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ABSTRACT

This report summarises the implementation of release 19.6 (MVT) of the IBM System/360 Operating System. A number of additions and modification to the system were made.

Although further changes have been made since the time of writing, the report provides basic information for the generation of future releases of the IBM Operating System.

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The following descriptors have been selected from the INIS Thesaurus to describe the subject content of this report for information retrieval purposes. For further details please refer to IAEA–INIS–12 (INIS: Manual for Indexing) and IAEA–INIS–13 (INIS: Thesaurus) published in Vienna by the International Atomic Energy Agency.

COMPUTER CODES; CONTROL; IBM COMPUTERS; OPERATION; PROGRAMMING

CONTENTS

1. INTRODUCTION

This report describes the generation of and subsequent modifications to the IBM System/360 Operating System at the AAEC Research Establishment, Lucas Heights. It does not describe the detailed mechanics of the system generation at the AAEC or the generation of an IBM operating system generally. What is described is rather the numerous modifications to the standard system which it was found necessary or desirable to apply.

A brief description of the System/360 MVT Operating System is given. The various components of the operating system referenced in later sections of the report are mentioned so the reader is aware of where these components lie in the logical execution of the operating system as it processes jobs. No attempt is made to provide a comprehensive description of MVT. IBM themselves find this task a most difficult one, even with their numerous and voluminous manuals.

The release 19.6 version of the MVT operating system was first generated at Lucas Heights in July 1971. After six months of operating, observing, and modifying, another system generation was performed primarily to allow for the inclusion of the Houston Automatic Spooling Program (HASP) and also to recreate the system in the light of six months operational experience. The running of the MVT operating system is not a dormant, unchanging process. Effort is continually being applied to improve its operation, to investigate its errors and illogical quirks and to correct these when found. Consequently one can only attempt to document the system at one convenient and hopefully significant time. Six months after the initial trauma seems to be such a time.

2. MULTIPROGRAMMING WITH A VARIABLE NUMBER OF TASKS

2.1 Job Scheduling

Figure 1 depicts the scheduling of users jobs in a multiprogramming environment of the IBM Operating System. The various stages in the processing of the job are described below.

The users deck which defines the job is read into the system via a card-reader or magnetic tape unit.

The reader/interpreter reads the Job Control statements which partly make up the job deck. Validation of the user's requests for system resources can be done at this time. Depending on the job's requirements it is given by the user a Job Class. As each job is read into the system, it is stored on disk in Input Queues. Within any one job class the jobs are arranged in order of Scheduling Priority, which, in most instances, is the same for all jobs and hence jobs are queued in the order in which they are read in.

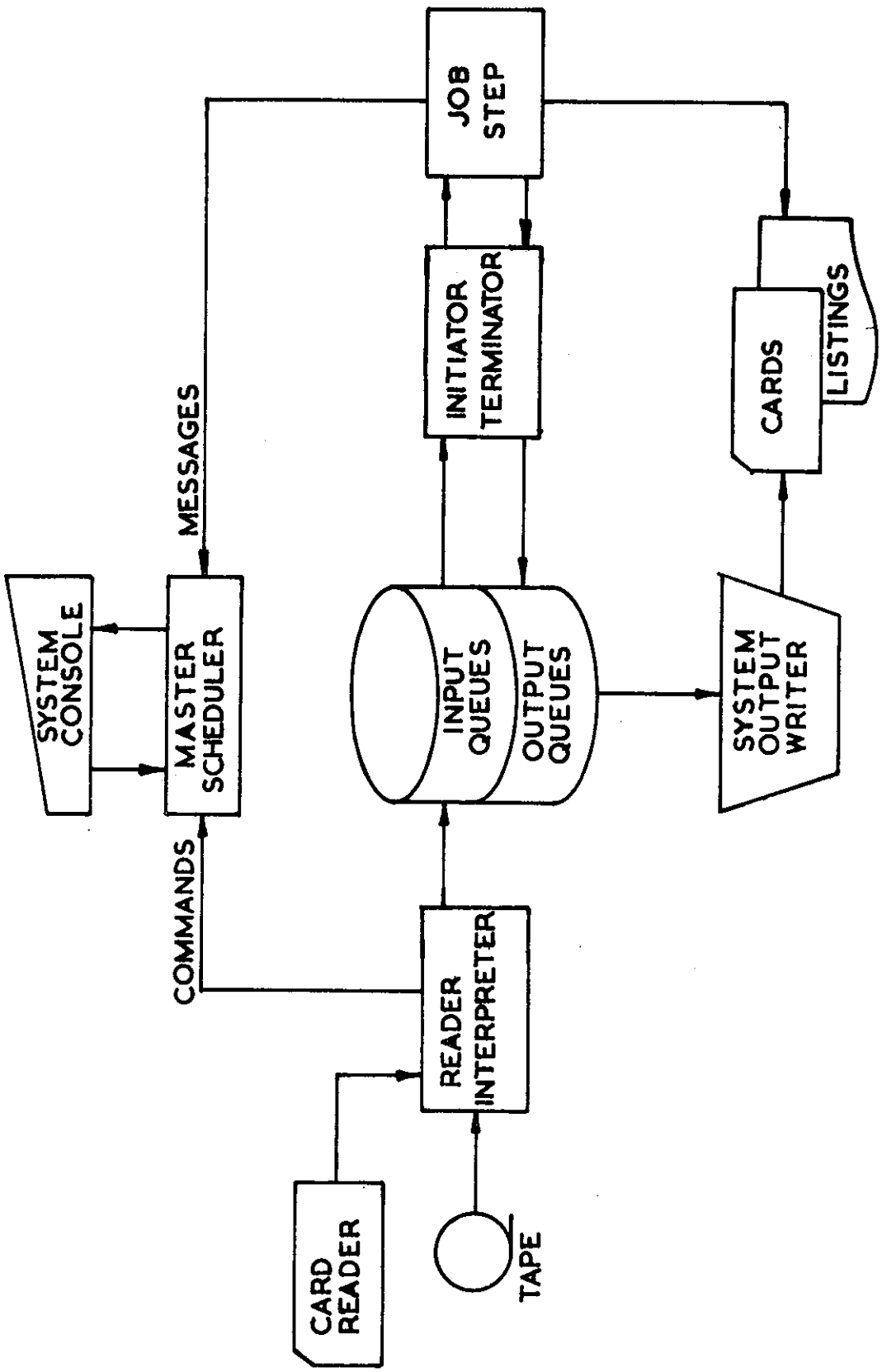


FIGURE 1. SCHEDULING JOBS IN MVT

The jobs are picked out of the job input queues by Initiators. Each initiator (there may be several in the system at any one time) can be associated with only one job at a time; it is supplied with a list of job classes upon which it is capable of acting. The sequence of classes in this list determines the order in which the different job queues are searched for the existence of the next job to be picked up by the initiator. Obviously some thought must be applied to the list of job queues available to an initiator and also to the type and number of initiators allowed to be active at any one time.

The initiator/terminator prepares the user's job and eventually hands it over to the Task Management routines which supervise its execution. For the user programmer the unit of work is a job. For the system, however, the logical unit of work is a Task. A task is the smallest unit of work that can command control of the CPU. Each job may be made up of one or more tasks. Furthermore only one task can have control of the CPU at any one time.

The job step, appearing as a task to the operating system can issue messages via the Master Scheduler to the operator who in turn can issue commands to the system and user tasks.

Output is created by the user's job which is queued on output queues on disk. There are output classes, quite unrelated to job classes, which the user's job may create. These are processed by system routines called the Output Writer which eventually produce the cards and listings requested by the user.

2.2 Task Scheduling

The entire operating system, including user's jobs, exists in the computer as a collection of tasks. That is, a collection of units of code each of which can demand to have control of the CPU or elect to relinquish control, or have control forcibly removed from it. Each of these tasks has associated with it a Task Control Block and these are arranged in a queue of priorities as shown in Figure 2.

The transfer of control from task to task is discussed further in a later section on the routine AEDDP. Suffice to say that when each task becomes dispatchable (i.e. capable of using the CPU) it is able to remove control of the CPU from a task of lower (dispatching) priority than it and assume control itself. This principle constitutes the basis of the operating system and fortunately works most of the time.

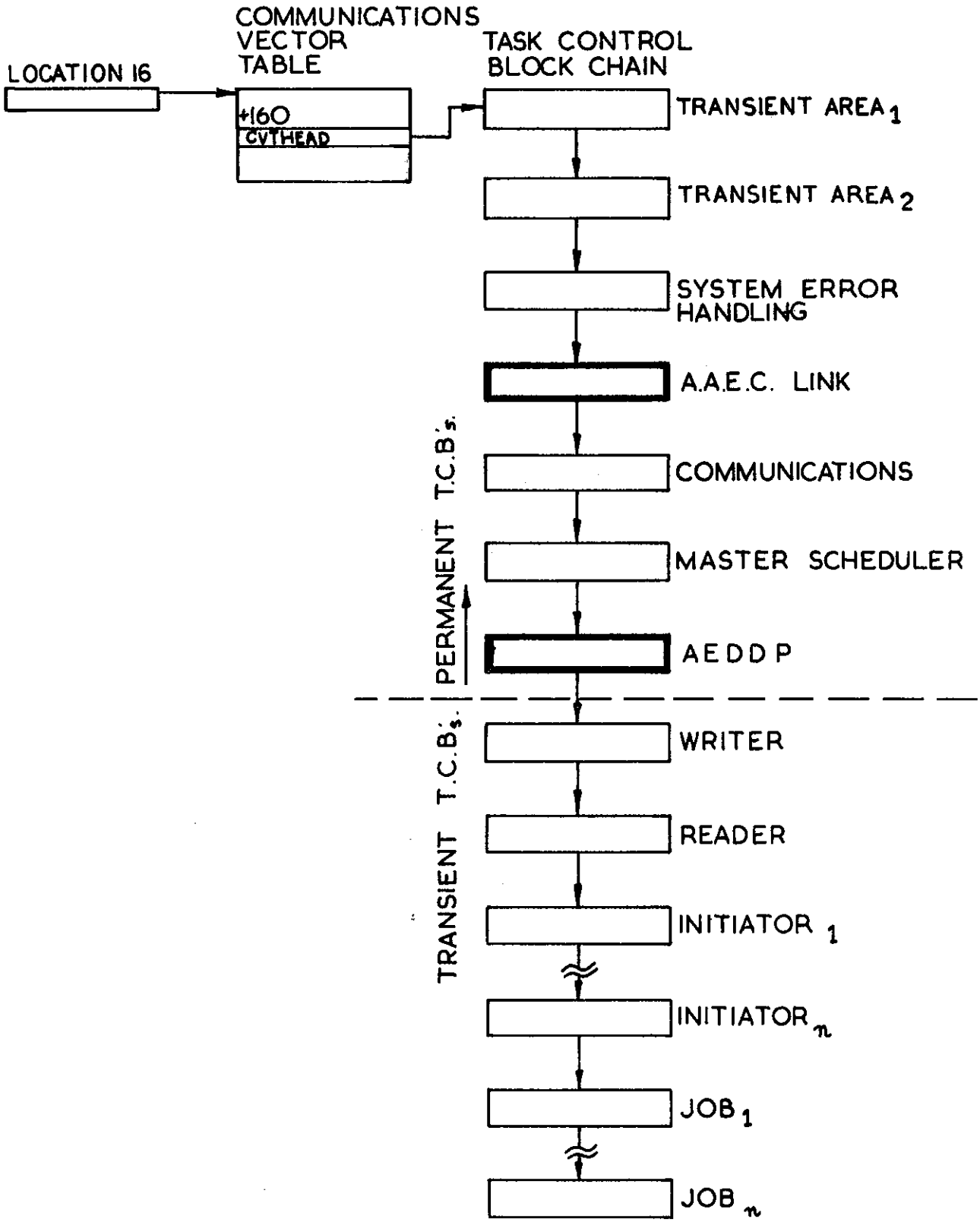
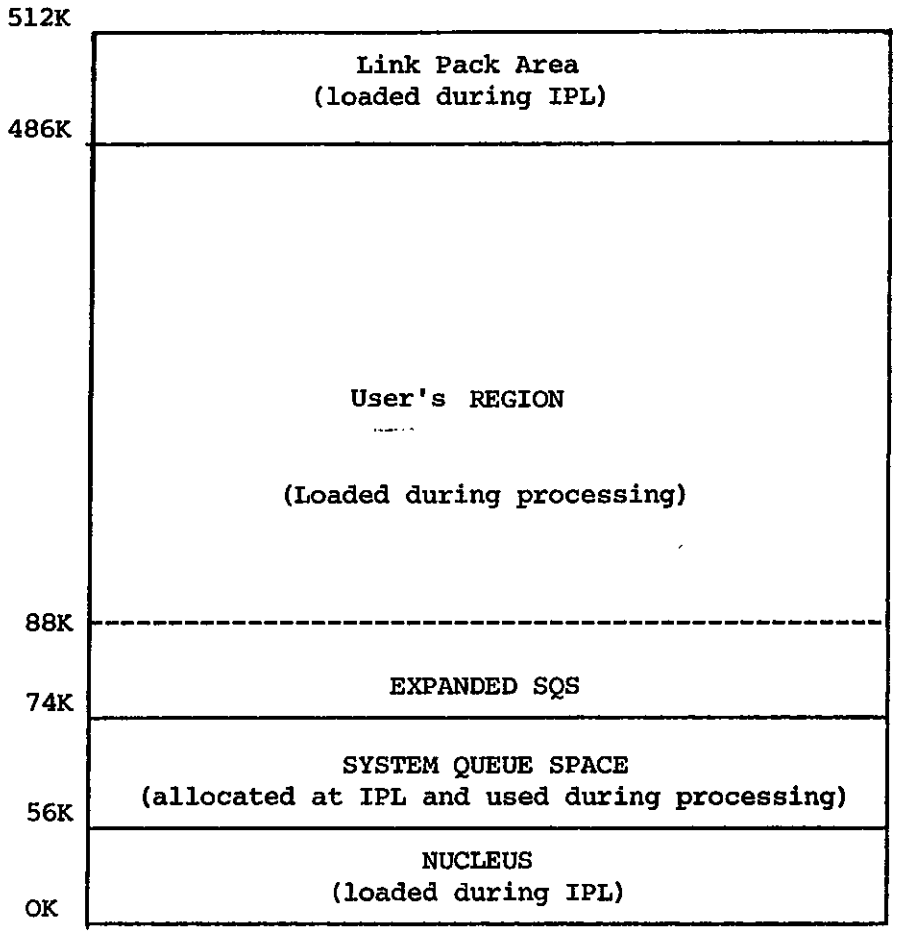


FIGURE 2. THE CHAIN OF PERMANENT SYSTEM, PERMANENT AAEC AND TRANSIENT SYSTEM TASK CONTROL BLOCKS

2.3 Core Layout

The layout of core during job processing is as follows:



The nucleus is that portion of the control program that is loaded into low core at Initial Program Load (IPL) time from the system library SYS1.NUCLEUS. It is never overlaid by another part of the operating system.

The Link Pack Area is that portion of high core that contains selected re-enterable routines from SYS1.SVCLIB and SYS1.LINKLIB, selected serially reusable I/O error routines from SYS1.SVCLIB and a list of track addresses, called the BLDL LIST, of selected routines in SYS1.LINKLIB. These are loaded at IPL time by the Nucleus Initialisation Program (NIP), using lists specified in the library SYS1.PARMLIB.

The System Queue Space is constructed adjacent to the fixed area of the nucleus. This area is used to construct the required control blocks and tables used by the control program. This SQS may require to be expanded if more space is requested than is available. Once expanded it does not shrink back again until the next IPL.

3. SYSGEN PARAMETERS AND PRE-SYSGEN MODIFICATIONS

As mentioned earlier one of the main reasons for the system generation in December 1971 was the need to be able to run HASP on the system. Appendix 1 is a listing of the stage 1 SYSGEN deck. It shows the generation of the HASP pseudo unit record devices. HASP modified OS to the extent of these unit record devices appearing, by virtue of their associated UCB's, as real physical devices. Another point of interest, touching on HASP again, is the removal of ordered seek (IBM System/360 System Generation; Form No. GC28-6554) for the disk address that holds the HASP Spool pack.

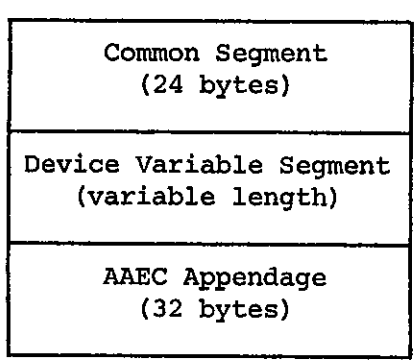
Also added at this system generation were more 7-track tape UCB's for the expanding Dataway requirements. Automatic Volume Recognition (AVR) was removed from the system since the previous 6 months experience proved that the feature produced numerous operational problems. Another feature not generated in December was the Rollout/Rollin facility. This was rarely used in the earlier system. SVC 200 was added to the system to allow HASP to execute its functions.

The processor libraries for FORTRAN, PL/1 and COBOL are no longer generated automatically with each system generation. The philosophy is now to keep them separate and generate them only when relatively bug-free versions are available.

3.1 UCB Modification

There is a UCB for each device attached to the system. The UCB describes the characteristics of the device to the I/O Supervisor and is used by the Job Scheduler during allocation of the device.

The UCB usually consists of two segments - a segment common to all devices and a segment that varies according to the device. AAEC can add to chosen UCB's, at SYSGEN-time, a third segment used for communication over the Dataway.



The addition of these bytes is effected by:

(i) the addition to SYS1.GENLIB of an AAEC written macro AEATTN; Appendix 2.1.

(ii) modifying SGIEC202 in SYS1.GENLIB to utilise AEATTN and generate the extra bytes; Appendix 2.2.

The stage 1 instruction to create modified UCB's for addresses 240, 248 and 250, for example, would be

```
AEATTN  (240,248,250),41
```

the operand 41 indicates that the attention byte which is also modified by the macro is 41 bytes from the end of the UCB. It is unlikely that this displacement should vary from release to release.

3.2 AAEC LINK TCB

Figure 2 shows the existence of a permanent AAEC TCB in the chain of permanent system TCB's. The creation and initialisation of this LINK TCB is effected as follows;

(i) modification, shown in Appendix 3.1, to the members SGIEA2BK and SGIEA2NP both in SYS1.GENLIB. These changes initialise global variables to be used in modified versions of IEAQBK and IEAANIP.

(ii) modification, shown in Appendix 3.2, to IEAQBK in SYS1.MODGEN. These changes emulate for the LINK the instructions that generate the Request Block (RB) and TCB for the systems communications task.

(iii) modification to IEAANIP in SYS1.MODGEN shown in Appendix 3.3 to initialise the newly created TCB.

3.3 AAEC Attention Handler

Appendix 4 shows the changes made to IECIOS in SYS1.MODGEN to insert a V-type address constant for the AAEC attention handler.

3.4 SVC 255

Appendix 5 shows the modifications to IEAQNU in SYS1.MODGEN to generate the code to handle SVC 255, which allows entry into SUPERVISOR state.

3.5 Modification to OPEN

The OPEN/CLOSE module IGG0199Z in SYS1.DM508 was modified to allow the current date to be inserted in the FORMAT 1 Data Set Control Block each time the data set is opened. This allows a check to be kept on those data sets not frequently used, and which, therefore, could well be kept on magnetic tape and unloaded when required. The added coding in IGG0199Z picks up the date from the CVT in packed decimal form and stores it at offset 68 of the DSCB. This location is supposed to contain the Programming System Code ID (offset 62 to 74), but is not used in the current release.

The instructions added are listed below. The record identification field is relevant to release 19.6. The first and last instructions listed are the standard OS ones between which the AAEC instructions have been added.

```
         EXCP    DXIOB                    READ DSCB VIA EXCP              05800018
         WAIT    ,ECB=DXECB               WAIT FOR READ TO COMPLETE
         TM      DXECB,X'20'              ERROR?
         BZ      AAEC                     YES. BR OVER AAEC CODE
         CLI     DSCFMTID,X'F1'           IS IT FORMAT 1 DSCB?
         BNE     AAEC                     BR OVER AAEC CODE IF NOT
         L       1,16                     LOAD CVT POINTER
         L       15,164(,1)               LOAD HIGHEST AVAILABLE ADDRESS
         L       1,0(,1)                  LOAD TCB POINTER
         L       1,4(,1)                  LOAD CURRENT TCB ADDRESS
         L       1,112(,1)                LOAD SAVE AREA ADDRESS
         L       1,16(,1)                 LOAD CONTENTS OF R15(=EP)
         LA      1,0(,1)                  CLEAR HIGH ORDER BYTE
         CR      15,1                     IS SAVED ADDRESS SENSIBLE?
         BL      AAEC002                  IF NOT OMIT THE CLC INSTRUCTION
         CLC     5(7,1),AEDLIST           IS IT AEDLIST OPENING?
*                                         ABOVE INSTRUCTION ASSUMES
*                                         STANDARD LINKAGE CONVENTIONS
         BE      AAEC                     IF SO BR OVER AAEC CODE
AAEC002  XC      DXECB(4),DXECB           CLEAR ECB FOR WRITE OPERATION
         TIME    BIN                      GET TIME OF DAY AND DATE
         L       RD,DSCSYSCD+10           LOAD TOD OF LAST OPEN
         ST      RE,DSCSYSCD+10           STORE CURRENT TOD
         C       RF,DSCSYSCD+6            COMPR CURRENT DATE WITH DSCB
         BNE     AAEC003                  BR TO MOVE IN NEW DATE
         SR      RE,RD                    EVALUATE CURRENT DELTA T
         L       RD,DSCSYSCD+14           LOAD DSCB DELTA T
         AR      RE,RD                    ADD OLD TO CURRENT DELTA T
         SRL     RE,1                     DIVIDE BY 2
         ST      RE,DSCSYSCD+14           AND STORE IN DSCB
         L       RF,DSCSYSCD+2            LOAD OLD USE COUNT
         LA      RF,1(,RF)                INCREMENT USE COUNT
         ST      RF,DSCSYSCD+2            AND STORE IN DSCB
         B       AAEC004
AAEC003  ST      RF,DSCSYSCD+6            MOVE NEW DATE INTO DSCB
AAEC004  XC      DXCCW3(32),DXCCW3        CLEAR CCW AREA
         LA      RD,DXCCW7                SAVE COUNT ADDRESS
         LA      RJ,DXJBF                 GET DSNAME KEY ADDRESS
         LA      RE,DXCCW3
         LA      RF,DXDSCB                GET DSCB BUFFER ADDRESS
*                                         SET UP THE CCWS
         ST      RD,DXCCW3
         ST      RJ,DXCCW4
         ST      RE,DXCCW5
         ST      RF,DXCCW6
         OC      DXCCW3(32),OPKCCW1       OR IN THE INSTRUCTIONS
*                                                                         *
         CLI     DSCEXPDT,X'00'           IS EXPIRY DATE SPECIFIED?
         BNE     AAE000
*                                                                         *
         MVI     DXCCW3+24,X'05'          ALTER A READ TO A WRITE
AAE000   EXCP    DXIOB                    WRITE OUT DSCB WITH DATE
AAEC     EQU     *
         BC      15,OPA1020                                               05820018
```

4. SUPERZAPS

The IBM utility program IMASPZAP permits the alteration of instructions in load modules which are members of partitioned data set libraries (IBM System/360 Service Aids, Form No. GC28-6719). A series of such superzaps, as this doctoring process is called, were run on various items of the operating system. Some of these superzaps were essential to effect the correct operation of the operating system, due to incorrect coding or logic in the standard supplied software. Others can be optionally applied to the system,

which will run correctly without their application. However, by applying them one is able to improve the capabilities and operation of the operating system. Appendix 6 lists the steps of this superzapping operation. Each NAME statement in the listing specifies the module name and CSECT within module to be altered. Below is a brief account of the changes.

IEFSDO94 - This module is the Standard Page Separator routine that prints the jobname in block capitals at the start of the user's output. The normal operation of the Separator is to produce 3 such identical pages. This, it was thought, was time consuming and wasteful of paper. The superzap reduces the separation to 1 page.

IFASMFDP - The program which dumps the SMF accounting information from SYS1.MANX or SYS1.MANY to tape has a bug that prevented it from dumping to a tape whose disposition was MOD. This superzap allows such an essential operation to take place.

IGG019OP - This superzap makes a logical change to the standard code that executes a MVI instruction, and hence clears the SLI bit in a CCW. It changes the instruction to an OI instruction, which is logically the correct action to take, so that the SLI bit is not cleared. This problem arose with multifile tape processing over the AAEC Link.

IEEVSTAR - The standard default MSGCLASS for all console startable tasks is SYSOUT=A. This causes every task, including the frequently generated readers, writers and initiators to be listed on the line printer. This superzap alters the default MSGCLASS to SYSOUT=O which is then stored on disk to be scratched at any convenient time by the starting of the WTRO procedure.

IEEVIPL - During system generation it is possible to elect to allow the system to issue automatically three start commands. The start commands allow a reader, writer and initiator to be started. By requesting this option, and its subsequent superzapping, three 'Vary Offline' commands could be issued to units 240, 248 and 250. This was done to suppress the OS requests to unload these units each time OS referenced a 2400 tape unit, to which these addresses appear to belong. They refer, in fact, to attention generating devices on the Dataway.

IEEVRCTL - This superzap suppresses the correct generation of an error condition when an unauthorised program is started from the console. Thus all programs are nominally capable of being started from the console.

IEFSDO61 - This superzap corrects a logical error in the initiator allowing the successful operation of the AAEC AELINK routine (Mason and Richardson 1969).

5. SMF EXIT ROUTINES

SMF (IBM System/360 System Management Facilities; Form No.GC28-6712) is an optional feature of the System/360 Operating System which this installation chose to select at system generation. SMF provides accounting information related to the system, jobs and job-steps. Various exits to installation written routines are provided, to allow local functions to be performed. One of the main functions of these routines is to enforce installation standards such as job identification, core requirements, maximum execution time and maximum wait-time. SMF collects this accounting information and writes it out to two data sets on disk, SYS1.MANX and SYS1.MANY. At Lucas Heights these data sets take approximately 3 days each to fill and hence are periodically dumped to magnetic tape.

The installation can choose which SMF options it wishes to make use of by means of the SMF default parameters specified in the member SMFDEFLT in SYS1.PARMLIB (See Appendix 7). This installation chose not to allow operator intervention at IPL time to permit changing these parameters. This decision was based on the fact that the need to change the parameters arose so rarely that it was easier to alter the SMFDEFLT member than always to force the operator to give a 'no change' reply at IPL time.

The exit routines written for this installation were:

IEFUJV	-	Job validation exit
IEFUJI	-	Job initiation exit
IEFUSI	-	Step initiation exit
IEFACTRT	-	Termination exit
IEFUTL	-	Time limit exit

IEFUJV

This exit routine receives control just before each JCL statement read by the card reader is interpreted, and again just before the job is queued in the input queue for scheduling. In addition to validating the job's resource requirements and accounting information, the routine writes a special (TYPE 128) record to the SMF data set that provides information additional to that provided when a job was submitted at the input desk.

The program consists of two CSECTS. UJVTABLE consists of a table relating job class to maximum core and maximum time allowed to jobs of that class, and user group number (as contained within the job card account number) to the maximum allowed initiation priority. The other CSECT is IEFUJV. For each job read into the system this routine compares the requested values of some keyword parameters with those allowed in UJVTABLE and accepts or rejects the

job depending on it requesting legal or illegal values for these parameters. The error messages, supplied to the console operator, on rejection of a job are shown below. Appendix 8.1 is a listing of the job validation routine IEFUJV.

SMF Error Code	Reason for Error
01-PRTY	A priority was specified on a JOB or EXEC statement that exceeded that allowed for the user.
02-REGION	A region specified on a JOB or EXEC Statement that exceeded that allowable for the class of the job.
03-TIME	A time was specified on a JOB or EXEC statement that exceeded that allowable for the class of the job.
04-ROLL	A job requested the invocation of the ROLLOUT/ROLLIN facility which was not allowed for the user.
07-ACCT N	An account number was specified on the job card that did not match with any in the table of authorised users.
08-NO TIME	No time was specified on the job card when it was required.
09-NO ROOM	For a class that permits the user to omit the TIME parameter, SMF inserts TIME=5 on the job statement image. If there is no room within the statement image to insert this keyword this error arises.

IEFUJI

This routine receives control just before each job is initiated. Its function is, for each job, to save in a special area of core in SQS information pertinent to the job that is just about to be initiated. For each initiator started, an area of SQS is getmained, and information is saved pertinent to the job currently under the control of the initiator. This information

is used by AELINK, to pass information to the plotting and paper tape routines, and by other AAEC modifications to OS, principally one that gives current status information about jobs in execution.

The format of this block is shown below, and is generated as a DSECT by the macro AESQS in AAE.MACLIB. Appendix 8.2 is a listing of the routine IEFUJI.

Offset (decimal)	Length	Contents
0	4	Unused
4	8	Jobname (EBCDIC)
12	20	User Name (EBCDIC)
32	4	Reader Start Time (hundredths of seconds)
36	4	Reader Start Date (format is OOYYDDDF)
40	2	Highest Condition Code encountered in job
42	2	Unused
44	16	Timer Work Area (4 words updated each step start)
60	8	Initiator Identifier (EBCDIC)
68	8	Jobstep Name (EBCDIC)
76	8	User Account Number (EBCDIC)
84	12	Unused

IEFUSI

This routine receives control just before each step is initiated. It saves in the associated area in SQS the step-name of the step about to be initiated. Appendix 8.3 is a listing of the routine IEFUSI.

IEFACTRT

This routine receives control when the execution of a job or job-step has terminated. The routine writes to the user's SYSPRINT data set the condition code of the terminating step. It also saves in the associated area in SQS the currently highest encountered condition code for the job, and prints this out at job termination. Appendix 8.4 is a listing of the routine IEFACTRT.

IEFUTL

This routine receives control whenever the job CPU time, step CPU time or job wait-time limits expire. For CPU time expiries the job is cancelled. For wait time expiries a message is issued to the operator who has the choice of cancelling the job or granting it some extra wait-time, during which time it is hoped the job will find itself free to do something other than wait.

Appendix 8.5 is a listing of the routine IEFUTL.

6. AEDDP - DYNAMIC DISPATCHING PRIORITY SCHEDULER

As discussed in the introduction, the basis of the System/360 Operating System philosophy lies in the existence of quite clearly definable units of work called tasks, the physical expression of the uniqueness of each of these tasks being displayed in the creation of Task Control Blocks (TCB's). Each task can demand the resources of the CPU, but only one task at any one time can be given it. This section discusses how the System/360 goes about giving control to the various tasks demanding control and how a locally written routine AEDDP goes some way to improve what OS does.

As shown in Figure 2 the TCB's are arranged in a sequential priority queue. Any task can be regarded as being in one of two states:

(i) able to utilise the CPU i.e. dispatchable

(ii) unable to utilise the CPU i.e. non-dispatchable.

Only one task in the dispatchable state can actually have control of the CPU at any instant, and that task will be the highest such task in the queue. No task in the non-dispatchable state will ever have control of the CPU. A task entering state (i) forcibly removes control from any task of lower priority than it, and conversely control is, in turn, forcibly removed from it by a higher priority task entering state (i). A task entering state (ii) can only do so when it has control of the CPU and allows the operating system to pass control to the next lower priority task in state (i). If all tasks are in state (ii) the system finally passes control to the pseudo-task at the bottom of the TCB chain. This pseudo-task sits in the wait state until any task becomes dispatchable.

A major problem arises from this otherwise elegant concept. Each user job can, for all intents and purposes, be regarded as a task to the system. The position of this task (i.e. job) on the queue of competing tasks depends simply on when it was initiated*.

---

* In fact a variation on this theme allows the initiators to set the dispatching priority of job classes to a pre-set value, but this is equally inflexible since it is difficult to define a job's class on the basis of its CPU/I/O boundness. What is stated in the text is essentially true for the purpose of the argument.

Tasks are placed in the queue under those tasks already present. This means that if a job enters the system after a CPU bound job (that is one that does not frequently revert to state (ii)), the latter CPU bound job will be higher in the chain of tasks and will rarely pass control to the second task underneath it.

This situation, in terms of CPU usage alone, is tolerable, simply because the CPU is doing as much as it possibly can. But considered with two related facts, it proves to be an inefficient and costly way to run the resources of the central computing facility. These facts are core usage and the method of charging by IBM.

First, core usage. With the installation's present 512K, core is the resource with the highest premium. A job sitting in core in a state of being capable of executing but not being allowed to, results in poor usage of this important system resource.

Second, and perhaps more important, is the method currently used to charge the installation. Basically a charge is made per unit of time recorded on a meter which records CPU activity. Once started in motion, by the CPU executing at least one instruction (a few micro-seconds), this meter will run for a minimum period of $\sim 1/2$ second ($\sim 10^6$ micro seconds). This meter is wired to a light on the console - the 'system light'. While this light is on a charge is being made for the CPU. There is another light on the console, called the 'wait light', which goes off whenever the CPU is being utilised. Thus the time being used by the installation is measured by the amount of time the wait light is OFF. The time charged to the installation, and for which it is requested to pay, is measured by the time the system light is ON. Because of the $1/2$ second minimum ON time for the system light, an I/O bound job can cause the system light to be fully and permanently on and the wait light also almost always ON.

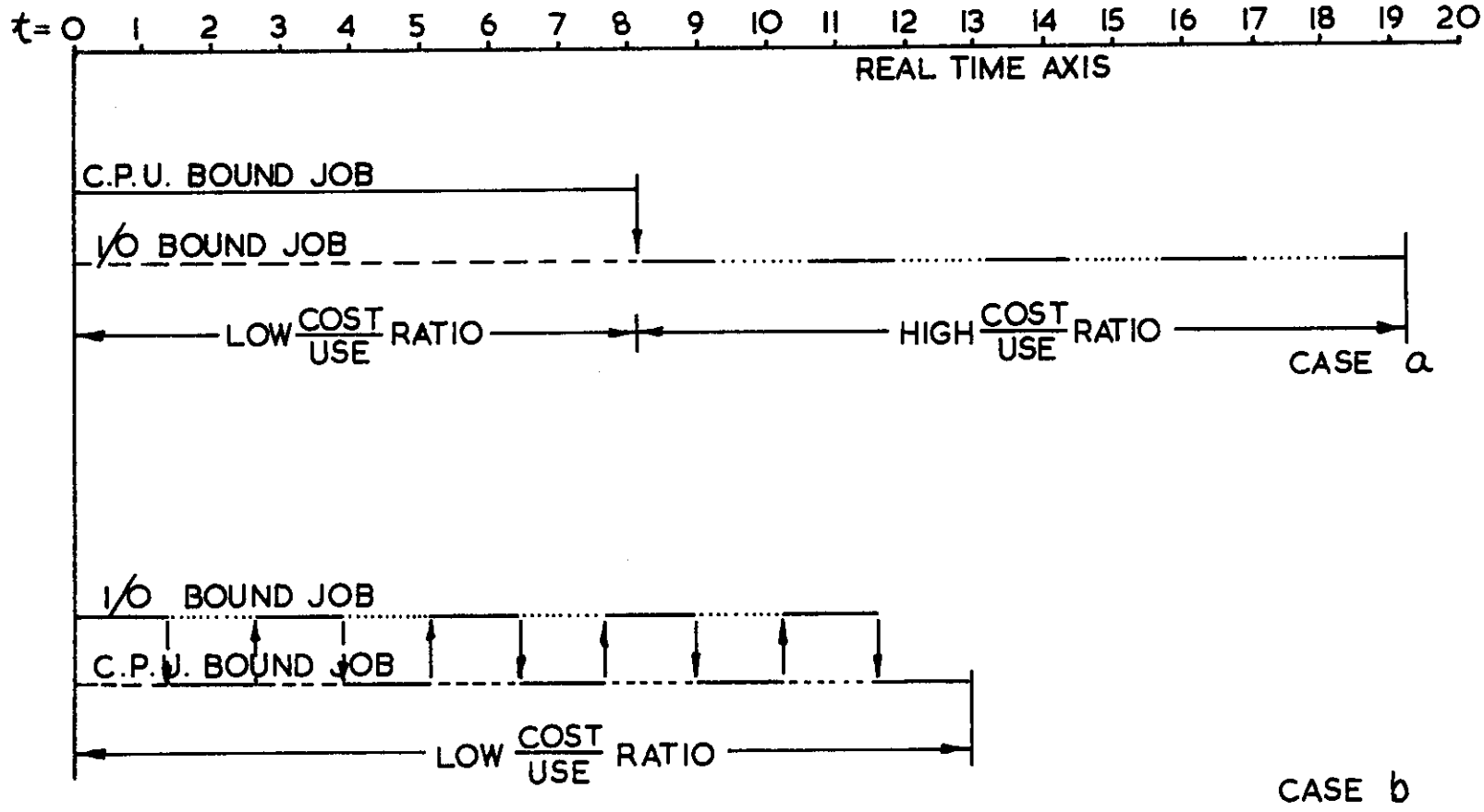
Thus for an I/O bound job the ratio

$$\frac{\text{CPU rental cost}}{\text{CPU usage}}$$

is high.

For a CPU bound job this ratio is at a minimum.

AEDDP attempts to redress this unsatisfactory situation brought about by the normal functioning of OS and tries to run the CPU for as long as possible in a state of low CPU cost/CPU use ratio. Figure 3 illustrates how it does this in an idealised case of two jobs executing in the machine, one job being totally CPU bound and another reasonably I/O bound. In case (a) the CPU bound job has a higher dispatching priority than the I/O bound job.



——— DISPATCHABLE & IN CONTROL OF C.P.U.

– – – – – – – DISPATCHABLE BUT NOT IN CONTROL OF C.P.U.

..... NON-DISPATCHABLE

FIGURE 3. CPU UTILISATION FOR TWO TASKS IN CORE
a) CPU BOUND JOB HAS HIGHER DISPATCHING PRIORITY
b) I/O BOUND JOB HAS HIGHER DISPATCHING PRIORITY

Consequently the latter never gets control until time $t \cong 8$, when the I/O bound job gets control. While the cost/use ratio of the CPU is low for the duration of the CPU bound job (i.e. from time t = 0 to t = 8), the cost/use ratio for the entire duration of the I/O job is high. Furthermore, the total elapsed time for the running of both jobs is from t = 0 to t = 19, during which time the I/O job may have had exclusive use of a number of peripheral devices, though capable of using them for only a short part of that time. In case (b) the I/O bound job is given a higher dispatching priority. Consequently whenever it is unable to make use of the CPU because it is waiting on the completion of an I/O operation, the lower priority CPU bound job is given control, which then runs until the I/O bound job becomes dispatchable again, at which juncture it assumes control of the CPU. The effect of this is to increase the length of time for which the cost/use ratio is at a minimum and decreases the length of time the I/O job is in core and allocated peripheral devices. There is, naturally, a corresponding increase in time which the CPU bound job spends in core and may have allocated peripheral devices. This increase in time can be shown to be the time the I/O job has control of the CPU. Statistically, the definition of the CPU bound job reduces the likelihood of it having slow peripheral devices allocated to it, though it by no means excludes the possibility.

While the above argument is very much over simplified and idealised, it does serve to show what AEDDP attempts to do, and, given the correct mix of jobs in core, does do. It does it in the following manner.

AEDDP resides permanently in the link pack area. Its TCB is the lowest of the permanent TCB's (See Figure 2). Most of the time AEDDP sits in state (ii), that is, non-dispatchable. Every few seconds (and this time can be varied when required) AEDDP becomes dispatchable. Since it is at a higher priority than the user tasks it receives control almost immediately. It scans the TCB chain and calculates how much CPU time each user task has used in the previous time interval. The TCB's for these tasks are then rearranged in the inverse order of the CPU time used. The net effect of this is to cause the I/O bound jobs to tend to the top of the user TCB queue and the CPU bound jobs to be suppressed and kept at the bottom of the queue. AEDDP then returns to its non-dispatchable state and control is again passed to the user tasks. This technique caters for the case when the characteristics of a job vary throughout its execution. Only its most recent history is considered in assessing its CPU or I/O boundness. Appendix 9 is a listing of the routine AEDDP. The technique of grafting the routine into the system is

described elsewhere in this report.

7. POST SYSGEN MODIFICATIONS TO OS SOURCE CODE

This section and subsequent sections describe modifications made to the source code of System/360 Operating System which enhance its capabilities.

7.1 Modification to IEESMFIT

The chain of TCB's illustrated in Figure 2 shows the TCB for AEDDP firmly embedded in the permanent TCB list. The insertion into this chain of the TCB for AEDDP is effected by a simple modification to the module IEESMFIT whose normal function is to initialise the SMF accounting system. Appendix 10.1 shows that by insertion of an ATTACH Macro specifying AEDDP the operating system causes to be loaded at IPL time the dynamic dispatcher into the Link Pack Area. It should be noted that this simple technique can be used to create any desired number of local resident tasks.

7.2 Modifications to IEEVRCTL

A function of OS exists that allows the execution of certain system tasks by the issuing of an operator console START command (IBM System/360 MVT Job Management PLM p 91, Form No. GY28-6660-5). Normal OS restricts these system tasks to basic job management functions such as reading input streams, initiating job-steps and writing system output. In validating the tasks requested by the operator to be started, the System Task Control Routine inspects a table of authorised program names set up in the routine IEEVLNKT. This routine exists in SYS1.LINKLIB as a module in its own right and also as a CSECT of the module IEEVRCTL. IEEVLNKT was modified by inserting in this table a number of other routines which the installation wished or may wish in the future to be executed by means of a START command from the console. The initial modifications were made to the source version of IEEVLNKT which was assembled and link-edited into the Starter System library SYS1.CI505 prior to the link-editing of the OS System Task Control Routines. Subsequent changes may be made by superzapping the CSECT IEEVLNKT in the load modules IEEVLNKT and IEEVRCTL in SYS1.LINKLIB. Appendix 10.2 lists a recent version of IEEVLNKT. The existence of a program's name in the Authorised Program List in IEEVLNKT allows that program to be started from the console and to run in Supervisor State. A further modification was made to the routine IEEPSN in the module IEEVRCTL. This is the routine that looks up the Linkage Table and if the requested program is not authorised it returns an error condition. A superzap was run to suppress this error condition, thereby allowing any program to be started from the console. A listing of the superzap is to be found in Appendix 6.

8. MODIFICATION OF THE DISPLAY COMMAND

The normal System/360 Operating System reply to the operator request to display the status of a job that is currently active or being initiated is a rather perfunctory 'job selected'. To augment this meagre information supplied by OS, several changes were applied to the system. The following paragraphs describe the modules affected by these changes.

The four sources and sinks of information for the various items of detailed job information are the Timer Queue Element (TQE), the Linkage Control Table (LCT), the Timing Control Table (TCT) and the special AAEC blocks in SQS. It has been described earlier how the SMF exit routine IEFUJI creates for each initiator a 96 byte area in SQS in which is stored information pertinent to both the initiator and the job running under the initiator. This block supplies the linking information required for the extraction of the required information about a job.

The TQE is one element in a queue of elements called the Timer Queue (IBM System/360 MVT Supervisor PLM, Form No. GY28-6659-4). The timer queue provides a means of scheduling values representing time intervals for placement into the interval timer to cause interruptions to occur at appropriate times. Each time a routine issues an STIMER macro one of these elements is created. At every task switch the time information in each element of the timer queue is updated so that any inspection of the queue provides accurate timing information about each associated task.

The LCT (IBM System/360 MVT Job Management PLM, p236) is built in core by the Initiator Initialisation routine. It is used as a communications area by the various routines of the initiator.

The TCT (IBM System/360 MVT Job Management PLM, p258) is built in core by the User Exit Initialisation routine (IEFSMFIE) of the initiator. The table is passed to the supervisor when the job step is established. It is the source of information for the SMF Termination records.

8.1 Modification to IEFSD263

This routine (IBM System/360 MVT Job Management PLM, p52) is the initiator attach module. It is the routine that presents the users job (step) as a task to the operating system. In executing this function one of the last things it does before attaching the user's program is to issue an STIMER macro. After issuing the STIMER, the routine was modified to save in the special AAEC area for the job in SQS the Timer Work Area and the Initiator Identifier. Appendix 11.1 is a listing of the relevant changes to IEFSD263.

8.2 Modification to IEESD565

This routine (IBM System/360 Job Management PLM, p97) is one of the Queue Alter Routines and is the message routine that provides the normally sparse information, mentioned at the beginning of this section, regarding the status of a job. This routine links to a message writing routine with a value in register 4 indicating which message is to be written to the operator. A value of 17 in register 4 indicates that a 'job selected' message has been issued. When this is the case the AAEC modification extracts information from the LCT, TQE, TCT and SQS to give the following information:

(i) TCB address of the current step

(ii) JTU = Job CPU time used to the start of the current step

(iii) TTG = CPU time to go before the occurrence of a CPU time expiry interrupt

(iv) RC = requested core for the step

(v) UUC = unused core of the requested core

(vi) Stepname of the current step

(vii) Initiator identifier.

Appendix 11.2 is a listing of the relevant changes made to IEESD565.

9. START COMMAND MODIFICATION

9.1 Introduction - WAATTACH and WAAXCTL

WAATTACH and WAAXCTL were created for two reasons. Firstly they give to the operating installation an increased capability of executing under OS tasks generated by the normal OS START command. Further, these tasks are always in a stoppable state - that is either stopped by the STOP command or cancelled by the CANCEL command. Both of these reasons apply to each of the routines under differing circumstances and by differing techniques. Neither routine is dependent on the existence of the other. Only one small superzap to OS allows WAAXCTL to function. No change to OS is needed to allow WAATTACH to function.

To describe the purpose of each of these routines a description is first needed of how OS deals with the START command.

9.1.1 The OS START command

It is the System Task Control Routine that processes the START command. Normally OS allows the START command to initiate basic OS functions such as reading input streams, initiating jobsteps and writing system output. The routines that perform these basic functions are similar to user's tasks and job control language (JCL) statements are generated to describe the required task. These statements are processed in a manner similar to a user's job.

When the master scheduler determines that a command issued is START it issues an ATTACH macro instruction to pass control to IEEPRWI2 which resides in the linkpack area. IEEPRWI2 getmains core, to load and execute the remaining Task Control routines, and then issues an XCTL to IEEVSTAR(IEEVSTAR, IEEVJCL)* which builds up the JCL images needed for the task requiring to be started, each JCL statement being chained to the next. IEEVJCL transfers control to the CSECT IEEVRCTL within the module IEEVRCTL(IEEVRCTL,IEEVRJCL, IEEPSN, IEEVLNKT). The various CSECT's within IEEVRCTL interpret for validity the generated JCL and also check that the specified PGM name is authorised to be started from the console. IEEVLNKT is the authorisation table used by the CSECT IEEPSN to check the validity of the program wishing to be executed. If the program is unauthorised control is returned to IEEPSN with a bit set in a location pointed to by register 3 to indicate an error. Control is subsequently passed on to other routines of the System Task Control Routine which either continue or abort the initiation of the task. Finally IEEPRTN (IEEPRTN2) is given control to free the core obtained for the loading and executing of all of the above mentioned routines.

9.1.2 The first modifications to START

Soon after MVT was implemented at Lucas Heights the following changes were made to the System Task Control Routine. Firstly additions were made to the authorisation table in IEEVLNKT. This allowed these additional AAEC programs to be started from the console as well as the standard IBM routines. However, as more and more programs were added to this list it soon became evident that a neater way to allow freedom to start any job from the console was to suppress the error indication in IEEPSN. This was duly done and the changes made to OS to allow this are described elsewhere in this report.

The great freedom in console capability had three drawbacks. One was the sharp increase in the number of console jobs started during the day and also at any one time, with the associated problem of expanding System Queue space. Another was the total inability to cancel such jobs with the normal OS CANCEL command, a status that proved embarrassing on many occasions. Thirdly these jobs were not accounted for by the System Management Facility of OS.

With the first two risks known and allowed for in ones' actions and the latter deficiency accepted the situation was just tolerable. Then HASP was

---

* We use the convention that the relevant CSECTS within a load module follow in parentheses the name of the load module i.e. module (csectl, csect2, csect3,...)

generated as an operating facility and the situation became obviously intolerable. This was due to the fact that the SYSOUT output of such console startable jobs was not spooled to the HASP output data sets, and printed under control of HASP, but was spooled to an OS output data set. This could only be printed by first stopping the HASP printer, varying online the associated device, and starting the OS writer to that device - all rather slow and clumsy.

WAAXCTL and WAATTACH remedy most of these problems.

9.1.3 <u>START command JCL building</u>

To describe the function of WAATTACH it is necessary to understand the mechanisms whereby the JCL is generated from the START Command.

While any procedure in SYS1.PROCLIB can have any stepname and DDname, special significance is attached to the stepname IEFPROC and the DDname IEFRDER as will be explained below. The general form of the START command is

```
S  procname[.identifier][,devicename][,volser][,parmvalue]   (positional)
           [,keyword=option,.....][,H={0}]                    (keyword)
                                      {1}
```

with the usual meaning attached to square and curly brackets.

Positional parameters like device name, volume serial and parmvalue must be entered in exactly the order in which they appear above. To omit a positional parameter, a comma must be inserted in its place. Keyword parameters can be entered in any order or omitted altogether.

<u>Examples</u>:

```
S  AEDLIST.A,,AAE001,DSN=SYS1.LINKLIB,LOAD=DSPMAP
             ↑ ↑       ↑______________________↑ keyword
             | |
             | |volume serial       }
             |                      }positional
             |omitted device name   }

S  WTR,OOD,,B,REGION=22K
       ↑ ↑↑   ↑____keyword
       | ||
       | ||parmvalue              }
       | |                        }
       | |omitted volume serial   }positional
       |                          }
       |device name               }
```

The keywords typed in are compared by the Syntax Checker routine IEEVSTAR with a list of acceptable DD keyword parameters. Those that match are saved to be used as an overriding statement for the IEFRDER DD statement. Those

that do not match are assumed to be symbolic parameters and inserted in the EXEC statement.

The purpose of the identifier is to give the system a means of stopping, modifying or cancelling the task. Thus tasks with the same PROCEDURE name can be made unique by the creation of a unique identifier. If, however, an identifier is not supplied by the operator (most common at Lucas Heights), the system generates one as follows. If the procedure stepname is IEFPROC and if there is a DD statement IEFRDER it takes the device name associated with the IEFRDER statement, and inserts it as the identifier. In this way, for instance, one can stop or cancel the normal OS reader to 00C or writer to 00E by the commands

```
        p   00C
    or  c   00E   respectively.
```

If there is no IEFRDER statement the system forms an identifier from the name of the procedure in the START command. Thus when AECOPY, which does not have an IEFRDER statement, is started by

```
        s   AECOPY
```

the system interprets this command as though

```
        s   AECOPY.AECOPY
```

had been typed on the console. The stop command

```
        p   AECOPY
```

is directed to the identifier rather than the procedure name.

A final point should be made regarding the JCL building by the System Task Control Routine. The stepname given to the EXEC PROCname statement, (as opposed to the step within the procedure that is EXEC PGM=) is given the name STARTING. The generated JCL for a writer to 00E would appear on a listing of the form

```
        //WTR       JOB MSGLEVEL=(0,0),etc....
        //STARTING EXEC WTR
        XXIEFPROC  EXEC PGM=IEFSD080,PARM='PA,IEFSD094'
        XXIEFRDER  DD   UNIT=00E,etc....
```

9.2 WAATTACH

None of the above discussion, which was restricted to the generation of JCL for console started tasks, explains why none of the user written routines started in this way were cancellable. The fact is that the system tasks of readers, writers and initiators are written in such a way that they

(i) assume they are always initiated via a START command and

(ii) test appropriate flags periodically for STOP or MODIFY, or create appropriate ECB's to be POSTed by CANCEL.

The user written routines, however, should not require to be rewritten in order to allow them to be stopped when desired and should have the capability of being started in one of three possible ways:

(a) as a user job via the card reader,

(b) as a system task directly under OS,

(c) as a console job passed to the HASP internal reader (this concept will be clarified when WAAXCTL is discussed).

WAATTACH allows these conditions to be satisfied provided a set of rules is followed. These rules are:

1. If it is wished that a routine have the capability of being started from the console then the procedure that describes that routine should specify to execute PGM=WAATTACH.

2. This procedure MUST have the same name as the routine wishing to be executed. This requirement is to allow WAATTACH to ATTACH the required routine from the JOBLIB or STEPLIB library by finding the PROCname in the Command Scheduling Control Block (CSCB) for case (b) above. It also only has meaning for case (b).

3. The step within the procedure should, whenever possible, also be the name of the routine wishing to be executed e.g.

```
//AECOPY    EXEC    PGM=WAATTACH
```

in order to execute the AECOPY program.

This rule is to account for cases (a) and (c) above.

4. The step that executes the procedure should, where possible, also be the name of the program wishing to be executed. This has meaning only for jobs read in via the card reader. This rule, for procedures unable to comply with rule 3, permits WAATTACH to find the program name from this PROCSTEP name e.g.

```
//AEDLIST   EXEC    AEDLIST
XXIEFPROC   EXEC    PGM=WAATTACH
XXetc...
```

5. For jobs read into the HASP internal reader, the PROCSTEP name is STARTING, so rule 4 can never be enforced. For jobs such as

```
//AEDLIST   JOB     etc....
//STARTING  EXEC    AEDLIST
//IEFPROC   EXEC    PGM=WAATTACH
//SYSPRINT  DD      etc....
```

WAATTACH picks up the program name from the JOB name generated by the operating system.

The above set of rules allows WAATTACH to issue the ATTACH macro for the required program without the need for any additional PARM values to be specified.

When the job is read in via the OS card reader or HASP internal card reader it is cancellable by the normal OS CANCEL command. For the case when the task is invoked by a START command, WAATTACH periodically (every ~ 5 seconds) tests the STOP flag in the CSCB so that the issue of a STOP command to the identifier of the task causes WAATTACH to DETACH the task and terminate.

WAATTACH allows, without any modification of the start command or major modification to procedures, complete flexibility in executing by the START command any suitable routine the user wishes. Appendix 12 is a listing of WAATTACH.

9.3 The Second Modifications to START - WAAXCTL

The existence of WAATTACH obviates the need to alter IEEPSN, since only WAATTACH need be authorised to execute any suitable routine. However the generation of HASP, as mentioned earlier, brought with it the problem of system task SYSOUT. WAAXCTL requires one small change to another routine of the System Task Control Routine.

WAAXCTL was written primarily to permit console started jobs to direct their SYSOUT data to the HASP on-line printer. This is not currently an available facility in a HASP environment. Additional facts to be stated, and which are considered beneficial are:

(i) WAAXCTL reads these tasks into the HASP internal reader and hence they are cancellable as are all users jobs;

(ii) as effective user jobs, these tasks produce SMF records and hence their execution is accounted for;

(iii) because they are jobs under initiators, only those jobs are executed for which there are available initiators (which are essentially fixed in number). This will help towards slowing down the increase in SQS.

The only modification to the System Task Control Routine is to alter an XCTL instruction within IEEVJCL to pass control to WAAXCTL instead of IEEVRCTL. WAAXCTL first of all tests if HASP is present and active on the system. It does this by issuing SVC 200 (the HASP SVC) which under special circumstances returns a value in register 15 which, if zero, indicates HASP is not active. If non-zero HASP is active. If HASP is not active WAAXCTL XCTL's to IEEVRCT and the START command is processed as it normally would be by OS. If HASP is

active a test is made to ascertain whether the procedure started contains as its first characters RDR, INIT, WTR, HOS, SYS. If it does,control is again passed to IEEVRCTL since it is assumed such tasks should be executed as system tasks and not users routines. If the START is not for one of these 5 classes of procedures tests are made to check if any other task is currently using the internal reader. If so, control is again passed to IEEVRCTL to process the command in the normal manner. When eventually it has been decided that the internal reader is available and required, WAAXCTL passes over to the reader the string of JCL statements generated by the routine IEEVSTAR. On detecting the last generated statement it then passes over a / * EOF card image which indicates to the internal reader the end of job. WAAXCTL then XCTL's to IEEPRTN which freemains core getmained by the System Task Control Routine. The job generated is given a special account number, and has a class and priority which permits it to be initiated as soon as the first initiator is available (which is often immediately). Appendix 13.1 is a listing of the superzap to IEEVJL, and 13.2 is a listing of WAAXCTL.

10. CONCLUSION

The additions and modifications described in this report are of two kinds. There are those that are entirely peculiar to the IBM System/360 at Lucas Heights, allowing both the Operating System and the Dataway to function. There are also those that can be applied to basically any MVT (or even MFT) System. Among the latter are AEDDP, WAATTACH, WAAXCTL, and modification to OPEN. It is felt that these additions usefully augment the capabilities of OS and at the same time are relatively easy to apply to any level of release.

It is hoped that this report will provide a useful base from which to generate further releases of the IBM System/360 Operating System.

11. ACKNOWLEDGEMENTS

The author is indebted to all members of the Applied Maths and Computing Section of AAEC Lucas Heights for their help and support in the implementation of the MVT version of the IBM/360 Operating System. In particular, thanks to Dr. D.J. Richardson and Mr. C.B. Mason for useful and enjoyable discussions.

12. REFERENCE

Mason C.B., and Richardson D.J.: "AELINK - A Facility for the Dynamic Linkage of Independent IBM 360 Computer Programs". Proceedings of Fourth Australian Computer Conference, 1969, p.363.

APPENDIX 1

The Stage 1 deck for the

HASP/OS SYSGEN, DECEMBER 1971.

```
//AAA      JOB C1A90000,OPERATORS.USE,CLASS=M,TIME=20,REGION=380K
//*********************************************************************** ********
//*                                                                               *
//*      R19.6 OS-MVT SYSGEN DONE IN DECEMBER 1971 FOR THE IMPROVE-               *
//*      MENT OF THE OS SYSTEM AND THE INCLUSION OF HASP.                         *
//*      THIS SYSTEM IS BASED ON 6 MONTHS EXPERIENCE OF MVT AT AAEC.              *
//*                                                                               *
//*********************************************************************** ********
//STAGE1 EXEC  ASMFC,PARM.ASM='DECK,NOLOAD'
//ASM.SYSLIB  DD  VOL=REF=PACK3,DISP=SHR,DSN=SYS1.GENLIB
//ASM.SYSUT1 DD VOL=REF=PACK6,SPACE=(CYL,(10,10)),DISP=(,PASS)
//ASM.SYSUT2 DD VOL=REF=PACK7,SPACE=(CYL,(10,10)),DISP=(,PASS)
//ASM.SYSUT3 DD VOL=REF=PACK8,SPACE=(CYL,(10,10)),DISP=(,PASS)
//ASM.SYSPRINT  DD  SYSOUT=A,SPACE=(CYL,(10,10))
//ASM.SYSPUNCH  DD  SYSOUT=B,SPACE=(CYL,(10,10))
//ASM.SYSIN  DD  *
     TITLE     '    **** RELEASE 19 SYSGEN FOR HASP/MVT: DEC ''71 ****'
*              *****  CENTRAL PROCESSOR  *****
      SPACE
      CENPROCS MODEL=50,STORAGE=I
      SPACE
      AEATTN (240,248,250),41     AAEC UCB MODIFIER          ***AAEC***
*              ******  I/O EQUIPMENT  *****
*              *****  MULTIPLEXOR CHANNEL *****
     SPACE
MPX   CHANNEL  ADDRESS=0,TYPE=MULTIPLEXOR
      SPACE
*              ** HASP PSEUDO DEVICES **
      SPACE
IRDR  IODEVICE UNIT=DUMMY,ADDRESS=080,DEVTYPE=11000805
RDR1  IODEVICE UNIT=DUMMY,ADDRESS=(081,15),DEVTYPE=10000801
RDR2  IODEVICE UNIT=DUMMY,ADDRESS=(090,6),DEVTYPE=10000801
PUN   IODEVICE UNIT=DUMMY,ADDRESS=(09A,4),DEVTYPE=10000802
SFPUN IODEVICE UNIT=DUMMY,ADDRESS=(09E,2),DEVTYPE=51800803
SFPRT IODEVICE UNIT=DUMMY,ADDRESS=(0A0,10),DEVTYPE=1000080A
PRNT1 IODEVICE UNIT=DUMMY,ADDRESS=0AF,DEVTYPE=10000808
PRNT2 IODEVICE UNIT=DUMMY,ADDRESS=(0B0,16),DEVTYPE=10000808
      SPACE
*              ** UNIT RECORD DEVICES **
      SPACE
CONSL IODEVICE UNIT=1052,ADDRESS=009,MODEL=7
URCTL IOCONTRL UNIT=2821,ADDRESS=00,FEATURE=COLBNRY,MODEL=1
READR IODEVICE UNIT=2540R,ADDRESS=00C,MODEL=1
PUNCH IODEVICE UNIT=2540P,ADDRESS=00D,MODEL=1
PRNTR IODEVICE UNIT=1403,ADDRESS=00E,MODEL=N1,FEATURE=UNVCHSET
PCTRL IOCONTRL UNIT=2822,ADDRESS=00
PTAPE IODEVICE UNIT=2671,ADDRESS=007,MODEL=1
      SPACE
*              *****  SELECTOR CHANNEL 1  *****
      SPACE
SEL1  CHANNEL  ADDRESS=1,TYPE=SELECTOR
D130  IODEVICE UNIT=2314,ADDRESS=(130,1),IOREQUE=ORDERED
D131  IODEVICE UNIT=2314,ADDRESS=(131,1),IOREQUE=FIFO
D132  IODEVICE UNIT=2314,ADDRESS=(132,6),IOREQUE=ORDERED
      SPACE
*              *****  SELECTOR CHANNEL 2  *****
      SPACE
SEL2  CHANNEL  ADDRESS=2,TYPE=SELECTOR
LINK  IOCONTRL UNIT=2803,MODEL=1,ADDRESS=24,FEATURE=(DATACONV,7-TRACK)
T240  IODEVICE UNIT=2401,MODEL=2,FEATURE=7-TRACK,ADDRESS=240
```

```
T241   IODEVICE UNIT=2401,MODEL=2,FEATURE=7-TRACK,ADDRESS=241
T242   IODEVICE UNIT=2401,MODEL=2,FEATURE=7-TRACK,ADDRESS=242
T243   IODEVICE UNIT=2401,MODEL=2,FEATURE=7-TRACK,ADDRESS=243
T248   IODEVICE UNIT=2401,MODEL=2,FEATURE=7-TRACK,ADDRESS=248
T249   IODEVICE UNIT=2401,MODEL=2,FEATURE=7-TRACK,ADDRESS=249
LINK2   IOCONTRL UNIT=2803,MODEL=1,ADDRESS=25,FEATURE=(DATACONV,7-TRACK)
T250   IODEVICE UNIT=2401,MODEL=2,FEATURE=7-TRACK,ADDRESS=250
T251   IODEVICE UNIT=2401,MODEL=2,FEATURE=7-TRACK,ADDRESS=251
T252   IODEVICE UNIT=2401,MODEL=2,FEATURE=7-TRACK,ADDRESS=252
TCTL   IOCONTRL UNIT=2403,ADDRESS=28,MODEL=2
T280   IODEVICE UNIT=2403,MODEL=2,FEATURE=9-TRACK,ADDRESS=280
T281   IODEVICE UNIT=2401,MODEL=2,FEATURE=9-TRACK,ADDRESS=281
       UCS      IMAGE=(QN,TN),DEFAULT=QN
       UNITNAME UNIT=00C,NAME=RDR
       UNITNAME UNIT=00E,NAME=WTR
       UNITNAME UNIT=00D,NAME=PCH
       UNITNAME UNIT=00D,NAME=SYSCP
       UNITNAME UNIT=007,NAME=PTAPE
       UNITNAME UNIT=080,NAME=INTRDR
       UNITNAME UNIT=((09A,4)),NAME=B
       UNITNAME UNIT=((080,16)),NAME=A
       UNITNAME UNIT=((130,8)),NAME=DISK
       UNITNAME UNIT=((130,8)),NAME=DISC
       UNITNAME UNIT=((130,8)),NAME=SYSOA
       UNITNAME UNIT=((130,8),(280,2)),NAME=SYSSQ
       UNITNAME UNIT=((280,2)),NAME=TAPE
       UNITNAME UNIT=240,NAME=PDP9L
       UNITNAME UNIT=((241,2)),NAME=2400-2
       UNITNAME NAME=SPOOL,UNIT=((130,1))
       UNITNAME NAME=SPOOL1,UNIT=((130,3))
       UNITNAME NAME=SPOOL2,UNIT=(130,(132,2))
       SPACE
*              *****    END OF MACHINE CONFIG  *****
       EJECT
*              *****  CONTROL PROGRAM (MVT)  *****
       SPACE
       CTRLPROG MAXIO=30,QSPACE=9,FETCH=PCI,TYPE=MVT
       SCHEDULR TYPE=MVT,OPTIONS=NOLOG,ACCTRTN=SMF,                    X
                WTOBFRS=10,REPLY=5,ESV=SMF,EVA=(5,5),                  X
                JOBQFMT=21,JOBQLMT=200,JOBQTMT=200,                    X
                JOBQWTP=4,MINPART=52,CONSOLE=009,JOBQRES=135,          X
                STARTW=A-00E,STARTR=A-00C,STARTI=AUTO
       SUPRVSOR RESIDNT=(ATTACH,BLDLTAB,IDENTIFY,SPIE,RENTCODE,TRSVC),  X
                OPTIONS=(COMM,PROTECT,TRSVCTBL,IDENTIFY,ONLNTEST),     X
                WAIT=MULTIPLE,                                         X
                SER=SER1,                                              X
                TIMER=JOBSTEP,                                         X
                TRACE=500
                SPACE
*               ****  END OF CONTROL PROG MACROS  *****
       SPACE
       SVCTABLE SVC-250-T4-S6,                                         *
                SVC-249-T4-S6,                                         *
                SVC-248-T3-S6,                                         *
                SVC-247-T3-S6,                                         *
                SVC-246-T2-S6,                                         *
                SVC-245-T2-S6,                                         *
                SVC-244-T1-S0,                                         *
                SVC-243-T1-S0,                                         *
                SVC-200-T1-S0
```

```
*               *****  DATA MANAGEMENT  *****
      SPACE
      DATAMGT  ACSMETH=(BDAM,ISAM)
      SPACE
*               *****  END OF DATA MANAGEMENT MACROS  *****
                EJECT
*               *****  PROCESSORS AND LIBRARIES  *****
      PARMLIB
      SPACE
      GENERATE OBJPDS=SYS1.OBJMOD,UT1SDS=SYS1.UT1,UT2SDS=SYS1.UT2,      X
               UT3SDS=SYS1.UT3,UT4SDS=SYS1.UT4,                         X
               RESTYPE=2314,RESNAME=2314,RESVOL=AAE001,ASMPRT=ON,       X
               LEPRT=(LIST,MAP),DIRDATA=PDS
         END
/*
```

APPENDIX 2

2.1 AAEC UCB Modifier macro to be added to SYS1.GENLIB

2.2 Modification to SGIEC202.

```
//*********************************************************************
//*                                                                   *
//*      AAEC UC3 MODIFIER MACRO TO BE ADDED TO SYS1.GENLIB           *
//*                                                                   *
//*********************************************************************
//ST2  EXEC  PGM=IEBUPDTE,PARM=NEW
//SYSPRINT  DD  SYSOUT=A
//SYSUT2 DD DSN=SYS1.GENLIB,DISP=OLD,VOL=REF=PACK3
//SYSIN  DD  *
./  ADD  NAME=AEATTN,LIST=ALL
         MACRO                                                  ***AAEC*** 00100000
         AEATTN &ATTN,&DISP                                     ***AAEC*** 00200000
         GBLC  &AAELINK                                         *AAEC MOD* 00250000
         GBLC  &AAECCHK(50),&AAECDIS                            ***AAEC*** 00300000
         GBLA  &AAECLST,&AAECN                                  ***AAEC*** 00400000
&AAECLST SETA  N'&ATTN                                          ***AAEC*** 00500000
&AAECDIS SETC  '&DISP'                                          ***AAEC*** 00550000
.*  SET VALUE IN STAGE 1 GLOBAL VARIABLE USED & TESTED IN       *AAEC MOD* 00564000
.*  MODIFIED STAGE 1 MACROS SGIEA2BK & SGIEA2NP                 *AAEC MOD* 00566000
&AAELINK SETC  'AAECLINK'                                       *AAEC MOD* 00570000
.LOOP    ANOP                                                   ***AAEC*** 00600000
&AAECN   SETA  &AAECN+1                                         ***AAEC*** 00700000
&AAECCHK(&AAECN) SETC '&ATTN(&AAECN)'                           ***AAEC*** 00800000
         AIF   (&AAECN LT &AAECLST).LOOP                        ***AAEC*** 00900000
         MEND                                                   ***AAEC*** 01000000
./  ENDUP
/*
//
```

```
//*********************************************************************
//*                                                                   *
//*      MODIFICATION TO VIRGIN IBM VERSION OF SGIEC202 ALLOWING      *
//*      THE EXTENDED AAEC UCB TO BE GENERATED                        *
//*                                                                   *
//*********************************************************************
//ST4 EXEC PGM=IEBUPDTE
//SYSPRINT  DD  SYSOUT=A
//SYSUT1  DD  DSN=SYS1.GENLIB,VOL=REF=PACK3,DISP=OLD
//SYSUT2  DD  DSN=SYS1.GENLIB,VOL=REF=PACK3,DISP=OLD
//SYSIN  DD  *
./  CHANGE  NAME=SGIEC202,UPDATE=INPLACE
         GBLC  &AAECCHK(50),&AAECDIS                          ***AAEC*** 00050000
         GBLA  &AAECLST,&AAECN                                ***AAEC*** 00055000
.*             TEST FOR ATTENTION DEVICE                      ***AAEC*** 14141000
&AAECN   SETA  0                                              ***AAEC*** 14142000
.AAEC    ANOP                                                 ***AAEC*** 14143000
&AAECN   SETA  &AAECN+1                                       ***AAEC*** 14144000
         AIF   (&AAECN GT &AAECLST).GREND                     ***AAEC*** 14145000
         AIF   ('&AAECCHK(&AAECN)' NE '&DEVAD').AAEC          ***AAEC*** 14146000
 PUNCH '          ORG   *-&AAECDIS                                  ***X14147100
              AAEC***'                                                  14147200
 PUNCH 'AAECBIT&AAECN  DC X''08''                                    ***X14147300
              AAEC***'                                                  14147400
 PUNCH '**********     AAECBIT DOES NOT SHOW IN LISTING N.B.         ***X14147500
              AAEC***'                                                  14147600
 PUNCH '          ORG                                                 14147700
.*                            LOCATION COUNTER RESET          ***AAEC*** 14147800
 PUNCH 'AAECATT&AAECN  DC 32X''0''                                   ***X14147900
              AAEC***'                                                  14148000
./  ENDUP
/*
//
```

APPENDIX 3

3.1 Modifications to SGIEA2BK and SGIEA2NP

3.2 Modification to IEAQBK

3.3 Modification to IEAANIP

```
//*********************************************************************
//*                                                                   *
//*      AAEC MODIFICATIONS TO SGIEA2BK AND SGIEA2NP TO GENERATE      *
//*      THE AAEC LINK TCB                                            *
//*                                                                   *
//*********************************************************************
//UPD2   EXEC  PGM=IEBUPDTE
//SYSPRINT DD  SYSOUT=A
//SYSUT1   DD  DSN=SYS1.GENLIB,VOL=REF=PACK3,DISP=OLD
//SYSUT2   DD  DSN=SYS1.GENLIB,VOL=REF=PACK3,DISP=OLD
//SYSIN    DD  DATA
./     CHANGE  NAME=SGIEA2BK,LIST=ALL
         GBLC  &AAELINK                                    *AAEC MOD* 00050019
         AIF   ('&AAELINK' EQ '').AAE010                   *AAEC MOD* 00245019
         PUNCH '         GBLC  &&DATLINK                             C00246019
               *AAEC MOD*'                                 *AAEC MOD* 00247019
         PUNCH '*  SET STAGE 2 GLOBAL VARIABLE USED IN MODIFIED IEAQBK C00248019
               MACRO *AAEC MOD*'                           *AAEC MOD* 00249019
         PUNCH '&&DATLINK SETC  ''DATALINK''                       C00250019
                     *AAEC MOD*'                           *AAEC MOD* 00251019
.AAE010  ANOP                                              *AAEC MOD* 00252019
./     CHANGE  NAME=SGIEA2NP,LIST=ALL
         GBLC  &AAELINK                                    *AAEC MOD* 01000019
         AIF   ('&AAELINK' EQ '').AAE010                   *AAEC MOD* 76050019
         PUNCH '         GBLC  &&DATLINK                             C76100019
               *AAEC MOD*'                                 *AAEC MOD* 76150019
         PUNCH '*  SET STAGE 2 GLOBAL VARIABLE USED IN MODIFIED IEAANIPC76200019
                MACRO*AAEC MOD*'                           *AAEC MOD* 76230019
         PUNCH '&&DATLINK SETC  ''DATALINK''                       C76250019
                     *AAEC MOD*'                           *AAEC MOD* 76300019
.AAE010  ANOP                                              *AAEC MOD* 76350019
./     ENDUP
/*
//
```

```
//*********************************************************************
//*                                                                   *
//*      MODIFICATION TO IEAQBK TO GENERATE AAEC LINK RB & TCB        *
//*      CODE BELOW ASSUMES A VIRGIN IBM VERSION OF IEAQBK            *
//*                                                                   *
//*********************************************************************
//UPD2   EXEC  PGM=IEBUPDTE
//SYSPRINT DD  SYSOUT=A
//SYSUT1   DD  DSN=SYS1.MODGEN,VOL=REF=PACK3,DISP=OLD
//SYSUT2   DD  DSN=SYS1.MODGEN,VOL=REF=PACK3,DISP=OLD
//SYSIN    DD  DATA
./     CHANGE  NAME=IEAQBK,LIST=ALL
         GBLC  &DATLINK                                  *AAEC MOD* 00050019
         AIF   ('&JOBSTEP' EQ 'AEALTCB').AEC010          *AAEC MOD* 01895019
.AEC010  ANOP                                            *AAEC MOD* 02062019
*                                                        *AAEC MOD* 02062119
*   DATAWAY/LINK COMMUNICATIONS PRB                      *AAEC MOD* 02062219
*                                                        *AAEC MOD* 02062319
         AGO   .NOCVTCB                                  *AAEC MOD* 02062419
         AIF   ('&JOBSTEP' EQ 'AEALTCB').AEC030          *AAEC MOD* 02375019
         AIF   ('&DATLINK' EQ '').AEC015                 *AAEC MOD* 02701019
&RQUEUE  SETC  'AEALTCB'                                 *AAEC MOD* 02702019
         AGO   .TAG024                                   *AAEC MOD* 02703019
.AEC015  ANOP                                            *AAEC MOD* 02704019
         AIF   ('&DATLINK' EQ '').AEC020                 *AAEC MOD* 03120719
&RQUEUE  SETC  'AEALTCB'                                 *AAEC MOD* 03120739
         AGO   .AEC022                                   *AAEC MOD* 03120759
.AEC020  ANOP                                            *AAEC MOD* 03120779
.AEC022  ANOP                                            *AAEC MOD* 03120919
         AIF   ('&DATLINK' EQ '').AEC030                 *AAEC MOD* 03135019
         ENTRY AEALTCB .                                 *AAEC MOD* 03135219
         EXTRN AEALWAIT .                                *AAEC MOD* 03135319
&TASK    SETC  'AEALTCB'                                 *AAEC MOD* 03135419
&PGM     SETC  'AEALWAIT'                                *AAEC MOD* 03135619
         AIF   ('&ROLLOUT' EQ '').AEC024                 *AAEC MOD* 03135819
&SISTER  SETC  'IEAROTCB'                                *AAEC MOD* 03136019
         AGO   .AEC025                                   *AAEC MOD* 03136219
.AEC024  ANOP                                            *AAEC MOD* 03136419
&SISTER  SETC  'IEAERTCB'                                *AAEC MOD* 03136619
.AEC025  ANOP                                            *AAEC MOD* 03136819
&RQUEUE  SETC  'IEECVTCB'                                *AAEC MOD* 03137019
&JOBSTEP SETC  'AEALTCB'                                 *AAEC MOD* 03137219
&TCBNAME SETC  'AEALTCB'                                 *AAEC MOD* 03137419
&RBSIZE  SETC  '04'                                      *AAEC MOD* 03137619
&N       SETA  &N+1                                      *AAEC MOD* 03137819
*                                                        *AAEC MOD* 03138019
*   DATAWAY/LINK COMMUNICATIONS TCB                      *AAEC MOD* 03138219
*                                                        *AAEC MOD* 03138419
         AGO   .BUILD1                                   *AAEC MOD* 03138619
.AEC030  ANOP                                            *AAEC MOD* 03138819
         AIF   ('&DATLINK' EQ '').AEC035                 *AAEC MOD* 03161019
&SISTER  SETC  'AEALTCB'                                 *AAEC MOD* 03162019
         AGO   .TAG038                                   *AAEC MOD* 03163019
.AEC035  ANOP                                            *AAEC MOD* 03164019
./       ENDUP
/*
//
```

```
//*********************************************************************
//*                                                                   *
//*      MODIFICATION TO IEAANIP TO INITIALISE AAEC LINK TCB.         *
//*      THESE MODS MADE TO A IEAANIP THAT WAS ALREADY MODIFIED       *
//*      TO INITIALISE THE PCP ACCREC DATA SET. THE MODS DESCRIBED    *
//*      BELOW CAN BE APPLIED TO A VIRGIN IBM VERSION OF IEAANIP      *
//*      TO CREATE THE CORRECT TCB INITIALISING CODE FOR AN MVT       *
//*      SYSTEM.                                                      *
//*                                                                   *
//*********************************************************************
//UPD2   EXEC  PGM=IEBUPDTE
//SYSPRINT DD  SYSOUT=A
//SYSUT1   DD  DSN=SYS1.MODGEN,VOL=REF=PACK3,DISP=OLD
//SYSUT2   DD  DSN=SYS1.MODGEN,VOL=REF=PACK3,DISP=OLD
//SYSIN    DD  DATA
./     CHANGE  NAME=IEAANIP,LIST=ALL
         GBLC  &DATLINK                                          *AAEC MOD* 00098019
         AIF   ('&DATLINK' EQ '').JQNEG                          *AAEC MOD* 00490019
         EXTRN AEALTCB .               MVT LINK TCB ADDR         *AAEC MOD* 00495019
         AIF   (&STORAGE NE 1).AEA010                            *AAEC MOD* 09953019
*   CODE TO INITIALIZE PCP ACCREC DATA SET                       *AAEC MOD* 09953519
.AEA010  ANOP                                                    *AAEC MOD* 09958519
         AIF   ('&DATLINK' EQ '').AEA020                         *AAEC MOD* 11037019
*   INITIALIZE LINK TCB                                          *AAEC MOD* 11037519
         L     10,AEATCB .             LOAD ADDR OF LINK TCB     *AAEC MOD* 11038019
         ST    2,152(,10) .            SET PTR TO PQE IN TCB     *AAEC MOD* 11038519
*   END OF AAEC MOD                                              *AAEC MOD* 11039019
.AEA020  ANOP                                                    *AAEC MOD* 11039519
         AIF   (&STORAGE NE 1).AEA030                            *AAEC MOD* 15243059
         XC    CVTUSER+4(4,R5),CVTUSER+4(R5) ZERO USER AREA      ***AAEC*** 15243219
.AEA030  ANOP                                                    *AAEC MOD* 15243259
         AIF   (&STORAGE NE 1).AEA040                            *AAEC MOD* 69882019
.AEA040  ANOP                                                    *AAEC MOD* 69885019
         AIF   ((&STORAGE NE 4) OR ('&DATLINK' EQ '')).AEA050 AAEC MOD* 69885219
AEATCB   DC    A(AEALTCB) .            ADDR OF LINK TCB          *AAEC MOD* 69885419
.AEA050  ANOP                                                    *AAEC MOD* 69885619
./     ENDUP
/*
//
```

APPENDIX 4

Modification to IECIOS

```
//*********************************************************************
//*                                                                   *
//*      CHANGE TO IECIOS FOR AAEC ATTENTION ROUTINE                  *
//*      INSERTS ADCON  IN ATTENTION TABLE FOR AAEC LINK              *
//*      CODE BELOW ASSUMES A VERSION OF IECIOS MODIFIED PREVIOUSLY   *
//*      BY AAEC FOR R19.6 PCP. SEE AAEC TM/TN.7(JULY,1971) FOR       *
//*      FURTHER DETAILS. IF APPLIED TO A VIRGIN IBM VERSION          *
//*      REMOVE THE ./ DELETE STATEMENT.                              *
//*                                                                   *
//*********************************************************************
//ST3  EXEC  PGM=IEBUPDTE
//SYSPRINT  DD  SYSOUT=A
//SYSUT1  DD  DSN=SYS1.MODGEN,VOL=REF=PACK3,DISP=OLD
//SYSUT2  DD  DSN=SYS1.MODGEN,VOL=REF=PACK3,DISP=OLD
//SYSIN  DD  DATA
./  CHANGE    NAME=IECIOS
.AAEIOS1 DC    V(AEINTATN) AAEC ATTENTION ROUTINE          ***AAEC*** 76660019
./  DELETE  SEQ1=77141019,SEQ2=77146019
./  ENDUP
/*
//
```

APPENDIX 5

Modification to IEAQNU

```
//*********************************************************************
//*                                                                   *
//*      MODIFICATION TO IEAONU TO COPE WITH AAEC SVC 255             *
//*      CODE BELOW ASSUMES A VIRGIN IBM VERSION OF IEAONU            *
//*                                                                   *
//*********************************************************************
//UPDTE  EXEC  PGM=IEBUPDTE
//SYSPRINT  DD  SYSOUT=A
//SYSUT1    DD  DSN=SYS1.MODGEN,
//              DISP=(OLD,KEEP),VOL=SER=DLIB02,UNIT=2314
//SYSUT2    DD  DSN=SYS1.MODGEN,
//              DISP=(OLD,KEEP),VOL=SER=DLIB02,UNIT=2314
//SYSIN  DD  *
./        CHANGE  NAME=IEAONU
          STM   0,15,IEASCSAV       SAVE ALL REGS IN LOW CORE            15400500
          BALR  2,0                                                      15400600
          USING *,2                                                      15400700
.*  AAEC MOD FOR COPING WITH SVC 255                          *AAEC MOD* 15401000
          CLI   SVCOPSW+3,255           IS IT SVC 255?        *AAEC MOD* 15402000
          BNE   *+26                    CONTINUE IF NOT       *AAEC MOD* 15403000
          MVC   SVCOPSW+2(2),SVCOPSW    SAVE MASK, KEY, STATE *AAEC MOD* 15404000
          MVI   SVCOPSW,X'00'           SET MASK BITS TO ZERO *AAEC MOD* 15405000
          NI    SVCOPSW+1,X'FE'         SET PSW TO SUPVSR     *AAEC MOD* 15406000
          L     2,IEASCSAV+8            RELOAD R2             *AAEC MOD* 15407000
          LPSW  SVCOPSW                 LOAD PSW AND RETURN   *AAEC MOD* 15408000
          BALR  2,0           RESET BASE TO SCBASE                *AAEC* 15440000
          USING *,2            - JUST IN CASE!                    *AAEC* 15460000
./  ENDUP
/*
//
```

APPENDIX 6

SUPERZAPS to the standard OS code residing in SYS1.LINKLIB and SYS1.SVCLIB.

```
//*********************************************************************** ********
//*
//*
//*            SUPERZAPS TO THE STANDARD IBM SYSTEM  R19.6 OS-MVT
//*
//*
//*
//*********************************************************************** ********
//*
//*
//*
//* REDUCES 3-PAGE SEPARTION BETWEEN JOBS TO 1-PAGE SEPARATION
//* ADDRESS LOCATIONS APPLICABLE TO R19.6
//*
//ST1  EXEC  PGM=IMASPZAP
//SYSPRINT  DD  SYSOUT=A
//SYSLIB  DD  DSN=SYS1.LINKLIB,DISP=SHR,VOL=SER=AAE111,UNIT=SYSDA
//SYSIN  DD  *
  NAME  IEFSD094  IEFSD094
  VERIFY  0398 00000007
     REP  0398 00000003
    DUMPT  ALL
/*
//*********************************************************************** ********
//*
//* ALLOWS SMF DUMP PROGRAM TO COPE WITH DISP=MOD ON SMF DUMP TAPE
//* ADDRESS LOCATIONS APPLICABLE TO R19.6
/*
//  EXEC  PGM=IMASPZAP
//SYSPRINT  DD  SYSOUT=A
//SYSLIB  DD  DSN=SYS1.LINKLIB,VOL=SER=AAE111,UNIT=SYSDA,DISP=OLD
//SYSIN  DD  *
 NAME IFASMFDP IFASMFDP
 VERIFY  0360  47B0C372
 REP     0360  47B0C37A
/*
//*********************************************************************** ********
//*
//* ALLOWS LABEL PROCESSING OF MULTI-FILE TAPES
//* ADDRESS LOCATIONS APPLICABLE TO R19.6
//*
//  EXEC  PGM=IMASPZAP
//SYSPRINT  DD  SYSOUT=A
//SYSLIB  DD  DSN=SYS1.SVCLIB,VOL=SER=AAE111,UNIT=SYSDA,DISP=OLD
//SYSIN  DD  *
 NAME IGG0190P IGG0190P
 VERIFY 02E8 92404174
 REP  02E8 96
/*
//*********************************************************************** ********
//*
//* CAUSES THE MSGCLASS OF ALL CONSOLE STARTABLE JOBS TO BE CLASS 0
//* THIS FIX ALSO MAKES MSGLEVEL=(0,0)
//* ADDRESS LOCATIONS APPLICABLE TO R19.6
//*
//  EXEC  PGM=IMASPZAP
//SYSPRINT  DD  SYSOUT=A
//SYSLIB  DD  DSN=SYS1.LINKLIB,VOL=SER=AAE111,UNIT=SYSDA,DISP=OLD
//SYSIN  DD  *
 NAME IEEVSTAR IEEVSTAR
```

```
 VERIFY  0B54  E2C7D3C5E5C5D37EF1616140
 REP     0B54  E2C7C3D3C1E2E27ED6616140
/*
//*********************************************************************** ********
//*
//* ALTERS THE STANDARD IPL REQUESTS 'S RDR,S WTR,S INIT' TO VARY
//* OFFLINE COMMANDS
//* ADDRESS LOCATIONS APPLICABLE TO R19.6
//*
//  EXEC  PGM=IMASPZAP
//SYSPRINT  DD  SYSOUT=A
//SYSLIB  DD  DSN=SYS1.LINKLIB,VOL=SER=AAE111,UNIT=SYSDA,DISP=OLD
//SYSIN  DD  *
 NAME IEEVIPL IEEVIPL
 VERIFY  0556  D24787D27008
 REP     0556  D24787D27000
 VERIFY  055C  5B2085E6
 REP     055C  07000700
 VERIFY  082C  C9C5C5F1F0F3C940E240E6E3D96BF0F0C5
 REP     082C  E540F2F4F068D6C6C6D3C9D5C540404040
 VERIFY  087C  C9C5C5F1F0F3C940E240D9C4D96BF0F0C3
 REP     087C  E540F2F4F86BD6C6C6D3C9D5C540404040
 VERIFY  08CC  C9C5C5F1F0F3C940E240C9D5C9E3
 REP     08CC  E540F2F5F06BD6C6C6D3C9D5C540
/*
//*********************************************************************** ********
//*
//* ALLOWS ANY ONE-STEP PROCEDURE TO BE 'AUTHORISED'
//* ADDRESS LOCATIONS APPLICABLE TO R19.6
//*
//  EXEC  PGM=IMASPZAP
//SYSPRINT  DD  SYSOUT=A
//SYSLIB  DD  DSN=SYS1.LINKLIB,VOL=SER=AAE111,UNIT=SYSDA,DISP=OLD
//SYSIN  DD  *
 NAME IEEVRCTL IEEPSN
 VERIFY  0056  92043000
 REP     0056  92003000
/*
//*********************************************************************** ********
//*
//* FIXES AN IBM BUG THAT CAUSES A TIGHT LOOP IN AELINK APPLICATION
//* ADDRESS LOCATIONS APPLICABLE TO R19.6
//*
//  EXEC  PGM=IMASPZAP
//SYSPRINT  DD  SYSOUT=A
//SYSLIB  DD  DSN=SYS1.LINKLIB,VOL=SER=AAE111,UNIT=SYSDA,DISP=OLD
//SYSIN  DD  *
 NAME    IEFSD061 IEFYP
 VERIFY  00FC  478090FE
 REP     00FC  47F090FE
/*
//*********************************************************************** ********
```

APPENDIX 7

SYS1.PARMLIB entries

```
//*********************************************************************
//*                                                                   *
//*      SYS1.PARMLIB ENTRIES FOR R19.6 MVT SYSTEM GENERATED DEC. '71 *
//*      BASED ON 6 MONTHS EXPERIENCE WITH MVT.                       *
//*                                                                   *
//*********************************************************************
//  EXEC  PGM=IEBUPDTE,PARM=NEW,REGION=52K
//SYSPRINT  DD  SYSOUT=A
//SYSUT2 DD DSN=SYS1.PARMLIB,VOL=SER=AAE111,UNIT=SYSDA,DISP=OLD
//SYSIN  DD  DATA
./       ADD   NAME=SMFDEFLT
./  NUMBER  NEW1=10,INCR=10
 OPT=2,EXT=YES,JWT=05,BUF=400,SID=01,MDL=50,OPI=NO,MAN=ALL,            *
               PRM=(AAE002,136),ALT=(AAE002,136),REC=0,DSV=0
./       ADD   NAME=IEABLD00
 SYS1.LINKLIB IEFSD060,IEFSD061,IEFSD062,IEFSD070,IEFSD078,IEFSD080,  *
               IEFSD086,IEFSD087,IEFSD094,IEFWC000,IEFW21SD,          *
               IEKAA00,IEWL,IEYFORT
./       ADD   NAME=IEAIGG00
SYS1.SVCLIB    AEDDP,IGG019AA,IGG019AR,IGG019AQ,IGG019BC,IGG019BB,     *
               IGG019BA,IGG019CI,IGG019CH,IGG019CD,IGG019CC
./     ADD     LIST=ALL,NAME=PRESRES
./     NUMBER  NEW1=10,INCR=10
AAE001,1,2,2314,N       RESERVED, PRIVATE
AAE002,0,2,2314,N       PERMANENTLY RESIDENT,PRIVATE
AAE003,0,0,2314,N       PERMANENTLY RESIDENT, STORAGE
AAE004,0,0,2314,N       PERMANENTLY RESIDENT, STORAGE
AAE005,1,2,2314,N       RESERVED,PRIVATE
AAE006,0,0,2314,N       PERMANENTLY RESIDENT, STORAGE
AAE007,1,0,2314,N       RESERVED,STORAGE
AAE008,1,0,2314,N       RESERVED,STORAGE
./       ADD   NAME=IEARSV00
SYS1.SVCLIB    IGC0007B,IGC0107B,IGG0230D,IGG0190L
./       ADD   LIST=ALL,NAME=LNKLST00
 SYS1.LINKLIB,SYSP.LINKLIB,SYS2.LINKLIB,DJR.LINKLIB
./       ADD   NAME=IEAIGE00
SYS1.SVCLIB
./  ENDUP
/*
//
```

APPENDIX 8

SMF EXIT ROUTINES

8.1 IEFUJV

8.2 IEFUJI

8.3 IEFUSI

8.4 IEFACTRT

8.5 IEFUTL

SYMBOL	TYPE	ID	ADDR	LENGTH	LD ID
IEFUJV	SD	01	000000	000644	
TIMETABL	ER	02			
REGTABL	ER	03			
USERTABL	ER	04			
ENDTABL	ER	05			

```
LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                F08APR70  12/20/71
                                    1          PRINT NOGEN
                                    2 ********************************************************************
                                    3 *        JOB VALIDATION ROUTINE  IEFUJV                            *
                                    4 *                                                                  *
                                    5 *        THIS ROUTINE SCANS THE JCL CARD IMAGE SUPPLIED TO IT      *
                                    6 *        BY THE OS READER-INTERPRETER AND CHECKS THAT THE USER'S   *
                                    7 *        REQUESTS FOR CORE, TIME, AND PRIORITY ARE WITHIN THE      *
                                    8 *        PREDETERMINED LIMITS LAID DOWN IN THE CSECT UJVTABLE.     *
                                    9 *        ANY JOB REQUESTING VALUES OUTSIDE THE ACCTEPTABLE LIMITS  *
                                   10 *        IS CANCELLED.                                             *
                                   11 *        AT JOB ENQUING TIME AN SMF RECORD(TYPE 128) IS WRITTEN    *
                                   12 *        TO THE SMF DATA SET . THIS RECORD CONTAINS THE JOBNAME,   *
                                   13 *        READER START TIME, USER ACCOUNT NUMBER,PROGRAMMER NAME,   *
                                   14 *        AND A UNIQUE ID NUMBER PICKED UP AFTER THE LAST CARD OF THE *
                                   15 *        JOB HAS BEEN READ BY THE READER.                          *
                                   16 *                                                                  *
                                   17 *        ON ENTRY REGISTER1 POINTS TO A LIST OF 4-BYTE ADDRESSES   *
                                   18 *        IN THE FOLLOWING ORDER:-                                  *
                                   19 *         1. ADDRESS OF COMMON PARAMETER AREA                      *
                                   20 *         2. ADDRESS OF 80-BYTE CARD IMAGE                         *
                                   21 *         3. ADDRESS OF A 1-BYTE AREA INDICATING THE CARD TYPE     *
                                   22 *            BEING PRESENTED                                       *
                                   23 *                                                                  *
                                   24 *        ON EXIT REGISTER15 CONTAINS EITHER-                       *
                                   25 *         0 - CONTINUE PROCESSING JOB    OR                        *
                                   26 *         4 - CANCEL JOB                                           *
                                   27 *                                                                  *
                                   28 *        FURTHER DETAILS ABOUT THE REQUIREMENTS OF IEFUJV CAN BE   *
                                   29 *        HAD FROM THE IBM SMF MANUAL GC28-6712.                    *
                                   30 *                                                                  *
                                   31 ********************************************************************
                                   32 ********************************************************************
                                   33 *  REGISTER USAGE                                                  *
                                   34 *  **************                                                  *
                                   35 *                                                                  *
                                   36 *  R1  ADDRESS OF PARAMETER LIST                                   *
                                   37 *  R2  ADDRESS OF COMMON EXIT PARAMETER AREA                       *
                                   38 *  R3  ADDRESS OF JCL CARD IMAGE                                   *
                                   39 *  R4  ADDRESS OF A ONE BYTE TYPE FIELD -WHAT TYPE OF JCL CARD     *
                                   40 *      ALSO USED AS AN AUXILIARY SCAN POINTER                      *
                                   41 *  R5  POINTER IN JCL CARD IMAGE                                   *
                                   42 *  R6  INCREMENT -USUALLY 1. ALSO USE CTO SAVE REG1 FOR FREEMAIN   *
                                   43 *  R7  LOOP TERMINATING VALUE -COLUMN 72 OF CARD IMAGE             *
                                   44 *  R8  INCREMENT OF 2 FOR LOOPING                                  *
                                   45 *  R9  LOOP TERMINATING VALUE                                      *
                                   46 *  R10 WORK REGISTER                                               *
                                   47 *  R11 WORK REGISTER                                               *
                                   48 *  R12 CALLING ROUTINE SAVE AREA ADDRESS                           *
                                   49 *  R13 THIS ROUTINE'S SAVE AREA ADDRESS & BASE REGISTER            *
                                   50 *  R14 RETURN ADDRESS FOR BRANCHES                                 *
                                   51 *  R15 WORK REGISTER                                               *
                                   52 *                                                                  *
                                   53 ********************************************************************
000000                             54 IEFUJV   CSECT
000000                             55         USING *,R15
```

A8.1-2

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 LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT
000000 47F0 F00C             0000C    56          B     *+12
000004 07C9C5C6E4D1E540              57          DC    AL1(7),CL7'IEFUJV'
00000C 90EC D00C             0000C    58          STM   R14,R12,12(R13)
000010 18CD                           59          LR    R12,R13
000012 0700                           60          CNOP  0,4
000014 41D0 F024             00024    61          LA    R13,*+16
000018 50D0 C008             00008    62          ST    R13,8(0,R12)
00001C 50C0 D004             00004    63          ST    R12,4(0,R13)
000020 47F0 F080             00080    64          B     *+96
000024                                65          USING *,R13
000024                                66          DS    18F
00006C 41F0 0000             00000    67          LA    R15,0
                                      68 *        L     R13,4(0,R13)      LOAD OLD SAVE AREA ADDR IN R13
000070 18DC                           69          LR    R13,R12           LOAD OLD SAVE AREA ADDR IN R13
000072 980C D014             00014    70          LM    R0,R12,20(R13)    RESTORE REGS 0 TO 12
000076 58E0 D00C             0000C    71          L     R14,12(0,R13)     RESTORE REG 14
00007A 92FF D00C       0000C          72          MVI   12(R13),255       SET RETURN FLAG
00007E 07FE                           73          BR    R14
000000                                74 R0       EQU   0
000001                                75 R1       EQU   1
000002                                76 R2       EQU   2
000003                                77 R3       EQU   3
000004                                78 R4       EQU   4
000005                                79 R5       EQU   5
000006                                80 R6       EQU   6
000007                                81 R7       EQU   7
000008                                82 R8       EQU   8
000009                                83 R9       EQU   9
00000A                                84 R10      EQU   10
00000B                                85 R11      EQU   11
00000C                                86 R12      EQU   12
00000D                                87 R13      EQU   13
00000E                                88 R14      EQU   14
00000F                                89 R15      EQU   15
000080 9824 1000             00000    90          LM    R2,R4,0(R1)     GET PARAMETER ADDRESSES
000084 4173 0047             00047    91          LA    R7,71(R3)       POINT R7 TO LAST COLUMN OF CARD
000088 4160 0001             00001    92          LA    R6,1            LOAD R6 WITH A USEFUL INCREMENT
00008C 9110 4000       00000          93          TM    0(R4),X'10'     TEST FOR JOB ENQUEUE
000090 4710 D418             0043C    94          BO    JOBENQ
000094 95D6 2023       00023          95          CLI   35(R2),C'D'
000098 4780 D414             00438    96          BE    EXIT
00009C 9120 2022       00022          97          TM    34(R2),X'20'
0000A0 4710 D414             00438    98          BO    EXIT
0000A4 9101 4000       00000          99          TM    0(R4),X'01'     TEST FOR JOB CARD
0000A8 4710 D098             000BC   100          BO    JOBCARD
0000AC 9102 4000       00000         101          TM    0(R4),X'02'     TEST FOR EXEC CARD
0000B0 4710 D294             002B8   102          BO    EXECARD
0000B4 9200 D013       00013         103          MVI   19(R13),X'00'   SET 'CONTINUE PROCESSING' CODE IN R15 LON
0000B8 47F0 D414             00438   104          B     EXIT
0000BC 1B44                          105 JOBCARD  SR    R4,R4
0000BE 4342 0020             00020   106          IC    R4,32(R2)       PLACE BRANCH CODE IN R4.
0000C2 47F4 D0A2             000C6   107          B     *+4(R4)
0000C6 47F0 D0CA             000EE   108          B     FIRST
0000CA 910F 2022       00022         109          TM    34(R2),X'0F'    HAVE WE TESTED ALL REQUIRED KEYWORDS
0000CE 4710 D410             00434   110          BO    FIVE
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  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                        F08APR70  12/20/71

0000D2 4153 0003            00003   111          LA    R5,3(R3)        SET R5 TO COLUMN 4 OF CONTINUE CARD
0000D6 9150 2022      00022         112          TM    34(R2),X'50'    TEST CONTN. CARD FOR CLASS?              71.223
0000DA 4710 D15E            00182   113          BO    AAE02           YES: BRANCH TO DO SO
0000DE 4155 0001            00001   114 LOOP1    LA    R5,1(R5)
0000E2 9540 5000      00000         115          CLI   0(R5),C' '      SEEK FIRST NON-BLANK CHARACTER
0000E6 4780 D0BA            000DE   116          BE    LOOP1
0000EA 47F0 D1BA            001DE   117          B     CONTINU
                                    118 *
                                    119 *
0000EE 1BAA                         120 FIRST    SR    R10,R10         ***
0000F0 5840 D5DC            00600   121 USERCHK  L     R4,USERTBL
0000F4 5870 D5E0            00604   122          L     R7,ENDTBL
0000F8 D207 2014 300F 00014 0000F   123          MVC   20(8,R2),15(R3) MOVE ACCT NO INTO USER ID FIELD
0000FE 5864 0000            00000   124 USER1    L     R6,0(R4)        LOAD R6 WITH LENGTH OF SECTION FIELD
000102 D500 4004 300F 00004 0000F   125          CLC   4(1,R4),15(R3)  COMPARE FIELDS
000108 4780 D0F6            0011A   126          BE    USERTEST
00010C 4146 4000            00000   127          LA    R4,0(R6,R4)     INCREMENT R4 TO BEYOND USER FIELD
000110 1547                         128          CLR   R4,R7           FINISHED LOOKUP?
000112 4740 D0DA            000FE   129          BL    USER1           NO: CONTINUE SCAN
000116 47F0 D3A2            003C6   130          B     EXIT7
00011A 8860 0002            00002   131 USERTEST SRL   R6,2
00011E 4144 0004            00004   132 USER2    LA    R4,4(R4)
000122 D502 4000 300F 00000 0000F   133          CLC   0(3,R4),15(R3)
000128 4780 D110            00134   134          BE    PLIM
00012C 4660 D0FA            0011E   135          BCT   R6,USER2
000130 47F0 D3A2            003C6   136          B     EXIT7
000134 D703 2020 2020 00020 00020   137 PLIM     XC    32(4,R2),32(R2)       ZERO COMMN. FIELD                  71.278
00013A D200 2021 4003 00021 00003   138          MVC   33(1,R2),3(R4)        STORE LIMIT PRTY IN COMM AREA
000140 4170 3047            00047   139          LA    R7,71(0,R3)           RESET R7 TO POINT TO CC72
000144 4160 0001            00001   140          LA    R6,1                  RESET R6 FOR MAINLINE PROGRAM
000148 D502 3002 D5A2 00002 005C6   141          CLC       2(3,R3),DJR
00014E 4770 D136            0015A   142          BNE   AAE008
000152 9620 2022      00022         143          OI    34(R2),X'20'
000156 47F0 D414            00438   144          B     EXIT
00015A 4153 0018            00018   145 AAE008   LA    R5,24(R3)             POINT R5 TO CC25 OF CARD
00015E 954B 5000      00000         146 LOOP     CLI   0(R5),X'4B'           SEARCH FOR A .
000162 4740 D3FC            00420   147          BL    TWO                   BLANK FOUND, ASSUME CLASS A
000166 956B 5000      00000         148          CLI   0(R5),X'6B'           SEARCH FOR A COMMA
00016A 4780 D152            00176   149          BE    CLASS                 , FOUND . SEARCH FOR CLASS KEY
00016E 4155 0001            00001   150          LA    R5,1(R5)
000172 47F0 D13A            0015E   151          B     LOOP
                                    152 *
                                    153 * START SCAN FOR CLASS. AT THIS POINT R5 POINTS TO THE COMMA AFTER
                                    154 * THE PROGRAMMER'S NAME
                                    155 *
000176 4155 0001            00001   156 CLASS    LA    R5,1(R5)
00017A 9540 5000      00000         157          CLI   0(R5),X'40'           DOES BLANK FOLLOW COMMA
00017E 4780 D404            00428   158          BE    THREE                 YES. ASSUME 'A' AND A CONTN CRD
000182 1845                         159 AAE02    LR    R4,R5                 SAVE RECORD OF PRESENT POSN.
000184 D505 5000 D571 00000 00595   160 LOOP2    CLC   0(6,R5),CLASSX
00018A 4780 D4D8            004FC   161          BE    MSGCLASS              TEST IF KEYWORD IS MSGCLASS      71.232
                                    162 *                                     OR CLASS                         71.232
00018E 8756 D160            00184   163 AAE009   BXLE  R5,R6,LOOP2
000192 92C1 2023      00023         164          MVI   35(R2),C'A'
000196 9650 2022      00022         165          OI    34(R2),X'50'          FLAG TO SCAN FOR CLASS ON NEXT   71.223
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  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                       F08APR70  12/20/71

                                    166 *                                                                   CARD
00019A 47F0 D196            001BA   167           B     TAG2                  NO CLASS FOUND,ASSUME CLASS A
00019E D200 2023 5006 00023 00006   168 FOUND     MVC   35(1,R2),6(R5)        MOVE CLASS INTO COMMUNICATN AREA
0001A4 94EF 2022      00022         169           NI    34(R2),X'EF'          INDICATE THAT CLASS HAS BEEN      71.223
                                    170 *                                     FOUND ON A CONTINUE CARD
0001A8 95D6 5006      00006         171 OCLASS    CLI   6(R5),C'O'
0001AC 4780 D414            00438   172           BE    EXIT
                                    173 *
                                    174 *                  CHECK IF CLASS IS THE FIRST PARM AFTER PROGRAMMER
                                    175 * NAME. IF NOT RESET R5 TO POINT TO COLUMN IMMEDIATELY AFTER PROGRAMMER
                                    176 * NAME.
                                    177 *
0001B0 1545                         178           CLR   R4,R5            ARE R4 AND R5 EQUAL
0001B2 4770 D196            001BA   179           BNE   TAG2             NO. CLASS IS NOT 1ST KEYWORD PARAMETER
0001B6 4145 0008            00008   180           LA    R4,8(R5)         YES.SET R4 TWO COLUMNS AFTER CLASS
0001BA 1B46                         181 TAG2      SR    R4,R6
0001BC 1854                         182           LR    R5,R4            SET R5 TO , OR BLANK AFTER PREVIOUS FIELD
                                    183 *                                (PROGRAMMER OR CLASS)
0001BE 91FF 2020      00020         184           TM    32(R2),X'FF'              IS THIS FIRST JOB CARD?
0001C2 4780 D1AA            001CE   185           BZ    LOOP4                     YES.  SKIP NEXT TEST
0001C6 9140 2022      00022         186           TM    34(R2),X'40'     HAVE WE BEEN TESTING CONT. CARD FOR CLASS
0001CA 4710 D0BA            000DE   187           BO    LOOP1           YES: SO BRANCH WHERE WE CAME FROM
0001CE 956B 5000      00000         188 LOOP4     CLI   0(R5),X'6B'      IS FIRST CHARACTER , OR BLANK
0001D2 4740 D4AC            004D0   189           BL    AAE007           ITS A BLANK. TEST FOR TIME
0001D6 4770 D410            00434   190           BNE   FIVE             NOT , SO ASSUME JCL ERROR
0001DA 4155 0001            00001   191           LA    R5,1(R5)         PREVIOUS COLUMN MUST HAVE BEEN A ,
0001DE 9540 5000      00000         192 CONTINU   CLI   0(R5),X'40'      IS THIS COLUMN A BLANK
0001E2 4770 D1C6            001EA   193           BNE   TM
0001E6 47F0 D40C            00430   194           B     FOUR
0001EA 9101 2022      00022         195 TM        TM    34(R2),X'01'     HAVE I ALREADY FOUND PRTY KEYWORD
0001EE 4780 D1E2            00206   196           BZ    PRTY                      :NO
0001F2 9102 2022      00022         197           TM    34(R2),X'02'     HAVE I ALREADY FOUND REGION KEYWORD
0001F6 4780 D20C            00230   198           BZ    REGION                    :NO
0001FA 9104 2022      00022         199           TM    34(R2),X'04'     HAVE I ALREADY FOUND TIME KEYWORD
0001FE 4780 D232            00256   200           BZ    TIME                      :NO
                                    201 *         IF ROLL IS INCLUDED IN THE SYSTEM THE FOLLOWING INSTRUCTIONS *
                                    202 *         SHOULD BE INCLUDED TO TEST FOR THE ROLL KEYWORD ON THE       *
                                    203 *         JOBCARD.                                                     *
                                    204 *         TM    34(R2),X'08'     HAVE I ALREADY FOUND ROLL KEYWORD
                                    205 *         BZ    ROLL                      :NO
                                    206 *                                         :YES- SO ALL KEYWORDS HAVE BEEN FOUND
000202 47F0 D410            00434   207           B     FIVE
                                    208 *
                                    209 *
000206 D504 5000 D577 00000 0059B   210 PRTY      CLC   0(5,R5),PRTYX    IS KEYWORD PRTY
00020C 4770 D20C            00230   211           BNE   REGION           NO. TRY REGION COMPARE
000210 9601 2022      00022         212           OI    34(R2),X'01'     SET 'PRIORITY FOUND' FLAG
000214 4155 0005            00005   213           LA    R5,5(R5)         SET R5 TO START OF PRIORITY DIGITS
000218 45E0 D346            0036A   214           BAL   R14,CHKDGTS
00021C 59A0 D59C            005C0   215           C     R10,MAXPRTY
000220 4740 D1AA            001CE   216           BL    LOOP4            CONTINUE SCAN IF PRIORITY IS VALID
                                    217 *
                                    218 * ID PRTY ON CARD EXCEEDS EXPECTED PRTY FOR CLASS, CHECK AGAINST
                                    219 * SECTION CODE
                                    220 *
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  LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                F08APR70  12/20/71

000224 44A0 D36E             00392   221          EX    R10,CLI
000228 4740 D372             00396   222          BL    EXIT1          IF SECTION PRIORITY IS LOWER THAN REQUEST
                                     223 *                             THEN CANCEL JOB
00022C 47F0 D1AA             001CE   224          B     LOOP4          CONTINUE SCAN FOR KEYWORDS
                                     225 *
                                     226 *
000230 D506 5000 D57C 00000 005A0   227 REGION   CLC   0(7,R5),REGX   IS IT REGION KEYWORD
000236 4770 D232             00256   228          BNE   TIME           NO: BRANCH TO TIME KEYWORD TEST
00023A 9602 2022       00022         229          OI    34(R2),X'02'   YES: SET 'REGION FOUND' FLAG
00023E 4155 0007             00007   230          LA    R5,7(R5)       SET R5 TO FIRST DIGIT OF REGION
000242 45E0 D346             0036A   231          BAL   R14,CHKDGTS
000246 45E0 D478             0049C   232          BAL   R14,AAE005
00024A 4720 D37A             0039E   233          BH    EXIT2          CANCEL IF REQUESTING TOO MUCH CORE
00024E 4155 0001             00001   234          LA    R5,1(R5)      SPACE OVER THE K OF REGION
000252 47F0 D1AA             001CE   235          B     LOOP4          CONTINUE KEYWORD SCAN
                                     236 *
                                     237 *
                                     238 *        CHECK THE TIME VALUE SPECIFIED
                                     239 *
000256 D504 5000 D583 00000 005A7   240 TIME     CLC   0(5,R5),TIMEX  IS IT TIME KEYWORD
00025C 4770 D27C             002A0   241          BNE   AAE1           SCAN FOR NEXT COMMA OR BLANK
000260 4155 0005             00005   242          LA    R5,5(R5)       SET R5 TO FIRST COLUMN AFTER TIME=
000264 9604 2022       00022         243          OI    34(R2),X'04'   SET 'TIME FOUND' FLAG
000268 954D 5000       00000         244          CLI   0(R5),C'('      DO WE HAVE TIME=(,SEC) OR TIME=(MIN,SEC)
00026C 4770 D250             00274   245          BNE   MINUTES        NO: TEST THE MINUTES
000270 4155 0001             00001   246          LA    R5,1(R5)       YES: SO INCREMENT R5 BEYOND BRACKET
000274 45E0 D346             0036A   247 MINUTES  BAL   R14,CHKDGTS
000278 45E0 D470             00494   248          BAL   R14,AAE006
                                     249 *        C     R10,MAXMINS
00027C 4720 D382             003A6   250          BH    EXIT3          CANCEL IF REQUESTED TIME EXCEEDS LIMIT
000280 95F0 5001       00001         251          CLI   1(R5),X'F0'    IS CHARACTER AFTER R5 AN INTEGER
000284 47A0 D268             0028C   252          BC    10,LOOP6       YES: SO WE ARE POINTING TO THE COMMA
                                     253 *                             BEFORE THE SECONDS DIGITS. BRANCH
000288 47F0 D1AA             001CE   254          B     LOOP4          NO: SO CONTINUE KEYWORD SCAN
00028C 4155 0001             00001   255 LOOP6    LA    R5,1(R5)       INCREMENT R5 BY 1
000290 955D 5000       00000         256          CLI   0(R5),C')'     HAVE WE REACHED CLOSING BRACKET
000294 4770 D268             0028C   257          BNE   LOOP6          NO: TRY NEXT ONE
000298 4155 0001             00001   258          LA    R5,1(R5)       YES: POINT R5 TO COLUMN AFTER )
00029C 47F0 D1AA             001CE   259          B     LOOP4          CONTINUE KEYWORD SCAN
0002A0 4155 0001             00001   260 AAE1     LA    R5,1(R5)       INCREMENT R5 ALONG CARD IMAGE
0002A4 9568 5000       00000         261          CLI   0(R5),C','      DOES R5 POINT TO A COMMA
0002A8 4780 D1AA             001CE   262          BE    LOOP4          COMMA FOUND: CONTINUE KEYWORD SCAN
0002AC 9540 5000       00000         263          CLI   0(R5),C' '     IS IT A BLANK
0002B0 4780 D4AC             004D0   264          BE    AAE007
0002B4 47F0 D27C             002A0   265          B     AAE1           CONTINUE SEARCHING FOR COMMA
                                     266 *
                                     267 *
                                     268 *        CHECK EXEC CARD
                                     269 *
0002B8 4173 0048             00048   270 EXECARD  LA    R7,72(R3)          POINT R7 TO END OF CARD
0002BC 4153 0002             00002   271          LA    R5,2(R3)
0002C0 9180 2022       00022         272          TM    34(R2),X'80'       TEST EXEC CONTINUE FLAG
0002C4 4710 D2CE             002F2   273          BO    KEYSCAN            CONT. CARD SO KEYSCAN IMMEDIATELY
0002C8 4155 0001             00001   274 EXECLOOP LA    R5,1(R5)
0002CC 1957                          275          CR    R5,R7
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  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                                          F08APR70  12/20/71

0002CE 4740 D2B6            002DA   276           BC    4,COMMA
0002D2 947F 2022      00022         277           NI    34(R2),X'7F'          ZERO ' EXEC CONTINUE ' FLAG      71.223
0002D6 47F0 D414            00438   278           B     EXIT
0002DA 956B 5000      00000         279 COMMA     CLI   0(R5),C','
0002DE 4770 D2A4            002C8   280           BNE   EXECLOOP
0002E2 9540 5001      00001         281 BLANK     CLI   1(R5),C' '            DOES BLANK FOLLOW COMMA
0002E6 4770 D2CE            002F2   282           BNE   KEYSCAN               NO; SO KEYWORD SCAN
0002EA 9680 2022      00022         283           OI    34(R2),X'80'          YES; SO SET CONTINUE FLAG AND EXIT
0002EE 47F0 D414            00438   284           B     EXIT
0002F2 4155 0000            00000   285 KEYSCAN   LA    R5,0(R5)
0002F6 D505 5001 D57C 00001 005A0   286           CLC   1(6,R5),REGX
0002FC 4780 D320            00344   287           BE    TESTREG
000300 D503 5001 D583 00001 005A7   288           CLC   1(4,R5),TIMEX
000306 4770 D2A4            002C8   289           BNE   EXECLOOP
00030A 4155 0001            00001   290 XTIME     LA    R5,1(R5)
00030E 1975                         291           CR    R7,R5
000310 4740 D414            00438   292           BC    4,EXIT
000314 957E 5000      00000         293           CLI   0(R5),C'='
000318 4770 D2E6            0030A   294           BNE   XTIME
00031C 4155 0001            00001   295           LA    R5,1(R5)
000320 954D 5000      00000         296           CLI   0(R5),C'('
000324 4770 D310            00334   297           BNE   XMINS
000328 4155 0001            00001   298           LA    R5,1(R5)              SPACE OVER BRACKET
00032C 95F0 5000      00000         299           CLI   0(R5),C'0'            IS IT A NUMBER?
000330 4740 D2A4            002C8   300           BL    EXECLOOP              NO; CONTINUE KEYWORD SCAN
000334 45E0 D346            0036A   301 XMINS     BAL   R14,CHKDGTS
000338 45E0 D470            00494   302           BAL   R14,AAE006          BR TO CHECK CLASS AGAINST STEP TIME
                                    303 *         C     R10,MAXMINS             DO MORE DETAILED CKECK ON STEP TIME
00033C 4720 D382            003A6   304           BH    EXIT3
000340 47F0 D2A4            002C8   305           B     EXECLOOP              CONTINUE SCAN
000344 4155 0001            00001   306 TESTREG   LA    R5,1(R5)
000348 1975                         307           CR    R7,R5
00034A 4740 D414            00438   308           BC    4,EXIT
00034E 957E 5000      00000         309           CLI   0(R5),C'='
000352 4770 D320            00344   310           BNE   TESTREG
000356 4155 0001            00001   311           LA    R5,1(R5)
00035A 45E0 D346            0036A   312           BAL   R14,CHKDGTS
00035E 45E0 D478            0049C   313           BAL   R14,AAE005
000362 4720 D37A            0039E   314           BH    EXIT2
000366 47F0 D2A4            002C8   315           B     EXECLOOP
                                    316 *         IF BLANK FOLLOWS COMMA EXPECT A CONTINUATION CARD
                                    317 *         THE APPROPRIATE ACTION MUST BE TAKEN
                                    318 *
                                    319 *
                                    320 *
00036A 1BAA                         321 CHKDGTS   SR    R10,R10
00036C 4160 0001            00001   322           LA    R6,1                SET R6 TO CONVENIENT INCREMENT
000370 95F0 5000      00000         323 NEXTDGT   CLI   0(R5),X'F0'         DOES THIS BYTE CORRESPOND TO AN INTEGER
000374 074E                         324           BCR   4,R14               NO: END DIGIT CHECK, BRANCH BACK
000376 95F9 5000      00000         325           CLI   0(R5),X'F9'         YES POSSIBLY: CHECK IF ITS OVER X'F9'
00037A 4720 D414            00438   326           BC    2,EXIT              YES: ITS OVER ,SO CANCEL
00037E 43B5 0000            00000   327           IC    R11,0(R5)           NO: INSERT BONA FIDE DIGIT BYTE IN R11
000382 89B0 001C            0001C   328           SLL   R11,28              REMOVE ZONE FROM DIGIT BYTE
000386 8DA0 0004            00004   329           SLDL  R10,4               MOVE THE NUMERIC PART INTO R10
00038A 8756 D34C            00370   330           BXLE  R5,R6,NEXTDGT       MOVE POINTER TO NEXT COLUMN ON CARD
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 LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT
00038E 47F0 D414            00438   331          B     EXIT           TOO MANY DIGITS- ERROR
                                    332 *
                                    333 *
                                    334 *
000392 9500 2021      00021         335 CLI      CLI   33(R2),X'00'
000396 5840 D554            00578   336 EXIT1    L     R4,ADDM1
00039A 47F0 D3BA            003DE   337          B     PRINT
00039E 5840 D558            0057C   338 EXIT2    L     R4,ADDM2
0003A2 47F0 D3BA            003DE   339          B     PRINT
0003A6 5840 D55C            00580   340 EXIT3    L     R4,ADDM3
0003AA 47F0 D3BA            003DE   341          B     PRINT
0003AE 5840 D560            00584   342 EXIT4    L     R4,ADDM4
0003B2 47F0 D3BA            003DE   343          B     PRINT
0003B6 5840 D564            00588   344 EXIT5    L     R4,ADDM5
0003BA 47F0 D3BA            003DE   345          B     PRINT
0003BE 5840 D568            0058C   346 EXIT6    L     R4,ADDM6
0003C2 47F0 D3BA            003DE   347          B     PRINT
0003C6 4140 D52A            0054E   348 EXIT7    LA    R4,MESS7
0003CA 47F0 D3BA            003DE   349          B     PRINT
0003CE 4140 D534            00558   350 EXIT8    LA    R4,MESS8
0003D2 47F0 D3BA            003DE   351          B     PRINT
0003D6 4140 D53E            00562   352 EXIT9    LA    R4,MESS9
0003DA 47F0 D3BA            003DE   353          B     PRINT
                                    354 *
                                    355 PRINT    GETMAIN R,LV=40
0003E8 1861                         359          LR    R6,R1          SAVE REGISTER1
0003EA D21D 1000 D5B4 00000 005D8   360          MVC   0(30,R1),WTOLIST
0003F0 D207 1006 2000 00006 00000   361          MVC   6(8,R1),0(R2)          MOVE IN JOBNME
0003F6 D209 1013 4000 00013 00000   362          MVC   19(10,R1),0(R4)        MOVE IN SMF MESSAGE
0003FC D207 3048 D5AC 00048 005D0   363          MVC   72(8,R3),ERR           MARK CARD IMAGE
                                    364          WTO   MF=(E,(R1))
000406 1816                         367          LR    R1,R6          RESTORE REGISTER 1
                                    368          FREEMAIN R,LV=40,A=(R1)
                                    373 *
000414 9204 C013      00013         374          MVI   19(R12),X'04'
000418 41F0 0004            00004   375          LA    R15,4
00041C 47F0 D414            00438   376 ONE      B     EXIT
000420 92C1 2023      00023         377 TWO      MVI   35(R2),C'A'
000424 47F0 D4AC            004D0   378          B     AAE007
000428 92C1 2023      00023         379 THREE    MVI   35(R2),C'A'
00042C 9650 2022      00022         380          OI    34(R2),X'50'  FLAG:'CLASS A ASSUMED-TEST CONTN CARD'     71.223
000430 9204 2020      00020         381 FOUR     MVI   32(R2),X'04'
000434 9200 D013      00013         382 FIVE     MVI   19(R13),X'00'
000438 47F0 D04C            0004C   383 EXIT     B     76(0,R13)
00043C D50F 3002 D610 00002 00634   384 JOBENQ   CLC   2(16,R3),BLANKO        DOES AN ID CARD EXIST?           71.313
000442 4780 D42C            00450   385          BE    AEIDNO               YES                              71.313
000446 D703 2020 2020 00020 00020   386          XC    32(4,R2),32(R2)      NO. BLANK OUT USER COMMN. AREA   71.313
00044C 47F0 D048            00048   387          B     72(0,R13)            AND EXIT                         71.313
000450 4150 3049            00049   388 AEIDNO   LA    R5,73(0,R3)          POINT R5 TO CC 74 OF ID CARD     71.313
000454 4160 0007            00007   389          LA    R6,7                                                  71.313
000458 95F0 5000      00000         390 INTGR    CLI   0(R5),X'F0'          IS IT A VALID INTEGER?           71.313
00045C 4720 D440            00464   391          BH    NEXT1                YES                              71.313
000460 92F0 5000      00000         392          MVI   0(R5),X'F0'          NO. INSERT EBCDIC ZERO           71.313
000464 4155 0001            00001   393 NEXT1    LA    R5,1(R5)             INCREMENT POINTER                71.313
000468 4660 D434            00458   394          BCT   R6,INTGR             LOOP BACK FOR NEXT CHARACTER     71.313
```

```
  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  F08APR70  12/20/71

00046C F236 2020 3049 00020 00049   395          PACK  32(4,R2),73(7,R3)       PACK ID INTO USER COMMN. FIELD   71.313
000472 94FC 2024      00024         396          NI    36(R2),X'FC'            AND IN PACKED DECIMAL SIGN       71.313
000476 D21B D5EC 2008 00610 00008   397          MVC   RECORD(28),8(R2)        MOVE IN PART OF SMF RECORD 128   71.313
00047C D207 D608 2000 0062C 00000   398          MVC   RECORD+28(8),0(R2)      MOVE IN REMAINDER OF SMF RECORD  71.313
000482 4160 D5E6            0060A   399          LA    R6,SMFREC               LOAD SMF RECORD ADDRESS          71.313
                                    400          SMFWTM (6)                    WRITE SMF RECORD TYPE 128        71.313
00048A D703 2020 2020 00020 00020   403          XC    32(4,R2),32(R2)                                          71.313
000490 47F0 D048            00048   404          B     72(0,R13)               EXIT                             71.313
000494 5840 D5D4            005F8   405 AAE006   L     R4,TIMETBL
000498 47F0 D47C            004A0   406          B     AAE004
00049C 5840 D5D8            005FC   407 AAE005   L     R4,REGTBL
0004A0 1B66                         408 AAE004   SR    R6,R6
0004A2 5070 D5A8            005CC   409          ST    R7,SAVE7          SAVE R7 CONTENTS
0004A6 4372 0023            00023   410          IC    R7,35(R2)
0004AA 8970 001A            0001A   411          SLL   R7,26
0004AE 8D60 0006            00006   412          SLDL  R6,6
0004B2 95D1 2023      00023         413          CLI   35(R2),C'J'
0004B6 4740 D49E            004C2   414          BL    AAE003
0004BA 1B77                         415          SR    R7,R7
0004BC 4170 0007            00007   416          LA    R7,7
0004C0 1B67                         417          SR    R6,R7
0004C2 8960 0001            00001   418 AAE003   SLL   R6,1
0004C6 49A6 4000            00000   419          CH    R10,0(R6,R4)
0004CA 5870 D5A8            005CC   420          L     R7,SAVE7          RESTORE R7
0004CE 07FE                         421          BR    R14
                                    422 *
                                    423 *        THIS SECTION ENSURES THAT TIME HAS BEEN SPECIFIED ON THE
                                    424 *        JOB CARD. IF NOT, TIME IS INSERTED IF POSSIBLE IN THE CARD
                                    425 *        IMAGE FOR CLASS=A. FOR OTHER CLASSES THE JOB IS CANCELLED.
                                    426 *        ON ENTRY TO THIS SECTION R5 POINTS TO THE BLANK COLUMN AFTER
                                    427 *        THE LAST KEYWORD SCANNED. R7 POINTS TO COLUMN 72
0004D0 9104 2022      00022         428 AAE007   TM    34(R2),X'04'            HAS TIME KEYWORD BEEN FOUND?
0004D4 4710 D04C            0004C   429          BO    76(0,R13)               YES: EXIT NORMALLY
0004D8 95C1 2023      00023         430          CLI   35(R2),C'A'             IS IT CLASS A?
0004DC 4770 D3AA            003CE   431          BNE   EXIT8                   NO: EXIT TO FAIL
0004E0 4A50 D550            00574   432          AH    R5,SEVEN                YES, TEST IF ROOM TO INSERT
0004E4 1957                         433          CR    R5,R7                   TIME KEYWORD ON CARD IMAGE
0004E6 4740 D4CA            004EE   434          BL    TIMEADD                 THERE'S ROOM
0004EA 47F0 D3B2            003D6   435          B     EXIT9                   NO ROOM - TOUGH
0004EE 4B50 D550            00574   436 TIMEADD  SH    R5,SEVEN                RESET R5
0004F2 D206 5000 D548 00000 0056C   437          MVC   0(7,R5),TIM             MOVE TIME KEYWORD
0004F8 47F0 D04C            0004C   438          B     76(0,R13)               EXIT NORMALLY
                                    439 *                                                                  71.232
                                    440 *        TEST THAT WHEN THE CHARACTERS 'CLASS' ARE FOUND THAT THEY  71.232
                                    441 *        DO NOT BELONG TO 'MSGCLASS', IF SO CONTINUE SCANNING      71.232
                                    442 *                                                                  71.232
0004FC 1B56                         443 MSGCLASS SR    R5,R6                                               71.232
0004FE 95C7 5000      00000         444          CLI   0(R5),C'G'              DOES A G PRECEDE CLASS?          71.232
000502 4770 D4E8            0050C   445          BNE   AAE010                  NO , SO BRANCH TO FOUND          71.232
000506 1A56                         446          AR    R5,R6                   RESET R5 TO PREVIOUS VALUE       71.232
000508 47F0 D16A            0018E   447          B     AAE009                  BRANCH TO CONTINUE SCAN LOOP     71.232
00050C 1A56                         448 AAE010   AR    R5,R6                   RESET R5                         71.232
00050E 47F0 D17A            0019E   449          B     FOUND                   BRANCH TO FOUND AT LAST          71.232
000512 F0F160D7D9E3E840             450 MESS1    DC    C'01-PRTY   '
00051C F0F260D9C5C7C9D6             451 MESS2    DC    C'02-REGION '
```

```
000526 F0F360E3C9D4C540            452 MESS3     DC C'03-TIME   '
000530 F0F46040D9D6D3D3            453 MESS4     DC C'04- ROLL  '
00053A F0F56040C5E7C5C3            454 MESS5     DC C'05- EXEC  '
000544 F0F660E2C5C3E340            455 MESS6     DC C'06-SECT   '
00054E F0F76040C1C3C3E3            456 MESS7     DC   C'07- ACCT N'
000558 F0F860D5D640E3C9            457 MESS8    DC    C'08-NO TIME'
000562 F0F960D5D640D9D6            458 MESS9     DC   C'09-NO ROOM'
00056C 6BE3C9D4C57EF5              459 TIM      DC    C',TIME=5'
000573 00
000574 0007                        460 SEVEN    DC    H'7'
000576 0000
000578 00000512                    461 ADDM1    DC    A(MESS1)
00057C 0000051C                    462 ADDM2    DC    A(MESS2)
000580 00000526                    463 ADDM3    DC    A(MESS3)
000584 00000530                    464 ADDM4    DC    A(MESS4)
000588 0000053A                    465 ADDM5    DC    A(MESS5)
00058C 00000544                    466 ADDM6    DC    A(MESS6)
000590 C4D7D9E3E8                  467 DPRTYX   DC    C'DPRTY'
000595 C3D3C1E2E27E                468 CLASSX   DC    C'CLASS='
00059B D7D9E3E87E                  469 PRTYX    DC    C'PRTY='
0005A0 D9C5C7C9D6D57E              470 REGX     DC    C'REGION='
0005A7 E3C9D4C57E                  471 TIMEX    DC    C'TIME='
0005AC D9D6D3D37E                  472 ROLLX    DC    C'ROLL='
0005B1 000000
0005B4 00000002                    473 MAXMINS  DC    F'2'
0005B8 00000064                    474 MAXREGA  DC    F'100'
0005BC 000000C8                    475 MAXREG   DC    F'00000200'
0005C0 00000004                    476 MAXPRTY  DC    F'4'
0005C4 C3F1                        477 AMC      DC    C'C1'
0005C6 C4D1D9                      478 DJR      DC    C'DJR'
0005CC                             479 SAVE7    DS    F
0005D0 5C5C5CC5D9D9D6D9            480 ERR      DC    C'***ERROR'            MARK CARD IMAGE
                                   481 WTOLIST  WTO   '**        **SMF        ',MF=L

0005F5 000000
0005F8 00000000                    487 TIMETBL  DC    V(TIMETABL)
0005FC 00000000                    488 REGTBL   DC    V(REGTABL)
000600 00000000                    489 USERTBL  DC    V(USERTABL)
000604 00000000                    490 ENDTBL   DC    V(ENDTABL)
000608                             491          DS    1H                                    71.278
00060A                             492 SMFREC   EQU   *                                     71.313
00060A 002A00000080                493 HEADER   DC    X'002A00000080'                       71.313
000610                             494 RECORD   DS    CL36                                  71.313
000634 4040404040404040            495 BLANKO   DC    16C' '                                71.313
                                   496          END
```

```
SYMBOL    TYPE ID  ADDR   LENGTH LD ID

UJVTABLE  SD   01 000000 000164
USERTABL  LD      000000          01
ENDTABL   LD      000124          01
REGTABL   LD      000124          01
TIMETABL  LD      000144          01
```

```
  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT

000000                              1 UJVTABLE CSECT
000000                              2          DS    0F
                                    3          ENTRY USERTABL
                                    4          ENTRY ENDTABL
                                    5          ENTRY REGTABL
                                    6          ENTRY TIMETABL
000000 00000028                     7 USERTABL DC    F'40'
000004 C1F0F006                     8          DC    C'A00',X'06'
000008 C1F1C106                     9          DC    C'A1A',X'06'
00000C C1F1C206                    10          DC    C'A1B',X'06'
000010 C1F1C306                    11          DC    C'A1C',X'06'
000014 C1F2C106                    12          DC    C'A2A',X'06'
000018 C1F2C206                    13          DC    C'A2B',X'06'
00001C C1F3C106                    14          DC    C'A3A',X'06'
000020 C1F4C106                    15          DC    C'A4A',X'06'
000024 C1F5C106                    16          DC    C'A5A',X'06'
000028 00000018                    17          DC     F'24'
00002C C3F0F012                    18          DC    C'C00',X'12'
000030 C3F1C109                    19          DC    C'C1A',X'09'
000034 C3F1C209                    20          DC    C'C1B',X'09'
000038 C3F1C309                    21          DC    C'C1C',X'09'
00003C C3F1C409                    22          DC    C'C1D',X'09'
000040 00000018                    23          DC     F'24'
000044 C5F0F005                    24          DC    C'E00',X'05'
000048 C5F1C105                    25          DC    C'E1A',X'05'
00004C C5F1C205                    26          DC    C'E1B',X'05'
000050 C5F1C305                    27          DC    C'E1C',X'05'
000054 C5F2C105                    28          DC    C'E2A',X'05'
000058 00000010                    29          DC     F'16'
00005C C7F0F005                    30          DC    C'G00',X'05'
000060 C7F1C105                    31          DC    C'G1A',X'05'
000064 C7F1C205                    32          DC    C'G1B',X'05'
000068 00000018                    33          DC     F'24'
00006C C8F0F005                    34          DC    C'H00',X'05'
000070 C8F1C105                    35          DC    C'H1A',X'05'
000074 C8F1C205                    36          DC    C'H1B',X'05'
000078 C8F1C305                    37          DC    C'H1C',X'05'
00007C C8F1C405                    38          DC    C'H1D',X'05'
000080 00000018                    39          DC     F'24'
000084 C9F0F005                    40          DC    C'I00',X'05'
000088 C9F1C105                    41          DC    C'I1A',X'05'
00008C C9F1C205                    42          DC    C'I1B',X'05'
000090 C9F1C305                    43          DC    C'I1C',X'05'
000094 C9F1C405                    44          DC    C'I1D',X'05'
000098 00000010                    45          DC     F'16'
00009C D1F0F005                    46          DC    C'J00',X'05'
0000A0 D1F1C105                    47          DC    C'J1A',X'05'
0000A4 D1F1C205                    48          DC    C'J1B',X'05'
0000A8 00000018                    49          DC     F'24'
0000AC D4F0F005                    50          DC    C'M00',X'05'
0000B0 D4F1C105                    51          DC    C'M1A',X'05'
0000B4 D4F1C205                    52          DC    C'M1B',X'05'
0000B8 D4F1C305                    53          DC    C'M1C',X'05'
0000BC D4F2C105                    54          DC    C'M2A',X'05'
0000C0 00000018                    55          DC     F'24'
```

```
 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT
0000C4 D6F0F005                    56           DC    C'000',X'05'
0000C8 D6F1C105                    57           DC    C'01A',X'05'
0000CC D6F1C205                    58           DC    C'01B',X'05'
0000D0 D6F1C305                    59           DC    C'01C',X'05'
0000D4 D6F1C405                    60           DC    C'01D',X'05'
0000D8 00000014                    61           DC     F'20'
0000DC D7F0F005                    62           DC    C'P00',X'05'
0000E0 D7F1C105                    63           DC    C'P1A',X'05'
0000E4 D7F1C205                    64           DC    C'P1B',X'05'
0000E8 D7F1C305                    65           DC    C'P1C',X'05'
0000EC 00000014                    66           DC     F'20'
0000F0 E3F1C105                    67           DC    C'T1A',X'05'
0000F4 E3F1C205                    68           DC    C'T1B',X'05'
0000F8 E3F2C105                    69           DC    C'T2A',X'05'
0000FC E3F2C205                    70           DC    C'T2B',X'05'
000100 00000024                    71           DC     F'36'
000104 E7F1C105                    72           DC    C'X1A',X'05'
000108 E7F1C205                    73           DC    C'X1B',X'05'
00010C E7F1C305                    74           DC    C'X1C',X'05'
000110 E7F1C405                    75           DC    C'X1D',X'05'
000114 E7F1C505                    76           DC    C'X1E',X'05'
000118 E7F2C105                    77           DC    C'X2A',X'05'
00011C E7F2C205                    78           DC    C'X2B',X'05'
000120 E7F3C106                    79           DC    C'X3A',X'06'
000124                             80 ENDTABL   EQU   *
000124 0000                        81 REGTABL   DC    X'0000'
000126 0100                        82           DC    X'0100'          A
000128 0200                        83           DC    X'0200'          B
00012A 0100                        84           DC    X'0100'          C
00012C 0100                        85           DC    X'0100'          D
00012E 0100                        86           DC    X'0100'          E
000130 0052                        87           DC    X'0052'          F
000132 0100                        88           DC    X'0100'          G
000134 0100                        89           DC    X'0100'          H
000136 0200                        90           DC    X'0200'          I
000138 0380                        91           DC    X'0380'          J
00013A 0400                        92           DC    X'0400'          K
00013C 0200                        93           DC    X'0200'          L
00013E 0400                        94           DC    X'0400'          M
000140 0100                        95           DC    X'0100'          N
000142 0100                        96           DC    X'0100'          O
000144 0000                        97 TIMETABL  DC    X'0000'
000146 0005                        98           DC    X'0005'          A
000148 0012                        99           DC    X'0012'          B
00014A 0005                       100           DC    X'0005'          C
00014C 0005                       101           DC    X'0005'          D
00014E 0005                       102           DC    X'0005'          E
000150 0005                       103           DC    X'0005'          F
000152 0005                       104           DC    X'0005'          G
000154 0005                       105           DC    X'0005'          H
000156 0012                       106           DC    X'0012'          I
000158 0012                       107           DC    X'0012'          J
00015A 0012                       108           DC    X'0012'          K
00015C 0025                       109           DC    X'0025'          L
00015E 7999                       110           DC    X'7999'
```

```
  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT
000160 0005                       111          DC    X'0005'              N
000162 0005                       112          DC    X'0005'              O
                                  113          END
```

```
LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                F08APR70  12/20/71
                                    1 ************************************************************************
                                    2 *        IEFUJI - JOB INITIATION EXIT                                  *
                                    3 *                                                                      *
                                    4 *        IEFUJI RECEIVES CONTROL JUST BEFORE EACH JOB IS               *
                                    5 *        INITIATED. IT OBTAINS IN SQS THE SPECIAL AAEC AREA FOR THE    *
                                    6 *        INITIATOR IF THE LATTER HAS NOT ALREADY BEEN ALLOCATED IT.    *
                                    7 *        IT THEN STORES IN THAT AREA INFORMATION PERTINENT TO THE       *
                                    8 *        CURRENT JOB TO BE USED BY OTHER SYSTEM ROUTINES.              *
                                    9 *                                                                      *
                                   10 * REGISTER USAGE                                                       *
                                   11 *                                                                      *
                                   12 * R1 - ADDRESS OF LIST OF FOUR BYTE ADDRESSES. THESE ADDRESSES         *
                                   13 * ARE LOADED INTO R2,R3,R4,R5.                                         *
                                   14 *                                                                      *
                                   15 * R2 - ADDRESS OF SMF COMMON PARAMETER AREA                            *
                                   16 *                                                                      *
                                   17 * R3 = ADDRESS OF 20-BYTE AREA - PROGRAMMER'S NAME                     *
                                   18 *                                                                      *
                                   19 * R4 - ADDRESS OF A 1-BYTE- REQUESTED PRIORITY                        *
                                   20 *                                                                      *
                                   21 * R5 - ADDRESS OF AN AREA HOLDING ACCOUNTING INFORMATION(NOT USED)    *
                                   22 *                                                                      *
                                   23 * R6 - EVENTUALLY HOLDS THE INIATOR'S TCB ADDRESS                     *
                                   24 *                                                                      *
                                   25 * R7 - SQS ADDRESS                                                    *
                                   26 *                                                                      *
                                   27 *                                                                      *
                                   28 ************************************************************************
000000                             29 IEFUJI   CSECT
000000                             30          USING *,15
000000 47F0 F00C           0000C   31          B     *+12
000004 07C9C5C6E4D1C940            32          DC    AL1(7),CL7'IEFUJI'
                                   33          SAVE  (14,12)
00000C                             34+         DS    0H
00000C 90EC D00C           0000C   35+         STM   14,12,12(13) SAVE REGISTERS
000010 05C0                        36          BALR  12,0
000012                             37          USING *,12
                                   38 * STEP0: LOAD ADDRESSES OF PERTINENT FIELDS
                                   39 *
000012 9825 1000           00000   40          LM    2,5,0(1)
000016 5860 0010           00010   41          L     6,16                    LOAD CVT ADDRESS
                                   42 *
                                   43 * STEP1: GET ADDRESS OF INITIATOR'S TCB
                                   44 *
00001A 5860 6000           00000   45          L     6,0(0,6)                LOAD TCB POINTER
00001E 5860 6004           00004   46          L     6,4(0,6)                LOAD TCB ADDRESS
                                   47 *
                                   48 * STEP2: TEST IF SQS AREA ALREADY OBTAINED
                                   49 *
000022 D503 60A8 C05E 000A8 00070  50          CLC   168(4,6),ZERO           IS TCBUSER ZERO?
000028 4780 C046           00058   51          BE    GETSQS                  YES
00002C 5870 60A8           000A8   52 AAE01    L     7,168(0,6)              NO
                                   53 *
                                   54 * STEP 3: MOVE SMF DATA INTO GETMAINED SQS AREA
                                   55 *
```

```
 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT

000030 D207 7004 2000 00004 00000    56          MVC   4(8,7),0(2)            MOVE IN JOBNAME
000036 D213 700C 3000 0000C 00000    57          MVC   12(20,7),0(3)          MVC IN PROGRAMMER NAME
00003C D207 7020 2008 00020 00008    58          MVC   32(8,7),8(2)           MOVE IN RDR TIME/DATE
000042 D207 704C 2014 0004C 00014    59          MVC   76(8,7),20(2)          MOVE IN USER ACCOUNT NUMBER     71.319
000048 D201 7028 C05E 00028 00070    60          MVC   40(2,7),ZERO           ZERO CC FIELD IN SQS            71.313
                                     61 *
                                     62 *
                                     63 * STEP4: RETURN TO CALLING ROUTINE
                                     64 *
00004E 98EC D00C             0000C   65 RETURN   LM    14,12,12(13)           RESTORE REGS
000052 41F0 0000             00000   66          LA    15,0                   SET GOOD CONDN. CODE
000056 07FE                          67          BR    14
                                     68 *
                                     69 * GETMAIN AREA IN SYSTEM QUEUE SPACE
                                     70 *
                                     71 GETSQS   GETMAIN  R,LV=96,SP=253
000058                               72+         CNOP  0,4
000058 4510 C04E             00060   73+GETSQS   BAL   1,*+8 BRANCH AROUND SP+LV
00005C FD                            74+         DC    AL1(253) SUBPOOL VALUE
00005D 000060                        75+         DC    AL3(96) LENGTH
000060 5801 0000             00000   76+         L     0,0(1,0) LOAD SP AND LV
000064 0A0A                          77+         SVC   10 ISSUE GETMAIN SVC
000066 5010 60A8             000A8   78          ST    1,168(0,6)             STORE GETMAINED AREA ADDRESS
00006A 47F0 C01A             0002C   79          B     AAE01
                                     80 *
00006E 0000
000070 00000000                      81 ZERO     DC    F'0'
                                     82          END
```

```
  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                                    F08APR70  12/20/71

                                     1 *********************************************************************
                                     2 *        IEFUSI - STEP INITIATION EXIT                               *
                                     3 *                                                                    *
                                     4 *        IEFUSI RECEIVES CONTROL JUST BEFORE EACH JOB STEP           *
                                     5 *        IS INITIATED. IT PLACES IN THE SPECIAL SQS AREA THE STEP    *
                                     6 *        NAME OF THE CURRENT STEP.                                   *
                                     7 *                                                                    *
                                     8 *********************************************************************
000000                               9 IEFUSI   CSECT
000000                              10          USING *,15
000000 47F0 F00C            0000C   11          B     *+12
000004 07C9C5C6E4E2C940             12          DC    AL1(7),CL7'IEFUSI'
                                    13          SAVE  (14,12)
00000C                              14+         DS    0H
00000C 90EC D00C            0000C   15+         STM   14,12,12(13) SAVE REGISTERS
000010 05C0                         16          BALR  12,0
000012                              17          USING *,12
000012 9825 1000            00000   18          LM    2,5,0(1)
000016 5860 0010            00010   19          L     6,16
00001A 5860 6000            00000   20          L     6,0(,6)
00001E 5860 6004            00004   21          L     6,4(,6)                R6 POINTS TO CURRENT TCB
000022 5870 60A8            000A8   22          L     7,168(,6)              LOAD ADDRESS OF SQS
000026 D207 7044 3000 00044 00000   23          MVC   68(8,7),0(3)           MOVE STEPNAME INTO SQS
00002C 98EC D00C            0000C   24 RETURN   LM    14,12,12(13)
000030 41F0 0000            00000   25          LA    15,0
000034 07FE                         26          BR    14
                                    27          END
```

```
SYMBOL   TYPE ID  ADDR  LENGTH LD ID

IEFACTRT  SD  01 000000 0001B5
IEFYS     ER  02
```

```
 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                F08APR70  12/20/71
                                     1 ************************************************************************
                                     2 *        IEFACTRT - TERMINATION EXIT                                   *
                                     3 *                                                                      *
                                     4 *        IEFACTRT RECEIVES CONTROL WHEN EXECUTION OF A JOB OR JOB      *
                                     5 *        STEP IS TERMINATED.                                           *
                                     6 *        AT STEP TERMINATION THE ROUTINE CHECKS THE CONDN. CODE        *
                                     7 *        FOR PREVIOUS STEPS SAVED IN THE SPECIAL AAEC AREA IN SQS      *
                                     8 *        AND REPLACES IT IF THE CURRENT CONDN. CODE IS GREATER.        *
                                     9 *        AT JOB TERMINATION THE CONDN. CODE IN SQS IS PRINTED AS THE   *
                                    10 *        HIGHEST ENCOUNTERED CONDN.CODE.                               *
                                    11 *                                                                      *
                                    12 *        ON ENTRY REG1 POINTS TO A LIST OF 4-BYTE ADDRESSES.           *
                                    13 *        THE ONLY ONE OF THIS LIST IS ADDRESS AT DISPLACEMENT 32,      *
                                    14 *        THIS BEING A POINTER TO A 2-BYTE AREA CONTAINING THE CONDN.   *
                                    15 *        CODE OF THE TERMINATING STEP.                                 *
                                    16 *        ALSO ON ENTRY REG0 CONTAINS-                                  *
                                    17 *          12 - STEP TERMINATION                                       *
                                    18 *          16 - JOB TERMINATION                                        *
                                    19 *                                                                      *
                                    20 *        ON EXIT REG15 CONTAINS -                                      *
                                    21 *          4 - TO CONTINUE JOB                                         *
                                    22 *                                                                      *
                                    23 ************************************************************************
000000                              24 IEFACTRT CSECT
000000 47FF 000C            0000C   25          B     12(15)
000004 C9C5C6C1C3E3D9E3             26          DC    CL8'IEFACTRT'
00000C 90EC D00C            0000C   27          STM   14,12,12(13)
000010 0580                         28          BALR  11,0
000012                              29          USING *,11
000012 18A0                         30          LR    10,0                                          71.313
000014 55A0 B18A            0019C   31          CL    10,F16                                        71.313
000018 4770 B066            00078   32          BNE   START                                         71.313
00001C 5880 0010            00010   33          L     8,16                                          71.313
000020 5880 8000            00000   34          L     8,0(,8)                                       71.313
000024 5880 8004            00004   35          L     8,4(,8)                                       71.313
000028 5890 80A8            000A8   36          L     9,168(,8)                                     71.313
                                    37          GETMAIN R,LV=300                                    71.313
00002C 4100 012C            0012C   38+         LA    0,300(0,0) LOAD LENGTH
000030 4510 B022            00034   39+         BAL   1,*+4 INDICATE GETMAIN
000034 0A0A                         40+         SVC   10 ISSUE GETMAIN SVC
000036 186D                         41          LR    6,13                                          71.313
000038 1871                         42          LR    7,1                                           71.313
00003A 18D1                         43          LR    13,1                                          71.313
000000                              44          USING GOT,13                                        71.313
00003C F111 D100 9028 00100 00028   45          MVO   WORK1(2),40(2,9)                              71.313
000042 F321 D102 D100 00102 00100   46          UNPK  WORK2(3),WORK1(2)                             71.313
000048 96F0 D104      00104         47          OI    WORK2+2,X'F0'                                 71.313
00004C DC02 D102 B088 00102 0009A   48          TR    WORK2(3),HEX-240                              71.313
000052 D214 D105 B18E 00105 001A0   49          MVC   MSG(21),MSGT                                  71.313
000058 D208 D11A B10B 0011A 0011D   50          MVC   CC(9),CCC                                     71.313
00005E D202 D11B D102 0011B 00102   51          MVC   CC+1(3),WORK2                                 71.313
000064 47F0 B0C2            000D4   52          B     AAE002                                        71.313
000068 18D6                         53 END      LR    13,6                    RESTORE R13
00006A 98EC D00C            0000C   54          LM    14,12,12(13)            RESTORE REGS.
00006E 41F0 0000            00000   55          LA    15,0                    SET RETURN CODE
```

A8.4-2

```
  LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  F08APR70  12/20/71

000072 4110 0000             00000    56          LA    1,0                       SET RETURN CODE
000076 07FE                           57          BR    14
000078 5821 0020             00020    58 START    L     2,32(1)                   GET ADDRESS OF COND. CODE
                                      59          GETMAIN R,LV=300                GET WORK AND SAVE AREA          71.226
00007C 4100 012C             0012C    60+         LA    0,300(0,0) LOAD LENGTH
000080 4510 B072             00084    61+         BAL   1,*+4 INDICATE GETMAIN
000084 0A0A                           62+         SVC   10 ISSUE GETMAIN SVC
000086 186D                           63          LR    6,13                      SAVE CONTENTS OF R13
000088 1871                           64          LR    7,1                       SAVE CONTENTS OF R1
00008A 18D1                           65          LR    13,1                      LOAD ADDRESS OF SAVE AREA
000000                                66          USING GOT,13
00008C F111 D100 2000 00100 00000     67          MVO   WORK1(2),0(2,2)           MOVE COND. CODE INTO WORK AREA
000092 F321 D102 D100 00102 00100     68          UNPK  WORK2(3),WORK1(2)         UNPK COND. CODE
000098 96F0 D104      00104           69          OI    WORK2+2,X'F0'             SET ZONE 1/2 BYTE TO F
00009C DC02 D102 B088 00102 0009A     70          TR    WORK2(3),HEX-240
0000A2 5880 0010             00010    71          L     8,16                                                      71.313
0000A6 5880 8000             00000    72          L     8,0(0,8)                                                  71.313
0000AA 5880 8004             00004    73          L     8,4(0,8)                  R8 POINTS TO CURRENT TCB        71.313
0000AE 5890 80A8             000A8    74          L     9,168(0,8)                LOAD ADDRESS OF SQS             71.313
0000B2 D501 9028 2000 00028 00000     75          CLC   40(2,9),0(2)              COMPARE CC IN SQS WITH CURRENT  71.313
0000B8 4720 B0B0             000C2    76          BH    AAE001                                                    71.313
0000BC D201 9028 2000 00028 00000     77          MVC   40(2,9),0(2)              MOVE CURRENT CC IBTO SQS        71.313
0000C2 D208 D11A B10B 0011A 0011D     78 AAE001   MVC   CC(9),CCC                                               71.226
0000C8 D214 D105 B0F6 00105 00108     79          MVC   MSG(21),MSGC
0000CE D202 D11B D102 0011B 00102     80          MVC   CC+1(3),WORK2
0000D4 4140 D105             00105    81 AAE002   LA    4,MSG
0000D8 5040 B0F2             00104    82          ST    4,SAVE12
0000DC D203 C024 B0F2 00024 00104     83          MVC   36(4,12),SAVE12           STORE ADDRESS OF MESSAGE
0000E2 D201 C02A B0EC 0002A 000FE     84          MVC   42(2,12),MSGLEN           STORE MESSAGE LENGTH
0000E8 58F0 B0EE             00100    85          L     15,VIEFYS
0000EC 05EF                           86          BALR  14,15                     BRANCH TO SYSPRINT MESSAGE
0000EE 1817                           87          LR    1,7
                                      88          FREEMAIN R,LV=300,A=(1)                                   71.226
0000F0 4100 012C             0012C    89+         LA    0,300(0,0) LOAD LENGTH
0000F4 4111 0000             00000    90+         LA    1,0(1) CLEAR THE HIGH ORDER BYTE
0000F8 0A0A                           91+         SVC   10 ISSUE FREEMAIN SVC
0000FA 47F0 B056             00068    92          B     END
0000FE 001E                           93 MSGLEN   DC    H'30'                                                   71.226
000100 00000000                       94 VIEFYS   DC    V(IEFYS)
000104                                95 SAVE12   DS    F
000108 5C5C5C40C3D6D5C4               96 MSGC     DC    C'*** CONDITION CODE = '
00011D 404040404DC8C5E7               97 CCC      DC    C'    (HEX)'                                            71.226
000126                                98          DS    100C
00018A F0F1F2F3F4F5F6F7               99 HEX      DC    C'0123456789ABCDEF'
00019A 0000
00019C 00000010                      100 F16      DC    F'16'                                                   71.313
0001A0 C8C9C7C8C5E2E340              101 MSGT     DC    C'HIGHEST CONDN CODE = '                                71.313
000000                               102 GOT      DSECT
000000                               103          DS    64F
000100                               104 WORK1    DS    2C
000102                               105 WORK2    DS    3C
000105                               106 MSG      DS    21C
00011A                               107 CC       DS    9C                                                      71.226
                                     108          END
```

```
LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                          F08APR70  12/20/71

                                    1 ***********************************************************************
                                    2 *       IEFUTL - TIME LIMIT EXIT                                      *
                                    3 *                                                                     *
                                    4 *       IEFUTL RECEIVES CONTROL WHEN ANY JOB SITS CONTINUOUSLY IN     *
                                    5 *       THE WAIT STATE FOR A PREDETERMINED TIME(SPECIFIED IN THE      *
                                    6 *       READER PROCEDURE).  THE OPERATOR IS GIVEN THE OPPORTUNITY     *
                                    7 *       TO CANCEL THE JOB OR LET IT CONTINUE.                         *
                                    8 *       ON ENTRY REG0 CONTAINS-                                       *
                                    9 *         0 - JOB CPU TIME EXPIRY. NO ACTION- OS CANCELS JOB          *
                                   10 *         4- STEP CPU TIME EXPIRY - NO ACTION. OS CANCELS JOB         *
                                   11 *         8 - JOB WAIT TIME LIMIT.                                    *
                                   12 *                                                                     *
                                   13 *       ON EXIT REG15 CONTAINS-                                       *
                                   14 *         0 - CONTINUE PROCESSING JOB(I.E. LET OS CANCEL JOB)         *
                                   15 *         4 - LET JOB CONTINUE WITH ADDITIONAL TIME SPECIFIED IN      *
                                   16 *         REGISTER1                                                   *
                                   17 *                                                                     *
                                   18 ***********************************************************************
000000                             19 IEFUTL   CSECT
000000                             20          USING *,R15
000000 47F0 F00C            0000C  21          B     *+12
000004 07C9C5C6E4E3D340            22          DC    AL1(7),CL7'IEFUTL'
00000C 90EC D00C            0000C  23          STM   R14,R12,12(R13)
000010 18CD                        24          LR    R12,R13
000012 0700                        25          CNOP  0,4
000014 41D0 F024            00024  26          LA    R13,*+16
000018 50D0 C008            00008  27          ST    R13,8(0,R12)
00001C 50C0 D004            00004  28          ST    R12,4(0,R13)
                                   29 *        B     *+96
000020 47F0 F08C            0008C  30          B     *+108                        TO ALLOW FOR FREEMAIN ETC.      71.227
000024                             31          USING *,R13
000024                             32          DS    18F
00006C 41F0 0004            00004  33          LA    R15,4                        LOAD 'EXTEND TIME' CONDN.CODE
                                   34 *        L     R13,4(0,R13)                 LOAD OLD SAVE AREA ADDR IN R13
000070 181B                        35          LR    R1,R11
                                   36          FREEMAIN R,LV=(R10),A=(1)
000072 180A                        37+         LR    0,R10 LOAD LENGTH
000074 4111 0000            00000  38+         LA    1,0(1) CLEAR THE HIGH ORDER BYTE
000078 0A0A                        39+         SVC   10 ISSUE FREEMAIN SVC
00007A 1817                        40          LR    R1,R7                        SET UP WAIT TIME EXTN.          719227
00007C 18DC                        41 END      LR    R13,R12                      LOAD OLD SAVE AREA ADDR IN R13
00007E 982C D01C            0001C  42          LM    R2,R12,28(R13)               RESTORE REGS 2 TO 12
000082 58E0 D00C            0000C  43          L     R14,12(0,R13)                RESTORE REG 14
000086 92FF D00C      0000C        44          MVI   12(R13),255                  SET 'I'VE BEEN HERE' FLAG
00008A 07FE                        45          BR    R14
000000                             46 R0       EQU   0
000001                             47 R1       EQU   1
000002                             48 R2       EQU   2
000003                             49 R3       EQU   3
000004                             50 R4       EQU   4
000005                             51 R5       EQU   5
000006                             52 R6       EQU   6
000007                             53 R7       EQU   7
000008                             54 R8       EQU   8
000009                             55 R9       EQU   9
```

```
 LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT
00000A                             56 R10      EQU   10
00000B                             57 R11      EQU   11
00000C                             58 R12      EQU   12
00000D                             59 R13      EQU   13
00000E                             60 R14      EQU   14
00000F                             61 R15      EQU   15
000002                             62 N        EQU   2
00008C 41F0 0000            00000  63          LA    R15,0
000090 5821 0000            00000  64          L     R2,0(R1)              R2 POINTS TO PARAMETERS
000094 1850                        65          LR    R5,R0
000096 47F5 D076            0009A  66          B     *+4(R5)
00009A 47F0 D082            000A6  67 JOBTIME   B     JOB                   NO PROCESSING BY THIS ROUTINE
00009E 47F0 D082            000A6  68 STEPTIME  B     JOB                   NO PROCESSING BY THIS ROUTINE
0000A2 47F0 D086            000AA  69 WAITTIME  B     WT                    PROCESSED BY THIS ROUTINE
0000A6 47F0 D058            0007C  70 JOB       B     END                   CPU TIME LIMIT - CANCEL
0000AA 41A0 D12C            00150  71 WT        LA    R10,WTORLST           LOAD LIST
0000AE 4190 D184            001A8  72          LA    R9,WTOREND
0000B2 1B9A                        73          SR    R9,R10
0000B4 18A9                        74          LR    R10,R9
                                   75          GETMAIN R,LV=(R10)
0000B6 180A                        76+         LR    0,R10 LOAD LENGTH
0000B8 4510 D098            000BC  77+         BAL   1,*+4 INDICATE GETMAIN
0000BC 0A0A                        78+         SVC   10 ISSUE GETMAIN SVC
0000BE 0690                        79          BCTR  R9,0                  DECREMENT R9 FOR MVC INSTN.
0000C0 4490 D188            001AC  80          EX    R9,MOVE
0000C4 18B1                        81          LR    R11,R1
0000C6 D207 B00F 2000 0000F 00000  82          MVC   15(8,R11),0(R2)       MOVE IN JOBNAME
0000CC D703 B054 B054 00054 00054  83          XC    84(4,R11),84(R11)  ZERO ECB
0000D2 188B                        84          LR    R8,R11
0000D4 D707 B050 B050 00050 00050  85 WTOR      XC    80(8,R11),80(R11)  BLANK ECB AND REPLY AREA
                                   86          WTOR  ,80(R11),1,84(R11),MF=(E,(R11))
0000DA 181B                        87+         LR    1,(R11) LOAD PARAMETER REG 1
0000DC 410B 0050            00050  88+         LA    0,80(R11) LOAD REPLY ADDR
0000E0 5001 0000            00000  89+         ST    0,0(1,0) STORE REPLY ADDR
0000E4 9201 1000      00000        90+         MVI   0(1),1 MOVE IN REPLY LENGTH
0000E8 41EB 0054            00054  91+         LA    14,84(R11) LOAD ADDRESS OF ECB
0000EC 50E1 0004            00004  92+         ST    14,4(1,0) STORE ECB ADDRESS
0000F0 0A23                        93+         SVC   35 ISSUE WTOR SVC
0000F2 18B8                        94          LR    R11,R8
                                   95          WAIT  ECB=84(R11)           AWAIT REPLY
0000F4 411B 0054            00054  96+         LA    1,84(R11) LOAD PARAMETER REG 1
0000F8 4100 0001            00001  97+         LA    0,1(0,0) COUNT OMITTED,1 USED
0000FC 0A01                        98+         SVC   1 LINK TO WAIT ROUTINE
0000FE 95E4 B050      00050        99          CLI   80(R11),C'U'          CONTINUE(UPPER)?
000102 4780 D0FC            00120 100          BE    CONTINU
000106 95A4 B050      00050       101          CLI   80(R11),C'U'          CONTINUE(LOWER)?
00010A 4780 D04C            0004C 102          BE    76(0,R13)
00010E 95C3 B050      00050       103          CLI   80(R11),C'C'          CANCEL(UPPER)?
000112 4780 D04C            0004C 104          BE    76(0,R13)
000116 9583 B050      00050       105          CLI   80(R11),C'C'          CANCEL(LOWER)?
00011A 4770 D0B0            000D4 106          BNE   WTOR
                                  107 CONTINU  WTO   '***WAIT-TIME EXTENSION GRANTED'
00011E 0700                       108+         CNOP  0,4
000120 4510 D122            00146 109+CONTINU  BAL   1,IHB0007A BRANCH AROUND MESSAGE
000124 0022                       110+         DC    AL2(IHB0007-*) MESSAGE LENGTH
```

```
  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                                F08APR70  12/20/71

000126 0000                         111+            DC    B'0000000000000000' MCSFLAGS FIELD
000128 5C5C5CE6C1C9E360             112+            DC    C'***WAIT-TIME EXTENSION GRANTED' MESSAGE
000146                              113+IHB0007     EQU   *
000146                              114+IHB0007A    DS    0H
000146 0A23                         115+            SVC   35 ISSUE SVC
000148 5870 D184             001A8  116             L     R7,FIVE                 LOAD TIME EXTENSION IN R7        719227
00014C 47F0 D048             00048  117             B     72(0,R13)
                                    118 WTORLST     WTOR  '***JOBNAMES, WAIT-TIME EXPIRY. REPLY ''C'' TO CANCEL, O*
                                                          THERWISE ''U''',WORKA,2,ECB,MF=L
000150                              119+WTORLST     DS    0F
000150 02                           120+            DC    AL1(2) REPLY LENGTH
000151 0001A0                       121+            DC    AL3(WORKA) REPLY ADDRESS
000154 000001A4                     122+            DC    A(ECB) ECB ADDRESS
000158 0045                         123+            DC    AL2(IHB0009-*) MESSAGE LENGTH
00015A 0000                         124+            DC    B'0000000000000000' MCSFLAGS FIELD
                                    125+            DC    C'***JOBNAMES, WAIT-TIME EXPIRY, REPLY ''C'' TO CANCEL, X
00015C 5C5C5CD1D6C2D5C1               +                   OTHERWISE ''U''' MESSAGE
00019D                              126+IHB0009     EQU   *
00019D 000000
0001A0 00000000                     127 WORKA       DC    F'0'
0001A4 00000000                     128 ECB         DC    F'0'
0001A8                              129 WTOREND     EQU   *
0001A8 002DC6C0                     130 FIVE        DC    F'3000000'
0001AC D200 1000 D12C 00000 00150   131 MOVE        MVC   0(0,R1),WTORLST
                                    132             END
```

APPENDIX 9

DYNAMIC DISPATCHING PRIORITY SCHEDULER - AEDDP

SYMBOL	TYPE	ID	ADDR	LENGTH	LD ID
	PC	01	000000	000000	
AEDDP	SD	02	000000	0002A0	

```
LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                               F08APR70  12/20/71

                                   1 ********************************************************************** 71.320
                                   2 *        THIS ROUTINE SITS IN THE WAIT STATE FOR A PREDETERMINED TIME * 71.320
                                   3 *        THEN GETS A TIMER INTERRUPT AND RECEIVES CONTROL OF THE CPU. * 71.320
                                   4 *        ITS FUNCTION THEN IS TO RESCHEDULE THE ORDER OF TASK         * 71.320
                                   5 *        PRIORITIES BY RE-ORDERING THE TCB CHAIN.                     * 71.320
                                   6 *        HAVING DONE THAT IT GOES BACK INTO THE WAIT STATE .          * 71.320
                                   7 *                                                                     * 71.320
                                   8 *        THE FIRST SECTION SCANS DOWN THE TCB CHAIN. IN TABLE TCBLIST * 71.320
                                   9 *        IT STORES THE ADDRESS OF THE TCB FOR THE LOWEST PRIORITY     * 71.320
                                  10 *        INITIATOR AND SUBSEQUENT TCB ADDRESSES - THE SUBSEQUENT      * 71.320
                                  11 *        ONES BEING FOR USERS TASKS.                                  * 71.320
                                  12 *        THE TASK TIME OF EACH USER IS MONITERED PER SCAN AND STORED  * 71.320
                                  13 *        IN TABLE TLIST. FOR THOSE TASKS THAT WERE MONITERED          * 71.320
                                  14 *        IN THE PREVIOUS SCAN, A DELTA T VALUE IS COMPUTED AND ALSO   * 71.320
                                  15 *        STORED IN TLIST. TASKS THAT ARE NEW TO THE CURRENT SCAN      * 71.320
                                  16 *        ARE GIVEN A DELTA T VALUE OF ZERO. TASKS THAT ARE NO LONGER  * 71.320
                                  17 *        ACTIVE ARE GIVEN A NULLIFYING VALUE OF FFFFFFFF.             * 71.320
                                  18 *                                                                     * 71.320
                                  19 *                                   W.A.ANGUS   AAEC    71.320        * 71.320
                                  20 *                                                                     * 71.320
                                  21 ********************************************************************** 71.320
000000                            22 R0       EQU   0                                                        71.316
000001                            23 R1       EQU   1                                                        71.316
000002                            24 R2       EQU   2                                                        71.316
000003                            25 R3       EQU   3                                                        71.316
000004                            26 R4       EQU   4                                                        71.316
000005                            27 R5       EQU   5                                                        71.316
000006                            28 R6       EQU   6                                                        71.316
000007                            29 R7       EQU   7                                                        71.316
000008                            30 R8       EQU   8                                                        71.316
000009                            31 R9       EQU   9                                                        71.316
00000A                            32 R10      EQU   10                                                       71.316
00000B                            33 R11      EQU   11                                                       71.316
00000C                            34 R12      EQU   12                                                       71.316
00000D                            35 R13      EQU   13                                                       71.316
00000E                            36 R14      EQU   14                                                       71.316
00000F                            37 R15      EQU   15                                                       71.316
000000                            38 AEDDP    CSECT
                                  39 *        R2    POINTER TO STERT OF TCBLIST                                71.316
                                  40 *        R4    POINTER TO STERT OF TIME ELEMENT LIST                      71.316
                                  41 *        R11   TCB ADDRESS                                                71.316
                                  42 *        R12   BASE REGISTER                                              71.316
                                  43 *        R8    DECREMENTING COUNTER                                       71.316
                                  44 *        R9    DECREMENTING COUNTER                                       71.316
                                  45 *        R10   TQE POINTER                                                71.316
                                  46 *                                                                       71.316
                                  47 *                                                                       71.316
                                  48          PRINT NOGEN
                                  49          SAVE  (14,12)                                                    71.316
000004 05C0                       52          BALR  R12,0                                                      71.316
000006                            53          USING *,R12                                                      71.316
000006 58F0 0010           00010  54          L     R15,16
00000A 58F0 F000           00000  55          L     R15,0(,R15)
00000E 58F0 F004           00004  56          L     R15,4(,R15)             LOAD ADDRESS OF ACTIVE TCB
000012 D203 F0A8 C296 000A8 0029C 57          MVC   168(4,R15),WAA1         LOAD UNIQUE IDENTIFIER INTO TCB
```

```
  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                              FØ8APR7Ø  12/2Ø/71

ØØØØ18 ØAFF                          58 SVC255    SVC    255
ØØØØ1A 82ØØ C282      ØØ288          59           LPSW   PSW1                                                  71.316
ØØØØ1E 8ØØØ CØ19      ØØØ1F          6Ø PSW1A     SSM    *+1
ØØØØ22 412Ø C1BE            ØØ1C4    61 SSM       LA     R2,TCBUPPER                                           71.316
ØØØØ26 414Ø C1EA            ØØ1FØ    62           LA     R4,TLIST                                              71.316
ØØØØ2A 413Ø ØØØ4            ØØØØ4    63           LA     R3,4                                                  71.316
ØØØØ2E 41BØ ØØ1Ø            ØØØ1Ø    64           LA     R11,16                                                71.316
ØØØØ32 58BØ BØØØ            ØØØØØ    65           L      R11,Ø(Ø,R11)          LOAD CVT ADDRESS                71.316
ØØØØ36 58BØ BØAØ            ØØØAØ    66           L      R11,16Ø(Ø,R11)        LOAD FIRST TCB                  71.316
ØØØØ3A 58BØ BØ74            ØØØ74    67 DDPØØ1    L      R11,116(Ø,R11)                                        71.316
ØØØØ3E 12BB                          68           LTR    R11,R11
ØØØØ4Ø 478Ø C184            ØØ18A    69           BZ     DDPØ45
ØØØØ44 95FF BØ23      ØØØ23          7Ø           CLI    35(R11),X'FF'         TEST DISPATCHING PRIORITY
ØØØØ48 478Ø CØ34            ØØØ3A    71           BE     DDPØØ1
ØØØØ4C 5ØBØ C1BE            ØØ1C4    72 DDPØØ2    ST     R11,TCBUPPER
ØØØØ5Ø 58BØ BØ74            ØØØ74    73           L      R11,116(Ø,R11)
ØØØØ54 12BB                          74           LTR    R11,R11
ØØØØ56 478Ø C184            ØØ18A    75           BZ     DDPØ45
ØØØØ5A 95DF BØ22      ØØØ22          76           CLI    34(R11),X'DF'         TEST LIMIT PRIORITY
ØØØØ5E 472Ø CØ46            ØØØ4C    77           BH     DDPØØ2
ØØØØ62 418Ø ØØØA            ØØØØA    78           LA     R8,1Ø
ØØØØ66 41FØ ØØØ5            ØØØØ5    79           LA     R15,5                                                 71.316
ØØØØ6A 5ØB3 2ØØØ            ØØØØØ    8Ø DDPØØ3    ST     R11,Ø(R3,R2)          STORE TCB ADDRESS IN TCBLIST    71.344
ØØØØ6E 413Ø 3ØØ4            ØØØØ4    81           LA     R3,4(Ø,R3)            INCRENENT INDEX BY 4            71.316
ØØØØ72 12BB                          82           LTR    R11,R11               IS IT LAST TCB?                 71.316
ØØØØ74 478Ø C1Ø2            ØØ1Ø8    83           BZ     AETST                                                 71.316
ØØØØ78 45EØ CØ82            ØØØ88    84           BAL    R14,DDPØ1Ø            BRANCH TO COLLECT TIME DATA     71.316
ØØØØ7C 58BØ BØ74            ØØØ74    85           L      R11,116(Ø,R11)        GET NEXT TCB ADDRESS            71.316
ØØØØ8Ø 468Ø CØ64            ØØØ6A    86           BCT    R8,DDPØØ3             CONTINUE SCAN OF LOWER TCBS     71.316
ØØØØ84 47FØ C19E            ØØ1A4    87           B      DDPØ46                FILLED STORE TABLE              71.316
                                     88 *                                                                      71.316
                                     89 *                                                                      71.316
                                     9Ø *                                                                      71.316
ØØØØ88 419Ø ØØØA            ØØØØA    91 DDPØ1Ø    LA     R9,1Ø                                                 71.316
ØØØØ8C 1854                          92           LR     R5,R4                                                 71.316
ØØØØ8E 55BØ 5ØØØ            ØØØØØ    93 DDPØ11    CL     R11,Ø(Ø,R5)           DOES TCB MATCH EXISTING ENTRY   71.316
ØØØØ92 478Ø CØBA            ØØØCØ    94           BE     DDPØ2Ø                YES, GO FILL TIME DATA          71.316
ØØØØ96 415Ø 5ØØC            ØØØØC    95           LA     R5,12(Ø,R5)           NO. INCREMENT POINTER           71.316
ØØØØ9A 469Ø CØ88            ØØØ8E    96           BCT    R9,DDPØ11             AND CONTINUE SCAN               71.316
ØØØØ9E 419Ø ØØØA            ØØØØA    97           LA     R9,1Ø                 NO TCB MATCH, SO SCAN DOWN      71.316
                                     98 *                                      LIST AGAIN AND PLACE IN FIRST   71.316
                                     99 *                                      AVAILABLE SLOT (FF IN DELTA/T)  71.316
ØØØØA2 1854                         1ØØ           LR     R5,R4                                                 71.316
ØØØØA4 95FF 5ØØ8      ØØØØ8         1Ø1 DDPØ12    CLI    8(R5),X'FF'           IS DELTA/T FIELD FF?            71.316
ØØØØA8 477Ø CØAE            ØØØB4   1Ø2           BNE    DDPØ13                NO                              71.316
ØØØØAC 5ØBØ 5ØØØ            ØØØØØ   1Ø3           ST     R11,Ø(Ø,R5)           YES, STORE TCB ADDRESS          71.316
ØØØØBØ 47FØ CØBA            ØØØCØ   1Ø4           B      DDPØ2Ø                GO FILL IN TIME DATA            71.316
ØØØØB4 415Ø 5ØØC            ØØØØC   1Ø5 DDPØ13    LA     R5,12(Ø,R5)           INCREMENT TLIST POINTER         71.316
ØØØØB8 469Ø CØ9E            ØØØA4   1Ø6           BCT    R9,DDPØ12                                             71.316
ØØØØBC 47FØ C19E            ØØ1A4   1Ø7           B      DDPØ46                FILLED TLIST TABLE - SO EXIT    71.316
                                    1Ø8 *                                                                      71.316
                                    1Ø9 *                                                                      71.316
                                    11Ø *                                                                      71.316
ØØØØCØ 58AØ BØ84            ØØØ84   111 DDPØ2Ø    L      R1Ø,132(Ø,R11)        LOAD ADDRESS OF TCB RESPONSIBLE 71.316
                                    112 *                                      FOR THE CURRENT TCB BEING       71.316
```

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                                                                                    F08APR70  12/20/71
  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT
                                   113 *                                           CONSIDERED                     71.316
0000C4 58A0 A078            00078  114            L     R10,120(0,R10)             LOAD TCBTME FROM INIT'S TCB    71.316
0000C8 9594 A000      00000        115            CLI   0(R10),X'94'               IS IT TQE TYPE ONE             71.316
0000CC 4770 C0E4            000EA  116            BNE   DDP022                                                    71.316
0000D0 58A0 A00C            0000C  117            L     R10,12(0,R10)              LOAD CPU TIME                  71.316
0000D4 5870 5004            00004  118 DDP021     L     R7,4(0,R5)                 LOAD OLD CPU TIME              71.316
0000D8 187A                        119            SR    R7,R10                     GET LATEST DELTA/T             71.316
0000DA 47B0 C0DA            000E0  120            BC    11,DDP021A                                                71.316
0000DE 1877                        121            SR    R7,R7                      IF R7 WAS -VE  MAKE ZERO       71.316
0000E0 5070 5008            00008  122 DDP021A    ST    R7,8(0,R5)                 ST DELTA T IN TLIST            71.316
0000E4 50A0 5004            00004  123            ST    R10,4(0,R5)                STORE NEW CPU TIME             71.316
0000E8 07FE                        124            BR    R14                        BR FROM WHENCE WE CAME         71.316
0000EA 9517 A000      00000        125 DDP022     CLI   0(R10),X'17'               IS IT TQE TYPE TWO?            71.316
0000EE 4780 C0FA            00100  126            BE    DDP023                                                    71.316
0000F2 D703 5004 5004 00004 00004  127            XC    4(4,R5),4(R5)              ZERO CPU TIME                  71.316
0000F8 D703 5008 5008 00008 00008  128            XC    8(4,R5),8(R5)              ZERO DELTA T                   71.316
0000FE 07FE                        129            BR    R14                                                       71.316
000100 58A0 A014            00014  130 DDP023     L     R10,20(0,R10)              LOAD CPU TIME                  71.316
000104 47F0 C0CE            000D4  131            B     DDP021                                                    71.316
                                   132 *                                                                          71.316
                                   133 *                                                                          71.316
                                   134 *                                                                          71.316
                                   135 ********************************************************************** 71.316
                                   136 *          THIS SECTION OF CODING IS ENTERED WHEN THE ADDRESS OF THE     * 71.316
                                   137 *          LAST DUMMY (ADDRESS = 0000 ) TCB IS PLACED IN TCBLIST.        * 71.316
                                   138 *                                                                        * 71.316
                                   139 *          ON ENTRY THE FOLLOWING REGISTERS CONTAIN OR ARE USED FOR --   * 71.316
                                   140 *          R2     POINTER TO START OF TCBLIST                            * 71.316
                                   141 *          R4     POINTER TO START OF TLIST                              * 71.316
                                   142 *          R3     POINTER TO LAST ELEMENT OF TLIST                       * 71.316
                                   143 *          R5     POINTER TO THE ELEMENT OF TLIST THAT CURRENTLY HOLDS   * 71.316
                                   144 *                 THE HIGHEST VALUE OF DELTA T                           * 71.316
                                   145 *          R6     THE VALUE OF THE CURRENT HIGHEST DELTA T               * 71.316
                                   146 *          R7     MOVING POINTER USED TO SCAN ALONG TLIST ELEMENTS       * 71.316
                                   147 *          R8     ALWAYS CONTAINS THE VALUE FFFFFFFF                     * 71.316
                                   148 *          R9     INITIALLY CONTAINS 00000000. SUBSEQUENTLY CONTAINS     * 71.316
                                   149 *                 THE ADDRESS OF TO BE PLACED IN THE TCBTCB FIELD        * 71.316
                                   150 *                 OF THE NEXT HIGHEST TCB IN THE NEW CHAIN               * 71.316
                                   151 ********************************************************************** 71.316
                                   152 *                                                                          71.316
000108                             153 AETST      EQU   *
000108 4130 C26E            00274  154            LA    R3,LIATEND                                                71.317
00010C 4190 0000            00000  155            LA    R9,0                                                          *
000110 5880 C292            00298  156            L     R8,FF                                                         *
000114 1874                        157            LR    R7,R4                      SET MOVING POINTER TO START OF 71.316
                                   158 *                                           THE TLIST TABLE                71.316
000116 1854                        159            LR    R5,R4                      LIKEWISE FOR THE CURRENT H PTR 71.316
000118 5860 4008            00008  160 DDP039     L     R6,8(0,R4)                 SET H DELTA T TO BE 1ST ELEMENT 71.316
00011C 4170 700C            0000C  161 DDP040     LA    R7,12(0,R7)                SET R7 TO POINT TO NEXT ELEMENT 71.316
000120 1937                        162            CR    R3,R7                      END OF TLIST?                  71.316
000122 4740 C14A            00150  163            BL    DDP042                     YES                            71.316
000126 5980 7008            00008  164            C     R8,8(0,R7)                 IS DT IN CURRENT ELEMENT FF TYPE 71.316
00012A 4780 C116            0011C  165            BE    DDP040                     YES, SO CONTINUE SCAN          71.316
00012E 1968                        166            CR    R6,R8                      NO. IS SAVED HIGH DT FF TYPE?  71.316
000130 4770 C138            0013E  167            BNE   DDP041                     NO. BRANCH TO COMPARE VALUES   71.316
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  LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                F08APR70  12/20/71

000134 5860 7008            00008   168           L     R6,8(0,R7)          YES. REPLACE SAVED DT & RESET R5 71.316
000138 1857                         169           LR    R5,R7                                        71.316
00013A 47F0 C116            0011C   170           B     DDP040              CONTINUE SCAN DOWN TLIST     71.316
00013E 5960 7008            00008   171 DDP041    C     R6,8(0,R7)          COMPARE SAVED DT WITH CURRENT DT 71.316
000142 47A0 C116            0011C   172           BC    10,DDP040           IF SAVED DT>OR= CURRENT DT, BRCH 71.316
000146 5860 7008            00008   173           L     R6,8(0,R7)          OTHERWISE REPLACE SAVED DT   71.316
00014A 1857                         174           LR    R5,R7               AND RESET POINTER TO HIGHEST 71.316
00014C 47F0 C116            0011C   175           B     DDP040              ELEMENT AND CONTINUE SCAN    71.316
000150 1968                         176 DDP042    CR    R6,R8               IS R6 FF TYPE?               71.316
000152 4780 C16C            00172   177           BE    DDP043              YES BRANCH                   71.316
000156 5870 5000            00000   178           L     R7,0(0,R5)          LOAD A(TCB) IN HIGHEST ELEMRNT 71.316
                                    179 *                                   NOTE THAT 'HIGHEST' MEANS    71.316
                                    180 *                                   'WITH THE LARGEST DELTA T VALUE' 71.316
00015A 5090 7074            00074   181           ST    R9,116(0,R7)        SET TCBTCB FIELD IN THIS 'HIGH' 71.316
00015E 5890 5000            00000   182           L     R9,0(0,R5)          ADDRESS OF 'HIGH' TCB BECOMES 71.316
                                    183 *                                   TCBTCB FIELD FOR NEXT TCB    71.316
000162 5080 5008            00008   184           ST    R8,8(0,R5)          NULLIFY DT BY MAKING FF TYPE 71.316
000166 1874                         185           LR    R7,R4               RESET POINTER                71.316
000168 1868                         186           LR    R6,R8               SET HIGH DT TO FF TYPE       71.316
00016A 4170 C1DE            001E4   187           LA    R7,TLIST-12         RESET R7 TO POINT 12 BEFORE TLST 71.317
00016E 47F0 C116            0011C   188           B     DDP040              AND CONTINUE SCAN            71.316
000172 5990 C1BA            001C0   189 DDP043    C     R9,ZERO                                          71.316
000176 41F0 0005            00005   190           LA    R15,5                                        71.316
00017A 4780 C184            0018A   191           BE    DDP045                                       71.316
00017E 5870 2000            00000   192           L     R7,0(0,R2)          LOAD A(TCB) OF INIT          71.316
                                    193 *                                   NOTE THAT THIS INIT IS THE   71.316
                                    194 *                                   LOWEST PRTY INIT IN THE READY Q 71.316
                                    195 *                                   IT IS THE FIRST ENTRY IN TCBLIST 71.316
000182 5090 7074            00074   196           ST    R9,116(0,R7)        STORE TCBTCB FIELD IN INIT TCB 71.316
000186 47F0 C19E            001A4   197           B     DDP046                                       71.316
00018A 8000 C27A      00280         198 DDP045    SSM   AAE7F                                       71.344
                                    199           STIMER WAIT,TUINTVL=MINS#5                         71.344
00019C 41F0 0001            00001   204           LA    R15,1
0001A0 47F0 C012            00018   205           B     SVC255                                       71.344
0001A4 8000 C27A      00280         206 DDP046    SSM   AAE7F                                       71.344
                                    207 DDP046A   STIMER  WAIT,TUINTVL=WAITTIME
0001B6 47F0 C012            00018   212           B     SVC255
                                    213 EXIT      RETURN (14,12)
0001C0 00000000                     217 ZERO      DC    F'0'                                         71.316
0001C4 00000000000000000            218 TCBUPPER  DC    11F'0'                                       71.316
0001F0 00000000000000000            219 TLIST     DC    2F'0',X'FFFFFFFF'                            71.316
0001FC 00000000000000000            220           DC    2F'0',X'FFFFFFFF'                            71.316
000208 00000000000000000            221           DC    2F'0',X'FFFFFFFF'                            71.316
000214 00000000000000000            222           DC    2F'0',X'FFFFFFFF'                            71.316
000220 00000000000000000            223           DC    2F'0',X'FFFFFFFF'                            71.316
00022C 00000000000000000            224           DC    2F'0',X'FFFFFFFF'                            71.316
000238 00000000000000000            225           DC    2F'0',X'FFFFFFFF'                            71.316
000244 00000000000000000            226           DC    2F'0',X'FFFFFFFF'                            71.316
000250 00000000000000000            227           DC    2F'0',X'FFFFFFFF'                            71.316
00025C 00000000000000000            228           DC    2F'0',X'FFFFFFFF'                            71.316
000268 00000000000000000            229           DC    2F'0',X'FFFFFFFF'                            71.316
000274 00000000000000000            230 LIATEND   DC    2F'0',X'FFFFFFFF'                            71.316
000280 FF                           231 AAE7F     DC    X'FF'
000288                              232           DS    0D
000288 0004000000000001E            233 PSW1      DC    X'00040000',A(PSW1A)
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  LOC   OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT

000290 000EF420                      234 WAITTIME DC    F'980000'
000294 00BAEB90                      235 MINS#5   DC    F'12250000'
000298 FFFFFFFF                      236 FF       DC    X'FFFFFFFF'
00029C 00000010                      237 WAA1     DC    F'16'
                                     238          END
```

APPENDIX 10

MODIFICATIONS TO OS SOURCE-1

10.1 IEESMFIT

10.2 IEEVLNKT

```
LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                              F08APR70  12/20/71

                                    1 *                                                                       00060018
                                    2 ************************************************************************ 00120018
                                    3 *                                                                     * 00180018
                                    4 *TITLE    IEESMFIT   SYSTEM MANAGEMENT FACILITIES INITIALIZATION      * 00240018
                                    5 *                                                                     * 00300018
                                    6 *FUNCTION       PERFORMS ALL THE FOLLOWING INITIALIZATION FOR THE     * 00360018
                                    7 *         SMF FUNCTIONS.                                              * 00420018
                                    8 *                                                                     * 00480018
                                    9 *         1. ADDS THE SMF TIOT TO THE MASTER SCHEDULER TIOT.          * 00540018
                                   10 *                                                                     * 00600018
                                   11 *         2. GET CORE FROM SUBPOOL 255 FOR THE SYSTEM MANAGEMENT      * 00660018
                                   12 *         CONTROL AREA (SMCA) AND A POINTER TO IT IS PLACED IN        * 00720018
                                   13 *         THE CVT.                                                    * 00780018
                                   14 *                                                                     * 00840018
                                   15 *         3. OPENS SYS1.PARMLIB AND READS THE SMF PARAMETER MEMBER    * 00900018
                                   16 *         SMFDEFLT.                                                   * 00960018
                                   17 *                                                                     * 01020018
                                   18 *          4. IF THE MEMBER IS MISSING OR AN IO ERROR OCCURRED,    19018 01080019
                                   19 *         PASSES CONTROL TO ROUTINE IEESMFI3 SO PARAMETERS MAY     19018 01140019
                                   20 *         BE ENTERED FROM THE OPERATOR'S CONSOLE.                  19018 01200019
                                   21 *                                                                  19018 01260019
                                   22 *         5. IF MEMBER IS PRESENT, PASSES CONTROL TO IEESMFI3      19018 01320019
                                   23 *         TO VALIDITY CHECK FOR COMPLETE AND CORRECT SMF VALUES    19018 01380019
                                   24 *                                                                     * 01500018
                                   25 *         6. CLOSES PARMLIB AND GETS CORE FROM SUBPOOL 255 FOR THE    * 01560019
                                   26 *            USER DEFINED SMF BUFFER AND INITIALYZE IT.               * 01620018
                                   27 *                                                                     * 01680018
                                   28 *         7. CALL ROUTINE TO INITIALIZE THE SMF I/O CONTROL BLOCKS,   * 01740019
                                   29 *            ALLOCATE AND OPEN SYS1.MANX (PRIMARY DATA SET)           * 01800018
                                   30 *                                                                     * 01860018
                                   31 *ENTRY    IEESMFIT - XCTL FROM IEEVIPL  (MVT)                         * 02060019
                                   32 *                  - LINK FROM IEFSD569 (MFT)                         * 02260019
                                   33 *         IEESMFI4 - XCTL FROM IEESMFI3                            19018 02360019
                                   34 *                                                                     * 02520018
                                   35 *INPUT    WARM START INDICATOR IN CVT                                 * 02580018
                                   36 *                                                                     * 02640018
                                   37 *OUTPUT   SMF TIOT ADDED TO MASTER TIOT                               * 02700018
                                   38 *         SMCA POINTER PLACED IN CVT                                  * 02760018
                                   39 *                                                                     * 02820018
                                   40 *EXITS    IEESMFI3 - TO VALIDITY CHECK SMF VALUES                  19018 02830019
                                   41 *            R6  - POINTS TO REGISTER SAVE AND WORK AREA           19018 02840019
                                   42 *            R8  - POINTS TO END OF INPUT BUFFER                   19018 02850019
                                   43 *            R9  - POINTS TO START OF INPUT BUFFER                 19018 02860019
                                   44 *            R12 - POINTS TO SMCA                                  19018 02870019
                                   45 *         IEESMFOI - TO OPEN SYS1.MANX (SMF PRIMARY DATA SET)         * 02890019
                                   46 *           R5  - CONTAINS JOB WAIT TIME IN MINUTES                   * 02910019
                                   47 *           R12 - POINTS TO SMCA                                      * 02940019
                                   48 *         IEESMFI2 (MFT)-ON RETURN FROM IEESMFOI TO CREATE SMF RECORDS * 02970019
                                   49 *         IEFSD569 (MFT)-NORMAL EXIT ON RETURN FROM IEESMFI2          * 03000019
                                   50 *                                                                     * 03060018
                                   51 *MESSAGES                                                             * 03120018
                                   52 *                                                                     * 03180018
                                   53 *         'IEE351I SMF SYS1.MAN RECORDING NOT BEING USED'-MAN=NONE 19018 03200019
                                   54 *             WAS SPECIFIED - THERE IS NO SMF RECORDING            19018 03220019
                                   55 *                                                                     * 04140018
```

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 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                                F08APR70  12/20/71

000000                             86 IEESMFIT CSECT                                                                  05880018
                                   87 * 097200                                                          M4296 05885019
                                   88 * 423100                                                         A29136 05890019
                                   89 * 863400                                                          M0035 05910018
                                   90 * 644400-646800                                                   M4112 05920018
                                   91 *019200-024600,029400-030000,060000,070200-070800,091800,         19018 05925019
                                   92 *427200-428400,443400-444600,444900,446400-526800,642600-643200,  19018 05930019
                                   93 *843000-861000,869400,873600                                            05935019
                                   94          ENTRY IEESMFI4                                           19018 05995019
                                   95 *                                                                       06060018
                                   96 *   INITIALYZE                                                          06120018
                                   97 *                                                                       06180018
000000 05A0                        98          BALR  R10,0                    SET MODULE BASE                 06240018
000002                             99          USING *,R10                                                    06300018
                                  100 ********************************************************************** ********
                                  101          ATTACH EP=AEDDP
000002 41F0 A00A           0000C  102+         LA    15,IHB0001 LOAD 15 WITH LIST ADDR
000006 47FF 0024           00024  103+         B     36(15) BRANCH AROUND LIST          I270
00000C                            104+IHB0001  DS    0F SUP. PARAM. LIST
00000C 00000028                   105+         DC    A(*+28) ADDRESS OF SYMB NAME
000010 00                         106+         DC    AL1(0) NO HIARCHY                      LCS1
000011 000000                     107+         DC    AL3(0) DCB ADDRESS                 LCS1
000014 00000000                   108+         DC    A(0) ECB ADDRESS
000018 00000000                   109+         DC    A(0) GSPV VALUE OR GSPL ADR
00001C 00000000                   110+         DC    A(0) SHSPL OR SHSPV
000020 02                         111+         DC    AL1(2) SET ROLLOUT BITS  RORI
000021 000000                     112+         DC    AL3(0) ETXR ROUT. ADDRESS    RORI
000024 0000                       113+         DC    AL2(0) DPMOD VALUE
000026 00                         114+         DC    AL1(0) LPMOD VALUE
000027 00                         115+         DC    AL1(0)
000028 C1C5C4C4D7404040           116+         DC    CL8'AEDDP' EP SYMBOL
000030 0A2A                       117+         SVC   42 ISSUE ATTACH SVC
                                  118 ********************************************************************** ********
000032                            119 SMFBASE  EQU   *                                                        06360018
                                  120 *  GET REGISTER SAVE AREA (RSA) AND WORK SPACE                      19018 06390019
                                  121          GETMAIN R,LV=96,SP=SUBPOOL                                  19018 06420019
000032 0700                       122+         CNOP  0,4
000034 4510 A03A           0003C  123+         BAL   1,*+8 BRANCH AROUND SP+LV
000038 FF                         124+         DC    AL1(SUBPOOL) SUBPOOL VALUE
000039 000060                     125+         DC    AL3(96) LENGTH
00003C 5801 0000           00000  126+         L     0,0(1,0) LOAD SP AND LV
000040 0A0A                       127+         SVC   10 ISSUE GETMAIN SVC

000042 D75F 1000 1000 00000 00000  129          XC    N0(N96,R1),N0(R1)       CLEAR GOTTEN CORE          19018 06480019
000048 1861                        130          LR    R6,R1                   BASE RSA AND WORK AREA     19018 06510019
000000                             131          USING SMFWKSPC,R6                                        19018 06540019
00004A 5010 6054           00054  132          ST    R1,R13SAV               SAVE RSA PTR               19018 06606019
00004E 5820 0010           00010  133          L     R2,CVTPTR               CVT POINTER                19018 06612019
000000                             134          USING SMFCVT,R2                                          19018 06618019
000052 9120 2074       00074       135          TM    CVTDCB,X20              IS THIS AN MFT SYSTEM-     19018 06624019
000056 4780 A05C           0005E   136          BZ    NOMFT1                  NO-SKIP REGISTER SAVE      19018 06630019
                                  137 * STORE SAVE AREA PTR AND RETURN PTR FOR IEFSD569 ( MFT ONLY)       19018 06636019
00005A 90DE 604C           0004C   138          STM   R13,R14,PTRSAV                                     19018 06642019
00005E                            139 NOMFT1   EQU   *                                                    19018 06648019
00005E 18D1                       140          LR    R13,R1                  SET NEW REG SAVE AREA              06660018
```

```
//SG1 EXEC PGM=ASMBLR,COND=(4,LT)
//SYSUT1 DD DISP=OLD,VOLUME=(,RETAIN),LABEL=(,SL),DSNAME=SYS1.UT1
//SYSUT2 DD DISP=OLD,VOLUME=(,RETAIN),LABEL=(,SL),DSNAME=SYS1.UT2
//SYSUT3 DD DISP=OLD,VOLUME=(,RETAIN),DSNAME=SYS1.UT3
//SYSPRINT  DD  SYSOUT=A
//SYSPUNCH  DD  SYSOUT=B
//SYSIN  DD  *
IEEVLNKT CSECT                                                          00020000
* 000800-003000,004950                                           I272 00030019
*                                                                      00040000
*********************************************************************** 00060000
* NAME -       IEEVLNKT                                          I272 00070019
*                                                                  * 00080019
* FUNCTION -   THIS MODULE CONSISTS OF A TABLE OF PROGRAMS       I272 00090019
*              SPECIFIED ON THE EXEC STATEMENTS OF SYSTEM        I272 00100019
*              PROCEDURES WHICH CAN BE STARTED FROM THE          I272 00110019
*              CONSOLE.                                          I272 00120019
*                                                                  * 00130019
* NOTES -      THE PROGRAMS ARE GIVEN CONTROL VIA AN ATTACH      I272 00140019
*              ISSUED BY INITIATOR MODULE IEFSD263. (THE         I272 00150019
*              ATTACH WAS FORMERLY ISSUED BY MASTER SCHE-        I272 00160019
*              DULER MODULE IEEVWILK/IEEPWILI.)                  I272 00170019
*                                                                  * 00180019
*              THE TABLE IS SEARCHED BY IEEPSN (TO DETER-        I272 00190019
*              MINE IF THE STARTED PROCEDURE IS A SYSTEM TASK,)  I272 00200019
*                                                                  * 00210019
*              THE ATTACHED PGM MUST SAVE AND RESTORE REGS.        * 00220019
*              EACH TABLE ENTRY MUST BE 8 BYTES.                   * 00230019
*              X'00' INDICATES THE END OF THE TABLE.               * 00240019
*********************************************************************** 00320000
*              THIS IS A SEMI-STABLE VERSION OF THE CSECT IEEVLNKT    *
*              THAT WAS CURRENT ON 22/12/71.                          *
*              FURTHER MODIFICATIONS CAN BE MADE BY SUPERZAPPING.     *
*                                 W.A.ANGUS     AAEC   22/12/71       *
*                                                                     *
***********************************************************************
*                                                                       00340000
REFTBL   EQU   *                                                        00360000
         DC    CL8'IEFIRC'          READER INTERPRETER                 00400000
         DC    CL8'IEFSD080'          SYSOUT WRITER                    00440000
         DC    CL8'IEEVMNT2'      MOUNT PROCEDURE                      00460000
         DC    CL8'IHKRJBGN'            RJE READER                     00480000
         DC    CL8'IEFVRRC'       CHECK POINT RESTART          AACA 00481017
         DC    CL8'IKDINPRO'      GRAPHICS                     AACA 00482017
         DC    CL8'IKDSGJP'       GRAPHICS                     AACA 00483017
         DC    CL8'IEFVMA'         SPOOL SPLITTER              I171 00484017
         DC    CL8'IKAGFX'        GRAPHICS PROGRAM             AAAA 00485015
         DC    CL8'IKAGJP'        GRAPHICS PROGRAM             AAAA 00490015
         DC    CL8'IHKBGN'         CRJE                       19006 00492019
         DC    CL8'IEFIIC'         STARTED INITIATOR           I272 00494019
         DC    CL8'IEFDSO'         DIRECT SYSOUT               0099 00496019
*  INSERT TABLE ADDITIONS HERE                                        00500000
         DC    CL8'AEDLIST'                                   *AAEC*
         DC    CL8'AEBUF'                                     *AAEC*
         DC    CL8'AEXCTL'                                    *AAEC*
         DC    CL8'USERNOTE'                                  *AAEC*
         DC    CL8'COMPRESS'                                  *AAEC*
         DC    CL8'IEBCOPY'                                   *AAEC*
         DC    CL8'AECOPY'                                    *AAEC*
         DC    CL8'AELABEL'                                   *AAEC*
```

```
         DC    CL8'IEHDASDR'                                          *AAEC*
         DC    CL8'IFCEREP0'                                          *AAEC*
         DC    CL8'IFASMFDP'                                          *AAEC*
         DC    CL8'TAPETEST'                                          *AAEC*
         DC    CL8'HASP'                                              *AAEC*
         DC    CL8'AEPROG4'                                           *AAEC*
         DC    CL8'AEPROG5'                                           *AAEC*
                                                                              00520000
*                                                                             00540000
REFEND   DC    X'00'                                                  M4331 00541019
*                                                                     M4331 00542019
*********************************************************************M4331 00543019
*                                                                     M4331 00544019
* TABLE II CONTAINS THE PROGRAM NAMES FOR THE STARTABLE SYSTEM        M4331 00545019
* TASKS WHICH ARE NOT TO HAVE DATA SET INTEGRITY.                     M4331 00546019
*                                                                     M4331 00547019
*********************************************************************M4331 00548019
*                                                                     M4331 00549019
         DC    CL8'IEFSD080'       SYSOUT WRITER                     M4331 00550019
         DC    CL8'IEFDSO'         DIRECT SYSOUT                     M4331 00551019
         DC    X'00'               END OF TABLE II                         00560000
         END
/*
```

APPENDIX 11

MODIFICATIONS TO OS SOURCE-2

11.1 IEFSD263

11.2 IEESD565

```
  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                                  F08APR70   2/01/72
000140 18A0                         295            LR    R10,R0                        PUT ADDRESS IN R10                  03020000
000142 D503 C34A A000 0034C 00000   296            CLC   HOURS24(4),0(R10)            CHECK FOR INDICATION THAT STEP      03040000
000148 4720 C158            0015A   297            BH    SETTIME                      IS NOT TO BE TIMED                  03060000
00014C 4170 0001            00001   298            LA    R7,1                         SET SWITCH TO INDICATE TIMER        03080000
                                    299 *                                             WAS NOT SET                         03100000
000150 D203 A004 C34E 00004 00350   300            MVC   4(4,R10),TUHRS24             SET TIME REMAINING FIELD OF         03120000
                                    301 *                                             TIMER WORK AREA TO 1440 MIN         03140000
                                    302 *                                             SO THAT IF THIS IS A CATALOGED      03160000
                                    303 *                                             PROCEDURE THE REMAINING STEPS       03180000
                                    304 *                                             WILL ALSO NOT BE TIMED              03200000
000156 47F0 C18A            0018C   305            B     BYPASS                       BRANCH AROUND STIMER MACRO          03220000
00015A 1B77                         306 SETTIME    SR    R7,R7                        SET SWITCH TO INDICATE TIMER        03240000
                                    307 *                                             WAS SET                             03260000
                                    308            STIMER TASK,EXIT,BINTVL=(0)        SET TIMER                           03280000
00015C 1810                         309+           LR    1,(0) LOAD PARAMETER REG 1
00015E 4100 C338            0033A   310+           LA    0,EXIT LOAD PARAMETER REG 0
000162 41E0 0010            00010   311+           LA    14,16(0,0) LOAD FLAG BYTE
000166 89E0 0018            00018   312+           SLL   14,24(0) SHIFT TO HI-ORDER BYTE
00016A 160E                         313+           OR    0,14 AND PACK WITHEXIT ADDR
00016C 0A2F                         314+           SVC   47 ISSUE STIMER SVC
                                    315 ************************************************************************ ********
                                    316 *          AAEC MOD TO ADD TO AN AREA IN SQS ASSOCIATED WITH THE INIT-         *
                                    317 *          IATOR THE FOLLOWING FIELDS---                                       *
                                    318 *          THE TIMER WORK AREA IN LCT ASSOCIATED WITH JOB                      *
                                    319 *          THE INITIATOR'S TQE ADDRESS                                         *
                                    320 *          THE INITIATOR'S IDENTITY                                            *
                                    321 ************************************************************************ ********
00016E D503 C346 50A8 00348 000A8   322 AECSTART CLC   AAEZERO(4),168(5)          TEST TCBUSER
000174 4780 C18A            0018C   323          BE    BYPASS
000178 5860 50A8            000A8   324          L     R6,168(0,R5)                 LOAD SPECIAL SQS ADDRESS
00017C D20F 602C 4050 0002C 00050   325          MVC   44(16,R6),80(R4)             MOVE TIME WORK AREA INTO SQS
000182 58D0 5078            00078   326          L     R13,120(0,R5)                LOAD INITS TQE ADDRESS
000186 D207 603C 414C 0003C 0014C   327          MVC   60(8,R6),332(R4)             MOVE INIT IDENTITY INTO SQS
                                    328 ************************************************************************ ********
00018C                              329 BYPASS   EQU   *                                                                  03300000
00018C 5860 4024            00024   330          L     R6,LCTPARM1             ADDRESS OF SYS TASK PARM              I272 03301019
000190 4166 0000            00000   331          LA    R6,X0(R6)               CLEAR HIGH ORDER BYTE                 I272 03302019
000194 1266                         332          LTR   R6,R6                   TEST FOR SYSTEM TASK                  I272 03303019
000196 4780 C1B6            001B8   333          BE    NONSYSTK                BRANCH NOT SYSTEM TASK                I272 03304019
00019A D20F 6000 4024 00000 00024   334          MVC   X0(X16,R6),LCTPARM1 INITIALIZE PARM LIST                      I272 03304519
0001A0 5810 C35A            0035C   335          L     R1,SPOOL253             FREE SUBPOOL 253                      M3441 03305519
0001A4 4100 016C            0016C   336          LA    R0,IEFEND-IEFLOT        LENGTH OF LCT                         I272 03307019
0001A8 1601                         337          OR    R0,R1                   SP AND LENGTH IN REG 0                I272 03308019
                                    338          FREEMAIN R,LV=(0),A=(4)      FREE LCT                              I272 03309019
0001AA 1814                         339+         LR    1,4 LOAD AREA ADDRESS
0001AC 4111 0000            00000   340+         LA    1,0(1) CLEAR THE HIGH ORDER BYTE
0001B0 0A0A                         341+         SVC   10 ISSUE FREEMAIN SVC
0001B2 18D6                         342          LR    R13,R6                  ADDRESS OF PARM AREA                  I272 03310019
0001B4 47F0 C1BA            001BC   343          B     GOWAIT                                                        I272 03311019
0001B8 41D0 4024            00024   344 NONSYSTK LA    R13,LCTPARM1            ADDRESS OF PARM IN LCT                I272 03312019
0001BC                              345 GOWAIT   EQU   *                                                             I272 03313019
0001BC 1812                         346          LR    R1,R2                         ADDRESS OF ECB LIST                   03320000
0001BE 5820 1004            00004   347          L     R2,4(0,R1)                    ADDRESS OF CANCEL ECB                 03340000
0001C2 94FD B021      00021         348          NI    TCBPKF+5(R11),255-STMCFLAG  SET TCB DISPATCHABLE          MP65 03350018
                                    349          WAIT  ECBLIST=(1)                                                         03360000
```

F08APR70 2/01/72

```
 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT
                                  460 *                                SYSTEM TASKS.  R6 WILL BE ZERO   I272 03716019
                                  461 *                                FOR NON SYSTEM TASKS.            I272 03716519
000322 1818                       462          LR    R1,R8             PARAMETER LIST POINTER                03720000
                                  463          XCTL  EP=IEFSD104,MF=(E,(1))                                03740000
000324                            464+         CNOP  0,4
000324 45F0 C336          00338   465+         BAL   15,*+20 LOAD SUP.PARAMLIST ADR
000328 00000330                   466+         DC    A(*+8) ADDR OF EP PARAMETER
00032C 00000000                   467+         DC    A(0) DCB ADDRESS PARAMETER       LC0A
000330 C9C5C6E2C4F1F0F4           468+         DC    CL8'IEFSD104' EP PARAMETER
000338 0A07                       469+         SVC   7 ISSUE XCTL SVC
00033A                            470 EXIT     EQU   *                       EXIT RTN USED WHEN TIMER EXP    03760019
00033A 1812                       471          LR    R1,R2                        CANCEL ECB               03780000
00033C 187E                       472          LR    R7,R14                       SAVE REG 14              03800000
                                  473          POST  (1)                          POST CANCEL ECB          03820000
00033E 1B00                       474+         SR    0,0 SET CODE VALUE OF 0
000340 0A02                       475+         SVC   2 ISSUE POST SVC
000342 18E7                       476          LR    R14,R7                       RESTORE REGISTER 14      03840000
                                  477          RETURN                                                      03860000
000344 07FE                       478+         BR    14 RETURN
                                  479 ********************************************************************************
                                  480 *                ADDITIONAL CONSTANT FOR THE AAEC MOD                          *
                                  481 ********************************************************************************
000346 0000
000348 00000000                   482 AAEZERO DC     F'0'                                                    *
                                  483 *
                                  484 ********************************************************************************
00034C 0083D600                   485 HOURS24  DC    F'8640000'                1440 MINUTES(IN HUNDREDTHS OF    03880000
                                  486 *                                       SECONDS)                         03900000
000350 C5                         487 TUHRS24  DC    X'C5'                  1440 MINUTES IN TIMER UNITS   A24887  03920019
000351 C1                         488          DC    X'C1'                  IF SPECIFIED ON EXECUTE CARD  A24887  03940019
000352 00                         489          DC    X'00'                  THE JOB IS NOT TO BE          A24887  03960019
000353 00                         490          DC    X'00'                  TIMED                         A24887  03990019
000354                            491 A        DS    F                                                           04020000
000358 00FFFFF8                   492 ALLCORE  DC    X'00FFFFF8'                                                 04040000
00035C FD000000                   493 SPOOL253 DC    X'FD000000'                                          M3441  04041019
000360 00020005                   494 MPNDFLGS DC    AL2(STMCFLAG),AL2(STATFLAG)   STATUS SVC PARMS       MP65   04043018
000364 00000181                   495 CON385   DC    F'385'                    TU TO HUND SEC               SMF1  04046018
000368 00000000                   496 SMFAT    DC    V(IEFSMFAT)               SMF TCT BUILDER              SMF1  04052018
000000                            497 X0       EQU   0                                                     I272  04052419
000001                            498 X1       EQU   1                                                     I272  04052819
000003                            499 X3       EQU   3                                                     I272  04053219
000004                            500 X4       EQU   4                                                     I272  04053619
000008                            501 X8       EQU   8                                                     I272  04054019
000010                            502 X16      EQU   16                  DISPLACEMENT                      I272  04054419
000020                            503 X32      EQU   32                  DISPLACEMENT                      I272  04054819
000042                            504 SYSCNCL  EQU   X'42'                SYSTEM CANCEL INDICATOR           I272  04055219
0000F7                            505 POOL247  EQU   247                                                 I272  04055619
000080                            506 ENDLIST  EQU   X'80'                                                 I272  04056019
000080                            507 PPABEND  EQU   X'80'                                                 I272  04056419
000070                            508 TCBFSA   EQU   112                                                         04056819
00001D                            509 TCBFLGS  EQU   29                                                    I272  04057219
000098                            510 TCBPQE   EQU   X'98'                                                 I272  04057419
000040                            511 TCBSTI   EQU   X'40'                                                 I272  04057619
00036C 00222000                   512 CODE1    DC    X'00222000'               JOB CANCELLED - NO DUMP     I272  04058019
000370 80122000                   513 CODE2    DC    X'80122000'               JOB CANCELLED - DUMP        I272  04058419
```

A11.1-2

```
  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                F08APR70  12/21/71
000000                              2 IEESD565 CSECT                                                  00800015
                                    3 * 580000,588000-600000,640000-696000                M3817 00803019
                                    4 ************************************************************** 00806015
                                    5 *432000,479540,496000                               19744 00809019
                                    6 ************************************************************** 00812015
                                    7 *  NAME                                                      * 00818015
                                    8 *  IEESD565                                                    00824015
                                    9 *                                                            * 00830015
                                   10 ************************************************************** 00836015
                                   11 *                                                            * 00842015
                                   12 *  FUNCTION                                                  * 00848015
                                   13 *  TO PERFORM ALL OR SOME OF THE FOLLOWING BASED ON INPUT -    00854015
                                   14 *  ENQUEUE A JOB QUEUE ENTRY                                   00860015
                                   15 *  FREE THE ECB/IOB USED FOR SEARCHING THE QUEUE               00866015
                                   16 *  WRITE A MESSAGE                                             00872015
                                   17 *  FREE THE COMMAND CSCB                                     * 00878015
                                   18 *  FREE THE INTERNAL DATA AREA                                 00884015
                                   19 *                                                            * 00890015
                                   20 ************************************************************** 00896015
                                   21 *                                                            * 00902015
                                   22 *  ENTRY                                                     * 00908015
                                   23 *  IEESD565 FROM IEESD562, OR IEESD563                       * 00914015
                                   24 *                                                            * 00920015
                                   25 ************************************************************** 00926015
                                   26 *                                                            * 00932015
                                   27 *  INPUT                                                     * 00938015
                                   28 *  REG6 POINTS AT THE INTERNAL DATA AREA                     * 00944015
                                   29 *  REG7 POINTS AT THE CSCB                                   * 00950015
                                   30 *  REG 12 POINTS TO THE ECB/IOB USED IN QUEUE SEARCHING      * 00956015
                                   31 *                                                            * 00962015
                                   32 ************************************************************** 00968015
                                   33 *                                                            * 00974015
                                   34 *  OUTPUT                                                    * 00980015
                                   35 *  NONE                                                      * 00986015
                                   36 *                                                            * 00992015
                                   37 ************************************************************** 00998015
                                   38 *                                                            * 01004015
                                   39 *  EXIT                                                      * 01010015
                                   40 *  EXIT IS BY RESTORING THE REGISTERS ORIGINALLY PASSED TO IEESD562  * 01016015
                                   41 *  AND RETURNING. IN MVT TO IEEVWAIT, AND IN MFT TO IEECIR50 * 01022015
                                   42 *                                                            * 01028015
                                   43 ************************************************************** 01034015
                                   44 *                                                            * 01040015
                                   45 *  EXTERNAL REFERENCES                                       * 01046015
                                   46 *  CVT                                                       * 01052015
                                   47 *  CSCB                                                      * 01058015
                                   48 *  QUEUE MANAGER DCB                                         * 01064015
                                   49 *  IEFQMNQ2 - THE QUEUE MANAGER ENTRY ENQUEUE MODULE         * 01070015
                                   50 *  IEE0503D THE GENERAL MESSAGE MODULE FOR MASTER SCHEDULER  * 01076015
                                   51 *                                                            * 01082015
                                   52 ************************************************************** 01088015
                                   53 *                                                            * 01094015
                                   54 *  ERROR CONDITIONS                                          * 01100015
                                   55 *  NONE                                                      * 01106015
                                   56 *                                                            * 01112015
```

A11.2-2


```
 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                              FØ8APR7Ø  12/21/71

                                   57 ************************************************************************ Ø1118Ø15
                                   58 *                                                                      * Ø1124Ø15
                                   59 *  NOTES                                                               * Ø113ØØ15
                                   6Ø *  THE INTERNAL DATA AREA CONTAINS CODES WHICH DETERMINE THE           * Ø1136Ø15
                                   61 *  FUNCTION(S) PERFORMED BY THIS ROUTINE AND CONTAIN THE INPUT         * Ø1142Ø15
                                   62 *  CODE FOR THE LINK TO IEEØ5Ø3D                                      * Ø1148Ø15
                                   63 *  THE UCM INDICATOR IS INSERTED IN XAU FOR MCS                   MØ417 Ø1151Ø18
                                   64 *                                                                      * Ø1154Ø15
                                   65 ************************************************************************ Ø116ØØ15
                                   66 ************************************************************************ Ø1166Ø15
                                   67 *                         REGISTER ASSIGNMENTS                          * Ø12ØØØ15
ØØØØØØ                             68 RØ       EQU   Ø             PARAMETER REGISTER                          Ø16ØØØ15
ØØØØØ1                             69 R1       EQU   1             PARAMETER REGISTER                          Ø2ØØØØ15
ØØØØØ2                             7Ø R2       EQU   2             HOLDS LOG. ADDR (NN) OF QUEUE TO BE SEARCHED Ø24ØØØ15
ØØØØØ3                             71 R3       EQU   3             OUTPUT REG FOR QSEARCH, PARAM REG FOR OTHERS Ø28ØØØ15
ØØØØØ4                             72 R4       EQU   4             HOLDS COMMAND INDEX                         Ø32ØØØ15
ØØØØØ5                             73 R5       EQU   5             PARAM REG FOR SUBROUTINES                   Ø36ØØØ15
ØØØØØ6                             74 R6       EQU   6             UTILITY REGISTER                            Ø4ØØØØ15
ØØØØØ7                             75 R7       EQU   7             UTILITY REGISTER                            Ø44ØØØ15
ØØØØØ8                             76 R8       EQU   8             UTILITY REG AND LINK REG (TO SUBROUTINES)   Ø48ØØØ15
ØØØØØ9                             77 R9       EQU   9             BASE REGISTER FOR THIS MODULE               Ø52ØØØ15
ØØØØØA                             78 R1Ø      EQU   1Ø            PARAM REG FOR SUBROUTINES, UTILITY REGISTER Ø56ØØØ15
ØØØØØB                             79 R11      EQU   11            UTILITY REGISTER                            Ø6ØØØØ15
ØØØØØC                             8Ø R12      EQU   12            PARAMETER REGISTER FOR SUBROUTINES          Ø64ØØØ15
ØØØØØD                             81 R13      EQU   13              STANDARD                                  Ø68ØØØ15
ØØØØØE                             82 R14      EQU   14                LINKAGE                                 Ø72ØØØ15
ØØØØØF                             83 R15      EQU   15                  REGISTERS                             Ø76ØØØ15
                                   84 *                                                                      * Ø8ØØØØ15
ØØØØ4Ø                             85 EBLANK   EQU   C' '                                                M1191 Ø8Ø4ØØ18
ØØØØ68                             86 E68      EQU   X'68'                                               M1191 Ø8Ø8ØØ18
ØØØØ48                             87 E48      EQU   X'48'                                               M1191 Ø812ØØ18
ØØØØ74                             88 E74      EQU   X'74'                                               M1191 Ø816ØØ18
ØØØØ6C                             89 E6C      EQU   X'6C'                                               M1191 Ø82ØØØ18
ØØØØAF                             9Ø AF       EQU   X'AF'                                               M1191 Ø824ØØ18
ØØØØØ1                             91 E1       EQU   1                                                   M1191 Ø828ØØ18
ØØØØØ8                             92 E8       EQU   8                                                   M1191 Ø832ØØ18
                                   93 *                                                                      * Ø84ØØØ15
ØØØØØØ                             94 TOPOFQ   EQU   Ø             LOG. ADDR (NN) OF TOP ENTRY, OFFSET FROM    Ø88ØØØ15
                                   95 *                                      JOB TYPE (QUEUE) HANDLE           Ø92ØØØ15
ØØØØ1E                             96 NULLPR   EQU   3Ø            OFFSET OF BOTTOM-OF-Ø-PRTY PTR IN SAME      Ø96ØØØ15
ØØØØ2Ø                             97 HELDTOP  EQU   32            OFFSET OF Q-HELD/TOP-PRTY BYTE IN SAME--    1ØØØØØ15
                                   98 *                                      'FX'=QUEUE BEING HELD             1Ø4ØØØ15
                                   99 *                                      'ØX'=QUEUE NOT HELD               1Ø8ØØØ15
                                  1ØØ *                                        X =TOP PRTY IN QUEUE            112ØØØ15
                                  1Ø1 *                                                                      * 116ØØØ15
ØØØØØ2                            1Ø2 JOBQNN   EQU   2             LOGICAL ADDR (NN) OF JOB QUEUE 'HANDLE'     12ØØØØ15
ØØØØØ1                            1Ø3 HOLDQNN  EQU   1             LOGICAL ADDR (NN) OF HOLD QUEUE 'HANDLE'    124ØØ
ØØØØ24                            1Ø4 HNDLELNG EQU   36            LENGTH (IN BYTES) OF JOB TYPE HANDLE        128ØØØ
ØØØØ14                            1Ø5 ENTRYLNG EQU   2Ø            LENGTH (IN BYTES) OF QUEUE ENTRY            132ØØØ15
ØØØØ68                            1Ø6 D1Ø4     EQU   1Ø4           CONSTANT USED FOR BRANCHING TABLE           136ØØØ15
                                  1Ø7 *                                                                      * 14ØØØØ15
ØØØØ24                            1Ø8 MBBOFF   EQU   36            OFFSET (FROM ECB/IOB) OF MBBCCHHR FIELD     144ØØØ15
                                  1Ø9 *                                                                      * 148ØØØ15
                                  11Ø *                         CODES FOR MESSAGE MODULE                       * 152ØØØ15
ØØØØØ1                            111 JCANCEL  EQU   1             CODE FOR ' JOB CANCELLED'                   156ØØØ15
```

```
  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                F08APR70  12/21/71

000004                            112 JRESET   EQU   4                ' JOB RESET'                          16000015
000010                            113 JNOTFND  EQU   16               ' JOB NOT FOUND'                      16400015
000011                            114 JSELEC   EQU   17               ' JOB SELECTED'                       16800015
000012                            115 QEMPTY   EQU   18               'QUEUE EMPTY'                         17000015
00001E                            116 JHELD    EQU   30               ' JOB HELD'                           17200015
00001F                            117 JRELD    EQU   31               ' JOB RELEASED'                       17600015
000020                            118 QHELD    EQU   32               'QUEUE HELD'                          18000015
000021                            119 QRELD    EQU   33               'QUEUE RELEASED'                      18400015
                                  120 *                                                                     *  18800015
000000                            121 QELEM    EQU   0          OFFSETS FROM GOTTEN CORE-- ENQ/DEQ ELEM      19200015
000008                            122 MBB      EQU   8                MBBCCHHR SAVE FIELD                   19600015
000010                            123 HANDLE   EQU   16               JOB TYPE HANDLE                       20000015
000030                            124 MSGAREA  EQU   48               MESSAGE SPACE FOR MSG MODULE & WTO    20400015
000038                            125 JOBNM    EQU   MSGAREA+8          JOBNAME (FILLER) AREA IN SAME      20800015
000040                            126 PRTYFLD  EQU   MSGAREA+16           PRIORITY          AREA            21200015
000048                            127 ELEMNO   EQU   MSGAREA+24           ELEMENT NUMBER                    21600015
000056                            128 QTYPE    EQU   MSGAREA+38           TYPE OF QUEUE                     22000015
00002C                            129 MSGHEAD  EQU   MSGAREA-4          TO BE USED FOR MSG HEADER (WTO)     22400015
00005C                            130 SAVE     EQU   92                 SAVE AREA OFFSET IN GOT CORE        22800015
                                  131 *                                                                     *  23200015
000008                            132 QIOBA    EQU   8                                                      23600015
000014                            133 QIOBB    EQU   20                                                     24000015
00002C                            134 QIOBC    EQU   44                                                     24400015
000031                            135 QMCOP    EQU   X'31'                                                  24800015
000003                            136 THR3     EQU   3            FIRST SYSOUT Q                            24900017
000026                            137 THR38    EQU   38         LAST SYSOUT Q                               25000017
                                  138 *                                                                     *  25200015
                                  139 ********************************************************************** 25600015
                                  140 ********************************************************************** 26000015
000000                            141          USING QMRESAR,R3                                             26400015
000000                            142          USING IOPARAMS,R5                                            26800015
000000                            143          USING QSDATA,R6                                              27200015
000000                            144          USING CHNCSCB,R7                                             27600015
000000 0590                       145          BALR  R9,0               SET PROGRAM BASE                    28000015
000002                            146          USING *,R9                                                   28400015
000002 4340 605C          0005C   147          IC    R4,QSMHD           SAVE MESSAGE CODE, IF ANY           28800015
                                  148 ********************************************************************** 29200015
                                  149 * THIS SECTION IS USED TO PREVENT DUPLICATION OF CODING FOR ALL      *  29600015
                                  150 * PARTS OF THIS PROGRAM WHICH MUST DEQUEUE THE TASK FROM THE        *  30000015
                                  151 * QUEUE MANAGER'S  QCB                                             *  30400015
                                  152 ********************************************************************** 30800015
000006 5880 0010          00010   153          L     R8,CVTPTR                                              31200015
000000                            154          USING COMMVECT,R8                                            31600015
00000A 5880 800C          0000C   155          L     R8,CVTJOB           PTR TO                           32000015
000000                            156          USING QMRESAR,R8           'QMGR AREA'S                      32400015
                                  157          DROP  R8                                                     32800015
                                  158          DEQ   MF=(E,IEFALTRA)                DEQUEUE OFF RESOURCE    33200015
00000E 4110 953E          00540   159+         LA    1,IEFALTRA LOAD PARAMETER REG 1
000012 0A30                       160+         SVC   48 SDS1
000014 9108 6001          00001   161          TM    QST2,QSNQ          JOB ENQUEUE REQUESTED?              33600015
000018 4780 9058          0005A   162          BZ    FIOB               NO-GO FREE ECB/IOB.                 34000015
                                  163 ********************************************************************** 34400015
                                  164 * THIS SUBROUTINE LINKS TO THE QUEUE MANAGER TO ENQUEUE A JOB ON A   *  34800015
                                  165 * QUEUE. A QMGR PARAM AREA IS PASSED TO THIS LINK-RTN, ADDR IN GR5   *  35200015
                                  166 * THE QUEUE IS NAMED AND 'ENQUEUE' OPERATION INDICATED IN THAT AREA  *  35600015
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  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                              FØ8APR7Ø  12/21/71

                                    167 ********************************************************************** 36ØØØØ15
ØØØØ1C D7Ø3 5Ø18 5Ø18 ØØØ18 ØØØ18   168          XC    QMWTQ(4),QMWTQ      NO TRACKING WANTED.              364ØØØ15
ØØØØ22 D7Ø3 5Ø2Ø 5Ø2Ø ØØØ2Ø ØØØ2Ø   169          XC    QMPCL(4),QMPCL      ZERO OUT LAST  4-BYTE FIELD IN   368ØØØ15
                                    17Ø *                           QMNGR PARAM AREA TO INDICATE 'NO JCT'   372ØØØ15
ØØØØ28 5ØCØ 5Ø1C             ØØØ1C  171          ST    R12,QMEIA           STORE ECB/IOB PTR IN             376ØØØ15
                                    172 *                                   PROPER SLOT IN QMGR PARAM AREA   38ØØØØ15
ØØØØ2C 1815                         173          LR    R1,R5               LOAD ADDR OF QMGR PARAM AREA     384ØØØ15
ØØØØ2E 41DØ 6Ø38             ØØØ38  174          LA    R13,QSAVE                                            388ØØØ15
                                    175          LINK  EP=IEFQMNQ2,MF=(E,(1))   LNK TO QMGR JOB ENQUEUE RTN     392ØØØ15
ØØØØ32 Ø7ØØ                         176+         CNOP  Ø,4
ØØØØ34 45FØ 9Ø46             ØØØ48  177+         BAL   15,*+2Ø LOAD SUP.PARAMLIST ADR
ØØØØ38 ØØØØØØ4Ø                     178+         DC    A(*+8) ADDR OF EP PARAMETER
ØØØØ3C ØØØØØØØØ                     179+         DC    A(Ø) DCB ADDRESS PARAMETER      LCØA
ØØØØ4Ø C9C5C6D8D4D5D8F2             18Ø+         DC    CL8'IEFQMNQ2' EP PARAMETER
ØØØØ48 ØAØ6                         181+         SVC   6 ISSUE LINK SVC
                                    182 *                                                                  * 396ØØØ15
ØØØØ4A 94F7 6ØØ1       ØØØØ1        183          NI    QST2,255-QSNQ            SHUT OFF ENQUEUE BIT      OC69 3965ØØ17
ØØØØ4E 92DD 6Ø58       ØØØ58        184          MVI   QSRDA+8,X'DD'             INDICATE SYSOUT ENQUEUED OC69 397ØØØ17
ØØØØ52 45AØ 92DØ             ØØ2D2  185 OC69DB   BAL   R1Ø,OC69TST               BR TO TEST ROUTINE.      OC69 398ØØØ17
ØØØØ56 47FØ 9Ø74             ØØØ76  186          B     WMSG                GO WRITE MESSAGE                 4ØØØØØ15
ØØØØ5A                              187 FIOB     EQU   *                                                    4Ø4ØØØ15
ØØØØ5A 45AØ 92DØ             ØØ2D2  188          BAL   R1Ø,OC69TST               LINK                     OC69 4Ø6ØØØ17
ØØØØ5E 12CC                         189          LTR   R12,R12             WAS ECB/IOB ACQUIRED?            4Ø8ØØØ15
ØØØØ6Ø 478Ø 9Ø74             ØØØ76  19Ø          BZ    WMSG                NO-TRY MESSAGE                   412ØØØ15
ØØØØ64 58ØØ 939A             ØØ39C  191          L     RØ,QIOBLGH          SET SP252 & LENGTH OF ECB/IOB    416ØØØ15
ØØØØ68 411Ø ØØØ4             ØØØØ4  192          LA    R1,4                SUBTRACT FOUR FROM ECB/IOB ADDR  42ØØØØ15
ØØØØ6C 1111                         193          LNR   R1,R1                                                424ØØØ15
ØØØØ6E 1A1C                         194          AR    R1,R12              TO SET UP FREEMAIN OF AREA       428ØØØ15
                                    195          FREEMAIN R,LV=(Ø),A=(1)        FREE ECB/IOB            19744 432ØØØ19
ØØØØ7Ø 4111 ØØØØ             ØØØØØ  196+         LA    1,Ø(1) CLEAR THE HIGH ORDER BYTE
ØØØØ74 ØAØA                         197+         SVC   1Ø ISSUE FREEMAIN SVC
ØØØØ76                              198 WMSG     EQU   *                                                    436ØØØ15
ØØØØ76 911Ø 6ØØ1       ØØØØ1        199          TM    QST2,QSMG           A MESSAGE TO BE WRITTEN?         44ØØØØ15
ØØØØ7A 471Ø 9Ø8Ø             ØØØ82  2ØØ          BO    WRITE             YES, GO WRITE MESSAGE              441ØØØ15
ØØØØ7E 45EØ 92AE             ØØ2BØ  2Ø1          BAL   R14,TESTHIT         TEST FOR SUCCESSFUL SEARCH       442ØØØ15
                                    2Ø2 *                                  RETURN VIA 14 IF MSG REQUIRED    444ØØØ15
ØØØØ82                              2Ø3 WRITE    EQU   *                                                    446ØØØ15
ØØØØ82 91Ø1 6ØØ1       ØØØØ1        2Ø4          TM    QST2,QSWRT                WAS MSG WRITTEN          OC69 4465ØØ17
ØØØØ86 471Ø 92A2             ØØ2A4  2Ø5          BO    MSGEE                     YES AVOID WRITING ONE    OC69 447ØØØ17
ØØØØ8A 96Ø1 6ØØ1       ØØØØ1        2Ø6          OI    QST2,QSWRT                NO SET MSG WRITTEN BIT   OC69 4475ØØ17
ØØØØ8E 412Ø 6Ø6Ø             ØØØ6Ø  2Ø7          LA    R2,QSMSG                                             448ØØØ15
ØØØØØØ                              2Ø8          USING MESSAGE,R2                                           452ØØØ15
ØØØØ92 424Ø 2Ø1Ø             ØØØ1Ø  2Ø9          STC   R4,XAE              SET MESSAGE CODE                 456ØØØ15
ØØØØ96 D2ØØ 2Ø28 7Ø1D ØØØ28 ØØØ1D   21Ø          MVC   XAU(1),CHUCMP            UCM ENTRY INDICATOR      MØ417 4565ØØ18
ØØØØ9C 95AF 6Ø58       ØØØ58        211          CLI   QSRDA+E8,AF              WAS COMMAND INVALID      M1191 457ØØØ18
ØØØØAØ 478Ø 9ØB2             ØØØB4  212          BE    SYNERR                                         M1191 458ØØØ18
ØØØØA4 D2Ø7 2Ø18 7Ø2Ø ØØØ18 ØØØ2Ø   213          MVC   XAV(8),CHBUF        MOVE JOBNAME TO MESSAGE AREA     46ØØØØ15
ØØØØAA D2Ø7 9442 2Ø18 ØØ444 ØØØ18   214          MVC   AAEJBN(8),XAV
ØØØØBØ 47FØ 91ØA             ØØ1ØC  215          B     STORE                                          M1191 4603ØØ18
ØØØØB4 924Ø 2Ø19       ØØØ19        216 SYNERR   MVI   XAV+1,C' '                                     M1191 4606ØØ18
ØØØØB8 D2Ø5 2Ø1A 2Ø19 ØØØ1A ØØØ19   217          MVC   XAV+2(6),XAV+1                                 M1191 4609ØØ18
ØØØØBE 9568 7ØØ4       ØØØØ4        218          CLI   CHVCD,E68                DISPLAY                  M1191 4612ØØ18
ØØØØC2 478Ø 9ØE6             ØØØE8  219          BE    DPLY                                           M1191 4615ØØ18
ØØØØC6 9548 7ØØ4       ØØØØ4        22Ø          CLI   CHVCD,E48                CANCEL                   M1191 4618ØØ18
ØØØØCA 478Ø 9ØFØ             ØØØF2  221          BE    CNCL                                           M1191 4621ØØ18
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HAS     IEESD565 - JOB ENQUEUE AND MESSAGE MODULE                                                                          PAGE   5

  LOC  OBJECT CODE      ADDR1 ADDR2  STMT   SOURCE STATEMENT                                                  F08APR70  12/21/71
0000CE 9574 7004        00004         222            CLI   CHVCD,E74                  RESET                     M1191 46240018
0000D2 4780 9104              00106   223            BE    RST                                                  M1191 46270018
0000D6 956C 7004        00004         224            CLI   CHVCD,E6C                  HOLD                      M1191 46300018
0000DA 4780 90FA              000FC   225            BE    HLD                                                  M1191 46330018
0000DE D206 2018 95A8 00018 005AA     226            MVC   XAV(7),=C'RELEASE'                                   M1191 46360018
0000E4 47F0 910A              0010C   227            B     STORE                                                M1191 46390018
0000E8 D206 2018 95AF 00018 005B1     228 DPLY       MVC   XAV(7),=C'DISPLAY'                                   M1191 46420018
0000EE 47F0 910A              0010C   229            B     STORE                                                M1191 46450018
0000F2 D205 2018 95A2 00018 005A4     230 CNCL       MVC   XAV(6),=C'CANCEL'                                    M1191 46480018
0000F8 47F0 910A              0010C   231            B     STORE                                                M1191 46510018
0000FC D203 2018 959E 00018 005A0     232 HLD        MVC   XAV(4),=C'HOLD'                                      M1191 46540018
000102 47F0 910A              0010C   233            B     STORE                                                M1191 46570018
000106 D204 2018 95B6 00018 005B8     234 RST        MVC   XAV(5),=C'RESET'                                     M1191 46600018
00010C 90E4 6040              00040   235 STORE      STM   R14,R4,QSJN                   SAVE REGS              M1191 46630018
                                      236            LINK  EP=IEE0503D            LINK TO WRITE MESSAGE           46800015
000110                                237+           CNOP  0,4
000110 45F0 9122              00124   238+           BAL   15,*+20 LOAD SUP.PARAMLIST ADR
000114 0000011C                       239+           DC    A(*+8) ADDR OF EP PARAMETER
000118 00000000                       240+           DC    A(0) DCB ADDRESS PARAMETER        LC0A
00011C C9C5C5F0F5F0F3C4               241+           DC    CL8'IEE0503D' EP PARAMETER
000124 0A06                           242+           SVC   6 ISSUE LINK SVC
000126 98E4 6040              00040   243            LM    R14,R4,QSJN            RESTORE REGS                    47200015
                                      244 ******************************************************************************** ********
                                      245 *
                                      246 *
                                      247 *                 AAEC ADDITION TO GIVE JOB INFORMATION                *
                                      248 *                 WHEN JOB IS SELECTED - MESSAGE TYPE 17               *
                                      249 *                                                                      *
                                      250 *                                                                      *
                                      251 ******************************************************************************** ********
00012A 8000 9129        0012B         252            SSM   *+1
00012E 90EC 9402              00404   253            STM   R14,R12,AAESAVE
000132 4120 6060              00060   254            LA    R2,QSMSG
000000                                255            USING MESSAGE,R2
000136 1B66                           256            SR    R6,R6
000138 4360 944A              0044C   257            IC    R6,AAE17
00013C 8940 0018              00018   258            SLL   R4,24                      ZERO TOP 3 BYTES
000140 8840 0018              00018   259            SRL   R4,24                      Z
000144 1546                           260            CLR   R4,R6
000146 4770 929A              0029C   261            BNE   AAECON
00014A 4150 0010              00010   262            LA    5,16                       LOAD CVT ADDRESS
00014E 5850 5000              00000   263            L     5,0(0,5)                   LOAD CVT ADDRESS
000152 5850 50A0              000A0   264            L     5,160(0,5)                 LOAD TOP TCB ADDRESS
000156 5850 5074              00074   265 AAELD      L     5,116(0,5)                 LOAD A(TCB NEXT)
00015A 1255                           266            LTR   R5,R5                      IS IT LAST TCB?
00015C 4780 929A              0029C   267            BC    8,AAECON
000160 D503 50A8 943E 000A8 00440     268            CLC   168(4,5),AAEZETA
000166 4780 9154              00156   269            BE    AAELD
00016A 5870 50A8              000A8   270            L     7,168(0,5)                 LOAD INITS SQS ADDRESS
00016E D507 9442 7004 00444 00004     271            CLC   AAEJBN(8),4(7)             COMPAR SQS INFO WITH CURRENT
000174 4770 9154              00156   272            BNE   AAELD
                                      273            DROP  R7
000000                                274            USING AESQS,R7
                                      275 *                MOVE IN TCB ADDRESS
000178 D246 94B1 9469 004B3 0046B     276            MVC   AEOUT1(71),AEEDIT          MOVE IN EDIT FIELD
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  LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT
00017E F133 945E 5088 00460 00088   277          MVO   AEWRK(4),136(4,5)       MOVE OFFSET JOB TCB ADDRESS
000184 F373 945E 945E 00460 00460   278          UNPK  AEWRK(8),AEWRK(4)      UNPACK TCB ADDRESS
00018A 92F0 945E      00460         279          MVI   AEWRK,X'F0'             ZERO HI ORDER BYTE
00018E 96F0 9465      00467         280          OI    AEWRK+7,X'F0'           OR IN CORRECT ZONE CODE
000192 DC07 945E 9409 00460 0040B   281          TR    AEWRK(8),AEHEX-240
000198 D205 94B5 9460 004B7 00462   282          MVC   AEOUT1+4(6),AEWRK+2     MOVE IN PRINTABLE TCB ADDRESS
                                    283 *              MOVE IN STEPNAME
00019E D207 94E9 7044 004EB 00044   284          MVC   AEOUT8,AESTEP
                                    285 *              MOVE IN INITIATOR IDENTIFIER
0001A4 D207 94F1 703C 004F3 0003C   286          MVC   AEOUT9,AEINIT
0001AA D503 943E 5088 00440 00088   287          CLC   AAEZETA(4),136(R5)      TEST FOR A ZERO TCB ADDRESS
0001B0 4770 91BC      001BE         288          BNE   AAEMVC
0001B4 D231 94BC 9509 004BE 0050B   289          MVC   AEOUT2(50),AEMSG
0001BA 47F0 9288      0028A         290          B     AEPRNT
                                    291 *              MOVE IN TIME USED TO START OF CURRENT JOB STEP
0001BE 1BAA                         292 AAEMVC   SR    R10,R10
0001C0 58B0 702C      0002C         293          L     R11,AELCT1              LOAD JTU TO DATE
0001C4 58C0 944E      00450         294          L     R12,AE6000
0001C8 1DAC                         295          DR    R10,R12
                                    296 *                                    R11 HAS MINUTES QUANTITY
                                    297 *                                    R10 HAS 1/100 SECS QUANTITY
0001CA 4EB0 945E      00460         298          CVD   R11,AEWRK
0001CE DE02 94C0 9464 004C2 00466   299          ED    AEOUT3(3),AEWRK+6        EDIT IN MINS   MMM
0001D4 4EA0 945E      00460         300          CVD   R10,AEWRK
0001D8 F127 9466 945E 00468 00460   301          MVO   AEWRK2(3),AEWRK
0001DE DE04 94C4 9466 004C6 00468   302          ED    AEOUT3+4(5),AEWRK2      EDIT IN SECS    SS.TH
0001E4 1BAA                         303          SR    R10,R10
000000                              304          USING AETQE,R8
0001E6 5880 5078      00078         305          L     R8,120(0,R5)        LOAD TQE ADDRESS
0001EA 9594 8000      00000         306 AAE      CLI   0(8),X'94'              IS IT A TASK TYPE TQE
0001EE 4770 91F8      001FA         307          BNE   AAEREAL
0001F2 58B0 800C      0000C         308          L     R11,TQEVAL              LOAD REMAINING CPU STEP TIME
0001F6 47F0 920C      0020E         309          B     AAE2
0001FA 9517 8000      00000         310 AAEREAL  CLI   0(8),X'17'              IS IT A REAL TYPE TQE
0001FE 4770 9208      0020A         311          BNE   AAE1
000202 58B0 8014      00014         312          L     R11,TQESAV              LOAD SAVED CPU TIME TO GO
000206 47F0 920C      0020E         313          B     AAE2
00020A 41B0 0000      00000         314 AAE1     LA    R11,0
00020E 58C0 9452      00454         315 AAE2     L     R12,AE26
000212 1CAC                         316          MR    R10,R12             TIMER UNITS  X  26
000214 58C0 9456      00458         317          L     R12,AE10000
000218 1DAC                         318          DR    R10,R12             (TU X 26)/10000= T IN 1/100SECS
00021A 89A0 0020      00020         319          SLL   R10,32                  REMOVE REMAINDER
00021E 58C0 944E      00450         320          L     R12,AE6000
000222 1DAC                         321          DR    R10,R12
000224 4EB0 945E      00460         322          CVD   R11,AEWRK
000228 DE02 94CE 9464 004D0 00466   323          ED    AEOUT5(3),AEWRK+6
00022E 4EA0 945E      00460         324          CVD   R10,AEWRK
000232 F127 9466 945E 00468 00460   325          MVO   AEWRK2(3),AEWRK
000238 DE04 94D2 9466 004D4 00468   326          ED    AEOUT5+4(5),AEWRK2
                                    327          DROP  R6
000000                              328          USING AETCT,R6
00023E 5860 50A4      000A4         329 AAETCT   L     R6,164(0,R5)            LOAD TCT ADDTESS
000242 5870 6038      00038         330          L     R7,TCTMINC0
000246 8970 0010      00010         331          SLL   R7,16                   CLEAR TCTMINC0 FIELD
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00024A 8870 000F             0000F   332          SRL   R7,15                    MULTIPLY TCTRSZ0 BY 2
00024E 4E70 945E             00460   333          CVD   R7,AEWRK
000252 DE02 940B 9464 004DD  00466   334          ED    AEOUT7(3),AEWRK+6
000258 5870 6038             00038   335          L     R7,TCTMINC0
00025C 8870 000F             0000F   336          SRL   R7,15                    MULT TCTMINC0 BY 2
000260 4E70 945E             00460   337          CVD   R7,AEWRK
000264 DE02 94E4 9464 004E6  00466   338          ED    AEOUT7+9(3),AEWRK+6
00026A 4150 94C0             004C2   339          LA    R5,AEOUT3
00026E 4160 0001             00001   340          LA    6,1
000272 4170 94E9             004EB   341          LA    R7,AEOUT8
000276 9521 5000       00000         342 AECLI    CLI   0(R5),X'21'
00027A 4720 9280             00282   343          BH    AELA
00027E 92F0 5000       00000         344          MVI   0(R5),X'F0'
000282 4155 0001             00001   345 AELA     LA    R5,1(R5)
000286 8756 9274             00276   346          BXLE  R5,R6,AECLI
00028A D246 93B2 94B1 003B4  004B3   347 AEPRNT   MVC   AAEWTO+4(71),AEOUT1      MOVE EDITED OUTPUT TO WTO LIST
                                     348          WTO   MF=(E,AAEWTO)
000290 4110 93AE             003B0   349+         LA    1,AAEWTO LOAD PARAMETER REG 1
000294 0A23                          350+         SVC   35 ISSUE SVC
000296 D246 94B1 9469 004B3 0046B    351          MVC   AEOUT1(71),AEEDIT        MOVE EDIT FIELD BACK INTO OUT
                                     352          DROP  R6
                                     353          DROP  R7
000000                               354          USING QSDATA,R6                RE-ESTABLISH ADDRESSABILITY
000000                               355          USING CHNCSCB,R7               RE-ESTABLISH ADDRESSABILITY
00029C 98EC 9402             00404   356 AAECON   LM    R14,R12,AAESAVE          RESTORE REGS
0002A0 8000 93AA       003AC         357          SSM   AAEFF
                                     358 *
                                         ********************************************************************** ********

0002A4 92EE 6058       00058         359 MSGEE    MVI   QSRDA+8,X'EE'             INDICATE MSG JUST WRITTEN  0C69 47260017
0002A8 45A0 92D0             002D2   360          BAL   R10,DC69TST                LINK                       0C69 47320017
0002AC 47F0 9370             00372   361          B     FRWK              GO FREE WORK AREA & EXIT                47400015
                                     362          DROP  R2                                                      47600015
0002B0                               363 TESTHIT  EQU   *                                                       47640015
0002B0 9104 6001       00001         364          TM    QST2,QSHIT          WAS SEARCH SUCCESSFUL?                47680015
0002B4 4710 9370             00372   365          BO    FRWK                BR YES- NO MESSAGE NEEDED             47720015
0002B8 4140 0010             00010   366          LA    R4,JNOTFND          SET JOB NOT FOUND MESSAGE             47740015
0002BC 9120 6001       00001         367          TM    QST2,QSJ            WAS THIS A JOBNAME SEARCH?            47760015
0002C0 077E                          368          BCR   7,R14               BR YES                                47780015
0002C2 4140 0012             00012   369          LA    R4,QEMPTY           SET QUEUE EMPTY MESSAGE               47800015
0002C6 9240 7020       00020         370          MVI   CHBUF,C' '          CLEAR OUT JOBNAME                     47820015
0002CA D206 7021 7020 00021  00020   371          MVC   CHBUF+1(7),CHBUF      FIELD IN CSCB FOR MESSAGE             47840015
0002D0 07FE                          372          BR    R14                                                     47920015
0002D2                               373 DC69TST  EQU   *                       TESTING SUBROUTINE         0C69 47922017
0002D2 D500 7004 93A7 00004  003A9   374          CLC   CHVCD(1),RES116+1     IS COMMAND RESET           0C69 47924017
0002D8 077A                          375          BCR   7,R10                  NO  THEN RETURN            0C69 47926017
0002DA 9526 6003       00003         376          CLI   QSNUM+1,THR38       ID Q # EQUAL OR HIGHER THAN 38         47928017
0002DE 07AA                          377          BCR   10,R10                YES THEN RETURN (NOT SYSOUT)       47930017
0002E0 9503 6003       00003         378          CLI   QSNUM+1,THR3          IS Q LOWER THAN 3                  47932017
0002E4 074A                          379          BCR   4,R10                 YES RETURN (NOT SYSOUT)    0C69 47934017
0002E6 9140 6000       00000         380          TM    QST1,QSEL             IS IT SELECTIVE SEARCH     0C69 47936017
0002EA 071A                          381          BCR   1,R10                 YES RETURN                 0C69 47938017
0002EC 9180 6000       00000         382          TM    QST1,QSGEN            IS IT GENERAL SEARCH       0C69 47940017
0002F0 078A                          383          BCR   8,R10                 NO RETURN                  0C69 47942017
0002F2 4940 93A8             003AA   384          CH    R4,CON4           IS MESSAGE JOB RESEG                   47944017
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  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                                F08APR70  12/21/71

0002F6 077A                        385          BCR   7,R10                  NO THEREFORE RETURN                47946017
0002F8 95DD 6058       00058       386          CLI   QSRDA+8,X'DD'           WAS ENQ OF SOUT PERFORMED  0C69 47948017
0002FC 4770 9334             00336 387          BNE   MSGTST                  NO TEST MSG REQUIRED       0C69 47950017
000300 5800 939A             0039C 388          L     R0,QIOBLGH                                          47952017
                                   389          GETMAIN R,LV=(0)               GET CORE FOR ECB/IOB      19774 47955019
000304 4510 9306             00308 390+         BAL   1,*+4 INDICATE GETMAIN
000308 0A0A                        391+         SVC   10 ISSUE GETMAIN SVC
00030A 41C1 0004             00004 392          LA    R12,4(R1)                                           47958017
00030E 5001 0000             00000 393          ST    R0,0(R1)                                            47960017
000312 D243 C000 955A 00000  0055C 394          MVC   0(QIOBL,R12),QMECB     MOVE BASIC ECB/IOB INTO CORE       47962017
000318 50CC 0008             00008 395          ST    R12,QIOBA(R12)                                      47964017
00031C 411C 002C             0002C 396          LA    R1,QIOBC(R12)                                       47966017
000320 501C 0014             00014 397          ST    R1,QIOBB(R12)                                       47968017
000324 D202 C035 C015 00035  00015 398          MVC   53(3,R12),QIOBB+1(R12)                              47970017
00032A 411C 0027             00027 399          LA    R1,QIOBC-5(R12)                                     47972017
00032E 501C 002C             0002C 400          ST    R1,QIOBC(R12)                                       47974017
000332 9631 C02C       0002C       401          OI    QIOBC(R12),QMCOP                                    47976017
000336 95EE 6058       00058       402 MSGTST   CLI   QSRDA+8,X'EE'            WAS A MSG JUST WRITTEN     0C69 47978017
00033A 4780 9344             00346 403          BE    TCTL563                  YES XCTL TO IEESD563       0C69 47980017
00033E 9110 6001       00001       404          TM    QST2,QSMG                IS A MSG INDICATED         0C69 47982017
000342 4710 9080             00082 405          BO    WRITE                    YES BRANCH TO WRITE        0C69 47984017
000346                             406 TCTL563  EQU   *                                                   0C69 47986017
                                   407          ENQ   MF=(E,IEFALTRA)                                     47988017
000346 4110 953E             00540 408+         LA    1,IEFALTRA LOAD PARAMETER REG 1
00034A 0A38                        409+         SVC   56
00034C 9200 6058       00058       410          MVI   QSRDA+8,X'00'            ZERO OUT INDICATOR FIELD   0C69 47990017
000350 9200 6006       00006       411          MVI   QSELA+2,X'00'           ZERO OUT NO PRTY OR Q CHGE FLD   47992017
000354 4120 0064             00064 412          LA    R2,100                   R2 MUST BE NONZERO         0C69 47994017
000358 4340 7004             00004 413          IC    R4,CHVCD                 GET COMMAND CODE FROM CSCB 0C69 47995017
                                   414          XCTL  EP=IEESD563                                         47996017
00035C                             415+         CNOP  0,4
00035C 45F0 936E             00370 416+         BAL   15,*+20 LOAD SUP.PARAMLIST ADR
000360 00000368                    417+         DC    A(*+8) ADDR OF EP PARAMETER
000364 00000000                    418+         DC    A(0) DCB ADDRESS PARAMETER       LC0A
000368 C9C5C5E2C4F5F6F3            419+         DC    CL8'IEESD563' EP PARAMETER
00037O 0A07                        420+         SVC   7 ISSUE XCTL SVC
000372                             421 FRWK     EQU   *                                                   48000015
000372 5800 9396             00398 422          L     R0,WKLGTH          SET SP252 & WORK AREA LENGTH         48400015
000376 58D0 603C             0003C 423          L     R13,QS13           GET CALLER'S SAVE AREA PT.           48800015
00037A 1816                        424          LR    R1,R6             SET ADDR FOR FREEMAIN                49200015
                                   425          FREEMAIN R,LV=(0),A=(1)        FREE QSWORK AREA          19774 49600019
00037C 4111 0000             00000 426+         LA    1,0(1) CLEAR THE HIGH ORDER BYTE
000380 0A0A                        427+         SVC   10 ISSUE FREEMAIN SVC
000382 1817                        428          LR    R1,R7              LOAD ORIGINAL INPUT  ADDRESS         50000015
000000                             429          USING CHNCSCB,R1         ADDRESSABILITY FOR CSCB                50400015
000384 9602 7006       00006       430          OI    CHSTS,CHFC         INDICATE 'FREE CORE' TO SVC 34 MOD   50800015
000388 1311                        431          LCR   R1,R1              COMPLEMENT ADDR IN R1  FOR THE MACRO 51200015
00038A 1B00                        432          SR    R0,R0              INDICATE CSCB PROCESSING             51400018
                                   433          MGCR  (1)                THIS WILL FREE  CSCB  CORE           51600015
00038C 0A22                        434+         SVC   34 ISSUE MGCR SVC
                                   435          DROP  R1                                                  52000015
                                   436          RETURN (14,12),T                                          52400015
00038E 98EC D00C             0000C 437+         LM    14,12,12(13) RESTORE THE REGISTERS
000392 92FF D00C       0000C       438+         MVI   12(13),X'FF' SET RETURN INDICATION
000396 07FE                        439+         BR    14 RETURN
```

```
  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                               FØ8APR70  12/21/71

000398                              440           DS    ØF                                                         52800015
000398 FC                           441 WKLGTH    DC    X'FC' 252          *SUBPOOL-THESE 4 DC'S                   53200015
000399 0000E8                       442           DC    AL3(QSLGTH)         * MUST BE TOGETHER                     53600015
00039C                              443           DS    ØF                                                         54000015
00039C FC                           444 QIOBLGH   DC    X'FC' 252           SUBPOOL                                54400015
00039D 000048                       445           DC    AL3(QIOBL+4)                                               54800015
                                    446 *                                                                        * 55200015
```

```
                                448 ********************************************************************** 56000015
                                449 *                                                                    * 56400015
                                450 *                          CONSTANTS                                 * 56800015
                                451 *                                                                    * 57200015
                                452 ********************************************************************** 57600015
0003A0                          453          DS    0F                                                      58400015
0003A0 0048                     454 CAN72    DC    H'72'          INDEX CODE FOR CANCEL   COMMAND         60400015
0003A2 0068                     455 DIS104   DC    H'104'                 DISPLAY                          60800015
0003A4 006C                     456 HLD108   DC    H'108'                 HOLD                             61200015
0003A6 0070                     457 REL112   DC    H'112'                 RELEASE                          61600015
0003A8 0074                     458 RES116   DC    H'116'                 RESET                            62000015
0003AA 0004                     459 CON4     DC    H'4'                                                    70000015
                                460 ********************************************************************
                                461 *                                                                  *
                                    *          ADDITIONAL CONSTANTS FOR THE AAEC MODS                  *
                                    *                                                                  *
                                    ********************************************************************

0003AC FE                       462 AAEFF    DC    X'FE'
                                463 AAEWTO   WTO    '
                                                                ',MF=L,ROUTCDE=11
0003B0                          464+AAEWTO   DS    0F
0003B0 004E                     465+         DC    AL2(IHB0021-*) MESSAGE LENGTH
0003B2 8000                     466+         DC    B'1000000000000000' MCSFLAGS FIELD
                                467+         DC    C'                                                  X
0003B4 4040404040404040            +                          ' MESSAGE
0003FE                          468+IHB0021  EQU   *
0003FE 0000                     469+         DC    B'0000000000000000' DESCRIPTOR CODES
000400 0020                     470+         DC    B'0000000000100000' ROUTING CODES
000402 0000
000404 0000000000000000         471 AAESAVE  DC    15F'0'
000440 00000000                 472 AAEZETA  DC    F'0'
000444                          473 AAEJBN   DS    CL8
00044C 11                       474 AAE17    DC    X'11'
00044D 000000
000450 00001770                 475 AE6000   DC    F'6000'
000454 0000001A                 476 AE26     DC    F'26'
000458 00002710                 477 AE10000  DC    F'10000'
00045C 00000000
000460 0000000000000000         478 AEWRK    DC    D'0'
000468                          479 AEWRK2   DS    CL3
00046B E3C3C27E40404040         480 AEEDIT   DC    C'TCB='
000476 D1E3E47E                 481 AE2      DC    C'JTU='
00047A 212020D421204B20         482 AE3      DC    X'212020',C'M',X'2120',C'.',X'20',C'S '
000484 E3E3C77E                 483 AE4      DC    C'TTG='
000488 212020D421204B20         484 AE5      DC    X'212020',C'M',X'2120',C'.',X'20',C'S '
000492 D9C37E                   485 AE6      DC    C'RC='
000495 212020D26BE4E4C3         486 AE7      DC    X'212020',C'K,UUC=',X'212020',C'K '
0004A3 4040404040404040         487 AE8      DC    8C' '
0004AB 4040404040404040         488 AE9      DC    8C' '
0004B3                          489 AEOUT1   DS    11C
0004BE                          490 AEOUT2   DS    4C
0004C2                          491 AEOUT3   DS    10C
```

```
  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                                F08APR70  12/21/71

0004CC                            492 AEOUT4   DS   4C
0004D0                            493 AEOUT5   DS    10C
0004DA                            494 AEOUT6   DS    3C
0004DD                            495 AEOUT7   DS    14C
0004EB                            496 AEOUT8   DS    CL8
0004F3                            497 AEOUT9   DS    CL8
0004F8 F0F1F2F3F4F5F6F7           498 AEHEX    DC    C'0123456789ABCDEF'     TRANSLATE TABLE
00050B 404040D1D6C240E3           499 AEMSG    DC    C'   JOB TASK NOT ON THE READY QUEUE
                                  500 *                                                                 *  70400015
                                  501 ************************************************************************  70800015
                                  502 ************************************************************************* 71200015
                                  503 *          ENQ/DEQ MACRO PARAMETER LIST                           * 71600015
                                  504 ************************************************************************* 72000015
                                  505 IEFALTRA ENQ   (IEFSQCBS,IEFQ1QCB,E,2,SYSTEM),MF=L  ENQ/DEQ PARM LIST   72400015
000540                            506+IEFALTRA DS    0F
000540 FF                         507+         DC    AL1(255) LAST ENTRY INDICATION
000541 02                         508+         DC    AL1(2) LENGTH
000542 40                         509+         DC    BL1'01000000' SDS1
000543 00                         510+         DC    AL1(0) RETURN CODE FIELD
000544 0000054C                   511+         DC    A(IEFSQCBS) QNAME ADDRESS
000548 00000554                   512+         DC    A(IEFQ1QCB) RNAME ADDRESS
00054C E2E8E2C9C5C6E2C4           513 IEFSQCBS DC    C'SYSIEFSD'             MAJOR NAME                    72800015
000554 D8F1                       514 IEFQ1QCB DC    C'Q1'                   MINOR NAME ENQ/DEQ Q MNGR     73200015
```

```
 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT
0000A0                            957+          ORG
                                  959+QSREAD    DS    18F THIS AREA IS USED BY QSEARCH FOR READING
                                  960+*                   IN JOB HANDLES. THE AREA IS SUFFICIENT FOR
                                  961+*                   CONTAINING 2 HANDLES WHICH ARE USED
                                  962+*                   ALTERNATELY.
0000E8                            964+QSLGTH    EQU   *-QSDATA
                                  965 ********************************************************************************
                                  966 *                                                                              *
                                  967 *              DSECTS FOR AAEC SECTION                                         *
                                  968 *              LINKAGE CONTROL TABLE,TIMING CONTROL TABLE                      *
                                  969 *                                                                              *
                                  970 *                                                                              *
000000                            971 AETCT       DSECT
000000                            972           DS    CL4
000004                            973 TCTTCB    DS    CL4
000008                            974           DS    CL4
00000C                            975 TCTIOTBL  DS    CL4
000010                            976 TCTPOOL   DS    CL4
000014                            977 TCTUTL    DS    CL4
000018                            978 TCTUDATA  DS    CL4
00001C                            979 TCTJMR    DS    CL4
000020                            980 TCTUSO    DS    CL4
000024                            981 TCTSTOF   DS    CL4
000028                            982 TCTSACT   DS    CL4
00002C                            983 TCTWLMT   DS    CL4
                                  984 * PROCESSOR STORAGE TABLE - HIERARCHY Ø
000030                            985 TCTLWMØ   DS    CL4                     CURRENT  HI WTR MARK
000034                            986 TCTHWMØ   DS    CL4                     CURRENT  LO WTR MARK
000038                            987 TCTMINCØ  DS    CL2                     MINIMUM  DIFF BETWEEN HI & LO
00003A                            988 TCTRSZØ   DS    CL2                     REGION REQUEST
00003C                            989 TCTRBCØ   DS    CL2
00003E                            990 TCTMBCØ   DS    CL2                     TOTAL ROLLOUT OBTAINED STORAGE
                                  991 * PROCESSOR STORAGE TABLE - HIERARCHY 1
000040                            992 TCTLWM1   DS    CL4                     CURRENT  HI WTR MARK
000044                            993 TCTHWM1   DS    CL4                     CURRENT  LO WTR MARK
000048                            994 TCTMINC1  DS    CL2                     MINIMUM  DIFF BETWEEN HI & LO
00004A                            995 TCTRSZ1   DS    CL2                     REGION REQUEST
00004C                            996 TCTRBC1   DS    CL2
00004E                            997 TCTMBC1   DS    CL2                     TOTAL ROLLOUT OBTAINED STORAGE
                                  998 * TCT I/O TABLE FOLLOWS.
000000                            999 AETQE       DSECT
000000                           1000 TQEFLGS   DS    CL1
000001                           1001 TQETCB    DS    CL3
000004                           1002           DS    CL1
000005                           1003 TQEFLNK   DS    CL3
000008                           1004           DS    CL1
000009                           1005 TQEBLND   DS    CL3
00000C                           1006 TQEVAL    DS    CL4
000010                           1007 TQELHPSW  DS    CL4
000014                           1008 TQESAV    DS    CL4
000018                           1009 TQESAADR  DS    CL4
00001C                           1010           DS    CL1
```

```
  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                                F08APR70  12/21/71
000010                           1011 TQEEXIT  DS    CL3
000020                           1012 TQEGRS   DS    18F
                                 1013 ************************************************************************
                                 1014 *        THE FOLLOWING DSECT MAPS OUT AN AREA IN SYSTEM QUEUE SPACE    *
                                 1015 *        THAT IS GETMAINED BY EACH INITIATOR.                          *
                                 1016 *        FOR EACH JOB RUNNING UNDER THAT INITIATOR THE AREA CONTAINS   *
                                 1017 *        INFORMATION PERTINENT TO THAT JOB.                            *
                                 1018 *                                                                      *
                                 1019 *        THE AREAS OF OS (MVT ONLY) THAT HAVE BEEN MODIFIED TO         *
                                 1020 *        GENERATE THE INFORMATION IN THIS AREA ARE ---                  *
                                 1021 *        IEFUSI - SMF STEP INITIATION USER EXIT                        *
                                 1022 *        IEFSD263 - INITIATOR MODULE THAT FINALLY ATTACHES JOB         *
                                 1023 *        IEFACTRT - SMF USER EXIT                                      *
                                 1024 *                                                                      *
                                 1025 *        FOR ANY REQUEST FOR ADDITIONAL FIELDS TO THIS AREA,           *
                                 1026 *        OR ANY QUERIES - SEE W.A.ANGUS                                *
                                 1027 *                                                  AAEC  71.316        *
                                 1028 ************************************************************************
000000                           1029 AESQS    DSECT
000000                           1030 UNUSED   DS    4C    UNUSED
000004                           1031 AEJOB    DS    28C   8 BYTE JOB NAME, 20 BYTE PROGRAMMER NAME
000020                           1032 AERDR    DS    4C    READER START TIME (IN 1/100THS OF A SECOND)
000024                           1033 AEDATE   DS    4C    READER START DATE (FORMAT IS 00YYDDDF )
000028                           1034 AECC     DS    2C    HIGHEST CONDN. CODE ENCOUNTERED SO FAR IN JOB
00002A                           1035          DS    2C    UNUSED
00002C                           1036 AELCT1   DS    4C    CPU TIME USED BY PREVIOUS STEPS (1/100TH SEC)
000030                           1037 AELCT2   DS    4C    STEP TIME
000034                           1038 AELCT3   DS    4C    REMAINING STEP TIME (BEFORE A 322 ABEND)
000038                           1039 AELCT4   DS    4C    TIME USED (STEP)
00003C                           1040 AEINIT   DS    8C    IDENTIFIER OF INITIATOR RUNNING JOB
000044                           1041 AESTEP   DS    8C    NAME OF STEP CURRENT (SEE TIOT FOR PROCSTEP)
00004C                           1042 AEACT    DS    8C    USERHS ACCOUNT NUMBER (EBCDIC)
                                 1043 ************************************************************************
                                 1044          END                                                           87600015
0005A0 C8D6D3C4                  1045               =C'HOLD'
0005A4 C3C1D5C3C5D3              1046               =C'CANCEL'
0005AA D9C5D3C5C1E2C5            1047               =C'RELEASE'
0005B1 C4C9E2D7D3C1E8            1048               =C'DISPLAY'
0005B8 D9C5E2C5E3                1049               =C'RESET'
```

APPENDIX 12

WAATTACH

SYMBOL	TYPE	ID	ADDR	LENGTH	LD ID
WAATTACH	SD	01	000000	000204	
STASK	ER	02			
WAAEND	SD	03	000208	00000F	
STASK	LD		000216		03

```
 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                F08APR70  3/08/72

000000                              1 WAATTACH CSECT
                                    2 ********************************************************************
                                    3 *                                                                  *
                                    4 *       THIS ROUTINE RUNS UNDER OS AND USES ENTIRELY STANDARD OS    *
                                    5 *       FACILITIES.  IT IS A MEANS OF EXECUTING ROUTINE BY MEANS OF *
                                    6 *       THE OPERATOR START COMMAND. THIS ROUTINE ALLOWS SUCH ROUTINES*
                                    7 *       TO BE STOPPABLE AT ANY POINT DURING THEIR EXECUTION, A      *
                                    8 *       FACILITY WHICH WAS NOT AVAILABLE BY OTHER METHODS OF STARTING*
                                    9 *       CONSOLE STARTABLES.                                        *
                                   10 *       THIS ROUTINE ALLOWS PROCEDURES THAT MAY BE CONSOLE STARTABLE *
                                   11 *       TO ALSO BE EXECUTABLE AS JOB STEPS (VIA THE CARD READER).  *
                                   12 *                                                                  *
                                   13 *       THE PROGRAM MUST PICK UP THE PGM NAME UNDER THREE TYPES OF  *
                                   14 *       CONITIONS.....                                             *
                                   15 *                                                                  *
                                   16 *       (1)   AS A SYSTEM TASK STARTED FROM THE CONSOLE.( HAS MEANING*
                                   17 *             ONLY UNDER MVT).                                     *
                                   18 *       (2)   AS A JOB READ TO THE HASP INTERNAL READER VIA A      *
                                   19 *             START COMMAND TO THE CONSOLE.                        *
                                   20 *       (3)   AS A USER JOB READ IN VIA THE NORMAL CARD READER     *
                                   21 *       THE ROUTINE TESTS THE TCBUSER FIELD OF THE MOTHER TCB.     *
                                   22 *       IF THIS FIELD IS ZERO THE ROUTINE ASSUMES IT IS RUNNING    *
                                   23 *       UNDER CONDITIONS (2) OR (3).                               *
                                   24 *       FOR CONDN. (1) THE PGM NAME IS PICKED UP FROM THE CSCB.    *
                                   25 *       FOR CASES (2) OR (3) THE ROUTINE LOOKS AT THE FOLLOWING    *
                                   26 *       FIELDS IN TURN.....                                        *
                                   27 *       STEPNAME WITHIN THE PROCEDURE. IF IT IS IEFPROC IT MOVES   *
                                   28 *       ON TO THE NEXT FIELD . OTHERWISE IT ASSUMES THAT THE FIELD *
                                   29 *       IS THE PGM NAME.                                           *
                                   30 *       STEPNAME OF THE STEP THAT INVOKES THE PROCEDURE. IF THIS   *
                                   31 *       FIELD IS 'STARTING' THE ROUTINE THEN ASSUMES THE JOB IS ONE *
                                   32 *       READ TO THE HASP INTERNAL READER AND SO PICKS THE PGM NAME *
                                   33 *       FROM THE JOB NAME ON THE JOBCARD.   ALL OF THES FIELDS ARE *
                                   34 *       AVAILABLE ON THE TIOT.                                     *
                                   35 *                                                                  *
                                   36 ********************************************************************
000000                             37         USING *,15
000000 47F0 F00E           0000E   38         B     *+14
000004 08                          39         DC    AL1(8)    1
000005 E6C1C1E3E3C1C3C8            40         DC    CL8'WAATTACH'
                                   41         SAVE  (14,12)
00000E                             42+        DS    0H
00000E 90EC D00C           0000C   43+        STM   14,12,12(13) SAVE REGISTERS
000012 50D0 F184           00184   44         ST    13,WAASAVE+4
000016 18CD                        45         LR    12,13
000018 41D0 F180           00180   46         LA    13,WAASAVE
00001C 50D0 C008           00008   47         ST    13,8(,12)
000020 18CF                        48         LR    12,15
                                   49         DROP  15
000000                             50         USING WAATTACH,12
000022 1881                        51         LR    8,1
000024 5830 0010           00010   52         L     3,16                    CVT POINTER
000028 5830 3000           00000   53         L     3,0(,3)                 TCB POINTER
00002C 5830 3004           00004   54         L     3,4(,3)                 CURRENT ADDRESS
000030 5840 3084           00084   55         L     4,132(,3)               LOAD MOTHER TCB ADDRESS
```

```
  LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  F08APR70   3/08/72

000034 5840 40A8             000A8    56          L     4,168(,4)              LOAD TCB USER
000038 1244                           57          LTR   4,4                    IS IT A SYSTEM TASK?
00003A 4780 C06E             0006E    58          BZ    WAA000                 YES
00003E 92FF C1EC       001EC         59          MVI   USERFLG,255            SET FLAG TO INDICATE USER JOB
000042 5840 300C             0000C    60          L     4,12(,3)               LOAD ADDRESS OF TIOT
000046 D507 4008 C1F0 00008 001F0     61          CLC   8(8,4),=C'IEFPROC '
00004C 4770 C064             00064    62          BNE   WA000                  ASSUME STEP WITHIN THE
                                      63 *                                     PROCEDURE IS CORRECT SO ATTACH.
000050 4140 4008             00008    64          LA    4,8(,4)                INCREMENT ALONG TIOT
000054 D507 4008 C1F8 00008 001F8     65          CLC   8(8,4),=C'STARTING'
00005A 4770 C064             00064    66          BNE   WA000                  ASSUME THE STEPNAME THAT INVOKES
                                      67 *                                     THE PROCEDURE IS CORRECT -ATTACH
00005E 4150 0010             00010    68          LA    5,16                   LOAD DECREMENTING VALUE
000062 1B85                           69          SR    8,5                    POINT R4 8 BEFORE TIOT
                                      70 *                                     CAN NOW ONLY ASSUME THAT THE
                                      71 *                                     JOBNAME IS CORRECT
000064 D207 C1E4 4008 001E4 00008     72 WA000    MVC   EPNAME(8),8(4)         PICK PGM NAME FOR ATTACH
00006A 47F0 C0A0             000A0    73          B     ATTACH
00006E 9300 C1DC       001DC         74 WAA000   TS    LOCK
000072 4740 C140             00140    75          BC    4,WAA010               SYSTEM TASK ALREADY ACTIVE
                                      76          EXTRACT WAA005,'S',FIELDS=COMM
000076 0700                           77+         CNOP  0,4
000078 4510 C088             00088    78+         BAL   1,*+16 BRANCH AROUND LIST
00007C 000001CC                       79+         DC    A(WAA005) LIST ADDRESS
000080 00000000                       80+         DC    A(0) TCB ADDRESS
000084 01                             81+         DC    AL1(1) FIELD BYTE
000085 000000                         82+         DC    AL3(0)
000088 0A28                           83+         SVC   40 ISSUE EXTRACT SVC
00008A 5830 C1CC             001CC    84          L     3,WAA005               LOAD COMMN. AREA ADDRESS
00008E 5830 3000             00000    85          L     3,0(,3)                LOAD S/M ECB ADDRESS
000092 4160 0034             00034    86          LA    6,52
000096 1873                           87          LR    7,3
000098 1876                           88          SR    7,6
00009A D207 C1E4 7014 001E4 00014     89          MVC   EPNAME(8),20(7)        PICK PROCEDURE NAME
0000A0 1818                           90 ATTACH   LR    1,8                    RESTORE REG1
                                      91          ATTACH EPLOC=EPNAME,ETXR=WAAEND,ECB=ECBCC
0000A2 41F0 C0AC             000AC    92+         LA    15,IHB0003 LOAD 15 WITH LIST ADDR
0000A6 47FF 0024             00024    93+         B     36(15) BRANCH AROUND LIST          1270
0000AC                                94+IHB0003  DS    0F SUP. PARAM. LIST
0000AC 000001E4                       95+         DC    A(EPNAME) ADDRESS OF SYMB NAME
0000B0 00                             96+         DC    AL1(0) NO HIARCHY                      LCS1
0000B1 000000                         97+         DC    AL3(0) DCB ADDRESS                LCS1
0000B4 000001E0                       98+         DC    A(ECBCC) ECB ADDRESS
0000B8 00000000                       99+         DC    A(0) GSPV VALUE OR GSPL ADR
0000BC 00000000                      100+         DC    A(0) SHSPL OR SHSPV
0000C0 02                            101+         DC    AL1(2) SET ROLLOUT BITS  RORI
0000C1 000208                        102+         DC    AL3(WAAEND) EXIT ROUT. ADDRESS    RORI
0000C4 0000                          103+         DC    AL2(0) DPMOD VALUE
0000C6 00                            104+         DC    AL1(0) LPMOD VALUE
0000C7 00                            105+         DC    AL1(0)
0000C8 4040404040404040              106+         DC    CL8' ' I270
0000D0 0A2A                          107+         SVC   42 ISSUE ATTACH SVC
0000D2 5010 C1C8             001C8   108          ST    1,TCBADD
0000D6 9110 3000       00000         109 WAA001  TM    0(3),STOP              STOP REQUESTED?
0000DA 4710 C0F8             000F8   110          BO    DETACH                 IF YES, DETACH
```

```
  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  F08APR70  3/08/72

                                    111          STIMER WAIT,TUINTVL=WAITTIME  ELSE WAIT A FEW SECONDS
0000DE 4110 C1D4            001D4   112+         LA    1,WAITTIME LOAD PARAMETER REG 1
0000E2 4100 0001            00001   113+         LA    0,1(0,0) LOAD FLAG BYTE
0000E6 8900 0018            00018   114+         SLL   0,24(0) SHIFT TO HI-ORDER BYTE
0000EA 0A2F                         115+         SVC   47 ISSUE STIMER SVC
0000EC 5810 C200            00200   116          L     1,=V(STASK)
0000F0 91FF 1000       00000        117          TM    0(1),255                SUBTASK COMPLETED?
0000F4 4780 C0D6            000D6   118          BZ    WAA001                  LOOP IF NOT
                                    119 DETACH   DETACH TCBADD
0000F8 4110 C1C8            001C8   120+DETACH   LA    1,TCBADD LOAD PARAMETER REG 1
0000FC 0A3E                         121+         SVC   62 ISSUE DETACH SVC
0000FE 95FF C1EC       001EC        122          CLI   USERFLG,255             IS IT A USER JOB?
000102 4780 C126            00126   123          BE    WAA001A                 IF SO BRANCH OVER WTO
000106 D207 C116 C1E4 00116 001E4   124          MVC   WAA003+10(8),EPNAME     MOVE TASK NAME TO MESSAGE
                                    125 WAA003   WTO   '**          ENDED'
00010C                              126+         CNOP  0,4
00010C 4510 C124            00124   127+WAA003   BAL   1,IHB0008A BRANCH AROUND MESSAGE
000110 0014                         128+         DC    AL2(IHB0008-*) MESSAGE LENGTH
000112 0000                         129+         DC    B'0000000000000000' MCSFLAGS FIELD
000114 5C5C4040404040404040         130+         DC    C'**          ENDED' MESSAGE
000124                              131+IHB0008  EQU   *
000124                              132+IHB0008A DS    0H
000124 0A23                         133+         SVC   35 ISSUE SVC
000126 D703 C1DC C1DC 001DC 001DC   134 WAA001A  XC    LOCK(4),LOCK
00012C 58D0 D004            00004   135 WAA002   L     13,4(,13)               RESTORE SAVE AREA POINTER
000130 58F0 C1E0            001E0   136          L     15,ECBCC                SET UP SUBTASK CONDN. CODE
000134 58E0 D00C            0000C   137          L     14,12(,13)              RELOAD RETURN ADDRESS
000138 980C D014            00014   138          LM    0,12,20(13)             RESTORE REMAINDER OF REGISTERS
00013C 07FE                         139          BR    14
                                    140 WAA010   WTO   'ONLY ONE CONSOLE STARTABLE AT A TIME, PLEASE'
00013E 0700                         141+         CNOP  0,4
000140 4510 C174            00174   142+WAA010   BAL   1,IHB0009A BRANCH AROUND MESSAGE
000144 0030                         143+         DC    AL2(IHB0009-*) MESSAGE LENGTH
000146 0000                         144+         DC    B'0000000000000000' MCSFLAGS FIELD
000148 D6D5D3E840D6D5C5             145+         DC    C'ONLY ONE CONSOLE STARTABLE AT A TIME, PLEASE' MESSAGE
000174                              146+IHB0009  EQU   *
000174                              147+IHB0009A DS    0H
000174 0A23                         148+         SVC   35 ISSUE SVC
000176 47F0 C12C            0012C   149          B     WAA002
000180                              150          DS    0D
000180 0000000000000000             151 WAASAVE  DC    18F'0'
0001C8 00000000                     152 TCBADD   DC    F'0'
0001CC 00000000                     153 WAA005   DC    F'0'
0001D0 00000000                     154          DC    F'0'
0001D4 00013880                     155 WAITTIME DC    F'80000'
0001D8 00000000                     156 ECBCANC  DC    F'0'
0001DC 00000000                     157 LOCK     DC    F'0'
0001E0 00000000                     158 ECBCC    DC    F'0'
0001E4 4040404040404040             159 EPNAME   DC    C'        '
0001EC 00                           160 USERFLG  DC    X'00'                   USER JOB TYPE FLAG
000010                              161 STOP     EQU   X'10'                   STOP COMMAND CODE
0001ED FFFF                         162 MASK     DC    X'FFFF'
0001EF                              163 EXIT     EQU   *
0001F0                              164          LTORG
0001F0 C9C5C6D7D9D6C340             165               =C'IEFPROC '
```

```
 LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT
0001F8 E2E3C1D9E3C9D5C7             166               =C'STARTING'
000200 00000000                     167               =V(STASK)
000208                              166 MAAEND   CSECT
                                    169          ENTRY STASK
000208                              170          USING *,15
                                    171          SAVE  (14,12)
000208                              172+         DS    0H
000208 90EC D00C            0000C   173+         STM   14,12,12(13) SAVE REGISTERS
00020C 92FF F00E      00216         174          MVI   STASK,255              SET COMPLETION FLAG
                                    175          RETURN (14,12)
000210 98EC D00C            0000C   176+         LM    14,12,12(13) RESTORE THE REGISTERS
000214 07FE                         177+         BR    14 RETURN
000216 00                           178 STASK    DC    X'00'
                                    179          END
```

POS.ID	REL.ID	FLAGS	ADDRESS
01	01	0C	00007C
01	01	0C	0000AC
01	01	0C	0000B4
01	02	1C	000200
01	03	08	0000C1

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SYMBOL	LEN	VALUE	DEFN	REFERENCES			
ATTACH	00002	0000A0	00090	0073			
DETACH	00004	0000F8	00120	0110			
ECBCANC	00004	0001D8	00156				
ECBCC	00004	0001E0	00158	0098	0136		
EPNAME	00008	0001E4	00159	0072	0089	0095	0124
EXIT	00001	0001EF	00163				
IHB0003	00004	0000AC	00094	0092			
IHB0008	00001	000124	00131	0128			
IHB0008A	00002	000124	00132	0127			
IHB0009	00001	000174	00146	0143			
IHB0009A	00002	000174	00147	0142			
LOCK	00004	0001DC	00157	0074	0134	0134	
MASK	00002	0001ED	00162				
STASK	00001	000216	00178	0169	0174		
STOP	00001	000010	00161	0109			
TCBADD	00004	0001C8	00152	0108	0120		
USERFLG	00001	0001EC	00160	0059	0122		
WAAEND	00001	000208	00168	0172			
WAASAVE	00004	000180	00151	0044	0046		
WAATTACH	00001	000000	00001	0050			
WAA000	00004	00006E	00074	0058			
WAA001	00004	0000D6	00109	0118			
WAA001A	00006	000126	00134	0123			
WAA002	00004	00012C	00135	0149			
WAA003	00004	00010C	00127	0124			
WAA005	00004	0001CC	00153	0079	0084		
WAA010	00004	000140	00142	0075			
WAITTIME	00004	0001D4	00155	0112			
WA000	00006	000064	00072	0062	0066		

NO STATEMENTS FLAGGED IN THIS ASSEMBLY
STATISTICS SOURCE RECORDS (SYSIN) = 125 SOURCE RECORDS (SYSLIB) = 1576
OPTIONS IN EFFECT LIST, DECK, LOAD, NORENT, XREF, NOTEST, ALGN, OS, LINECNT = 55
236 PRINTED LINES

APPENDIX 13

WAAXCTL

13.1 Superzap to IEEVJCL

13.2 Listing of WAAXCTL

```
//*********************************************************************
//*
//* THIS SUPERZAP ALLOWS THE IMPLEMENTATION OF WAAXCTL.
//* WAAXCTL INTERCEPTS OS START COMMANDS AFTER OS HAS GENERATED
//* THE JCL FOR THE TASK.  THIS SUPEZAP ALLOWS OS TO XCTL TO WAAXCTL
//* INSTED OF IEEVRCTL.
//  EXEC  PGM=IMASPZAP
//SYSPRINT  DD  SYSOUT=A
//SYSLIB  DD  DSN=SYS1.LINKLIB,DISP=SHR,VOL=SER=AAE001,UNIT=SYSDA
//SYSIN  DD  *
 NAME IEEVSTAR IEEVJCL
 VERIFY  011C  C9C5C5E5D9C3E3D3
 REP     011C  E6C1C1E7C3E3D340
  DUMP  IEEVSTAR IEEVJCL
/*
//*
//*********************************************************************
```

SYMBOL	TYPE	ID	ADDR	LENGTH	LD ID
WAAXCTL	SD	01	000000	0001D6	
XCTL002	LD		0000F4		01
R14	LD		00010C		01
IO	ER	02			
IO	SD	03	0001D8	0002D0	
XCTL002	ER	04			
R14	ER	05			

```
 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                F08APR70  8/21/72

000000                             1 WAAXCTL CSECT
                                   2         ENTRY XCTL002,R14
                                   3 ********************************************************************************
                                   4 *                                                                              *
                                   5 *        THIS ROUTINE INTERFACES BETWEEN THE OS ROUTINE IEEVJCL                *
                                   6 *        AND IEEVRCTL.  ITS PURPOSE IS TO INTERCEPT OS START COMMAND           *
                                   7 *        PROCESSING AT THE STAGE WHEN OS HAS CREATED THE JCL FOR THE           *
                                   8 *        SYSTEM TASK AND TO PASS THIS JCL TO THE HASP INTERNAL READER.         *
                                   9 *                                                                              *
                                  10 *        THE ROUTINE CONTAINS A TABLE OF SYSTEM TASKS THAT ARE NOT             *
                                  11 *        TO BE PROCESSED IN THIS MANNER.  THEY INCLUDE THE OS RDR,             *
                                  12 *        WTR, AND INIT.                                                        *
                                  13 *                                                                              *
                                  14 *        SINCE THIS ROUTINE WRITES RECORDS TO THE HASP INTERNAL READER         *
                                  15 *        TO AVOID JCL STATEMENTS GETTING INTERLEAVED FOR TWO TASKS,            *
                                  16 *        ONLY ONE TASK IS DEALT WITH AT A TIME.  THE ROUTINE XCTL'S TO         *
                                  17 *        IEEVRCTL AS OS NORMALLY WOULD SHOULD TWO TASKS TRY TO GAIN            *
                                  18 *        CONTROL SIMULTANEOUSLY.                                               *
                                  19 *                                                                              *
                                  20 *                                                                              *
                                  21 *        NOTE THAT THIS ROUTINE ISSUES SVC200 AS THE AAEC DEFINED              *
                                  22 *        HASP SVC. HENCE ROUTINE SHOULD NEVER BE USED IF THIS SVC              *
                                  23 *        DOES NOT EXIST.                                                       *
                                  24 *                                                                              *
                                  25 *                                                                              *
                                  26 ********************************************************************************
000000                            27         USING *,15
000000 47F0 F00C            0000C 28         B     *+12
000004 07                         29         DC    AL1(7)
000005 E6C1C1E7C3E3D3             30         DC    CL7'WAAXCTL'
00000C 41D0 F110            00110 31         LA    13,WAASAVE
000010 18CF                       32         LR    12,15
                                  33         DROP  15
000000                            34         USING WAAXCTL,12
000012 50E0 C10C            0010C 35         ST    14,R14
000016 18A1                       36         LR    10,1                    SAVE POINTER TO DSCB
000018 5820 103C            0003C 37         L     2,60(,1)                LOAD POINTER TO 1ST JCLS
00001C 1B11                       38         SR    1,1                     CLEAR R1 FOR THE HASP TEST
00001E 0AC8                       39         SVC   200                     TEST OF HASP IS ACTIVE
000020 12FF                       40         LTR   15,15                   IF ZERO THEN HASP IS NOT THERE
000022 4780 C0F2            000F2 41         BZ    XCTL001A                SO XCTL TO OS AS PER NORMAL
000026 D504 2008 C1C2 00008 001C2 42         CLC   8(5,2),=C'//WTR'        IS A WTR BEING STARTED
00002C 4780 C0F2            000F2 43         BE    XCTL001A
000030 D504 2008 C1C7 00008 001C7 44         CLC   8(5,2),=C'//RDR'        IS A RDR BEING STARTED
000036 4780 C0F2            000F2 45         BE    XCTL001A
00003A D505 2008 C1BC 00008 001BC 46         CLC   8(6,2),=C'//INIT'       IS AN INITIATOR BEING STARTED
000040 4780 C0F2            000F2 47         BE    XCTL001A
000044 D504 2008 C1CC 00008 001CC 48         CLC   8(5,2),=C'//SYS'        IS A SYSTEM PROC BEING STARTED
00004A 4780 C0F2            000F2 49         BE    XCTL001A
00004E D504 2008 C1D1 00008 001D1 50         CLC   8(5,2),=C'//HOS'        IS IT THE HASP ASB RDR
000054 4780 C0F2            000F2 51         BE    XCTL001A
                                  52         ENQ   (QNAME,RNAME,E,,SYSTEM) ENQ ON INTRDR
000058                            53+        CNOP  0,4
000058 4510 C068            00068 54+        BAL   1,IHB0001 BRANCH AROUND LIST0242
00005C FF                         55+        DC    AL1(255) LAST ENTRY INDICATION
```

```
00005D 08                                  56+          DC    AL1(8) LENGTH                0721
00005E 40                                  57+          DC    BL1'01000000' SDS1
00005F 00                                  58+          DC    AL1(0) RETURN CODE FIELD
000060 000001A7                            59+          DC    A(QNAME) QNAME ADDRESS
000064 000001AF                            60+          DC    A(RNAME) RNAME ADDRESS
000068                                     61+IHB0001   DS    0H 0242
000068 0A38                                62+          SVC   56
00006A D228 2017 C17E 00017 0017E          63           MVC   23(41,2),ACCTNO          MOVE REQUIRED AAEC DATA INTO JOB
000070 1222                                64 XCTL000   LTR   2,2                      IS IT LAST IN LIST
000072 4780 C0A2             000A2         65           BZ    XCTL001                  YES
000076 4130 2008             00008         66           LA    3,8(,2)                  LOAD ADDRESS OF CARD IMAGE
00007A 5033 C170             00170         67           ST    3,XCTL005
00007E D700 C170 C170 00170 00170          68           XC    XCTL005(1),XCTL005       CLEAR HIFH ORDER RYTE
000084 D603 C168 C170 00168 00170          69           OC    HASPCCW(4),XCTL005       OR IN DATA ADDRESS INTO CCW
00008A 4110 C158             00158         70           LA    1,HASPBLOK               LOAD ADDRESS OF IOCPBLOCK
00008E 58F0 C1B8             001B8         71           L     15,=V(IO)                LOAD ADDRESS OF IO ROUTINE
000092 05EF                                72           BALR  14,15                    TO WRITE TO INTRDR
000094 D702 C169 C169 00169 00169          73           XC    HASPCCW+1(3),HASPCCW+1   CLEAR ADDRESS PORTION OF CCW
00009A 5820 2000             00000         74           L     2,0(,2)                  LOAD ADDRESS OF NEXT JCLS
00009E 47F0 C070             00070         75           B     XCTL000                  LOOP
0000A2 4130 C178             00178         76 XCTL001   LA    3,EOF
0000A6 5030 C170             00170         77           ST    3,XCTL005
0000AA D603 C168 C170 00168 00170          78           OC    HASPCCW(4),XCTL005
0000B0 4110 C158             00158         79           LA    1,HASPBLOK
0000B4 58F0 C1B8             001B8         80           L     15,=V(IO)
0000B8 05EF                                81           BALR  14,15
0000BA 58F0 C1B8             001B8         82           L     15,=V(IO)
0000BE 56F0 C174             00174         83           O     15,XCTL007               SET SIGN BIT TO CLOSE IOCP
0000C2 05EF                                84           BALR  14,15                    BR TO FREEMAIN IN IO ROUTINE
                                           85           DEQ   (QNAME,RNAME,,SYSTEM)    DEQ INTRDR
0000C4                                     86+          CNOP  0,4
0000C4 4510 C0D4             000D4         87+          BAL   1,IHB0003 BRANCH AROUND LIST0242
0000C8 FF                                  88+          DC    AL1(255) LAST ENTRY INDICATION
0000C9 08                                  89+          DC    AL1(8) LENGTH                0721
0000CA 40                                  90+          DC    BL1'01000000' SDS1
0000CB 00                                  91+          DC    AL1(0) RETURN CODE FIELD
0000CC 000001A7                            92+          DC    A(QNAME) QNAME ADDRESS
0000D0 000001AF                            93+          DC    A(RNAME) RNAME ADDRESS
0000D4                                     94+IHB0003   DS    0H 0242
0000D4 0A30                                95+          SVC   48 SDS1
0000D6 58E0 C10C             0010C         96           L     14,R14                   RESTORE 14 TO WHAT IT WAS ON
                                           97 *                                       ENTRY - JUST IN CASE
0000DA 181A                                98           LR    1,10                     RESTORE REGISTER POINTER TO DSCB
                                           99           XCTL  EP=IEEPRTN               FREE CSCB CORE
0000DC                                     100+         CNOP  0,4
0000DC 45F0 C0F0             000F0         101+         BAL   15,*+20 LOAD SUP.PARAMLIST ADR
0000E0 000000E8                            102+         DC    A(*+8) ADDR OF EP PARAMETER
0000E4 00000000                            103+         DC    A(0) DCB ADDRESS PARAMETER       LC0A
0000E8 C9C5C5D7D9E3D540                    104+         DC    CL8'IEEPRTN' EP PARAMETER
0000F0 0A07                                105+         SVC   7 ISSUE XCTL SVC
0000F2 181A                                106 XCTL001A LR  1,10                       RESET CSCB POINTER
                                           107 XCTL002  XCTL  EP=IEEVRCTL             XCTL BACK TO OS
0000F4                                     108+XCTL002  DS    0H
0000F4                                     109+         CNOP  0,4
0000F4 45F0 C108             00108         110+         BAL   15,*+20 LOAD SUP.PARAMLIST ADR
```

```
  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                                F08APR70   8/21/72

0000F8 00000100                     111+            DC    A(*+8) ADDR OF EP PARAMETER
0000FC 00000000                     112+            DC    A(0) DCB ADDRESS PARAMETER       LC0A
000100 C9C5C5E5D9C3E3D3             113+            DC    CL8'IEEVRCTL' EP PARAMETER
000108 0A07                         114+            SVC   7 ISSUE XCTL SVC
00010A 0000
00010C 00000000                     115 R14         DC    F'0'
000110 0000000000000000             116 WAASAVE     DC    18F'0'
000158                              117 HASPBLOK EQU   *
000158 0000                         118 HASP        DC    AL2(0)
00015A 0080                         119 HASPUNIT DC    X'0080'
00015C 00000168                     120 HASPCAW     DC    A(HASPCCW)
000160 0000000000000000             121 HASPCSW     DC    A(0),A(0)
000168 0100000020000050             122 HASPCCW     CCW   X'01',0,X'20',80
000170 00000000                     123 XCTL005     DC    F'0'
000174 80000000                     124 XCTL007     DC    X'80000000'
000178 615CC5D6C640                 125 EOF         DC    CL6'/*EOF '              END OF INPUT STREAM INDICATOR
00017E 4DC3F1C5F9F0F0F0             126 ACCTNO      DC    C'(C1E90000,XXX),CONSOLE.USE,CLASS=F,PRTY=9'
0001A7 C9D5E3C5D9D5C1D3             127 QNAME       DC    C'INTERNAL'
0001AF D9C5C1C4C5D9F8F0             128 RNAME       DC    C'READER80'
0001B8                              129             LTORG
0001B8 00000000                     130                   =V(IO)
0001BC 6161C9D5C9E3                 131                   =C'//INIT'
0001C2 6161E6E3D9                   132                   =C'//WTR'
0001C7 6161D9C4D9                   133                   =C'//RDR'
0001CC 6161E2E8E2                   134                   =C'//SYS'
0001D1 6161C8D6E2                   135                   =C'//HOS'
0001D8                              136 IO          CSECT
0001D8                              137             USING *,15
0001D8 47F0 F00A              001E2 138             B     *+10
0001DC 05                           139             DC    AL1(5)
0001DD E6C1C1C9D6                   140             DC    CL5'WAAIO'
0001E2 90EC D00C              0000C 141             STM   14,12,12(13)
0001E6 50D0 F224              003FC 142             ST    13,SAVEAREA+4
0001EA 18CD                         143             LR    12,13
0001EC 41D0 F220              003F8 144             LA    13,SAVEAREA
0001F0 50D0 C008              00008 145             ST    13,8(,12)
0001F4 18CF                         146             LR    12,15
                                    147             DROP  15
0001D8                              148             USING IO,12
0001F6 12FF                         149             LTR   15,15
0001F8 4740 C1CE              003A6 150             BL    CLOSE
0001FC 1871                         151             LR    7,1                      SAVE IOCP BLOCK ADDRESS
0001FE 4820 1002              00002 152             LH    2,2(0,1)
000202 F342 C20A 1002 003E2 00002 153             UNPK  IO4A(5),2(3,1)           CONVERT TO
000208 DC02 C20B C120 003E3 002F8 154             TR    IO4A+1(3),TRHEX-240      EBCDIC
00020E 4130 C1FC              003D4 155             LA    3,IO2A                   POINT TO DEVICE UNIT TABLE
000212 4920 3002              00002 156 IO1         CH    2,2(,3)                  COMPARE CURRENT DEV ADDRESS
000216 4780 C0E0              002B8 157             BE    IO4                      WITH TABLE
00021A 95FF 3000        00000       158             CLI   0(3),255                 END OF TABLE?
00021E 4780 C052              0022A 159             BE    IO2
000222 4130 3008              00008 160             LA    3,8(,3)                  INCREMENT ALONG TABLE
000226 47F0 C03A              00212 161             B     IO1
00022A 5840 0010              00010 162 IO2         L     4,16                     CVT POINTER
00022E 5850 4028              00028 163             L     5,40(,4)                 UCB LIST POINTER
000232 4860 5000              00000 164 IO3         LH    6,0(,5)                  LOAD AND TEST VALUE
```

```
000236 4150 5002              00002   165          LA    5,2(,5)                 OF UCB POINTER
00023A 1266                           166          LTR   6,6
00023C 4780 C05A              00232   167          BZ    IO3
000240 4960 C208              003E0   168          CH    6,IO3A                  END OF LIST?
000244 4780 C154              0032C   169          BE    IOEXIT1
000248 D502 C208 600D 003E3   0000D   170          CLC   IO4A+1(3),13(6)         COMPARE WITH DEVICE ADDRESS
00024E 4770 C05A              00232   171          BNE   IO3
000252 9540 601C      0001C           172          CLI   28(6),C' '              TEST CONCURRENT IOCP USE
000256 4780 C190              00368   173          BE    IOEXIT5
00025A 9240 601C      0001C           174          MVI   28(6),C' '              SET VOL SER TO BLANK
00025E 5060 C2C0              00498   175          ST    6,AEDEMOD               SET UCB POINTER
000262 9203 C2C0      00498           176          MVI   AEDEMOD,3               SET MODE TO NOP
000266 D202 C2BD 4015 00495 00015     177          MVC   AEDEAPP,21(4)           SET APPENDAGE TABLE ADDRESS
                                      178          GETMAIN R,LV=96,SP=0
00026C                                179+         CNOP  0,4
00026C 4510 C09C              00274   180+         BAL   1,*+8 BRANCH AROUND SP+LV
000270 00                             181+         DC    AL1(0) SUBPOOL VALUE
000271 000060                         182+         DC    AL3(96) LENGTH
000274 5801 0000              00000   183+         L     0,0(1,0) LOAD SP AND LV
000278 0A0A                           184+         SVC   10 ISSUE GETMAIN SVC
00027A 5020 3000              00000   185          ST    2,0(,3)                 STORE UNIT ADDRESS IN TABLE
00027E 5010 3004              00004   186          ST    1,4(,3)                 STORE IOB ADDRESS IN TABLE
000282 D25F 1000 C268 00000   00440   187          MVC   0(96,1),AEDCB           MOVE COMPOSITE BLOCK
000288 5820 1004              00004   188          L     2,4(,1)
00028C 1A21                           189          AR    2,1
00028E 5020 1004              00004   190          ST    2,4(,1)                 RELOCATE ECB ADDRESS
000292 5010 1014              00014   191          ST    1,20(,1)                RELOCATE 1ST. DCB REFERENCE
000296 5820 102C              0002C   192          L     2,44(,1)
00029A 1A21                           193          AR    2,1
00029C 5020 102C              0002C   194          ST    2,44(,1)                RELOCATE DEB ADDRESS
0002A0 5820 1050              00050   195          L     2,80(,1)
0002A4 1A21                           196          AR    2,1
0002A6 5020 1050              00050   197          ST    2,80(,1)                RELOCATE 2ND. DCB REFERENCE
0002AA 5820 4000              00000   198          L     2,0(,4)                 LOAD TCB POINTER
0002AE 5820 4004              00004   199          L     2,4(,4)                 LOAD CURRENT TCB ADDRESS
0002B2 D300 1050 201C 00050   0001C   200          MVZ   80(1,1),28(2)           MOVE PROTECT FLAGS INTO DEB
0002B8 5810 3004              00004   201 IO4      L     1,4(,3)                 LOAD IOB ADDRESS FROM TABLE
0002BC 5860 1058              00058   202          L     6,88(,1)                LOAD UCB ADDR FRM GETMAINEDCORE
0002C0 5820 7004              00004   203          L     2,4(,7)                 LOAD IOCP CAW AND
0002C4 5020 1010              00010   204          ST    2,16(,1)                MOVE INTO IOB IN GETMAINED CORE
0002C8 94BF 1000      00000           205          NI    0(1),X'BF'              CLEAR CHAINING BIT IN IOB
0002CC 9140 2004      00004           206          TM    4(2),X'40'              TEST CHAINING BIT IN CCW
0002D0 47E0 C100              002D8   207          BNO   IO5
0002D4 9640 1000      00000           208          OI    0(1),X'40'              SET CHAINING BIT IN IOB
0002D8 94BF 6006      00006           209 IO5      NI    6(6),X'BF'              SET UNIT READY IN UCB
0002DC 5810 3004              00004   210 IO6      L     1,4(,3)                 LOAD IOB ADDRESS
0002E0 0A00                           211          SVC   0                       ISSUE EXCP
0002E2 5810 3004              00004   212          L     1,4(,3)                 RELOAD IOB ADDRESS
0002E6 4110 1034              00034   213          LA    1,52(,1)                LOAD ECB ADDRESS POINTER
0002EA 4100 0001              00001   214          LA    0,1                     AND
0002EE 0A01                           215          SVC   1                       WAIT
0002F0 5810 3004              00004   216          L     1,4(,3)                 LOAD IOB ADDRESS AGAIN
0002F4 D200 C20F 1004 003E7   00004   217          MVC   ECBCODE(1),4(1)         SAVE ECB CODE
0002FA D207 7008 100B 00008   00008   218          MVC   8(8,7),8(1)             MOVE CSW INTO IOCP BLOCK
000300 D201 7000 1002 00000   00002   219          MVC   0(2,7),2(1)             MOVE 2 SENSE BYTES INTO IOCP BLK
```

```
 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                F08APR70   8/21/72

000306 957F 1034       00034          220           CLI   52(1),X'7F'             ERROR FREE?
00030A 4780 C140               00318  221           BE    IOEXIT20                YES, EXIT
00030E D703 1034 1034 00034 00034  222           XC    52(4,1),52(1)           CLEAR ECB FOR NEXT IO OPERATION
000314 5820 7004               00004  223           L     2,4(,7)                 ACCEPT ERROR & LOAD CCW FROM
                                      224 *                                        IOCP BLOCK
                                      225 *                                        ERROR MESSAGE TO BE PRINTED
000318 5810 3004               00004  226 IOEXIT20 L     1,4(,3)
00031C D703 1034 1034 00034 00034  227           XC    52(4,1),52(1)           CLEAR ECB FOR NEXY IO
000322 58D0 D004               00004  228           L     13,4(,13)               RESTORE SAVE AREA POINTER
000326 98EC D00C               0000C  229           LM    14,12,12(13)            RESTORE REGISTERS
00032A 07FE                           230           BR    14
                                      231 IOEXIT1  WTO   'INTRDR ADDRESS NOT FOUND'
00032C                                232+          CNOP  0,4
00032C 4510 C174               0034C  233+IOEXIT1  BAL   1,IHB0009A BRANCH AROUND MESSAGE
000330 001C                           234+          DC    AL2(IHB0009-*) MESSAGE LENGTH
000332 0000                           235+          DC    B'0000000000000000' MCSFLAGS FIELD
000334 C9D5E3D9C4D940C1               236+          DC    C'INTRDR ADDRESS NOT FOUND' MESSAGE
00034C                                237+IHB0009  EQU   *
00034C                                238+IHB0009A DS    0H
00034C 0A23                           239+          SVC   35 ISSUE SVC
00034E 58D0 D004               00004  240           L     13,4(,13)               RESTORE SAVE AREA POINTER
000352 58F0 C2C8               004A0  241           L     15,=V(XCTL002)
000356 58E0 C2CC               004A4  242           L     14,=V(R14)              LOAD ADDRESS OF R14 SAVE AREA
00035A 58E0 E000               00000  243           L     14,0(,14)               LOAD VALUE OF SAVED REG14
00035E 5810 D03C               0003C  244           L     1,60(,13)               RESTORE DSCB POINTER SAVED IN R
000362 58C0 D044               00044  245           L     12,68(,13)              RESTORE BASE REG FOR WAAXCTL
000366 07FF                           246           BR    15
                                      247 IOEXIT5  WTO   'CONCURRENT INTRDR ACTIVITY'
000368                                248+          CNOP  0,4
000368 4510 C1B2               0038A  249+IOEXIT5  BAL   1,IHB0010A BRANCH AROUND MESSAGE
00036C 001E                           250+          DC    AL2(IHB0010-*) MESSAGE LENGTH
00036E 0000                           251+          DC    B'0000000000000000' MCSFLAGS FIELD
000370 C3D6D5C3E4D9D9C5               252+          DC    C'CONCURRENT INTRDR ACTIVITY' MESSAGE
00038A                                253+IHB0010  EQU   *
00038A                                254+IHB0010A DS    0H
00038A 0A23                           255+          SVC   35 ISSUE SVC
00038C 58D0 D004               00004  256           L     13,4(,13)               RESTORE SAVE AREA POINTER
000390 58F0 C2C8               004A0  257           L     15,=V(XCTL002)
000394 58E0 C2CC               004A4  258           L     14,=V(R14)              LOAD ADDRESS OF R14 SAVE AREA
000398 58E0 E000               00000  259           L     14,0(,14)               LOAD VALUE OF SAVED REG14
00039C 5810 D03C               0003C  260           L     1,60(,13)               RESTORE DSCB POINTER SAVED IN R
0003A0 58C0 D044               00044  261           L     12,68(,13)              RESTORE BASE REG FOR WAAXCTL
0003A4 07FF                           262           BR    15
0003A6 4130 C1FC               003D4  263 CLOSE    LA    3,IO2A                  POINT TO UNIT TABLE
0003AA 5810 3004               00004  264           L     1,4(,3)                 LOAD IOB ADDRESS
0003AE 5810 1058               00058  265           L     1,88(,1)                LOAD UCB ADDRESS
0003B2 9200 101C       0001C          266           MVI   28(1),0                 REMOVE THE X'40' DSN REFRENCE
0003B6 5A10 3004               00004  267           L     1,4(,3)                 RELOAD IOB ADDRESS
                                      268           FREEMAIN R,LV=96,A=(1),SP=0   FREE CORE USED BY COMPOSITE BLK
0003BA 0700                           269+          CNOP  0,4
0003BC 47F0 C1EC               003C4  270+          B     **8 BRANCH AROUND SP+LV
0003C0 00                             271+          DC    AL1(0) SUBPOOL VALUE
0003C1 000060                         272+          DC    AL3(96) LENGTH
0003C4 5800 C1E8               003C0  273+          L     0,*-4 LOAD SP AND LV
0003C8 4111 0000               00000  274+          LA    1,0(1) CLEAR THE HIGH ORDER BYTE
```

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 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT
0003CC 0A0A                        275+         SVC   10 ISSUE FREEMAIN SVC
0003CE 47F0 C140            00318  276          B     IOEXIT20
0003D2 0000
0003D4 FFFFFFFFFFFFFFFF             277 IO2A     DC    3F'-1'                  UNIT TABLE
0003E0 FFFF                         278 IO3A     DC    X'FFFF'
0003E2 0000000000                   279 IO4A     DC    X'0000000000'           WORK AREA
0003E7 40                           280 ECBCODE  DC    C' '
0003E8 F0F1F2F3F4F5F6F7             281 TRHEX    DC    C'0123456789ABCDEF'
0003F8 0000000000000000             282 SAVEAREA DC    18F'0'
000440                              283 AEDCB    DS    0D
000440 0200                         284 AEIOB    DC    X'0200'                 UNRELATED REQUEST
000442 0000                         285          DC    X'0000'                 FIRST TWO SENSE BYTES
000444 00000034                     286 AEIOECP  DC    A(AEECB-AEDCB)          ECB ADDRESS
000448 0000000000000000             287 AEIOCSW  DC    2A(0)                   CHANNEL STATUS WORD
000450 00000000                     288 AEIOCCP  DC    A(0)                    CCW ADDRESS
000454 00000000                     289 AEIODCP  DC    A(AEDCB-AEDCB)          DCB ADDRESS
000458 0000000000000000             290          DC    4A(0)
000468 0000                         291 AEDCT1F  DC    H'0'                    TIOT FIELD
00046A 0000                         292 AEDCMCF  DC    H'0'                    MACRF FIELD
00046C 0C                           293 AEDCIFL  DC    X'0C'                   INPUT FLAGS
00046D 000038                       294 AEDCDEB  DC    AL3(AEDEB-AEDCB)        DEB ADDRESS
000470 00000000                     295 AEDCOFL  DC    A(0)                    OUTPUT FLAGS
000474 00000000                     296 AEECB    DC    A(0)                    ECB
000478                              297 AEDEB    EQU   *
000478 00000000                     298 AEDETCP  DC    A(0)                    TCB POINTER
00047C 00000000                     299 AEDEDEP  DC    A(0)                    DEB POINTER
000480 12                           300 AEDEOPN  DC    X'12'                   OPEN FLAG
000481 000000                       301 AEDEIRP  DC    AL3(0)                  IRB POINTER
000484 00                           302 AEDEOPA  DC    X'00'                   OPEN ATTRIBUTES
000485 000000                       303 AEDEPGP  DC    AL3(0)                  SYS PURGE CHAIN
000488 00                           304 AEDEXTN  DC    X'00'                   EXTENTS
000489 000000                       305 AEDEUPP  DC    AL3(0)                  USER PURGE
00048C 00                           306 AEDEPRY  DC    X'00'                   PRIORITY
00048D 000000                       307 AEDEPEP  DC    AL3(0)                  PURGE ECB
000490 0F                           308 AEDEPRT  DC    X'0F'                   PROTECT TAG
000491 000000                       309 AEDEDCB  DC    AL3(AEDCB-AEDCB)        DCB ADDRESS
000494 02                           310 AEDEXTS  DC    X'02'                   EXTENT SCALE
000495 000000                       311 AEDEAPP  DC    AL3(0)                  APPENDAGE ADDRESS
000498 00                           312 AEDEMOD  DC    X'00'                   MODIFIER
000499 000000                       313 AEDEUCP  DC    AL3(0)                  UCB POINTER
0004A0                              314          LTORG
0004A0 00000000                     315                =V(XCTL002)
0004A4 00000000                     316                =V(R14)
                                    317          END
```

POS.ID	REL.ID	FLAGS	ADDRESS
01	01	0C	000060
01	01	0C	000064
01	01	0C	0000CC
01	01	0C	0000D0
01	01	0C	0000E0
01	01	0C	0000F8
01	01	0C	00015C
01	02	1C	0001B8
03	04	1C	0004A0
03	05	1C	0004A4

SYMBOL	LEN	VALUE	DEFN	REFERENCES						
ACCTNO	00041	00017F	00126	0063						
AEDCB	00008	000440	00283	0187	0286	0289	0289	0294	0309	0309
AEDCDEB	00003	00046D	00294							
AEDCIFL	00001	00046C	00293							
AEDCMCF	00002	00046A	00292							
AEDCOFL	00004	000470	00295							
AEDCT1F	00002	000468	00291							
AEDEAPP	00003	000495	00311	0177						
AEDEB	00001	000478	00297	0294						
AEDEDCB	00003	000491	00309							
AEDEDEP	00004	00047C	00299							
AEDEIRP	00003	000481	00301							
AEDEMOD	00001	000498	00312	0175	0176					
AEDEOPA	00001	000484	00302							
AEDEOPN	00001	000480	00300							
AEDEPEP	00003	000488	00307							
AEDEPGP	00003	000485	00303							
AEDEPRT	00001	000490	00308							
AEDEPRY	00001	00048C	00306							
AEDETCP	00004	000478	00298							
AEDEUCP	00003	000499	00313							
AEDEUPP	00003	000489	00305							
AEDEXTN	00001	000488	00304							
AEDEXTS	00001	000494	00310							
AEECB	00004	000474	00296	0286						
AEIOB	00002	000440	00284							
AEIOCCP	00004	000450	00288							
AEIOCSW	00004	000448	00287							
AEIODCP	00004	000454	00289							
AEIOECP	00004	000444	00286							
CLOSE	00004	0003A6	00263	0150						
ECBCODE	00001	0003E7	00280	0217						
EOF	00006	000178	00125	0076						
HASP	00002	000158	00118							
HASPBLOK	00001	000158	00117	0070	0079					
HASPCAW	00004	00015C	00120							
HASPCCW	00008	000168	00122	0069	0073	0073	0078	0120		
HASPCSW	00004	000160	00121							
HASPUNIT	00002	00015A	00119							
IHB0001	00002	000068	00061	0054						
IHB0003	00002	0000D4	00094	0087						
IHB0009	00001	00034C	00237	0234						
IHB0009A	00002	00034C	00238	0233						
IHB0010	00001	00038A	00253	0250						
IHB0010A	00002	00038A	00254	0249						
IO	00001	0001D8	00136	0148						
IOEXIT1	00004	00032C	00233	0169						
IOEXIT20	00004	000318	00226	0221	0276					
IOEXIT5	00004	000368	00249	0173						
IO1	00004	000212	00156	0161						
IO2	00004	00022A	00162	0159						
IO2A	00004	0003D4	00277	0155	0263					
IO3	00004	000232	00164	0167	0171					
IO3A	00002	0003E0	00278	0168						
IO4	00004	0002B8	00201	0157						

SYMBOL	LEN	VALUE	DEFN	REFERENCES					
I04A	00005	0003E2	00279	0153	0154	0170			
I05	00004	0002D8	00209	0207					
I06	00004	0002DC	00210						
QNAME	00008	0001A7	00127	0059	0092				
RNAME	00008	0001AF	00128	0060	0093				
R14	00004	00010C	00115	0002	0035	0096			
SAVEAREA	00004	0003F8	00282	0142	0144				
TRHEX	00016	0003E8	00281	0154					
WAASAVE	00004	000110	00116	0031					
WAAXCTL	00001	000000	00001	0034					
XCTL000	00002	000070	00064	0075					
XCTL001	00004	0000A2	00076	0065					
XCTL001A	00002	0000F2	00106	0041	0043	0045	0047	0049	0051
XCTL002	00002	0000F4	00108	0002					
XCTL005	00004	000170	00123	0067	0068	0068	0069	0077	0078
XCTL007	00004	000174	00124	0083					

NO STATEMENTS FLAGGED IN THIS ASSEMBLY
STATISTICS SOURCE RECORDS (SYSIN) = 247 SOURCE RECORDS (SYSLIB) = 1678
OPTIONS IN EFFECT LIST, NODECK, LOAD, NORENT, XREF, NOTEST, ALGN, OS, LINECNT = 55
  432 PRINTED LINES