Suggested Reading

The chart below correlates topics from the Student Guide with pages from the manual A Series Systems An Introduction (1169562). These pages may be used as suggested reading assignments after the topics have been discussed in class. Note that this manual also has a glossary and a section describing the various A Series manuals, both of which may be helpful to students. You should suggest that the students refer to the manuals provided in class, and become familiar with their contents.

COURSE SECTION	UNIT	TOPIC	MANUAL PAGES
2	1-5	Files,Families and Disk Directories	52-54, 86-90, 140-141
3	1-2	MARC	37-38
4	1	System Initialization Concepts	110-111
5	1	Hardware and I/O Overview	1-7, 24-25, 33, 81-84
6	1-2	Data Communications Concepts	64-69
7	1	Address Spaces	102-105
8	1	CANDE Overview	43-44
9	1-6	Stack Architecture Concepts	26-29
11	1	Libraries Overview	31-32, 94-95
12	1	Memory Management	113-114
13	1-5	WFL Overview	48-51, 125-126
14	1	Security Overview	76-79
15	1	Printing Subsystem	91-93
15	3	DMS II Overview	58-63
15	4	SMF II, BARS BNA	96-99 71-75
16	1	Software Installation	107-121, 152-153

Some valid statements from Figure 1-1 are:

ROW THE BOAT DOWN STR

ROW, ROW, ROW YOUR BOAT GENTLY DOWN THE OLD MILL STREAM

ROW, ROW, ROW THE BOAT GENTLY DOWN THE OLD, MILL STREAM TO CHICAGO

Railroad Diagram Rules:

1. Read left to right except where indicated by arrows pointing right to left.
2. A loop is an item or group of items that can be repeated.
3. A bridge shows the maximum number of times you can take this path.
4. If diagram will not fit on one line, a right arrow (>) appears at the end of the first line. Another right arrow will appear at the beginning of the continuation line.
5. The end of the diagram is denoted by a vertical bar (|) or a percent sign (%).
6. A vertical bar means the command can be followed by a semicolon and another command.
7. A percent sign indicates that nothing else is to follow.
8. Upper case words must be spelled as they appear. You may use the acceptable abbreviation, which is underlined.
9. At least one blank must appear between words.
10. Blanks are optional around special characters.
11. Brackets with lower case words inside indicate that this a user-supplied variable.
12. Brackets are omitted.
13. A bridge with an integer only indicates the number of times that path can be traveled.
14. A bridge with an integer * indicates that this path must be traveled that number of times.

VALID 1. ONE OF THE INTERPRO PRODUCTS IS MARC.

VALID 2. SOME OF THE INTERPRO PRODUCTS ARE COMS, MARC AND IDC.

VALID 3. ONE OF THE INTERPRO PRODUCTS ARE ERGO.

INVALID 4. FIVE OF THE INTERPRO PRODUCTS ARE MARC, COMS, IDC, SDF ERGO.

A "," or the word "and" must separate SDF and ERGO

VALID 5. THREE OF THE INTERPRO PRODUCTS ARE MARC, ADDS AND SDF.

INVALID 6. ALL OF THE INTERPRO PRODUCTS ARE MARC, COMS, IDC, ADDS, SDF AND ERGO.

All is not a valid <number> option.

Practice

Part A: Match the terms on the left with the descriptions on the right.

__j__ 1.	FAMILY	a.	Composed of 1 to 17 alphanumeric characters.
__g__ 2.	DIRECTORY	b.	Composed of 1 to 13 identifiers.
__e__ 3.	FLAT DIRECTORY	c.	An identifier used to establish user identity and can be either privileged or non-privileged.
__c__ 4.	USERCODE	d.	An exact copy(ies) of a family.
__b__ 5.	FILE NAME	e.	A file that contains the file headers.
__i__ 6.	PACK	f.	A unique number assigned to each member of a family.
__a__ 7.	IDENTIFIER	g.	Node of a file name.
__f__ 8.	FAMILYINDEX	h.	Contains the Master Control Program and can be called the System Disk.
__d__ 9.	MIRROR DISK	i.	A family normally known as the System Resource Pack.
__h__ 10.	DISK	j.	A collection of disk devices with a common name and file directory.

Part B: See next page.

Part B: Given the information below, draw the logical tree-structured diagram that represents the files listed, by placing the correct identifier in the space provided.

a. The usercode is USER1.

b. The family is named EDUCATION.

c. The files are:

A/C/F/L
A/C/F/K
A/C/E/J
A/C/E/I
A/B/D/H
A/B/D/G

Fill in transparency of Figure 2-5 as the students provide the anwers.

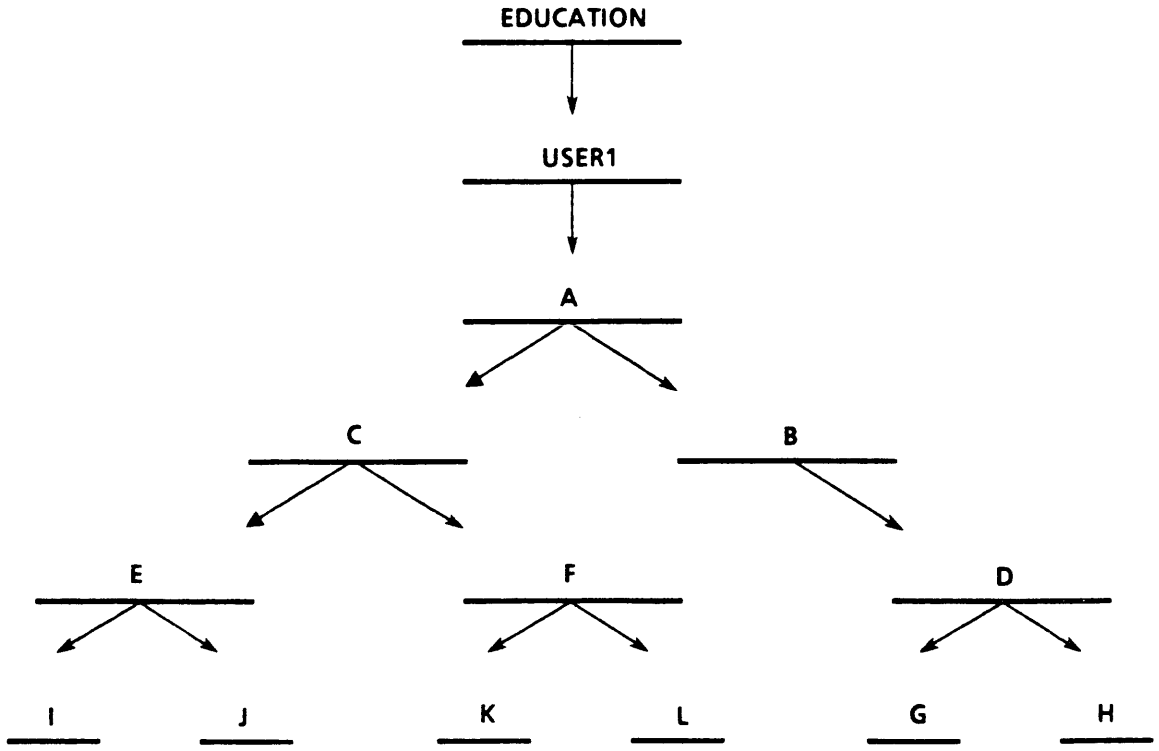

Figure 2-5 Tree Structure

Practice

Part A: Match the terms on the left with the descriptions on the right.

__d__ 1.	PAST	a.	A file that contains file headers for each file on the family.
__g__ 2.	SYSTEM/ACCESS DIRECTORY	b.	The ability to easily specify where the system should search for files.
__a__ 3.	FLAT DIRECTORY	c.	A file used to update the FAST when a pack is brought on-line.
__b__ 4.	FAMILY SUBSTITUTION	d.	A structure that contains an entry for each family on the system.
__c__ 5.	LAST	e.	An entry containing the row addresses and characteristics of the file.
__f__ 6.	FAST	f.	A structure containing pointers to file headers.
__e__ 7.	FILE HEADER	g.	A file comprised of the PAST and FAST.

Part B: See next page.

Part B: Write the Family Substitution statements necessary to accomplish the following:

1. The system should access files requested from the family EDUCATION. If a file is not located on this family, the system should not look on any other family.

FAMILY DISK = EDUCATION ONLY

2. You have been informed that all compilers will be available for your use on family TEST. Your usercode defaults to the family NEWAP with no alternate family.

FAMILY DISK = NEWAP OTHERWISE TEST

3. Your data files are located on family DBALL. All other files for your use are on family PRODUCTION.

FAMILY DISK = DBALL OTHERWISE PRODUCTION

OR

FAMILY DISK = PRODUCTION OTHERWISE DBALL

4. All non-usercoded files are located on DISK. Your private files should be located on STUDENTPACK.

FAMILY DISK = STUDENTPACK OTHERWISE DISK

Practice

Match the terms on the left with the descriptions on the right.

__b__ 1.	AREAS	a.	This attribute specifies the number of logical records in an area of a disk file.
__c__ 2.	BLOCKSIZE	b.	The value of this attribute is the number of areas (or rows) a disk file can allocate.
__a__ 3.	AREASIZE	c.	The value of this attribute is the length of a block.
__e__ 4.	MAXRECSIZE	d.	This attribute indicates whether or not a disk file can be allocated more areas.
__g__ 5.	UNITS	e.	This attribute specifies the maximum size of records in the logical file.
__d__ 6.	FLEXIBLE	f.	This attribute describes the peripheral unit associated with the logical file.
__f__ 7.	KIND	g.	This attribute indicates whether the transfer of data in the file will be word or character oriented.
__i__ 8.	TITLE	h.	This attribute can be programmatically changed and is the internal file name.
__h__ 9.	INTNAME	i.	This attribute is the external file name which is used to associate a logical file with a physical or permanent file.

Practice

Match the terms on the left with the descriptions on the right.

__e__ 1.	Halt/Load	a.	This is the most severe form of system initialization that an operator can invoke.
__d__ 2.	??PHL	b.	This action loads a new MCP to the H/L unit from a system tape.
__f__ 3.	OLAYROW message	c.	Command used to install a new MCP file.
__a__ 4.	Cold Start	d.	Command used to invoke a Halt/Load.
__c__ 5.	CM	e.	This action is the least severe form of system initialization.
__b__ 6.	Cool Start	f.	A Cold Start is indicated by the operator by entering this message to SYSTEM/LOADER.

Practice

Match the terms on the left with the descriptions on the right.

__d__ 1.	QLA	a.	A part of the MCP that controls the physical movement of information between the central system and the Data Communications Subsystem.
__e__ 2.	NSP	b.	Accepts keystrokes and converts them into bits and transmits them to the system.
__g__ 3.	LSP	c.	The source program that describes the Data Comm network in terms of station names, terminal types, line speeds and line procedures.
__b__ 4.	MT/TD/ET	d.	On input, assembles bits into bytes; on output, disassembles bytes into bits.
__a__ 5.	DCC	e.	Transmits whole messages between itself and the CPU.
__c__ 6.	NDL II	f.	This program is an MCS which provides such features as extensive transaction processing, windows, and a continuous operating environment.
__h__ 7.	MCSs	g.	Receives characters from the QLA and sends messages to the NSP.
__i__ 8.	NDL II Compiler	h.	The DCALGOL programs that exist for the purpose of controlling stations (traffic cop), and provide an interface between the Data Comm network and the application programs.
__l__ 9.	DATACOMINFO FILE	i.	This program compiles the NDL II source and produces the code for the NSP as well as tables used by the central system and the Data Communications Subsystem.
__k__ 10.	DCDLP	j.	The Data Communications Subsystem is initialized by this command.

Continued on next page.

Practice

Match the terms on the left with the descriptions on the right.

__h__ 1.	DELETE	a.	Determine the status of a task, station, or CANDE command.
__e__ 2.	HELLO	b.	Discard the workfile or some other file.
__d__ 3.	LIST	c.	Display and update the contents of the workfile.
__b__ 4.	REMOVE	d.	Display the contents of the workfile.
__f__ 5.	?AX	e.	Log on to CANDE.
__g__ 6.	?CS	f.	Reply to an accept message from a program.
__i__ 7.	?DS	g.	Display status of a compile.
__a__ 8.	?STATUS	h.	Remove lines from a workfile.
__j__ 9.	?Y	i.	Terminate an executing task.
__c__10.	PAGE	j.	Display information about the current task.

Practice

Match the terms on the left with the descriptions on the right.

__c__ 1.	Process Information Block	a. This action occurs at program execution time if there is insufficient memory available.
__f__ 2.	Process Stack	b. This action occurs when a segment descriptor is accessed for the first time.
__e__ 3.	File Parameter Blocks	c. The MCP builds this structure in memory and adds information from the program's PPB if it is present.
__a__ 4.	Scheduled	d. The memory estimate is located in this part of the object file.
__b__ 5.	Presence Bit Interrupt	e. These parts of the object code file contain the file attributes declared in the source program.
__h__ 6.	Segment Dictionary	f. This structure stores the program's working environment.
__d__ 7.	Segment 0	g. These vary in size and number depending on the structure of the source program.
__g__ 8.	Object Code Segments	h. This memory structure contains the segment descriptors for object code segments on disk and in memory.

Practice

Match the terms on the left with the descriptions on the right.

__c__1.	Return Control Word	a. A word placed on the stack when a procedure is invoked,to maintain the program history.
__f__2.	Indirect Reference Word	b. A word that contains the address of an object code segment.
__j__3.	Single Precision Operand	c. A word that specifies the address where control should return after a paragraph is performed of a paragraph is executed.
__h__4.	Presence Bit	d. A portion of a word used by the system in checking for read and write errors.
__i__5.	Program Control Word	e. A portion of a word that indicates the type of information contained in the word.
__b__6.	Segment Descriptor	f. A word that contains the address of an item in the stack.
__e__7.	Tag Field	g. A word that contains the address of data outside the stack.
__d__8.	Parity Bit	h. A portion of some descriptors, that indicates whether the item referenced is in memory or on disk.
__g__9.	Data Descriptor	i. A word that contains the address of the first object code instruction in a paragraph or procedure.
__a__10.	Mark Stack Control Word	j. A word that contains the value of a numeric variable declared in a program.

Practice

Match the registers on the left with the functions on the right.

__d__ 1.	BOSR	a. Contain the operands used by the current operator.
__f__ 2.	S Register	b. Contain portions of double-precision operands.
__e__ 3.	LOSR	c. Control the addressing environment for an ALGOL program.
__b__ 4.	X and Y Registers	d. Points to the very first word of the currently active stack.
__g__ 5.	D[2] Register	e. Points to the very last word allocated for the currently active stack.
__a__ 6.	A and B Registers	f. Points to the last (topmost) valid word of the currently active stack.
__c__ 7.	D[3-15] Registers	g. Points to the word on the stack where the currently active program began executing (above the MCP accounting area).

Practice

Write the statement and/or parameters needed for SYSTEM/DUMPALL to perform the following.

1. An operator at the ODT needs to list a file called (PAYROLL)DEPARTMENT/CHECKS ON PAYPACK.

   RUN SYSTEM/DUMPALL ("LIST (PAYROLL)DEPARTMENT/CHECKS ON PAYPACK")

   RUN SYSTEM/DUMPALL ("L (PAYROLL)DEPARTMENT/CHECKS ON PAYPACK")

2. A user signed on to MARC as USER6. The user wishes to list 30 records of a file called (USER6)DEVELOPMENT/RECEIVES beginning at record 15. The output should be in the format of the intmode of the file.

   LISTAN DEVELOPMENT/RECEIVES REC 15 THRU 44

   LISTAN (USER6)DEVELOPMENT/RECEIVES REC 15 THRU 44

   LISTAN DEVELOPMENT/RECEIVES SKIP + 15 INCL 30

   LAN DEVELOPMENT/RECEIVES REC 15 THRU 44

3. An ODT operator wishes to list records 1 to 10 of all files that begin with (TEST)COBOL/APPLICATIONS located on the family DEVELOPMENT.

   RUN SYSTEM/DUMPALL ("LIST (TEST)DEPARTMENT/CHECKSCOBOL/APPLICATIONS/= ON DEVELOPMENT REC 1 THRU 10")

4. The ODT operator from question 3 has now signed on to MARC. The operator needs to repeat the listing produced in question 3.

   LIST COBOL/APPLICATIONS = REC 1 THRU 10

Practice

Part A: Name the parts of the Work Flow Management System that perform the following functions.

1. This program checks the syntax of a WFL source file, and translates the WFL statements into machine code.

   ___WFL Compiler_____

2. This file contains object code, WFL source, data decks, log entries, and restart information for the job.

   ___Jobfile_____

3. This independent runner coordinates other parts of the WFL system, and handles all commands entered at the ODT.

   ___Controller_____

4. This procedure places jobs in queues by matching the requirements of the jobs with the characteristics of the job queues.

   ___Abstract_____

5. The Controller organizes the jobs by class and priority within this file.

   ___Jobdesc_____

6. After a job ends, this procedure formats the printed output and enqueues the job for printing.

   ___Jobformatter_____

Part B: Under what ADM category would the following information be displayed? (Or, what ODT command could you enter to display this information?)

1. An initiation message output by a program **__MSG___**
2. Notification that a task has ended **__C_____**
3. The prompt for an Accept needed by a program **__W_____**
4. The name of a tape mounted on a tape drive **__PER MT__**
5. The job and task number for an executing task **__A_____**
6. The name of a missing file needed by a program **__W_____**
7. Notification that a file has been removed **__MSG___**
8. The names of all the scheduled tasks **__S_____**

Practice

Identify the lines of the sample WFL job below by their sequence numbers.

```
BEGIN JOB SAMPLE;                                          100
FAMILY DISK = PRODUCTION OTHERWISE DISK;                   200
PRIORITY = 75;                                             300
INTEGER MONTH;                                             400
MONTH := 9;                                                500
RUN WEEKLY/REPORTS;                                        600
    FILE WEEK (TITLE = THIS/WEEK/DATA ON ACCT);            700
RUN WEEKLY/TOTALS;                                         800
COMPILE MONTHLY/REPORTS COBOL LIBRARY;                     900
    COMPILER FILE CARD (KIND = DISK, TITLE =               1000
        SOURCE/MONTHLY/REPORTS);                           1100
END JOB                                                    1200
```

1. Which lines form the following sections of the job?

   a. Job Attributes __200,300_____

   b. Job Header __100_____

   c. Working Section __500-1100_____

   d. End Job Section __1200_____

   e. Job Declarations __400_____

2. Which lines illustrate the following types of WFL statements?

   a. File Equation __700,1000-1100__

   b. Assignment __500_____

   c. Compiler Initiation __900_____

3. Which lines cause tasks to be executed? ___600,800,900_____

Practice

Write the LIBRARY/MAINTENANCE statements to accomplish the following.

1. Create a backup tape called BKUPATS containing all files under the ATS directory on the ACCTS pack.

   COPY ATS/= FROM ACCTS (PACK) TO BKUPATS (TAPE)
   or
   COPY ATS/= FROM ACCTS (PACK) TO BKUPATS

2. An existing file on the TEST pack called PAYROLL/TEST/DATA is improperly named. The file name should be TEST/DATA/PAYROLL/CKS.

   CHANGE PAYROLL/TEST/DATA TO TEST/DATA/PAYROLL/CKS FROM TEST
   or
   CHANGE PAYROLL/TEST/DATA TO TEST/DATA/PAYROLL/CKS FROM TEST (PACK)
   or
   CHANGE PAYROLL/TEST/DATA ON TEST TO TEST/DATA/PAYROLL/CKS

3. Some files that should be under the (AR) directory are missing from the family PRODUCTION. A backup of all the (AR) files was made last week on the tape ARBACK. Copy only the missing files from the tape to the pack.

   ADD (AR)= FROM ARBACK (TAPE) TO PRODUCTION (PACK)
   or
   ADD (AR)= FROM ARBACK TO PRODUCTION (PACK)

4. The file TEST/DATA/PAYROLL/CKS is no longer needed on the TEST pack.

   REMOVE TEST/DATA/PAYROLL/CKS FROM TEST
   or
   REMOVE TEST/DATA/PAYROLL/CKS FROM TEST (PACK)
   or
   REMOVE TEST/DATA/PAYROLL/CKS ON TEST

5. The ALGOL compiler, called SYSTEM/ALGOL, should be on the family SUPPORT instead of on DISK.

   COPY SYSTEM/ALGOL FROM DISK TO SUPPORT (PACK)
   or
   COPY SYSTEM/ALGOL TO SUPPORT (PACK)
   then
   REMOVE SYSTEM/ALGOL FROM DISK
   or
   REMOVE SYSTEM/ALGOL

Practice

Match the programs and software products on the left with the capabilities on the right.

__e__ 1.	SYSTEM/LOGANALYZER	a. Produces user-defined reports on the performance and utilization of the system.
__g__ 2.	ReprintS	b. Produces reports on disk files and their attributes.
__d__ 3.	DASDL	c. Produces tabular or graphic reports, using the data in databases or conventional files.
__a__ 4.	SMF II	d. Defines the structure of DMS II databases.
__b__ 5.	SYSTEM/FILEDATA	e. Produces reports of selected information from the system logs, on a printer, terminal, or ODT.
__h__ 6.	LINC II	f. Services all requests to read and write DMS II databases.
__c__ 7.	ERGO	g. Prints files on remote printers controlled by COMS and MARC.
__f__ 8.	SYSTEM/ ACCESSROUTINES	h. Generates application systems from a single set of specifications.

Practice

Match the programs and commands on the left with the functions on the right.

__d__ 1.	OBJECT/LISTNOTES	a. Reconfigures disk packs.
__c__ 2.	SL	b. Specifies the disk locations of special types of files.
__e__ 3.	MQ	c. Specifies the file names where certain library entry points are located.
__b__ 4.	DL	d. Prints software documentation such as P & D notes from tapes.
__g__ 5.	CM	e. Makes or modifies job queues.
__h__ 6.	OP	f. Applies patches and compiles system software.
__a__ 7.	[illegible]	g. Specifies the file title of the MCP.
__f__ 8.	WFL/COMPILE/ SOFTWARE	h. Sets or resets system options.

ANSWERS TO HARDWARE PRACTICES

A 3

_f_ 1.
_e_ 2.
_b_ 3.
_a_ 4.
_g_ 5.
_c_ 6.
_d_ 7.

A 9

_e_ 1.
_c_ 2.
_g_ 3.
_h_ 4.
_a_ 5.
_d_ 6.
_b_ 7.
_f_ 8.

A 10

_e_ 1.
_c_ 2.
_g_ 3.
_h_ 4.
_a_ 5.
_d_ 6.
_b_ 7.
_f_ 8.

A 15

_d_ 1.
_a_ 2.
_h_ 3.
_c_ 4.
_i_ 5.
_b_ 6.
_f_ 7.
_g_ 8.
_e_ 9.

B 5900

_b_ 1.
_d_ 2.
_g_ 3.
_e_ 4.
_a_ 5.
_h_ 6.
_f_ 7.
_c_ 8.

B 6900

_f_ 1.
_c_ 2.
_g_ 3.
_e_ 4.
_a_ 5.
_b_ 6.
_d_ 7.

B 7900

_d_ 1.
_a_ 2.
_h_ 3.
_c_ 4.
_i_ 5.
_b_ 6.
_f_ 7.
_g_ 8.
_e_ 9.

Practice

Match the A 3 system elements on the left with the descriptions on the right.

__f__1.	Control Store	a. Interfaces the central system to the I/O Subsystem.
__e__2.	Data Link Processor	b. Performs system initialization and diagnostic testing.
__b__3.	User Interface Processor	c. Interfaces the CPU to the Memory Subsystem.
__a__4.	Host Dependent Port	d. Contains the Arithmetic Logic Unit.
__g__5.	Code-Isolate	e. Is hardware designed to control a specific type of peripheral device.
__c__6.	Memory Control Unit	f. Stores the operator microcode.
__d__7.	Data Section	g. Captures object code, and provides input to the Micro-Address Module.

Practice

Match the A 9 system elements on the left with the descriptions on the right.

__e__1.	Multiple Logical Processor	a. Contains the Top-of-Stack register pairs.
__c__2.	Data Link Processor	b. Functions as an ODT, SCP, or maintenance display.
__g__3.	Maintenance Interface Processor	c. Is hardware designed to control a specific type of peripheral device.
__h__4.	Message Level Interface Processor	d. Stores the operator microcode.
__a__5.	Data Path	e. Contains 3 logical processors, to pipeline hardware operator tasks.
__d__6.	Stored Logic Control	f. Determines the tasks required to execute the object code.
__b__7.	Ergonomic Work Station	g. Executes maintenance programs initiated on-site or from a remote site.
__f__8.	Program Controller	h. Interfaces the A 9 processor to the I/O subsystem.

Practice

Match the A 10 system elements on the left with the descriptions on the right.

__e__1.	Multiple Logical Processor	a. Contains the Top-of-Stack register pairs.
__c__2.	Data Link Processor	b. Functions as an ODT, SCP, or maintenance display.
__g__3.	Maintenance Interface Processor	c. Is hardware designed to control a specific type of peripheral device.
__h__4.	Message Level Interface Processor	d. Stores the operator microcode.
__a__5.	Data Path	e. Contains 3 logical processors, to pipeline hardware operator tasks.
__d__6.	Stored Logic Control	f. Determines the tasks required to execute the object code.
__b__7.	Ergonomic Work Station	g. Executes maintenance programs initiated on-site or from a remote site.
__f__8.	Program Controller	h. Interfaces the A 10 processor to the I/O subsystem.

Practice

Match the A 15 system elements on the left with the descriptions on the right.

__d__1.	Data Link Processor	a. High speed memory that contains the most recently used data and object code.
__a__2.	Cache	b. Buffers data to reduce the number of writes to memory.
__h__3.	SYCON	c. Performs the logical and arithmetic operators in the processor.
__c__4.	Execution Unit	d. Is hardware designed to control a specific type of peripheral device.
__i__5.	Program Control Unit	e. Functions as a maintenance processor.
__b__6.	Write Unit	f. Manages all data transfers between main memory and the I/O subsystem.
__f__7.	Host Data Unit	g. Is a subset of A 15 modules which has been configured as a separate system.
__g__8.	Partition	h. Is a program to initialize and configure the A 15 from the console.
__e__9.	SMP	i. Builds the operator pipeline.

Practice

Match the B 5900 system elements on the left with the descriptions on the right.

__b__1.	Program Controller	a. Develops the timing required to read and write memory.
__d__2.	Stored Logic Control	b. Extracts individual operators and their parameters from code words fetched from memory.
__g__3.	Data Processor	c. Is hardware designed to control a specific type of peripheral device.
__e__4.	Message Level Interface Processor	d. Stores the operator microcode.
__a__5.	Memory Control Module	e. Interfaces the B 5900 processor to the I/O subsystem.
__h__6.	Maintenance Processor	f. Serves as an interface between the console and the Maintenance Processor.
__f__7.	Maintenance Interface Processor	g. Contains the logic necessary to perform arithmetic functions and shift data.
__c__8.	Data Link Processor	h. Performs maintenance functions against processor modules.

Practice

Match the B 6900 system elements on the left with the descriptions on the right.

__f__1.	Host Control Port	a. Controls the paths to memory.
__c__2.	Data Link Processor	b. Performs system initialization and testing.
__g__3.	Data Processor	c. Is hardware designed to control a specific type of peripheral device.
__e__4.	Message Level Interface Processor	d. Connects an IODC base module to the Message Level Interface Processor.
__a__5.	Memory Control Module	e. Interfaces the B 6900 processor to the I/O subsystem.
__b__6.	Maintenance Diagnostic Processor	f. Serves as an interface between the Data Processor and the Maintenance Diagnostic Processor.
__d__7.	Message Level Interface	g. Contains the logic necessary to perform arithmetic functions and shift data.

Practice

Match the B 7900 system elements on the left with the descriptions on the right.

__d__1.	Data Link Processor	a. Includes a local and a shared memory component.
__a__2.	Address Space	b. Buffers data to reduce the number of writes to memory.
__h__3.	SYCON	c. Performs the logical and arithmetic operators in the processor.
__c__4.	Execution Unit	d. Is hardware designed to control a specific type of peripheral device.
__i__5.	Program Control Unit	e. Functions as a maintenance processor, or as an auxiliary processor.
__b__6.	Store Queue	f. Manages all data transfers between main memory and the I/O subsystem.
__f__7.	Host Data Unit	g. Is a subset of B 7900 modules which has been configured as a separate system.
__g__8.	Partition	h. Is a program to initialize and configure the B 7900 from the console.
__e__9.	AP/AMP	i. Builds the operator pipeline.

MARC LAB

Approximate lab time: 1 hour (shorter if students have experience using the system)

Ask the students to fill in the blanks as they work through the lab.

1. Give the students the usercode and password before the lab session.

2 - 8. These steps are very simple. They are intended to provide practice using MARC menus, command mode, and typeahead.

9. The CO is required only if the beginning of the command could be confused with the Actions allowed at this point (for example, C for Completed entries could be confused with CO for Command, so you must enter CO C , or C C, to display Completed entries).

MARC LAB, cont.

10 - 11. Simple menu usage.

12. The file cannot be located, because the family substitution for the MARC session has been changed.

13-14. Menu and Help usage.

15. The file can be located now, because the family substitution has been restored.

16. Students should develop the habit of signing off when they are finished.

After the lab, discuss common questions and problems encountered during the lab session.

CANDE LAB

Approximate lab time: 1 hour 30 minutes

A. Basic CANDE Commands

1 - 2. Remind the students of the correct usercode, password, and family statement.

3. The purpose of this lab is to practice CANDE, not to learn ALGOL. ALGOL source was chosen because it is much shorter than COBOL.

4. SEQ 100 + 100 is the default, so students can just enter SEQ.

5. There should be errors (they will be corrected by following the steps below).

6. Add the line by inserting it at the proper spot on the screen, or by typing it at the top of the screen (single-line entry).

9. There should still be errors.

10. Use DEL 350, or V in column 1 of line 350.

11. There should not be errors at this point. If there are, help the students correct the problems.

13. R3 = 15

CANDE LAB, cont.

14. There should be a source file and an object file.

15. Use LFILES to list the attributes.

B. CANDE Control Commands

1. ?MSG

2. ?WRU gives COMS information

3. ??WRU gives CANDE information (COMS responds to ? commands if it understands them, and passes them to CANDE if it does not. WRU is a command in both MCSs, so you must use ?? to bypass COMS and talk to CANDE).

4. ?WM

5. ?TD

6. ?COUNTS

CANDE LAB, cont.

C. COMS Windows and Dialogs

1 - 3. These steps illustrate moving back and forth between MARC and CANDE.

4. The session number should be the same.

6. The session number should be different.

7 - 9. This address file will be used to build a class roster in the next lab.

11-12. These steps should prove that this is the original CANDE session.

13. The file exists because it was saved in the other CANDE session.

14. Do not encourage students to move to other windows--the results may be unpredictable.

After the lab, discuss common questions and problems. Use this discussion to lead into the Additional CANDE Commands covered in Section 8 Unit 5.

CANDE/DUMPALL LAB

Approximate lab time: 1 hour 15 minutes

A. Additional CANDE Commands

1. This provides more practice with CANDE, and with Insert and Move.

2. Practice with Find and Replace.

3. Practice with Do files.

4. These directions assume 3.6 (or higher) CANDE. If you are using 3.5 CANDE, the BACK command gives different options.

CANDE/DUMPALL LAB, cont.

B. SYSTEM/DUMPALL

1 - 2. These steps provide practice running DUMPALL in different modes.

3. Practice reading the attributes and data from a DUMPALL listing.

g-h. Lastrecord should be 1 less than the number of records in the file (LASTRECORD is 0-relative).

After the lab, discuss common questions and problems encountered during the lab session.

DUMP LAB (OPTIONAL)

Approximate lab time: 45 minutes

Note to instructor: If the students are not familiar with block-structured languages, discuss this program for a few minutes. It may help to draw lines on the source listing, to illustrate the program structure.

Objective: Identify and interpret portions of a program dump for a program that failed. This optional exercise is designed for students who are interested in dump reading.

This exercise refers to the program listing on page C-64, the compile listing on pages C-65 and C-66, and the program dump on pages C-67 and C-68.

1. Name the procedures in which the following variables can be referenced.

   V1 __All_____

   V3 __A,B_____

   V5 __D_____

2. How much memory is required to execute this program? __37 words_____

3. For each of the following variables, give the stack address and value at the time of the dump.

	Stack Address	Value
V1	__(2,2)_____	__0__
V3	__(3,2)_____	__3__
V5	__(4,2)_____	__5__

4. What caused PCWs to be placed at (2,4) and (2,5) on the dump?

   __Procedures A and C were declared at lines 400 and 1500_____

5. What is the first executable statement in the program? __C at line 2900_____

DUMP LAB (OPTIONAL), cont.

6. Trace the execution of the program, and compare it to the dump, by completing the chart below.

Sequence Number	Procedure	Lex Level	Offset in Dump
200	BOT	2	0014
2900	C	3	001B
2600	D	4	001F
2300	A	3	0022
1200	B	4	0026

7. Why does D[3] appear at offsets 001B and 0022 both? Where was D[3] pointing at the time of the dump?

Procedures A and C both execute at lex level 3. The topmost D[3] on the stack (offset 0022) was current at the time of the dump.

8. a. What is the significance of the numbers 1000, 1200, 2300, 2600 after "Fault Termination" on page C-67 of the dump?

The program failed at line 1000. The other sequence numbers trace the program history backwards from there (compare to the chart above).

b. These numbers are not printed on every dump. Why were they printed on this dump?

The LINEINFO $ option was set in the source program.

9. Why did this program fail?

Divide by zero at line 1000 (V2 was 0 at the time of the dump).

WFL LAB

Approximate lab time: 1 hour 30 minutes (shorter if the students have good background)

A. The lab tape includes a solution to this job, for instructor use.

2 - 3. Remind the students of the usercode, password, and family substitution statement.

7. This will give the students a listing of the class roster. The program receives the class date and student name through Accept messages, and prints this data at the beginning of the listing.

B If the students do not have easy access to an ODT, you may wish to set up a terminal as a REMOTESPO with an ADM, for the students to observe during this lab.

WFL LAB, cont.

C. Library Inquiries

1. If you are not a systemuser, entering LIBS through MARC may not show any libraries, because you do not have a system-wide view. The LIBS ODT command will show all the libraries.

2. The students can see that there are many system libraries.

After the lab, discuss common questions and problems. Ask the students to look through their job summaries to see the information provided:

Banner page
WFL source
Job summary log with BOJ, BOTs, EOTs, EOJ, messages, operator entries, Elapsed time, Processor time, I/O time, Presence bit statistics
Printed output from tasks
End page