Design and Implementation of Transaction in Indonet Using CICS/VS and VSAM

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in partial fulfilment of the requirements
for the award of the Degree of

MASTER OF PHILOSOPHY

A. MESHACH PONRAJ

Sup: Phoha, R.C.

SCHOOL OF COMPUTER AND SYSTEM SCIENCES
JAWAHARLAL NEHRU UNIVERSITY
NEW DELHI-110067

1987

JAWAHARLAL NEHRU UNIVERSITY,

SCHOOL OF COMPUTER & SYSTEMS SCIENCES,

NEW DELHI - 110 067.

CERTIFICATE

This is to certify that the dissertation entitled "Design and Implementation of a Transaction in Indonet using CICS/VS and VSAM" submitted by A. Meshach Ponraj is in partial fulfilment of the requirement for the award of degree of Master of Philosophy.

The work is original and has not been submitted, in part or full, elsewhere for the award of a degree.

R C Phoha

(Dr. R. C. PHOHA)
Supervisor

K K Nambiar

(Prof K. K. NAMBIAR)
Dean

CMC Limited सीएमसी लिमिटेड

8-F Hansalaya, 15 Barakhamba Road, New Delhi-110001, Phones: 3314346-9, Telex: 031-66814, Cable: COMPSERVE
8-एफ हंसालया, 15 बाराखम्बा रोड, नई दिल्ली-110001 फोन: 3314346-9, टेलेक्स: 031-66814, तार: कॉम्पसर्व

July 17, 1987

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Mr. A.Meshach Ponraj has worked on the project entitled, "Design and implementation of Transaction in Indonet using CICS/VS and VSAM" at CMC Delhi from August 86 to April 87.

We found Mr.A.Meshach Ponraj to be hardworking and sincere during his period.

Regards,

A.K.Dua
Systems Manager

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New Delhi,
15,July 1987.

A. Meshach Ponraj
(A.Meshach Ponraj)

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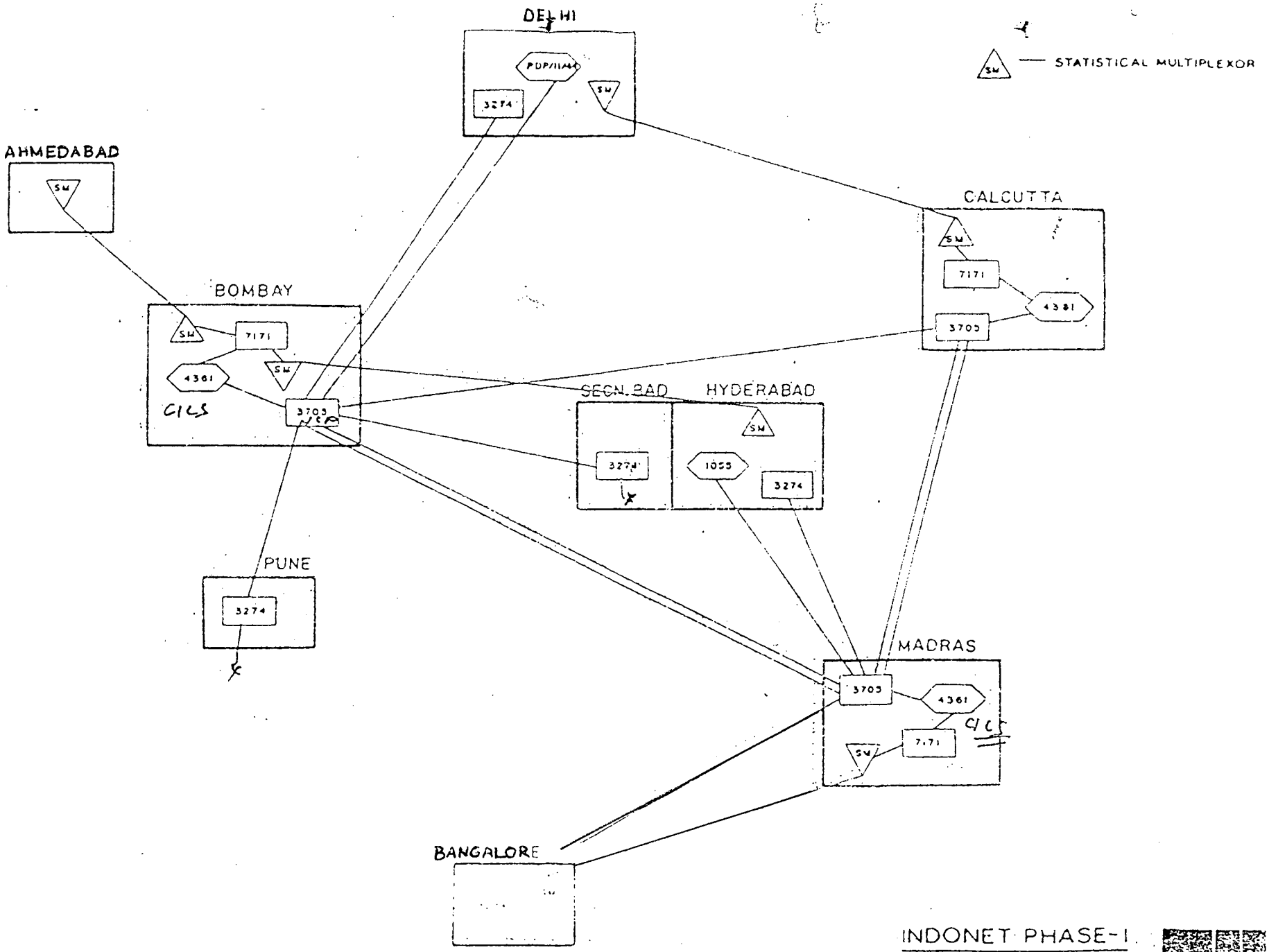
Chapter 1

THE TOPOLOGY OF INDONET

INTRODUCTION

The current decade, as far as the computer industry is concerned, belongs to that of a revolution in "COMPUTER NETWORKING". As a clear evidence of this, many networks like BHELnet, Bank-net, Coalnet, Railway Network, IIT-net, NIC-net and Indonet have come up in this country. The networking culture gets a warm welcome with open hands especially in a country like india which is geographically vast.

Among the above mentioned networks, INDONET is the first commercial public data processing network introduced by Computer Maintenance Corporation **(CMC)**. In the current phase, (as shown in the fig 1)the computer systems (IBM 4361 ç PDP 1144 ç R 1055) at Bombay Calcutta, Delhi, Hyderabad and Madras are linked through the dedicated Department Of



INDONET PHASE-I
CONFIGURATION

Telecommunications **(DOT)** voice grade channels. All IBM main frames situated at Bombay, Calcutta and Madras are known as the **Nodel Computers.** In the next phase (as shown in the fig 2) the nodel computers would be linked through the satellite **INSAT-1C.** for the inter-city data communication. Intra-city communication facility will be available, (in the next phase) to the couster's location through ratio links.

THE HARDWARE

Currenly three mainframes (IBM/370) are in use for data communication as well as for data processing, and tmo minicomputers (PDP 11/44 at Delhi and R-1055 at Hyderabad) are used as RJEs (Remote Job Entry). Data prossesing is not possible in the RJE Systems; only file transfer is possible.

The complete detail of the hardware available at the five major cities (Bombay, Calcutta, Delhi, Hyderabad and Madras)is given in the table as follows:

INDONET — ON TO PHASE II

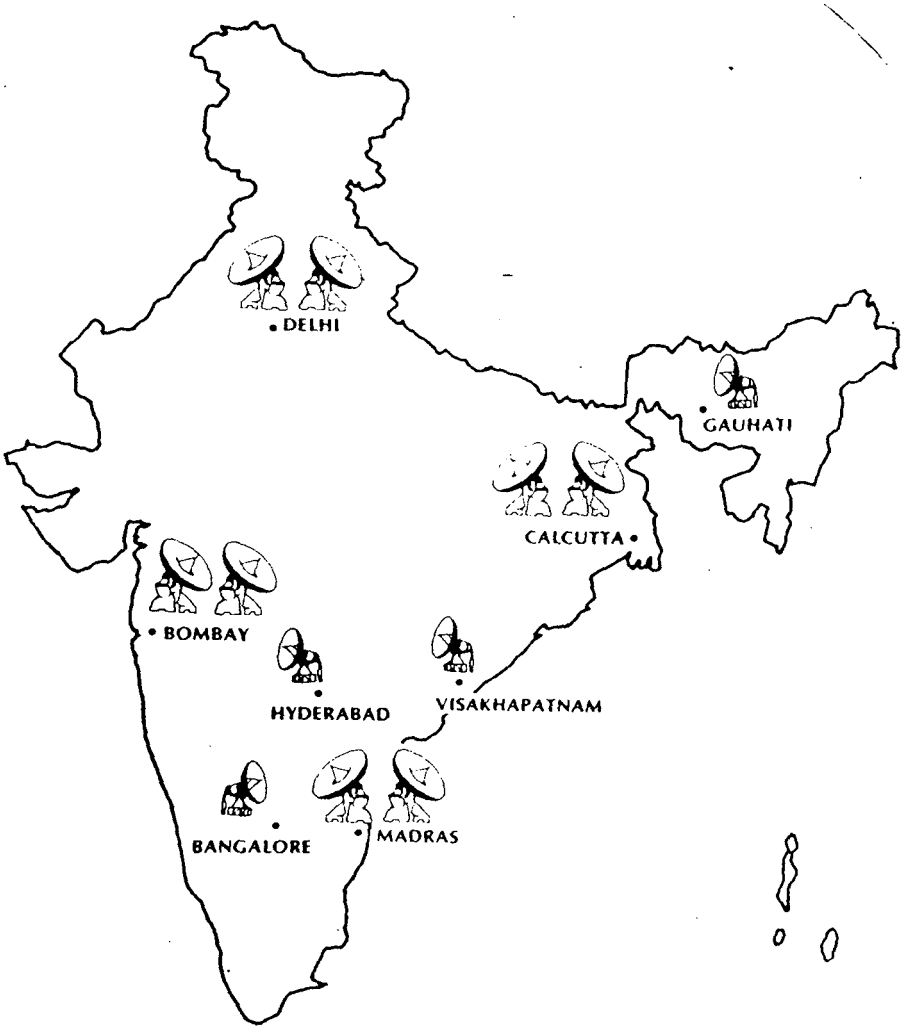


TABLE 1: HARDWARE DETAILS:

	BOMBAY	CALCUTTA	DELHI	HYDERABAD	MADRAS
CPU	IBM/4361	IBM/4361	PDP 11/44	R 1055	IBM/4361
MEMORY	4MB	4MB	1.5MB	2MB	4MB
DISKS	2340MB	2340MB	900MB	800MB	2340MB
TAPES	2X1600 6250BPI	2X1600 6250BPI	2X800 1600BPI	2X1600 6250BPI	2X1600 6250BPI
PRINTERS	1200 LPM	1200 LPM	600 LPM	600 LPM	1200 LPM
TERMINALS	10+10 +UR	10+00+UR	16+00+00	08+00+00	10+10+UR
COMM.CON	3705	3705	3274	2703	3705
PC/AT	1	1	1	1	1
OS	VM/CMS DOS/VSE	VM/CMS DOS/VSE	RSTS	OS/VS (SVS)	VM/CMS DOS/VSE

MB : Megabyte

BPI : Bytes Per Inch

LPM : Line Per Minute

COMN.CON : Commmunication Controller

OS : Operating System

In this table, TERMINALS row

.s represented in the following format:

XX + YY + ZZ

XX : represents the number of local terminals supported by the system

YY : represents the number of remote terminals supported by the system through the network

ZZ : represents the other general users

IBM 3274 is the CLUSTER CONTROLLER. Each remote user can communicate with any host computer through cluster controller if his/her terminal is an asynchonus-terminal. Currently five terminals at Delhi are connected through this to Bombay host. Ofcourse, it can support more than five terminals, but the response will go down. It basically works in a round robin technique i.e, it test each terminal in an equal intervel of time and if the terminal is requesting to send some data to its host then the Cluster Controler receives the data which is in the digital form, converts these data into analog signals with the help of an A/D (Analog to Digital) converter which is a part of the Cluster Controler. A MODEM, in general modulates as well as

demodulates the signals i.e, If an analog signal is given to it, then it modulates. If a modulated signal is given,it demodulates. That is why it is known as modulater/demodulater. In short form, it is known as **MODEM.** Throughout our discussion we call it as Modem. The Analog signals are then modulated through the modulater and then it is sent to the nearest host.

IBM 3705 is the front-end processor which works in parallel processing technique with each nodel computer. The modulated analog ,signals (as mentioned in the above para) which are sent from different remote locations are received. First, these signals are demodulated when they are sent through the MODEM. Then these analog signals are converted to digital signals. The front end processor looks for the address of the host. If its own host is addressed then the information is sent to the CPU. If some other host in the network is addressed, then the message/command will be directed to that particular host in the shortest possible route without interupting the host-CPU. In this way the

CPU will not be loaded up (to some extent), and hence increases the efficency of the network. Since the P&T lines (basically which are not meant for data communication) are used, the data transfer rate is very slow (1200 -2400 bits per second). The data transfer rate would be high in the next phase (shown in fig.2) since the satellite (INSAT 1C) would be used for data communication.

An IBM PC/AT is connected in each location (as mentioned in the above table) in order to make the file transfer. The files created in any PC/XT or PC /AT, can be transfered to its host. The software PC3278/79 is developed for this purpose. The IBM /370 accepts only EBCDIC character. But all PC's works in ASCII. Hence all the ASCII characters should be converted to ebcedic, before transfering the file.

The PC3278/79 is an emulating software that emulates the IBM PC/AT into an Indonet terminal. The PC/AT can share the resources of its host. But the host can not share any of the resources of the PC/AT.

The Software

The following softwares are currently available in the nodel computers.

1)Under Virtual Machine(VM):

i) Control Program **(CP)**
ii) Conversational Monitoring System G(CMS)
iii)Remote Spooling Control Communication System **(RSCS)**

are available.

2) Under Disk Operating System (DOS):

i) Virtual Storage Extended **(VSE/AF)**
ii) Virtual Storage Extended / Priority Output Writers, Execution Processors And Readers **(VSE/POWER)**
iii) Remote Job Entry (RJE)
iv) Virtual Storage Access Method **(VSAM)**

are available.

3) Under Coustomers Information Control System (CICS/VS):

i) Coustomers Information Control System/Virtual Storage **(CICS/VS)**
ii) Screen Developement Facility **(SDF)**

are available.

Beside these software, hierarchial as well as relational Management Information Systems **(MIS)** are also available as follows:

1) Data Language / one (DL/1) which is a hirarchical data base.

2) Sequencial Queary Language (SQL)

which is a relational data base.

The following software which are very useful in the network are also available.

1) Network Communication Control Facility **(NCCF)**
2) Network Problem Determination **(NPDA)**
3) Network Control Program / Virtual Telecommunication Access Method **(NCP/VTAM)**

AN OVERVIEW OF THE OPERATING SYSTEMS :

As mentioned earlier the system has many operating systems. At any time one operating system will be running. At the earlier stage all IBM machines were batch processing machines. Later extra hardware as well as software were added in order to convert the batch machine into on-line system. **VSE** (virtual storage extended) is the operati ; system for batch processing. Virtual Machine (VM) will be running in the on-line processing. **CMS** (conversatinal moniter system) is also an operating system of its own right.It creates an enveronment for the on-line user to manage his/her files as well as to run the application programs. The Control Program (CP) controls the resources of the real computer to

provide multiple Virtual Mechine to the users. CP takes care of the inter-operating systems communications. When the user logged on, the CP will be read. It first checks the account number and the passward for validity. After the user has succesfully logged on, it gives a copy of CMS to the user and gives the control to the CMS.

CICS/VS is an application package that interfaces application programs with the system. More details are given in chapter two.

VSAM is a file access method developed by IBM in the mid of the last decade. It helps to retrive the on-line files. In IBM terminology, the VSAM Cluster is nothing but a VSAM data set. In the VSAM Cluster it is possible to add, delete, read, read for updation, rewrite and browse the records. The complete discussion is given in chapter three.

Chapter 2

CICS/VS IN THE NETWORK

Chapter 2
CICS/VS IN THE NETWORK

INTRODUCTION

Customers Information Control System/Virtual Storage shortly known as **CICS/VS** is a teleprocessing moniter developed by IBM. As said in the previous chapter it is an interface with the application program to the terminals, data bases and operating system. Statements are written in the command level language CICS/VS which will be translated into COBOL, PL/1 or IBM ASSEMBLY language. Some of the main features (like Multy-threading, Multy-tasking, Transaction driven, priority processing and Quasi-reentrant) are discussed in this chapter. Further prgram development is also discussed.

THE MULTITHREADING AND QUASI-REENTRANT

Normally when several terminals are using the same program in a multitasking environment,the operating system, gives one copy of the program to each terminal. In this way the main storage is not utilized efficiently. At the

ame time, if a program runs under CICS/VS, instead of giving one copy to each terminal, only one copy of the program will be shared by all the terminals in a "time-slicing-way" i.e, CICS/VS makes one copy of the program and give it to one user at a time. when his/her time (which depends on the priority assign to the job) is over, it takes the same copy and replaces the original data (if any data is changed during the run time) and then gives the same program to th next user waiting with the highest priority in the queue. In this way in a commercial application, it enables the memory manager to utilize the main storage efficiently.

MULTITASKING

CICS/VS runs in one partition with highest priority (priority number 9)i.e, in one part of the main storage. Several tasks can be executed concurrently in a single partition. A task can be suspended temporarily and it will be put in the waiting queue and the next highest priority task takes the control. The previous task (depending on the waiting time and its priority) takes the contral in a later time.

TRANSACTION DRIVEN

All CICS/VS programs are transaction driven, in other words several programs can be put in one particular name (which is known as a transaction) and it is possible to run this, just by giving the transaction ID. This technique which is supported by CICS/VS is very helpful in designing the application program in a pseudo-conversational mode. A comparision of the conversational mode vs pseudo-conversatioal mode can be found in chapter four.

PRIORITY PROCESSING

A Priority is assigned to each terminal by the systems programer. It is possible for the application programer to assign a priority (a number n, such that $0 < n < 10$) for the task while designing the transaction. Greater the number greater will be the priority. Hence there will be faster responce for higher priority.

TERMINAL CONTROL FACILITY

In a CICS/VS program

there is no read, input, write or display command. A map which is a set of constant as well as variable attributes, can be sent by the program to the terminal, received from the terminal to the program, or can be used to read/ write/ update/ rewrite/ delete/ browse the VSAM Cluster. A complete discussion is given in chapter 4.

THE FILE MANAGEMENT

In CICS/VS program there is no open-file or close-file command. All the on-line files are open when the CICS/VS was brought up and all of them will be closed while it is brought down. Simultanously users can have the access to the same cluster. However if a dataset is read for updation for by particular user, then no other user can have access to that particular data set. However, if a particular user releases this exclusive control (using an 'UNLOCK' command) then it is possible for other users to access the same data set. To regain the exclusive control again 'LOCK' command can be used. The default locks the cluster. Thus the problem which arise out of concurrency is removed. We would

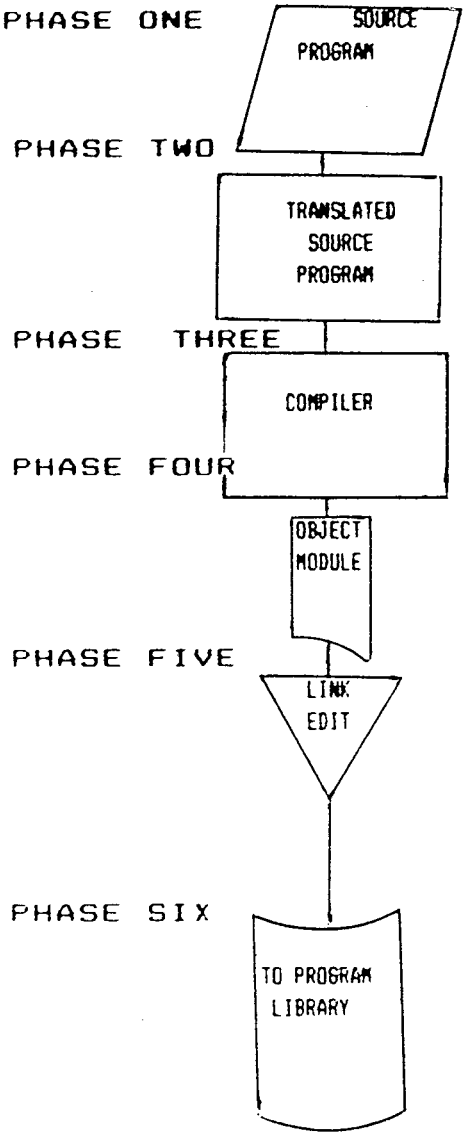
disscuss more about this in the fourth chapter.

CICS/VS interfaces with the VSAM Cluster and helps the application programers to read/ write/ update/ rewrite/ delete/ browse his/her file. Even if the data are neither relational nor hirarchy with the help of VSAM and CICS, it is possible to design a transaction which does the above mentioned file operations. The file control operations & commands are disscussed in chapter four.

THE PROGRAM DEVELOPMENT

As shown in the flow chart (in the next page), the source program can be can be developed by using the CMS editor or Word Star. T' word star should be IBM compatable. The Word Start file which is in the required format should be transfered from the pc to the host. While developeing the source the CICS COMMANDS are enclosed within the "EXEC CICS" and "END-EXEC" statements. During the translation the translator looks only for "EXEC CICS" statment and start the translation of the command into COBOL, PL/1, or IBM ASSEMLY as

FLOW-CHART


PHASE ONE
SOURCE PROGRAM
PHASE TWO
TRANSLATED SOURCE PROGRAM
PHASE THREE
COMPILER
PHASE FOUR
OBJECT MODULE
PHASE FIVE
LINK EDIT
PHASE SIX
TO PROGRAM LIBRARY

specified in the JCL. Then it puts a comment mark. This comment mark is to inform the compiler not to look into these command level statements. Then the translater writes the error messages and the compiler is called.

Compiler checks the syntax of the statements & to some extent the logic of the program. The error messages produced by the Compiler are included at the end of the file.

If there no error produced by the compiler or the errors are not fatel then the link editor will be called. The final object moule will be put in the library.

Though the all host compurs are IBM 4361, the same source program has to be translated, compiled and link-edited since the libraries are different in each host-computers.

Chapter 3

VSAM in the transaction processing environment

Chapter 3
VSAM IN THE TRANSACTION PROCESSING ENVIRONMENT

INTRODUCTION:

Virtual Storage Access Method (VSAM) was announced as the new access method by IBM in 1972. VSAM was designed to replace all traditional access methods like Sequencial Access Method, Indexed Sequencial Access Method (ISAM) and Direct Access Method (DAM). IBM looks for software compatability and integrity. Even if a file structure is designed in one of the above mentioned access methods, one can easily convert these file structures into VSAM, using the VSAM utilities without loosing the data.

GEMERAL DESCRIPTION:

A user had to learn one interface to request ISAM access to records and another interface to perform standard sequencial I/O and so on. ISAM depends on the hardware feature of the disk or drum. So, in ISAM the situation is harder to suppport and write programs for. One of the major achievements in VSAM is device independence.

In VSAM major stride was taken in standardizing the user and programming interface to the access method and file system.

In an entry sequencial access method, records should be read sequencially and new addition of record is possible only at the end of the file.

In the direct access method for a given key, it is possible to read the record directly in a disk or drum. But in this method records can not read in key-sequence.

This problem was solved in the indexed sequencial file structure. In this access method records can be read sequencially as well as by their key.

In ISAM seperate -over flow area technique is used. If there is more insertion of records than expected, the system allots an overflow area for the over flow records and the records are written with appropriate pointers. So if there is a need to read a record, first the original area of the file should be searched. If

the record is not found in this area, then the overflow area should be searched. In this way, though the insertion of record is easier than VSAM, the seek time to search a record doubles.

VSAM FILE ORGANISATION:

VSAM supports three different data set organisations ie, key-sequenced, entry-sequenced and relative byte addressing, all of which allow both sequential and direct processing, record addition and record deletion. The basic difference among these three organisations is the sequence in which logical records are stored.

KEY SEQUENCED FILE ORGANISATION :

In this organisation the records are placed in the ascending/descending order of the key. The organisation is same as the ISAM (which is the earlier release of IBM). The only difference is that for the overflow area technique of ISAM is replaced by the block splitting technique. If the number of read operation is more than that of write operation, then this VSAM organisation is preferred.

ENTRY SEQUENCED FILE ORGANISATION :

As the name conveys, the records are written and retrieved on the basis of the entry in the file. All the records are written according to their insertion order during the cluster creation. No insertion of record is allowed in the middle of the file. Addition of record is possible at the end of the file. This organisation is appropriate for the applications that require no special ordering of the records.

RELATIVE RECORD FILE ORGANISATION :

A relative record data set has no index just like an entry sequenced file. The entire file can be viewed as a sequence of fixed-length slots, each of which is identified by a relatiove record number from 1 to n, where n is the maximum number of records that can fit into the file. Each record occupies a slot and is stored and retrieved by the relative record number of the slot. The records in a relative record data set are not ordered either by their contents (that is, key) or their entry-sequence.

A general comparison of VSAM with other file systems is given in the tabular form in the next page.

THE BLOCK SPLITTING TECHNIQUE:

Because the overflow area is kept separately, the seek time in ISAM increases. To avoid this, BLOCK SPLITING TECHNIQUE which is preferable in the case where the read operation of the records is more compared to insertion of records, is used in VSAM. In this method, when the cluster is first created, empty space is left in each block interval, i.e., on initial loading of the file, each block is not completely filled, thereby allowing some extra space for insertion of record in future. When a new record is to be inserted into a block which is already full, the records which are higher in the key are placed in an empty interval which was created during cluster creation. Appropriate pointers are placed between the records in order to maintain key-sequence.

VSAM supports the following two access methods:

TABLE-3:COMPARISION OF VSAM WITH OTHER FILE SYSTEMS:

FUNCTIONALITY	Sequen. File	Relat. File	Dir File	ISAM File	Index File	VSAM File
READ-Sequential	Y	Y	N	Y	Y	Y
-Random	N	Y	Y	Y	Y	Y
WRITE-Sequential	Y	Y	N	N	N	Y
-Random	N	Y	Y	Y	Y	Y
UPDATE-In place	N	Y	Y	Y	Y	Y
-With length changed	N	Y	Y	Y	Y	Y
DELETE-Logical	Y	Y	Y	Y	Y	Y
-Physical	N	N	Y	Y	-	Y
READ-NEXT						
Single-key retrieval	-	Y	Y	Y	Y	Y
Unique-key retrieval	-	Y	Y	Y	Y	Y

1) Accessing the records through a given key.

2) Accessing the records key-sequencially

In the following sections we will discuss the algorithms for read/write operation and their merits and demerits.

ALGORITHMS TO READ A RECORD:

i) Index Tree Walking:

A Tree Walking is defined as the ability to walk down an index until the data record has been found. This Algorithm is used to randomly access a record for a given key. For a given key a search is made in the index sequence set. Once the tree tranversal has reached the lowest-level index which is the sequence set, the algorithm takes the pointer to the control interval (CI) in which the target record could reside.

Now the only one search that can be executed, is the search within the CI. The result of the search of CI is, either the record is found in the CI, or it does not exist. Because there is no other overflow area exist, which will double the seek time! So in VSAM, the time to search any

record is the same no matter where the record may reside in the file.

ii) **SEQUENTIAL ACCESS:**

To access the records sequencially, first we must position to some key value within the index sequence set. Then the control interval that points to that particular index should be taken and the records should be retrieved in the ascending/descending key values (The FILE-BROWSE program is implemented using this algorithm). If the read operation of the records has reached the end of the control interval, it is possible to go to the next control interval, and so on and so forth still all the control intervals in the control area are read.

Thus the sequencial access performance will approximate the READ-NEXT performance of an sequencial file, and faster than that for indexed files.

RECORD-INSERTIOIN ALGORITHM:

The collision occurs, whenever an attempt has been made to insert a record into a

file where the target location within the control interval in currently occupied. The three possibilities that exist during an insertion of a record are listed below:

i) New record fits within the target control interval.

ii) New record is larger than the control interval hence the control interval splits.

iii) Control area is filled (so there is no way to split the control interval) hence the control area splits.

SPACE AVAILABLE IN CI:

If the key value of the new record falls between the values of two consecutive records in the control interval which has enough free space at the end of the control interval, according to the algorithm, a physical insertion of the new record will take place in the I/O buffer of the main memory as in the following sequence:

1) All the records whose key values are higher than the record which has to be inserted, are moved up in the control interval and a hole is created.

2) In the I/O buffer of the main memory, the physical insertion of the new record, into the newly created hole takes place.

3) The move modified CI is rewritten back to the file.

EMPTY CONTROL INTERVAL IN THE CONTROL AREA:

If the target record cannot fit in the proper control interval, a check must be made to see if an unused control interval exists within that control area. If there is a free control interval, the following actions take place.

1) Determine where in the original control interval the target record should have been inserted had there been enough room within the control interval.

2) Locate the new empty control interval and copy all the records with higher key values from the original control interval into the new control interval.

3) If there is enough space available the original control interval, copy the target record into the original control area.

In case of inadequate space within the original control interval, the algorithm checks to findout whether there is enough space available in the newly allocated control interval. If there is enough room, move all records with higher key values into the new control interval. This is done to create enough free space for the new user data record to be added.

While checking this, if it is found that there is still no space in the original as well as in the newly allocated control interval, a new control area is allocated. This makes available all the control intervals within the new control area. Then the access method will copy the records with high-key values from the original control interval into their own control interval. The user data record is then copied into the control interval.

4) When all processing has been completed, the sequence set must be updated to correctly reflect the position of all the records that now reside in both the old and new control intervals.

NO ROOM IN THE CONTROL AREA:

If there is simply no room in the control area, a new control area will be allocated and initialized. Then all records with key values higher than the target record's key value must be copied into the newly allocated control area. Next, the original target record that started all of this procesing must be copied into either of the control areas, depending on whether the original control area has enough room for the record.

Chapter 4

Design And Implementation Of The Transaction

Chapter 4

THE DESIGN AND IMPLEMENTATION OF THE TRANSATION

INTRODUCTION

The market price in this country which is geographicaly vast varies from time to time, and place to place. The daily news papers like 'THE ECONOMIC TIMES' which gives the market price along with year ending, Book Value per share, Equity Capital, Reserves & Surplus, Equity Earning per Share, Dividend per share for the running year and for the previous year, Cover(times), Market Price and Price Earning Ratio, only after 24 hours!. The need of a media which gives the abvoe mentioned data anytime within a day, was felt. INDONET has come as a timely help to full fill the need. One can say that desighing and implementing the above requirement would be a good exercise to learn about the INDONET, VSAM and CICS.

THE DESIGN

Six different programs (as given

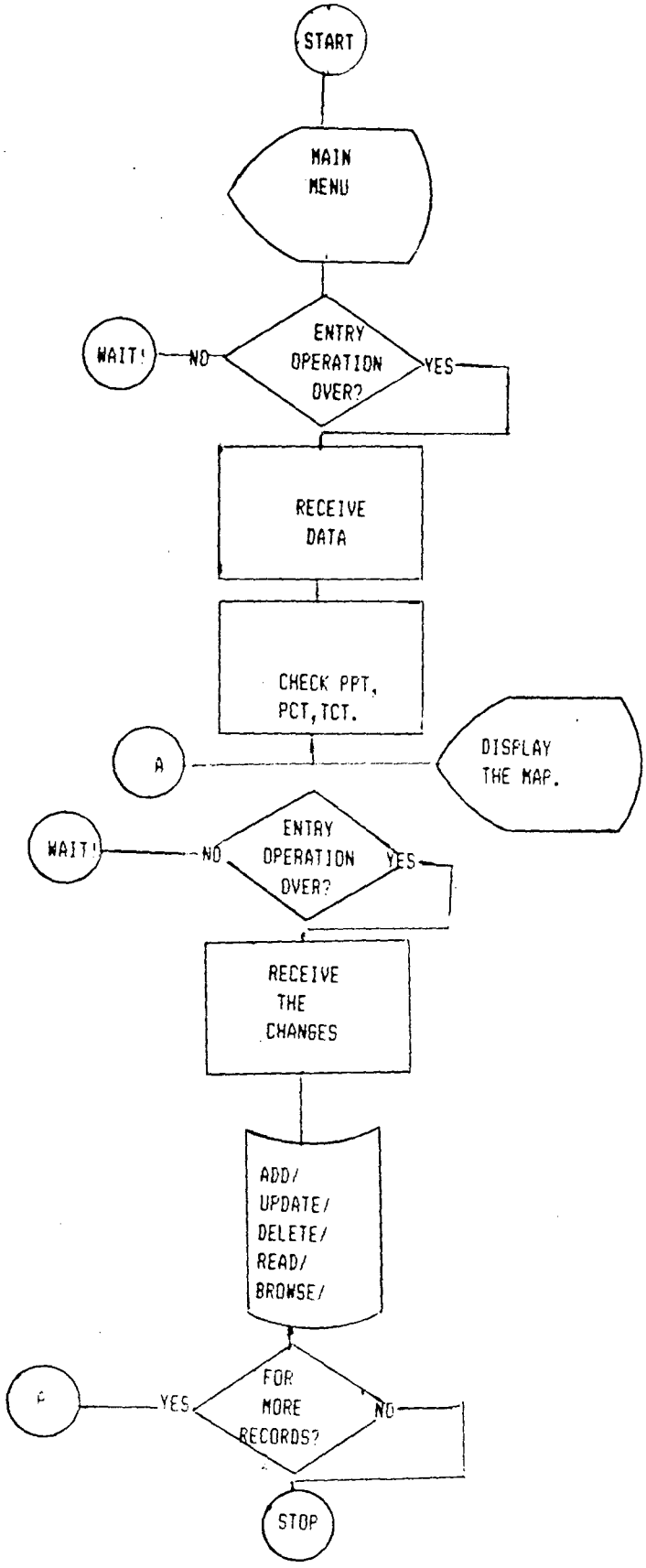
in tabular form in the next page) which are put together in one transaction constitute the design. The transaction can be as a complete process of addition, updation and query-answering. Transaction was implemented to some extent in a pseudo-conversational mode. In the next page, Both the conversational as well as peseudo-conversational sequence are given in the flow-chart form. It should be noted that there is no wait state for the CPU in the pseudo-conversational mode. Hence the CPU is utilized efficiently.

However in certain cases pseudo-conversational mode can be achived only at the cost of some other facilities. In such cases implementation follows the the conversational mode. A comparison of conversational mode with the pseudo-conversational mode, and their advantages as well as their disadvantages are given in the later part of the discussion. It is possible to implement Browse-Program in the pseudo-conversational mode by transfering the control from one program (that reads the VSAM Cluster for browseing and puts the appropreate pointers for forward as well as backward browseing) to another program (which

TABLE-2 THE PROGRAM DETAILS:

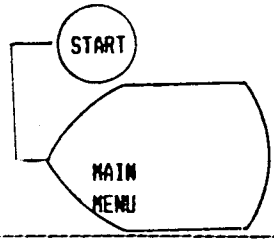
S.NO	PROGRAM	FUNCTION OF THE PROGRAM	PGM-ID	TRN-ID
1	MAIN MENU	Displays the main menu and then transfers the control to any of the progrom in S.NO 2, 3, 4, 5 & 6 depending upon the operator's option.	DEOPT	DEOP
2	ADD PROGRAM	Adds new records to the VSAM Cluster & Repeats the process or terminnates the transaction depending upon the operator's option.	DEADD	DEAD
3	INQUIRY PROGRAM	For a given key, it search for the required record & repeats the process or terminates the task depending upon the operarter's option.	DEINQY	DEIN
4	UPDATE PROGRAM	For a given key, it reads the record for updation, receives the modified record & re-writes the record. Repeats the process or terminates the task depending upon the operaters option.		
5	DELETE PROGRAM	For a given key , it deletes the record from the VSAM Cluster. Repeats the process or terminates the task depending upon the operaters option.	DEUPDT	DEUP
6	BROWSE PROGRAM	For a given key, reads a record and keeping that particular record as the starting point it browses the record in forward/backward direction.		

CONVERSATIONAL SEQUENCE:

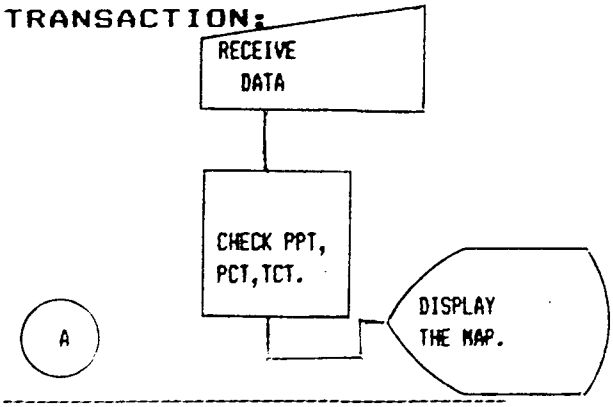


PSEDO-CONVERSATIONAL SEQUENCE:

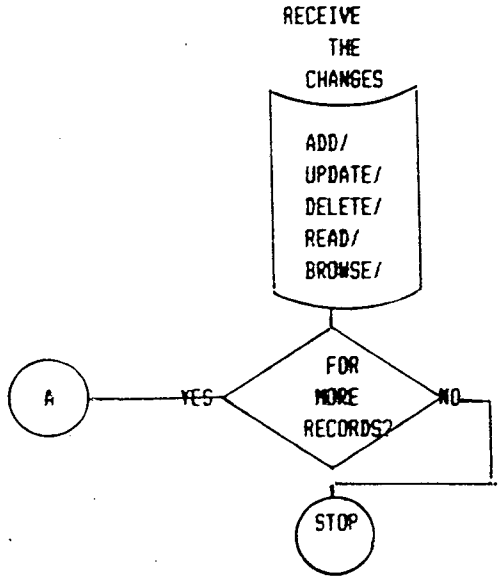
TRANSACTION:
FIRST



SECOND TRANSACTION:



THIRD TRANSACTION:



displays the map with required data and wait for the operater's response and communicates with the former through the communication-area. But in this way, one can not enjoy the full future of VSAM. If such cases, the conversational-mode is adopted.

CREATING MAP THROUGH THE SDF:

In any business applications, the input and output Data is large. In CICS program the commands like read, write and inputs are not allowed. In the CICS program, for input the system always sends the maps which are already created by the programer. A map is a set of variable and constant characters, which helps to operator to enter the required data i.e., it conveys the operator whether a particular data is a numeric or alpha-numeric with the specified pictures and again when the Data entry is over, the Basic Mappint Support (BMS) communicates between the terminal and the program i.e., a one to one onto mapping is made between the data entered on the screen and working storage section.

A set of map is called a map set. A map set can have one or more maps. All the maps are

defined only for the terminal IBM 3270 which is a monochromatic terminal connected to Indonet. It is also possible to run the same program in IBM PC/AT which can be emulated to Indonet through the emulating swoftware pc 3278/79 in which case 3278 (which is the terminal ID for a colour terminal) should also be included in the terminal control table.

Totally three mapset namely DEMAPA ,DEMAP3 and DEMAPI were defined. According to CMC-Bombay Systems Standards, all the mapsets created from Delhi should have the name which starts with "DE" and followed by four characters. Hence these names were given to the mapsets.

It is possible to define all the maps in only one mapset. But when the BMS copy the map into the Working-Storage section, the maps which are not at all required for a particular program will also be copied , because the BMS copies the whole mapset. Hence the working-storage will become very large and it will decrease the performance. To prevent this , three diffierent mapsets were defined as follows:

(1)´ DEMAP3´ which contains two maps namely ´FIRST´ and ´OPT´.

(2)´DEMAPI´ which contains only one map namely ´MORE´ .

(3) ´DEMAPA´ which also contains only one map namely ´CNAME´.

The maps are in the next page.

All these maps were defined on IBM 3270 which is a 80 X 24 terminal (i.e., the width is 80 characteres and it is possible to write 24 lines with single spaceing). In the screen developement facility (SDF) it is possible to define each attributes in the map whether bright, normal or dark intensity. All the passwords have dark attributes. The data which are to be high lighted are given bright attributes. The default is always correspons to normal intensity. In the SDF it is possible to define the Picture of each attributes straight in the screen itself. Nameing the attributes is also possible. In this way SDF helps to application programer to generate the maps and mapsets.

After generating the maps with the help of SDF, these maps were copied into the Working-

DEMAP3/OPT

THE FOLLOWING FILE-OPERATION POSSIBLE:

1.FILE-ADD 2.FILE-INQUIRY 3.FILE-DELETE 4.FILE-UPDATE

5.FILE-BROWSE

ENTER YOUR OPTION:_

DEMAP3/FIRST

COMPANY NAME:..... YEAR ENDING:....

BOOK VALU PER SHARE:.... .. FACE VALUE:...

EQUITY EARNING:... .. COVER(TIMES): .. ..

DIVIDED PER SHARE | RUNNING YEAR : .. .. | PREVIOUS YEAR: .. .. PRICE EARNING RATIO | HIGH :.... | LOW :....

MARKET PRICE :.... ..

DEMAPA/CNAME

PLEASE ENTER THE COMPANY NAME FOR INQUIRY/DELETE/BROWSE/UPDATE/ | .....

DEMAPI/MORE

DO YOU WANT MORE RECORDS? (Y/N):_

Storage sections of the programs. Here there are two data areas:

One is for the input-data, i.e., whenever the program is in need of getting some data from the terminal, it receives those data into this data-area.

The other is the output area. The program uses the output area when it is required to display some map with data. In all the program intput area is redefined by the output area. However, these data areas containt only transient data i.e., when a 'XCTL' command is being executed all the data contained in these areas will be destroyed. If there is any need to save the data, temporary stroage queues can be used. If the data are only few , then it can be stored in the DFHCOMMAREA, which is the communication area same for all programs. Hence the programs can communicate through the DFHCOMMAREA.

HANDLING EXCEPTIONAL CONDITION:

EXCEPTIONAL CONDITIONs during runtime error may abend (ABNORMAL END) the CIGS PROGRAM, if

the handle condition commands were not used. These commands are executable only for a particular program where it was specified. These commands are not visible outside the domain of the program, because all the handle condition commands are deactivated when the control passes from one program to another program. These commands should be included in an error routine, that may give rise to the same condition that caused to branch the routine. A lists of exceptional conditions, their meaning and the required routines are given below:

MAPFAIL:

This occurs when the operator supposed to enter the data, but by mistake he pressed enter or an undefined pf/pa key. So an empty map will be received by the program which will produce erraneous results or the program will be abended without giving an error message which the operator may not be able to understand, though CICS gives an error code which has to be searched in ´The Codes And Messages ´Manual.

To avoid this, an error message, ´UNDEFINED PA/PF KEY USED/MAPFAIL´ is moved into

the major error message and it is displayed. It is also possible to redisplay the required map without abending the program.

NOT OPEN:

There is no open file or close file command in the CICS programme. When CICS brought up, the required file will be opened by the CICS and similarly when CICS is being brought down all the on-line files will be closed. If the file has not opened when the CICS being brought up and an attempt has been made to write in an online file,this error will occur. Appropriate error message will be moved into the required map and that will be sent to the terminal and the program will come to an end.

DSIDERR:

Data Set IDentification ERRor will occur when the entry is not made in the File Conrol Table (FCT) or when the logical data set name given in the read/write dataset command of the program is different from the logical name which is used in the Cluster Creation. In this case also, the program is designed in such a way an that, an appropriate error message will be moved to the

MAJOR-ERROR-MSG and the job will be abended i.e., it will reach an abnormal end.

DUPREC:

This error occures when the keys are duplicate. Here company name (named as 'CNAMI' in the program) is the key in which the write operation is being executed in the VSAM Cluster.

ENDFILE:

This error occures when a request is made (here using the pf of key) to Browse more records from a particular file, when the pointer is currently at the end of the file. So it is not possible to Browse records in the forward direction. This 'HANDLE CONDITION' is used only in the Browse programme.

NOSPACE:

This error occures when an attempt is being made to write a record when there is no more space in the VSAM Cluster. The file was originally created to deal with hundred records only. This error will occur when the operator exceeds the limit; (say 101st record). An error message will be sent to the terminal, and job will be terminated.

To over come this problem the VSAM file has to be extended for more records.

NOTFIND:

This Handle Condition error will occur in the following cases.

(1) when an attempt has been made to delete a record with the key entered by the oprator was not found .

(2) when an attemopt has made to start browsing the record from a particular record with the key (in a backward or forward direction) as entered by the operator, is not found.

(3) when an attempt has made to read a record with a particular key (as entered by the operator) is not found.

The job will be terminated with an error message. It is also possible to redisplay the required map so that the operator can enter some other key.

TERMINAL I/O COMMANDS

(I) sending data/map:

A 'SEND MAP' command is used whenever there is a need to transmit BMS Mapped output data to a terminal as in COBOL or in any other high

level language, it is not possible to use a display or write command is CICS programme, since pseudo-conversational mode is implemented. The syntax of the command is :

SEND MAP (name)

MAP SET (name)

DATA ONLY ‡MAP ONLY

FROM (data-area)

LENGTH (data-value)

In all the six programs the mapset names and their corresponding map names are different. Hence the map names as well as the corresponding map set names are always specified. 'MAPONLY' option of the SEND MAP command indicates that a display is to be built using data from the physical map, without inserting user data. This option is very useful in the beginning of the programme where there is a need to displaty the menu. But in the case of data only option, the user data will also be sent by the program to the terminal.

To send a map with data to the terminal, by the programme, the data area should be defined in the Working-Storage section, since data division is not used in the CICS program. "BMSMAPBR COPY

(mapset name)" command in the Working-Storage section will copy the application structure which is defined in the SDF, into the working storage section , and "data area" can be used to send a map or to receive a map. If there is a need to read a record from a VSAM cluster and send the data to the terminal then

(i) the data should be transfered from the VSAM cluster to the data area.

(ii) then a send map command can be used to send the data from data area to the terminal.

It is not possible to send the data directly from the vsam cluster to the terrminal.

DEVICE CONTROL OPTIONS:

The basic mapping support (BMS) can relay device control commands. Almost in all the programs, cursor erase and freekb commands were used. The cursor command specifies the position of the cursor after the map has been sent by the program to the terminal. Cursor position is a half-binary value, representing the absolute screen address of the cursor. In case of default, the cursor will be positioned in the first column and

first row.

The erase command will erase the screen and place the cursor in top left corner of screen before the map was sent to the terminal.

FREEKB command will unlock the key board for data input. The default will lock the key board and by pressing the RESET key, the key board will be unlocked.

RECEIVING DATA FROM A DISPLAY

This command maps the data from the terminal to the ´data area´ in the application program i.e. it is an on-line entry of data from the terminal to the application program.

The syntax of the command is:

RECEIVE MAP map name

MAPSET mapset name

INTO (data-area) /SET(ptr-ref)

FROM (data-area) LENGTH (Value) /ASIS

The map BMS must use to convert the data to its unformated form, and the map set to which the map belongs. In the pseudo-conversational mode, this command is executed after ´XCTL´ (i.e., ´transfer control´) command. ´INTO´

in the syntax mentioned above, helps the application programer to map display data into a named data area defined in the working -storage section.

If the 'SET' command is used instead of 'INTO' then BMS generates the 'data area' and then maps display Data into it. In this case, the name of the 'data area' should be defined in the Linkage section as a linkage pointer.

Whenever a RECEIVE command is being executed, all the values of the 'data area' will be nullified by the BMS.

FILE CONTROL COMMANDS:

READ A RECORD (READ)

A READ Command is used to read a record from a direct access data set on a local or remote system. For this project work, the VSAM CLUSTER is used on the remote system (IBM/370 ONLINE) at Bombay. The syntax of the command is as follows:

READ

DATASET (name)

INTO (data area) ç SET (ptr-ref)

LENGTH (data-area)

RIDFLD (data area)

UPDATE

If the UPDATE option is used, then the record can be updated or deleted. CICS/VS will secure exclusive control of the record which should be updated, so that no other task can delete the record or modify the record. If the programer finishes his job of updating/deleting the file, then he can issue a command like "UNLOCK" which will release the exclusive control over the file. If the task is terminated, then again CICWS will release the exclusive control over the file.

In IBM terminology Dataset name is nothing but the name of the file. RIDFLD data name denotes the key-name. All the file control command will be executed based upon this key only. This key should be defined in the working-storage section. It can be part of the data-area.

Through out the design only ESDS (Entry sequenced Data Set) is used. So all the records will be written or read sequencially. Additiion of record is possible only at the end. LENGTH data-

area specifies the length of the record.

If a record is read with an UPDATE option, a REWRITE Command should be followed by the READ with UPDATE COMMAND. Otherwise an ILOGIC error will appear during the run-time. The following conditions were taken care of in the 'HANDLE CONDITION' command.

1) DSIDERR
2) DUPKEY
3) ILLOGIC
4) INVREQ
5) IOERR
6) LENGERR
7) NOTFND
8) NOTOPEN

WRITE A RECORD

A WRITE command is used to add new records to the existing file. No inserting of record is possible in the Entry Sequenced Data Set (ESDS). Records are added only at the end of the file.

The syntax is as follows:

```
WRITE
    DATASET(name)
    FROM (data-area)
    LENGTH (data-value)
    RIDFLD (data-area)
```

In this command, DATASET (name)

specifies the name of the logical file as written in the JCL for VSAM CLUSTER Creation. If the name specified here different from the name specified during the cluster creation,then a 'DSIDERR' will occur during the run time. 'FROM (data-area)' specifies the name of the memory space where the data that has to be written is currently available. In this design it is defined under the name, FIRSTI' for input and 'FIRSTO' for output option. 'RIDFLD' (data-area) denotes key of the record. Before executing this command, in the 'HANDLE CONDITION' the following errors were taken care off.

1) DSIDERR	5) IOERR	9) NOTOPEN
2) DUPREC	6) ISCINVRIQ	10) SYSIDERR
3) ILLOGIC	7) LENGERR	
4) INVREQ	8) NOSPACE	

The only extra condition added here is the 'NOSPACE' condition. It is designed in such a way that the VSAM CLUSTER can handle only upto 100 records. So this error will occur when we are trying to insert the 101st record in which case the cluster has to be expanded to accept more records.

UPDATE A RECORD:

To update a record, the record should

be read with an update option as mentioned in the READ command and a REWRITE command should be used. The syntax for REWRITE command is as follows:

```
REWRITE
DATASET (name)
FROM (data-area)
LENGTH (data-value)
SYSID (name)
```

All the notations have their own usual meaning as explained in the READ & WRITE Command. Once the file is read for updation, then either it should be rewritten or it should be deleted. Before executing the REWRITE option, the record should be read for updation. Otherwise, a run-time error will occur.

DELETE A VSAM RECORD :

In VSAM it is possible to delete a record and the deleted space will be regained by the system immediatly.The syntax is as follows:

```
DELETE
DATASET (name)
RIDFLD (data-area)
KEYLENGTH (data-value)
GENERIC cNUMERIC (data-area)
```

The KEYLENGTH is mandatory with GENERIC option. The RIDFLD (data-area) is also mandatory with GENERIC or SYSID option. A group of +records can be deleted with a GENERIC option. A group is always identified with the GENERIC option.

The Handle Condition Errors which were taken care off in the FILE-DELETE programme are the following:

1) DSIDER	4) LOERR	7) NOTOPEN
2) ILLOGIC	5) ISCINVREQ	8) SYSIDERR
3) INVREQ	6) NOTFND	

BROWSEING A FILE:

Normally when the operator enters the data, he may forget the previous records. In such case the package is designed in such a way that, just by entering the 'KEY-NAME' it is possible to retrive the complete records. But practically it is not possible for the operator to remember all the 'KEY-NAMES' and enter it one by one and search for it. To avoid this type of problem the 'FILE-BROWSE' program was written. With the help of 'FILE-BROWSE' program, the operator enters a key as the starting point and the records are read in the Forward or Backward direction using the PF7 or

PF8 key respectively. These PF keys are defined as an attention identifies in the´HANDLE AID´ Command.

FILE-Browse is strictly read only operation. No ´WRITE´ Command is allowed. It is not efficient to implement Browse operation in a pseudo-conversational mode for the resons as explained in earlier.

START BROWSE (STARTBR)

If one wants to browse a key sequenced or entry sequence dataset, the startinng record should be specified by entering the appropriate key. So the transaction is designed in such a way that it sends the required map to the operator so that he can enter the key of the record where he/she wants the browsing to start. Then for that particular key, the CICS/VS with VSAM makes a search and the result will be reported to the operator through the display device. The syntax is as follows:

```
STARTBR
DATASET (name)
RIDFLD (data-area)
[KEYLENGTH (data-value) [GENERIC]
```

GTEQ¢EQUAL]

In the option if EQUAL is specified, then only one record whose key exactly matches will be displayed. In case of GTEQ, all the records whose keys are greater than or equal to the given key will be displayed. No record will be read unless this command is folowed by a READNEXT or READPREV command.

READ NEXT RECORD DURING A BROWSE

This command is very helpful if the operator wants to browse a file in the forward direction (in the case of entry sequence dataset). In the Browse program the PF8 key is defined for this purpose. Whenever the operator wants the forward browsing, he/she has to press PF8 key. The PF8 key is already defined in the attention identifier for the FORWARD-BROWSE para. The syntax of the command is as follows:

READNEXT

DATASET (name)

\INTO (data-area) ¢ SET(ptr-ref)

[LENGTH (data-area)

RIDFLD (data-area)

[KEYLENGTH (data-value)

This command is used to read records in a sequencial order or in a skip sequencial order (for VSAMonly). This command should always be follow the STARTBR comand, otherwise an ILLOGIC error will occur during the run-time.

READ PREVIOUS RECORD DURING A BROWSE:

This command is very helpful if the operator wants to browse a file in the backward direction (in the case of entry sequence Dataset). In the Browse program the PF7 key is defined for this purpose. Whenever the operator wants the backward browseing, he/she has to press PF7 key. The PF7 key is already defined in the attention identifier for BACKWARD-BROWSE para. The syntax of the command is as follows:

READPREV

DATASET (name)

\INTO (data-area) ¢SET (ptr-ref)^

[LENGTH (data-area)

RIDFLD (data-area)

This command is used to read records in a sequencial order or in a skip sequencial order (for VSAM only). This command should always follow

the 'STARTBR' Command, otherwise an 'ILLOGIC' error will occur during the run-time.

END BROWSE (ENDBR)

An end browse command is used when the operator wants to READ, WRITE, UPDATE OR DELETE a record. The syntax of the command 'ENDBR' is as follows:

ENDBR

DATASET (name)

[REQID (data-value)

[SYSID (name)

In all the Browse command the following exceptional condition errors were taken care off.

1) DSIDERR
2) INVREQ
3) NOTFND
4) NOTOPEN
5) ENDFILE
6) IOERR
7) LENGER
8) ILLOGIC

PROGRAM CONTROL COMMANDS.

Depending upon the logic of the design, the control of the program were transferred using the following commands like RELEASE, LOAD, XCTL, LINK and RETURN.

1) RELEASE: This command is used to

delete from main storage a program, table, or map previously loaded by a LOAD command. The syntax of the command is as follows:

RELEASE

PROGRAM (name)

2) LOAD: This command is used to fetch application programs, tables, or maps from the library where they resides and load them into the main storage and leave the control to the requesting programme. The syntax of the command is as follows:

LOAD

PRGRAM (name)

SET (ptr-ref)

LENGTH (data-area)

HOLD

All the names have their own usual meaning. If the HOLD option is specified the loaded program, table or map remains in the main storage until a release command is issued. If HOLD is not specified, the program, the table or map remains in the main storage until a RELEASE command is issued or until the table that issued the LOAD command is terminated normally or

abnormally.

3) XCTL: Transfers control from one programme to other programme cancelling the previous programe from the main storage. All the data in the programme will be destroyed. One can use a termporary storage queues to store the data and it can be passed to any other program that receives the control sooner or later.

The syntax is as follows:

XCTL

PROGRAM (name)

COMMAREA (data-area)

LENGTH (data-value)

4) LINK: calls a programme as a subroutine and returns the control to the calling programme with a 'RETURN' command. So the calling program is logically one level above the called program. But all the transient data remains same and are not destroyed. So there is no need to use the temporary queues. The syntax of the command is as follows:

LINK

PROGRAM (name)

[COMMAREA (data-area)

[LENGTH (data-value)

Since this command makes one program as a subroutine to another program, all the resources were held by the task and hence it utilizes a vast area of main storage which wil reduce the efficiency of the system and other task will suffer because of lack of resources. Whereever it is possible, Usage of this command should be avoided.

5) RETURN: Returns control from a logically lower level program, to a higher level program or to CICS/VS. The syntax of the command is as follows:

RETURN

[TRANSID (name)

[COMMAREA (data-area)

[LENGTH (data-value)]]]

Whe the comand is issued in a lower-level program, the program to which control is returned will have relinquished control by issuing a link comand and will reside one logical level higher than the program returning control.

In all the cases, CICS runs in the highest logical level. So all the program will

finally returns the control to CICS by the RETURN command.

If some other task has to run in the same terminal, after the termination of the current task, the TRASID (name) option can be specified. With TRANSID (name), COMMAREA (data-area) can also be specified, in case of any transformation of the control with the data from the current programme to the next programme that receives the control.

SUGGESTIONS & FURTHER IMPROVEMENTS:

Currently the design is implemented only on the Bombay System. The same Source Programs can be translated, compiled, link edited and put into the respective host computers at Madras and Calcutta. CICS offers intersystem communication facility, in order to do distributed processing in the network.

The data are neither heirarchial nor relational to use DL/1 or SQL, in which case it would be possible to design a distributed data base.

In the next phase of the indonet it would be possible to link 35 major cities in India through the Satellite INSAT 1C. In this case, it is desirable to implement a data dictionary which is nothing but a "data about data".

LIST OF ABBREVIATIONS USED

BMS	:	Basic Mapping Support
CICS/VS	:	Customer Information Control System/Virtual Storage
CMS	:	Conversational Monitoring System
CP	:	Control Program
FCT	:	File Control Table
MODEM	:	Modulator/Demodulator
NCCF	:	Network Communication Control Facility
NCP/VTAM	:	Network Control Program/Virtual Telecommunication Access Method
NPDA	:	Network Problem Determination
PCT	:	Program Control Table
POWER	:	Priority Output Writers, Executi processors and Readers
PPT	:	Program Process Table
RJE	:	Remote Job Entry
RSCSSNA	:	Remote Spooling Communication System/System Network Architectur
SDF	:	Screen Development Facility
VM	:	Virtual Machine
VSE	:	Virtual Storage Extended

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CHAPTER 2

1. All the relevant IBM manuals
2. CICS/VS WITH ANS COBOL EXAMPLES- by P.A.LIM
3. TELE PROCESSING MONITORS- An NCC (National Computing Centre) Publication

CHAPTER 3

1. GETTING INTO VSAM- by MICHAEL P. BOUROS
2. All the relevant IBM manuals
3. CMC Lecture Notes
4. FILE SYSTEMS Design and Implementation- by DANIEL GROSSHANS

PROGRAM ONE

MAIN-MENU

```
CBL FLAGE CLIST APOST LIB STATE FLOW=10 VERB
00001 *** **********************CICS  PROGRAM
00002           IDENTIFICATION DIVISION.
00003           PROGRAM-ID.DLOPT
00004           AUTHOR. MESHACH.
00005           ENVIRONMENT DIVISION.
00006           DATA DIVISION.
00007           WORKING-STORAGE SECTION.
00008           01   FIRSTI.
00009             02 CNAML COMP PIC S9(4).
00010             02 CNAMF PIC X.
00011             02 CNAMI PIC X(20).
00012             02 YENDL COMP PIC S9(4).
00013             02 YENDF PIC X.
00014             02 YENDI PIC 9(4).
00015             02 BVALL COMP PIC S9(4).
00016             02 BVALF PIC X.
00017             02 BVALI PIC 9(4).
00018             02 DOL COMP PIC S9(4).
00019             02 DOF PIC X.
00020             02 DOI PIC 99.
00021             02 FVAL COMP PIC S9(4).
00022             02 FVAF PIC X.
```

```
00023           02 FVAI PIC 999.
00024           02 EQCAPL COMP PIC S9(4).
00025           02 EQCAPF PIC X.
00026           02 EQCAPI PIC 99.
00027           02 D1L COMP PIC S9(4).
00028           02 D1F PIC X.
00029           02 D1I PIC 99.
00030           02 RESUL COMP PIC S9(4).
00031           02 RESUF PIC X.
00032           02 RESUI PIC S9(3).
00033           02 D2L COMP PIC S9(4).
00034           02 D2F PIC X.
00035           02 D2I PIC 99.
00036           02 EANL COMP PIC S9(4).
00037           02 EANF PIC X.
00038           02 EANI PIC S9(3).
00039           02 D3L COMP PIC S9(4).
00040           02 D3F PIC X.
00041           02 D3I PIC 99.
00042           02 DRL COMP PIC S9(4).
00043           02 DRF PIC X.
00044           02 DRI PIC 99.

00045           02 D4L COMP PIC S9(4).
00046           02 D4F PIC X.
```

```
00047           02 D4I PIC 99.
00048           02 DPL COMP PIC S9(4).
00049           02 DPF PIC X.
00050           02 DPI PIC 99.
00051           02 D5L COMP PIC S9(4).
00052           02 D5F PIC X.
00053           02 D5I PIC 99.
00054           02 COTL COMP PIC S9(4).
00055           02 COTF PIC X.
00056           02 COTI PIC S99.
00057           02 D6L COMP PIC S9(4).
00058           02 D6F PIC X.
00059           02 D6I PIC 99.
00060           02 PEAL COMP PIC S9(4).
00061           02 PEAF PIC X.
00062           02 PEAI PIC 999.
00063           02 D7L COMP PIC S9(4).
00064           02 D7F PIC X.
00065           02 D7I PIC 99.
00066           02 PRICL COMP PIC S9(4).
00067           02 PRICF PIC X.
00068           02 PRICI PIC 9999.
00069           02 D8L COMP PIC S9(4).
00070           02 D8F PIC X.
00071           02 D8I PIC 99.
```

```
00072            02 HIGHL COMP PIC S9(4).
00073            02 HIGHF PIC X.
00074            02 HIGHI PIC 9999.
00075            02 D9L COMP PIC S9(4).
00076            02 D9F PIC X.
00077            02 D9I PIC 99.
00078            02 LOWL COMP PIC S9(4).
00079            02 LOWF PIC X.
00080            02 LOWI PIC 9999.
00081            02 DDL COMP PIC S9(4).
00082            02 DDF PIC X.
00083            02 DDI PIC 99.
00084            02 REPL COMP PIC S9(4).
00085            02 REPF PIC X.
00086            02 REPI PIC X(3).
00087        01  FIRSTO REDEFINES FIRSTI.
00088            02 FILLER PIC X(2).
00089            02 CNAMA PIC X.
00090            02 CNAMO PIC X(20).
00091            02 FILLER PIC X(2).
00092            02 YENDA PIC X.
00093            02 YENDO PIC 9(4).
00094            02 FILLER PIC X(2).
00095            02 BVALA PIC X.
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```
00096           02 BVALO PIC 9(4).
00097           02 FILLER PIC X(2).
00098           02 DOA PIC X.
00099           02 DOO PIC 99.
00100           02 FILLER PIC X(2).
00101           02 FVAA PIC X.
00102           02 FVAO PIC 999.
00103           02 FILLER PIC X(2).
00104           02 EQCAPA PIC X.
00105           02 EQCAPO PIC 99.
00106           02 FILLER PIC X(2).
00107           02 D1A PIC X.
00108           02 D1O PIC 99.
00109           02 FILLER PIC X(2).
00110           02 RESUA PIC X.
00111           02 RESUO PIC S9(3).
00112           02 FILLER PIC X(2).
00113           02 D2A PIC X.
00114           02 D2O PIC 99.
00115           02 FILLER PIC X(2).
00116           02 EANA PIC X.
00117           02 EANO PIC S9(3).
00118           02 FILLER PIC X(2).
00119           02 D3A PIC X.
```

```
00120            02 D30 PIC 99.
00121            02 FILLER PIC X(2).
00122            02 DRA PIC X.
00123            02 DRO PIC 99.
00124            02 FILLER PIC X(2).
00125            02 D4A PIC X.
00126            02 D40 PIC 99.
00127            02 FILLER PIC X(2).
00128            02 DPA PIC X.
00129            02 DPO PIC 99.
00130            02 FILLER PIC X(2).
00131            02 D5A PIC X.
00132            02 D50 PIC 99.
00133            02 FILLER PIC X(2).
00134            02 COTA PIC X.
00135            02 COTO PIC S99.
00136            02 FILLER PIC X(2).
00137            02 D6A PIC X.
00138            02 D60 PIC 99.
00139            02 FILLER PIC X(2).
00140            02 PEAA PIC X.
00141            02 PEAO PIC 999.
00142            02 FILLER PIC X(2).
00143            02 D7A PIC X.
00144            02 D70 PIC 99.
```

```
00145            02 FILLER PIC X(2).
00146            02 PRICA PIC X.
00147            02 PRICO PIC 9999.
00148            02 FILLER PIC X(2).
00149            02 D8A PIC X.
00150            02 D8O PIC 99.
00151            02 FILLER PIC X(2).
00152            02 HIGHA PIC X.
00153            02 HIGHO PIC 9999.
00154            02 FILLER PIC X(2).
00155            02 D9A PIC X.
00156            02 D9O PIC 99.
00157            02 FILLER PIC X(2).
00158            02 LOWA PIC X.
00159            02 LOWO PIC 9999.
00160            02 FILLER PIC X(2).
00161            02 DDA PIC X.
00162            02 DDO PIC 99.
00163            02 FILLER PIC X(2).
00164            02 REPA PIC X.
00165            02 REPO PIC X(3).
00166        01  OPTI.
00167            02 SELECTL COMP PIC S9(4).
00168            02 SELECTF PIC X.
```

```
00169            02 SELECTI PIC X.
00170        01   OPTO REDEFINES OPTI.
00171            02 FILLER PIC X(2).
00172            02 SELECTA PIC X.
00173            02 SELECTO PIC X.
00174        01   CNAMEI.
00175            02 COMPANYNAMEL COMP PIC S9(4).
00176            02 COMPANYNAMEF PIC X.
00177            02 COMPANYNAMEI PIC X(20).

00178        01   CNAMEO REDEFINES CNAMEI.
00179            02 FILLER PIC X(2).
00180            02 COMPANYNAMEA PIC X.
00181            02 COMPANYNAMEO PIC X(20).
00182        01 AREA1.
00183             05 JOB-NORMAL-END-MESSAGE PIC X(22) VALUE

00184                'TERMINATION OF THE JOB'.
00185             05 JOB-ABORTED-MESSAGE.
00186               10 FILLER              PIC X(17) VALUE
00187                '***JOB ABORTED***'
00188               10 MAJOR-ERROR-MSG     PIC X(30).
00189        01  DFHLDVER PIC X(22) VALUE 'LD TABLE DFHEITAB 1-6.'.
00190        01  DFHEIDO PICTURE S9(7) COMPUTATIONAL-3 VALUE ZERO.
00191        01  DFHEIBO PICTURE S9(4) COMPUTATIONAL VALUE ZERO.
00192        01  DFHEICB  PICTURE X(8) VALUE IS '
```

```
00194          01   DFHEIV16  COMP PIC S9(8).
00195          01   DFHEIV11  COMP PIC S9(4).
00196          01   DFHEIV12  COMP PIC S9(4).
00197          01   DFHEIV13  COMP PIC S9(4).
00198          01   DFHEIV14  COMP PIC S9(4).
00199          01   DFHEIV15  COMP PIC S9(4).
00200          01   DFHB0025  COMP PIC S9(4).
00201          01   DFHEIV5   PIC X(4).
00202          01   DFHEIV6   PIC X(4).
00203          01   DFHEIV17  PIC X(4).
00204          01   DFHEIV18  PIC X(4).
00205          01   DFHEIV19  PIC X(4).
00206          01   DFHEIV1   PIC X(8).
00207          01   DFHEIV2   PIC X(8).
00208          01   DFHEIV3   PIC X(8).
00209          01   DFHEIV20  PIC X(8).
00210          01   DFHC0084  PIC X(8).
00211          01   DFHC0085  PIC X(8).
00212          01   DFHC0320  PIC X(32).
00213          01   DFHEIV7   PIC X(2).
00214          01   DFHEIV8   PIC X(2).
00215          01   DFHC0022  PIC X(2).
00216          01   DFHC0023  PIC X(2).
00217          01   DFHEIV10  PIC S9(7) COMP-3.
```

```
00218          01   DFHEIV4   PIC X(6).
00219          01   DFHC0070  PIC X(7).
00220          01   DFHC0071  PIC X(7).
00221          01   DFHDUMMY COMP PIC S9(4).
00222          01   DFHEIV0  PICTURE X(29).
00223            LINKAGE SECTION.
00224          01  DFHEIBLK.
00225          02    EIBTIME  PIC S9(7) COMP-3.
00226          02    EIBDATE  PIC S9(7) COMP-3.
00227          02    EIBTRNID PIC X(4).
00228          02    EIBTASKN PIC S9(7) COMP-3.
00229          02    EIBTRMID PIC X(4).
00230          02    DFHEIGDI COMP PIC S9(4).
00231          02    EIBCPOSN COMP PIC S9(4).
00232          02    EIBCALEN COMP PIC S9(4).
00233          02    EIBAID   PIC X(1).
00234          02    EIBFN    PIC X(2).
00235          02    EIBRCODE PIC X(6).
00236          02    EIBDS    PIC X(8).
00237          02    EIBREQID PIC X(8).
00238          02    EIBRSRCE PIC X(8).
00239          02    EIBSYNC  PIC X(1).
00240          02    EIBFREE  PIC X(1).
00241          02    EIBRECV  PIC X(1).
00242          02    EIBFIL02 PIC X(1).
```

```
00243          02   EIBATT   PIC X(1).
00244          02   EIBEOC   PIC X(1).
00245          02   EIBFMH   PIC X(1).
00246          02   EIBCOMPL PIC X(1).
00247          02   EIBSIG   PIC X(1).
00248          02   EIBCONF  PIC X(1).
00249          02   EIBERR   PIC X(1).
00250          02   EIBERRCD PIC X(4).
00251          02   EIBSYNRB PIC X(1).
00252          02   EIBNODAT PIC X(1).
00253          01  DFHCOMMAREA PICTURE X(1).
00254            01 LINKAGE-POINTERS.
00255               05 FILLER                PIC S9(8) COMP.
00256               05 REPOINT1              PIC S9(8) COMP.
00257          01  DFHBLLSLOT1 PICTURE X(1).
00258          01  DFHBLLSLOT2 PICTURE X(1).
00259            PROCEDURE DIVISION USING DFHEIBLK DFHCOMMAREA.
00260              CALL 'DFHEI1'.
00261         $EXEC CICS
00262         $      HANDLE CONDITION
00263         $      ERROR (HANDLE-ERR)
00264         $      MAPFAIL (ERR-RES)
00265         $END-EXEC.
00266               MOVE '             00194     ' TO DFHEIV0
```

```
00267              CALL 'DFHEI1' USING DFHEIV0
00268              GO TO  HANDLE-ERR ERR-RES DEPENDING ON DFHEIGDI.
00271           STEP1.
00272              MOVE SPACES TO FIRSTI , OPTI .
00273              MOVE 0 TO DFHCOMMAREA.
00274          *EXEC CICS
00275          *     SEND MAP     ('OPT')
00276          *          MAPSET  ('DEMAP3')
00277          *          ERASE
00278          *END-EXEC.
00279              MOVE '                    00202   ' TO DFHEIV0
00280              MOVE 'OPT' TO DFHC0070
00281              MOVE 'DEMAP3' TO DFHC0071
00282             CALL 'DFHEI1' USING DFHEIV0  DFHC0070 OPTO DFHDUMMY
00283            DFHC0071.
00284          *EXEC CICS
00285          *     RECEIVE MAP  ('OPT')
00286          *             MAPSET ('DEMAP3')
00287          *             INTO (OPTI)
00288          *END-EXEC.
00289              MOVE '          00207   ' TO DFHEIV0
00290              MOVE 'OPT' TO DFHC0070
00291              MOVE 'DEMAP3' TO DFHC0071
00292             CALL 'DFHEI1' USING DFHEIV0  DFHC0070 OPTI DFHDUMMY
00293            DFHC0071.
```

```
00294              IF SELECTI EQUAL TO 1
00295                 GO TO FILE-INQUIRY.
00296              IF SELECTI EQUAL TO 2
00297                 GO TO FILE-ADD.
00298              IF SELECTI EQUAL TO 3
00299                 GO TO FILE-UPDATE.
00300              IF SELECTI EQUAL TO 4
00301                 GO TO FILE-DELETE.
00302              IF SELECTI EQUAL TO 5
00303                 GO TO FILE-BROWSE.
00304                 GO TO ERR-ROUTINE.
00305           FILE-INQUIRY.
00306               MOVE 1 TO DFHCOMMAREA.
00307          *EXEC CICS
00308          *     SEND MAP     ('CNAME')
00309          *          MAPSET  ('DEMAPI')
00310          *          MAPONLY
00311          *          ERASE
00312          *END-EXEC.
00313                  MOVE '                    00225   ' TO DFHEIV0
00314                  MOVE 'CNAME' TO DFHC0070
00315                  MOVE 'DEMAPI' TO DFHC0071
00316                 CALL 'DFHEI1' USING DFHEIV0  DFHC0070 DFHEICB DFHDUMMY
00317               DFHC0071.
```

```
00318
00319        *EXEC CICS
00320        *     XCTL PROGRAM ('DLINQY')
00321        *END-EXEC.
00322                MOVE '            00231   ' TO DFHEIV0
00323                MOVE 'DLINQY' TO DFHEIV1
00324               CALL 'DFHEI1' USING DFHEIV0  DFHEIV1.
00325               GO TO END-OF-PGM-OPT.
00326             FILE-ADD.
00327               MOVE 1 TO DFHCOMMAREA.
00328        *EXEC CICS
00329        *     SEND MAP    ('DEMAP3')
00330        *          MAPSET ('FIRST')
00331        *          MAPONLY
00332        *          ERASE
00333        *END-EXEC.
00334                MOVE '            00237   ' TO DFHEIV0
00335                MOVE 'DEMAP3' TO DFHC0070
00336                MOVE 'FIRST' TO DFHC0071
00337               CALL 'DFHEI1' USING DFHEIV0  DFHC0070 DFHEICB DFHDUMMY
00338              DFHC0071.
00340        *EXEC CICS
00341        *     XCTL PROGRAM ('DLADD')
00342        *END-EXEC.
00343                MOVE '            00243   ' TO DFHEIV0
```

```
00344                MOVE 'DLADD' TO DFHEIV1
00345               CALL 'DFHEI1' USING DFHEIV0  DFHEIV1.
00346               GO TO END-OF-PGM-OPT.
00347          FILE-UPDATE.
00348               MOVE 1 TO DFHCOMMAREA.
00349          *EXEC CICS
00350          *     SEND MAP    ('CNAME')
00351          *          MAPSET ('DEMAPI')
00352          *          MAPONLY
00353          *          ERASE
00354          *END-EXEC.
00355                MOVE '          00249   ' TO DFHEIV0
00356                MOVE 'CNAME' TO DFHC0070
00357                MOVE 'DEMAPI' TO DFHC0071
00358               CALL 'DFHEI1' USING DFHEIV0  DFHC0070 DFHEICB DFHDUMMY
00359              DFHC0071.
00361          *EXEC CICS
00362          *     XCTL PROGRAM ('DLUPDT')
00363          *END-EXEC.
00364                MOVE '          00255   ' TO DFHEIV0
00365                MOVE 'DLUPDT' TO DFHEIV1
00366               CALL 'DFHEI1' USING DFHEIV0  DFHEIV1.
00367               GO TO END-OF-PGM-OPT.
00368          FILE-DELETE.
```

```
00369              MOVE 1 TO DFHCOMMAREA.
00370        *EXEC CICS
00371        *     SEND MAP    ('CNAME')
00372        *          MAPSET ('DEMAPI')
00373        *          MAPONLY
00374        *          ERASE
00375        *END-EXEC.
00376               MOVE '             00261   ' TO DFHEIV0
00377               MOVE 'CNAME' TO DFHC0070
00378               MOVE 'DEMAPI' TO DFHC0071
00379              CALL 'DFHEI1' USING DFHEIV0  DFHC0070 DFHEICB DFHDUMMY
00380             DFHC0071.
00382        *EXEC CICS
00383        *     ICTL PROGRAM ('DLDELE')
00384        *END-EXEC.
00385               MOVE '           00267   ' TO DFHEIV0
00386               MOVE 'DLDELE' TO DFHEIV1
00387              CALL 'DFHEI1' USING DFHEIV0  DFHEIV1.
00388              GO TO END-OF-PGM-OPT.
00389          FILE-BROWSE.
00390              MOVE 1 TO DFHCOMMAREA.
00391        *EXEC CICS
00392        *     SEND MAP ('CNAME')
00393        *     MAPSET ('DEMAPI')
00394        *     MAPONLY
```

```
00395        *     ERASE
00396        *END-EXEC.
00397                 MOVE '            00273   ' TO DFHEIV0
00398                 MOVE 'CNAME' TO DFHC0070
00399                 MOVE 'DEMAPI' TO DFHC0071
00400                CALL 'DFHEI1' USING DFHEIV0  DFHC0070 DFHEICB DFHDUMMY
00401               DFHC0071.
00403        *EXEC CICS
00404        *     XCTL PROGRAM ('DLBROW')
00405        *END-EXEC.
00406                 MOVE '            00279   ' TO DFHEIV0
00407                 MOVE 'DLBROW' TO DFHEIV1
00408                CALL 'DFHEI1' USING DFHEIV0  DFHEIV1.
00409                GO TO END-OF-PGM-OPT.
00410           ERR-RES.
00411               MOVE '******MAP FALIUR **************' TO MAJOR-ERROR-MSG.
00412               GO TO ERR-RESPONSE.
00413           ERR-ROUTINE.
00414               MOVE 'PL..ENTER 1 TO 5 NOS ONLY.....' TO MAJOR-ERROR-MSG.
00415               GO TO ERR-RESPONSE.
00416           HANDLE-ERR.
00417        *EXEC CICS DUMP DUMPCODE('PMUD') END-EXEC.
00418                     MOVE '        00290   ' TO DFHEIV0
00419                     MOVE 'PMUD' TO DFHEIV5
```

```
00420                 CALL 'DFHEI1' USING DFHEIV0  DFHEIV5.
00421               MOVE 'HANDLE-ERR DUMPED ON PMUD####' TO MAJOR-ERROR-MSG.
00422               GO TO ERR-RESPONSE.
00423            ERR-RESPONSE.
00424          *EXEC CICS
00425          *     SEND FROM (AREA1)
00426          *          LENGTH (80)
00427          *          ERASE
00428          *END-EXEC.
00429                  MOVE '                 00294   ' TO DFHEIV0
00430                  MOVE 80 TO DFHEIV11
00431                CALL 'DFHEI1' USING DFHEIV0  DFHDUMMY DFHDUMMY AREA1
00432               DFHEIV11.
00434             END-OF-PGM-OPT.
00435          *EXEC CICS
00436          *     RETURN
00437          *END-EXEC.
00438                  MOVE '       00300   ' TO DFHEIV0
00439                CALL 'DFHEI1' USING DFHEIV0.
```

PROGRAM TWO

FILE-ADD

CBL FLAGE CLIST APOST LIB STATE FLOW=10 VERB

```
00001 *** **********CICS  PROGRAM
00002            IDENTIFICATION DIVISION.
00003            PROGRAM-ID.DEADD.
00004            AUTHOR. MESHACH.
00005            ENVIRONMENT DIVISION.
00006            DATA DIVISION.
00007            WORKING-STORAGE SECTION.
00008         01   FIRSTI.
00009              02 CNAML COMP PIC S9(4).
00010              02 CNAMF PIC X.
00011              02 CNAMI PIC X(20).
00012              02 YENDL COMP PIC S9(4).
00013              02 YENDF PIC X.
00014              02 YENDI PIC 9(4).
00015              02 BVALL COMP PIC S9(4).
00016              02 BVALF PIC X.
00017              02 BVALI PIC 9(4).
00018              02 DOL COMP PIC S9(4).
00019              02 DOF PIC X.
00020              02 DOI PIC 99.
00021              02 FVAL COMP PIC S9(4).
00022              02 FVAF PIC X.
00023              02 FVAI PIC 999.
```

```
00024           02 EQCAPL COMP PIC S9(4).
00025           02 EQCAPF PIC X.
00026           02 EQCAPI PIC 99.
00027           02 D1L COMP PIC S9(4).
00028           02 D1F PIC X.
00029           02 D1I PIC 99.
00030           02 RESUL COMP PIC S9(4).
00031           02 RESUF PIC X.
00032           02 RESUI PIC S9(3).
00033           02 D2L COMP PIC S9(4).
00034           02 D2F PIC X.
00035           02 D2I PIC 99.
00036           02 EANL COMP PIC S9(4).
00037           02 EANF PIC X.
00038           02 EANI PIC S9(3).
00039           02 D3L COMP PIC S9(4).
00040           02 D3F PIC X.
00041           02 D3I PIC 99.
00042           02 DRL COMP PIC S9(4).
00043           02 DRF PIC X.
00044           02 DRI PIC 99.
00045           02 D4L COMP PIC S9(4).
00046           02 D4F PIC X.
00047           02 D4I PIC 99.
00048           02 DPL COMP PIC S9(4).
00049           02 DPF PIC X.
00050           02 DPI PIC 99.
00051           02 D5L COMP PIC S9(4).
```

```
00052           02 D5F PIC X.
00053           02 D5I PIC 99.
00054           02 COTL COMP PIC S9(4).
00055           02 COTF PIC X.
00056           02 COTI PIC S99.
00057           02 D6L COMP PIC S9(4).
00058           02 D6F PIC X.
00059           02 D6I PIC 99.
00060           02 PEAL COMP PIC S9(4).
00061           02 PEAF PIC X.
00062           02 PEAI PIC 999.
00063           02 D7L COMP PIC S9(4).
00064           02 D7F PIC X.
00065           02 D7I PIC 99.
00066           02 PRICL COMP PIC S9(4).
00067           02 PRICF PIC X.
00068           02 PRICI PIC 9999.
00069           02 D8L COMP PIC S9(4).
00070           02 D8F PIC X.
00071           02 D8I PIC 99.
00072           02 HIGHL COMP PIC S9(4).
00073           02 HIGHF PIC X.
00074           02 HIGHI PIC 9999.
00075           02 D9L COMP PIC S9(4).
00076           02 D9F PIC X.
00077           02 D9I PIC 99.
00078           02 LOWL COMP PIC S9(4).
```

```
00079            02 LOWF PIC X.
00080            02 LOWI PIC 9999.
00081            02 DDL COMP PIC S9(4).
00082            02 DDF PIC X.
00083            02 DDI PIC 99.
00084            02 REPL COMP PIC S9(4).
00085            02 REPF PIC X.
00086            02 REPI PIC X(3).
00087        01  FIRSTO REDEFINES FIRSTI.
00088            02 FILLER PIC X(2).
00089            02 CNAMA PIC X.
00090            02 CNAMO PIC X(20).
00091            02 FILLER PIC X(2).
00092            02 YENDA PIC X.
00093            02 YENDO PIC 9(4).
00094            02 FILLER PIC X(2).
00095            02 BVALA PIC X.
00096            02 BVALO PIC 9(4).
00097            02 FILLER PIC X(2).
00098            02 DOA PIC X.
00099            02 DOO PIC 99.
00100            02 FILLER PIC X(2).
00101            02 FVAA PIC X.
00102            02 FVAO PIC 999.
00103            02 FILLER PIC X(2).
00104            02 EQCAPA PIC X.
00105            02 EQCAPO PIC 99.
00106            02 FILLER PIC X(2).
```

```
00107           02 D1A PIC X.
00108           02 D1O PIC 99.
00109           02 FILLER PIC X(2).
00110           02 RESUA PIC X.
00111           02 RESUO PIC S9(3).
00112           02 FILLER PIC X(2).
00113           02 D2A PIC X.
00114           02 D2O PIC 99.
00115           02 FILLER PIC X(2).
00116           02 EANA PIC X.
00117           02 EANO PIC S9(3).
00118           02 FILLER PIC X(2).
00119           02 D3A PIC X.
00120           02 D3O PIC 99.
00121           02 FILLER PIC X(2).
00122           02 DRA PIC X.
00123           02 DRO PIC 99.
00124           02 FILLER PIC X(2).
00125           02 D4A PIC X.
00126           02 D4O PIC 99.
00127           02 FILLER PIC X(2).

00128           02 DPA PIC X.
00129           02 DPO PIC 99.
00130           02 FILLER PIC X(2).
00131           02 D5A PIC X.
00132           02 D5O PIC 99.
00133           02 FILLER PIC X(2).
```

```
00134            02 COTA PIC X.
00135            02 COTO PIC S99.
00136            02 FILLER PIC X(2).
00137            02 D6A PIC X.
00138            02 D6O PIC 99.
00139            02 FILLER PIC X(2).
00140            02 PEAA PIC X.
00141            02 PEAO PIC 999.
00142            02 FILLER PIC X(2).
00143            02 D7A PIC X.
00144            02 D7O PIC 99.
00145            02 FILLER PIC X(2).
00146            02 PRICA PIC X.
00147            02 PRICO PIC 9999.
00148            02 FILLER PIC X(2).
00149            02 D8A PIC X.
00150            02 D8O PIC 99.

00151            02 FILLER PIC X(2).
00152            02 HIGHA PIC X.
00153            02 HIGHO PIC 9999.
00154            02 FILLER PIC X(2).
00155            02 D9A PIC X.
00156            02 D9O PIC 99.
00157            02 FILLER PIC X(2).
00158            02 LOWA PIC X.
00159            02 LOWO PIC 9999.
00160            02 FILLER PIC X(2).
```

```
00161            02 DDA PIC X.
00162            02 DDO PIC 99.
00163            02 FILLER PIC X(2).
00164            02 REPA PIC X.
00165            02 REPO PIC X(3).
00166        01   OPTI.
00167            02 SELECTL COMP PIC S9(4).
00168            02 SELECTF PIC X.
00169            02 SELECTI PIC X.
00170        01   OPTO REDEFINES OPTI.
00171            02 FILLER PIC X(2).
00172            02 SELECTA PIC X.
00173            02 SELECTO PIC X.
00174             02 RES           PIC 9.
00175        01   MOREI.
00176            02 ANSWERL COMP PIC S9(4).
00177            02 ANSWERF PIC X.
00178            02 ANSWERI PIC 9.
00179        01   MOREO REDEFINES MOREI.
00180            02 FILLER PIC X(2).
00181            02 ANSWERA PIC X.
00182            02 ANSWERO PIC 9.
00183        01 PROS.
00184            02 PROS-CTR-SW PIC X.
00185         01 AREA1.
00186             05 JOB-NORMAL-END-MESSAGE PIC X(22) VALUE
00187                'TERMINATION OF THE JOB'.
```

```
00188              05 JOB-ABORTED-MESSAGE.
00189                10 MAJOR-ERROR-MSG     PIC X(30).
00190           01 KEY-AREA.
00191              05 KEY-NAME              PIC X(20).

00192           01  DFHLDVER PIC X(22) VALUE 'LD TABLE DFHEITAB 1-6.'.
00193           01  DFHEIDO PICTURE S9(7) COMPUTATIONAL-3 VALUE ZERO.
00194           01  DFHEIBO PICTURE S9(4) COMPUTATIONAL VALUE ZERO.
00195           01  DFHEICB  PICTURE X(8) VALUE IS '        '.
00196
00197           01   DFHEIV16  COMP PIC S9(8).
00198           01   DFHEIV11  COMP PIC S9(4).
00199           01   DFHEIV12  COMP PIC S9(4).
00200           01   DFHEIV13  COMP PIC S9(4).
00201           01   DFHEIV14  COMP PIC S9(4).
00202           01   DFHEIV15  COMP PIC S9(4).
00203           01   DFHB0025  COMP PIC 89(4).
00204           01   DFHEIV5   PIC X(4).
00205           01   DFHEIV6   PIC X(4).
00206           01   DFHEIV17  PIC X(4).
00207           01   DFHEIV18  PIC X(4).
00208           01   DFHEIV19  PIC X(4).
00209           01   DFHEIV1   PIC X(8).

00210           01   DFHEIV2   PIC X(8).
00211           01   DFHEIV3   PIC X(8).
00212           01   DFHEIV20  PIC X(8).
00213           01   DFHC0084  PIC X(8).
```

```
00214          01   DFHC0085  PIC X(8).
00215          01   DFHC0320  PIC X(32).
00216          01   DFHEIV7   PIC X(2).
00217          01   DFHEIV8   PIC X(2).
00218          01   DFHC0022  PIC X(2).
00219          01   DFHC0023  PIC X(2).
00220          01   DFHEIV10  PIC S9(7) COMP-3.
00221          01   DFHEIV4   PIC X(6).
00222          01   DFHC0070  PIC X(7).
00223          01   DFHC0071  PIC X(7).
00224          01   DFHDUMMY COMP PIC S9(4).
00225          01   DFHEIV0  PICTURE X(29).
00226            LINKAGE SECTION.
00227          01  DFHEIBLK.
00228          02    EIBTIME  PIC S9(7) COMP-3.
00229          02    EIBDATE  PIC S9(7) COMP-3.
00230          02    EIBTRNID PIC X(4).
00231          02    EIBTASKN PIC S9(7) COMP-3.
00232          02    EIBTRMID PIC X(4).
00233          02    DFHEIGDI COMP PIC S9(4).
00234          02    EIBCPOSN COMP PIC S9(4).
00235          02    EIBCALEN COMP PIC S9(4).
00236          02    EIBAID   PIC X(1).
00237          02    EIBFN    PIC X(2).
00238          02    EIBRCODE PIC X(6).
00239          02    EIBDS    PIC X(8).
00240          02    EIBREQID PIC X(8).
00241          02    EIBRSRCE PIC X(8).
```

```
00242          02   EIBSYNC  PIC X(1).
00243          02   EIBFREE  PIC X(1).
00244          02   EIBRECV  PIC X(1).
00245          02   EIBFIL02 PIC X(1).
00246          02   EIBATT   PIC X(1).
00247          02   EIBEOC   PIC X(1).
00248          02   EIBFMH   PIC X(1).
00249          02   EIBCOMPL PIC X(1).
00250          02   EIBSIG   PIC X(1).
00251          02   EIBCONF  PIC X(1).
00252          02   EIBERR   PIC X(1).
00253          02   EIBERRCD PIC X(4).
00254          02   EIBSYNRB PIC X(1).
00255          02   EIBNODAT PIC X(1).
00256          01  DFHCOMMAREA PICTURE X(1).
00257            01 LINKAGE-POINTERS.
00258               05 FILLER                PIC S9(8) COMP.
00259               05 SETPOINTER            PIC S9(8) COMP.
00260               05 REPOINT1              PIC S9(8) COMP.
00261          01  DFHBLLSLOT1 PICTURE X(1).
00262          01  DFHBLLSLOT2 PICTURE X(1).
00263            PROCEDURE DIVISION USING DFHEIBLK DFHCOMMAREA.
00264              CALL 'DFHEII'.
00265            STEP1.
00266                MOVE SPACES TO FIRSTI , OPTI , MOREI , PROS.
00267         $EXEC CICS
00268         $     HANDLE CONDITION
```

```
00269      $          MAPFAIL (ERR-RES)
00270      $          ERROR   (ERRORS)
00271      $          NOTOPEN (FILE2BOPENE)
00272      $END-EXEC.
00273               MOVE '              00200   ' TO DFHEIV0
00274              CALL 'DFHEI1' USING DFHEIV0
00275               GO TO  ERR-RES ERRORS FILE2BOPENE DEPENDING ON DFHEIGDI.
00279                MOVE DFHCOMMAREA TO PROS.
00280                IF PROS EQUAL TO 1
00281                THEN GO TO PSEDO-MOD.
00282            ACCEPT-ADD.
00283      $EXEC CICS
00284      $     SEND MAP     ('FIRST')
00285      $          MAPSET  ('DEMAP3')
00286      $          MAPONLY
00287      $END-EXEC.
00288               MOVE '      00210   ' TO DFHEIV0
00289               MOVE 'FIRST' TO DFHC0070
00290               MOVE 'DEMAP3' TO DFHC0071
00291              CALL 'DFHEI1' USING DFHEIV0  DFHC0070 DFHEICB DFHDUMMY
00292              DFHC0071.
00293            PSEDO-MOD.
00294      $EXEC CICS
00295      $     RECEIVE MAP    ('FIRST')
00296      $             MAPSET ('DEMAP3')
00297      $             INTO   ( FIRSTI)
00298      $END-EXEC.
00299               MOVE '       0216   ' TO DFHEIV0
```

```
00300              MOVE 'FIRST' TO DFHC0070
00301              MOVE 'DEMAP3' TO DFHC0071
00302             CALL 'DFHEI1' USING DFHEIV0  DFHC0070 FIRSTI DFHDUMMY
00303            DFHC0071.

00304             IF REPI OF FIRSTI EQUAL TO 'Y'
00305             THEN GO TO  ADD-THE-FILE
00306             ELSE GO TO  CONFORM.
00307             MOVE CNAMI TO KEY-AREA.
00308          ADD-THE-FILE.
00309         *EXEC CICS
00310         *      HANDLE CONDITION

00311         *            DSIDERR (CHECK-UR-FCT-NAME )
00312         *            DUPREC  ( UR-KEYS-R-DUP )

00313         *            LENGERR ( LREC-LONG )
00314         *            NOSPACE (TEL2EXIT-FILE )
00315         *END-EXEC.
00316                MOVE '           00226   ' TO DFHEIV0
00317              CALL 'DFHEI1' USING DFHEIV0

00318              GO TO  CHECK-UR-FCT-NAME UR-KEYS-R-DUP LREC-LONG
00319           TEL2EXIT-FILE DEPENDING ON DFHEIGDI.
00323         *EXEC CICS
00324         *    WRITE DATASET ('DLSM')
00325         *         RIDFLD   (KEY-AREA )
00326         *         FROM     (FIRSTI)
00327         *         LENGTH   (132)
```

```
00328        $END-EXEC.
00329              MOVE '          00233   ' TO DFHEIV0
00330              MOVE 'DLSM' TO DFHEIV1
00331              MOVE 132 TO DFHEIV11
00332             CALL 'DFHEI1' USING DFHEIV0  DFHEIV1  FIRSTI DFHEIV11
00333            KEY-AREA.
00335         FOR-MORE-RECORD.
00336        $EXEC CICS
00337        $     SEND MAP    ('MORE')
00338        $          MAPSET ('DEMAPA')
00339        $          MAPONLY
00340        $          ERASE
00341        $ END-EXEC.
00342              MOVE '          00240   ' TO DFHEIV0
00343              MOVE 'MORE' TO DFHC0070
00344              MOVE 'DEMAPA' TO DFHC0071
00345             CALL 'DFHEI1' USING DFHEIV0  DFHC0070 DFHEICB DFHDUMMY
00346            DFHC0071.
00348        $EXEC CICS
00349        $     RECEIVE MAP   ('MORE')
00350        $            MAPSET ('DEMAPA')
00351        $            INTO   (MOREI )
00352        $END-EXEC.
00353              MOVE '            00246   ' TO DFHEIV0
00354              MOVE 'MORE' TO DFHC0070
00355              MOVE 'DEMAPA' TO DFHC0071
```

```
00356              CALL 'DFHEII' USING DFHEIV0  DFHC0070 MOREI DFHDUMMY
00357            DFHC0071.
00358              IF ANSWERI OF MOREI EQUAL TO 1
00359                 GO TO ACCEPT-ADD.
00360              IF ANSWERI OF MOREI EQUAL TO 2
00361                 GO TO MAIN-MENU.
00362              IF ANSWERI OF MOREI EQUAL TO 3
00363                 GO TO END-OF-PRG-ADDI.
00364           ERR-RES.
00365              MOVE 'UNDEFINED PA/PF KEY USED/MFAIL' TO MAJOR-ERROR-MSG.
00366              GO TO ERR-RESPONSE.
00367           FILE2BOPENE.
00368              MOVE '$$$$$FILE NOT OPEN$$$$$$$$$$$$$' TO MAJOR-ERROR-MSG.

00369              GO TO ERR-RESPONSE.
00370           MAIN-MENU.
00371              MOVE 'THIS PART IS NOT SUPPORTED$$$$' TO MAJOR-ERROR-MSG.
00372              GO TO ERR-RESPONSE.

00373           CHECK-UR-FCT-NAME.
00374              MOVE 'DATASET(FN) DIFFS FROM FCTN$$$' TO MAJOR-ERROR-MSG.
00375              GO TO ERR-RESPONSE.
00376           UR-KEYS-R-DUP.
00377              MOVE 'DUPLICATE CNAMES ARE USED $$$$' TO MAJOR-ERROR-MSG.
00378              GO TO ERR-RESPONSE.

00379           LREC-LONG.
00380              MOVE 'LREC LONGER THAN WRITE-LENGTH ' TO MAJOR-ERROR-MSG.
00381              GO TO ERR-RESPONSE.
```

```
00382          TEL2EXIT-FILE.
00383               MOVE 'NO SPACE. ENTEN THE FILE$$$$$$' TO MAJOR-ERROR-MSG.
00384               GO TO ERR-RESPONSE.
00385          CONFORM.
00386               MOVE 'DATA NOT CONFORM.ENTER Y $$$$$' TO MAJOR-ERROR-MSG.
00387               GO TO ERR-RESPONSE.
00388          ERRORS
00389         $EXEC CICS DUMP DUMPCODE('PMUD') END-EXEC.
00390                MOVE '^\C ^00282   ' TO DFHEIV0
00391                MOVE 'PMUD' TO DFHEIV5
00392               CALL 'DFHEI1' USING DFHEIV0  DFHEIV5.
00393               MOVE 'HANDLE CONDITION ERROR .......' TO MAJOR-ERROR-MSG.
00394               GO TO ERR-RESPONSE.
00395          END-OF-PGM-ADD.
00396               MOVE 'NORM END OF THE JOB.NO ERR MSG' TO MAJOR-ERROR-MSG.
00397               GO TO ERR-RESPONSE.
00398            ERR-RESPONSE.

00399         $EXEC CICS
00400         $     SEND FROM (AREA1)

00401         $          LENGTH (80)
00402         $          ERASE
00403         $END-EXEC.
00404                MOVE '       00289   ' TO DFHEIV0
00405                MOVE 80 TO DFHEIV11
00406               CALL 'DFHEI1' USING DFHEIV0
                     DFHDUMMY DFHDUMMY AREA1
```

```
00407              DFHEIV11.
00409           END-OF-PRG-ADDI.
00410          *EXEC CICS
00411          *     RETURN
00412          *END-EXEC.
00413                MOVE '      00295    ' TO DFHEIV0
00414               CALL 'DFHEI1' USING DFHEIV0.
00415
```

PROGRAM THREE

FILE-INQUIRY

```
CBL FLAGE CLIST APOST LIB STATE FLOW=15 VERB

00001 *** ********************CICS PROGRAM
00002           IDENTIFICATION DIVISION.
00003           PROGRAM-ID.DLADD.
00004           AUTHOR. MESHACH.
00005           ENVIRONMENT DIVISION.
00006           DATA DIVISION.
00007           WORKING-STORAGE SECTION.
00008         01   CNAMEI.
00009             02 COMPANYNAMEL COMP PIC S9(4).
00010             02 COMPANYNAMEF PIC X.
00011             02 COMPANYNAMEI PIC X(20).
00012         01   CNAMEO REDEFINES CNAMEI.
00013             02 FILLER PIC X(2).
00014             02 COMPANYNAMEA PIC X.
00015             02 COMPANYNAMED PIC X(20).
00016         01   FIRSTI.
00017             02 CNAML COMP PIC S9(4).
00018             02 CNAMF PIC X.
00019             02 CNAMI PIC X(20).
00020             02 YENDL COMP PIC S9(4).
00021             02 YENDF PIC X.
00022             02 YENDI PIC 9(4).
```

```
00023           02 BVALL COMP PIC S9(4).
00024           02 BVALF PIC X.
00025           02 BVALI PIC 9(4).
00026           02 D0L COMP PIC S9(4).
00027           02 D0F PIC X.
00028           02 D0I PIC 99.
00029           02 FVAL COMP PIC S9(4).
00030           02 FVAF PIC X.
00031           02 FVAI PIC 999.
00032           02 EQCAPL COMP PIC S9(4).
00033           02 EQCAPF PIC X.
00034           02 EQCAPI PIC 99.
00035           02 D1L COMP PIC S9(4).
00036           02 D1F PIC X.
00037           02 D1I PIC 99.
00038           02 RESUL COMP PIC S9(4).
00039           02 RESUF PIC X.
00040           02 RESUI PIC S9(3).
00041           02 D2L COMP PIC S9(4).
00042           02 D2F PIC X.
00043           02 D2I PIC 99.
00044           02 EANL COMP PIC S9(4).
00045           02 EANF PIC X.
00046           02 EANI PIC S9(3).
00047           02 D3L COMP PIC S9(4).
```

```
00048            02 D3F PIC X.
00049            02 D3I PIC 99.
00050            02 DRL COMP PIC S9(4).
00051            02 DRF PIC X.
00052            02 DRI PIC 99.
00053            02 D4L COMP PIC S9(4).
00054            02 D4F PIC X.
00055            02 D4I PIC 99.
00056            02 DPL COMP PIC S9(4).
00057            02 DPF PIC X.
00058            02 DPI PIC 99.
00059            02 D5L COMP PIC S9(4).
00060            02 D5F PIC X.
00061            02 D5I PIC 99.
00062            02 COTL COMP PIC S9(4).
00063            02 COTF PIC X.
00064            02 COTI PIC S99.
00065            02 D6L COMP PIC S9(4).
00066            02 D6F PIC X.
00067            02 D6I PIC 99.
00068            02 PEAL COMP PIC S9(4).
00069            02 PEAF PIC X.
00070            02 PEAI PIC 999.
00071            02 D7L COMP PIC S9(4).
```

```
00072            02 D7F PIC X.
00073            02 D7I PIC 99.
00074            02 PRICL COMP PIC S9(4).
00075            02 PRICF PIC X.
00076            02 PRICI PIC 9999.
00077            02 D8L COMP PIC S9(4).
00078            02 D8F PIC X.
00079            02 D8I PIC 99.
00080            02 HIGHL COMP PIC S9(4).
00081            02 HIGHF PIC X.
00082            02 HIGHI PIC 9999.
00083            02 D9L COMP PIC S9(4).
00084            02 D9F PIC X.
00085            02 D9I PIC 99.
00086            02 LOWL COMP PIC S9(4).
00087            02 LOWF PIC X.
00088            02 LOWI PIC 9999.
00089            02 DDL COMP PIC S9(4).
00090            02 DDF PIC X.
00091            02 DDI PIC 99.
00092            02 REPL COMP PIC S9(4).
00093            02 REPF PIC X.
00094            02 REPI PIC X(3).
00095        01  FIRSTO REDEFINES FIRSTI.
00096            02 FILLER PIC X(2).
```

```
00097           02 CNAMA PIC X.
00098           02 CNAMO PIC X(20).
00099           02 FILLER PIC X(2).
00100           02 YENDA PIC X.

00101           02 YENDO PIC 9(4).
00102           02 FILLER PIC X(2).
00103           02 BVALA PIC X.
00104           02 BVALO PIC 9(4).
00105           02 FILLER PIC X(2).
00106           02 DOA PIC X.
00107           02 DOO PIC 99.
00108           02 FILLER PIC X(2).
00109           02 FVAA PIC X.
00110           02 FVAO PIC 999.
00111           02 FILLER PIC X(2).
00112           02 EOCAPA PIC X.
00113           02 EOCAPO PIC 99.
00114           02 FILLER PIC X(2).
00115           02 D1A PIC X.
00116           02 D1O PIC 99.
00117           02 FILLER PIC X(2).
00118           02 RESUA PIC X.
00119           02 RESUO PIC S9(3).
00120           02 FILLER PIC X(2).
```

```
00121           02 D2A PIC X.
00122           02 D2O PIC 99.
00123           02 FILLER PIC X(2).
00124           02 EANA PIC X.
00125           02 EANO PIC S9(3).
00126           02 FILLER PIC X(2).
00127           02 D3A PIC X.
00128           02 D3O PIC 99.
00129           02 FILLER PIC X(2).
00130           02 DRA PIC X.
00131           02 DRO PIC 99.
00132           02 FILLER PIC X(2).
00133           02 D4A PIC X.
00134           02 D4O PIC 99.
00135           02 FILLER PIC X(2).
00136           02 DPA PIC X.
00137           02 DPO PIC 99.
00138           02 FILLER PIC X(2).
00139           02 DSA PIC X.
00140           02 DSO PIC 99.
00141           02 FILLER PIC X(2).
00142           02 COTA PIC X.
00143           02 COTO PIC S99.
00144           02 FILLER PIC X(2).
```

```
00145           02 D6A PIC X.
00146           02 D60 PIC 99.
00147           02 FILLER PIC X(2).
00148           02 PEAA PIC X.
00149           02 PEAO PIC 999.
00150           02 FILLER PIC X(2).
00151           02 D7A PIC X.
00152           02 D70 PIC 99.
00153           02 FILLER PIC X(2).
00154           02 PRICA PIC X.
00155           02 PRICO PIC 9999.
00156           02 FILLER PIC X(2).
00157           02 D8A PIC X.
00158           02 D80 PIC 99.
00159           02 FILLER PIC X(2).
00160           02 HIGHA PIC X.
00161           02 HIGHO PIC 9999.
00162           02 FILLER PIC X(2).
00163           02 D9A PIC X.
00164           02 D90 PIC 99.
00165           02 FILLER PIC X(2).
00166           02 LOWA PIC X.
00167           02 LOWO PIC 9999.
00168           02 FILLER PIC X(2).
00169           02 DDA PIC X.
```

```
00170            02 DDO PIC 99.
00171            02 FILLER PIC X(2).
00172            02 REPA PIC X.
00173            02 REPO PIC X(3).
00174         01  OPTI.
00175            02 SELECTL COMP PIC S9(4).
00176            02 SELECTF PIC X.
00177            02 SELECTI PIC X.
00178         01  OPTO REDEFINES OPTI.
00179            02 FILLER PIC X(2).
00180            02 SELECTA PIC X.
00181            02 SELECTO PIC X.
00182         01  MOREI.
00183            02 ANSWERL COMP PIC S9(4).
00184            02 ANSWERF PIC X.
00185            02 ANSWERI PIC 9.
00186         01  MORED REDEFINES MOREI.
00187            02 FILLER PIC X(2).
00188            02 ANSWERA PIC X.
00189            02 ANSWERO PIC 9.
00190          01 AREA1.
00191              05 JOB-NORMAL-END-MESSAGE PIC X(22) VALUE
00192                 'TERMINATION OF THE JOB'.
00193              05 JOB-ABORTED-MESSAGE.
```

```
00194              10 FILLER              PIC X(17) VALUE
00195                  '***JOB ABORTED***'
00196              10 MAJOR-ERROR-MSG     PIC X(30).
00197          01 PROS-CTR-SW              PIC X(1).
00198          01 KEY-AREA.
00199              05 KEY-NAME             PIC X(20).
00200          01  DFHLDVER PIC X(22) VALUE 'LD TABLE DFHEITAB 1-6.'.
00201          01  DFHEID0 PICTURE S9(7) COMPUTATIONAL-3 VALUE ZERO.
00202          01  DFHEIB0 PICTURE S9(4) COMPUTATIONAL VALUE ZERO.
00203          01  DFHEICB  PICTURE X(8) VALUE IS '        '.
00205          01   DFHEIV16  COMP PIC S9(8).
00206          01   DFHEIV11  COMP PIC S9(4).
00207          01   DFHEIV12  COMP PIC S9(4).
00208          01   DFHEIV13  COMP PIC S9(4).
00209          01   DFHEIV14  COMP PIC S9(4).
00210          01   DFHEIV15  COMP PIC S9(4).
00211          01   DFHB0025  COMP PIC S9(4).
00212          01   DFHEIV5   PIC X(4).
00213          01   DFHEIV6   PIC X(4).
00214          01   DFHEIV17  PIC X(4).
00215          01   DFHEIV18  PIC X(4).
00216          01   DFHEIV19  PIC X(4).
00217          01   DFHEIV1   PIC X(8).
00218          01   DFHEIV2   PIC X(8).
00219          01   DFHEIV3   PIC X(8).
```

```
00220          01   DFHEIV20 PIC X(8).
00221          01   DFHC0084 PIC X(8).
00222          01   DFHC0085 PIC X(8).
00223          01   DFHC0320 PIC X(32).
00224          01   DFHEIV7  PIC X(2).
00225          01   DFHEIV8  PIC X(2).
00226          01   DFHC0022 PIC X(2).
00227          01   DFHC0023 PIC X(2).
00228          01   DFHEIV10 PIC S9(7) COMP-3.
00229          01   DFHEIV4  PIC X(6).
00230          01   DFHC0070 PIC X(7).
00231          01   DFHC0071 PIC X(7).
00232          01   DFHDUMMY COMP PIC S9(4).
00233          01   DFHEIV0  PICTURE X(29).
00234            LINKAGE SECTION.
00235          01 DFHEIBLK.
00236          02   EIBTIME  PIC S9(7) COMP-3.
00237          02   EIBDATE  PIC S9(7) COMP-3.
00238          02   EIBTRNID PIC X(4).
00239          02   EIBTASKN PIC S9(7) COMP-3.
00240          02   EIBTRMID PIC X(4).
00241          02   DFHEIGDI COMP PIC S9(4).
00242          02   EIBCPOSN COMP PIC S9(4).
00243          02   EIBCALEN COMP PIC S9(4).
```

```
00244          02  EIBAID  PIC X(1).
00245          02  EIBFN   PIC X(2).
00246          02  EIBRCODE PIC X(6).
00247          02  EIBDS   PIC X(8).
00248          02  EIBREQID PIC X(8).
00249          02  EIBRSRCE PIC X(8).
00250          02  EIBSYNC  PIC X(1).
00251          02  EIBFREE  PIC X(1).
00252          02  EIBRECV  PIC X(1).
00253          02  EIBFIL02 PIC X(1).
00254          02  EIBATT   PIC X(1).
00255          02  EIBEOC   PIC X(1).
00256          02  EIBFMH   PIC X(1).
00257          02  EIBCOMPL PIC X(1).
00258          02  EIBSIG   PIC X(1).
00259          02  EIBCONF  PIC X(1).
00260          02  EIBERR   PIC X(1).
00261          02  EIBERRCD PIC X(4).
00262          02  EIBSYNRB PIC X(1).
00263          02  EIBNODAT PIC X(1).
00264          01  DFHCOMMAREA PICTURE X(1).
00265            01 LINKAGE-POINTERS.
00266               05 FILLER                PIC S9(8) COMP.
00267               05 SETPOINTER            PIC S9(8) COMP.
00268               05 REPOINT1              PIC S9(8) COMP.
```

```
00269          01  DFHBLLSLOT1 PICTURE X(1).
00270          01  DFHBLLSLOT2 PICTURE X(1).
00271            PROCEDURE DIVISION USING DFHEIBLK DFHCOMMAREA.
00272              CALL 'DFHEI1'.
00273            STEP1.
00274          *EXEC CICS
00275          *     HANDLE CONDITION
00276          *          MAPFAIL (ERR-RES)
00277          *          ERROR   (ERRORS)
00278          *          NOTOPEN (FILE2BOPENE)
00279          *END-EXEC.
00280                   MOVE '                  00287    ' TO DFHEIV0
00281                  CALL 'DFHEI1' USING DFHEIV0
00282                   GO TO  ERR-RES ERRORS FILE2BOPENE DEPENDING ON DFHEIGDI.
00286                   MOVE SPACES TO FIRST1 , CNAME1 , MORE1.
00287                   MOVE DFHCOMMAREA TO PROS-CTR-SW.
00288                   IF PROS-CTR-SW EQUAL TO 1
00289                   GO TO PSEDO-MOD
00290                   ELSE GO TO ACCEPT-QUIRY.
00291           ACCEPT-QUIRY.
00292          *EXEC CICS
00293          *     SEND MAP ('CNAME')
00294          *          MAPSET ('DEMAP1')
00295          *          MAPONLY
```

```
00296        *          ERASE                                          E
00297        *END-EXEC.
00298                   MOVE '            00219    ' TO DFHEIV0
00299                   MOVE 'CNAME' TO DFHC0070
00300                   MOVE 'DEMAPI' TO DFHC0071
00301                  CALL 'DFHEI1' USING DFHEIV0  DFHC0070 DFHEICB DFHDUMMY
00302                 DFHC0071.
00304                PSEDO-MOD.
00305        *EXEC CICS
00306        *     RECEIVE MAP   ('CNAME')
00307        *             MAPSET ('DEMAPI')
00308        *             INTO (CNAMEI)
00309        *END-EXEC.
00310                   MOVE '                00226    ' TO DFHEIV0
00311                   MOVE 'CNAME' TO DFHC0070
00312                   MOVE 'DEMAPI' TO DFHC0071
00313                  CALL 'DFHEI1' USING DFHEIV0  DFHC0070 CNAMEI DFHDUMMY
00314                 DFHC0071.
00315                  MOVE COMPANYNAMEI TO KEY-AREA.
00316                READ-THE-FILE.
00317        *EXEC CICS
00318        *     READ DATASET ('DLSM')
00319        *          RIDFLD   (KEY-NAME )
00320        *          INTO     (FIRST1)
00321        *END-EXEC.
```

```
00322              MOVE '              00233   ' TO DFHEIV0
00323              MOVE 'DLSM' TO DFHEIV1
00324             CALL 'DFHEI1' USING DFHEIV0  DFHEIV1  FIRST1 DFHDUMMY
00325            KEY-NAME.
00328         DISPLAY-THE-RECORD.
00329        *EXEC CICS
00330        *     SEND MAP    ('FIRST')
00331        *          MAPSET ('DEMAP3')
00332        *          FROM   (FIRST1)
00333        *          ERASE
00334        * END-EXEC.
00335              MOVE '              00240   ' TO DFHEIV0
00336              MOVE 'FIRST' TO DFHC0070
00337              MOVE 'DEMAP3' TO DFHC0071
00338             CALL 'DFHEI1' USING DFHEIV0  DFHC0070 FIRST1 DFHDUMMY
00339            DFHC0071.
00341         FOR-MORE-RECORDS.
00342  0034*EXEC CI*EXEC CICS
00343        *     SEND MAP    ('MORE')
00344        *          MAPSET ('DEMAP1')
00345        *          MAPONLY
00346        *END-EXEC.
00347              MOVE '              00247   ' TO DFHEIV0
00348              MOVE 'MORE' TO DFHC0070
```

```
00349                MOVE 'DEMAPI' TO DFHC0071
00350               CALL 'DFHEI1' USING DFHEIV0  DFHC0070 DFHEICB DFHDUMMY
00351              DFHC0071.
00352  00352*EXEC CI*EXEC CICS
00353         *     RECEIVE MAP   ('MORE')
00354         *             MAPSET ('DEMAPI')
00355         *             INTO   (MOREI)
00356         *END-EXEC.
00357                 MOVE '                00252   ' TO DFHEIV0
00358                 MOVE 'MORE' TO DFHC0070
00359                 MOVE 'DEMAPI' TO DFHC0071
00360                CALL 'DFHEI1' USING DFHEIV0  DFHC0070 MOREI DFHDUMMY
00361              DFHC0071.
00362                IF ANSWERI OF MOREI EQUAL TO 1
00363                   GO TO ACCEPT-QUIRY.
00364                IF ANSWERI OF MOREI EQUAL TO 2
00365                   GO TO MAIN-MENU.
00366                IF ANSWERI OF MOREI EQUAL TO 3

00367                   GO TO END-OF-PRG-INQIRY.
00368            ERR-RES.
00369                MOVE 'UNDEFINED PA/PF KEY USED/MFAIL' TO MAJOR-ERROR-MSG.
00370                GO TO ERR-RESPONSE.
00371           FILE2BOPENE.
00372                MOVE '*****FILE NOT OPEN**********' TO MAJOR-ERROR-MSG.
```

```
00373              GO TO ERR-RESPONSE.
00374         MAIN-MENU.
00375              MOVE 'THIS PART IS NOT SUPPORTED****' TO MAJOR-ERROR-MSG.
00376              GO TO ERR-RESPONSE.
00377         REC2BFOUND.
00378              MOVE '*******RECORD NOT FOUND *******' TO MAJOR-ERROR-MSG.
00379              GO TO ERR-RESPONSE.
00380         ERRORS.
00381  00381 *EXEC CICSEXECDUMPICS DUMP
                    DUMPCODE('PMUD')
              END-EXEC.
00382               MOVE '          00276     TO DFHEIV0
00383               MOVE 'PMUD' TO DFHEIV5
00384              CALL 'DFHEI1' USING DFHEIV0  DFHEIV5.
00385              MOVE 'HANDLE CONDITION ERROR .....' TO MAJOR-ERROR-MSG.
00386              GO TO ERR-RESPONSE.
00387           ERR-RESPONSE.
00388  00388EXEC CICSEXEC CICS
00389         *     SEND FROM (AREA1)
00390         *          LENGTH (00)
00391         *          ERASE
00392         *END-EXEC.
00393               MOVE '          00200    ' TO DFHEIV0
00394               MOVE 00 TO DFHEIV11
00395              CALL 'DFHEI1' USING DFHEIV0  DFHDUMMY DFHDUMMY AREA1
```

```
00396             DFHEIV11.
00398         END-OF-PRG-INQIRY.
00399  00399   *EXEC CICSEXEC CICS
00400         *     RETURN
00401         *END-EXEC.
00402                MOVE '           00286   ' TO DFHEIV0
00403               CALL 'DFHEI1' USING DFHEIV0.
00404
```

PROGRAM FOUR

FILE DELETE

```
 CBL FLAGE CLIST APOST LIB STATE FLOW=10 VERB
00001 *** **********************CICS  PROGRAM
00002            IDENTIFICATION DIVISION.
00003            PROGRAM-ID.DEDELE.
00004            AUTHOR. MESHACH.
00005            ENVIRONMENT DIVISION.
00006            DATA DIVISION.
00007            WORKING-STORAGE SECTION.
00008         01   CNAMEI.
00009              02 COMPANYNAMEL COMP PIC S9(4).
00010              02 COMPANYNAMEF PIC X.
00011              02 COMPANYNAMEI PIC X(20).
00012         01   CNAMEO REDEFINES CNAMEI.
00013              02 FILLER PIC X(2).
00014              02 COMPANYNAMEA PIC X.
00015              02 COMPANYNAMEO PIC X(20).
00016         01   MOREI.
00017              02 ANSWERL COMP PIC S9(4).
00018              02 ANSWERF PIC X.
00019              02 ANSWERI PIC 9.
00020         01   MOREO REDEFINES MOREI.
00021              02 FILLER PIC X(2).
00022              02 ANSWERA PIC X.
```

```
00023            02 ANSWERO PIC 9.
00024         01 MORE-DELETE.
00025            02 RES           PIC 9.
00026         01 AREA1.
00027            05 JOB-NORMAL-END-MESSAGE PIC X(22) VALUE
00028              'TERMINATION OF THE JOB'.
00029            05 JOB-ABORTED-MESSAGE.
00030              10 FILLER              PIC X(17) VALUE
00031               '###JOB ABORTED###'
00032              10 MAJOR-ERROR-MSG     PIC X(30).
00033        01 PROS-CTR-SW               PIC X(1).
00034         01 KEY-AREA.
00035            05 KEY-NAME             PIC X(20).
00036        01  DFHLDVER PIC X(22) VALUE 'LD TABLE DFHEITAB 1-6.'.
00037        01  DFHEIDO PICTURE S9(7) COMPUTATIONAL-3 VALUE ZERO.
00038        01  DFHEIBO PICTURE S9(4) COMPUTATIONAL VALUE ZERO.
00039        01  DFHEICB  PICTURE X(8) VALUE IS '        '.
00040
00041        01   DFHEIV16  COMP PIC S9(8).
00042        01   DFHEIV11  COMP PIC S9(4).
00043        01   DFHEIV12  COMP PIC S9(4).
00044        01   DFHEIV13  COMP PIC S9(4).
00045        01   DFHEIV14  COMP PIC S9(4).
00046        01   DFHEIV15  COMP PIC S9(4).
00047        01   DFHB0025  COMP PIC S9(4).
```

```
00048          01   DFHEIV5   PIC X(4).
00049          01   DFHEIV6   PIC X(4).
00050          01   DFHEIV17  PIC X(4).
00051          01   DFHEIV18  PIC X(4).
00052          01   DFHEIV19  PIC X(4).
00053          01   DFHEIV1   PIC X(8).
00054          01   DFHEIV2   PIC X(8).
00055          01   DFHEIV3   PIC X(8).
00056          01   DFHEIV20  PIC X(8).
00057          01   DFHC0084  PIC X(8).
00058          01   DFHC0085  PIC X(8).
00059          01   DFHC0320  PIC X(32).
00060          01   DFHEIV7   PIC X(2).
00061          01   DFHEIV8   PIC X(2).
00062          01   DFHC0022  PIC X(2).
00063          01   DFHC0023  PIC X(2).
00064          01   DFHEIV10  PIC S9(7) COMP-3.
00065          01   DFHEIV4   PIC X(6).
00066          01   DFHC0070  PIC X(7).
00067          01   DFHC0071  PIC X(7).
00068          01   DFHDUMMY COMP PIC S9(4).
00069          01   DFHEIV0  PICTURE X(29).
00070            LINKAGE SECTION.
00071          01  DFHEIBLK.
```

```
00072          02   EIBTIME  PIC S9(7) COMP-3.
00073          02   EIBDATE  PIC S9(7) COMP-3.
00074          02   EIBTRNID PIC X(4).
00075          02   EIBTASKN PIC S9(7) COMP-3.
00076          02   EIBTRMID PIC X(4).
00077          02   DFHEIGDI COMP PIC S9(4).
00078          02   EIBCPOSN COMP PIC S9(4).
00079          02   EIBCALEN COMP PIC S9(4).
00080          02   EIBAID   PIC X(1).
00081          02   EIBFN    PIC X(2).
00082          02   EIBRCODE PIC X(6).
00083          02   EIBDS    PIC X(8).
00084          02   EIBREQID PIC X(8).
00085          02   EIBRSRCE PIC X(8).
00086          02   EIBSYNC  PIC X(1).
00087          02   EIBFREE  PIC X(1).
00088          02   EIBRECV  PIC X(1).
00089          02   EIBFIL02 PIC X(1).
00090          02   EIBATT   PIC X(1).
00091          02   EIBEOC   PIC X(1).
00092          02   EIBFMH   PIC X(1).
00093          02   EIBCOMPL PIC X(1).
00094          02   EIBSIG   PIC X(1).
00095          02   EIBCONF  PIC X(1).
00096          02   EIBERR   PIC X(1).
```

```
00097          02    EIBERRCD PIC X(4).
00098          02    EIBSYNRB PIC X(1).
00099          02    EIBNODAT PIC X(1).
00100          01  DFHCOMMAREA PICTURE X(1).
00101            01 LINKAGE-POINTERS.
00102               05 FILLER              PIC S9(8) COMP.
00103               05 SETPOINTER          PIC S9(8) COMP.
00104               05 REPOINT1            PIC S9(8) COMP.
00105          01  DFHBLLSLOT1 PICTURE X(1).
00106          01  DFHBLLSLOT2 PICTURE X(1).
00107            PROCEDURE DIVISION USING DFHEIBLK DFHCOMMAREA.
00108              CALL 'DFHEI1'.
00109            STEP1.
00110         *EXEC CICS
00111         *     HANDLE CONDITION
00112         *          MAPFAIL (ERR-RES)
00113         *          ERROR   (ERRORS)
00114         *          NOTOPEN (FILE2BOPENE)
00115         *END-EXEC.
00116                 MOVE '           00043   ' TO DFHEIV0
00117               CALL 'DFHEI1' USING DFHEIV0
00118                GO TO  ERR-RES ERRORS FILE2BOPENE DEPENDING ON DFHEIGDI.
00122               MOVE SPACES TO  PROS-CTR-SW.
00123               MOVE DFHCOMMAREA TO PROS-CTR-SW.
```

```
00124              IF PROS-CTR-SW EQUAL TO 1
00125              THEN GO TO PSEDO-MOD
00126              ELSE GO TO ACCEPT-DELETE.
00127           ACCEPT-DELETE.
00128         $EXEC CICS
00129         $     SEND MAP     ('CNAME')
00130         $          MAPSET  ('DEMAPI')
00131         $          MAPONLY
00132         $END-EXEC.
00133                 MOVE '              00055   ' TO DFHEIV0
00134                 MOVE 'CNAME' TO DFHC0070
00135                 MOVE 'DEMAPI' TO DFHC0071
00136                CALL 'DFHEI1' USING DFHEIV0  DFHC0070 DFHEICB DFHDUMMY
00137               DFHC0071.
00138          PSEDO-MOD.
00139         $EXEC CICS
00140         $     RECEIVE MAP    ('CNAME')
00141         $             MAPSET ('DEMAPI')
00142         $             INTO   ( CNAMEI)
00143         $END-EXEC.
00144                 MOVE '           00061   ' TO DFHEIV0
00145                 MOVE 'CNAME' TO DFHC0070
00146                 MOVE 'DEMAPI' TO DFHC0071
00147                CALL 'DFHEI1' USING DFHEIV0  DFHC0070 CNAMEI DFHDUMMY
00148               DFHC0071.
```

```
00149         DEL-THE-REC.
00150        $EXEC CICS
00151        $      HANDLE CONDITION
00152        $             DSIDERR (CHECK-UR-FCT-NAME )
00153        $             IOERR   (PHYSICAL-DAMAGE)
00154        $END-EXEC.
00155                MOVE '                00067   ' TO DFHEIV0
00156               CALL 'DFHEI1' USING DFHEIV0
00157                GO TO  CHECK-UR-FCT-NAME PHYSICAL-DAMAGE DEPENDING ON
00158              DFHEIGDI.
00159
00160        $EXEC CICS
00161        $     DELETE DATASET ('DESM')
00162        $             RIDFLD (COMPANYNAMEI)
00163        $END-EXEC.
00164                MOVE '                00072   ' TO DFHEIV0
00165                MOVE 'DESM' TO DFHEIV1
00166               CALL 'DFHEI1' USING DFHEIV0  DFHEIV1  DFHDUMMY DFHDUMMY
00167              COMPANYNAMEI.
00168         FOR-MORE-DELETE.
00169        $EXEC CICS
00170        $     SEND MAP    ('MORE')
00171        $          MAPSET ('DEMAPA')
00172        $          MAPONLY
```

```
00173        *          ERASE
00174        * END-EXEC.
00175                MOVE '                          00077   ' TO DFHEIV0
00176                MOVE 'MORE' TO DFHC0070
00177                MOVE 'DEMAPA' TO DFHC0071
00178               CALL 'DFHEI1' USING DFHEIV0  DFHC0070 DFHEICB DFHDUMMY
00179              DFHC0071.
00181        *EXEC CICS
00182        *     RECEIVE MAP   ('MORE')
00183        *             MAPSET ('DEMAPA')
00184        *             INTO   (MOREI)
00185        *END-EXEC.
00186                 MOVE '             00083   ' TO DFHEIV0
00187                 MOVE 'MORE' TO DFHC0070
00188                 MOVE 'DEMAPA' TO DFHC0071
00189                CALL 'DFHEI1' USING DFHEIV0  DFHC0070 MOREI DFHDUMMY
00190              DFHC0071.
00191                IF ANSWERI OF MOREI EQUAL TO 1
00192                   GO TO ACCEPT-DELETE.
00193                IF ANSWERI OF MOREI EQUAL TO 2
00194                   GO TO MAIN-MENU.
00195                IF ANSWERI OF MOREI EQUAL TO 3
00196                   GO TO END-OF-PRG-DELETEI.
00197         END-OF-PRG-DELETEI.
00198                MOVE 'ALL DEL OK.NO ERR MSG********' TO MAJOR-ERROR-MSG.
```

```
00199                GO TO ERR-RESPONSE.
00200              ERR-RES.
00201                MOVE 'UNDEFINED PA/PF KEY USED/MFAIL' TO MAJOR-ERROR-MSG.
00202                GO TO ERR-RESPONSE.
00203            FILE2BOPENE.
00204                MOVE 'FILE IS NOT OPENED.$$$$$$$$$$$' TO MAJOR-ERROR-MSG.
00205                GO TO ERR-RESPONSE.
00206            MAIN-MENU.
00207                MOVE 'THIS PART IS NOT SUPPORTED$$$$' TO MAJOR-ERROR-MSG.
00208                GO TO ERR-RESPONSE.
00209            CHECK-UR-FCT-NAME.
00210                MOVE 'DATASET(FN) DIFFS FROM FCTN$$$' TO MAJOR-ERROR-MSG.
00211                GO TO ERR-RESPONSE.
00212            PHYSICAL-DAMAGE.
00213                MOVE 'CICS NOT ABLE TO R/W.IOERR$$$$' TO MAJOR-ERROR-MSG.
00214                GO TO ERR-RESPONSE.
00215            ERRORS.
00216                MOVE 'HANDLE CONDITION ERROR/DUMP...' TO MAJOR-ERROR-MSG.
00217           *EXEC CICS DUMP DUMPCODE('PMUD') END-EXEC.
00218                 MOVE '                    00114    ' TO DFHEIV0
00219                 MOVE 'PMUD' TO DFHEIV5
00220                CALL 'DFHEI1' USING DFHEIV0  DFHEIV5.
00221                GO TO ERR-RESPONSE.
00222              ERR-RESPONSE.
```

```
00223        *EXEC CICS
00224        *     SEND FROM (AREA1)
00225        *          LENGTH (80)
00226        *          ERASE
00227        *END-EXEC.
00228                MOVE '                    00117   ' TO DFHEIV0
00229                MOVE 80 TO DFHEIV11
00230               CALL 'DFHEI1' USING DFHEIV0  DFHDUMMY DFHDUMMY AREA1
00231              DFHEIV11.
00233         END-OF-PRG-DELETE.
00234        *EXEC CICS
00235        *     RETURN
00236        *END-EXEC.
00237                MOVE '                    00123   ' TO DFHEIV0
00238               CALL 'DFHEI1' USING DFHEIV0.
00239
```

PROGRAM FIVE

FILE-UPDATE

```
    1  IBM DOS/VS COBOL
 REL 3.0              PP NO. 5746-CB1

 CBL FLAGE CLIST APOST LIB STATE FLOW=10 VERB

00001 $$$ $$$$$$$$$$$$$$$$$$$$CICS  PROGRAM

00002            IDENTIFICATION DIVISION.

00003            PROGRAM-ID.DEUPDT.

00004            AUTHOR. MESHACH.

00005            ENVIRONMENT DIVISION.

00006            DATA DIVISION.

00007            WORKING-STORAGE SECTION.

00008          01   CNAMEI.

00009              02 COMPANYNAMEL COMP PIC S9(4).

00010              02 COMPANYNAMEF PIC X.

00011              02 COMPANYNAMEI PIC X(20).

00012          01   CNAMEO REDEFINES CNAMEI.

00013              02 FILLER PIC X(2).

00014              02 COMPANYNAMEA PIC X.

00015              02 COMPANYNAMEO PIC X(20).

00016          01   FIRSTI.

00017              02 CNAML COMP PIC S9(4).

00018              02 CNAMF PIC X.

00019              02 CNAMI PIC X(20).

00020              02 YENDL COMP PIC S9(4).

00021              02 YENDF PIC X.

00022              02 YENDI PIC 9(4).

00023              02 BVALL COMP PIC S9(4).

00024              02 BVALF PIC X.
```

```
00025            02 BVALI PIC 9(4).
00026            02 DOL COMP PIC S9(4).
00027            02 DOF PIC X.
00028            02 DOI PIC 99.
00029            02 FVAL COMP PIC S9(4).
00030            02 FVAF PIC X.
00031            02 FVAI PIC 999.
00032            02 EQCAPL COMP PIC S9(4).
00033            02 EQCAPF PIC X.
00034            02 EQCAPI PIC 99.
00035            02 D1L COMP PIC S9(4).
00036            02 D1F PIC X.
00037            02 D1I PIC 99.
00038            02 RESUL COMP PIC S9(4).
00039            02 RESUF PIC X.
00040            02 RESUI PIC S9(3).
00041            02 D2L COMP PIC S9(4).
00042            02 D2F PIC X.
00043            02 D2I PIC 99.
00044            02 EANL COMP PIC S9(4).
00045            02 EANF PIC X.
00046            02 EANI PIC S9(3).
00047            02 D3L COMP PIC S9(4).
00048            02 D3F PIC X.
00049            02 D3I PIC 99.
00050            02 DRL COMP PIC S9(4).
00051            02 DRF PIC X.
00052            02 DRI PIC 99.
```

```
00053           02 D4L COMP PIC S9(4).
00054           02 D4F PIC X.
00055           02 D4I PIC 99.
00056           02 DPL COMP PIC S9(4).
00057           02 DPF PIC X.
00058           02 DPI PIC 99.
00059           02 D5L COMP PIC S9(4).
00060           02 D5F PIC X.
00061           02 D5I PIC 99.
00062           02 COTL COMP PIC S9(4).
00063           02 COTF PIC X.
00064           02 COTI PIC S99.
00065           02 D6L COMP PIC S9(4).
00066           02 D6F PIC X.
00067           02 D6I PIC 99.
00068           02 PEAL COMP PIC S9(4).
00069           02 PEAF PIC X.
00070           02 PEAI PIC 999.
00071           02 D7L COMP PIC S9(4).
00072           02 D7F PIC X.
00073           02 D7I PIC 99.
00074           02 PRICL COMP PIC S9(4).
00075           02 PRICF PIC X.
00076           02 PRICI PIC 9999.
00077           02 D8L COMP PIC S9(4).
00078           02 D8F PIC X.
00079           02 D8I PIC 99.
```

```
00080            02 HIGHL COMP PIC S9(4).
00081            02 HIGHF PIC X.
00082            02 HIGHI PIC 9999.
00083            02 D9L COMP PIC S9(4).
00084            02 D9F PIC X.
00085            02 D9I PIC 99.
00086            02 LOWL COMP PIC S9(4).
00087            02 LOWF PIC X.
00088            02 LOWI PIC 9999.
00089            02 DDL COMP PIC S9(4).
00090            02 DDF PIC X.
00091            02 DDI PIC 99.
00092            02 REPL COMP PIC S9(4).
00093            02 REPF PIC X.
00094            02 REPI PIC X(3).
00095        01  FIRSTO REDEFINES FIRSTI.
00096            02 FILLER PIC X(2).
00097            02 CNAMA PIC X.
00098            02 CNAMO PIC X(20).
00099            02 FILLER PIC X(2).
00100            02 YENDA PIC X.
00101            02 YENDO PIC 9(4).
00102            02 FILLER PIC X(2).
00103            02 BVALA PIC X.
00104            02 BVALO PIC 9(4).
00105            02 FILLER PIC X(2).
00106            02 DOA PIC X.
00107            02 DOO PIC 99.
```

```
00108            02 FILLER PIC X(2).
00109            02 FVAA PIC X.
00110            02 FVAO PIC 999.
00111            02 FILLER PIC X(2).
00112            02 EQCAPA PIC X.
00113            02 EQCAPO PIC 99.
00114            02 FILLER PIC X(2).
00115            02 D1A PIC X.
00116            02 D1O PIC 99.
00117            02 FILLER PIC X(2).
00118            02 RESUA PIC X.
00119            02 RESUD PIC S9(3).
00120            02 FILLER PIC X(2).
00121            02 D2A PIC X.
00122            02 D2O PIC 99.
00123            02 FILLER PIC X(2).
00124            02 EANA PIC X.
00125            02 EANO PIC S9(3).
00126            02 FILLER PIC X(2).
00127            02 D3A PIC X.
00128            02 D3O PIC 99.
00129            02 FILLER PIC X(2).
00130            02 DRA PIC X.
00131            02 DRO PIC 99.
00132            02 FILLER PIC X(2).
00133            02 D4A PIC X.
00134            02 D4O PIC 99.
```

```
00135           02 FILLER PIC X(2).
00136           02 DPA PIC X.
00137           02 DPD PIC 99.
00138           02 FILLER PIC X(2).
00139           02 D5A PIC X.
00140           02 D5D PIC 99.
00141           02 FILLER PIC X(2).
00142           02 COTA PIC X.
00143           02 COTD PIC S99.
00144           02 FILLER PIC X(2).
00145           02 D6A PIC X.
00146           02 D6D PIC 99.
00147           02 FILLER PIC X(2).
00148           02 PEAA PIC X.
00149           02 PEAD PIC 999.
00150           02 FILLER PIC X(2).
00151           02 D7A PIC X.
00152           02 D7D PIC 99.
00153           02 FILLER PIC X(2).
00154           02 PRICA PIC X.
00155           02 PRICD PIC 9999.
00156           02 FILLER PIC X(2).
00157           02 D8A PIC X.
00158           02 D8D PIC 99.
00159           02 FILLER PIC X(2).
00160           02 HIGHA PIC X.
00161           02 HIGHD PIC 9999.
00162           02 FILLER PIC X(2).
```

```
00163            02 D9A PIC X.
00164            02 D9O PIC 99.
00165            02 FILLER PIC X(2).
00166            02 LOWA PIC X.
00167            02 LOWO PIC 9999.
00168            02 FILLER PIC X(2).
00169            02 DDA PIC X.
00170            02 DDO PIC 99.
00171            02 FILLER PIC X(2).
00172            02 REPA PIC X.
00173            02 REPO PIC X(3).
00174        01   OPTI.
00175            02 SELECTL COMP PIC S9(4).
00176            02 SELECTF PIC X.
00177            02 SELECTI PIC X.
00178        01   OPTO REDEFINES OPTI.
00179            02 FILLER PIC X(2).
00180            02 SELECTA PIC X.
00181            02 SELECTO PIC X.
00182        01   MOREI.
00183            02 ANSWERL COMP PIC S9(4).
00184            02 ANSWERF PIC X.
00185            02 ANSWERI PIC 9.
00186        01   MOREO REDEFINES MOREI.
00187            02 FILLER PIC X(2).
00188            02 ANSWERA PIC X.
00189            02 ANSWERO PIC 9.
```

```
00190          01 MORE-UPDATE.
00191              02 RES            PIC 9.
00192          01 AREA1.
00193              05 JOB-NORMAL-END-MESSAGE PIC X(22) VALUE
00194                'TERMINATION OF THE JOB'.
00195              05 JOB-ABORTED-MESSAGE.
00196                10 FILLER              PIC X(17) VALUE
00197                 '***JOB ABORTED***'
00198                10 MAJOR-ERROR-MSG     PIC X(30).
00199         01 PROS-CTR-SW                PIC X(1).
00200          01 KEY-AREA.
00201              05 KEY-NAME             PIC X(20).
00202         01  DFHLDVER PIC X(22) VALUE 'LD TABLE DFHEITAB 1-6.'.
00203         01  DFHEIDO PICTURE S9(7) COMPUTATIONAL-3 VALUE ZERO.
00204         01  DFHEIBO PICTURE S9(4) COMPUTATIONAL VALUE ZERO.
00205         01  DFHEICB  PICTURE X(8) VALUE IS '        '.
00207         01   DFHEIV16  COMP PIC S9(8).
00208         01   DFHEIV11  COMP PIC S9(4).
00209         01   DFHEIV12  COMP PIC S9(4).
00210         01   DFHEIV13  COMP PIC S9(4).
00211         01   DFHEIV14  COMP PIC S9(4).
00212         01   DFHEIV15  COMP PIC S9(4).
00213         01   DFHB0025  COMP PIC S9(4).
00214         01   DFHEIV5   PIC X(4).
00215         01   DFHEIV6   PIC X(4).
00216         01   DFHEIV17  PIC X(4).
00217         01   DFHEIV18  PIC X(4).
00218         01   DFHEIV19  PIC X(4).
```

```
00219          01   DFHEIV1   PIC X(8).
00220          01   DFHEIV2   PIC X(8).
00221          01   DFHEIV3   PIC X(8).
00222          01   DFHEIV20  PIC X(8).
00223          01   DFHC0084  PIC X(8).
00224          01   DFHC0085  PIC X(8).
00225          01   DFHC0320  PIC X(32).
00226          01   DFHEIV7   PIC X(2).
00227          01   DFHEIV8   PIC X(2).
00228          01   DFHC0022  PIC X(2).
00229          01   DFHC0023  PIC X(2).
00230          01   DFHEIV10  PIC S9(7) COMP-3.
00231          01   DFHEIV4   PIC X(6).
00232          01   DFHC0070  PIC X(7).
00233          01   DFHC0071  PIC X(7).
00234          01   DFHDUMMY COMP PIC S9(4).
00235          01   DFHEIV0  PICTURE X(29).
00236            LINKAGE SECTION.
00237          01  DFHEIBLK.
00238          02    EIBTIME  PIC S9(7) COMP-3.
00239          02    EIBDATE  PIC S9(7) COMP-3.
00240          02    EIBTRNID PIC X(4).
00241          02    EIBTASKN PIC S9(7) COMP-3.
00242          02    EIBTRMID PIC X(4).
00243          02    DFHEIGDI COMP PIC S9(4).
00244          02    EIBCPOSN COMP PIC S9(4).
00245          02    EIBCALEN COMP PIC S9(4).
```

```
00246           02    EIBAID   PIC X(1).
00247           02    EIBFN    PIC X(2).
00248           02    EIBRCODE PIC X(6).
00249           02    EIBDS    PIC X(8).
00250           02    EIBREQID PIC X(8).
00251           02    EIBRSRCE PIC X(8).
00252           02    EIBSYNC  PIC X(1).
00253           02    EIBFREE  PIC X(1).
00254           02    EIBRECV  PIC X(1).
00255           02    EIBFIL02 PIC X(1).
00256           02    EIBATT   PIC X(1).
00257           02    EIBEOC   PIC X(1).
00258           02    EIBFMH   PIC X(1).
00259           02    EIBCOMPL PIC X(1).
00260           02    EIBSIG   PIC X(1).
00261           02    EIBCONF  PIC X(1).
00262           02    EIBERR   PIC X(1).
00263           02    EIBERRCD PIC X(4).
00264           02    EIBSYNRB PIC X(1).
00265           02    EIBNODAT PIC X(1).
00266           01  DFHCOMMAREA PICTURE X(1).
00267             01 LINKAGE-POINTERS.
00268                05 FILLER                PIC S9(8) COMP.
00269                05 SETPOINTER            PIC S9(8) COMP.
00270                05 REPOINT1              PIC S9(8) COMP.
00271           01  DFHBLLSLOT1 PICTURE X(1).
00272           01  DFHBLLSLOT2 PICTURE X(1).
00273             PROCEDURE DIVISION USING DFHEIBLK DFHCOMMAREA.
```

```
00274            CALL 'DFHEI1'.
00275          STEP1.
00276        *EXEC CICS
00277        *     HANDLE CONDITION
00278        *          MAPFAIL (ERR-RES)
00279        *          ERROR   (ERRORS)
00280        *          NOTOPEN (FILE2BOPENE)
00281        *END-EXEC.
00282                  MOVE '              00209   ' TO DFHEIV0
00283                 CALL 'DFHEI1' USING DFHEIV0
00284                  GO TO  ERR-RES ERRORS FILE2BOPENE DEPENDING ON DFHEIGDI.
00288                 MOVE SPACES TO FIRSTI , OPTI , PROS-CTR-SW.
00289                 MOVE DFHCOMMAREA TO PROS-CTR-SW.
00290                 IF PROS-CTR-SW EQUAL TO 1
00291                 THEN GO TO PSEDO-MOD
00292                 ELSE GO TO ACCEPT-UPDATE.
00293          ACCEPT-UPDATE.
00294        *EXEC CICS
00295        *     SEND MAP     ('CNAME')
00296        *          MAPSET  ('DEMAPI')
00297        *          MAPONLY
00298        *END-EXEC.
00299                  MOVE '        00221   ' TO DFHEIV0
00300                  MOVE 'CNAME' TO DFHC0070
00301                  MOVE 'DEMAPI' TO DFHC0071
00302                 CALL 'DFHEI1' USING DFHEIV0  DFHC0070 DFHEICB DFHDUMMY
00303                DFHC0071.
```

```
00304          PSEDO-MOD.
00305         $EXEC CICS
00307         $     RECEIVE MAP    ('CNAME')
00308         $               MAPSET ('DEMAPI')
00309         $               INTO   ( CNAMEI)
00310         $END-EXEC.
00311                 MOVE '       00227   ' TO DFHEIV0
00312                 MOVE 'CNAME' TO DFHC0070
00313                 MOVE 'DEMAPI' TO DFHC0071
00314                CALL 'DFHEI1' USING DFHEIV0  DFHC0070 CNAMEI DFHDUMMY
00315               DFHC0071.
00317          ADD-THE-FILE.
00318         $EXEC CICS
00319         $      HANDLE CONDITION
00320         $               DSIDERR (CHECK-UR-FCT-NAME )
00321         $               DUPREC  ( UR-KEYS-R-DUP )
00322         $               LENGERR ( LREC-LONG )
00323         $               NOSPACE (TEL2EXT-FILE )
00324         $               INVREQ  (UPDATIONS-ERR)
00325         $               IOERR   (PHYSICAL-DAMAGE)
00326         $END-EXEC.
00327                 MOVE '         00234   ' TO DFHEIV0
00328                CALL 'DFHEI1' USING DFHEIV0
00329                 GO TO  CHECK-UR-FCT-NAME
                         UR-KEYS-R-DUP LREC-LONG
00330               TEL2EXT-FILE UPDATIONS-ERR
                         PHYSICAL-DAMAGE DEPENDING ON
00331              DFHEIGDI
```

```
00336        $EXEC CICS
00337        $    READ DATASET ('DLSM')
00338        $         RIDFLD   (KEY-AREA )
00339        $         INTO     (FIRSTI)
00340        $         UPDATE
00341        $END-EXEC.
00342                 MOVE '      00243   ' TO DFHEIV0
00343                 MOVE 'DLSM' TO DFHEIV1
00344                CALL 'DFHEI1' USING DFHEIV0
                       DFHEIV1  FIRSTI DFHDUMMY
00345               KEY-AREA.
00348        $EXEC CICS
00349        $     SEND MAP     ('FIRST')
00350        $          MAPSET  ('DEMAP3')
00351        $          FROM    (FIRSTI)
00352        $END-EXEC.
00353                 MOVE '         00249   ' TO DFHEIV0
00354                 MOVE 'FIRST' TO DFHC0070
00355                 MOVE 'DEMAP3' TO DFHC0071
00356                CALL 'DFHEI1' USING DFHEIV0
                       DFHC0070 FIRSTI DFHDUMMY
00357               DFHC0071.
00358        $EXEC CICS
00359        $     RECEIVE MAP     ('FIRST')
00360        $              MAPSET  ('DEMAP3')
00361        $              INTO    (FIRSTI )
00362        $END-EXEC.
00363         ---    MOVE '        00254   ' TO DFHEIV0
```

```
00364                MOVE 'FIRST' TO DFHC0070
00365                MOVE 'DEMAP3' TO DFHC0071
00366               CALL 'DFHEI1' USING DFHEIV0
                   DFHC0070 FIRSTI DFHDUMMY
00367               DFHC0071.
00368                MOVE CNAMI TO KEY-AREA.
00369                IF REPI OF FIRSTI EQUAL TO 'Y'
00370                THEN NEXT SENTENCE
00371                ELSE GO TO CONFORMATION.
00372           *EXEC CICS
00373           *     REWRITE DATASET ('DLSM')
00374           *             FROM    (FIRSTI )
00375           *             LENGTH  (132)
00376           *END-EXEC.
00377                   MOVE '          00263   ' TO DFHEIV0
00378                   MOVE 'DLSM' TO DFHEIV1
00379                   MOVE 132 TO DFHEIV11
00380                  CALL 'DFHEI1' USING DFHEIV0
                       DFHEIV1  FIRSTI DFHEIV11.
00382            FOR-MORE-UPDATE.
00383           *EXEC CICS
00384           *     SEND MAP    ('MORE')
00385           *          MAPSET ('DEMAPA')
00386           *          MAPONLY
00387           *          ERASE
00388           * END-EXEC.
00389                   MOVE '            00269   ' TO DFHEIV0
```

```
00390              MOVE 'MORE' TO DFHC0070
00391              MOVE 'DEMAPA' TO DFHC0071
00392             CALL 'DFHEI1' USING DFHEIV0
                  DFHC0070 DFHEICB DFHDUMMY
00393            DFHC0071.
00395        $EXEC CICS
00396        $     RECEIVE MAP   ('MORE')
00397        $             MAPSET ('DEMAPA')
00398        $             INTO   (MOREI)
00399        $END-EXEC.
00400              MOVE '       0275   ' TO DFHEIV0
00401              MOVE 'MORE' TO DFHC0070
00402              MOVE 'DEMAPA' TO DFHC0071
00403             CALL 'DFHEI1' USING DFHEIV0
                      DFHC0070 MOREI DFHDUMMY
00404            DFHC0071.
00405              IF ANSWERI OF MOREI EQUAL TO 1
00406                 GO TO ACCEPT-UPDATE.
00407              IF ANSWERI OF MOREI EQUAL TO 2
00408                 GO TO MAIN-MENU.
00409              IF ANSWERI OF MOREI EQUAL TO 3
00410                 GO TO END-OF-PRG-UPDATEI.
00411         END-OF-PRG-UPDATEI.
00412              MOVE 'ALL UPDTS R OK.NO ERR MSG$$$$' TO MAJOR-ERROR-MSG.
00413              GO TO ERR-RESPONSE.
00414           ERR-RES.
00415              MOVE 'UNDEFINED PA/PF KEY USED/MFAIL' TO MAJOR-ERROR-MSG.
00416              GO TO ERR-RESPONSE.
```

```
       FILE2NOPENE.
           MOVE '*****FILE NOT OPEN**************' TO MAJOR-ERROR-MSG.
           GO TO ERR-RESPONSE.
       MAIN-MENU.
           MOVE 'THIS PART IS NOT SUPPORTED****' TO MAJOR-ERROR-MSG.
           GO TO ERR-RESPONSE.
       CHECK-UR-FCT-NAME.
           MOVE 'DATASET(FN) DIFFS FROM FCTN***' TO MAJOR-ERROR-MSG.
           GO TO ERR-RESPONSE.
       UPDATIONS-ERR.
           MOVE 'UPDT-ERR.CHECK UR PGM LOGIC***' TO MAJOR-ERROR-MSG.
           GO TO ERR-RESPONSE.
       PHYSICAL-DAMAGE.
           MOVE 'CICS NOT ABLE TO R/W.IOERR****' TO MAJOR-ERROR-MSG.
           GO TO ERR-RESPONSE.
       CONFORMATION.
           MOVE 'TRANSACTION NOT CONFORMED*****' TO MAJOR-ERROR-MSG.
           GO TO ERR-RESPONSE.
       UR-KEYS-R-DUP.
           MOVE 'DUPLICATE CNAMES ARE USED ****' TO MAJOR-ERROR-MSG.
           GO TO ERR-RESPONSE.
       LREC-LONG.
           MOVE 'LREC LONGER THAN WRITE-LENGTH ' TO MAJOR-ERROR-MSG.
           GO TO ERR-RESPONSE.
       TEL2EXT-FILE.
           MOVE 'NO SPACE. ENTEN THE FILE******' TO MAJOR-ERROR-MSG.
           GO TO ERR-RESPONSE.
```

```
00444          ERRORS.
00445               MOVE 'HANDLE CONDITION ERROR .......' TO MAJOR-ERROR-MSG.
00446               GO TO ERR-RESPONSE.
00447            ERR-RESPONSE.
00448          *EXEC CICS
00449          *     SEND FROM (AREA1)
00450          *          LENGTH (80)
00451          *          ERASE
00452          *END-EXEC.
00453                MOVE '        00323   ' TO DFHEIV0
00454                MOVE 80 TO DFHEIV11
00455               CALL 'DFHEI1' USING DFHEIV0
                        DFHDUMMY DFHDUMMY AREA1
00456              DFHEIV11.
00458           END-OF-PRG-UPDATE.
00459          *EXEC CICS
00460          *     RETURN
00461          *END-EXEC.
00462                MOVE '           00329   ' TO DFHEIV0
00463               CALL 'DFHEI1' USING DFHEIV0.
00464
```

PROGRAM SIX

FILE-BROWSE

PP NO. 5746-CB1 16.21.52 04/10/87

```
 CBL FLAGE CLIST APOST LIB STATE FLOW=10 VERB
00001 *** **********CICS  PROGRAM
00002           IDENTIFICATION DIVISION.
00003           PROGRAM-ID.DLBRON.
00004           AUTHOR. MESHACH.
00005           ENVIRONMENT DIVISION.
00006           DATA DIVISION.
00007           WORKING-STORAGE SECTION.
00009         01   CNAMEI.
00010            02 COMPANYNAMEL COMP PIC S9(4).
00011            02 COMPANYNAMEF PIC X.
00012            02 COMPANYNAMEI PIC X(20).
00013         01   CNAMEO REDEFINES CNAMEI.
00014            02 FILLER PIC X(2).
00015            02 COMPANYNAMEA PIC X.
00016            02 COMPANYNAMEO PIC X(20).
00017         01   FIRSTI.
00018            02 CNAML COMP PIC S9(4).
00019            02 CNAMF PIC X.
00020            02 CNAMI PIC X(20).
00021            02 YENDL COMP PIC S9(4).
```

PP NO. 5746-CB1 16.21.52 04/10/87

```
 CBL FLAGE CLIST APOST LIB STATE FLOW=10 VERB
00001 *** ********************CICS  PROGRAM
00002           IDENTIFICATION DIVISION.
00003           PROGRAM-ID.DLBROW.
00004           AUTHOR. MESHACH.
00005           ENVIRONMENT DIVISION.
00006           DATA DIVISION.
00007           WORKING-STORAGE SECTION.
00009         01   CNAMEI.
00010             02 COMPANYNAMEL COMP PIC S9(4).
00011             02 COMPANYNAMEF PIC X.
00012             02 COMPANYNAMEI PIC X(20).
00013         01   CNAMEO REDEFINES CNAMEI.
00014             02 FILLER PIC X(2).
00015             02 COMPANYNAMEA PIC X.
00016             02 COMPANYNAMEO PIC X(20).
00017         01   FIRSTI.
00018             02 CNAML COMP PIC S9(4).
00019             02 CNAMF PIC X.
00020             02 CNAMI PIC X(20).
00021             02 YENDL COMP PIC S9(4).
```

```
00022           02 YENDF PIC X.
00023           02 YENDI PIC 9(4).
00024           02 BVALL COMP PIC S9(4).
00025           02 BVALF PIC X.
00026           02 BVALI PIC 9(4).
00027           02 D0L COMP PIC S9(4).
00028           02 D0F PIC X.
00029           02 D0I PIC 99.
00030           02 FVAL COMP PIC S9(4).
00031           02 FVAF PIC X.
00032           02 FVAI PIC 999.
00033           02 EQCAPL COMP PIC S9(4).
00034           02 EQCAPF PIC X.
00035           02 EQCAPI PIC 99.
00036           02 D1L COMP PIC S9(4).
00037           02 D1F PIC X.
00038           02 D1I PIC 99.
00039           02 RESUL COMP PIC S9(4).
00040           02 RESUF PIC X.
00041           02 RESUI PIC S9(3).
00042           02 D2L COMP PIC S9(4).
00043           02 D2F PIC X.
00044           02 D2I PIC 99.
00045           02 EANL COMP PIC S9(4).
00046           02 EANF PIC X.
```

```
00047           02 EANI PIC S9(3).
00048           02 D3L COMP PIC S9(4).
00049           02 D3F PIC X.
00050           02 D3I PIC 99.
00051           02 DRL COMP PIC S9(4).
00052           02 DRF PIC X.
00053           02 DRI PIC 99.
00054           02 D4L COMP PIC S9(4).
00055           02 D4F PIC X.
00056           02 D4I PIC 99.
00057           02 DPL COMP PIC S9(4).
00058           02 DPF PIC X.
00059           02 DPI PIC 99.
00060           02 D5L COMP PIC S9(4).
00061           02 D5F PIC X.
00062           02 D5I PIC 99.
00063           02 COTL COMP PIC S9(4).
00064           02 COTF PIC X.
00065           02 COTI PIC S99.
00066           02 D6L COMP PIC S9(4).
00067           02 D6F PIC X.
00068           02 D6I PIC 99.
00069           02 PEAL COMP PIC S9(4).
00070           02 PEAF PIC X.
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00071            02 PEAI PIC 999.
00072            02 D7L COMP PIC S9(4).
00073            02 D7F PIC X.
00074            02 D7I PIC 99.
00075            02 PRICL COMP PIC S9(4).
00076            02 PRICF PIC X.
00077            02 PRICI PIC 9999.
00078            02 D8L COMP PIC S9(4).
00079            02 D8F PIC X.
00080            02 D8I PIC 99.
00081            02 HIGHL COMP PIC S9(4).
00082            02 HIGHF PIC X.
00083            02 HIGHI PIC 9999.
00084            02 D9L COMP PIC S9(4).
00085            02 D9F PIC X.
00086            02 D9I PIC 99.
00087            02 LOWL COMP PIC S9(4).
00088            02 LOWF PIC X.
00089            02 LOWI PIC 9999.
00090            02 DDL COMP PIC S9(4).
00091            02 DDF PIC X.
00092            02 DDI PIC 99.
00093            02 REPL COMP PIC S9(4).
00094            02 REPF PIC X.
00095            02 REPI PIC X(3).
```

```
00096        01  FIRSTO REDEFINES FIRSTI.
00097            02 FILLER PIC X(2).
00098            02 CNAMA PIC X.
00099            02 CNAMO PIC X(20).
00100            02 FILLER PIC X(2).
00101            02 YENDA PIC X.
00102            02 YENDO PIC 9(4).
00103            02 FILLER PIC X(2).
00104            02 BVALA PIC X.
00105            02 BVALO PIC 9(4).
00106            02 FILLER PIC X(2).
00107            02 DBA PIC X.
00108            02 DBO PIC 99.
00109            02 FILLER PIC X(2).
00110            02 FVAA PIC X.
00111            02 FVAO PIC 999.
00112            02 FILLER PIC X(2).
00113            02 EQCAPA PIC X.
00114            02 EQCAPO PIC 99.
00115            02 FILLER PIC X(2).
00116            02 DIA PIC X.
00117            02 DIO PIC 99.
00118            02 FILLER PIC X(2).
00119            02 RESUA PIC X.
```

```
00120           02 RESUO PIC S9(3).
00121           02 FILLER PIC X(2).
00122           02 D2A PIC X.
00123           02 D2O PIC 99.
00124           02 FILLER PIC X(2).
00125           02 EANA PIC X.
00126           02 EANO PIC S9(3).
00127           02 FILLER PIC X(2).
00128           02 D3A PIC X.
00129           02 D3O PIC 99.
00130           02 FILLER PIC X(2).
00131           02 DRA PIC X.
00132           02 DRO PIC 99.
00133           02 FILLER PIC X(2).
00134           02 D4A PIC X.
00135           02 D4O PIC 99.
00136           02 FILLER PIC X(2).
00137           02 DPA PIC X.
00138           02 DPO PIC 99.
00139           02 FILLER PIC X(2).
00140           02 D5A PIC X.
00141           02 D5O PIC 99.
00142           02 FILLER PIC X(2).
00143           02 COTA PIC X.
00144           02 COTO PIC S99.
```

```
00145           02 FILLER PIC X(2).
00146           02 D6A PIC X.
00147           02 D6O PIC 99.
00148           02 FILLER PIC X(2).
00149           02 PEAA PIC X.
00150           02 PEAO PIC 999.
00151           02 FILLER PIC X(2).
00152           02 D7A PIC X.
00153           02 D7O PIC 99.
00154           02 FILLER PIC X(2).
00155           02 PRICA PIC X.
00156           02 PRICO PIC 9999.
00157           02 FILLER PIC X(2).
00158           02 D8A PIC X.
00159           02 D8O PIC 99.
00160           02 FILLER PIC X(2).
00161           02 HIGHA PIC X.
00162           02 HIGHO PIC 9999.
00163           02 FILLER PIC X(2).
00164           02 D9A PIC X.
00165           02 D9O PIC 99.
00166           02 FILLER PIC X(2).
00167           02 LOWA PIC X.
00168           02 LOWO PIC 9999.
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```
00169            02 FILLER PIC X(2).
00170            02 DDA PIC X.
00171            02 DDO PIC 99.
00172            02 FILLER PIC X(2).
00173            02 REPA PIC X.
00174            02 REPO PIC X(3).
00175         01  OPTI.
00176            02 SELECTL COMP PIC S9(4).
00177            02 SELECTF PIC X.
00178            02 SELECTI PIC X.
00179         01  OPTO REDEFINES OPTI.
00180            02 FILLER PIC X(2).
00181            02 SELECTA PIC X.
00182            02 SELECTO PIC X.
00183             02 RES            PIC 9.
00184          01 AREA1.
00185             05 JOB-NORMAL-END-MESSAGE PIC X(22) VALUE
00186               'TERMINATION OF THE JOB'.
00187             05 JOB-ABORTED-MESSAGE.
00188               10 FILLER              PIC X(17) VALUE
00189                 '***JOB ABORTED***'
00190               10 MAJOR-ERROR-MSG     PIC X(30).
00191          01 KEY-AREA.
00192             05 KEY-NAME             PIC X(20).
00193          77 START-POINTER  PIC X(20) VALUE IS SPACES.
```

```
00194          77 BACK-POINTER   PIC X(20) VALUE IS SPACES.
00195          77 FORWARD-POINTER  PIC X(20) VALUE IS SPACES.
00196          01  DFHLDVER PIC X(22) VALUE 'LD TABLE DFHEITAB 1-6.'.
00197          01  DFHEID0 PICTURE S9(7) COMPUTATIONAL-3 VALUE ZERO.
00198          01  DFHEIB0 PICTURE S9(4) COMPUTATIONAL VALUE ZERO.
00199          01  DFHEICB  PICTURE X(8) VALUE IS '        '.
00200
00201          01   DFHEIV16  COMP PIC S9(8).
00202          01   DFHEIV11  COMP PIC S9(4).
00203          01   DFHEIV12  COMP PIC S9(4).
00204          01   DFHEIV13  COMP PIC S9(4).
00205          01   DFHEIV14  COMP PIC S9(4).
00206          01   DFHEIV15  COMP PIC S9(4).
00207          01   DFHB0025  COMP PIC S9(4).
00208          01   DFHEIV5   PIC X(4).
00209          01   DFHEIV6   PIC X(4).
00210          01   DFHEIV17  PIC X(4).
00211          01   DFHEIV18  PIC X(4).
00212          01   DFHEIV19  PIC X(4).
00213          01   DFHEIV1   PIC X(8).
00214          01   DFHEIV2   PIC X(8).
00215          01   DFHEIV3   PIC X(8).
00216          01   DFHEIV20  PIC X(8).
00217          01   DFHC0004  PIC X(8).
```

```
00218          01   DFHC0085  PIC X(8).
00218          01   DFHC0085  PIC X(8).
00219          01   DFHC0320  PIC X(32).
00220          01   DFHEIV7   PIC X(2).
00221          01   DFHEIV8   PIC X(2).
00222          01   DFHC0022  PIC X(2).
00223          01   DFHC0023  PIC X(2).
00224          01   DFHEIV10  PIC S9(7) COMP-3.
00225          01   DFHEIV4   PIC X(6).
00226          01   DFHC0070  PIC X(7).
00227          01   DFHC0071  PIC X(7).
00228          01   DFHDUMMY COMP PIC S9(4).
00229          01   DFHEIV0  PICTURE X(29).
00230            LINKAGE SECTION.
00231          01  DFHEIBLK.
00232          02    EIBTIME  PIC S9(7) COMP-3.
00233          02    EIBDATE  PIC S9(7) COMP-3.
00234          02    EIBTRNID PIC X(4).
00235          02    EIBTASKN PIC S9(7) COMP-3.
00236          02    EIBTRMID PIC X(4).
00237          02    DFHEIGDI COMP PIC S9(4).
00238          02    EIBCPOSN COMP PIC S9(4).
00239          02    EIBCALEN COMP PIC S9(4).
00240          02    EIBAID   PIC X(1).
00241          02    EIBFN    PIC X(2).
00242          02    EIBRCODE PIC X(6).
```

```
00243          02   EIBDS    PIC X(8).
00244          02   EIBREQID PIC X(8).
00245          02   EIBRSRCE PIC X(8).
00246          02   EIBSYNC  PIC X(1).
00247          02   EIBFREE  PIC X(1).
00248          02   EIBRECV  PIC X(1).
00249          02   EIBFIL02 PIC X(1).
00250          02   EIBATT   PIC X(1).
00251          02   EIBEOC   PIC X(1).
00252          02   EIBFMH   PIC X(1).
00253          02   EIBCOMPL PIC X(1).
00254          02   EIBSIG   PIC X(1).
00255          02   EIBCONF  PIC X(1).
00256          02   EIBERR   PIC X(1).
00257          02   EIBERRCD PIC X(4).
00258          02   EIBSYNRB PIC X(1).
00259          02   EIBNODAT PIC X(1).
00260          01  DFHCOMMAREA PICTURE X(1).
00261           01 LINKAGE-POINTERS.
00262              05 FILLER              PIC S9(8) COMP.
00263              05 SETPOINTER          PIC S9(8) COMP.
00264              05 REPOINT1            PIC S9(8) COMP.
00265          01  DFHBLLSLOT1 PICTURE X(1).
00266          01  DFHBLLSLOT2 PICTURE X(1).
```

```
00267          PROCEDURE DIVISION USING DFHEIBLK DFHCOMMAREA.
00268            CALL 'DFHEI1'.
00269          STEP1.
00270        *EXEC CICS
00271        *     HANDLE CONDITION
00272        *          MAPFAIL (ERR-RES)
00273        *          ERROR   (ERRORS)
00274        *          NOTOPEN (FILE2BOPENE)
00275        *END-EXEC.
00276                 MOVE '                  00283    ' TO DFHEIV0
00277               CALL 'DFHEI1' USING DFHEIV0
00278                GO TO  ERR-RES ERRORS FILE2BOPENE DEPENDING ON DFHEIGDI.
00282        *EXEC CICS
00283        *     HANDLE AID
00284        *          PF8 (FORWARD-BROWSE )
00285        *          PF7 (BACKWARD-BROWSE )
00286        *          PF3 (TERMINATION )
00287        *END-EXEC.
00288                 MOVE '                          00289    ' TO DFHEIV0
00289               CALL 'DFHEI1' USING DFHEIV0
00290                GO TO  FORWARD-BROWSE BACKWARD-BROWSE TERMINATION
00291              DEPENDING ON DFHEIGDI.
00294          ACCEPT-BROWSE.
00295              IF DFHCOMMAREA EQUAL TO 1
00296              THEN GO TO PSEDO-MOD
```

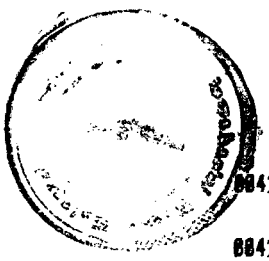
```
00297              ELSE GO TO  CONVO-MOD.
00298          CONVO-MOD.
00299         *EXEC CICS
00300         *     SEND MAP     ('CNAME')
00301         *          MAPSET  ('DEMAPI')
00302         *          MAPONLY
00303         *          ERASE
00304         *          FREEKB
00305         *END-EXEC.
00306                 MOVE '     00228    ' TO DFHEIV0
00307                 MOVE 'CNAME' TO DFHC0070
00308                 MOVE 'DEMAPI' TO DFHC0071
00309                CALL 'DFHEI1' USING DFHEIV0  DFHC0070 DFHEICB DFHDUMMY
00310               DFHC0071.
00313          PSEDO-MOD.
00314         *EXEC CICS
00315         *     RECEIVE MAP    ('CNAME')
00316         *             MAPSET ('DEMEPI')
00317         *             INTO   ( CNAMEI)
00318         *END-EXEC.
00319                 MOVE '                00228    ' TO DFHEIV0
00320                 MOVE 'CNAME' TO DFHC0070
00321                 MOVE 'DEMEPI' TO DFHC0071
00322                CALL 'DFHEI1' USING DFHEIV0  DFHC0070 CNAMEI DFHDUMMY
```

```
00323              DFHC0871.
00324         *EXEC CICS
00325         *      HANDLE CONDITION
00326         *             DSIDERR (CHECK-UR-FCT-NAME )
00327         *             IOERR   (PHYSICAL-DAMAGE)
00328         *END-EXEC.
00329                 MOVE '                        00233    ' TO DFHEIV0
00330               CALL 'DFHEI1' USING DFHEIV0
00331                GO TO  CHECK-UR-FCT-NAME PHYSICAL-DAMAGE DEPENDING ON
00332              DFHEI6DI.
00334               MOVE COMPANYNAMEI TO START-POINTER.
00335         *EXEC CICS
00336         *    STARTBR DATASET ('DESM')
00337         *         RIDFLD   (START-POINTER)
00338         *END-EXEC.
00339                 MOVE '                            00239    ' TO DFHEIV0
00340                 MOVE 'DESM' TO DFHEIV1
00341                CALL 'DFHEI1' USING DFHEIV0  DFHEIV1  DFHDUMMY DFHEI00
00342              START-POINTER.
00343          FORWARD-BROWSE.
00344         *EXEC CICS
00345         *     HANDLE CONDITION
00346         *            ENDFILE (EOF-REACHED )
00347         *END-EXEC.
00348                 MOVE '                   0244    ' TO DFHEIV0
```

```
00349              CALL 'DFHEI1' USING DFHEIV0
00350               GO TO  EOF-REACHED DEPENDING ON DFHEIGDI.
00352              MOVE LOW-VALUES TO FIRSTO.
00353              MOVE FORWARD-POINTER TO START-POINTER.
00354           READ-THE-NEXT-REC.
00355          *EXEC CICS
00356          *     READNEXT
00357          *     INTO (FIRSTO)
00358          *     DATASET ('DESM')
00359          *     RIDFLD (START-POINTER )
00360          *END-EXEC.
00361                 MOVE '                          00251    ' TO DFHEIV0
00362                 MOVE 'DESM' TO DFHEIV1
00363                CALL 'DFHEI1' USING DFHEIV0  DFHEIV1  FIRSTO DFHDUMMY
00364               START-POINTER DFHDUMMY DFHEIB0.
00367                GO TO READ-THE-NEXT-REC.
00368           BACKWARD-BROWSE.
00369          *EXEC CICS
00370          *     HANDLE CONDITION
00371          *            ENDFILE ( TOP-OF-FILE )
00372          *END-EXEC.
00373                 MOVE '                           00259    ' TO DFHEIV0
00374                CALL 'DFHEI1' USING DFHEIV0
00375                 GO TO  TOP-OF-FILE DEPENDING ON DFHEIGDI.
```

```
00377              MOVE LOW-VALUES TO FIRSTI.
00378              MOVE BACK-POINTER TO START-POINTER.
00379           READ-THE-PREV-REC.
00380          *EXEC CICS
00381          *     READPREV INTO (FIRSTI)
00382          *              DATASET ('DESM')
00383          *              RIDFLD  (START-POINTER)
00384          *END-EXEC.
00385                 MOVE '                          00266    ' TO DFHEIV0
00386                 MOVE 'DESM' TO DFHEIV1
00387                CALL 'DFHEI1' USING DFHEIV0  DFHEIV1  FIRSTI DFHDUMMY
00388               START-POINTER DFHDUMMY DFHEIB0.
00390                GO TO READ-THE-PREV-REC.
00391             ERR-RES.
00392                MOVE 'UNDEFINED PA/PF KEY USED/MFAIL' TO MAJOR-ERROR-MSG.
00393                GO TO ERR-RESPONSE.
00394           FILE2BOPENE.
00395                MOVE '*****FILE NOT OPEN************' TO MAJOR-ERROR-MSG.
00396                GO TO ERR-RESPONSE.
00397          CHECK-UR-FCT-NAME.
00398                MOVE 'DATASET(FN) DIFFS FROM FCTN***' TO MAJOR-ERROR-MSG.
00399                GO TO ERR-RESPONSE.
00400          EOF-REACHED.
00401                MOVE 'EOF REACHED.NO FURTHER FWD-BR.' TO MAJOR-ERROR-MSG.
00402                GO TO ERR-RESPONSE.
```

```
00403          TOP-OF-FILE.
00404               MOVE 'TOP OF FILE.NO FURTHER BWD-BR.' TO MAJOR-ERROR-MSG.
00405               GO TO ERR-RESPONSE.
00406          PHYSICAL-DAMAGE.
00407               MOVE 'CICS NOT ABLE TO R/W.IOERR####' TO MAJOR-ERROR-MSG.
00408               GO TO ERR-RESPONSE.
00409          ERRORS.
00410               MOVE 'HANDLE CONDITION ERROR .......' TO MAJOR-ERROR-MSG.
00411               GO TO ERR-RESPONSE.
00412          TERMINATION.
00413               MOVE 'BROWSEING TERMINATED BY OP....' TO MAJOR-ERROR-MSG.
00414               GO TO ERR-RESPONSE.
00415            ERR-RESPONSE.
00416         *EXEC CICS
00417         *     SEND FROM (AREA1)
00418         *          LENGTH (80)
00419         *          ERASE
00420         *END-EXEC.
00421                MOVE '                                00297    ' TO DFHEIV0
00422                MOVE 80 TO DFHEIV11
00423               CALL 'DFHEI1' USING DFHEIV0  DFHDUMMY DFHDUMMY AREA1
00424             . DFHEIV11.
00425
00426          END-OF-PRG-ADD.
```



```
00427          *EXEC CICS
00428          *     RETURN
00429          *END-EXEC.
00430                   MOVE '                    00383    ' TO DFHEIV0
00431                   CALL 'DFHEI1' USING DFHEIV0.
```