTE, MCP WILL REPEAT THE I/O OPERATION.

<UNIT SPECIFIER> TO BE SAVED

THIS MESSAGE IS TYPED IN RESPONSE TO THE "SV" MESSAGE WHEN THE
NOTED UNIT IS IN USE BY A PROGRAM, THE UNIT WILL BE "SAVED"
UPON THE OBJECT PROGRAM CLOSING THE FILE .

<UNIT SPECIFIER> L UNASSIGNED

THIS MESSAGE IS TYPED IN RESPONSE TO THE "OL" REQUEST AND
NOTES THAT THE SUBJECT UNIT IS CURRENTLY UNASSIGNED .
THE LETTER "L" STANDS FOR THE LABEL TYPE, AS DESCRIBED
UNDER THE "OL" KEYBOARD INPUT MESSAGE.

THE SYSTEM LOADER
 --- -----

THE SYSTEM LOADER
 --- -----

THE LOADING OF THE SYSTEM IS DESCRIBED IN SECTION 2, OF THE "MCP - GENERAL DESCRIPTION" PART OF THIS MANUAL. THIS SECTION IS A COMPLEMENT TO THE GENERAL DESCRIPTION, AND GIVES DETAILED INFORMATION CONCERNING

1. THE CONTENTS AND FORMATS OF THE SYSTEM LOADER CONTROL DECK,
2. OPERATING INSTRUCTIONS TO THE LOADING OF THE SYSTEM.

1. THE SYSTEM LOADER CONTROL DECK.
 -- --- -----

THE SYSTEM LOADER CONTROL DECK MUST FOLLOW THE MCP LOADER (MACHINE LANGUAGE LOADER) IN THE ORDER LISTED BELOW.

EACH CARD MAY HAVE (OPTIONALLY) AN <INVALID CHARACTER> IN COL. 1.

IN CASE OF A "COLD START ROUTINE" LOADING OPERATION, THE FOLLOWING CARDS (CARD-GROUPS) ARE REQUIRED IN THIS ORDER:

1. SYSTEM TAPE SPECIFIER CARD.
2. DATE CARD (OPTIONAL).
3. THE MCP SPECIFIER CARD, SHOWING THE <P-N> OF THE PARTICULAR MCP VERSION TO BE USED.
4. CHANNEL CARDS. ONE CARD MUST BE INCLUDED FOR EACH CHANNEL OR CHANNEL EXCHANGE ON THE SYSTEM.
5. UNIT CARDS. ONE CARD MUST BE INCLUDED FOR EACH PERIPHERAL UNIT WHICH IS TO BE HANDLED BY THE SYSTEM.
6. DISK SPECIFICATION CARDS, ONE OR MORE CARDS, AS REQUIRED, MUST BE INCLUDED TO SPECIFY THE CONFIGURATION OF DISK TO BE MAINTAINED BY THE SYSTEM. NOTE THAT ONE DISK OR SYSTEMS MEMORY MUST BE INCLUDED WHICH IS ASSIGNED ELECTRONICS UNIT ZERO (0). A PORTION OF THIS FIRST DISK OR SYSTEMS MEMORY IS USED TO MAINTAIN THE RUNNING MCP AND FOR DISK STORAGE DIRECTORIES AND DATA.
7. LOAD CARD (OPTIONAL).
8. PARAMETER AND OPTION CARDS.
9. "INSTALLATION LABEL" CARD (OPTIONAL).
10. FILE CARD GROUPS IF ANY ARE TO BE INCLUDED.
11. THE STOP CARD.

THE SYSTEM LOADER

--- -----

IN CASE OF A SIMPLE LOADING OPERATION WITH "MCPLDR", ONLY THE FOLLOWING CARDS ARE REQUIRED:

1. SYSTEM TAPE SPECIFIER CARD.

THIS CARD IS OPTIONAL. IF NOT PRESENT, THE SPD WILL BE PLACED IN "READY" STATUS AND THE OPERATOR MAY KEY IN THE CHANNEL AND UNIT NUMBERS FOR THE SYSTEM TAPE. IF MULTIPLE TAPE SPECIFIER CARDS ARE IN THE DECK, THE LAST CARD WILL BE USED.

2. MCP SPECIFIER CARD.

THIS CARD IS OPTIONAL. IF NOT PRESENT, THE LOADER WILL ASSUME THAT THE MCP USED IN THE LAST COLD START IS REQUESTED. IF MULTIPLE MCP SPECIFIER CARDS ARE PRESENT IN THE DECK, THE LAST CARD WILL BE USED.

3. STOP CARD.

IN CASE OF A SIMPLE LOADING OPERATION WITH "DKDKLD" THE SYSTEM TAPE SPECIFIER CARD IS NOT REQUIRED.

THE SYSTEM TAPE SPECIFIER CARD

--- -----

THE FIRST CARD FOLLOWING THE CSTART PROGRAM (MACHINE LANGUAGE DECK) MUST BE A CARD CONTAINING INFORMATION SPECIFYING THE LOCATION OF THE SYSTEM TAPE.

THE SYSTEM TAPE SPECIFIER CARD MUST HAVE THE FOLLOWING FORMAT:
<UNIT SPECIFIER>

EXAMPLE:

03/1

THE CHANNEL CARD

--- -----

THE SYSTEM LOADER
 --- -----

THE CHANNEL CARD IS USED TO SPECIFY CHANNEL IN THE MCP-S SYSTEM ENVIRONMENT. THE CHANNEL OR CHANNELS SPECIFIED BY THE CONTROL RECORDS ARE ADDED TO THE END OF THE CHANNEL PRIORITY LIST, AND THE I/O RESULT DESCRIPTORS ARE SCANNED IN THAT ORDER.

A SINGLE <INTEGER> FOLLOWED BY A PERIOD SPECIFIES SINGLE CHANNEL FACILITIES.

AN <INTEGER> FOLLOWED BY ONE OR MORE SPACES FOLLOWED BY A SECOND <INTEGER> FOLLOWED BY A PERIOD SPECIFIES CHANNEL EXCHANGE FACILITIES. THE FIRST <INTEGER> IN THE EXCHANGE SPECIFICATION MUST BE THE LOWEST CHANNEL NUMBER IN NUMERIC VALUE. THE SECOND <INTEGER> IS THE HIGHEST CHANNEL NUMBER IN THE EXCHANGE.

CHANNEL NUMBERS IN AN EXCHANGE ARE CONTIGUOUS.

THE CHANNEL CARDS MUST HAVE ONE OF THE FOLLOWING FORMATS:

CHANNEL <INTEGER>
 CHANNEL <INTEGER> <INTEGER>

EXAMPLES:

CHANNEL 4.
 CHANNEL 6 7.

THE UNIT CARD
 --- -----

THE UNIT CARD PERMITS THE OPERATOR TO INTRODUCE PERIPHERAL DEVICES INTO THE ENVIRONMENT OF THE MCP FOR CONTROL AND UTILIZATION.

THE "PERIPHERAL UNIT TYPE CODES" TABLE, SHOWN BELOW, ESTABLISHES <INTEGER> CODE NUMBERS FOR THE VARIOUS HARDWARE TYPES. THIS <INTEGER> CODE IS USED IN THE UNIT CARDS TO IDENTIFY THE TYPE OF HARDWARE.

THE PHYSICAL ASSIGNMENT OF THE PERIPHERAL DEVICE TO THE SYSTEM IS DONE BY EQUATING THE <INTEGER> CODE TO A <UNIT SPECIFIER>.

WHERE THE DEVICE IS HANDLED THROUGH AN I/O CHANNEL EXCHANGE, THE LOWEST CHANNEL NUMBER OF THE EXCHANGE SYSTEM IS USED IN THE UNIT SPECIFICATION ASSIGNMENT. THUS, IF A UNIT WERE SPECIFIED ON AN EXCHANGE ON CHANNELS 3 AND 4, THE UNIT CARDS FOR ALL PERIPHERALS ON THAT EXCHANGE WOULD BE SPECIFIED AS BEING ON CHANNEL 3.

THE UNIT CARD MUST HAVE THE FOLLOWING FORMAT:

UNIT <HARDWARE TYPE CODE> = <UNIT SPECIFIER>

EXAMPLES:

UNIT 4 = 03/1

UNIT 10 = 11/0

THE UNIT CARD INTRODUCING REMOTE DEVICES MUST HAVE THE FORMAT:

UNIT <HARDWARE TYPE CODE> = <CC/U> SPD (INQ) <ADAPTER ID.> SM
DIAL LOG <DIRECTION>

WHERE

CC = CHANNEL NUMBER IF ON SINGLE LINE CONTROL.

IF ON MULTILINE CONTROL, THEN
CC = ADAPTER POSITION + 19. (ADAPTER POSITION IS THE
LOCATION NUMBER OF THE ADAPTER IN THE I/O CONTROL CABINET.)
CC IS A UNIQUE NUMBER, E.G., CC = 20 MEANS ADAPTER POS. 1.
U = ALWAYS 0 (ZERO)

<ADAPTER I.D.> = IDENTIFIER OF 1 TO 6 CHARACTERS. THE FIRST
CHARACTER MUST BE ALPHABETIC, THE REMAINING CHARACTERS MUST
BE ALPHABETIC OR NUMERIC.

OPTIONAL REQUESTS ARE:

THE SYSTEM LOADER

SPO = REQUESTS HANDLING OF PERIPHERALS ATTACHED TO THIS ADAPTER AS REMOTE SPO-S,

INQ = RESERVE A NON-OVERLAYABLE BUFFER FOR A NON-REMOTE-SPO DATA COMM DEVICE.

SM = REQUEST TO PRINT OUT SYSTEM MESSAGES ON REMOTE SPO CONNECTED WITH ANY PROGRAM THE REMOTE SPO INITIATES.

DIAL = MUST BE GIVEN FOR SWITCHED LINES.

LOG = A REQUEST THAT A LOCAL (ON-SITE) LOG BE KEPT FOR REMOTE DEVICES. (SEE "DATA COMMUNICATIONS MCP" SECTION, "LOCAL (ON-SITE) LOG FOR REMOTE DEVICES"). A 9-CHANNEL MAGNETIC TAPE IS REQUIRED FOR THIS LOG.

<DIRECTION> MAY SPECIFY: IN (OR) OUT. "IN" CAUSES A LOG TO BE KEPT OF THE SYSTEM MESSAGES COMING FROM THE REMOTE DEVICE ON THAT CHANNEL, "OUT" CAUSES THE LOG TO BE KEPT OF THE SYSTEM MESSAGES GOING TO THE REMOTE DEVICE ON THAT CHANNEL. IF BOTH, THE INCOMING AND THE OUTGOING SYSTEM MESSAGES ARE TO BE ENTERED IN THE LOG, THE <DIRECTION> OPTION MUST NOT BE USED.

AS MENTIONED ABOVE, THE LOG IS WRITTEN ON A 9-TRACK MAGNETIC TAPE LABELLED "REMOTE/SPOLOG", IN UNBLOCKED RECORDS. (SEE FORMAT OF RECORDS IN APPENDIX 1, PART 1.) THE USER HAS TO WRITE HIS OWN PROGRAM TO PRINT THIS LOG FILE.

PERIPHERAL UNIT TYPE CODES TABLE:

CODE	PERIPHERAL DEVICE
01	SERIAL CARD READER
02	LINE PRINTER
03	CARD PUNCH
04	MAGNETIC TAPE - 7 CHANNEL
05	MESSAGE PRINTER - KEYBOARD SPO
06	SYSTEMS MEMORY OR DISK
07	MULTIPLE TAPE LISTER
08	SORTER READER
09	PAPER TAPE READER

THE SYSTEM LOADER

10	PAPER TAPE PUNCH
11	MAGNETIC TAPE - 9 CHANNEL
12	MULTI-LINE CONTROL CHANNEL
13	9350 TYPEWRITER INQUIRY STATION
14	OLB TERMINAL
15	83B3 SYSTEM
16	TWX
17	IBM 1050
18	UNIVAC DCT 2000
20	B2500 OR B3500
21	8A1 SYSTEM
24	IBM 1030
25	BURROUGHS TOUCH-TONE SYSTEM (BTT)
26	BURROUGHS INPUT & DISPLAY SUBSYSTEM (BIDS)
27	FRIDEN 7311
30	TC500
31	BURROUGHS 9300 OR B500 COMPUTER

THE DISK SPECIFICATION CARD GROUP

THE FUNCTION OF THE DISK SPECIFICATION GROUP IS TO SPECIFY THE NUMBER OF DISK ELECTRONICS UNITS CONTAINED IN THE SYSTEM AND THEIR ADDRESS RANGES.

EACH DISK SPECIFICATION CARD CONTAINS THE WORD DISK, FOLLOWED BY THREE INTEGERS, THE FIRST INTEGER SPECIFIES THE NUMBER OF THE ELECTRONICS UNIT, THE FOLLOWING TWO INTEGERS SPECIFY THE STARTING AND ENDING ADDRESSES OF THE SEGMENTS TO BE USED BY THE SYSTEM ON THAT ELECTRONICS UNIT.

SINCE ONE TO FIVE STORAGE UNITS CAN BE USED WITH A SINGLE ELECTRONICS UNIT, THE MAXIMUM RANGE OF ADDRESSES FOR ONE ELECTRONICS UNIT MAY BE FROM 000000 TO 499999. ELECTRONICS UNITS MAY BE SUBDIVIDED.

THE DISK ADDRESS CARDS MUST HAVE THE FOLLOWING FORMAT:

DISK <INTEGER> <INTEGER> <INTEGER>

EXAMPLE:

DISK 01 000000 299999

THE SYSTEM LOADER
 --- -----

NOTE: "DISK" MAY ALSO BE SPELLED "DISC".

THE DATE CARD
 --- -----

THIS CARD CAUSES THE DATE FIELD ON DISK - WHICH CONTAINS THE "CURRENT DATE" USED, FOR EXAMPLE, IN TAPE LABELS, - TO BE SET TO THE DATE SPECIFIED.

THE USE OF THE DATE CARD IS OPTIONAL, BUT IF USED, IT MUST FOLLOW IMMEDIATELY THE SYSTEM TAPE SPECIFIER CARD IN THE SYSTEM LOADER CONTROL DECK.

A DATE SUPPLIED IN A DT INPUT MESSAGE, ENTERED SUBSEQUENT TO THE USE OF THE DATE CARD, SUPERSEDES THE INFORMATION ON THE DATE CARD.

THE DATE CARD PROVIDES THE DATE IN THE FORM OF THREE <INTEGER>'S, SEPARATED BY THE CHARACTER "/". THE FIRST <INTEGER> SPECIFIES THE MONTH, THE SECOND THE DAY OF THE MONTH, THE THIRD THE LAST TWO DIGITS OF THE YEAR.

THE DATE CARD MUST CONTAIN THE FOLLOWING INFORMATION:

DATE <INTEGER> / <INTEGER> / <INTEGER>

EXAMPLE:

DATE 12/29/66

NOTE: THE FOLLOWING CARDS, WHICH BEGIN WITH "USE" ARE OPTIONAL:

THE USE SCHM CARD,
 --- -----

THE SYSTEM LOADER

--- -----

THE USE SCHM CARD SETS AN OPTION WHICH CAUSES THE "<P-N> <INTEGER>
SCHEDULED" MESSAGE TO BE TYPED ON THE SUPERVISORY PRINTER, IF A JOB IS
SCHEDULED FOR EXECUTION.

EXAMPLE:

USE SCHM

THE USE BOJ CARD

--- --- ---

THE USE BOJ CARD MAY BE USED TO SET AN OPTION CODE THAT SPECIFIES THAT A
BOJ MESSAGE IS TO BE TYPED EACH TIME THE MCP INITIATES A COMPILER OR AN
OBJECT PROGRAM.

EXAMPLE:

USE BOJ

THE USE ZIPM CARD.

--- --- ---

THE USE ZIPM CARD MAY BE USED TO SET AN OPTION WHICH CAUSES THE <J-S>
ZIP ** <CONTROL INFORMATION> MESSAGE TO BE TYPED ON THE SUPERVISORY
PRINTER.

EXAMPLE:

USE ZIPM

THE USE EOJ CARD

--- --- ---

THE USE EOJ CARD MAY BE USED TO SET AN OPTION CODE THAT SPECIFIES THAT
AN EOJ MESSAGE IS TO BE TYPED WHEN A COMPILER OR AN OBJECT PROGRAM

THE SYSTEM LOADER
--- -----

COMPLETES EXECUTION.

EXAMPLE:

USE EQJ

THE USE LOG CARD
--- -----

THE USE LOG CARD IS USED TO SIGNAL TO THE MCP THAT THE MAINTENANCE OF THE SYSTEM LOG IS REQUIRED.

THE FORMAT OF THE USE LOG CARD IS:

USE LOG <INTEGER>

THE <INTEGER> MAY BE USED TO SPECIFY A LARGER OR SMALLER LOG FILE THAN THE STANDARD 400 LOGICAL RECORDS PROVIDED BY THE SYSTEM. THE MAXIMUM ALLOWABLE LOG FILE IS 10000 RECORDS.

THE <INTEGER> MAY BE OMITTED IF NO CHANGE IN THE SIZE OF THE STANDARD LOG FILE IS REQUIRED.

EXAMPLE:

USE LOG 9980

THE USE OPN CARD
--- -----

THE USE OPN CARD MAY BE USED TO SET AN OPTION THAT SPECIFIES THAT A "FILE OPEN" MESSAGE SHOULD BE TYPED WHENEVER AN OBJECT PROGRAM OPENS A FILE.

EXAMPLE:

THE SYSTEM LOADER
 --- --- ---

USE OPN

NOTE: "OPN" MAY ALSO BE SPELLED "OPEN".

THE USE TERMINATE CARD.
 --- --- ---

THE USE TERMINATE CARD MAY BE USED TO SET AN OPTION CODE THAT SPECIFIES THAT THE TERMINATE ROUTINE OF THE MCP IS TO BE CALLED IF THE MCP MUST DISCONTINUE PROCESSING OF A PROGRAM DUE TO AN ERROR CONDITION. SINCE IT IS THE FUNCTION OF THE TERMINATE ROUTINE TO CLEAR THE SYSTEM OF ALL INFORMATION PERTAINING TO A DISCONTINUED PROGRAM, THE USE TERMINATE OPTION SHOULD GENERALLY ALWAYS BE SPECIFIED. HOWEVER, IF AN ERROR CONDITION SHOULD OCCUR WHERE IT IS NECESSARY TO OBTAIN A MEMORY DUMP THAT REFLECTS CORE CONDITIONS AT ERROR TIME, THE USE TERMINATE OPTION SHOULD NOT BE SPECIFIED.

EXAMPLE:

USE TERMINATE

NOTE: "TERMINATE" MAY ALSO BE SPECIFIED AS "TERM".

THE USE DATE CARD
 --- --- ---

THE USE DATE CARD MAY BE USED TO SET AN OPTION CODE THAT SPECIFIES THAT THE "DT PLEASE" MESSAGE IS TO BE TYPED AT HALT-LOAD TIME.

WHEN THIS OPTION IS SPECIFIED AND THE "DT PLEASE" MESSAGE IS TYPED, THE OPERATOR MUST ENTER THE "DT <DATE>" INPUT MESSAGE BEFORE PROCESSING CAN COMMENCE.

EXAMPLE:

USE DATE

THE SYSTEM LOADER
 --- -----

THE USE TIME CARD
 --- --- -----

THE USE TIME CARD MAY BE USED TO SET AN OPTION CODE THAT SPECIFIES THAT THE "TR PLEASE" MESSAGE IS TO BE TYPED AT HALT-LOAD TIME.

WHEN THIS OPTION IS SPECIFIED AND THE "TR PLEASE" MESSAGE IS TYPED, THE OPERATOR MUST ENTER THE "TR <TIME>" INPUT MESSAGE, BEFORE PROCESSING CAN COMMENCE.

EXAMPLE:

USE TIME

THE USE TRACE CARD.
 --- --- -----

THIS OPTION CAUSES THE NON-OVERLAYABLE TRACE ROUTINE TO BE LOADED INTO CORE MEMORY.

EXAMPLE:

USE TRACE

THE USE COMPMSG CARD.
 --- --- -----

THE USE COMPMSG OPTION MAY BE USED TO CAUSE COMPILERS TO TYPE ON THE SPO THE FOLLOWING OUTPUT MESSAGES:

1. FILE OPEN,
2. LIBRARY ACTION MESSAGES.

THE TYPING OF THESE MESSAGES IS CONTINGENT NOT ONLY ON SETTING THE USE COMPMSG OPTION, BUT ALSO ON THE "USE OPN" AND THE

THE SYSTEM LOADER
 --- -----

"USE LIBMSG" OPTIONS (WHICHEVER IS REQUIRED OR BOTH) BEING SET.

EXAMPLE:

USE COMPMSG

THE USE CROR CARD,
 --- -----

THE USE CROR CARD CAUSES THE NON-OVERLAYABLE CORE-TO-CORE TRANSFER SEGMENT TO BE LOADED INTO CORE MEMORY.

EXAMPLE:

USE CROR

THE USE LIBMSG CARD,
 --- -----

IF THIS OPTION IS SET, THE MCP WILL TYPE ON THE SPO THE LIBRARY MAINTENANCE ACTION LISTED BELOW. (DETAILED DESCRIPTION OF THESE FUNCTIONS MAY BE FOUND IN THE "CONTROL INFORMATION" SECTION).

1. <F-ID> CHANGED TO <F-ID>
2. <F-ID> REMOVED
3. <F-ID> LOADED
4. <F-ID> DUMPED

EXAMPLE:

USE LIBMSG

THE USE STGD CARD,
 --- -----

*

THE SYSTEM LOADER

--- -----

THE USE STGO CARD CAUSES A REPORT TO APPEAR ON THE SPO WHENEVER A PROGRAM IS STOPPED OR STARTED. THE MESSAGE IS PRINTED REGARDLESS WHETHER THE STOPPING OR STARTING OF THE PROGRAM WAS INITIATED FROM THE SPO OR PROGRAMMATICALLY, BY USING THE START AND STOP CONTROL CARDS.

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*
*

THE USE PBT CARD.

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THE USE PBT CARD MAY BE USED TO SET AN OPTION THAT SPECIFIES THAT OUTPUT FILES TO A LINE PRINTER MAY BE DIVERTED TO A PRINTER BACK-UP TAPE IN THE EVENT A LINE PRINTER IS UNAVAILABLE. THE TAPE DESIGNATED AS A PRINTER BACKUP TAPE WILL BE USED BY SUCCESSIVE PROGRAMS FOR THIS PURPOSE UNTIL THE "PB" REQUEST IS ENTERED, OR THE TAPE UNIT SET IN "NOT READY" STATUS WHILE NOT IN USE BY A PROGRAM. IF THE TAPE UNIT IS SET "NOT READY" WHILE ASSIGNED TO A PROGRAM, THE TAPE REMAINS A PRINTER BACKUP AND THE PROGRAM WILL STOP AND WAIT FOR THE TAPE TO BE SET READY AGAIN.

EXAMPLE:

USE PBT

THE USE PBD CARD.

--- --- -----

THE USE PBD CARD MAY BE USED TO SET AN OPTION THAT SPECIFIES THAT OUTPUT FILES TO A LINE PRINTER OR A CARD PUNCH MAY BE DIVERTED TO DISK, IF THE REQUIRED OUTPUT DEVICE IS NOT AVAILABLE. IF BOTH THE PBT AND PBD OPTIONS ARE SET, PBT HAS PRIORITY, I.E., TAPE WILL BE USED FIRST TO RECORD THE PRINTER OUTPUT FILE.

THE USE AUTO CARD.

--- --- -----

THE USE AUTO CARD MAY BE USED TO SPECIFY THAT PRINTER BACK-UP FILES BE AUTOMATICALLY PRINTED WHEN THE BACK-UP FILE IS RELEASED BY THE CREATING PROGRAM AND A LINE PRINTER BECOMES AVAILABLE. THE TAPE IS USED FOR PRINTER BACKUP PURPOSES BY SUCCESSIVE PROGRAMS AND REWINDS AND STARTS PRINTING ONLY WHEN A LINE PRINTER BECOMES AVAILABLE.

THE SYSTEM LOADER

EXAMPLE:

USE AUTO

THE USE CHARGE CARD.

IF THIS OPTION IS SET, ALL PROGRAMS MUST HAVE A CHARGE NUMBER IN ORDER TO GET INTO THE SCHEDULE.

THIS OPTION CAN ONLY BE SET OR RESET AT COLD-START OR WARM-START TIME.

THIS OPTION CANNOT BE SET OR RESET FROM THE SPO.

THE USER MAY SUPPLY HIS OWN CHARGE NUMBER TO BE USED WITH MCP-S NORMAL STATE PROGRAMS, SUCH AS THE LOADMP PROGRAM ("CATCH-ALL" CHARGE NUMBER). IN THE ABSENCE OF OF A "CATCH-ALL" CHARGE NUMBER, 999999 WILL BE USED.

THE FORMAT OF THE OPTION CARD IS:

USE CHARGE

OR

USE CHARGE <INTEGER>

WHERE THE <INTEGER> REPRESENTS THE "CATCH-ALL" CHARGE NUMBER AND MUST BE SIX DIGITS IN LENGTH.

WHEN ONE PROGRAM USES A ZIP STATEMENT TO ACTIVATE ANOTHER PROGRAM AND FAILS TO SUPPLY A CHARGE NUMBER FOR THE ZIPPED PROGRAM, THE CHARGE NUMBER OF THE FIRST PROGRAM WILL BE USED FOR THE ZIPPED PROGRAM TOO.

THE INSTALLATION LABEL CARD.

THIS CARD SERVES TO DEFINE THE FORMAT OF THE INSTALLATION LABEL, IF SUCH LABELS ARE USED. THE FORMAT OF THE CARD IS:

COL.	CONTENTS:	DESCRIPTION:
1 - 9	"LABEL"	THE RESERVED WORD "LABEL" MAY APPEAR ANYWHERE IN THE FIELD
10-19	1-10 CHAR-S	ACTUAL TEXT OF BEGINNING-OF-FILE LABEL IDENTIFIER
20-21	2 DIGITS<80	POSITION OF BEGINNING-OF-FILE LABEL IDENTIFIER FIELD
22-23	2 DIGITS	LENGTH OF BEGINNING-OF-FILE LABEL IDENTIFIER FIELD
24-25	2 DIGITS<80	POSITION OF MULTI-FILE ID. FIELD
26	1 DIGIT	LENGTH OF MULTI-FILE ID FIELD (ZERO, IF NO MUTLI-FILE)
27-28	2 DIGITS<80	POSITION OF FILE-ID. FIELD
29	1 DIGIT	LENGTH OF FILE ID. FIELD
30-31	2 DIGITS<80	POSITION OF REEL # FIELD
32	1 DIGIT	LENGTH OF REEL # FIELD
33-34	2 DIGITS	POSITION OF CREATION DATE FIELD (YYDD)
35-36	2 DIGITS<80	POSITION OF PURGE DATE FIELD
37	1 DIGIT	LENGTH OF PURGE DATE FIELD (<5 IMPLIES "RETENTION PERIOD" INSTEAD OF PURGE DATE)

THE SYSTEM LOADER

38-39	2 DIGITS<80	POS. OF PHYSICAL VOLUME ID. FIELD
40	1 DIGIT	LENGTH OF PHYSICAL VOLUME ID. FIELD
41-42	2 DIGITS	POS. OF END-OF-REEL OR END-OF-FILE LABEL IDENTIFIER
43	1 DIGIT	LENGTH OF END-OF-REEL OR END-OF-FILE LABEL IDENTIFIER
44-48	1-5 CHAR-S	TEXT OF END-OF-REEL LABEL ID
49-53	1-5 CHAR-S	TEXT OF END-OF-FILE LABEL ID
54-56	3 DIGITS	MAX. LENGTH OF LABEL RECORD
57-58	2 DIGITS	# OF LABEL RECORDS (ZERO=VARIABLE)
59	0 OR 1	1 = TAPE MARK AFTER END LABELS
60	0 OR 1	1 = TAPE MARK AFTER BEGINNING LABELS
61-62	2 DIGITS	POS. OF BLOCK COUNT FIELD (END LABELS ONLY)
63	1 DIGIT	LENGTH OF BLOCK COUNT FIELD
64-65	2 DIGITS	POS. OF RECORD COUNT FIELD (END LABELS ONLY)
66-67	2 DIGITS	LENGTH OF RECORD COUNT FIELD

ALL "POSITIONS" ARE RELATIVE TO THE BEGINNING OF THE LABEL RECORD, IN CHARACTERS. "LENGTH" IS EXPRESSED IN CHARACTERS.

THE SYSTEM LOADER
 --- -----

THE MCP SPECIFIER CARD.
 --- -----

THE FUNCTION OF THE MCP SPECIFIER CARD IS TO INFORM THE MCP LOADER WHICH MCP PROGRAM IS TO BE SELECTED FROM THE SYSTEM TAPE AND BE LOADED ONTO DISK, THERE MAY BE MORE MCP SPECIFIER CARDS IN THE DECK, BUT ONLY THE LAST IS CONSIDERED AS VALID.

THE FORMAT OF THE MCP SPECIFIER CARD IS:

MCP <MCP NAME>

<MCP NAME> MUST BE ONE OF THE FOLLOWING:

NAME:	VERSION:
CP14S	14-CHANNEL, STANDARD PERIPHERAL EQUIPMENT
CP20S	20-CHANNEL, STANDARD PERIPHERAL EQUIPMENT
CP20M	20-CHANNEL, MICR PERIPHERALS
CP14D	14-CHANNEL, DATA COMMUNICATIONS PERIPHERALS
CP20D	20-CHANNEL, DATA COMMUNICATIONS PERIPHERALS
CP40D	40-CHANNEL, DATA COMMUNICATIONS PERIPHERALS
CP56D	56-CHANNEL, DATA COMMUNICATIONS PERIPHERALS
CP56C	56-CHANNEL DATA COMM+MICR PERIPHERALS

STANDARD PERIPHERAL EQUIPMENT INCLUDES ON-SITE PERIPHERALS FROM THE FOLLOWING LIST:

CARD READER
 SYSTEMS MEMORY
 DISK FILE
 LINE PRINTER
 CARD PUNCH
 PAPER TAPE READER
 MAGNETIC TAPE 7-TRACK
 MAGNETIC TAPE 9-TRACK
 PAPER TAPE PUNCH
 CONSOLE KEYBOARD/MESSAGE PRINTER

MICR PERIPHERALS INCLUDE ON-SITE PERIPHERALS FROM THE FOLLOWING LIST :

MULTIPLE TAPE LISTER

THE SYSTEM LOADER

--- -----

SORTER READER

DATA COMMUNICATIONS PERIPHERAL EQUIPMENT LIST IS GIVEN IN THE SECTION OF THIS MANUAL ON THE DATA COMMUNICATIONS VERSIONS OF THE B2500/B3500 CONTROL PROGRAMS .

THE LOAD CARD.

--- -----

IN THE ABSENCE OF THIS CARD, NO MCP IS LOADED, ONLY A DISK DIRECTORY BUILT.

EXAMPLE:

LOAD

THE FILE CARD GROUP

--- -----

THE FUNCTION OF A FILE CARD GROUP IS TO DEFINE A USER FILE WHICH IS TO BE LISTED IN THE DISK DIRECTORY. THIS METHOD OF DEFINING A FILE, AS OPPOSED TO DEFINING A FILE THROUGH USE OF A FILE DECLARATION IN A PROGRAM, ALLOWS AN INSTALLATION TO EXPLICITLY ASSIGN SPECIFIC DISK ADDRESSES FOR FILES.

A FILE CARD GROUP CONSISTS OF A FILE CARD AND ONE OR MORE FILE ADDRESS CARDS. THERE MAY BE AS MANY FILE CARD GROUPS AS DESIRED IN THE COLD START DECK.

THE FILE CARD CONTAINS THE WORD FILE, WHICH IDENTIFIES THE FILE CARD GROUP, AND SUPPLIES THE FOLLOWING INFORMATION, IN THE ORDER LISTED AND SEPARATED WITH SPACES:

1. THE <F-ID> WHICH IS TO BE LISTED IN THE DISK DIRECTORY.
2. AN <INTEGER> X <INTEGER> CONSTRUCT, WHERE THE FIRST <INTEGER> SPECIFIES THE NUMBER OF AREAS ON DISK TO BE USED BY THE FILE, AND THE SECOND <INTEGER> SPECIFIES THE NUMBER OF 100 CHARACTER DISK SEGMENTS IN EACH AREA. THE TWO <INTEGER>-S ARE SEPARATED BY THE <LETTER> X.
3. LOAD INDICATOR:
 - LM = LOAD FROM MAG, TAPE
 - N = NO LOAD REQUIRED

THE SYSTEM LOADER
 --- -----

4. LIBRARY TAPE IDENTIFIER: ALL <FILE CARD>-S IN THE FILE CARD GROUP MUST SPECIFY THE SAME <LIBRARY TAPE I.D.>

IN TOTAL, A FILE CARD MUST CONTAIN THE FOLLOWING INFORMATION:

FILE <F-ID> <INTEGER> X <INTEGER> <LOAD IND.> <LIBRARY TAPE ID>

EXAMPLE:

FILE PREFIX 2 X 1000 LM STV

A FILE ADDRESS CARD CONTAINS A SINGLE <INTEGER>, WHICH -- IF DIFFERENT FROM ZERO -- SPECIFIES THE ABSOLUTE DISK ADDRESS OF THE FIRST WORD IN AN AREA TO BE USED BY THE FILE WHOSE NAME WAS SPECIFIED IN THE PRECEDING FILE CARD. THERE MUST BE ONE FILE ADDRESS CARD FOR EACH AREA SPECIFIED FOR THE FILE. THE FIRST FILE ADDRESS CARD IN A FILE CARD GROUP PROVIDES THE BEGINNING ADDRESS OF THE FIRST AREA TO BE USED BY THE FILE. THE SECOND FILE ADDRESS CARD PROVIDES THE BEGINNING ADDRESS OF THE SECOND AREA TO BE USED BY THE FILE, ETC.

A ZERO <INTEGER> FOR AN ADDRESS DENOTES THAT THE MCP IS TO ASSIGN THE ADDRESS FOR THE AREA.

AS NOTED ABOVE, A FILE ADDRESS CARD MUST CONTAIN THE FOLLOWING INFORMATION:

<INTEGER>

EXAMPLES:

2000

0

EXAMPLE OF A FILE CARD GROUP:

FILE B280 2 X 1500 LM SYSTEM

THE SYSTEM LOADER
--- -----

4300

8000

THE STOP CARD
--- -----

THE LAST CARD IN THE COLD START DECK MUST BE A STOP CARD.

EXAMPLE:

STOP

FLOATABLE MCP DISK RESIDENCE.

THE DISK FILE ELECTRONICS UNIT IN WHICH EACH PROCESSOR-S MCP IS TO RESIDE IS SPECIFIED IN ITS COLD START "UNIT" CARD FOR THE DISK SUBSYSTEM.
EXAMPLE:

UNIT 06 = CC/UU

WHERE CC IS THE DISK CHANNEL AND UU IS THE NUMBER OF THE DESIGNATED ELECTRONICS UNIT.

THE DISK AREAS DECLARED IN THE COLD START "DISK CARDS" FOR EACH PROCESSOR-S MCP SHOULD START WITH ITS SYSTEM RESIDENCE AREA. SINCE EACH PROCESSOR HAS ACCESS ONLY TO ITS OWN MCP-S DISK TABLES AND CANNOT UPDATE OTHERS, THE MULTIPLE PROCESSORS CAN COMMUNICATE WITH EACH OTHER VIA DISK FILES WHICH ARE PREDEFINED FOR ALL PROCESSORS AT COLD START TIME THROUGH FILE DEFINITION PARAMETERS (SEE "FILE CARD GROUP"). THE AREAS IN WHICH THESE COMMON FILES RESIDE SHOULD BE DECLARED FOR ALL PROCESSORS.

DISK AREAS MUST NOT OVERLAP.

2. OPERATING INSTRUCTIONS TO THE LOADING OF THE SYSTEM.
--- -----

THE SYSTEM LOADER

- 1. FOR BCL: 200000
- 2. FOR EBCDIC: 220000

THE DESCRIPTORS FOR THE PAPER TAPE READER ARE:

- 1. FOR BCL: 400010
- 2. FOR EBCDIC: 400020

4. DEPRESS THE OP KEY AND ENTER OP. CODE 66 ON THE NUMBERED KEYS,
(660000).

5. DEPRESS THE STOP/RUN KEY.

2B. THE NORMAL LOAD.

1. PLACE THE SYSTEM LOADER DECK IN THE PERIPHERAL UNIT DEFINED BY THE
LOAD LOGIC.

2. DEPRESS CL AND THE THE LD KEYS.

IF THE PROCESSOR STOPS WITH THE EQUAL INDICATOR ON AFTER DEPRESSION OF
THE STOP/RUN KEY, RETRY BY REPEATING THE ABOVE SEQUENCE. AFTER THE
SYSTEM LOADER HAS EXECUTED AND THE EQJ SYSTEM LOADER MESSAGE IS TYPED
OUT THE NORMAL LOAD FUNCTION SET TO THE DISK WILL CAUSE LOADING OF THE
MCP.

WHEN THE SYSTEM LOADER HAS SUCCESSFULLY LOADED THE MCP ONTO DISK, THE
MESSAGE

B-3500 MCP: <NAME> <TIME> <DATE> <VERSION DATE>

WILL BE TYPED,

2C. SYSTEM LOADER MESSAGES.

THE SYSTEM LOADER

<INV SCHEDULE CARD>

THE ABOVE MESSAGE MEANS THAT AN ERRONEOUS PARAMETER OR OPTION CARD WAS ENCOUNTERED DURING THE OPERATION OF THE SYSTEM LOADER. LOADING CONTINUES IGNORING THE INVALID CARD.

THIS SITUATION CAN BE REMEDIED BY PLACING THE CORRECTED CARD IN THE DECK AND RESTART THE COLD START.

<SYSTEM LOADER ERROR>

THIS MESSAGE INDICATES THAT A CONTROL RECORD, A PARAMETER RECORD, OR OPTION HAS BEEN READ WHICH CANNOT BE HANDLED. (E.G., A SORTER-READER UNIT CARD IS USED WITH AN MCP VERSION WHICH HAS NO MICR CAPABILITIES.)

MCP FILE <MCP NAME> NOT IN TAPE DIRECTORY

LOADER CAN NOT FIND THE REQUESTED MCP. IT IS EITHER NOT ON THE TAPE, OR THE TAPE IS NOT IN THE PROPER LIBRARY FORMAT.

ILLEGAL LOAD <MCP NAME>

THIS MESSAGE IS GENERATED ONLY BY THE SIMPLE MCP LOADER, IF THE MCP TO BE LOADED IS NOT COMPATIBLE WITH THE COLD START VARIABLES.

<MCP NAME> LOADED <LOADER VERSION DATE>

MCP LOADED BY <MCPLDR> OR <DKDKLD>.

THE SYSTEM LOADER

EOJ SYSTEM LOADER <LOADER VERSION DATE>

THIS MESSAGE INDICATES THAT THE COLD START ROUTINE HAS
BEEN COMPLETED.

<MCP NAME> LOADED

THIS MESSAGE INDICATES THAT THE MCP HAS BEEN LOADED BY
THE <CSTRT>.

CONTROL INFORMATION

CONTROL INFORMATION FOR THE B2500/3500 MCP.

INTRODUCTION.

CERTAIN SPECIAL INSTRUCTIONS, CALLED "CONTROL INFORMATION", CAUSE THE MCP TO PERFORM PARTICULAR ACTIONS. THEY ARE DIVIDED INTO TWO CLASSES:

1. PROGRAM CONTROL CARDS,
2. PROGRAM PARAMETER CARDS.

IN DESCRIBING THE FORMAT AND CONTENTS OF CONTROL INFORMATION, THE FOLLOWING CONVENTIONS ARE USED:

1. A WORD THAT MUST APPEAR AS PART OF A CONTROL INFORMATION, IS SHOWN AS IT MUST APPEAR.
2. WORDS OR CHARACTERS IN THE DESCRIPTION ENCLOSED IN PARENTHESES SERVE ONLY FOR CLARIFICATION.
3. WORDS OR PHRASES, WHICH HAVE A PARTICULAR DEFINITION, ARE CONTAINED WITHIN BROKEN BRACKETS (I.E., <>). THE DEFINITIONS ARE GIVEN IN THE "DEFINITIONS OF THE SYNTAX LANGUAGE" SECTION OF THIS MANUAL.

FORMATS.

CONTROL INFORMATION MAY BE SUPPLIED TO THE MCP THROUGH USE OF

- A. PUNCHED CARDS OR PAPER TAPE
- B. KEYBOARD INPUT MESSAGES
- C. ZIP STATEMENT OF AN EXECUTING PROGRAM.

THE CONTROL INFORMATION MUST BE SUPPLIED IN THE FOLLOWING ORDER:

1. "COMPILE" OR "EXECUTE" CARD,
2. "PROGRAM PARAMETER CARD"-S, IF USED,

3. OTHER "PROGRAM CONTROL CARD"-S, IN ANY ORDER.

A. IF PUNCHED CARDS OR PAPER TAPE ARE USED TO COMMUNICATE THE CONTROL INFORMATION TO THE MCP, THE FOLLOWING RULES APPLY:

1. COLUMN 1 MUST CONTAIN AN <INVALID CHARACTER>, AN <INVALID CHARACTER>, HOWEVER, MUST NOT APPEAR IN ANY OTHER COLUMN.

2. ONLY COLUMNS 2 THROUGH 72 MAY CONTAIN CONTROL INFORMATION; MCP IGNORES THE INFORMATION IN COLUMNS 73 THROUGH 80.

3. CONTROL INFORMATION IN COLUMNS 2 THROUGH 72 IS IN FREE FIELD FORMAT. THE "COMPILE" OR "EXECUTE" CARD MUST BE THE FIRST IN THE DECK, AND THE "DATA" CARD MUST BE THE CARD IMMEDIATELY PRECEDING THE INPUT DECK. BETWEEN THE ABOVE LIMITS, THE ORDER OF THE OTHER CONTROL CARDS IS FREE. *
*
*
*

4. THE "LABEL CARD" HAS A FIXED FORMAT, I.E., IT IS AN EXCEPTION FROM THE RULES DESCRIBED UNDER PAR. 3.

5. IF THE SPECIAL CHARACTER "." (I.E., A PERIOD) APPEARS IN A CONTROL CARD (INCLUDING THE LABEL CARD), AND IT IS NOT PART OF A <STRING>, ALL INFORMATION FOLLOWING THE PERIOD IS IGNORED. (THIS ALLOWS FOR COMMENTS ON CONTROL INFORMATION CARDS.)

6. THE CONTROL INFORMATION SPECIFIED IN THE FOLLOWING DESCRIPTIONS MAY BE CONTAINED IN MORE THAN ONE CARD (EXCEPT IN CASE OF A LABEL CARD). IF IT IS DESIRED TO CONTINUE INFORMATION FROM ONE CARD TO ANOTHER, THE LAST CHARACTER ON THE CARD TO BE CONTINUED MUST BE A HYPHEN (I.E., THE RESERVED CHARACTER "-"). THE HYPHEN, HOWEVER, MUST NOT DIVIDE AN <IDENTIFIER>. THE CARD ON WHICH THE INFORMATION IS CONTINUED, MUST NOT CONTAIN AN <INVALID CHARACTER> IN COLUMN 1.

7. THE CONTROL INFORMATION IS DESCRIBED ON THE FOLLOWING PAGES UNDER HEADINGS WHICH WOULD INDICATE THAT EACH OF THEM MUST CONSIST OF A SEPARATE CARD. (E.G., A COMPILE CARD, A PRIORITY CARD, ETC.)

HOWEVER, IF THE TEXT OF ONE CONTROL INFORMATION IS DELIMITED BY A SPACE, THEN THIS IS CONSIDERED AS INDICATING THE "LOGICAL END" OF THAT CONTROL INFORMATION AND IT MAY BE FOLLOWED BY ANOTHER CONTROL INFORMATION ON THE SAME PUNCHED CARD.

CONTROL INFORMATION

8. MCP CAN READ INPUT ONLY IN EBCDIC (STANDARD) OR BCL (NON-STANDARD) MODE. IT HAS NO FACILITIES TO HANDLE BINARY CARDS.

9. <P-N>=S AND <F-ID>=S, WHICH BEGIN WITH A NUMBER, OR CONTAIN SPECIAL CHARACTERS OR EMBEDDED BLANKS, MUST BE ENCLOSED IN PARENTHESES.

SINCE MCP TREATS EVERY <P-N> AND <F-ID> AS BEING SIX CHARACTERS LONG, THE PARENTHESES MAY ENCLOSE A SIX CHARACTER LONG FIELD. SHORTER IDENTIFIERS ARE UNDERSTOOD TO HAVE AN APPROPRIATE NUMBER OF TRAILING BLANKS APPENDED. THIS, HOWEVER, IS ALLOWED, BUT NOT REQUIRED. IT IS SYNTACTICALLY CORRECT TO ENCLOSE WITH PARENTHESES ONLY THE ACTUAL IDENTIFIER. EXAMPLES: (X-X,) OR (X-X.) ARE BOTH CORRECT.

B. IF THE CONTROL INFORMATION IS COMMUNICATED TO THE MCP THROUGH KEYBOARD INPUT MESSAGES, THE CHARACTER OF THE MESSAGE IS RECOGNIZED BY THE LETTERS "CC" WHICH MUST PRECEDE THE CONTROL INFORMATION, INSTEAD OF THE <INVALID CHARACTER>. (SEE "KEYBOARD INPUT MESSAGES", "THE CC MESSAGE").

C. IF A PROGRAM UNDER EXECUTION CONTAINS A ZIP STATEMENT, THE STATEMENT MUST REFERENCE A DATA AREA WITHIN THE PROGRAM. THE CONTROL CARD INFORMATION IN THAT DATA AREA MUST BE

1. DELIMITED BY A PERIOD, OR

2. IN THE ABSENCE OF A PERIOD, IT MUST BE 72 CHARACTERS LONG, SINCE MCP INSERTS THE MISSING PERIOD IN POS. 73., OR *

3. THE FIRST CHARACTER OF THE CONTROL INFORMATION MAY BE A PERIOD, IN WHICH CASE THE DATA AREA MAY BE OF ANY LENGTH AND MCP DOES NOT INSERT THE PERIOD IN POS. 73. THE END PERIOD IN THIS CASE MUST BE PRESENT IN THE PROGRAM. *

THE <DATA CARD> CONTROL INFORMATION MUST NOT BE USED IN A ZIP STATEMENT.

DESCRIPTION OF THE "PROGRAM CONTROL CARDS",
-----THE COMPILE CARD

THE COMPILE CARD IS USED TO CALL OUT A GENERATOR OR COMPILER TO GENERATE AN OBJECT PROGRAM. THE COMPILE CARD DESIGNATES THE GENERATOR TO BE USED, THE <P-N> OF THE SOURCE PROGRAM (THE INPUT TO THE GENERATOR), AND THE TYPE OF COMPILE RUN TO BE MADE. (SEE "MCP - GENERAL DESCRIPTION", SECTION "5G. END OF JOB PROCESSING.")

THE FOLLOWING TYPES OF RUNS MAY BE SPECIFIED:

A "COMPILE AND GO" RUN CAUSES THE COMPILED PROGRAM TO BE SCHEDULED TO RUN AFTER AN ERROR FREE COMPILATION, BUT DOES NOT ENTER THE PROGRAM IN THE DISK DIRECTORY. THE DISK SPACE OCCUPIED BY THE PROGRAM IS RETURNED AFTER THE PROGRAM IS RUN.

A "COMPILE FOR LIBRARY" RUN CAUSES THE COMPILED PROGRAM TO BE LEFT ON DISK AND ENTERED IN THE DISK DIRECTORY AFTER AN ERROR FREE COMPILATION, BUT DOES NOT CAUSE THE PROGRAM TO BE SCHEDULED TO RUN.

A "COMPILE FOR LIBRARY AND GO" RUN COMBINES THE "COMPILE AND GO" AND "COMPILE FOR LIBRARY" FEATURES, I.E., IT CREATES A PERMANENT FILE ON DISK AND SCHEDULES THE PROGRAM FOR EXECUTION.

A "COMPILE FOR SYNTAX CHECK" RUN CAUSES NO "RUN" OR "DIRECTORY ACTION" AFTER THE COMPILATION.

THE COMPILE CARD FOR "COMPILE AND GO" MUST CONTAIN THE FOLLOWING INFORMATION: ? COMPILE <P-N> WITH <COMPILER NAME>

THE COMPILE CARD FOR "COMPILE FOR LIBRARY" MUST CONTAIN THE FOLLOWING INFORMATION: ? COMPILE <P-N> WITH <COMPILER NAME> LIBRARY

THE FORMAT OF THE "COMPILE FOR LIBRARY AND GO" CARD IS:
? COMPILE <P-N> WITH <COMPILER NAME> SAVE

CONTROL INFORMATION

THE COMPILE CARD FOR "COMPILE FOR SYNTAX CHECK" MUST CONTAIN THE FOLLOWING INFORMATION:

? COMPILE <PROGRAM NAME> WITH <COMPILER NAME> SYNTAX

EXAMPLES:

? COMPILE JOB WITH FORTAN
 ? COMPILE PATSER WITH COBOL SYNTAX
 ? COMPILE SEPARA WITH COBOL LIBRARY
 ? COMPILE BRUTE WITH ASMBLR SAVE

THE EXECUTE CARD

--- -----

THE EXECUTE CARD IS USED TO CALL OUT A LIBRARY PROGRAM, ON DISK, FOR EXECUTION.

THE EXECUTE CARD MUST CONTAIN THE FOLLOWING INFORMATION:

? EXECUTE <PROGRAM NAME>

"EX" MAY BE USED AS AN ABBREVIATION FOR "EXECUTE".

EXAMPLES:

? EXECUTE JOB
 ? EX PF
 ? EXECUTE PROSOR, THIS IS RUN 2

THE "COMPILE AFTER" OR "EXECUTE AFTER" OPTION.

--- -----

IT MAY BE NECESSARY TO WAIT WITH THE COMPILATION OR EXECUTION OF A PROGRAM UNTIL THE EXECUTION OF SOME OTHER PROGRAM IS COMPLETED. THE REQUESTED COMPILE OR EXECUTE RUN WILL TAKE PLACE ONLY IF THE SPECIFIED PRECEDING PROGRAM HAS COME TO A NORMAL END OF JOB. THERE IS NO LIMITATION ON THE LENGTH OF TIME THE COMPILATION OR EXECUTION OF A JOB WILL HAVE TO WAIT FOR <P-N> TO BE FINISHED.

CONTROL INFORMATION

THIS OPTION MAY BE SPECIFIED EITHER ON A COMPILE OR AN EXECUTE CONTROL CARD IN THE FOLLOWING WAY:

? COMPILE JOB WITH FORTAN AFTER <P=N>
? EXECUTE JOB AFTER <P=N>

THE REMOVE CARD

THE REMOVE CARD CAUSES THE SPECIFIED FILE(S) TO BE REMOVED FROM THE DISK DIRECTORY AND CAUSES THE DISK SPACE USED BY THE FILE(S) TO BE MADE AVAILABLE FOR OTHER USE.

IF THE REMOVE REQUEST CANNOT BE COMPLIED WITH (E.G., BECAUSE THE SPECIFIED FILE HAS BEEN OPENED), MCP REJECTS THE REQUEST AND NOTIFIES THE OPERATOR WITH AN "*** INV KBD INPUT <INPUT TEXT>" MESSAGE ON THE SPO.

THE REMOVE CARD MUST CONTAIN THE FOLLOWING INFORMATION:

? REMOVE <FILE LIST>

TO REMOVE ALL FILES WHOSE <F-ID> BEGINS WITH THE CHARACTERS SPECIFIED IN THE REMOVE CARD:

? REMOVE <GROUP ID.> /

OR

? REMOVE <GROUP ID.>/, <GROUP ID.>/

WHERE EACH <GROUP ID.> MAY BE FROM 1 TO 5 CHARACTERS LONG.

TO REMOVE ALL FILES FROM THE DISK DIRECTORY EXCEPT "DSKDIR" AND "LOG", USE FORMAT:

? REMOVE ///

EXAMPLES:

CONTROL INFORMATION

? REMOVE OLD
 ? REMOVE JOB, ALLDAT
 ? REMOVE FREE, JOB, PF/

 THE DUMP CARD
 --- ---- -----

THE DUMP CARD CAUSES ONE OR MORE LIBRARY PROGRAMS OR DATA FILES TO BE COPIED ON A SCRATCH TAPE, FROM DISK. THE FILE INFORMATION WRITTEN ON THE MAGNETIC TAPE FORMS A MULTI-FILE REEL, AND IS REFERRED TO AS A "LIBRARY TAPE". THE DUMP CARD FACILITY DOES NOT REMOVE FILES FROM THE DISK DIRECTORY. A MAXIMUM OF 1980 FILES CAN BE DUMPED WITH ONE DUMP REQUEST.

SHOULD AN IRRECOVERABLE PARITY ERROR BE DETECTED DURING THE DUMP OPERATION, THE SYSTEM WILL DISPLAY A "DS OR DP" ADVICE MESSAGE, IF THE "TERM" OPTION IS RESET.

THE DUMP CARD MUST CONTAIN THE FOLLOWING INFORMATION:
 ? DUMP <LIBRARY TAPE ID> <FILE LIST>

TO DUMP ALL FILES WHOSE <F-ID> BEGINS WITH THE CHARACTERS SPECIFIED IN THE DUMP CARD:

? DUMP <LIBRARY TAPE ID.> <GROUP ID.>/

OR

? DUMP <LIBRARY TAPE ID.> <GROUP ID.>/, <GROUP ID.>/

WHERE EACH <GROUP ID.> MAY BE FROM 1 TO 5 CHARACTERS LONG.

TO DUMP ALL FILES PRESENT IN THE DISK DIRECTORY, USE FORMAT:

? DUMP <LIBRARY TAPE ID.>/

CONTROL INFORMATION

EXAMPLE: :

? DUMP SYSIRA PRO1, PRODAT

THE LOAD CARD
 --- ---- ----

THE LOAD CARD CAUSES THE FILES SPECIFIED BY THE <LIBRARY TAPE ID> AND <FILE LIST> TO BE LOADED TO DISK AND ENTERED IN THE DISK DIRECTORY. A MAXIMUM OF 1980 FILES CAN BE LOADED WITH ONE LOAD REQUEST.

SHOULD AN IRRECOVERABLE PARITY ERROR BE DETECTED DURING THE LOAD OPERATION, THE FILE CONTAINING THE PARITY WILL BE SKIPPED, AN APPROPRIATE MESSAGE DISPLAYED, AND LOADING WILL CONTINUE WITH THE NEXT FILE ON TAPE.

THE LOAD CARD MUST CONTAIN THE FOLLOWING INFORMATION:

? LOAD <LIBRARY TAPE ID> <FILE LIST>

TO LOAD ALL FILES WHOSE <F-ID> BEGINS WITH THE CHARACTERS SPECIFIED IN THE LOAD CARD:

? LOAD <LIBRARY TAPE ID.> <GROUP ID.> /

OR

? LOAD <LIBRARY TAPE ID.> <GROUP ID.> /, <GROUP ID.> /

WHERE EACH <GROUP ID.> MAY BE FROM 1 TO 5 CHARACTERS LONG.

TO LOAD ALL FILES PRESENT IN A LIBRARY TAPE, THE FORMAT IS:

? LOAD <LIBRARY TAPE ID> /

EXAMPLE:

CONTROL INFORMATION

? LOAD SYSIRA PRO1, PRODAT

THE LOAD AND DUMP FUNCTIONS ARE ACTUALLY EXECUTED BY MCP-S "LOADMP" NORMAL STATE PROGRAM. HOWEVER, IF THE DISK DIRECTORY CONTAINS A USER PROGRAM WITH THE <P-N>: LDDUMP, MCP WILL EXECUTE THE USER PROGRAM RATHER THAN ITS OWN (LOADMP) PROGRAM TO PERFORM THE LOAD/DUMP FUNCTIONS.

THE MEMDUMP CARD.

THIS CARD FORCES AN AUTOMATIC MEMORY DUMP IF THE PROGRAM TO BE PROCESSED COMES TO AN ABNORMAL END OF JOB.

EXAMPLE:

? MEMDUMP

THE CHANGE CARD

THE CHANGE CARD IS USED TO CHANGE THE IDENTIFIERS OF PROGRAM FILES AND/OR DATA FILES ON DISK. THE FIRST <FILE IDENTIFICATION> IN A <CHANGE ELEMENT> SIGNIFIES THE IDENTIFIER OF THE FILE WHOSE <F-ID> IS TO BE CHANGED. THE SECOND <FILE IDENTIFIER> IN A <CHANGE ELEMENT> SIGNIFIES THE NEW <IDENTIFIER> FOR THE FILE.

IF THE CHANGE REQUEST CANNOT BE COMPLIED WITH (E.G., BECAUSE THE SPECIFIED FILE HAS BEEN OPENED), MCP REJECTS THE REQUEST AND NOTIFIES THE OPERATOR WITH AN "*** INV KBD INPUT <INPUT TEXT>" MESSAGE ON THE SPO.

THE CHANGE CARD MUST CONTAIN THE FOLLOWING INFORMATION:
? CHANGE <CHANGE LIST>

EXAMPLES:

CONTROL INFORMATION

? CHANGE DATA1 DATA2
 ? CHANGE ALGOL OLDALG, NEWALG ALGOL

THE LABEL CARD

--- -----

THE LABEL CARD MAY BE USED TO RELATE A CARD OR PAPER TAPE FILE WITH A <FILE IDENTIFIER> AND OTHER LABEL INFORMATION. WITH THE EXCEPTION OF THE <INVALID CHARACTER> REQUIRED IN COLUMN 1, THE INFORMATION IN A LABEL CARD IS DEFINED AS IT IS FOR A STANDARD B2500/B3500 LABEL AS WOULD BE USED ON A MAGNETIC TAPE FILE.

A LABEL CARD HAS A FIXED FORMAT, AS DESCRIBED BELOW. IN THE DESCRIPTION BELOW, THE CHARACTER "B" SIGNIFIES A SINGLE <SPACE>.

THE LABEL CARD IS DESCRIBED AS FOLLOWS:

CHARACTERS	FIELD DESCRIPTION
1 - 8	?LABELBB
9	ZERO
10 - 16	MULTIPLE FILE IDENTIFICATION
17	ZERO
18 - 24	FILE IDENTIFICATION
25 - 27	REEL NUMBER
28 - 32	CREATION DATE
33 - 34	CYCLE NUMBER
35 - 64	IRRELEVANT FOR CARD OR PAPER TAPE FILES.

THE DATA CARD

--- -----

THE DATA CARD CAN BE USED IN LIEU OF A LABEL CARD IF THERE IS NO DESIRE TO PROVIDE LABEL INFORMATION OTHER THAN A <FILE IDENTIFICATION>

THE DATA CARD MUST CONTAIN THE FOLLOWING INFORMATION:

1. FOR INPUT IN STANDARD (EBCDIC) MODE:
 ? DATA <FILE IDENTIFICATION>

CONTROL INFORMATION

EXAMPLE:

? DATA CDIN

2, FOR INPUT IN NON-STANDARD (BCL) MODE:
 ? DATAB <FILE IDENTIFIER>

EXAMPLE:

? DATAB CDIN

THE RESTART <P-N> CARD,
 --- -----

THIS CONTROL CARD IS USED TO INITIATE THE RESTART OF THE EXECUTION OF A PROGRAM FROM THE BREAKOUT POINT.

IF THE FILE IN USE IS NOT A CARD FILE, THE FORMAT OF THE CONTROL CARD IS:

? RESTART <P-N>

IF THE FILE IS A CARD FILE, THE FORMAT OF THE CONTROL CARD IS:

? RESTART <P-N> DATA <F-ID>

THE UNIT CARD
 --- -----

THE UNIT CARD PERMITS THE OPERATOR TO INTRODUCE PERIPHERAL DEVICES INTO THE ENVIRONMENT OF THE MCP FOR CONTROL AND UTILIZATION. THE <INTEGER> HARDWARE TYPE IS SPECIFIED IN THE UNIT CARD USING THE STANDARD HARDWARE TYPE CODES SPECIFIED IN "PERIPHERAL UNIT TYPE CODES", (SEE "THE UNIT CARD" IN THE "SYSTEM LOADER" SECTION.)

THE CHANNEL AND UNIT SPECIFICATION SPECIFIES THE PHYSICAL ASSIGNMENT OF THE PERIPHERAL DEVICE ON THE SYSTEM, WHERE THE DEVICE IS HANDLED THROUGH AN I/O CHANNEL EXCHANGE, THE LOWEST CHANNEL NUMBER OF THE EXCHANGE SYSTEM IS USED IN THE UNIT SPECIFICATION ASSIGNMENT. THUS, IF A UNIT WERE SPECIFIED ON AN EXCHANGE ON CHANNELS 3 AND 4, THE UNIT CARDS FOR ALL PERIPHERALS ON THAT EXCHANGE WOULD BE SPECIFIED AS BEING ON CHANNEL 3.

THE UNIT CARD MUST HAVE THE FOLLOWING FORMAT:
? UNIT <HARDWARE TYPE CODE> = <UNIT SPECIFIER>

EXAMPLES

? UNIT 4 = 03/1
? UNIT 10 = 11/0

THE END CARD

THE PRIMARY FUNCTION OF THE END CARD IS TO DENOTE THE END OF FILE FOR A PARTICULAR CARD FILE. AN END OF FILE IS REQUIRED BY THE MCP, WHENEVER A PROGRAM IS FOR ANY REASON TERMINATED WHILE IT HAS CARD INFORMATION YET TO READ.

CONSEQUENTLY, THE END CARD IS REQUIRED TO BE THE LAST CARD IN A DECK PERTAINING TO A FILE. THAT IS, THE END CARD RELEVANT TO A PARTICULAR FILE SHOULD NOT BE FOLLOWED BY ANY OTHER CONTROL CARDS, OR ANY PROGRAM PARAMETER CARDS, OR ANY DATA CARDS FOR THAT SAME FILE. WHEN A PROGRAM ATTEMPTS TO READ AN END CARD AS DATA, AN END-OF-FILE ACTION WILL OCCUR.

THE END CARD MUST CONTAIN THE FOLLOWING INFORMATION:
? END

EXAMPLE:

? END
? END, THIS IS THE LAST CARD

CONTROL INFORMATION

DESCRIPTION OF THE "PROGRAM PARAMETER CARDS".

THE CARDS SPECIFIED AS "PROGRAM PARAMETER CARDS" INSTRUCT THE MCP TO EFFECT DYNAMICALLY CERTAIN CHANGES DURING THE SCHEDULING OR EXECUTION OF THE PROGRAM.

THE CHANGES MAY AFFECT GENERATORS AS WELL AS OBJECT PROGRAMS.

THE CARDS, IF USED, MUST FOLLOW IMMEDIATELY THE "COMPILE" OR THE "EXECUTE" CARD, WHICHEVER IS USED.

THE PRIORITY CARD

THE PRIORITY CARD SPECIFIES THE PRIORITY TO BE ASSIGNED TO A COMPILER OR OBJECT PROGRAM. PRIORITIES MAY RANGE FROM 1 TO 9, WHERE 1 IS THE LOWEST PRIORITY, AND 9 IS THE HIGHEST. MCP ASSIGNS A PRIORITY OF 1, UNLESS A PRIORITY CARD SPECIFIES TO DO OTHERWISE.

WHEN A PRIORITY OF "9" IS USED, THE FOLLOWING ACTION OCCURS:

1, IF NECESSARY, JOBS WHICH ARE RUNNING AND WHICH HAVE A LOWER PRIORITY THAN "9" WILL BE REMOVED FROM CORE TO DISK TO CREATE SPACE FOR THE "9" JOB. THIS ACTION (CALLED CRASHOUT) IS THE SAME AS THE ST INPUT REQUEST ACTION.

2, UPON TERMINATION OF THE "9" JOB, THE SUSPENDED PROGRAMS WILL BE RE-INITIATED IN CORE. A "9" JOB SCHEDULE WILL NOT AUTOMATICALLY SUSPEND OTHER "9" JOBS RUNNING IN CORE, HOWEVER THE OPERATOR MAY "ST" THEM PROVIDING THEY MEET THE OTHER CRITERIA FOR SUSPENSION.

A PRIORITY OF "8" WILL CAUSE A CRASHOUT IN THE SAME MANNER AS A PRIORITY "9", BUT IT WILL NOT INTERFERE WITH THE EXECUTION OF A PRIORITY "9" JOB.

THE <INTEGER> ON THE PRIORITY CARD SPECIFIES THE PRIORITY TO BE ASSIGNED. IN CASE OF A "COMPILE AND GO" RUN, THE PRIORITY ASSIGNED TO THE COMPILE PHASE IS ASSIGNED ALSO TO THE EXECUTE PHASE.

CONTROL INFORMATION

THE PRIORITY CARD FOR A PROGRAM MUST CONTAIN THE FOLLOWING INFORMATION:
? PRIORITY = <INTEGER>

EXAMPLE:

? PRIORITY = 3

THE FILE CARD (LABEL EQUATION)

THE FILE CARD (OFTEN REFERRED TO AS THE LABEL EQUATION CARD) SERVES TO EQUATE A <FILE NAME> USED IN THE SOURCE PROGRAM WITH A PARTICULAR <F-ID> TO BE USED AT EXECUTION TIME. ALSO, THE FILE CARD MAY SPECIFY AN OPTIONAL <OUTPUT MEDIUM> FOR OUTPUT FILES.

IN THE FOLLOWING DESCRIPTION, <FILE NAME> REFERS TO THE FILE NAME USED IN THE I/O STATEMENTS OF THE SOURCE PROGRAM.

THE <OUTPUT MEDIUM> MAY BE ANY OF THE FOLLOWING:

1. TAPE	2. PRINT	3. PAPER
4. PUNCH	5. BACK	6. FORM
7. PRINT DISK	8. PUNCH DISK	

IN THE ABOVE LISTING:

PAPER = PAPERTAPE PUNCH,
PUNCH = CARD PUNCH,
BACK = PRINTER BACKUP TAPE,
FORM = SPECIAL FORM,
PRINT DISK = PRINTER BACKUP DISK
PUNCH DISK = PUNCH BACKUP DISK

IF THE SPECIFIED <OUTPUT MEDIUM> IS "FORM", MCP NOTIFIES THE OPERATOR THROUGH A ** FM RQD <F-ID> <J-S> MESSAGE, THAT SPECIAL FORMS ARE REQUIRED.

THE FILE CARD FOR A COMPILER HAS THE FOLLOWING FORMAT:

CONTRCL INFORMATION

THE VALUE CARD
 --- -----

THE VALUE CARD PERMITS THE OPERATOR TO ASSIGN A SIX (6) INTEGER VALUE AT EXECUTION TIME TO A SPECIFIED ADDRESS IN THE PROGRAM-S CORE. THIS PARAMETER AFFECTS PERMANENT FILES (LIBRARY PROGRAMS) ONLY.

<INTEGER 1> IS THE RELATIVE ADDRESS IN THE PROGRAM INTO WHICH THE VALUE IS TO BE LOADED UPON PROGRAM INITIATION. <INTEGER 2> IS THE ACTUAL INTEGER TO BE LOADED.

NOTE: IN COBOL PROGRAMS, THE ADDRESS SPECIFIED IN <INTEGER 1> MUST NOT BE HIGHER THAN BASE RELATIVE 57. VALUES ENTERED INTO HIGHER BASE RELATIVE ADDRESSES WILL BE DESTROYED BY THE OVERLAY MECHANISM OF THE COBOL COMPILER.

THE VALUE CARD MUST CONTAIN THE FOLLOWING INFORMATION:

? VALUE <INTEGER 1> = <INTEGER 2>

EXAMPLE:

? VALUE 236 = 32767

THE INSERT CARD.
 --- -----

THE INSERT CARD ALLOWS THE OPERATOR TO INTRODUCE DATA AT EXECUTION TIME TO A SPECIFIED ADDRESS IN THE PROGRAM-S CORE. THE PARAMETER AFFECTS PERMANENT (LIBRARY PROGRAMS) ONLY.

THE INSERT CARD MUST CONTAIN THE FOLLOWING INFORMATION:

? INSERT <ADDRESS> <LENGTH> <CLASS> <DATA>

<ADDRESS> = RELATIVE ADDR. IN THE PROGRAM INTO WHICH THE DATA IS TO BE LOADED.

CONTROL INFORMATION

<LENGTH> = INTEGER,

<CLASS> = UN OR UA,

THE <LENGTH> MAY BE IN CASE OF UN DATA FROM 1 THROUGH 50, IN CASE OF UA DATA FROM 1 THROUGH 40.

<ADDRESS> MUST BE AN EVEN NUMBER, IF THE DATA IS UA.

EXAMPLE:

? INSERT 2 1 UA Z

NOTE: IN COBOL PROGRAMS, THE ADDRESS IN <INTEGER 1> MUST NOT SPECIFY A FIELD WHICH EXTENDS BEYOND BASE RELATIVE ADDRESS 62. THE OVERLAY MECHANISM OF THE COBOL COMPILER WILL DESTROY ANY DATA BEYOND THAT ADDRESS.

THE CHARGE CARD.

--- -----

THIS CARD PERMITS THE USER TO ASSIGN HIS OWN CHARGE NUMBER TO THE LOG RECORDS OF HIS PROGRAM. THIS NUMBER MUST BE AN <INTEGER> NOT GREATER THAN SIX DIGITS IN LENGTH. IN CASE OF A COMPILE AND GO RUN, THE CHARGE NUMBER APPLIES TO BOTH, THE COMPILE AND THE EXECUTE LOG RECORDS.

EXAMPLE:

? CHARGE 1257

THE TIME CARD.

--- -----

THIS CONTROL CAUSES THE AUTOMATIC DISCONTINUATION OF A JOB AFTER THE ELAPSE OF THE TIME SPECIFIED IN THE CONTROL CARD.

*

*

*

CONTROL INFORMATION

THE FORMAT OF THE CONTROL CARD IS:

*

? TIME NNNNN

*

WHERE NNNNN SPECIFIES THE NUMBER OF SECONDS OF PROCESSOR TIME THE JOB IS ALLOWED TO ACCUMULATE (LEADING ZEROES ARE OPTIONAL).

*

*

EXAMPLE:

*

? EXECUTE XYZ TIME 300.

*

THE STOP CARD.

--- ---- -----

THIS CARD SUSPENDS THE PROCESSING OF A PROGRAM. THE PROGRAM IS REMOVED FROM CORE TO DISK DURING THE PERIOD OF SUSPENSION. THE FORMAT OF THE STOP CARD IS:

? STOP <P=N>

? STOP COBOL

THE MCP WILL RESPOND WITH A NOTIFICATION THAT THE PROGRAM HAS BEEN SUSPENDED.

THE START CARD.

--- ---- -----

THIS CARD REINITIATES THE PROCESSING OF A PROGRAM WHICH WAS PREVIOUSLY STOPPED BY A STOP CARD. THE FORMAT OF THE START CARD IS:

? START <P=N>

? START COBOL

CONTROL INFORMATION

THE MCP RESPONDS WITH A NOTIFICATION THAT THE PROGRAM HAS BEEN
RESUMED.

DATA COMMUNICATIONS MCP
-----DATA COMMUNICATIONS VERSIONS OF THE B2500/B3500 MCP SYSTEMS
-----INTRODUCTION

THE BURROUGHS B3500 INFORMATION PROCESSING SYSTEM PROVIDES DATA COMMUNICATION CAPABILITIES WITH THE DATA COMMUNICATIONS MASTER CONTROL PROGRAM. THE PRIMARY PURPOSE OF THIS FACILITY IS TO FURNISH THE MEANS WHEREBY THE B3500 OBJECT PROGRAMS CAN COMMUNICATE WITH VARIOUS REMOTE DATA HANDLING DEVICES. WHEN USED WITH CERTAIN OF THESE REMOTE DEVICES, THIS FACILITY ALSO FURNISHES A MEANS WHEREBY CONTROL INFORMATION CAN BE SENT TO AND FROM REMOTE STATIONS. THE ABILITY OF THE DATA COMM MCP TO HANDLE REMOTE DEVICES PROCESSING IS AN EXTENSION OF THE STANDARD MCP AND THE DATA COMM MCP CONTAINS ALL THE FUNCTIONS AND CAPABILITIES OF THE STANDARD MCP.

SINCE THE OPERATIONAL CHARACTERISTICS OF ALL REMOTE DEVICES ARE NOT UNIFORM, IT IS NOT FEASIBLE FOR THE DATA COMM MCP TO HANDLE IDIOSYNCRASIES OF EACH DEVICE. THEREFORE AT THE MCP LEVEL, OPERATIONS WITH REMOTE DEVICES ARE RESTRICTED TO CERTAIN FUNCTIONS WHETHER AN IO OPERATION IS IN FACT A POLLING OPERATION, AN ACKNOWLEDGEMENT, OR A MESSAGE TRANSMISSION IS THE CONCERN OF AN OBJECT PROGRAM.

CERTAIN CODES INVOLVED IN TRANSMISSIONS WITH REMOTE STATIONS ARE TRANSLATED, OPTIONALLY, BY THE DATA COMM MCP. WHEN REQUESTED BY THE OBJECT PROGRAM, THE DATA COMM MCP WILL PERFORM THE CODE TRANSLATION FROM EBCDIC TO THE CODE SET FOR THE REMOTE STATION AND FROM THE REMOTE DEVICE CODE TO EBCDIC. ALL INPUT FROM DEVICES WHICH ARE DESIGNATED AS BEING CAPABLE OF SENDING AND RECEIVING CONTROL INFORMATION WILL ALWAYS BE TRANSLATED UPON RECEIPT BY THE DATA COMM MCP.

IN ADDITION TO PROVIDING FACILITIES WHICH ALLOW OBJECT PROGRAMS TO UTILIZE REMOTE DEVICES, IT SHOULD BE POINTED OUT THAT THE DATA COMM MCP ALSO ALLOWS USE OF AUTOMATIC DIALERS. THE USE OF THESE DIALERS IS THE RESPONSIBILITY OF THE OBJECT PROGRAM.

DATA COMM HARDWARE

THE DATA COMM MCP HAS THE CAPABILITIES TO HANDLE SINGLE AND MULTI-LINE CONTROLS WITH THE REMOTE DEVICES WHICH ARE LISTED IN APPENDIX 5. AND HAVE A CODE NUMBER >12. DEVICES WHOSE LINE CONTROL, CODE SETS, AND OPERATIONAL CHARACTERISTICS ARE IDENTICAL WITH ONE OF THOSE REFERRED TO ABOVE MAY BE HANDLED BY THE DATA COMM MCP.

OBJECT PROGRAM RESPONSIBILITIES AND FUNCTIONS

AS PREVIOUSLY NOTED, IT IS THE RESPONSIBILITY OF THE OBJECT PROGRAM TO HANDLE THE VARIOUS DEMANDS OF REMOTE STATIONS WITH WHICH IT IS COMMUNICATING. IN PARTICULAR, IT SHOULD BE RECOGNIZED THAT THE OBJECT

PROGRAM MAY BE REQUIRED TO PERFORM ENABLING, TO INDICATE DIALING, TO CONSTRUCT PHONE NUMBERS, TO CONSTRUCT POLLING OR ADDRESSING SEQUENCES, TO SEND ACKNOWLEDGEMENTS, TO RECOGNIZE ACKNOWLEDGEMENTS, BREAKS, AND "WRU" S SENT TO IT, TO PROVIDE "SYNC" CHARACTERS ON SYNCHRONOUS LINES, TO SEGMENT MESSAGES, TO DISCONNECT THE TELEPHONE CIRCUITS, TO RECOGNIZE THE REQUIREMENT FOR CODE TRANSLATION OR HANDLING THE CODE AS IS AND TO RECOVER FROM CERTAIN KINDS OF TRANSMISSION ERRORS.

INPUT-OUTPUT BUFFER TECHNIQUES.

THE FOLLOWING DISCUSSION DOES NOT APPLY TO FILES UPON WHICH STREAM MODE INPUT-OUTPUT OPERATION ARE PERFORMED. BUFFERS AND RECORD AREAS FOR SUCH FILES ARE DISCUSSED UNDER THE HEADING OF "STREAM MODE".

THE DATA COMM MCP DOES NOT UTILIZE MORE THAN ONE INPUT-OUTPUT BUFFER AREA PER DATA COMMUNICATION FILE. THERE IS NO RESTRICTION IN THE COMPILER LANGUAGES IN THIS RESPECT AND MORE THAN ONE BUFFER MAY BE ASSIGNED TO ALL FILES, BUT SINCE EACH DATA COMMUNICATION FILE IS ASSOCIATED WITH ONLY ONE LINE, THERE IS NO ADVANTAGE IN HAVING ALTERNATE BUFFERS.

THE DATA COMM MCP WILL MAKE USE OF RECORD AREAS ASSIGNED TO FILES. THERE IS AN ADVANTAGE TO HAVING A RECORD AREA IF THE COMPUTER APPLICATION INVOLVES A CONSIDERABLE AMOUNT OF OUTPUT OPERATIONS ON THE REMOTE DEVICE, AN OUTPUT OPERATION IS A WRITE-TO-CONTROL OR A WRITE-TRANSPARENT AS OPPOSED TO A WRITE-READ. THE ADVANTAGE GAINED IS DUE TO THE FACT THAT THE PROGRAM IS FREE TO RUN IMMEDIATELY AFTER THE WRITE INSTRUCTION IS EXECUTED, REGARDLESS WHETHER IT HAS BEEN COMPLETED OR NOT. SINCE RECORD AREAS MUST BE OF THE SAME SIZE AS THE INPUT-OUTPUT BUFFER, THE SIZE OF THE PROGRAM WILL BE INCREASED BY THEIR USE.

STREAM MODE.

IF THE VARIANT DIGITS IN THE DESCRIPTOR INDICATE STREAM MODE OPERATION, THE READ-TO-CONTROL DESCRIPTORS, WRITE-TO-CONTROL DESCRIPTORS, AND BOTH PORTIONS OF WRITE-TO-CONTROL/READ-TO-CONTROL DESCRIPTORS OPERATE IN A CONTINUOUS STREAM MODE. THIS MEANS THAT INFORMATION IS CONTINUALLY TRANSFERRED TO OR FROM CORE MEMORY UNTIL A CONTROL CODE SUCH AS ETX OR EOT IS TRANSMITTED.

STREAM MODE OPERATION IS BEST EXPLAINED BY USE OF AN EXAMPLE: A PROGRAM WISHES TO READ A PAPER TAPE FROM A REMOTE DEVICE WHICH IS CONNECTED TO THE COMPUTER ON A DIALED LINE. THE TAPE HAS A NUMBER OF VARIABLE LENGTH RECORDS, EACH OF WHICH IS TERMINATED BY A CARRIAGE RETURN CHARACTER. THE TAPE IS TERMINATED BY AN EOT CHARACTER, WHICH DISCONNECTS

DATA COMMUNICATIONS MCP

THE LINE WHEN IT IS READ.

SINCE THE PROGRAM CANNOT HAVE AN INFINITELY LARGE BUFFER, AND SINCE IT CANNOT STOP THE REMOTE TAPE READER AFTER IT BEGINS OPERATION, THE TAPE IS READ INTO CORE IN STREAM MODE AND WRITTEN ON DISK IN 100 CHARACTER RECORDS. WHEN THE EOT CHARACTER IN THE TAPE IS READ AND THE LAST 100 CHARACTER RECORD HAS BEEN WRITTEN ON DISK, THE DISK FILE IS CLOSED AND THEN REOPENED AS INPUT. THE DISK FILE NOW MAY BE READ AND THE INFORMATION CONTAINED ON THE ENTIRE TAPE PROCESSED.

THE FIRST INSTRUCTION TO READ A REMOTE FILE CONTAINS DIAL AND STREAM MODE BITS IN THE DESCRIPTOR VARIANTS. AT THE EXECUTION OF THE FIRST STREAM MODE READ ON A FILE, THE PROGRAM IS MARKED WAITING I/O AND IS NOT ALLOWED TO RUN. INFORMATION COMES INTO THE BUFFER AREA AND THE PROGRAM CONTINUES TO WAIT UNTIL THE BUFFER IS FILLED TO THE B-ADDRESS OF THE DESCRIPTOR. WHEN THE BUFFER IS FILLED TO THIS POINT, AN I/O INTERRUPT IS RECEIVED. THE DATA IN THE BUFFER IS TRANSLATED IF NECESSARY, MOVED FROM THE BUFFER TO THE RECORD AREA, IF ANY. IF THE FILE DOES NOT HAVE A RECORD AREA, THE PROGRAM INDEX REGISTER #2 WILL BE SET TO THE ADDRESS OF THE RECORD IN THE BUFFER AND THE PROGRAM IS MARKED READY TO RUN.

INFORMATION DOES NOT STOP COMING INTO THE BUFFER BUT CONTINUES INTO CORE LOCATIONS BEYOND THE B-ADDRESS OF THE DESCRIPTOR. IT WILL CONTINUE TO BE READ INTO MEMORY UNTIL AN ADDRESS OF B PLUS 200 IS REACHED, OR UNTIL A CONTROL CODE IS RECEIVED. ONCE THE PROGRAM IS MARKED READY TO RUN, IT BECOMES THE PROGRAM'S RESPONSIBILITY TO PROCESS THE RECORD RECEIVED AND TO ISSUE ANOTHER READ INSTRUCTION ON THE FILE BEFORE THE CONTROL HAS FILLED THE BUFFER TO THE ADDRESS GIVEN BY B PLUS 200. THE MCP RECORDS THAT A STREAM MODE OPERATION IS IN PROCESS ON THE FILE AND THE SECOND AND ALL SUBSEQUENT READ INSTRUCTIONS EXECUTED BY THE PROGRAM WILL BE CONVERTED TO THE PROPER I/O OPERATOR BY THE MCP. ONLY THE TIMING OF THE OPERATOR IS CRITICAL.

WHEN THE CONTROL HAS REACHED LOCATION B PLUS 200, AND ASSUMING THAT THE PROGRAM HAS ISSUED A SECOND READ INSTRUCTION, THE INFORMATION IN THE AREA BETWEEN THE B-ADDRESS AND THE B PLUS 200 ADDRESS WILL BE PASSED TO THE PROGRAM AND THE PROGRAM MAY THEN PROCESS THIS BLOCK OF DATA. IT IS IMPORTANT TO REMEMBER THAT THE CONTROL DOES NOT STOP TRANSFERRING INFORMATION UNTIL A CONTROL CODE IS RECEIVED. WHEN IT HAS FILLED UP TO B PLUS 200, IT CAUSES AN I/O INTERRUPT AND BEGINS TRANSFERRING THE NEXT CHARACTER INTO THE BUFFER AT A LOCATION GIVEN BY B MINUS 200. IT MUST RECEIVE THE NEXT READ INSTRUCTION BEFORE IT REACHES THE B-ADDRESS.

OBVIOUSLY, THE PROGRAM MUST LIMIT THE AMOUNT OF PROCESSING DONE ON EACH 100 CHARACTER RECORD. THE TIME SPENT PROCESSING EACH RECORD IS A FUNCTION OF THE SPEED OF THE REMOTE DEVICE. IF THE CONTROL DOES NOT RECEIVE THE READ INSTRUCTION BEFORE IT IS READY TO "PING-PONG" THE BUFFER, IT WILL STOP TRANSFERRING INFORMATION INTO CORE MEMORY. SINCE THE TAPE READER CANNOT BE STOPPED, INFORMATION WILL BE LOST.

THE CONTROL STORES A RESULT DESCRIPTOR IN CORE MEMORY EACH TIME IT PASSES THE B AND B PLUS 200 ADDRESSES. THIS RESULT DESCRIPTOR WILL CONTAIN A COMPLETE BIT AND AN EXCEPTION BIT. NO OTHER BITS SHOULD BE ON. THIS IS NORMAL FOR STREAM MODE OPERATION.

IF THE STREAM MODE OPERATION IS A WRITE OR A WRITE/READ, CONTROL IS RETURNED TO THE PROGRAM IMMEDIATELY AFTER EXECUTION OF THE FIRST I/O OPERATOR, REGARDLESS WHETHER THE OPERATION IS COMPLETE OR NOT.

THE REMOTE FILE SHOULD BE DECLARED TO HAVE 100 CHARACTER RECORDS AND THEY MUST BE BLOCKED TWO RECORDS PER BLOCK, THIS WILL INSURE THAT INFORMATION IS TRANSFERRED INTO A BUFFER AREA ONLY. THE MCP DOES NOT INITIATE A STREAM MODE OPERATOR, IF THERE ARE NOT AT LEAST 100 CHARACTERS BETWEEN THE A AND B ADDRESSES OF THE DESCRIPTOR.

CODE TRANSLATION

ONE OF THE FUNCTIONS OF THE DATA COMM MCP IS TO PROVIDE THE OPTION FOR OBJECT PROGRAMS TO INVOKE CODE TRANSLATION WITH THE READ OR WRITE REQUEST. AS SPECIFIED IN THE FILE DECLARATION OR IN THE SYSTEM LOADER THE MCP WILL TRANSLATE TO OR FROM THE FOLLOWING CODES AS INFORMATION IS MOVED BETWEEN THE INPUT/OUTPUT BUFFERS AND THE RECORD AREA:

1. USASCII
2. BAUDOT (USED BY MODEL 28 TELETYPE)
3. PTTC/6 (IBM 1050)
4. BCL (BURROUGHS COMMON LANGUAGE), A 7-BIT ALPHANUMERIC CODE TRANSMITTED FROM THE B500 SERIES COMPUTER.

IT SHOULD BE REMEMBERED THAT MESSAGES FROM DEVICES WHICH ARE DESIGNATED AS "CONTROL INPUT SOURCES" (REMOTE SPO-S) ARE ALWAYS TRANSLATED BY THE MCP INTO STANDARD EBCDIC AND EXAMINED FOR POSSIBLE MCP KEYBOARD INPUT MESSAGES. IF THE INPUT IS NOT AN MCP MESSAGE, IT IS PASSED ON, IN ITS TRANSLATED FORM, TO ANY PROGRAM WHICH MAY BE USING THE REMOTE STATION AS A FILE. THIS OBJECT PROGRAM SHOULD ALWAYS EXPECT TO SEE THE MESSAGE IN STANDARD EBCDIC.

OBJECT PROGRAMS WILL RECEIVE NO UPPER OR LOWER CASE SHIFT CHARACTERS EMBEDDED IN THE INPUT MESSAGE. IF THE REMOTE DEVICE REQUIRES THAT UPPER OR LOWER CASE SHIFT CHARACTERS BE SENT TO IT FOR PROPER PRINTING, THEN THE OBJECT PROGRAM MUST INSERT THESE CHARACTERS IN THE OUTPUT MESSAGE. THE EBCDIC CHARACTER WHOSE ALPHANUMERIC EQUIVALENT IS "36" IS TRANSLATED BY THE DATA COMM MCP TO A PTTC/6 UPPER CASE SHIFT. THE DIGITS "1A" ARE TRANSLATED TO A PTTC/6 LOWER CASE SHIFT.

THE DATA COMM MCP INCLUDES STANDARD AND NON-STANDARD TRANSLATION TABLES FOR USE WITH REMOTE DEVICES CAPABLE OF TRANSMITTING SEPARATE BIT CONFIGURATIONS FOR UPPER AND LOWER CASE CHARACTERS. THE IBM 1050 IS INCLUDED IN THIS CATEGORY, SINCE DIFFERENT BIT CONFIGURATIONS FOR UPPER AND LOWER CASE CHARACTERS ARE RECEIVED IN CORE MEMORY.

IF STANDARD TRANSLATION IS SPECIFIED IN THE FILE DECLARATION, LOWER CASE ASCII OR PTTC/6 CHARACTERS ARE TRANSLATED TO LOWER CASE EBCDIC CHARACTERS AND UPPER CASE ASCII OR PTTC/6 CHARACTERS ARE TRANSLATED TO UPPER CASE EBCDIC CHARACTERS. IF NON-STANDARD TRANSLATION IS SPECIFIED IN THE FILE DECLARATION, BOTH UPPER AND LOWER CASE ASCII OR PTTC/6 ALPHABETIC CHARACTERS ARE TRANSLATED TO UPPER CASE EBCDIC ALPHABETIC CHARACTERS. THE TRANSLATION OF CHARACTERS WHICH ARE ACTUALLY TYPED IN UPPER CASE BUT WHICH ARE NOT ALPHABETIC CHARACTERS IS NOT AFFECTED BY NON-STANDARD TRANSLATION.

REMOTE KEYBOARD CONTROL FACILITIES (REMOTE SPO)

DATA COMMUNICATIONS MCP

WHEN USED WITH THE DATA COMM MCP, CERTAIN TYPES OF REMOTE DEVICES ARE PERMITTED TO INPUT CONTROL INFORMATION TO THE SYSTEM. SPECIFICALLY, THEY MUST HAVE THE FOLLOWING CHARACTERISTICS:

1. STATIONS MUST BE OUTPUT AS WELL AS INPUT DEVICES, SUCH AS TWX AND B9350 TYPEWRITER.
2. STATIONS MUST NOT REQUIRE POLLING. THE MCP WILL NOT INTERROGATE STATIONS PERIODICALLY TO FIND OUT WHETHER A STATION HAS INFORMATION TO INPUT.
3. STATIONS MUST NOT REQUIRE ADDRESSING AT THE MESSAGE LEVEL. THAT IS, IT MUST NOT BE NECESSARY TO INSERT A SPECIAL CHARACTER INTO OUTPUT MESSAGES TO SELECT A PARTICULAR DEVICE ON A MULTI-POINT LINE.
4. INFORMATION RECEIVED FROM STATIONS MUST BE IN ONE OF THE CODES FOR WHICH THE DATA COMM MCP MAINTAINS A TRANSLATION TABLE.
5. STATIONS MUST NOT REQUIRE ACKNOWLEDGEMENTS TO THEIR MESSAGES, (AN ALLOWABLE EXCEPTION IS TWX WHICH REQUIRES A SPECIALLY FORMATTED IDENTIFICATION FROM THE ORIGINATOR.)

ANY REMOTE STATION WHICH SATISFIES THE ABOVE REQUIREMENTS IS SAID TO HAVE SPO CAPABILITIES. IF AT THE TIME THE SYSTEM LOADER IS EXECUTED A STATION IS SPECIFIED TO BE A CANDIDATE FOR CONTROL INFORMATION, IT MAY BE USED IN A MANNER SIMILAR TO THE SUPERVISORY PRINTER AT THE COMPUTER CONSOLE.

THE DATA COMM MCP ALWAYS PROVIDES CODE TRANSLATION FOR A REMOTE STATION HAVING SPO CAPABILITIES.

WHEN A QUESTION MARK (?) IS ENTERED AS THE FIRST DATA CHARACTER OF A MESSAGE, THE INPUT IS RECOGNIZED AS A CONTROL MESSAGE AND IS INTERCEPTED BY THE DATA COMM MCP. THE TEXT FOLLOWING THE QUESTION MARK IS IDENTICAL TO THAT ENTERED AT THE COMPUTER CONSOLE. FOR CONTROL CARD INPUT "?" OR "CC" MUST FOLLOW THE QUESTION MARK AND PRECEDE THE INPUT CONTROL CARD INFORMATION.

IT SHOULD BE NOTED THAT IN CASES WHERE THERE ARE CONFLICTS OF TOTAL SYSTEM OPERATION WITH REMOTE SPO USERS, THE REMOTE USER MAY BE OVERRULED. FOR EXAMPLE, THE ABILITY TO SET AND RESET OPTIONS IN THE MCP, TO CHANGE THE SYSTEMS REAL TIME CLOCK, TO CHANGE THE SYSTEMS DATE MAINTENANCE, ETC., WILL BE PROHIBITED. THE REMOTE SPO WILL BE PERMITTED TO INPUT CONTROL MESSAGES RELATED ONLY TO THE PARTICULAR JOB TO WHICH IT IS ASSIGNED.

IN GENERAL, THE REMOTE SPO USER WILL OPERATE WITH A RESTRICTED SET OF THE POSSIBLE CONSOLE SPO FACILITIES. HOWEVER, THE REMOTE STATION HAS THE CAPABILITY TO DIRECT SPECIFIC MESSAGES TO THE COMPUTER CONSOLE SPO OR OTHER REMOTE SPOs, AND THE CONSOLE SPO HAS THE CAPABILITY TO DIRECT A MESSAGE TO REMOTE STATIONS.

REMOTE SPO STATIONS WHICH HAVE INITIATED EXECUTION OF A PROGRAM (VIA THE EXECUTE, COMPILE, OR RUN SCHEDULE RECORD) WILL RECEIVE ALL SYSTEMS MESSAGES RELEVANT TO THAT JOB UNLESS THE STATION HAS SPECIFIED IN THE SYSTEM LOADER OR BY SPECIFIC REQUEST THAT IT IS NOT TO RECEIVE THEM. ALL SYSTEMS MESSAGES WHICH ARE TRANSMITTED TO THE REMOTE SPO STATIONS WILL ALSO BE PRINTED AT THE COMPUTER SPO. THEY WILL BE PREFIXED WITH THE STATION NUMBER (CHANNEL & UNIT) OF THE REMOTE TERMINAL.

NOTE: FOR THE PURPOSES OF STANDARD HANDLING THE UNIT NUMBER USED FOR REMOTE DEVICES IS ALWAYS 0. FOR EXAMPLE, AN INPUT MESSAGE FROM CHANNEL 12, UNIT 0 READS:

? CC EXECUTE PRIMES.

DATA COMMUNICATIONS MCP

THIS CAUSES THE DESIGNATED PROGRAM TO BE ADDED TO THE LIST OF PROGRAMS SCHEDULED FOR EXECUTION. WHEN THE PROGRAM IS LOADED BY THE MCP FOR EXECUTION THE SYSTEMS MESSAGES WHICH APPEAR AT THE REMOTE SPO AND THE COMPUTER SPO IS:

COMPUTER SPO

<12/0> PRIMES = 01 BOJ 10:30
<12/0> FILEID OPEN OUTPUT 05/0 PRIMES = 01

REMOTE SPO

PRIMES = 01 BOJ 10:30
FILEID OPEN OUTPUT 05/0 PRIMES=01

DATA COMM. DEVICE SPECIFICATIONS TO THE MCP.

THE REMOTE DEVICES MUST BE INCORPORATED IN THE SYSTEM ENVIRONMENT. THIS MAY BE DONE AT THE TIME OF "COLD START" LOADING, OR DYNAMICALLY LATER, WHEN THE SYSTEM IS ALREADY IN OPERATION. IF MULTI-LINE CONTROL IS USED, EACH CHANNEL CONNECTED TO THE MULTI-LINE CONTROL MUST BE DECLARED ON A "CHANNEL" CONTROL CARD. THE SEQUENCE OF THE CHANNEL CONTROL CARDS IN THE SYSTEM LOADER CONTROL DECK ESTABLISHES THE ORDER IN WHICH THE CHANNEL I/O RESULT DESCRIPTORS WILL BE SCANNED.

THE MULTI-LINE CONTROL ITSELF MUST BE DECLARED ON THE "UNIT CARD", SPECIFYING PERIPHERAL UNIT TYPE CODE 12.

THE REMOTE DEVICES AND THE ALLOWABLE OPTIONS MUST BE DECLARED INDIVIDUALLY ON "UNIT CARD"-S. (FOR DETAILS ON THE "CHANNEL" AND "UNIT" LOADER CONTROL CARDS SEE THE "SYSTEM LOADER" SECTION.)

DURING OPERATION OF THE SYSTEM, NEW REMOTE DEVICES MAY BE INTRODUCED, DELETED, ETC., THROUGH USE OF KEYBOARD INPUT MESSAGES. (SEE THE DL, CC, SM, HM, SJ, CP, SL MESSAGES IN THE "KEYBOARD INPUT MESSAGES" SECTION.)

MESSAGE FLOW / SWITCHED LINE / REMOTE SPO

SEQUENCE OF EVENTS FOR A GIVEN ADAPTER (ADAPTER N).

1. HALT/LOAD.

2. MCP ENABLES ALL SWITCHED LINE REMOTE SPO ADAPTERS.

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3. IF AN OBJECT PROGRAM DECLARED THE REMOTE SPO AS A FILE BEFORE THE REMOTE STATION DIALED ADAPTER N, IT BECOMES THE OBJECT PROGRAM-S RESPONSIBILITY TO HANDLE LINE DISCIPLINE (I.E., TO USE, OR TO RELEASE THE REMOTE SPO, OR TO RESPOND TO THE REMOTE SPO-S BREAK OR WRU REQUESTS.)
4. IF NO OBJECT PROGRAM USES ADAPTER N, CONTROL IS STILL WITH MCP AND THE REMOTE SPO MAY DIAL ADAPTER N.
5. MCP RESPONDS WITH WRITING THE MCP IDENTIFIER ON THE REMOTE SPO. THE MCP IDENTIFIER APPEARS IN THE FOLLOWING FORM:

<MCP NAME> <ADAPTER ID.> <CC/U>

6. MCP INITIATES A WCRC OPERATION.

THE WRITE-TO-CONTROL PORTION CONSISTS OF THE FOLLOWING CONTROL SYMBOLS: "BELL CR LF". THE BELL SIGNALS THE STATION THAT IT IS NOW IN A MCP READ STATE.

THE READ-TO-CONTROL PORTION EXPECTS CONTROL INFORMATION FROM THE REMOTE SPO. ANY OTHER INPUT CAUSES AN "INVALID KEYBOARD" RESPONSE.

THE FIRST INPUT INFORMATION MUST CONSIST OF A "LOG IN", OR A "BLACK OUT" MESSAGE. ("LI" OR "BO" KEYBOARD INPUT MESSAGES.)

- A. IF THE REMOTE OPERATOR HAS NOTHING TO SEND TO THE MCP, HE TAKES NO ACTION AND THE STATION REMAINS IN A CONSTANT READ STATE.
- B. IF THE OPERATOR, IN RESPONSE TO THE BELL, DEPRESSES THE "WRU" KEY ON HIS CONSOLE (WHICH GENERATES THE SAME USA STANDARD CODE AS THE "ENQ" KEY), THE MCP DISPLAYS THE MCP IDENTIFICATION IN A FORMAT SIMILAR TO THE ONE DESCRIBED UNDER # 5.
- C. IF CONTROL INFORMATION IS ENTERED FROM THE REMOTE STATION, IT IS PROCESSED AND THEN MCP AGAIN INITIATES A WCRC, AS DESCRIBED UNDER #6.

7. IF THE RC PORTION CONTAINS A REQUEST TO EXECUTE A PROGRAM, WHICH THEN OPENS THE REMOTE SPO AS A FILE, THE RESPONSIBILITY TO MAINTAIN THE LINE DISCIPLINE RESTS FROM HEREON WITH THE OBJECT PROGRAM.
8. ALL INPUT FROM THE REMOTE SPO TO THE OBJECT PROGRAM (AS A RESULT OF AN OBJECT PROGRAM RC OR WCRC) IS MONITORED FOR CONTROL INFORMATION BY THE MCP.

IF CONTROL INFORMATION IS DETECTED, IT IS PROCESSED AND THE ORIGINAL OBJECT PROGRAM I/O OPERATION RE-INSTATED.

9. IF THE OBJECT PROGRAM DISCONNECTS THE REMOTE SPO THROUGH USE OF AN UNCONDITIONAL CANCEL, OR CLOSES WITH RELEASE THE FILE ASSOCIATED WITH ADAPTER N (WHICH RELEASES THE ADAPTER TO THE SYSTEM), OR THE REMOTE SPO SENDS AN END OF TRANSMISSION CHARACTER,
 - A. MCP ASSUMES THAT THE ADAPTER IS NO LONGER ATTACHED TO THE PROGRAM AND LOGS OUT THE REMOTE SPO.
 - B. MCP ENABLES ADAPTER N.
 - C. THE PROCEDURE AS DESCRIBED IN THIS SECTION FROM #3 IS REPEATED.

MESSAGE FLOW / LEASED OR DIRECT LINE / REMOTE SPO

IF THE COMMUNICATION LINE IS A LEASED OR PRIVATE LINE, THE CORRESPONDING SEQUENCE OF EVENTS IS AS FOLLOWS:

1. HALT/LOAD.
2. MCP WRITES THE MCP IDENTIFICATION TO EACH REMOTE SPO.
3. IF AN OBJECT PROGRAM DECLARED THE REMOTE SPO AS A FILE BEFORE MCP INITIATED A WCRC, IT BECOMES THE OBJECT PROGRAM-S RESPONSIBILITY TO HANDLE LINE DISCIPLINE, AS DESCRIBED IN #3 OF

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THE SWITCHED LINE NETWORK MESSAGE FLOW.

4. IF NO OBJECT PROGRAM USES ADAPTER N, MCP INITIATES A WCRC.

FROM HERE ON, THE SEQUENCE OF EVENTS IS THE SAME AS ON SWITCHED LINE NETWORKS. DUE TO THE DIFFERENCE IN THE COMMUNICATION MEDIA, THE OBJECT PROGRAM TERMINATES ITS USE OF A REMOTE SPO ONLY BY CLOSING THE FILE WITH RELEASE.

WHEN THIS OCCURS, MCP CONSIDERS THE ADAPTER NO LONGER ATTACHED TO THE PROGRAM, AND STARTS THE ABOVE DESCRIBED SEQUENCE AGAIN BY INITIATING A NEW WCRC.

COMPILATION FROM REMOTE STATIONS

SPECIAL CONSIDERATIONS ARE GIVEN TO MAKING IT CONVENIENT TO PERFORM COMPILATIONS FROM REMOTE STATIONS. ALTHOUGH THE FOLLOWING FEATURES ARE NOT ENTIRELY WITHIN THE DATA COMM MCP RESPONSIBILITY, THEY ARE A PORTION OF THE TOTAL B3500 PROGRAMMING SYSTEM.

1. EXECUTION OF THE COMPILERS AND GENERATORS CAN BE INITIATED FROM REMOTE STATIONS.
2. IT IS POSSIBLE TO SUPPLY SYMBOLIC INPUT TO THE COMPILERS AND GENERATORS THROUGH THE SYSTEM ONTO AN ON-SITE MAGNETIC TAPE OR DISK.
3. IT CAN BE SPECIFIED THAT THE COMPILER AND GENERATOR OUTPUT BE DIRECTED TO MAGNETIC TAPE (EITHER THE ENTIRE LISTING OR ONLY THE ERROR LISTING). IT CAN THEN BE ACCESSED AND DIRECTED TO THE REMOTE STATION WITH NORMAL USER PROGRAMS.

LOCAL (ON-SITE) LOG FOR REMOTE SPO DEVICES.

A LOG MAY OPTIONALLY BE KEPT ON-SITE FOR REMOTE DEVICES THAT REQUEST THIS ACTION VIA THE SYSTEM LOADER. THE ON-SITE LOG FILE MAY THEN BE PROCESSED BY THE USER TO OBTAIN THE DESIRED INFORMATION.

EACH ENTRY IN THE ON-SITE LOG CONSISTS OF

1. MESSAGE ORIGINATION TIME AND DATE.
2. CHANNEL NUMBER.
3. THE MESSAGE SENT.

NOTE: ITEMS #1 AND 2 ARE SUPPLIED BY THE DATA COMM MCP. IF THIS OPTION IS REQUESTED, THE USER MUST HAVE A 9-TRACK TAPE AVAILABLE FOR THIS FILE. (SEE APPENDIX 1. FOR FORMAT.)

B3500 CORE SHARING SYSTEM FOR REMOTE USERS

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ONE SECTION OF THE DATA COMM MCP IS A ROUTINE WHICH SUPERVISES THE TIME SHARING OF AN AREA OF CORE MEMORY AMONG A NUMBER OF REMOTE USERS. THIS CONTROL METHOD IS ESPECIALLY SUITED FOR INTERACTIVE TYPEWRITER SYSTEMS SUCH AS BOSS, QUIKTRAN, AND JOSS.

THE ELAPSED TIME BETWEEN INPUT/OUTPUT OPERATIONS AT A REMOTE STATION WHERE AN OPERATOR IS KEYING IN INFORMATION IS USUALLY SEVERAL SECONDS AND POSSIBLY SEVERAL MINUTES. WITHOUT A CORE SHARING SYSTEM, ONE REMOTE USER CAN BURDEN THE CENTRAL PROCESSOR WITH AN AREA OF CORE MEMORY FOR HIS OBJECT PROGRAM WHICH IS USED ONLY INTERMITTENTLY. TO FACILITATE ACTUAL TIME SHARING, THE MCP ALLOWS A NUMBER OF REMOTE USERS TO UTILIZE THE SAME AREA OF CORE MEMORY IF THEY CHOOSE AND IF THEY ARE EXECUTING THE SAME OBJECT PROGRAM (HEREAFTER REFERRED TO AS A SHARED PROGRAM).

IN A SHARED PROGRAM REMOTE FILES (WHICH HAVE THE SAME IDENTIFICATION AS AN ADAPTER IN THE SYSTEM LOADER WITH REMOTE SPO SPECIFICATIONS) ARE LIMITED TO A BUFFER SIZE OF 100 CHARACTERS. THIS IS BECAUSE MESSAGES TO AND FROM REMOTES ON SPO ADAPTERS ARE DIRECTED THROUGH A 100 CHARACTER NON-OVERLAYABLE DATA COMM MCP BUFFER.

EXCEPT FOR A FEW SPECIAL CONDITIONS THE MCP CONSIDERS THE SHARED PROGRAM TO BE ANOTHER OBJECT PROGRAM. MCP PROVIDES STANDARD MIX AND SCHEDULE TABLE FUNCTIONS FOR ALL SHARED PROGRAMS.

ACTIVATION OF SHARED PROGRAMS:

THE REMOTE SPO USER INITIATES THE EXECUTION OF A SHARED PROGRAM WITH THE FOLLOWING CONTROL INPUT MESSAGE:

? CC RUN <P=N>

1. MCP OBTAINS THE CORE MEMORY NEEDED TO RUN THE SHARED PROGRAM.
2. MCP RESERVES AN AREA OF DISK IN WHICH TO COPY THE USERS CORE PROGRAM AT AN APPROPRIATE TIME.
3. MCP MARKS THE SHARED PROGRAM READY TO RUN.

FOR SUBSEQUENT USERS STEP 2 ABOVE IS DONE AND THE USER IS MARKED AS WAITING HIS TURN TO PROCESS.

TERMINATION OF SHARED PROGRAMS:

THE USER MAY DS (DISCONTINUE) ONLY HIS COPY OF THE SHARED PROGRAM, THE ON-SITE COMPUTER OPERATOR MAY SELECTIVELY DS ANY PROGRAM.

CORE SHARING PHILOSOPHY:

THE DATA COM MCP CHECKS FOR PROGRAMS WAITING TO BE BROUGHT INTO CORE EACH TIME A CORE-SHARED PROGRAM INITIATES I/O ON ITS ASSOCIATED REMOTE SPO, EACH TIME SUCH AN I/O OPERATION GOES TO COMPLETION, AND EACH TIME THE N-SECOND ROUTINE IS EXECUTED. THIS MAY BE BEST ILLUSTRATED BY THE FOLLOWING EXAMPLE:

"COPY A" OF A PROGRAM IS CURRENTLY EXECUTING AND INITIATES A WRITE/READ ON A REMOTE DEVICE. ASSUMING THAT A FILL WAS NOT USED, THE PROGRAM CANNOT RUN UNTIL THE READ PORTION IS COMPLETE. THE MCP NOW LOOKS FOR

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ANOTHER COPY OF THE PROGRAM WHICH MAY BE EXECUTED WHILE "COPY A" IS WAITING. IF NO OTHER PROGRAMS ARE WAITING, NO ACTION IS TAKEN. HOWEVER, IF ANOTHER COPY OF THE PROGRAM, FOR EXAMPLE "COPY B" IS WAITING TO BE BROUGHT INTO CORE, "COPY A" WILL BE STOPPED AND WRITTEN ONTO DISK. IT WILL ALSO BE MARKED WAITING I/O AND WILL NOT BE BROUGHT INTO CORE AGAIN UNTIL THE INITIATED I/O IS COMPLETE. AS SOON AS "COPY A" IS OUT OF CORE, "COPY B" IS BROUGHT IN AND ALLOWED TO RUN.

WHEN A PROGRAM IS STOPPED, ALL I/O INITIATED FROM BUFFERS WITHIN A PROGRAM-S AREA MUST BE COMPLETE. IT SHOULD BE REMEMBERED THAT BUFFERS FOR REMOTE SPO-S AND INQUIRY DEVICES ARE NOT WITHIN A PROGRAM-S AREA. ASSUMING EQUAL PRIORITIES, THE MCP DOES NOT ALLOW ONE COPY OF A CORE-SHARED PROGRAM TO RUN FOR LONGER THAN ONE N-SECOND PERIOD IF ANOTHER COPY OF THE PROGRAM IS WAITING TO BE BROUGHT INTO CORE.

OTHER CONSIDERATIONS:

1. TO CORE SHARE ANY GIVEN PROGRAM, IT MUST PREVIOUSLY BE IN THE SYSTEM PROGRAM DIRECTORY.
2. SYNTAX WILL BE PROVIDED:
 - A. TO ASK IF A PARTICULAR PROGRAM IN THE MIX IS BEING SHARED.
 - B. TO FIND THE NUMBER OF USERS OF A PARTICULAR SHARED PROGRAM IN THE MIX.

DATA COMM OBJECT PROGRAM / MCP COMMUNICATIONS

THE OBJECT PROGRAMS WHICH OPERATE WITH THE DATA COMM MCP HAVE THE FACILITIES FOR THE FOLLOWING OPERATIONS:

- (1) ENABLE A REMOTE DEVICE,
- (2) CONDITIONAL CANCEL (CNCL),
- (3) UNCONDITIONAL CANCEL (UNCL),
- (4) READ-TO-CONTROL (RC),
- (5) WRITE-TO-CONTROL (WC),
- (6) WRITE-TO-CONTROL/READ-TO-CONTROL (WCRC),
- (7) WRITE-TO-CONTROL/READ-TRANSPARENT (WCRT),
- (8) WRITE-TRANSPARENT/READ-TO-CONTROL (WTRC),
- (9) INTERROGATE (TO OBTAIN A RESULT DESCRIPTOR),
- (10) OPEN A FILE,
- (11) CLOSE A FILE,
- (12) WAIT (SUSPEND A PROGRAM PROCESSING UNTIL I-O COMPLETE UN ENABLE OR FILL),
- (13) ACCEPT AND DISPLAY INFORMATION ON ANY SPO IN THE SYSTEM.
- (14) SEND INFORMATION TO ANOTHER PROGRAM.
- (15) RECEIVE INFORMATION FROM ANOTHER PROGRAM.
- (16) INTERROGATE ADDRESS (OBTAIN END-ADDRESS OF LAST I/O OPERATION.)

TO USE THESE DATA COMMUNICATIONS CAPABILITIES, A REMOTE DEVICE MUST BE DECLARED AS A FILE IN THE USERS PROGRAM. DATA TRANSLATION MAY BE SPECIFIED FOR THOSE CODES HANDLED BY THE MCP. THE FILE IDENTIFICATION

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SPECIFIED IN THE FILE DECLARATION MUST CONTAIN THE IDENTIFICATION ASSOCIATED WITH THE PARTICULAR ADAPTER REQUIRED. THIS ADAPTER IDENTIFICATION IS NORMALLY PROVIDED IN THE PARAMETER CARDS TO THE SYSTEM LOADER, BUT MAY BE ALTERED OR SUPPLIED BY THE COMPUTER OPERATOR.

THE FOLLOWING ABBREVIATIONS ARE USED IN THE DESCRIPTION OF THE FUNCTIONAL MACROS:

DELETE ETX FUNCTION:

1. APPLICABLE TO FILL, WC, & THE WC PORTION OF THE WCRC ON 8A1 AND IBM 1050.
2. CONTROL CODE DENOTING END-OF-TEXT IS NOT TRANSMITTED AND THE END-OF-TRANSMISSION FUNCTION IS IGNORED.

PRESET STX FUNCTION:

1. APPLICABLE TO FILL, WC, & THE WC PORTION OF THE WCRC ON 8A1 AND IBM 1050.
2. THE FIRST CODE RECEIVED OR SENT IS CONSIDERED TEXT. THE START-OF-TEXT FUNCTION IS PRESET.

INHIBIT TIME-OUT:

1. APPLICABLE TO FILL, RC, & RC PORTION OF WCRC.
2. DEVICE NORMAL TIME-OUT

TWX	20 SECONDS
B2500-B3500	1 SECOND
1050	20 SECONDS
DCT 2000	1SECOND
IBM 1030	20 SECONDS
8A1	5 & 25 SECONDS
BURROUGHS BIDS	1SECOND
9350	20 SECONDS
TOUCH-TONE	5 SECONDS

DIAL NUMBER:

1. APPLICABLE TO FILL, RC, WC, WCRC, WCRT, WTRC.
2. A DIAL NUMBER IS ACCESSED FROM THE BEGINNING OF THE BUFFER, IT MUST BE IN 4-BIT FORMAT (DIGIT) AND IS TERMINATED BY A 4-BIT CONTROL CODE (1100). THE TOTAL NUMBER OF DIGITS MUST BE EVEN AND A FILLER DIGIT OF ANY VALUE MAY BE INSERTED AFTER THE CONTROL CODE IF NECESSARY. DATA TO BE READ OR WRITTEN STARTS IN THE CHARACTER FOLLOWING THE CONTROL CODE OR FILLER DIGIT.

SYNTAX WILL BE SPECIFIED IN EACH B3500 PROGRAMMING LANGUAGE TO ACCOMPLISH FUNCTIONS DESCRIBED IN THIS DOCUMENT.

ERROR CONDITIONS AND RECOVERY

THERE ARE VARIOUS POSSIBLE ERROR CONDITIONS FOR WHICH THE OBJECT PROGRAM IS RESPONSIBLE.

IF ANY OF THESE CONDITIONS OCCUR, THE MCP RECORDS THE ERROR IN THE BUFFER STATUS FIELD (RESULT DESCRIPTOR) ASSOCIATED WITH THE PERTINENT BUFFER. THE OBJECT PROGRAM CAN NOW PERFORM AN INTERROGATE REQUEST TO OBTAIN A COPY OF THE BUFFER STATUS FIELD FOR EXAMINATION AND TAKE THE

DATA COMMUNICATIONS MCP

REQUIRED ACTION.

NOTE: IF AN ERROR USE ROUTINE IS PROVIDED THEN IT IS PERFORMED. OTHERWISE PROCESSING CONTINUES ALONG THE NORMAL PATH.

IF AN ERROR OCCURS IN THE WRITE PORTION OF A FLIP COMMAND (WCRC, WCRT, OR WTRC), THE READ IS ABORTED BY THE HARDWARE.

A TABLE IDENTIFYING THE VARIOUS ERROR CONDITIONS AS THEY APPEAR IN THE BUFFER STATUS FIELD IS GIVEN IN THE DISCUSSION OF THE INTERROGATE REQUEST.

INVALID DESCRIPTORS THAT ARE A CONSEQUENCE OF A CANCEL ON AN IDLE CHANNEL OR A CONDITIONAL CANCEL ON A BUSY CHANNEL (DATA BEING TRANSMITTED) ARE NOT MADE KNOWN TO THE OBJECT PROGRAM. THE INDICATION OF AN INVALID DESCRIPTOR IS IN THE PROCESSOR RESULT DESCRIPTOR FOR SINGLE-LINE-CONTROL AND IN THE CHANNEL RESULT DESCRIPTOR FOR MULTI-LINE-CONTROL. ONLY A COPY OF THE ADAPTER RESULT DESCRIPTOR IS AVAILABLE TO THE OBJECT PROGRAM.

THE ENABLE REQUEST.

THOSE DEVICES WHICH HAVE THE CAPABILITY TO RESPOND TO AN "ENABLE" DESCRIPTOR WITH AN INQUIRY CODE OR RING INDICATOR (FOR SWITCHED NETWORKS) MAY BE PLACED IN AN ENABLED CONDITION BY THE OBJECT PROGRAM. THIS TECHNIQUE OF DETERMINING WHEN A REMOTE DEVICE HAS INPUT TRAFFIC IS USED IN LIEU OF POLLING WHEN THE DEVICE MAY BE SO HANDLED.

AN OPTIONAL ACTION LABEL MAY BE GIVEN WITH THIS REQUEST. REFER TO THE WAIT STATEMENT FOR DETAILS.

THE ENABLE REQUEST MAY BE USED AFTER THE FILE HAS BEEN OPENED TO CAUSE THE DATA COMM MCP TO ENABLE INQUIRY FROM THE REMOTE DEVICE AND RETURN CONTROL TO THE OBJECT PROGRAM. THE WAIT REQUEST IS USED IN CONJUNCTION WITH THE ENABLE REQUEST. WHEN A WAIT REQUEST IS EXECUTED, THE MCP DOES THE FOLLOWING:

1. IF AN INQUIRY INTERRUPT HAS OCCURRED FOR ANY DEVICE THAT THE OBJECT PROGRAM HAS ENABLED, THE MCP RETURNS CONTROL TO THE ACTION LABEL GIVEN WITH THE ENABLE FOR THAT DEVICE.

2. OTHERWISE THE OBJECT PROGRAMS PROCESSING IS SUSPENDED UNTIL ONE OF THE ENABLED STATIONS SUBMITS AN INQUIRY.

THE USER MAY SPECIFY IN THE SYSTEM LOAD DECK THE PRIORITY FOR MCP INTERROGATION OF I/O CHANNEL COMPLETES. THE ENABLES WILL BE SERVICED IN THIS ORDER IF MORE THAN ONE I/O COMPLETE OCCURS AT A GIVEN TIME.

NOTE: THE ENABLE DISCONNECTS THE TELEPHONE LINE, IF EXECUTED AFTER CONNECTION HAS BEEN MADE. THE ENABLE REQUESTS AND THE ASSOCIATED WAIT REQUEST MUST BE IN THE SAME OBJECT PROGRAM SEGMENT. ALL I/O OPERATIONS EXCEPT ENABLES SHOULD BE COMPLETE BEFORE EXECUTION OF A WAIT STATEMENT.

FOR DETAILS ON ERROR PROCEDURE REFER TO "ERROR CONDITIONS & RECOVERY".

THE WAIT REQUEST.

DATA COMMUNICATIONS MCP

THE WAIT REQUEST IS USED IN CONJUNCTION WITH ENABLE AND/OR FILL REQUESTS. WHEN A WAIT REQUESTED IS EXECUTED, THE MCP DOES THE FOLLOWING:

1. IF AN INQUIRY INTERRUPT (COMPLETION OF AN ENABLE) OR A COMPLETION OF A FILL REQUEST OCCURS, THE MCP RETURNS CONTROL TO THE ACTION LABEL GIVEN WITH THE ENABLE OR FILL FOR THAT DEVICE. IF THERE IS NO ACTION LABEL GIVEN, THEN PROCESSING CONTINUES AT THE STATEMENT IMMEDIATELY AFTER THE WAIT REQUEST.
2. OTHERWISE THE OBJECT PROGRAM IS SUSPENDED UNTIL ONE OF ITS FILLS OR ENABLES REACHES COMPLETION.

THE USER MAY SPECIFY IN THE SYSTEM LOAD DECK PRIORITY FOR MCP INTER-ROGATION OF I-O CHANNEL COMPLETES. ENABLE AND FILL COMPLETES ARE SERVICED IN THIS ORDER IF MORE THAN ONE I-O COMPLETE OCCURS AT A GIVEN TIME.

NOTE: THE ENABLE AND FILL REQUESTS AND THE ASSOCIATED WAIT REQUEST MUST NOT BE IN DISJUNCTIVE SEGMENTS, THAT IS, IT IS THE USER-S RESPONSIBILITY TO SEE THAT THE SEGMENT CONTAINING THE ACTION LABEL IS PRESENT IN CORE MEMORY WHEN THE WAIT STATEMENT IS EXECUTED.

THE RC REQUEST (READ-TO-CONTROL)

REFER TO THE FILL WRITE UP FOR DETAILS OF ITS USE WITH THE RC.

1. NO RECORD AREA, 1 BUFFER.
MCP INITIATES AN RC OPERATION FOR THE BUFFER AND CONTROL IS RETURNED TO THE OBJECT PROGRAM UPON COMPLETION OF THE REQUESTED RC.
2. RECORD AREA AND 1 BUFFER (NO FILL USED WITH FILE).
MCP INITIATES AN RC OPERATION FOR THE BUFFER, UPON COMPLETION OF THE REQUESTED RC THE CONTENTS OF THE BUFFER ARE MOVED TO THE WORK AREA. CONTROL IS THEN RETURNED TO THE OBJECT PROGRAM.

NOTE: THE FIRST RC STATEMENT REFERENCING A FILE ACTUALLY REQUESTS AN RC FOR THE FIRST RECORD (THERE IS NO READ DONE AT OPEN TIME).

PARAMETERS MAY BE SUPPLIED WITH THE RC REQUEST TO INDICATE:

1. DIAL NUMBER.
 2. PRESET STX FUNCTION FOR 8A1 & IBM 1050.
 3. INHIBIT TIME-OUT.
 4. END-OF-FILE ADDRESS (NEXT STATEMENT IS ASSUMED IF AN EOF CONDITION OCCURS AND NO EOF ADDRESS IS SUPPLIED.)
- FUR DETAILS ON ERROR PROCEDURE REFER TO "ERROR CONDITIONS & RECOVERY".

DATA COMMUNICATIONS MCP

THE WC REQUEST (WRITE-TO-CONTROL)

1. NO RECORD AREA, 1 BUFFER.

MCP INITIATES A WC OPERATION FOR THE BUFFER AND CONTROL IS RETURNED TO THE OBJECT PROGRAM UPON COMPLETION OF THE REQUESTED WC.

2. RECORD AREA AND 1 BUFFER.

MCP MOVES THE CONTENTS OF THE RECORD AREA TO THE BUFFER IF IT IS AVAILABLE AND INITIATES A WC OPERATION. CONTROL IS THEN RETURNED TO THE OBJECT PROGRAM.

PARAMETERS MAY BE SUPPLIED WITH THE WC REQUEST TO INDICATE:

1. DIAL NUMBER,
2. PRESET STX FUNCTION FOR 8A1 & IBM 1050,
3. DELETE ETX FUNCTION FOR 8A1 & IBM 1050,
4. VOICE RESPONDER,

FOR DETAILS ON ERROR PROCEDURE REFER TO "ERROR CONDITIONS & RECOVERY".

THE WCRC REQUEST (WRITE-TO-CONTROL/READ-TO-CONTROL)

REFER TO THE FILL WRITE UP FOR DETAILS OF ITS USE WITH THE WCRC.

THE DATA COMM MCP WILL CONSTRUCT A WCRC DESCRIPTOR AND INITIATE THE OPERATION. THE RESPONSE FROM THE REMOTE STATION (INPUT MESSAGE) WILL BE READ INTO THE BUFFER AREA FOLLOWING THE ETX CHARACTER AT THE END OF THE WC PORTION OF THE MESSAGE (THE WC PORTION AND THE RC PORTION MAY BOTH BE VARIABLE LENGTH).

PARAMETERS MAY BE SUPPLIED WITH THE WCRC REQUEST TO INDICATE:

1. DIAL NUMBER,
2. PRESET STX FUNCTION FOR 8A1 & IBM 1050,
3. DELETE ETX FUNCTION FOR 8A1 & IBM 1050,
4. INHIBIT TIME-OUT,
5. END-OF-FILE ADDRESS (NEXT STATEMENT IS ASSUMED IF AN EOF CONDITION OCCURS AND NO EOF ADDRESS IS SUPPLIED.)
6. VOICE RESPONDER,

FOR DETAILS ON ERROR PROCEDURE REFER TO "ERROR CONDITIONS & RECOVERY".

THE WCRT REQUEST (WRITE-TO-CONTROL/READ-TRANSPARENT)

REFER TO THE FILL WRITE UP FOR DETAILS OF ITS USE WITH THE WCRT.

THE DATA COMM MCP WILL CONSTRUCT A WCRT DESCRIPTOR AND INITIATE THE OPERATION. THE RESPONSE (INPUT MESSAGE) IS READ INTO THE BUFFER AREA FOLLOWING THE ETX CHARACTER AT THE END OF THE WC PORTION OF THE MESSAGE (THE WC PORTION IS VARIABLE LENGTH AND THE RT PORTION STOPS AT THE END OF THE BUFFER).

PARAMETERS MAY BE SUPPLIED WITH THE WCRT REQUEST TO INDICATE:

1. DIAL NUMBER,
2. INHIBIT TIME-OUT,

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3. END-OF-FILE ADDRESS (NEXT STATEMENT IS ASSUMED IF AN EOF CONDITION OCCURS AND NO EOF ADDRESS IS SUPPLIED.)
FOR DETAILS ON ERROR PROCEDURE REFER TO "ERROR CONDITIONS & RECOVERY".

THE WTRC REQUEST (WRITE-TRANSPARENT/READ-TO-CONTROL)

REFER TO THE FILL WRITE UP FOR DETAILS OF ITS USE WITH THE WTRC. THE DATA COMM MCP CONSTRUCTS A WTRC DESCRIPTOR AND INITIATES THE OPERATION. THE RESPONSE (INPUT MESSAGE) IS READ INTO THE AREA IMMEDIATELY FOLLOWING THE WT PORTION AND IS TERMINATED BY AN ETX CHARACTER (THE WT PORTION IS FIXED AND THE RC PORTION IS VARIABLE). THE RC PORTION CANNOT EXCEED 100 CHARACTERS. THE LENGTH OF THE WT IS SPECIFIED IN THE FILE DECLARATION.

PARAMETERS MAY BE SUPPLIED WITH THE WTRC REQUEST TO INDICATE:

1. DIAL NUMBER.
 2. INHIBIT TIME-OUT.
 3. END-OF-FILE ADDRESS (NEXT STATEMENT IS ASSUMED IF AN EOF CONDITION OCCURS AND NO EOF ADDRESS IS SUPPLIED.)
- FOR DETAILS ON ERROR PROCEDURE REFER TO "ERROR CONDITIONS & RECOVERY".

THE FILL REQUEST

THE FILL IS USED IN CONJUNCTION WITH THE RC, WCRC, WCRT, OR WTRC REQUEST FOR FILES HAVING A RECORD AREA AND ONE BUFFER. UPON RECEIPT OF A FILL REQUEST, THE MCP INITIATES THE INDICATED I/O OPERATION FOR THE BUFFER AND RETURNS CONTROL TO OBJECT PROGRAM. NOTE THAT MCP DOES NOT WAIT FOR COMPLETION OF THE I/O OPERATION.

TO ACCESS THE "FILLED" RECORD THE OBJECT PROGRAM MUST THEN PERFORM AN I/O REQUEST THAT MATCHES THE I/O OPERATION DONE BY THE FILL. IF THE I/O OPERATION INITIATED BY THE FILL IS COMPLETE, THE I/O REQUEST MOVES THE DATA FROM THE BUFFER TO THE RECORD AREA. IF THE OPERATION IS NOT COMPLETE, THE I/O REQUEST WAITS COMPLETION BEFORE IT PERFORMS THE MOVE.

AN OPTIONAL ACTION LABEL MAY BE GIVEN WITH THIS REQUEST. REFER TO THE WAIT STATEMENT FOR DETAILS. THE FILL CANNOT BE USED IN CONJUNCTION WITH STREAM MODE.

EXAMPLE OF USING FILL WITH RC:

```
FILL
  READ INTO BUFFER
  READ (PREVIOUS FILL DONE)
  MOVE BUFFER TO RECORD AREA
  READ (NO PREVIOUS FILL)
  READ INTO BUFFER
  WAIT FOR COMPLETION OF READ
  MOVE BUFFER TO RECORD AREA
```

PARAMETERS MAY BE SUPPLIED WITH THE FILL REQUEST TO INDICATE:

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1. DIAL NUMBER,
 2. PRESET STX FUNCTION FOR 8A1 & IBM 1050.
 3. DELETE ETX FUNCTION FOR 8A1 & IBM 1050.
 4. INHIBIT TIME-OUT.
 5. TYPE OF I/O OPERATION TO BE DONE.
- FOR DETAILS ON ERROR PROCEDURE REFER TO "ERROR CONDITIONS & RECOVERY".

THE INTERROGATE REQUEST

THE INTERROGATE REQUEST PERMITS THE OBJECT PROGRAM TO OBTAIN A 16 DIGIT FIELD (WITH EACH DIGIT EQUAL TO 0 OR 1) REPRESENTING THE STATUS OF THE PERTINENT DEVICE, THE DATA COMM MCP WILL RETURN TO THE AREA DESIGNATED BY THE USER ONE DIGIT FOR EACH BIT IN THE RESULT DESCRIPTOR FOR THE LAST I/O REQUESTED, ALL ZEROS IN THE STATUS FIELD INDICATE THAT THE BUFFER IS UNAVAILABLE BECAUSE IT DOES NOT CONTAIN A MESSAGE OR I/O IS NOT COMPLETE.

SINCE ONLY A FEW OF THE MANY POSSIBLE ERROR CONDITIONS ARE HANDLED BY THE DATA COMM MCP, THIS REQUEST IS USED TO OBTAIN A COPY OF THE RESULT DESCRIPTOR SO THAT CORRECTIVE ACTION MAY BE TAKEN BY THE OBJECT PROGRAM.

THE NORMAL CONDITION AT I/O COMPLETE TIME IS FOR ONLY DIGIT #1 TO BE EQUAL TO 1, IF ANY DIGIT FROM #3 THROUGH #12 IS EQUAL TO 1, THEN THE EXCEPTION DIGIT #2 IS ALSO EQUAL TO 1.

FOLLOWING IS A BREAKDOWN BY DIGITS OF THE ADAPTER RESULT DESCRIPTOR GIVEN BY THE B3500 HARDWARE:

DIGIT	MEANING
1	OPERATION COMPLETE
2	EXCEPTION CONDITION
3	NOT READY LOCAL
4	DATA ERROR
5	ACR (ABANDON CALL RETRY, PHONE LINE DISCONNECTED)
6	CANCEL COMPLETE
7	END OF TRANSMISSION
8	ATTEMPT TO EXCEED MAXIMUM ADDRESS
9	TIME-OUT
10	MEMORY PARITY ERROR
11	WRITE ERROR
12	CARRIER LOSS
4&5	DATA LOSS
6&7	BREAK DETECTED
13	STREAM COMPLETE
14-16	RESERVED

NOTE: IF DIGIT #11 =1 THEN THE ERROR OCCURRED DURING A WRITE, IF DIGIT #11 =0 THEN THE ERROR OCCURRED DURING A READ.

THE INTERROGATE ADDRESS REQUEST.

DATA COMMUNICATIONS MCP

THE INTERROGATE ADDRESS REQUEST CAUSES THE MCP TO EXECUTE A READ-ADDRESS INSTRUCTION ON THE CHANNEL ASSOCIATED WITH A FILE, SUBTRACT THE BEGINNING ADDRESS FIELD OF THE LAST DESCRIPTOR EXECUTED ON THE CHANNEL, DIVIDE THE REMAINDER BY TWO AND STORE THE RESULTS IN A SIX DIGIT FIELD IN THE PROGRAM-S AREA. THIS REQUEST IS INTENDED TO BE USED WHEN I/O IS NOT IN PROGRESS ON THE CHANNEL.

THE INTERROGATE ADDRESS REQUEST IS USEFUL WHEN A PROGRAM IS HANDLING SEVERAL POLLED REMOTE DEVICES CONNECTED ON THE SAME LINE. AND ANY OF THEM IS TURNED OFF, THE POLL DESCRIPTOR WILL TIME OUT IF THE PROGRAM INITIATES A POLL OPERATOR ON THE SEVERAL DEVICES AND THE PROGRAM WOULD HAVE TO POLL EACH DEVICE INDIVIDUALLY TO DETERMINE WHICH ONE IS TURNED OFF. - THE CHARACTER COUNT RETURNED BY THE INTERROGATE ADDRESS REQUEST POINTS, IN THE POLL LIST, PAST THE DEVICE WHICH CAUSED THE DESCRIPTOR TO TIME OUT.

THE CNCL REQUEST (CONDITIONAL CANCEL)

THE MCP EXAMINES THE I/O QUEUE TO DETERMINE THE LOGICAL EFFECT OF A CONDITIONAL CANCEL.

1. IF I/O IS WAITING INITIATION THE LAST ENTRY IS REMOVED (IF IT IS NOT A WC) AND OPERATION COMPLETE AND CANCEL COMPLETE MARKED IN THE USERS I/O RESULT DESCRIPTOR.

2. IF NO I/O IS WAITING INITIATION AND NO I/O IS IN PROGRESS THEN NO ACTION IS TAKEN FOR THE CANCEL REQUEST.

3. IF NO I/O IS WAITING AND AN I/O OTHER THAN A WC IS IN PROGRESS THEN THE CANCEL IS IMMEDIATELY INITIATED. A PRIOR DESCRIPTOR IS CANCELED IF NO DATA TRANSMISSION IS CURRENTLY IN PROGRESS AND/OR INPUT REQUESTS FROM THE REMOTE DEVICE ARE IGNORED.

FOR DETAILS ON ERROR PROCEDURE REFER TO "ERROR CONDITIONS & RECOVERY".

THE UNCL REQUEST (UNCONDITIONAL CANCEL)

THE MCP EXAMINES THE I/O QUEUE TO DETERMINE THE LOGICAL EFFECT OF AN UNCONDITIONAL CANCEL.

1. IF I/O IS WAITING INITIATION THE LAST ENTRY IS REMOVED AND OPERATION COMPLETE AND CANCEL COMPLETE MARKED IN THE USERS I/O RESULT DESCRIPTOR.

2. IF NO I/O IS WAITING INITIATION AND NO I/O IS IN PROGRESS THEN NO ACTION IS TAKEN FOR THE CANCEL REQUEST.

3. IF NO I/O IS WAITING AND I/O IS IN PROGRESS THEN THE CANCEL IS IMMEDIATELY INITIATED. A PRIOR DESCRIPTOR IS UNCONDITIONALLY CANCELED AND/OR INPUT REQUESTS FROM THE REMOTE DEVICE ARE IGNORED.

PARAMETERS MAY BE SUPPLIED WITH THE UNCL REQUEST TO INDICATE:

1. DISCONNECT THE PHONE LINE.
2. TRANSMIT A BREAK TO THE REMOTE DEVICE (APPLICABLE ONLY TO TWX, 8A1, 9350). THIS IS TO AVOID A COLLISION ON THE LINE AND LOCKS THE KEYBOARD OR TURNS OFF A PAPER TAPE READER.

FUR DETAILS ON ERROR PROCEDURE REFER TO "ERROR CONDITIONS & RECOVERY".

THE OPEN REQUEST

ALL FILES TO BE USED BY OBJECT PROGRAMS IN THE B3500 MCP SYSTEMS MUST BE OPENED PRIOR TO THEIR USE. THE OPEN REQUEST, WHEN REFERRING TO REMOTE DEVICES, CAUSES THE DEVICE TO BE ASSIGNED TO THE OBJECT PROGRAM. THE OPEN REQUEST FURNISHES A FILE IDENTIFICATION WHICH MUST MATCH AN IDENTIFICATION OF A REMOTE ADAPTER THAT WAS IN THE SYSTEM LOADER.

IF THE FILE IDENTIFICATION FURNISHED BY THE PROGRAM IS ALL BLANKS, THE MCP ATTEMPTS TO FIND AN UNASSIGNED ADAPTER OF THE SAME HARDWARE TYPE.

IF THE FILE-IDENTIFIER IS "REMSPO", THE MCP WILL ASSIGN THE ADAPTER ASSOCIATED WITH THE REMOTE SPO THAT INITIATED THE PROGRAM. THIS IS USEFUL FOR INTERACTIVE TYPEWRITER SYSTEMS. IF THE DESIRED IDENTIFICATION OR HARDWARE TYPE IS NOT FOUND IN THE I-O ASSIGNMENT TABLE, A "NO FILE" MESSAGE IS TYPED OUT. THE OPERATOR MAY THEN RESPOND WITH THE "IL" MESSAGE TO FURNISH THE IDENTIFICATION OF THE REQUESTED REMOTE. AFTER THE REMOTE DEVICE HAS BEEN ASSIGNED TO THE OBJECT PROGRAM, CONTROL IS RETURNED TO THAT PROGRAM. THE OPEN DOES NO READING OF RECORDS FOR INPUT FILES. THE FIRST READ OF AN INPUT FILE ACCESSES THE FIRST RECORD.

PARAMETERS MAY BE SUPPLIED WITH THE OPEN REQUEST TO INDICATE:

1. TYPE OF OPEN OPERATION (INPUT, OUTPUT, INPUT/OUTPUT).

THE CLOSE REQUEST

THE CLOSE REQUEST TERMINATES THE PROCESSING OF A FILE. FILES WHICH HAVE BEEN CLOSED MAY NOT BE REFERENCED WITHIN THE OBJECT PROGRAM UNTIL THEY ARE OPENED AGAIN.

LOGIC OF THE CLOSE REQUEST:

1. THE NORMAL CLOSE REQUEST RETAINS ASSOCIATION OF THE ADAPTER TO THIS PROGRAM. WHEN THE PROGRAM IS TERMINATED THE ADAPTER IS RELEASED TO THE SYSTEM.

2. THE CLOSE WITH RELEASE REQUEST RELEASES THE ASSOCIATED REMOTE DEVICE TO THE SYSTEM.

3. THE CLOSE WITHOUT DISCONNECT REQUEST RELEASES THE REMOTE DEVICE TO THE SYSTEM, BUT DOES NOT DISCONNECT THE DIALLED LINE. *

THE ACCEPT AND DISPLAY REQUEST.

DATA COMMUNICATIONS MCP

THE ACCEPT AND DISPLAY REQUEST ALLOWS ANY PROGRAM TO COMMUNICATE WITH ANY REMOTE SPO THAT IS LOGGED IN REGARDLESS OF ITS STATUS AS A FILE. THE ALPHA MNEMONIC OF THE REMOTE SPO IS FROM 1 TO 6 CHARACTERS LONG, MUST BE FOLLOWED BY A BLANK, AND MUST BE THE SAME AS THE MNEMONIC STATED ON THE UNIT CARD. ALPHA CHANNEL AND UNIT MUST BE FOLLOWED BY A BLANK AND MUST BE IN THE FORMAT: CC/U.

IF THE NAMED DEVICE IS NOT A REMOTE OR IS A REMOTE SPO BUT IS NOT LOGGED IN, THE ACCEPT OR DISPLAY IS DIRECTED TO THE LOCAL SPO,

FORMATS OF THE CONSTRUCTS ARE: FOR ACCEPT:
 ** <P-N> = <MIX-NO> ACCEPT (19CHARACTERS)
 FOR DISPLAY: <P-N> = <MIX-NO> DATA

THE SEND AND RECEIVE REQUESTS

THE SEND AND RECEIVE REQUESTS ALLOW THE TRANSFER OF DATA (TO A MAXIMUM OF 9999 CHARACTERS) FROM ONE PROGRAM TO ANOTHER PROGRAM. BOTH PROGRAMS (THE SENDING AND THE RECEIVING) MUST BE IN THE MIX TABLE AT THE TIME OF THE EXECUTION OF THESE REQUESTS.

THE SEND REQUEST INFORMS THE DATA COMM MCP THAT THE SENDING PROGRAM IS READY TO TRANSFER DATA TO THE PROGRAM. THE RECEIVING PROGRAM INDICATES ITS READINESS TO RECEIVE THE DATA THROUGH A RECEIVE REQUEST TO THE DATA COMM MCP. AFTER THE SEND REQUEST IS ACCEPTED BY A RECEIVE REQUEST, THE DATA TRANSFER IS EXECUTED, AND BOTH PROGRAMS ARE MARKED READY TO RUN.

IF A SEND REQUEST IS RECEIVED BY THE DATA COMM MCP, BUT THE RECEIVING PROGRAM IS NOT READY TO RECEIVE, THE SENDING PROGRAM IS REINSTATED AT THE ACTION ADDRESS FURNISHED IN THE SEND REQUEST. IF NO ACTION ADDRESS IS SPECIFIED, THE SENDING PROGRAM IS FORCED TO WAIT UNTIL THE DATA IS TRANSFERRED.

IF A RECEIVE REQUEST ARRIVES TO THE DATA COMM MCP, BUT NO SEND REQUEST WAS PREVIOUSLY RECEIVED, THE RECEIVING PROGRAM WILL BE REINSTATED AT THE ACTION LABEL ADDRESS SPECIFIED IN THE RECEIVE REQUEST.

STATION-TO-STATION CAPABILITY FOR REMOTE SPO

THIS KEYBOARD FUNCTION IS USED TO DIRECT A MESSAGE:

1. FROM THE COMPUTER (ON-SITE) SPO TO A REMOTE SPO.
2. FROM A REMOTE SPO TO THE COMPUTER SPO.
3. FROM A REMOTE SPO TO ANOTHER REMOTE SPO.

THIS REQUEST CAN BE USED TO ROUTE MESSAGE ONLY TO DEVICES WHICH HAVE BEEN DESIGNATED IN THE SYSTEM LOADER AS HAVING SPO CAPABILITIES AND WHICH ARE CURRENTLY ON LINE.

KEYBOARD INPUT MESSAGES

MESSAGES NOTED ARE IN ADDITION TO THOSE CAPABILITIES DEFINED FOR THE

STANDARD MCP VERSIONS. CERTAIN MESSAGES, HOWEVER, MAY NOT BE VALID WHEN ORIGINATED BY THE REMOTE SPO OPERATOR. INCLUDED ARE THOSE WHICH AFFECT SYSTEM STATUS,

INPUT MESSAGES WHICH MAY BE USED WITHOUT RESTRICTIONS ARE:

BU			
CC	CD		
HM			
LD	LI	LO	
MX			
OL			
SL	SM	SS	
TO			
WC	WD	WS	WT

PD MAY BE USED, BUT NOT TO LIST ALL FILES IN THE DIRECTORY.

THE MESSAGES LISTED BELOW MAY BE USED FROM THE REMOTE SPO ONLY IF THE <MIX NUMBER> REFERS TO A PROGRAM WHICH WAS ORIGINATED FROM THE STATION WHICH ALSO ORIGINATES THE MESSAGE. THE MESSAGES MARKED WITH ONE ASTERISK MAY BE USED ONLY IF THE PROGRAM AFFECTED IS NOT CORE-SHARED. THE MESSAGES MARKED WITH TWO ASTERISKS MAY BE USED ONLY WHEN THE AFFECTED PROGRAM IS IN CORE.

AX		
BK**		
DS		
IN**		
OK	OT**	OU
RM*	RS	
TI		
WY*		

THE MESSAGES LISTED BELOW ARE PROHIBITED TO THE REMOTE SPO USERS:

BR			
CK	CL	CN	CP
DL	DP	DT	
ED	EX		
FM	FR		
GU	GT		
IL			
KA	KP	KX	
LN			
NT			
OF			
PB	PD	PG	PR
RB	RD	RN	RO
SI	SO	SP	ST
			SV
			RY

DATA COMMUNICATIONS MCP

TL	TR
UL	
XD	XM

THE BO MESSAGE

IN ORDER TO KEEP USER AND AUTHENTICATION CODES SECRET, A REMOTE SPO OPERATOR MUST KEEP UNAUTHORIZED PERSONS FROM SEEING HIS TYPED USER AND AUTHENTICATION CODES AS THEY ARE TYPED IN AS A PART OF THE LOG-IN PROCEDURE.

THE BLACK-OUT FEATURE IS INVOKED BY TYPING IN THE BO MESSAGE BEFORE LOGGING-IN. THIS MESSAGE WILL CAUSE THE MCP TO BLACK OUT A LINE ON THE REMOTE DEVICE AND LEAVE THE CARRIAGE POSITIONED AT THE BEGINNING OF THE BLACKED-OUT LINE.

THE FORMAT FOR THE BO MESSAGE IS AS FOLLOWS: AD REMOT1

? BO

THE BO MESSAGE IS THE ONLY PERMISSIBLE MESSAGE FROM A REMOTE STATION PRIOR TO THE TIME WHEN THE REMOTE OPERATOR LOGS IN ON THE STATION.

THE LI MESSAGE

THE LI MESSAGE IS USED BY REMOTE OPERATORS ON STATIONS WHICH HAVE BEEN DECLARED TO HAVE SPO CAPABILITIES TO LOG IN TO THE DATA COMMUNICATIONS MCP. SEE SECTION OF THIS MANUAL ON SECURITY SYSTEM FOR USE AND DEFINITION OF <USER CODE> AND <AUTHENTICATION CODE>. IF THE SECURITY SYSTEM IS NOT BEING USED BY THE SYSTEM, ANY VALID IDENTIFIER MAY BE USED AS A USER CODE, AND THE AUTHENTICATION CODE MAY BE NULL.

THE LI MESSAGE MUST HAVE THE FOLLOWING FORMAT

? LI : <USER CODE> ; <AUTHENTICATION CODE>

OR

? LI : <IDENTIFIER>

EXAMPLES

? LI : STA1 : M15X

? LI : TERM1

THE LO MESSAGE.

THE LO MESSAGE IS USED BY REMOTE OPERATORS ON STATIONS WHICH HAVE REMOTE SPO CAPABILITIES TO LOGOUT TO THE DATA COMMUNICATION MCP AND DISCONNECT THE LINE.

THE FORMAT OF THE MESSAGE IS:

DATA COMMUNICATIONS MCP

? LO

THE HM MESSAGE

THE "HALT MESSAGE" IS USED BY REMOTE SPO OPERATORS TO INDICATE TO THE DATA COMMUNICATION MCP THAT SYSTEM MESSAGES ARE NOT TO BE SENT TO THAT DEVICE.

FORMAT FOR "HALT MESSAGE":

? HM

THE SI MESSAGE

THE "SET ID" MESSAGE IS USED BY THE CONSOLE OPERATOR TO RESET THE IDENTIFICATION OF A REMOTE SPO ADAPTER.

FORMAT FOR THE SI MESSAGE:

SI <UNIT SPECIFIER> (TO) <NEW IDENTIFICATION>

EXAMPLE:

SI 11/0 TO REMOT2

SI REMOT1 TO REMOT2

THE UNIT SPECIFIER MAY BE CHANNEL/UNIT OR THE PRESENT STATION-ID. THIS CHANGE IN ID LASTS ONLY TO THE NEXT HALT/LOAD. NOTE: THE "TO" IS OPTIONAL.

THE SM MESSAGE

THE SM MESSAGE IS USED BY REMOTE SPO OPERATORS TO INDICATE TO THE DATA COMMUNICATION MCP THAT SYSTEM MESSAGES ARE TO BE ROUTED TO THAT DEVICE.

FORMAT FOR THE SM MESSAGE:

? SM

THE SS MESSAGE

THE STATION-TO-STATION MESSAGE IS USED IN THE DATA COMM MCP TO DIRECT MESSAGES:

1. FROM THE COMPUTER (ON-SITE) SPO TO A REMOTE SPO.
2. FROM A REMOTE SPO TO ANOTHER REMOTE SPO.
3. FROM A REMOTE SPO TO THE COMPUTER SPO.

THE SPECIFIED REMOTE SPO MUST CURRENTLY BE ON-LINE. FOR MESSAGES SENT TO A REMOTE SPO THE <UNIT SPECIFIER> MUST BE CHANNEL/UNIT OR THE STATION IDENTIFICATION (MNEMONIC). FOR MESSAGES SENT TO THE COMPUTER SPO THE <UNIT SPECIFIER> MAY BE "SPO" OR LEFT OUT ENTIRELY.

FORMAT FOR THE SS MESSAGE:

? SS <UNIT SPECIFIER> : <TEXT>

EXAMPLE:

INPUT AT REMOTE SPO (CHANNEL 3, UNIT 0):

? SS SPO: PLEASE PURGE A TAPE

DATA COMMUNICATIONS MCP

OUTPUT AT COMPUTER SPO:
 (3/0): PLEASE PURGE A TAPE

THE SL MESSAGE.

THE SPO LIST MESSAGE RETURNS A LIST OF REMOTE SPO-S DEFINED IN THE SYSTEM.

FORMAT FOR THE ANSWER:

R.SPO=CC/O <STATION-ID> LOG-IN= < 0 OR 1 > <D OR SPACE >
 <ADAPTER TYPE>

WHERE CC = CHANNEL AND D = DIALED LINE.

REMOTE PRINTING OF PRINTER BACK-UP

GENERAL

THE DATA COMM MCP-S HAVE THE CAPABILITY TO PRINT A PRINTER BACK-UP TAPE TO SELECTED REMOTE DEVICES. TAPES USED AS INPUT AT THE COMPUTER SITE MUST BE IN PRINTER BACKUP FORMAT AS IS PREPARED BY THE MCPS. FORMAT OF THE KEYBOARD INPUT MESSAGE IS:

PB <DEVICE TYPE>

WHERE THE <DEVICE TYPE> IS THE PERIPHERAL UNIT TYPE CODE, (SEE APPENDIX 5.)

PRINTER BACKUP TO REMOTE IBM 1050 PRINTER

THE PROGRAM TO PRINT THE PRINTER BACK-UP TAPE WILL DISPLAY A MESSAGE ON THE ON-SITE SPO REQUESTING THAT THE 1050 STATION ID BE ENTERED VIA AN AX TYPE KEYBOARD INPUT MESSAGE.

THE MESSAGE

NO FILE <F-ID> <J-S>

WILL BE DISPLAYED ON THE ON-SITE SPO SO THAT THE DESIRED PRINTER BACK-UP TAPE UNIT DESIGNATION MAY BE ENTERED VIA THE KEYBOARD INPUT MESSAGE

<MIX-INDEX> IL <UNIT-SPECIFIER>

PRINTER BACKUP TO THE UNIVAC DCT 2000

TO BE DEFINED.

SYSTEMS OUTPUT MESSAGES,

** STATION <UNIT SPECIFIER> : NULL VERIFICATION

THE OCCURRENCE OF THIS MESSAGE DENOTES THAT A USER ATTEMPTED TO LOG-IN AT A REMOTE STATION AND NO VERIFICATION COULD BE MADE WITH THE LOG-IN CODES AND THE LIST OF ALLOWABLE USERS.

** INV MSG -- STATION NOT LOGGED-IN
-- --- -- ---

THIS MESSAGE IS ROUTED TO A REMOTE STATION WHICH HAS SENT A MESSAGE TO THE SYSTEM WITHOUT LOGGING-IN OR WITH AN ILLEGAL LOG-IN FORMAT.

MICR MCP

MICR VERSIONS OF THE B2500/B3500 MCP SYSTEMS

MICR OBJECT PROGRAM/MCP COMMUNICATES

THE OBJECT PROGRAMS WHICH OPERATE WITH THE MICR MCP HAVE THE FACILITIES FOR THE FOLLOWING OPERATIONS IN ADDITION TO THE STANDARD MCP COMMUNICATES:

1) START FLOW-READ (FLOW). START THE FEEDER AND READ THE NEXT DOCUMENT. IF FORMATTING IS NOT SPECIFIED, DATA IS STORED CONTINUOUSLY. IF FORMATTING IS SPECIFIED, DATA IS STORED CONTINUOUSLY UNTIL THE FIRST TRANSIT SYMBOL IS RECEIVED. BLANKS ARE THEN STORED UNTIL THE 40TH CHARACTER LOCATION IS REACHED AT WHICH POINT THE TRANSIT SYMBOL AND REMAINING DATA IS STORED, BLANKS ARE STORED, IN BOTH MODES, FOLLOWING THE LAST CHARACTER READ. WHEN FORMATTING IS SPECIFIED, AUTOMATIC VALIDITY CHECKING OF THE AMOUNT AND TRANSIT FIELDS IS PERFORMED. THE AMOUNT FIELD VALIDITY VERIFICATION INCLUDES CHECKING:

- A) THE 1ST AND 12TH CHARACTERS STORED FOR AMOUNT SYMBOLS.
- B) THE INTERVENING 10 CHARACTERS FOR DECIMAL DIGITS.

VALIDITY VERIFICATION OF THE TRANSIT FIELD INCLUDES CHECKING:

- A) THE 40TH AND 50TH CHARACTERS STORED FOR TRANSIT SYMBOLS.
- B) THE INTERVENING 9 CHARACTERS FOR THE FOLLOWING: 4 DECIMAL DIGITS-HYPHEN SYMBOL-4 DECIMAL DIGITS.

NOTE: CANADIAN CHECKS ARE REPORTED AS A VALIDITY ERROR.

2) READ (SRTR). THIS COMMUNICATE IS USED FOR BOTH FLOW AND DEMAND MODE OPERATIONS. IN DEMAND MODE, THE NEXT ITEM IS FEED AND READ, IN FLOW MODE, THE NEXT ITEM HAS BEEN FED BY THE FLOW COMMUNICATE SO ONLY THE READ TAKES PLACE. FORMATTING AND VALIDITY CHECKING ARE ACCOMPLISHED AS DESCRIBED UNDER FLOW.

3) POCKET SELECT (PCKT). POCKET SELECT THE LAST ITEM READ TO THE

POCKET SPECIFIED.

- 4) POCKET LIGHT (LGHT). LIGHT THE POCKET LIGHT AS SPECIFIED. FLOW MUST BE STOPPED AND ALL ITEMS POCKET SELECTED. THE POCKET LIGHT IS EXTINGUISHED BY THE SUCCESSFUL EXECUTION OF THE NEXT SORTER- READER REQUEST.
- 5) BATCH COUNT (CWNT). THE MECHANICAL BATCH COUNTER IN THE SORTER IS ADVANCED BY ONE. THIS REQUEST CAN ONLY BE INITIATED AFTER FLOW IS STOPPED AND ALL ITEMS POCKET SELECTED.
- 6) LISTER PRINT (LSTR). PRINT A 44 CHARACTER RECORD OF WHICH THE FIRST 22 CHARACTERS ARE PRINTED ON BOTH THE MASTER TAPE OF UNIT ONE AND THE DESIGNATED DETAIL TAPE. THE SECOND 22 CHARACTERS ARE PRINTED ON AN ADDITIONAL DETAIL TAPE AS SPECIFIED.
- 7) LISTER SPACE (SPAS). SPACE LISTER TAPES AS DESIGNATED.
- 8) LISTER SKIP (SKIP). SKIP DESIGNATED LISTER TAPES 2 1/2 INCHES.
- 9) LISTER SLEW (SLEW). SLEW DESIGNATED LISTER TAPES 10 INCHES.
- 10) LISTER ENABLE (ABLE). SUSPEND THE PROGRAM UNTIL THE LISTER NOT READY CONDITION (NOT READY OR END OF PAPER) HAS BEEN CORRECTED.

COMBINED CAPABILITIES MCP

COMBINED CAPABILITIES VERSIONS OF THE B2500/B3500 MCP SYSTEMS

THESE MCP SYSTEMS COMBINE THE CAPABILITIES OF THE STANDARD, THE DATA COMMUNICATIONS, AND THE MICR MCPS. THESE SYSTEMS ARE DESIGNED TO PROVIDE LIMITED MICR USAGE OF THE SYSTEM (IN FLOW MODE) WITH THE STANDARD AND DATA COMMUNICATIONS HANDLING. OF COURSE, IF SYSTEMS UTILIZATION IS SUFFICIENTLY HEAVY PROCESSING NON-MICR PROGRAMS AND I/O OPERATIONS AT THE TIME A SORTER IS IN FLOW MODE OPERATION, THE PERCENTAGE OF READ AND POCKET SELECTION FAULTS WILL INCREASE.

IN THESE VERSIONS OF THE MCP SYSTEMS, BOTH THE NON-OVERLAYABLE PROCEDURES FROM THE DATA COMMUNICATIONS HANDLING AND THE MICR HANDLING ARE IN MCP RESIDENT CORE.

MCP TABLES AND FORMATS

APPENDIX 1.

CONTENTS AND FORMATS OF TABLES
DESCRIBED IN THE
"MCP - GENERAL DESCRIPTION",
"THE MCP-S INFORMATION STORAGE SYSTEM" SECTION.

PART 1: MCP-S OWN TABLES.
PART 2: TABLES MAINTAINED IN THE OBJECT PROGRAM.

MCP TABLES AND FORMATS

PART 1: MCP-S OWN TABLES.

JOB REFERENCE TABLE (JRT).

LABEL	SIZE DIGITS	BITS	CONTENTS
JRT-ID	12		PROGRAM IDENTIFIER (ALPHANUM.)
JRT-SI	2		SUPPL.ID.
JRT-PR	1		PRIORITY
JR-GN		1	1 = PROGRAM IS A GENERATOR
		1	1 = MCP NORMAL STATE PROGRAM
		1	1 = LABEL EQUATION INFORMATION SUPPLIED
		1	NOT USED
JRT-RN	2		"RUN-NUMBER"
JR-COR	6		CORE REQUIRED
JR-PPL	3		PRECEDENCE LINK
JR-PSC	1		PROGRAM STATUS CODE

0 = NOT GENERATED
 1 = READY TO RUN, NO MIX MADE
 2 = MIX MADE, = ACTIVE
 9 = TERMINATED

JR-EXC	1		EXECUTE OPTIONS
--------	---	--	-----------------

0 = EXECUTE ONLY
 1 = COMPILE AND GO
 2 = COMPILE FOR SYNTAX
 3 = COMPILE FOR LIBRARY
 4 = COMPILE AND GO EXECUTION
 5 = "RUN" REQUEST
 7 = COMPILE TO LIBRARY AND
 EXECUTE "SAVE".

JR-VAD	6		IF JR-VLF SET = VALUE ADDRESS
JR-VLF		1	RESERVED
		1	RESERVED
		1	IF SET = "INSERT" TO PROCESS
		1	VALUE CARD (MCP NORMAL STATE PROG. ONLY)
JR-VAL	6		VALUE
JR-CHG	6		USER CHARGE NUMBER
JR-MCP	2		NUMBER OF DISK FILES IN PROGRAM

MCP TABLES AND FORMATS

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JR-LEA      8      LOG ENTRY ADDRESS
JR-REQ      4      IOAT INDEX FOR REQUESTOR (IF REMOTE)
JR-CID     12      IDENTIFIER OF PROGRAM GENERATOR IF GENERATOR RUN
JR-HED      8      HEADER ADDRESS
JRT-AF      1      SET = MEMORY DUMP REQUIRED AT EOJ
             3      RESERVED
             2      UNASSIGNED
JRCFIX      6      IOAT INDEX FOR CODE FILE (USED BY TERMINATE)
             6      (USED FOR SCHEDULE TIME UNTIL ROJ)
JR-FIA      8      FIRST INSTR. FOR MCP NORMAL PROG.=S
JR-FPF      1      OR DISK ADDR. FOR FILE-PARAM. BLOCK
             100     FILE PARAM. BLOCK FLAG
             100     UNASSIGNED

```

THE MIX TABLE (MIX)

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-----
LABEL          SIZE          CONTENTS
              DIGITS      BITS

MIX-WI          1          1 = OPEN, WAITING FOR HDWR
                1          1 = STOPPING FOR SORT ROLL OUT
                1          IF "OPEN WAITING FOR HARDWARE" BIT SET, THEN
                1          1 = WAITING I-O, ELSE
                1          1 = WAITING CORE-TO-CORE TRANSFER.
                1          IF "OPEN WAITING FOR HARDWARE" BIT SET, THEN
                1          1 = WAITING FOR SCRATCH FILE,
                1          0 = WAITING FOR INPUT FILE.
MIX-HW          2          HARDWARE TYPE WAITING FOR OR TYPE TERMINATE CODE
MIX-A           1          0 =RUN IN NORMAL, 1 = RUN IN CONTROL STATE
                1          SUSPENSION CODE, 1 =SUSPENDED
                1          1 = READY FOR NORMAL REINSTATE
                1          1 = READY FOR CONTROL STATE INITIATION
MIX-B           1          1 = WAITING FOR I-O COMPLETE
                1          1 = WAITING FOR OVERLAY PROCESSING
                1          1 = WAITING FOR N-SECOND RUNNING
                1          1 = WAITING FOR KEYBOARD RUNNING
MIX-C           1          1 = PROG. SLEEPING (IN CORE)
                1          1 = WAITING REMOTE SPO ACCEPT
                1          1 = REMOVE PROG. FROM DISK AT EOJ
                1          PROGRAM STOPPED BY HIHO ROUTINE
MIX-R           6          PROGRAM ADDRESS REGISTER SETTING
MIX-BA          3          BASE REGISTER
MIX-LM          3          LIMIT REGISTER
MIX-CT          1          ASCII-EBCDIC TOGGLE

```

MCP TABLES AND FORMATS

			1 = ASCII
			0 = EBCDIC
		1	OVERFLOW TOGGLE
		1	COMPARISON TOGGLE
		1	COMPARISON TOGGLE
MIX-D		1	1 = PROG. IS A COMPILER
		1	1 = "USE" PROCEDURE IN PROGRESS
		1	1 = CORE SHARED PROGRAM
		1	1 = PROGRAM IS A GENERATOR
MIX-PI	8		TIME LAST REINSTATED
MIX-TM	8		ACCUMULATED PROCESSOR TIME
MIX-ID	12		PROGRAM ID. (ALPHANUM.)
MIX-CA	3		CORE ASSIGNED TO PROG. IN K DIGITS
MIX-JR	3		MIX LINK TO JRT
MIX-LQ		1	1 = MEM. DUMP REQUIRED AT EOJ
		1	1 = TEST
		1	1 = PROCESSOR TIME LIMIT
		1	1 = LABEL EQUATION FLAG
MIX-SR		1	1 = SORT RUNNING ON TOP OF PROGRAM
		1	UNASSIGNED
		1	1 = WAITING IOC OF AUDIT RECORD
		1	1 = WAITING AUDIT TRAIL READY TO RECEIVE.
MIX-PB	8		ABSOLUTE DISK ADDRESS OF PROG.PARAM BLOCK
MIX-RQ	4		IDAT INDEX OF PROGRAM REQUESTOR
MIX-NO	2		MIX NUMBER
MIX-UP	5		ACTUAL TIME TO RESUME SLEEPING PROG.
MIX-OK		1	1 = NO FILE ON DISK CONDITION
		1	1 = NO USER DISK CONDITION
		1	1 = DUPL. LIBRARY CONDITION
		1	1 = WAITING FOR DUPL. FILE
MIX-UC	1		CONDITION TOGGLES FOR "USE" PROCEDURES
MIX-DC		1	1 = WAIT STATEMENT IN PROCESS
		1	"SLEEP" OVERLAPPING MIDNIGHT
		1	USED BY HIHO ROUTINE
		1	USED BY CONTROL SEGMENT SDHIHO
		1	CLOSE IN PROCESS
MIX-TR		1	SET = TERMINATE RUNNING THIS JOB
		1	SET = PRIORITY PUSH-OUT RUNNING
		1	SET = MCP SEGM. RUNNING AS NORMAL PROG.
		1	SET = TERMINATE CLOSE LOCK FLAG (LIB)
MIX-BC	1		IF 1 = OPERATOR STOPPED
			IF 2 = BREAKOUT IN PROCESS
			IF 3 = TERMINATE CORE PUSH DOWN
			IF 8 = STOPPED FOR PRIORITY RUN
MIX-MF	12		PROGRAM MULTI-FILE ID. (ALPHANUM.)
			THE LOW ORDER SIX DIGITS ARE USED BY THE DATA
			COMM. MCP WAIT FUNCTION FOR IDAT INDEX
			STORAGE.
MIX-ST	8		STARTING ADDRESS ON DISK FOR STOPPED PROGRAM
			OR IF MIX-DC INDICATES "CLOSE IN PROCESS"
			ZATX FOR FILE BEING CLOSED.

 FOLLOWING APPLICABLE ONLY TO DATA COM, "RUN" MIX:

MIX-WC	2		# OF NON-CORE SHARED IO-S WAITING FOR I-O COMPLETE BEFORE THIS PROGR. IS SWAPPED FROM CORE TO DISK
MIX-DA	8		BACKUP DISK ADDR. FOR CORE SHARE PROG. COPY.
MIX-XX		1	UNASSIGNED
		1	1 = C,S. BUFFER IOC FOR PROG. NOT IN CORE
		1	1 = C,S. I-O IN PROG.
		1	UNASSIGNED
MIX-RN	2		RUN COPY # "RUN XXX COPY = 3"
	3		UNASSIGNED.

INPUT-OUTPUT ASSIGNMENT TABLE (IOAT).

LABEL	SIZE		CONTENTS
	DIGITS	BITS	
	1		RESERVED
IOCHAN	2		PRIMARY CHANNEL
IOHDWR	2		PERIPHERAL UNIT HARDWARE TYPE
IOUNIT	1		UNIT NUMBER
IO-QTX	4		IOQT INDEX WHEN I-O IN PROCESS
IO-FIB	6		ABSOLUTE ADDRESS OF NORMAL STATE FIB
IO-G		1	SET = 9-TRACK, RESET = 7 TRACK
		1	SET = NORMAL STATE ENABLE OR FILL INITIATED
		1	SET = NORMAL STATE ENABLE OR FILL COMPLETED
		1	SET = PRINT SYSTEM MESSAGES ON REMOTE SPO
IO-H		1	TERMINATE CLOSE FLAG
		1	SECOND LABEL TRY FLAG
		1	SET = RETAINED OMITTED LABEL
		1	SET = SORTER FLOW, RESET = SORTER DEMAND
IO-TMP		1	SET = TERMINATE LOCK REQUEST
		1	WAITING FOR NRDY BIT
		1	TO BE SAVED FLAG
		1	SET = TEMPORARY DISK FLAG
IO-B		1	SET = UNIT SAVED
		1	HALT-LOAD BIT
		1	SET = READ OR RESET=WRITE
		1	SET=OPEN, RESET=CLOSED

MCP TABLES AND FORMATS

IO-C		1	SET = LABEL SENSED
		1	SET = MAG. TAPE REWINDING
		1	NOT READY = READY INDICATOR
		1	SET = END OF FILE SENSED
IO-BAS	3		PROGRAM BASE REGISTER
IO-ID	12		FILE IDENTIFIER (ALPHANUM.)
IOSTAT		1	AVAILABILITY: 1 = AVAIL., 0 = NON AVAIL.
		1	1 = PRINTER BACK-UP TAPE
		1	PSEUDO-READER USE
		1	I-O IN PROGRESS ON THIS UNIT,
IO-CTR	1		I-O ERROR RETRY FLAG AND COUNT
IO-CAB		1	SET = RESTARTED FILE
		1	SET = PSEUDO NOT READY
		1	FLAGS FOR DC LOCAL TAPE LOG
		1	(01 = LOG OUTPUT ONLY) (WC)
IO-TRV		1	SET = UNIT LOCKED
		1	SET = READ WITH TRANSLATION
		1	SET = PSEUDO CLOSE REQUEST FINISHED
		1	SET = PSEUDO CLOSE REQUESTED
IO-ECT	2		ERROR COUNT
IDMIX	5		MIX NUMBER OF USER
IO-WIO		1	CLOSE REQUEST FLAG
		1	CLOSED BY EXCEPT
		1	WAITING FILE POSITION
		1	PROG. WAITING I-O COMPL. ON THIS FILE
IO-EX	2		INDEX TO IOAT EXTENSION
IO-BCK	6		BLK CTR FOR CARDS OR TAPE OR
			ACTION LABEL FOR DATA COMM DEVICE
IOMFID	12		MULTI-FILE IDENTIFIER (ALPHANUM.)
IOREEL	3		REEL NUMBER
IO-UST	3		STATUS LAST N-SECOND RUN
IO-DEN	1		DENSITY;
			1 = 800
			3 = 556
			5 = 200
			7 = 1600
IO-DSY	1		DENSITY AND PARITY NORMAL = 9 = UNIT SETTING,
			JDD
IO-F		1	RESET = WRITE RING
		1	NON-TRN BIT FOR N-SECOND
		1	SET = REMOTE SPO HANDLING REQUESTED
		1	SET = REMOTE DEVICE
IO-DC		1	DATA COMM: 1 = DIALED LINES; 0 = LEASED LINES;
		1	LOG IN BIT FOR DIALED REMOTE SPO (1=LOG)
		1	1 = KEEP REM,KBD. MESSAGES ON LOCAL TAPE LOG
		1	WTG FOR RW SIGNAL FROM IO-ERR.
IO-FLG		1	1 = INQ DEVICE (OLB & CORE SHARE)
		1	1 = STREAM MODE I-O IN PROGRESS
			OR PBT PRINTOUT IN PROGRESS
		1	1 = INCORRECT LENGTH TAPE RECORD
		1	TAPE READ OPERATOR CHANGED IF 1

MCP TABLES AND FORMATS

IO-LAB		TAPE LABELLING CONVENTIONS:
	1	IF 0 = BURROUGHS LABEL
		IF 1 = ASA OR INST. LABELS
	1	IF 0 = ASA LABELS
		IF 1 = INSTALLATION LABELS
	1	IF 1 = PURGE AFTER REWINDING
	1	RESERVED

DIGITS 48-76 REDEFINED AND USED BY PSEUDO-READERS:

PR-DAD	8	DISK ADDR. OF NEXT CARD
PR-BEF	3	CARDS LEFT IN DISK AREA MINUS ONE
PR-ARC	2	AREA COUNTER
PR-FHA	4	HIGH ORDER DIGITS OF FILE HEADER ADDRESS
	7	UNASSIGNED

THE INPUT-OUTPUT QUEUE TABLE (IOQT).

PART 1. ONE ENTRY FOR EACH CHANNEL:

LABEL	SIZE		CONTENTS
	DIGITS	BITS	
Q-NEXT	4		LINK TO NEXT REQUEST FOR THIS CHANNEL
Q-STAT		1	MLC CHANNEL
		1	DISK CHANNEL
		1	NOT LAST CHANNEL OF EXCHANGE
		1	1 = CHANNEL ON SYSTEM AVAILABLE
	1	UNASSIGNED	
Q-INPR	4		LINK TO PART 2 OF IN-PROCESS I-O CURRENTLY ON THIS CHANNEL

PART 2. ONE ENTRY FOR EACH REQUEST.

LABEL	SIZE		CONTENTS
	DIGITS	BITS	

MCP TABLES AND FORMATS

Q-LINK	4	Q-TABLE LINK
Q-MIX	5	MIX INDEX OF REQUESTOR
Q-UNIT	1	UNIT-NUMBER
Q-RSLT	6	ADDRESS OF RESULT DESCR. (HIGH)
Q-IDAT	6	IOAT LINK FOR THIS REQUEST
QE-TYP		1 SET = CONTROL STATE I-O REQUEST
		1 SET = LOCAL SPO RESPONSE TO INPUT REQ.
		1 SET = LOCAL SPO "ENABLE" REQUEST
		1 SET = CLOSE REQUEST ENTRY
Q-ST2		1 SET = LOCAL SPO OUTPUT QUEUE
		1 SET = OVERLAY I-O
		1 SET = DC REMOTE
		1 SET = SPO IN QUEUE (Q-RSLT = INDEX)
Q-ST3		1 SET = MULTI-FILE REEL BEING SEARCHED
		1 SET = DO NOT "RAD" ON I-O COMPLETE
		1 SET = MICR REQUEST
		1 SET = DESCRIPTOR HAS ABSOLUTE ADDRESS
Q-SPXF		2 UNASSIGNED
		1 SET = EXIT WITHOUT ERROR CHECKING
		1 SET = EXIT AFTER NORMAL PROCESSING TO SW
Q-SPXT	2	SWITCH VALUE FOR SPECIAL EXITS
Q-PARM	2	TYPE DATA COMM I-O REQ.
		00 = NORMAL STATE RC
		03 = NORMAL STATE WCRC
		32 = CORE SHARE WC
		34 = CORE SHARE WCRT
		36 = CORE SHARE ENABLE
		43 = MCP IO WCRC <BELL> REMOTE SPO
		53 = MCP IO WCRC <MCP-ID> DIALED SPO
Q-CHAN	2	CHAN, ON WHICH I-O WAS INITIATED
	1380	UNASSIGNED

AVAILABLE SPACE (DISK) LIST.

LENGTH OF EACH LIST-SEGMENT: 200 DIGITS.

FIRST ENTRY: 8 DIGITS LINK TO NEXT LIST-SEGMENT

12 ENTRIES IN THE
FOLLOWING FORMAT: 8 DIGITS: DISK ADDRESS
8 DIGITS: LENGTH OF FIELD

MCP TABLES AND FORMATS

DISK DIRECTORY HEADER.

LENGTH OF THE DISK DIRECTORY HEADER: 200 DIGITS, CONTENTS ARE :

SIZE	CONTENTS
8 DIGITS	LINK TO NEXT DIRECTORY HEADER IN USER'S DISK.

16 FILE IDENTIFIERS:

12 DIGITS	FILE IDENTIFIER(ALPHANUM.)
-----------	----------------------------

DISK FILE HEADER. (LABEL OF RECORD: DFHDR)

THERE IS ONE HEADER PER FILE - KEPT IN CORE BEYOND THE NORMAL STATE LIMIT REGISTERS.

LABEL	SIZE IN DIGITS	CONTENTS
DFRSZ	5	LOGICAL RECORD SIZE
DFRPB	3	NUMBER OF LOGICAL RECORDS PER BLOCK
DFNMAR	2	NUMBER OF AREAS
DFEOPF	8	EOF POINTER
DFSEC	12	DISK FILE SECURITY I.D. (ALPHA)
DFSCTP	1	DISK FILE SECURITY TYPE
	3	UNASSIGNED
DFDSA	6	NUMBER OF SEGMENTS PER AREA
DFAR01	8	AREA # 1 ADDRESS
	152	ADDRESSES OF AREAS FROM # 2 THROUGH # 20

DFSEC, DFSCTP, AND THE FOLLOWING 3 UNASSIGNED DIGITS ARE REDEFINED IN CORE AS FOLLOWS: *

DFBEDF	8	BLOCK EOF POINTER	*
DFBPA	6	BLOCKS PER AREA COUNT	*
DFARCT	2	AREA NUMBER COUNTER	*

MCP TABLES AND FORMATS

CONTROL PROGRAM SEGMENT DICTIONARY. (LABEL: S-DICT)

THE SEGMENT DICTIONARY IS COMPOSED OF TWO PARTS WITH CORRESPONDING ENTRIES. THE FIRST PART HAS AN ENTRY LENGTH OF ONE DIGIT, AND CONTAINS THE "PRESENCE" INDICATOR FOR THIS SEGMENT, THE SECOND PART HAS AN ENTRY LENGTH OF SIX DIGITS, CONTAINING THE SEGMENT DISK ADDRESS AND AN INDEX INTO THE BEGIN-END ADDRESS TABLE.

ENTRIES 1 THROUGH N (WHERE N IS THE NUMBER OF SEGMENTS IN THE MCP) HAVE THE FOLLOWING FORMAT:

LABEL	SIZE IN DIGITS	CONTENTS
S-PRES	1	SEGM, PRESENCE FLAG
S-DISK	4	DISK ADDRESS OF SEGMENT
S-BET	2	BEGIN-END TABLE INDEX

KEYBOARD OUTPUT MESSAGE DICTIONARY. (MSG)

NUMBER IS THE VALUE PASSED TO [KBOUT] PROCEDURE TO FORMAT THE INDICATED WORD INTO THE OUTPUT MESSAGE STRING.

NUMBER	LENGTH	WORD	NUMBER	LENGTH	WORD
069	07	ABORTED	061	06	ACCEPT
026	04	ADDR	103	05	AVAIL
067	07	BACK-UP	098	08	BREAKOUT
005	03	BOJ	006	04	CARD
071	10	CHANGED TO	011	04	LINE
010	03	CHK	038	05	CLOSE
009	07	CONTROL	099	04	CURE
079	01		047	04	DATE
090	07	DENSITY	035	05	DESCR
083	01		058	09	DIRECTORY

MCP TABLES AND FORMATS

051	04	DISK	082	01	
055	05	DS-ED	095	08	DS OR DP
074	02	DT			
050	09	DUPLICATE	097	03	DUP
094	03	EOF	037	03	EOJ
024	05	ERROR	070	01	
007	04	FILE	063	04	FULL
064	04	HALF	096	07	IGNORED
042	02	IN	030	05	INPUT
034	05	INSTR	025	03	INV
039	09	IN USE BY	023	03	I-O
014	03	KBD	027	05	LABEL
081	01		019	03	LIB
031	05	LIMIT	088	06	LISTER
028	06	LOADED	036	06	LOCKED
062	03	LOG	075	03	MAG
105	05	MAINT	020	03	MEM
049	03	MIX	022	03	NEW
032	02	NO	012	03	NOT
089	02	OK	008	04	OPEN
054	08	OPERATOR	033	06	OUTPUT
003	05	PAPER	021	03	PAR
072	06	PLEASE	076	03	PKT
040	07	PRINTER	041	07	PROGRAM
086	05	PUNCH	048	06	PURGED
004	03	RDR	013	03	RDY
016	04	READ	078	04	RECD
104	04	REEL	015	01	#
085	01		059	07	REMOVED
080	07	RESTART	102	07	RESUMED
018	03	RET	002	03	RQD
093	05	SAVED	029	08	SECURITY
057	09	SCHEDULED	077	06	SELECT
100	06	SHARED	087	06	SORTER
091	01	(SPACE)	101	07	STOPPED
052	06	SYNTAX	043	06	SYSTEM
001	04	TAPE	044	04	TIME
092	05	TO BE	073	02	TR
060	10	UNASSIGNED	084	04	UNIT
068	04	USER	017	05	WRITE
056	05	ZIP**	045	01	(
046	01	)	065	02	**
066	02	--			

THE LOG FILE.

THE "TYPE CODE" IDENTIFIES THE RECORD TYPE.

0 = FILE CLOSE RECORD
1 = FILE OPEN RECORD
2 = END OF JOB RECORD
3 = SCHEDULE RECORD
4 = SHORT SCHEDULE RECORD
5 = RESTART (NOT OPERATIVE)
6 = BOJ RECORD
7 = IDLE TIME RECORD
8 = HALT/LOAD RECORD (MCP NORMAL SCHEDULE)

FILE CLOSE LOG RECORD - TYPE 0 - 100 DIGITS

0 1 UN TYPE CODE
1- 8 8 UN LOG ID NUMBER
9- 14 6 UN DATE CLOSED MMDDYY
15 1 UN NOT USED
16- 27 6 UA FILE ID
28- 29 2 UN HARDWARE TYPE
30 1 UN UNIT NUMBER
31 1 UN LABEL CONVENTION = 0,STD;1,OMITTED
32- 33 2 UN NUMBER OF DISK AREAS USED
34 1 UN DISK ACCESS TECHNIQUE = 0,SERIAL;1,RANDOM
35- 36 2 UN DISK FILE NUMBER
37- 41 5 UN RECORD SIZE IN WORDS
42- 48 7 UN NOT USED
49- 54 6 UN DISK SEGMENTS PER AREA
55- 57 3 UN ERROR COUNT
58- 65 8 UN RECORD COUNT/EOF POINTER (DISK FILES)
66- 77 6 UA MULTIFILE ID
78- 80 3 UN REEL NUMBER (LABEL)
81- 85 5 UN PHYSICAL TAPE NUMBER
86- 87 2 UN NOT USED
88- 89 2 UN PRIMARY I/O CHANNEL
90- 91 2 UN NOT USED
92- 99 8 UN TIME CLOSED (MILLISECONDS)

FILE OPEN LOG RECORD - TYPE 1 - 100 DIGITS

0	1	UN TYPE CODE
1- 8	8	UN LOG ID NUMBER
9- 14	6	UN DATE OPENED MMDDYY
15	1	UN NOT USED
16- 27	6	UA FILE ID
28- 29	2	UN HARDWARE TYPE
30	1	UN UNIT NUMBER
31	1	UN NOT USED
32	1	UN BUFFER ACCESS TECHNIQUE = 0,WORK AREA;1,BUFFER
33	1	UN LABEL CONVENTION = 0,STANDARD;1,OMITTED
34	1	UN NUMBER OF ALTERNATE AREAS
35	1	UN FILE STATUS CODE
		0 = OPEN
		1 = CLOSED (NEVER OPENED)
		2 = RESTRICTED
		3 = CLOSED (AFTER BEING OPENED)
39- 43	5	UN MAXIMUM RECORD LENGTH
36- 38	3	UN SAVE FACTOR
47- 52	6	UN MAXIMUM BLOCK SIZE
44- 46	3	UN RECORDS PER BLOCK
60- 61	2	UN DISK FILE NUMBER
54- 59	6	UN TIME FILE OPENED (SECONDS)
53	1	UN SPECIAL FORMS INDICATOR
		0 = NO FORMS
		1 = SPECIAL FORMS
		BIT 4 ON = PBT PRINTOUT FLAG
		BIT 8 ON = BACKUP FLAG
62	1	UN I/O FLAG = 0,IN;1,OUT;2,I/O
63	1	UN RECORDING MODE = 0,ALPHA;1,BINARY
64	1	UN BLOCKING TECHNIQUE = 0,UNBLOCKED;1,FIXED BLOCKED; 2, VARIABLE UNBLOCKED
65- 68	4	UN RESERVED
69	1	UN NOT USED
70- 75	6	UN BLOCK COUNT
76- 87	6	UA MULTIFILE ID
88- 89	2	UN PRIMARY I/O CHANNEL
90- 92	3	UN REEL NUMBER (LABEL AREA)
93- 97	5	UN CREATION DATE (LABEL AREA)
98- 99	2	UN CYCLE NUMBER (LABEL AREA)

END OF JOB LOG RECORD - TYPE 2 - 100 DIGITS

0	1	UN TYPE CODE
1- 8	8	UN LOG ID NUMBER
9- 14	6	UN DATE FINISHED MMDDYY
15- 23	9	UN TIME FINISHED (MILLISECONDS)

MCP TABLES AND FORMATS

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LONG SCHEDULE RECORD - TYPE 3 - 200 DIGITS

0	1	UN TYPE CODE
1-	8	8 UN LOG ID NUMBER
9-	14	6 UN DATE SCHEDULED MMDDYY
15-	23	9 UN TIME SCHEDULED (MILLISECONDS)
24	1	UN NOT USED
25	1	UN EXECUTION CODE
26-	28	3 UN CORE REQUIRED (K DIGITS) NO DISK HEADER SPACE
29-	30	2 UN NUMBER OF FILES
31-	32	2 UN NUMBER OF DISK FILES
33-	38	6 UN RESERVED
39-	43	5 UN NOT USED
44-	49	6 UN DISK SEGMENTS IN PROGRAM
50-	61	6 UA PROGRAM ID
62-	73	6 UA PROGRAM MFID
74-	193	60 UA HEADER CARD
194-	199	6 UN NOT USED

SHORT SCHEDULE RECORD - TYPE 4 - 100 DIGITS

0	1	UN TYPE CODE
1-	8	8 UN LOG ID NUMBER
9-	14	6 UN DATE SCHEDULED MMDDYY
15-	23	9 UN TIME SCHEDULED (MILLISECONDS)
24	1	UN NOT USED
25	1	UN EXECUTION CODE (6=MCP NORMAL STATE EXECUTION)
26-	28	3 UN CORE REQUIRED (K DIGITS) NO DISK HEADER SPACE
29-	30	2 UN NUMBER OF FILES
31-	32	2 UN NUMBER OF DISK FILES
33-	38	6 UN RESERVED
39-	43	5 UN NOT USED
44-	49	6 UN DISK SEGMENTS IN PROGRAM
50-	61	6 UA PROGRAM ID
62-	73	6 UA PROGRAM MFID
74-	99	26 UN NOT USED

REMOTE SPD SYSTEM USE RECORD OR PRORATED TIME RECORD -
TYPE 5 - 200 DIGITS.

0	1	UN TYPE CODE
1-	3	3 UN CHANNEL NUMBER
4	1	UN UNIT NUMBER
5	1	UN 0 = REMOTE SPD RECORD
6-	11	6 UN DATE LOGGED IN
12-	21	10 UN TIME LOGGED IN

22- 27 6 UN DATE LOGGED OUT
 28- 37 10 UN TIME LOGGED OUT
 38-199 UNASSIGNED

REDEFINITION FOR PRORATED TIME ENTRY

0 1 UN TYPE CODE
 1- 4 4 UN UNASSIGNED
 5 1 UN 1 - PRORATED TIME RECORD
 6- 9 4 UN UNASSIGNED
 10- 19 10 UN PRORATED TIME FOR MIX ENTRY NUMBER 01
 20- 29 10 UN PRORATED TIME FOR MIX ENTRY NUMBER 02
 30-159 140 UN PRORATED TIME FOR MIX ENTRIES #03-15
 160-199 40 UN UNASSIGNED

BEGINNING OF JOB RECORD - TYPE 6 - 100 DIGITS

0 1 UN TYPE CODE
 1- 8 8 UN LOG ID NUMBER
 9- 14 6 UN DATE BEGUN MMDDYY
 15- 23 9 UN BOJ TIME (MILLISECONDS)
 24 1 UN NOT USED
 25 1 UN EXECUTION CODE
 26- 28 3 UN CORE REQUIRED (K DIGITS) NO DISK HEADER SPACE
 29- 30 2 UN NOT USED
 31- 32 2 UN NUMBER OF DISK FILES
 33- 38 6 UN USER CHARGE NUMBER
 39- 40 2 UN MIX NUMBER
 41- 49 9 UN UNASSIGNED
 50- 61 6 UA PROGRAM ID
 62- 73 6 UA PROGRAM MFID
 74- 99 26 UN NOT USED

IDLE TIME RECORD - TYPE 7 - 100 DIGITS

0 1 UN TYPE CODE
 1- 8 8 UN IDLE TIME (MILLISECONDS)
 9- 99 91 UN NOT USED

HALT/LOAD RECORD - TYPE 8 - 200 DIGITS

0 1 UN TYPE CODE
 1- 8 8 UN NOT USED

MCP TABLES AND FORMATS

9- 14 6 UN DATE
 15- 23 9 UN TIME (MILLISECONDS)
 24- 25 2 UN NOT USED
 26- 47 11 UA HALT LOAD TIME HH:MM:SSMMM
 48- 63 8 UA HALT/LOAD DATE MM/DD/YY
 64-199 NOT USED

LOG FORMAT OF REMOTE SPD SYSTEM MESSAGES.

COLS.	DATA
1-3	"LOG"
4-9	DATE (MONTH-DAY-YEAR)
10-13	TIME (HOUR:MIN.)
14-15	CHANNEL NUMBER
16-115	TEXT OF MESSAGE

PART 2: TABLES MAINTAINED IN THE OBJECT PROGRAM AREA.

THE FILE INFORMATION BLOCK (FIB).

LABEL	SIZE	CONTENTS
FIBST1	1	BIT 8 ON: 9 CHAN, MAG, TAPE BIT 4 ON: 7 CHAN, MAG, TAPE BIT 2 ON: FILE TO BE LOCKED AT TERMINATE TIME
FIBST2	1	BIT 1 ON: NEED TO SEE FILE HEADER BIT 8 ON: SHORT WRITE BIT 4 ON: PRINTER BACKUP OUTPUT FILE BIT 2 ON: PRINTER ONLY BIT 1 ON: FILE OPENED BY OF MESSAGE
FIBRRN	5	RERUN COUNTER
FIBRRC	5	RERUN CONTROL
FIB-BA	1	BUFFER ACCESS TECHNIQUE 0 = WORK AREA AND BUFFER(S) <i>3 bits</i> 1 = NO WORK AREA
FIBLBL	1	LABEL CONVENTIONS 0 = STANDARD LABEL 1 = LABEL OMITTED 2 = USA STANDARD LABEL 4 = INSTALLATION LABEL <i>2 bits</i>
FIBALT	1	NUMBER OF ALTERNATE AREAS
FIBSTA	1	FILE STATUS 0 = OPEN 1 = CLOSED (NEVER OPENED) 2 = RESTRICTED 3 = CLOSED (AFTER BEING OPENED) 5 = CLOSED BY SDXCPT (OPENING NEXT REEL) 7 = CLOSED (OPENING NEXT REEL) 9 = MULTI-FILE SEARCH IN PROGRESS
FIB-SV	3	SAVE FACTOR
FIBMRL	5	MAX. RECORD LENGTH
FIBRPB	3	NUMBER OF RECORDS PER BLOCK
FIBARB	6	ADDRESS OF CURRENT REC. IN BUFFER
FIBSPF	1	SPECIAL FORMS INDICATOR 0 = NO SPECIAL FORMS 1 = SPECIAL FORMS 4 = PBT PRINTOUT FLAG (TAPE ONLY)
FIB-WA	6	WORK AREA ADDRESS
FIBTYP	2	HARDWARE TYPE (THE HARDWARE UNITS DENOTED BY THE

*
*

MCP TABLES AND FORMATS

		CODES ARE LISTED IN APPENDIX 5 UNDER THE TITLE " PERIPHERAL UNIT TYPE CODES",)	
FIB-IO	1	IN-OUT INDICATOR 0 = INPUT 1 = OUTPUT 2 = INPUT-OUTPUT (RANDOM DISK FILES ONLY)	
FIBMOD	1	RECORDING MODE 0 = ALPHA (EVEN) 1 = BINARY (ODD) 2 = EBCDIC (CARD FILES)	
FIBBLK	1	BLOCKING TECHNIQUE 0 = UNBLOCKED 1 = FIXED # OF FIXED LENGTH REC,-S PER BLOCK 2 = VARIABLE # OF VARIABLE LENGTH REC,-S PER BLOCK	
FIBFNM	2	FILE NUMBER (ASSIGNED SEQUENTIALLY BY ASSEMBLER OR COMPILER, E.G., 1ST FILE ENCOUNTERED = 00, ETC.)	
FIBLBA	2	LAST BUFFER TO ACCESS	*
FIBCBS	6	CURRENT BUFFER SIZE FOR VARIABLE LENGTH RECORDS	
FIBRCT	8	RECORD COUNT = DISK COUNTER	
FIBMBS	6	MAX. BLOCK SIZE	
FIB-NB	3	RELATIVE POSITION OF CURRENT DESCRIPTOR	
FIBIOA	6	IOAT INDEX	
FIBTRN	1	CODE TRANSLATION BIT 4 ON: MCP TRANSLATE BIT 2 ON: NON-STANDARD 1050 TO EBCDIC BIT 0 ON: STANDARD 1050 TO EBCDIC	* * *
FIBOPT	1	1 = OPTIONAL FILE 0 = NOT OPTIONAL	
FIBLRA	4	NUMBER OF LOGICAL RECORDS PER AREA	
FIBNAR	2	NUMBER OF AREAS ON DISK	
FIBDAT	1	DISK ACCESS TECHNIQUE 0 = SERIAL 1 = RANDOM	
FIBDFN	2	DISK FILE NUMBER ASSIGNED SEQUENTIALLY BY ASSEMBLER OR COMPILER	
FIBRSW	5	RECORD SIZE (IN NUMBER OF WORDS)	
FIBHPT	6	FILE HEADER POINTER CURRENT BUFFER ADDRESS = PBD	*
FIBRAD	1	RAD FLAG SIGNAL TO DETERMINE LENGTH OF RECORD READ 0 = READ-WRITE DOES NOT NEED REC. LENGTH 1 = I-O COMPLETE SHOULD DETERMINE BEGINNING ADDRESS 2 = I-O COMPLETE SHOULD DETERMINE ENDING ADDRESS	

MCP TABLES AND FORMATS

		4 = RETRY LONG OR SHORT RECORDS	
FIBDSB	5	NUMBER OF DISK SEGMENTS PER BLOCK	
FIBBKA	4	NUMBER OF BLOCKS PER AREA	
		LOGICAL RECORDS LEFT IN AREA = PBD	*
FIBDSA	8	DISK ADDRESS FOR SERIAL FILES	
		= FOR PBD =	*
		0-3 LOGICAL RECORD SIZE IN WORDS,	*
		4-6 LOGICAL RECORD SIZE IN DIGITS	*
FIBRSK	1	PBD BLOCK OVERFLOW COUNTER	*
FIBWSK	1	PBD DISK ADDRESS INCREMENT	*
		** NOTE: THE NEXT 2 CONSTANTS MUST BE	*
		ADJACENT FOR CLEARING	*
FIBKEY	6	ADDRESS OF ACTUAL KEY FOR RANDOM	
		DISK FILES	
		PBD: CURRENT BUFFER ADDRESS	*
FIBSBL	1	SEEK RETURN BOOLEAN	
		0 = NOT SEEK	
		1 = WAITING I=0 FOR SEEK	
FIBUNF	1	1 = IMPLIED SEEK FOR UNBLOCKED	
		WRITE	
		2 = CLOSE-RELEASE WITHOUT REWINDING	*
FIBFLM	1	FILE LIMITS FLAG	
		0 = NO FILE LIMITS	
		1 = FILE LIMITS FOR THIS FILE	
FIBIX2	1	INITIALIZE IX2 FLAG	
		0 = DO NOT SET IX2	
		1 = SET IX2 TO ADDRESS OF RECORD	
FIBBCT	8	BLOCK COUNT	
FIBPOS	5	COUNTER USED BY POSITION STATMNT	
		FOR DATA COMM STREAM MODE:	*
		1ST DIGIT: BUFFER COUNTER	*
		2ND DIGIT: FLIP FLAG	*
		3RD DIGIT: OP. CODE STORAGE	*
		4TH DIGIT: WAIT FLAG	*
		5TH DIGIT: COMPLETE FLAG	*
FIBUSE	2	TYPE OF USE ROUTINE	
FIBRWT	1	TO SAVE READ, WRITE, SEEK FLAGS	
FIBWKF	1	TEMPORARY WORK FILE IND.	*
		BIT 8: USED AT FILE OPEN TIME	*
		BIT 4: USED AT FILE OPEN TIME	
		BIT 2: PUT PROCESSOR # IN FILE ID	
		BIT 1: PUT MIX # IN FILE ID	
FIBDTK	1	DISK ASSIGNMENT TECHNIQUE:	
		0 = ASSIGN DISK AS AVAILABLE	
		1 = ASSIGN DISK BY FILE #	
		2 = ASSIGN DISK BY AREA #	
		4 = ASSIGN DISK BY "FIB-EU"	
FIB-EU	2	EU # FOR DISK FILE	
	1	UNASSIGNED	
FIBAUD	1	AUDIT TRAIL INFORM.	
		0 = NO AUDIT REQUIRED	

		1 = AUDIT BEFORE AND AFTER WRITE	
		2 = AUDIT AS READ OR TO BE WRITTEN	*
FIBULB	6	ADDRESS OF "USE ROUTINES" FOR LABEL HANDLING	
FIBUER	6	ADDRESS OF "USE ROUTINES" FOR I-O ERROR HANDLING	
FIBUEP	6	FOR PRINTER FILES: ADDRESS OF END-OF-PAGE "USE ROUTINE"	
FIBPIN		FOR DISK FILES: BEGINNING FILE LIMITS REDEFINES FIBUEP:	
		FOR DATA COMMUNICATIONS:	
FIBUPS	6	STREAM MODE DESCRIPTOR (B=200) ADDR. FOR SORTER FILES: ADDRESS OF POCKET SELECT "USE ROUTINE"	
		FOR DISK FILES: ENDING FILE LIMITS	
FIBPON		PBD: ADDR. OF CORE ALLOCATED (2000 DIGITS) REDEFINES FIBUPS:	*
		FOR DATA COMMUNICATIONS:	
FIBRPA	8	MODE DESCRIPTOR (B=ADDRESS)	
FIBCOD	2	NUMBER OF REC-S PER DISK AREA	
		I-O DESCRIPTOR STORAGE, USED BY READ-WRITE	
		CLOSE TYPES SEE APPENDIX 2 "BCT 0154":	*
FIBFST	1	SPEED READ-WRITE	
FIBLAB	6	BEGINNING ADDRESS OF LABEL AREA	
FIBLAE	6	ENDING ADDRESS OF LABEL AREA	

RESULT STATUS AND DESCRIPTOR AREA:
ONE RECORD FOR EACH BUFFER DECLARED.

FIBBSW	4	RESULT DESCRIPTOR
FIB-OP	2	DESCRIPTOR OP, CODE
FIB-V2	1	DESCRIPTOR VARIANT
FIB-UN	1	DESCRIPTOR UNIT NUMBER
FIB-V3	1	DESCRIPTOR VARIANT
FIB-V4	1	DESCRIPTOR VARIANT
FIB-AA	6	DESCRIPTOR A-ADDRESS
FIB-BB	6	DESCRIPTOR B-ADDRESS
FIB-AD	6	DESCRIPTOR DISK ADDRESS
FIBRCW	6	RETURN CONTROL WORD STORAGE FOR "USE ROUTINE"-S.
FIBACE	6	ACTUAL ENDING ADDRESS

THE PROGRAM PARAMETER BLOCK (PPB) AND SEGMENT DICTIONARY.

MCP TABLES AND FORMATS

THE PROGRAM PARAMETER BLOCK AND SEGMENT DICTIONARY FOR NORMAL STATE PROGRAMS HAVE A LENGTH OF 200 DIGITS IN THE FOLLOWING FORMAT:

1. THE PROGRAM PARAMETER BLOCK:

PB-PRN	6	PROGRAM IDENTIFIER (ALPHANUM)
PB-SGS	3	NUMBER OF OVERLAYABLE SEGMENTS IN PROGRAM
PB-INS	5	RELATIVE ADDRESS OF FIRST INSTRUCTION OF PROGRAM TO BE EXECUTED
PB-COR	6	TOTAL CORE REQUIRED BY THE PROGRAM
PB-SDA	6	CORE ADDRESS FOR PROGRAM-S SEGMENT DICTIONARY

THE OBJECT PROGRAM SEGMENT DICTIONARY SKELETON:

PB-BCT	6	72	BRANCH COMMUNICATE INTRS. TO OVERLAY ROUTINE
PB-DFD	2		NUMBER OF DISK FILES DECLARED IN THE PROGRAM
PB-FPF	1		FILE PARAMETER BLOCK FLAG
PB-QPS	3		NUMBER OF LOGICAL SEGMENTS
PB-LSI	6		DISK ADDR. OF MAIN BLOCK OF PROGR.
PB-QVN	3	90	REQUESTED SEGMENT FOR OVERLAY
PG-BSG	3		BASE SEGMENT (001)
	8		UNASSIGNED

FOUR SEGMENT DICTIONARY ENTRIES, EACH CONSISTING OF 32 DIGITS, IN THE FOLLOWING FORMAT:

PB-PRB	6	104	ADDRESS OF BCT INSTR. OR 1-ST SEGMENT INSTR.
PB-RDA	6		SIX LOW-ORDER DIGITS OF DISK ADDRESS FOR THIS SEGMENT.
PB-SLD	6		ADDR. OF 1-ST SEGM. INSTR., OR BCT INSTR.
PB-BEG	6		LOWEST ADDRESS OF SEGMENT
PB-END	6		HIGHEST ADDRESS OF SEGMENT
PB-LVL	2		TWO HIGH-ORDER DIGITS OF DISK ADDRESS FOR THIS SEGMENT.

THE LAST TWO ENTRIES OF THE BLOCK ARE:

PB-FIL	2		NUMBER OF FILES DECLARED
PB-MSZ	6		SIZE OF MAIN BLOCK

FURTHER SEGMENT DICTIONARY ENTRIES, IF REQUIRED, CONTINUE TO INCLUDE THE TOTAL SEGMENT DICTIONARY.

THE FILE PARAMETER BLOCK (FPB).

THE FILE PARAMETER BLOCK IS 100 DIGITS IN LENGTH AND CONTAINS THE FOLLOWING INFORMATION:

FP-FNM	12	FILE NAME (ALPHA)
FP-MFD	12	MULTI-FILE IDENTIFIER (ALPHA)
FP-FID	12	FILE IDENTIFIER (ALPHA)
FP-HWR	2	HARDWARE TYPE
FP-BUP	1	BACKUP FLAG
FP-LEQ	1	EQUATION DATA WAS GIVEN
FP-SPF	1	SPECIAL FORMS FLAG
	1	UNASSIGNED
FP-SID	12	SECURITY IDENTIFIER (ALPHA)
	46	UNASSIGNED

PROGRAM/MCP COMMUNICATION FORMATS

APPENDIX 2.

OBJECT PROGRAM/MCP COMMUNICATION FORMATS

1. OBJECT PROGRAM/MCP COMMUNICATION FORMATS:

OPEN FILE-NAME

```

BCT (30)0134
BUN (27)**+16
XXXXXX (FIB ADDRESS)
Y (TYPE OF OPEN)
    Y=0 - INPUT
    Y=1 - OUTPUT
    Y=2 - INPUT/OUTPUT
    Y=3 - OUTPUT/INPUT
Z (DISPOSITION)
    Z=0 - REWIND
    Z=1 - NO REWIND
    Z=2 - OPEN REVERSE
    Z=4 - FLOW (MICR FILES)
    LOCK (OTHER THAN MICR FILES)
    Z=8 - OPEN WITH LOCKOUT
    Z=6 - REVERSE/LOCK
    Z=8 - REVERSE/LOCKOUT

```

CLOSE FILE-NAME

```

BCT (30)0154
BUN (27)**+16
XXXXXX (FIB ADDRESS)
Y (TYPE OF CLOSE)
    Y=0 - CLOSE FILE REWIND
    Y=1 - CLOSE REEL REWIND
    Y=2 - CLOSE FILE NO REWIND
    Y=3 - CLOSE REEL NO REWIND
    Y=4 - CLOSE FILE RELEASE
    Y=5 - CLOSE REEL RELEASE
    Y=6 - CLOSE FILE LOCK
    Y=7 - CLOSE REEL LOCK
    Y=8 - CLOSE FILE PURGE
    Y=9 - CLOSE REEL PURGE
Z (DISPOSITION)
    Z=8 - NO DISCONNECT (DCOM FILES)

```

READ FILE-NAME

```

BCT (30)0114
BUN (27)**+20
XXXXXX (FIB ADDRESS)
YYYYYY (EOF ADDRESS)

```

NOTE: IF 8 BIT OF MSD OF FIB IS SET, THEN READ WITH LOCK. *

WRITE RECORD-NAME

```

BCT (30)0234
BUN (27)**+24
XXXXXX (FIB ADDRESS)

```


60-TH OF SECONDS.)

Y (TYPE OF COMMUNICATE)
 Y = 0 - GREGORIAN DATE
 Y = 1 - TIME
 Y = 2 - CORE REQUIRED AND SYNTAX FLAG
 Y = 3 - IS IT ON DISK
 Y = 4 - JULIAN DATE
 Y = 8 - TIME60

68 = MIX #

ZIPP

BCT (30)0274
 BUN (27)**+14
 XXXXXX (ADDRESS OF CONTROL CARD TO BE EXECUTED)

SPACE FILE-NAME

BCT (30) 0394
 BUN (27)**+26
 XXXXXX (FIB ADDRESS)
 YYYYYY (EOF ADDRESS; FOR PRINTERS, EOP ADDRESS IF NOT 0)
 SUUVVO

S = SIGN OR DIRECTION

+ = FORWARD

- = REVERSE

FOR PRINTER FILES:

UU = NUMBER OF LINES (0 - 99)

VV = CHANNEL NUMBER

FOR MAG TAPE, PAPER TAPE AND DISK FILES:

UUVV = NUMBER OF RECORDS TO POSITION

NOTE: OUTPUT PAPER TAPE FILES MAY NOT BE SPACED;

OUTPUT MAG TAPE FILES MAY BE SPACED REVERSE ONLY.

*** DELETION ***

STOP

BCT (30)0194

CORE-TO-CORE TRANSFER

BCT (30) 0414
 BUN (27)**+32
 XXXXXX (ADDRESS OF BUFFER AREA)
 YYYYYY (ADDRESS OF PROGRAM ID)
 ZZZZZZ (ACTION LABEL)
 JJJJ (# OF UNITS TO MOVE)
 K TYPE OF UNIT
 K=0 - BYTES
 K=1 - DIGITS

PROGRAM/MCP COMMUNICATION FORMATS

	K=2 = WORDS	*
L	ACTION CODE	*
	L=0 = SEND	*
	L=1 = RECEIVE	*

2. DATA COMM. MCP COMMUNICATION FORMATS:

DESCRIPTOR BITS:

T = NO TIME OUT		
S = STREAM		
D = DIAL		
B = BREAK		
H = HANG-UP (DISCONNECT)		
X = PRESET STX (8A1 & IBM 1050)		
E = DELETE ETX		*
V = VOICE (TOUCH-TONE)		
R = TONE RESPONSE (TOUCH-TONE)		
P = POLL		
Q = IGNORE ENQ		*

FUNCTION	ASSEMBL. MACRO	VARIANTS	*
----------	----------------	----------	---

READ-TO-CONTROL	(REED)	DESC OP = 32	
BCT 0354			
BUN NEXT INSTRUCTION			
00			
XXXXXX (FIB-ADR)			
YY (DESC. BITS)		TXSD	*
ZZZZZ (EGF-ADR,..OPTIONAL, 0 IF NOT GIVEN)			

FILL	(FILL)		
BCT 0354			
BUN NEXT INSTRUCTION			
01			*
XXXXXX (FIB-ADR)			
YY (DESC. BITS)		VTEXPQSD	*
Z (TYPE OF OPERATION)			
00 = REED			*
02 = RITE			*
03 = WCRC			*
04 = WTRC			*

PROGRAM/MCP COMMUNICATION FORMATS

```

          05 = WCRT
          GARBAGE DIGIT
          WWWW (ACTION LABEL...OPTIONAL, 0 IF NOT GIVEN)
*

WRITE-TO-CONTROL (RITE)  DESC OP = 34
  BCT 0354
  BUN NEXT INSTRUCTION
  02
  XXXXXX (FIB-ADR)
  YY (DESC. BITS) VEXRSD
*

WRITE-TO-CONTROL/READ-TO-CONTROL (WCRC)  DESC OP = 34
  BCT 0354
  BUN NEXT INSTRUCTION
  03
  XXXXXX (FIB-ADR)
  YY (DESC. BITS) VTEXPQSD
  ZZZZZ (EOF-ADR...OPTIONAL, 0 IF NOT GIVEN)
*

WRITE-TRANSPARENT/READ-TO-CONTROL (WTRC)  DESC OP = 33
  BCT 0354
  BUN NEXT INSTRUCTION
  04
  XXXXXX (FIB-ADR)
  YY (DESC. BITS) TD
  ZZZZZ (EOF-ADR...OPTIONAL, 0 IF NOT GIVEN)
*

WRITE-TO-CONTROL/READ-TRANSPARENT (WCRT)  DESC OP = 34
  BCT 0354
  BUN NEXT INSTRUCTION
  05
  XXXXXX (FIB-ADR)
  YY (DESC. BITS) TD
  ZZZZZ (EOF-ADR...OPTIONAL, 0 IF NOT GIVEN)
*

ENABLE (ENBL)  DESC OP = 35
  BCT 0354
  BUN NEXT INSTRUCTION
  06
  XXXXXX (FIB-ADR)
  WWWW (ACTION LABEL...OPTIONAL, 0 IF NOT GIVEN)

INTERROGATE (INTR)
  BCT 0354
  BUN NEXT INSTRUCTION

```

PROGRAM/MCP COMMUNICATION FORMATS

07
 XXXXXX (FIB-ADR)
 YYYYYY (OPERAND-ADR)

INTERROGATE ADDRESS
 BCT 0354
 BUN ++22
 12 COMMUNICATE TYPE
 XXXXXX RELATIVE ADDRESS OF FIB
 YYYYYY RELATIVE ADDRESS OF 6-DIGIT CONSTANT

CONDITIONAL-CANCEL (CNCL) DESC OP = 37
 BCT 0354
 BUN NEXT INSTRUCTION
 08
 XXXXXX (FIB-ADR)

BUFFER EMPTY (STREAM MODE) (REDY) DESC OP = 31
 BCT 0354
 BUN NEXT INSTRUCTION
 09
 XXXXXX (FIB-ADR)

WAIT (WAIT)
 BCT 0354
 BUN NEXT INSTRUCTION
 10
 XXXXXX = ADDRESS OF A FIVE DIGIT CONSTANT SPECIFYING
 THE NUMBER OF SECONDS.

UNCONDITIONAL-CANCEL (UNCL) DESC OP = 39
 BCT 0354
 BUN NEXT INSTRUCTION
 11
 XXXXXX (FIB-ADR)
 YY (DESC. BITS) BH *

ACCEPT AND DISPLAY TO REMOTE SPO
 BCT 0254
 BUN NEXT INSTRUCTION
 XXXXXX ADDRESS OF DATA TO BE ACCEPTED OR DISPLAYED
 Y 3 = R.SPU ACCEPT - 4 = R.SPO DISPLAY
 ZZ LENGTH OF CHARACTERS
 W 1 TRASH DIGIT
 AAAAAA ADDRESS OF ALPHA MNEMONIC OF REMOTE SPO OR
 CHANNEL AND UNIT OF REMOTE SPO.

PROGRAM/MCP COMMUNICATION FORMATS

*** DELETION ***

*

3. MICR MCP COMMUNICATION FORMATS:

-- ---- -- -----

OPEN

BCT 0134
 BUN NEXT INSTRUCTION
 XXXXXX FIB ADDRESS
 Y = 0 INPUT
 Z = 4 FLOW
 Z = 0 DEMAND

START FLOW=READ (FLOW)

BCT 0374
 BUN NEXT INSTRUCTION
 XXXXXX FIB ADDRESS
 62

POCKET LIGHT (LGHT)

BCT 0374
 BUN NEXT INSTRUCTION
 XXXXXX FIB ADDRESS
 64
 YYYYYY LOCATION OF 2 DIGIT POCKET NUMBER

READ (SRTR)

BCT 0374
 BUN NEXT INSTRUCTION
 XXXXXX FIB ADDRESS
 63
 YYYYYY FLOW STOPPED
 ZZZZZZ BAICH TICKET

POCKET SELECT (PKCT)

BCT 0374
 BUN NEXT INSTRUCTION
 XXXXXX FIB ADDRESS
 60
 YYYYYY POCKET LABEL (LOCATION OF 4 DIGIT
 POCKET NUMBER)
 FORMAT: NNRV WHERE
 NN = POCKET TO BE SELECTED,

PROGRAM/MCP COMMUNICATION FORMATS

R = 0
 V = 0 CONTINUE FLOW,
 1 STOP FLOW.

ZZZZZZ TOO LATE TO PS LABEL

BATCH COUNT (CWNT)
 BCT 0374
 BUN NEXT INSTRUCTION
 XXXXXX FIB ADDRESS
 66

LISTER ENABLE (ABLE)
 BCT 0374
 BUN NEXT INSTRUCTION
 XXXXXX FIB ADDRESS
 35

LISTER PRINT (LSTR)
 BCT 0374
 BUN NEXT INSTRUCTION
 XXXXXX FIB ADDRESS
 70
 YYYYYY NOT READY

LISTER SPACE (SPAS)
 BCT 0374
 BUN NEXT INSTRUCTION
 XXXXXX FIB ADDRESS
 71
 YYYYYY NOT READY

LISTER SKIP (SKIP)
 BCT 0374
 BUN NEXT INSTRUCTION
 XXXXXX FIB ADDRESS
 72
 YYYYYY NOT READY

LISTER SLEW (LISTER SLEW)
 BCT 0374
 BUN NEXT INSTRUCTION
 XXXXXX FIB ADDRESS
 73
 YYYYYY NOT READY

SYSTEMS MEMORY - DISK ORGANIZATION.

APPENDIX 3.

SYSTEMS MEMORY - DISK ORGANIZATION.

SYSTEMS MEMORY - DISK ORGANIZATION,

SYSTEMS MEMORY - DISK ORGANIZATION,

SEGMENT

CONTENTS:

000000-000001	HALT-LOAD BOOTSTRAP PROGRAM
000002-000011	HALT-LOAD VARIABLES FROM SYSTEM LOAD
000012-002048	MCP SEGMENTS

THE FOLLOWING ENTRIES HAVE NO FIXED ADDRESSES:

MASTER COPY OF DISK AVAILABLE TABLE
JOB REFERENCE (SCHEDULE) TABLE
CHANNEL AVAILABLE TABLE FROM SYSTEM LOAD
CHANNEL RESULT LINK LIST TABLE
PART I OF IOQT FROM SYSTEM LOADER
IOAT ENTRIES FROM SYSTEM LOADER
CURRENT DISK AVAILABILITY TABLE
CURRENT SYSTEM STATUS TABLE
FIRST SEGMENT OF DISK DIRECTORY
FILE HEADER AREA OF FIRST DIRECTORY FILE
USER DISK AREA

STANDARD LABELS.

APPENDIX 4.

1. BURROUGHS STANDARD LABEL FORMAT.
2. USA STANDARD LABEL FORMAT.

STANDARD LABELS.

THE BURROUGHS STANDARD LABEL FORMAT.

LABEL	SIZE IN BYTES	CONTENTS
LABELN	8	" LABEL "
	1	"0"
LABMF	7	MULTIFILE ID OR ZEROES
	1	"0"
LABFID	7	FILE IDENTIFIER
LABREL	3	REEL NUMBER
LABCD	5	CREATION DATE (YYDDD)
LABCYC	2	CYCLE NUMBER
LABPGD	5	PURGE DATE (YYDDD)
LABSEN	1	SENTINEL (END)

0 = END OF FILE
1 = END OF REEL

LABBCT	5	BLOCK COUNT (END)
LABRCT	7	RECORD COUNT (END)
LABMDK	1	MEM. DUMP KEY (BEGIN)

1 = MEM. DUMP FOLLOWS

LABTPN	5	PHYSICAL TAPE NUMBER
	22	UNASSIGNED

THE USA STANDARD LABEL FORMAT.

LAYOUT OF THE HDR1 LABEL WITH BURROUGHS LABEL DATA:

POSITION	BURROUGHS DATA	USA STANDARD FIELD NAME
1-3	"HDR"	LABEL IDENTIFIER
4	"1"	LABEL NUMBER

STANDARD LABELS.

5-13	BLANKS	FILE
14-21	FILE IDENTIFIER	IDENTIFIER
22-27	MULTI-FILE ID. OR ZEROES	SET IDENTIFICATION
28	"0"	FILE SECTION
29-31	REEL #	NUMBER
32-35	"0001"	FILE SEQ. NUMBER
36-39	BLANKS	GENERATION NUMBER (OPTIONAL)
40-41	CYCLE #	GENERATION VERSION NUMBER (OPTIONAL)
42-47	CREATION DATE "YYDDD"	CREATION DATE "YYDDD"
48-53	PURGE DATE "YYDDD"	EXPIRATION DATE "YYDDD"
54	BLANK	ACCESSABILITY
55-60	ZEROES (END LABEL BLOCK COUNT)	BLOCK COUNT "000000"
61-67	ZEROES (END LABEL REC. COUNT)	SYSTEM
68-73	"BUR "	CODE (OPTIONAL)
74-80	BLANKS	RESERVED (BLANKS)

HARDWARE TYPES AND EBCDIC CODES.

APPENDIX 5.

PART 1: PERIPHERAL UNIT TYPES.
PART 2: EBCDIC CODES.

PERIPHERAL UNIT TYPES.

PERIPHERAL UNIT TYPE CODES USED IN THE FILE INFORMATION BLOCK.

CODE: PERIPHERAL DEVICE:

01	SERIAL CARD READER	
02	LINE PRINTER	
03	CARD PUNCH	
04	MAGNETIC TAPE - 7-TRACK	
05	MESSAGE PRINTER - KEYBOARD SPO	
06	SYSTEMS MEMORY OR DISK	
07	MULTIPLE TAPE LISTER	
08	SORTER READER	
09	PAPER TAPE READER	
10	PAPER TAPE PUNCH	
11	RESERVED FOR MCP	
12	PSEUDO CARD READER	
13	REMOTE TYPEWRITER (9350)	
14	OLB TERMINAL	
15	83B3 SYSTEM	
16	TWX	
17	IBM 1050	
18	DCT2000	
20	B2500 OR B3500	
21	8A1 SYSTEM	
24	IBM 1030	
25	BURROUGHS TOUCH-TONE SYSTEM (BTT)	
26	BURROUGHS INPUT & DISPLAY SUBSYSTEM (BIDS)	
27	FRIDEN 7311	
30	TC500	
31	BURROUGHS B300 OR B500 COMPUTER	
40	PRINT BACKUP DISK @NNNNN IN DISC DIRECTORY	*
41	PUNCH BACKUP DISC *NNNN IN DISC DIR. (IN-OUT IND.)	*

EBCDIC CODES

EBCDIC CODES WITH ALPHANUMERIC EQUIVALENTS

00	NUL	10	DLE	20		30	
01	SOH	11	DC1	21		31	
02	STX	12	DC2	22		32	SYN
03	ETX	13	DC3	23		33	
04		14		24		34	
05	HT	15	NL	25	LF	35	
06		16	BS	26	ETB	36	
07	DEL	17		27	ESC	37	EOT
08		18	CAN	28		38	
09		19	EM	29		39	
0A		1A		2A		3A	
0B	VT	1B		2B		3B	
0C	FF	1C	FS	2C		3C	DC4
0D	CR	1D	GS	2D	ENQ	3D	NAK
0E	SD	1E	RS	2E	ACK	3E	
0F	SI	1F	US	2F	BEL	3F	SUB

*

EBCDIC CODES

40	SP	50	&	60	= (MINUS)	70	
41		51		61	/	71	
42		52		62		72	
43		53		63		73	
44		54		64		74	
45		55		65		75	
46		56		66		76	
47		57		67		77	
48		58		68		78	
49		59		69		79	
4A	[	5A	j	6A		7A	!
4B	.	5B	\$	6B	,	7B	#
4C	<	5C	*	6C	%	7C	@
4D	(	5D	)	6D	U SCD	7D	APOST
4E	+	5E	j	6E	>	7E	=
4F	V BAR	5F	NOT	6F	Q MK	7F	"

EBCDIC CODES

80		90		A0		B0
81	A LC	91	J LC	A1		B1
82	B LC	92	K LC	A2	S LC	B2
83	C LC	93	L LC	A3	T LC	B3
84	D LC	94	M LC	A4	U LC	B4
85	E LC	95	N LC	A5	V LC	B5
86	F LC	96	O LC	A6	W LC	B6
87	G LC	97	P LC	A7	X LC	B7
88	H LC	98	Q LC	A8	Y LC	B8
89	I LC	99	R LC	A9	Z LC	B9
8A		9A		AA		BA
8B		9B		AB		BB
8C		9C		AC		BC
8D		9D		AD		BD
8E		9E		AE		BE
8F		9F		AF		BF

EBCDIC CODES

C0	+0	D0	-0	E0		F0	0
C1	A	D1	J	E1		F1	1
C2	B	D2	K	E2	S	F2	2
C3	C	D3	L	E3	T	F3	3
C4	D	D4	M	E4	U	F4	4
C5	E	D5	N	E5	V	F5	5
C6	F	D6	O	E6	W	F6	6
C7	G	D7	P	E7	X	F7	7
C8	H	D8	Q	E8	Y	F8	8
C9	I	D9	R	E9	Z	F9	9
CA		DA		EA		FA	
CB		DB		EB		FB	
CC		DC		EC		FC	
CD		DD		ED		FD	
CE		DE		EE		FE	
CF	DELIMITER	DF		EF		FF	

OPERATION OF SYSTEM WITHOUT SUPERVISORY PRINTER.

APPENDIX 6.

OPERATION OF SYSTEM WITHOUT SUPERVISORY PRINTER.

OPERATION OF SYSTEM WITHOUT SUPERVISORY PRINTER.
-----OPERATION OF SYSTEM WITHOUT SUPERVISORY PRINTER.

THIS APPENDIX DESCRIBES A METHOD OF SYSTEM OPERATION WHICH MAY BE FOLLOWED WHEN IT IS NECESSARY TO OPERATE WITHOUT THE SUPERVISORY PRINTER AVAILABLE. THE MCP WILL, WHEN NOTIFIED, SELECT AN AVAILABLE LINE PRINTER FOR ITS EXCLUSIVE USE AND WILL PERMIT INTRODUCTION OF SPO INPUT MESSAGES THROUGH THE CARD READER.

THE FOLLOWING OPERATING INSTRUCTIONS ARE APPLICABLE WHEN IT IS DESIRED TO OPERATE WITHOUT THE SERVICES OF A SUPERVISORY PRINTER:

1. STOP AND CLEAR THE PROCESSOR (HIT STOP AND CL) .
2. HIT "AD" AND KEY IN ZERO (0).
3. HIT "WR" AND KEY IN DISK CHANNEL NUMBER (2-DIGITS FOLLOWED BY "510000". FOR EXAMPLE, 00510000.
4. HIT "OP" AND KEY IN "660000".
5. HIT "SI" SIX TIMES
6. HIT "AD" AND SET ADDRESS 61.
7. HIT "WR" AND KEY IN A ONE (1).
8. HIT START.

SYSTEM WILL THEN BEGIN OPERATION USING THE LINE PRINTER AS SUPERVISORY OUT MEDIA AND WILL ACCEPT CARDS FROM THE CARD READER WITH THE FOLLOWING FORMAT:

1. CARDS MUST HAVE INVALID CHARACTERS IN COLUMNS 1 AND 2.
2. CARDS MUST CONTAIN VALID KEYBOARD INPUT MESSAGES (SEE SECTION ON KEYBOARD INPUT MESSAGES).

INPUT MESSAGES RECEIVED VIA THE CARD READER WILL BE PRINTED ON THE LINE PRINTER TO INSURE A HARD COPY OF THE INPUT TO THE SYSTEM. SUFFICIENT EXTRA SPACING WILL BE PROVIDED TO PERMIT EXAMINATION OF THE INPUT AND OUTPUT MESSAGES THROUGH THE LINE PRINTER WINDOW.

THE KEYBOARD INPUT MESSAGE CONTROL CARDS MAY BE ENTERED VIA THE CARD READER AT ANY TIME, THAT IS, DURING THE USE OF THE CARD READER AS A DATA FILE BY OBJECT PROGRAMS OR WHEN IT IS UNDER MCP CONTROL.

BURROUGHS CORPORATION
DATA PROCESSING PUBLICATIONS
REMARKS FORM

TITLE: _____

FORM: _____
DATE: _____

CHECK TYPE OF SUGGESTION:

ADDITION

DELETION

REVISION

ERROR

cut along dot line

GENERAL COMMENTS AND/OR SUGGESTIONS FOR IMPROVEMENT OF PUBLICATION:

FROM: NAME _____
TITLE _____
COMPANY _____
ADDRESS _____

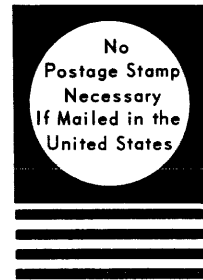
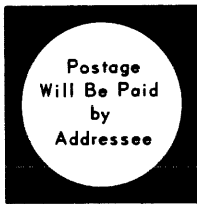
DATE _____

STAPLE

FOLD DOWN

SECOND

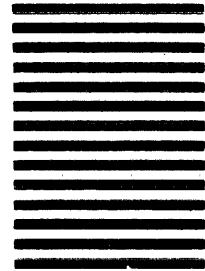
FOLD DOWN



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*Wherever There's
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