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by

I. J. HAYES

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ABSTRACT

This report describes the implementation of and modifications to the IBM360 operating system for release 21.6. The system generated was Multiprogramming with a Variable number of Tasks (MVT) with the Houston Automatic Spooling Program (HASP) II, version 3.1. The report makes extensive reference to the AAEC report on modifications and additions to the IBM360 operating system for release 19.6.

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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.

IBM COMPUTERS; PROGRAMMING; PERFORMANCE

ERRATUM

Appendix A, line 9 should read

```
./ NUMBER  SEQ1=1ØØØ19, SEQ2=1ØØØØØ
```

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1. INTRODUCTION

This report describes, in chronological order, the steps necessary to implement the AAEC release 21.6 IBM360 operating system (IBM 1972a). The system implemented (IBM 1972b) is Multi-programming with a Variable number of Tasks (MVT). The reader is referred to the release 19.6 operating system implementation report (Angus 1972) for a description of the relevant aspects of MVT. The Houston Automatic Spooling Program (HASP) II, version 3.1 was also included in the system (IBM 1971).

The release 21.6 operating system (OS) was implemented entirely under the existing release 19.6 operational system causing very little interference to the normal work load. This was in contrast to previous system generations performed under the starter system supplied by IBM, or a dedicated operational system, both of which use the computer inefficiently as only one job is run at a time.

Many of the modifications made to the system are those which were made to the release 19.6 system; however, not one modification was carried over to release 21.6 without being modified to some extent.

2. PREPARATION FOR SYSTEM GENERATION

The IBM360 operating system for release 21.6 was supplied on two tapes in a form suitable to be restored onto two disk packs 'DLIB01' and 'DLIB02'.

2.1 DLIB01 – The First Distribution Library

DLIB01 was restored onto a disk pack and its catalogue was then merged into the release 19.6 system catalogue. As several data sets on DLIB01 have the same names as data sets on the release 19.6 system, their names were changed to comply with the procedure for system generation under an existing operating system (IBM 1972a). The renamed data sets were:

SYS1.MACLIB renamed SYS1.DMACLIB

SYS1.SORTLIB renamed SYS1.DSORTLIB

SYS1.PARMLIB renamed SYS1.DPARMLIB

The renamed data sets were then catalogued under the release 19.6 system.

2.2 DLIB02 – The Second Distribution Library

DLIB02 was restored temporarily onto a disk pack and its data sets were then copied onto the permanently resident disk AAE002 and catalogued on the release 19.6 operating system. The copied data sets were:

SYS1.GENLIB

SYS1.TSOGEN

SYS1.MODGEN2

SYS1.DN554A

SYS1.SAMPLIB

This data set configuration meant that stage one of the system generation could be run without requiring any special disk pack to be mounted, while the stage two only required the distribution library DLIB01 and the target system AAE021 to be mounted. In fact, with stage two assemblies only DLIB01 needed to be mounted.

3. PRE-STAGE ONE MODIFICATIONS

The modifications to the macros AEATTN, SGIEC202, SGIEA2BK and SGIEA2NP in SYS1.GENLIB for release 19.6 were altered to suit release 21.6 (Appendix A). The modifications to SYS1.GENLIB are summarised below.

3.1 Unit Control Block Modification

The unit control block (UCB) for AAEC Dataway devices which can signal asynchronous attention to the IBM360 computer has the attention bit in the UCB set and is extended by a 32-byte AAEC appendage. This is achieved by use of the following two macros:

(i) AEATTN – A local macro added to SYS1.GENLIB to allow the specification at stage one time of up to 50 devices which are to have AAEC attention handling unit control blocks. The second operand (Angus 1972) specified the displacement from the end of the unit control block back to the attention byte. This was removed in favour of a displacement from the start of the unit control block built into the SGIEC202 modification as this was felt to be a more release-independent modification. The form of the AEATTN macro is:

```
AEATTN  (240,248,24A,24C,250)
```

which defines the Dataway devices 240,248,24A,24C and 250 as capable of presenting asynchronous attention and thus requiring an extended unit control block.

(ii) SGIEC202 – is the IBM macro used to generate a unit control block. It was modified to test if the device for which the UCB was being generated was an AAEC attention handling device and if so, to extend the unit control block for the device with the AAEC 32-byte appendage and set the attention bit. The modification is essentially the same as that for release 19.6 except that all the sequence numbering had to be changed; also, the attention bit displacement was changed to a fixed displacement from the start of the UCB rather than a displacement from the end of the UCB.

3.2 AAEC Link Task Control Block

The macros SGIEA2BK and SGIEA2NP were modified to punch out statements at stage one time to set the global variable &DATLINK to the value 'DATALINK' at stage two time if the system being generated is an AAEC system with attention handling Dataway devices, i.e. the AEATTN macro has been specified at stage one time. These modifications communicate to the stage two macros, IEAQBK and IEAANIP, whether or not the system being generated is to have AAEC attention handling devices when these macros are expanded as part of the stage two assemblies.

3.3 Allowing More Than Ninety Six Devices

With the addition of HASP to the system, it was found that the additional HASP pseudo-device unit control blocks brought the total number of unit control blocks to more than ninety six. This required a pre-stage one modification to SYS1.GENLIB as described in Appendix B of IBM (1972a). This modification allows for up to 248 devices by:

- renaming SGGBLPAK to SGPAK96,
- renaming SGPAK248 to SGGBLPAK, and
- adding two statements to the stage one deck (Section 4.1).

Essentially this modification redefines the global variables used by the stage one macros as having dimensions large enough to handle 248 devices.

3.4 Stage One Output

The stage one output was directed to a disk data set SYS1.STAGE1, rather than cards or tape, to enable easy use of the output for running various stage two steps as well as for applying program temporary fixes (PTFs).

4. STAGE ONE

Stage one of the system generation process tests the validity of the input parameters and, when no errors are detected, outputs a job which, when run, generates the new system. This stage one output job, when run, is referred to as stage two of the system generation process. The basic stage one input (Appendix B) is essentially the same as that for release 19.6, although the following modifications were necessary.

4.1 Allowing More Than Ninety Six Devices

As mentioned in Section 3.3, two statements must be added to the front of the stage one deck to allow more than ninety six devices. These statements are:

```
COPY SGGBLPAK

&LIMIT(1) SETB 1
```

which allows up to 248 devices to be specified if the pre-stage one modification to SYS1.GENLIB (Section 3.3) has been made.

4.2 Not Ready Devices Offline at IPL

The statement:

```
&SGMENTB(87) SETB 1
```

was added to the stage one input deck after the modification of Section 4.1 to specify that the system generated would set not-ready devices offline at initial program load (IPL) time thus ensuring only those disks that are ready will be online. This modification means, however, that the tape drives will be offline at IPL and,along with other unit record devices, must be varied online by the AEFUDGIT program (Section 7.10). This was felt more desirable as the devices to be varied online remain static while the disk configuration does not.

4.3 Attention Handling Devices

The configuration of devices on the AAEC Dataway which can handle asynchronous attention presentation was changed. The new specification using the AEATTN macro (Section 3.1(i)) was:

```
AEATTN (240,248,24A,24C,250)
```

where these devices are:

240 – PDP9L Dataway interface to the IBM360 computer system

248 – NOVA computer

24A – NOVA800 computer

24C – AAEC Physics Division PDP15 computer

250 – Remote PDP11 computer

These are the only devices on the Dataway that may initiate input/output over the IBM360 link.

4.4 Dataway Device Definition

The Dataway devices, which are on selector channel two, are defined through the IOCONTRL and IODEVICE system generation macros. Their definition for release 21.6 is:

```
*       PDP9L

LINK IOCONTRL UNIT=2803,MODEL=1,ADDRESS=24,FEATURE=(DATACONV,7-TRACK)

T240 IODEVICE UNIT=2401,MODEL=2,ADDRESS=(240,4),FEATURE=(7-TRACK)

*       NOVA1 AND NOVA2

LINK2 IOCONTRL UNIT=2803,MODEL=1,ADDRESS=24,FEATURE=(DATACONV,7-TRACK)

T248 IODEVICE UNIT=2401,MODEL=2,ADDRESS=(248,3),FEATURE=(7-TRACK)

*       PDP15A

T24C IODEVICE UNIT=2401,MODEL=2,ADDRESS=(24C,2),FEATURE=(7-TRACK)

*       PDP11A

LINK3 IOCONTRL UNIT=2803,MODE=1,ADDRESS=25,FEATURE=(DATACONV,7-TRACK)

T250 IODEVICE UNIT=2401,MODEL=2,ADDRESS=(250,2),FEATURE=(7-TRACK)
```

All the Dataway devices appear to the IBM360 system as 2401 type tape units which can have a maximum of eight devices per control unit and hence require three 2803 type tape controllers to be defined.

4.5 HASP Pseudo Devices

The HASP pseudo devices were specified as being on dummy selector channel 3. These dummy devices are used by HASP for the input and output units of jobs run under HASP as well as for the HASP internal readers. The HASP internal readers, of which there are five, are used for the following functions:

(i) Submitting console startables to HASP.

(ii) Submitting jobs to HASP from jobs running on the IBM360 system.

(iii) Submitting jobs to HASP from remote computers on the Dataway.

4.6 3400 Tape Drives

Four 3400 tape drives were specified in the release 21.6 stage one deck to allow for the proposed new tape system. Initially the system was run with only two 2400 tape drives by a modification to the device mask table (Section 7.4 (iv)). The 3400 tape drives were not supported under release 19.6 of the IBM360 operating system – this was one of the reasons for implementing release 21.6. The specification for the new tape drives was:

```
TCTL  IOCONTRL UNIT=3803,MODEL=1,ADDRESS=28,FEATURE=800BPI

T280  IODEVICE UNIT=3420,MODEL=3,ADDRESS=(280,4),
                    FEATURE=(9–TRACK,DUALDENS)
```

4.7 Generic Device Names

The generic device names for the HASP pseudo devices, the 3400 tape drives, the new Dataway device configuration and the non-HASP output spooling devices were modified as follows:

(i) The HASP pseudo devices for use in input/output spooling were given generic device names of "A" and "B" and the internal reader, for use in jobs running under the operating system, was given the generic device name "INTRDR".

(ii) The 3400 tape drives 280–283 were specified by the generic device names "TAPE" and "SYSSQ" which are the names used for 9-track tape units and sequential devices respectively.

(iii) The new Dataway device configuration was specified by the following generic names:

240 – PDP9L the Dataway interface to the IBM360,

248 – NOVA1 the NOVA computer,

24A – NOVA2 the NOVA820 computer,

24C – PDP15A the AAEC Physics Division PDP15 computer,

250 – PDP11A the remote PDP11 computer, and

241,242 – TAPE7 the 7-track tape units on the PDP9L

It was felt that the generic name TAPE7 should be added because the default system name 2400–2 also referred to all the devices on the Dataway, most of which are not actually 7-track tape units. A general way of referencing an actual 7-track tape was necessary rather than explicitly referring to a particular device as the device configuration may change.

(iv) The generic name for non-HASP output spooling was changed to SYSOUT on both the generic unit name definition and the reader/interpreter procedures RDR and RDRNPL.

4.8 CTRLPROG Macro

The MAXIO parameter on the CTRLPROG macro was increased from 30 to 50 to allow for the additional devices that have been added.

4.9 SUPRVSOR Macro

The ONLNTEST option was removed from the SUPRVSOR macro as this option was never used in the release 19.6 system.

4.10 RESMODS Macro

The AAEC resident additions to the nucleus were specified by the use of the RESMODS macro so that they would be automatically included from the data set SYS1.AAECSVC during the system generation process. Previously, these modifications were added separately after the system generation process. The specification of the RESMODS macro was:

```
RESMODS  PDS=SYS1.AAECSVC,MEMBERS=(IGC244,
              IGC200,
             AEALWAIT,
             AEINTATN,
             IGC246)
```

to include:

SVC 244 – the IBM360 simulator SVC,

SVC 200 – the HASP SVC,

SVC 246 – the link attention handling SVC,

AEALWAIT – the link TCB supervisor program, and

AEINTATN – the link attention handler in the input/output supervisor.

4.11 SVCLIB Macro

The AAEC non-resident SVCs were specified using the SVCLIB macro so that they would automatically be included from the data set SYS1.AAECSVC during the system generation process. The specification was:

```
SVCLIB  PDS=SYS1.AAECSVC,MEMBERS=(IGC00250,
              IGC01250,
              IGC02250,
              IGC03250,
              IGC0024G,
              IGC0024H,
              IGC0024I)
```

Unfortunately IBM has restricted the specification of members to names starting with "IGC" (i.e. SVCs only) so that the addition of non-SVCs to SYS1.SVCLIB had to be specified by modifying the stage one output to include the non-SVC members (Section 6.6). A request has been made to IBM to remove the restriction from the SVCLIB macro and thus make the process completely automatic.

4.12 Linkage Editor

The size options for the linkage editor were modified to increase the disk space utilisation. The new specifications are:

EDITOR DESIGN=F88,SIZE=(88K,6K)

EDITOR DESIGN=F128,SIZE=(200K,100K)

4.13 IMAGELIB Macro

Since the IMAGELIB macro was added to the IBM360 operating system in release 21, this macro had to be added to the stage one deck.

4.14 GENERATE Macro

The RESVOL parameter was changed to specify that the system residence volume was AAE021 so that the system could be generated under the release 19.6 system. The INDEX parameter was specified as INDEX=AAEC so that all system data sets to be generated in stage two would have names starting with "AAEC" and hence would not conflict with existing data set names.

5. PRE-STAGE TWO MODIFICATIONS (seeAppendix C)

5.1 IEAANIP

The source member IEAANIP in SYS1.MODGEN2 was modified to initialise the link task control block at nucleus initialisation time. This modification is essentially the same as that for release 19.6 except that the sequence numbering for updating has been changed and member IEAANIP is now in the data set SYS1.MODGEN2 rather than SYS1.MODGEN.

5.2 IEAQBK

The source member IEAQBK in SYS1.MODGEN was modified to generate the link task control block and program request block with the other permanent task control blocks and program request blocks if the system generation was for a system with Dataway devices (Section 3.2). This modification is essentially the same as for release 19.6 except that the sequence numbering for updating has been changed.

5.3 IECIOS

The source member IECIOS in SYS1.MODGEN was modified to put the address of the AAEC attention handling routine, AEINTATN, into the input/output supervisor. This modification is essentially the same as that for release 19.6 except that the sequence numbering has been changed.

5.4 IEAQNU

The source member IEAQNU in SYS1.MODGEN was modified to put the code for SVC 255 into the SVC handler in the nucleus. The modification is essentially the same as that for release 19.6 except that the sequence numbering has been changed.

5.5 SGIEE00V

The source member SGIEE00V in SYS1.MODGEN was modified to put in the code for automatic start commands for IPLTIME, AEFUDGIT and HASP. The modification was originally a

superzap to the load module for release 19.6, but it was preferable to make the source modification.

5.6 SYS1.AAECSVC

This data set was added to the system, then all the AAEC SVCs, members to go in SYS1.SVCLIB and members to go in SYS1.IMAGELIB were added. These members are:

IGC200 – HASP SVC 200 (Section 4.10)

IGC244 – IBM360 Simulator SVC 244 (Section 4.10)

IGC246 – Attention handler SVC 246 (Section 4.10)

AEALWAIT – Link TCB supervisor program (Section 4.10)

AEINTATN – Link attention handler (Section 4.10)

IGC00250 – SVC 250 module 0 (Section 4.11)

IGC01250 – SVC 250 module 1 (Section 4.11)

IGC02250 – SVC 250 module 2 (Section 4.11)

IGC03250 – SVC 250 module 3 (Section 4.11)

IGC0024G – Dummy SVC 247 (Section 4.11)

IGC0024H – Dummy SVC 248 (Section 4.11)

IGC0024I – Dummy SVC 249 (Section 4.11)

AEATNTSK – Link task attaching program (Section 6.6)

SADUMP – Stand alone dump program (Section 6.6)

IGG019WS – Start input/output appendage for AEMOVE

IGG019Z1 – Appendage for Oak Ridge program (Section 6.6)

UCS1IN – INIS print train UCS image (Section 6.9)

The first five of these members are used by the RESMODS macro (Section 4.10) while the next seven are used by the SVCLIB macro (Section 4.11) and the next four are brought in by modifying the stage one output of the SVCLIB macro so that those members are included (Section 6.6). The last member UCS1IN is copied across into SYS1.IMAGELIB during stage two (Section 6.9).

5.7 Target Initialisation

The member IEAIPL00 was punched out of SYS1.SAMPLIB for release 21.6. This IPL text was then used to initialise a disk volume with the label AAE021 using the IBM utility IEHDASDR.

5.8 Target Allocation

The data sets on the target disk pack AAE021 were allocated in the following order with the accompanying specifications:

SYSCTLG	TRK,(10,10)	
AAEC.HASPOLIB	TRK,(10,0)	RECFM=U,BLKSIZE=1024
AAEC.PARMLIB	TRK,(3,5,3)	RECFM=F,BLKSIZE=80
AAEC.IMAGELIB	TRK,(1,1,2)	RECFM=U,BLKSIZE=1024
AAEC.SVCLIB	CYL,(12,3,140)	RECFM=U,BLKSIZE=1024
AAEC.LINKLIB	CYL,(25,10,85)	RECFM=U,BLKSIZE=7294
SYS2.LINKLIB	CYL,(4,1,9)	RECFM=U,BLKSIZE=7294
AAEC.PROCLIB	CYL,(5,1,15)	RECFM=FB,LRECL=80,BLKSIZE=800
AAEC.PROCLIBY	CYL,(3,1,9)	RECFM=FB,LRECL=80,BLKSIZE=800
AAEC.LOGREC	CYL,(2,0)	
AAEC.MACLIB	CYL,(19,3,15)	RECFM=FB,LRECL=80,BLKSIZE=7200
SYS1.DUMP	CYL,(10,0)	
AAEC.NUCLEUS	CYL,(4,1,2)	RECFM=U,BLKSIZE=7294
AAEC.HASPMOD	CYL,(1,1,2)	RECFM=U,BLKSIZE=7294
SYS1.OBJMOD	CYL,(2,1,3)	RECFM=FB,LRECL=80,BLKSIZE=3200
SYS1.MODGEN	CYL,(50,5,10)	RECFM=FB,LRECL=80,BLKSIZE=3360

5.9 System Generation Allocation

The data sets necessary to run stage two of the system generation were set up. These were:

SYS1.OBJMOD

SYS1.UT1

SYS1.UT2

SYS1.UT3

SYS1.UT4

6. STAGE TWO

A Snobol program was written to go through the stage one output, SYS1.STAGE1, and output specific steps or a range of steps as complete jobs to either the internal reader for execution or to the card punch for further modification (Appendix D). The input to this program consists of cards containing either:

(i) a single number, or

(ii) two numbers separated by a '–' to indicate a range.

The numbers on the cards indicate the numbers of the system generation steps which are to be made into jobs. The jobs produced by the program have unique jobnames and each job has a step at the end of it which releases the next job in the sequence provided the highest condition code of the first job was zero.

Although most of the stage two system generation steps were run without modification, a number of the steps had to be modified. A description of the running of the stage two steps along with the modifications are outlined below.

6.1 Stage Two Assemblies

Stage two steps 1 to 32 were run after PTF US01379 (Section 8.11) was applied to the source member IEAQAT in SYS1.MODGEN. These assemblies produce object modules in SYS1.OBJMOD for use by latter steps in the system generation process.

6.2 MACLIB Generation

Steps 33 and 34 of the system generation process copy and rename AAEC.MACLIB as SYS1.MACLIB.

6.3 NUCLEUS Generation

Step 35 of the system generation, which linkage edits the nucleus into member IEANUC01 of AAEC.NUCLEUS, was modified to linkage edit the nucleus into IEANUC09 rather than IEANUC01.

6.4 SVCLIB and LINKLIB Generation

Steps 36 to 65 were run to generate members in AAEC.SVCLIB and AAEC.LINKLIB without any modifications.

6.5 SORTLIB Generation

Step 66 of the system generation process generates AAEC.SORTLIB. This data set was generated on AAE002 and, as the release 19.6 SYS1.SORTLIB was already on AAE002, the release 19.6 data set had to be moved off AAE002 before the release 21.6 data set could be renamed as SYS1.SORTLIB.

6.6 AAEC SVCs

Step 67 which copies AAEC SVCs from SYS1. AAECSVC to AAEC.SVCLIB was modified to copy the following members also:

IGG019Z1

AEATNTSK

SADUMP

IGG019WS

These members cannot be specified in the SVCLIB macro because it is restricted to members starting with "IGC", that is SVCs only.

6.7 IEHIOSUP

Step 68 of the system generation process runs the IBM utility IEHIOSUP on the data set AAEC.SVCLIB to prepare it for use as the system SVC library.

6.8 SYS1.LOGREC

Step 69 of the system generation was modified to initialise on existing SYS1.LOGREC rather than create a new SYS1.LOGREC. It was also modified to have a step library of SYS1.CI505, rather than SYS1.DN527 suggested by APAR P58007, as the distributed libraries were in error regarding the location of the release 21.6 IFCDIP00 program which initialises SYS1.LOGREC.

6.9 Copy Existing Data Sets From AAE001

The following data sets were copied from AAE001 to AAE021 rather than run step 70 of the system generation which catalogues SYS1.LOGREC:

SYS1.AAECSVC(UCS1IN) → AAEC.SVCLIB(UCS1IN)

SYS1.PROCLIB → AAEC.PROCLIB

SYS2.LINKLIB → SYS2.LINKLIB

SYS1.HASPMOD → AAEC.HASPMOD

SYSY.PROCLIB → AAEC.PROCLIBY

SYS1.HASPOLIB → AAEC.HASPOLIB

SYS1.OBJMOD → SYS1.OBJMOD

SYS1.MODGEN → SYS1.MODGEN

The data set SYS1.LOGREC is catalogued in the release 19.6 system, hence the copying of the release 19.6 catalogue (Section 7.9) into the 21.6 catalogue makes the original step 70 of stage two unnecessary. The data set SYS1.HASPMOD had a superzap applied to it to fix an error in HASP that occurred in release 19.6 but not in release 21.6. This superzap had to be removed before using HASP under release 21.6 by using the following superzap to AAEC.HASPMOD:

```
NAME  HASP  HASPCON

VER   0900  6018

REP   0900  601C
```

6.10 Rename Data Sets

Step 71 of the system generation, which renames data sets ready for their final use was modified to also rename:

AAEC.PROCLIB → SYS1.PROCLIB

AAEC.HASPOLIB → SYS1.HASPOLIB

AAEC.HASPMOD → SYS1.HASPMOD

AAEC.PROCLIBY → SYSY.PROCLIB

6.11 Data Set Listing

Step 72 was run to get listings of the contents of the new system data sets.

7. POST STAGE TWO MODIFICATIONS

A number of AAEC modifications as well as IBM PTFs and APARs were applied after the running of stage two. They are described below.

7.1 PARMLIB – IPL Time Options

SYS1.PARMLIB was created using an update deck similar to that used for release 19.6 but modified to achieve optimum performance and space utilisation under release 21.6 (Appendix E).

7.2 Linkage Editor Alias Names

The linkage editor alias names IEWL and LINKEDIT were given to the F88 level linkage editor, rather than the F128 level linkage editor, so that they could be used in existing procedures within class A jobs (less than 120 K).

7.3 IBM Authorised Program Analysis Reports (APARs)

The following IBM APAR fixes suggested by IBM (Appendix F) were applied to the system:

(i) P55763 – IEHMOVE causes IEHPROGM loop in release 21.6.

(ii) P56878 – IMAPTFLE incorrect.

(iii) P57133 – ED–521 address constant in relocation dictionary.

– IEWLF440,IEWLF880,IEWLF128.

(iv) P53762 – ED -521 IEW0232 messages.

– IEWLF440,IEWLF880,IEWLF128.

(v) P54004 – ASB reader gives procedure not found.

(vi) P53458 – see PTF US01475 (Section 8.10).

– this superzap must not be applied until the PTF is applied.

7.4 AAEC Superzaps

The following AAEC modifications were made to the system using the IMASPZAP utility program.

(i) The control section IEFSD094 in member IEFSD094 in SYS1.LINKLIB was modified to reduce the OS writer three page separator to one page. The modification is essentially the same as that for release 19.6 except that the address had to be modified thus:

```
NAME  IEFSD094  IEFSD094

VER   03A4  00000007

REP   03A4  00000003
```

(ii) The control section IEEVSTAR in member IEEVSTAR in SYS1.LINKLIB was modified to make the message class on console startables MSGCLASS=0 and the message level on console startables MSGLEVEL=(0,0). This modification is the same as for release 19.6 except that the address has been changed to give the control cards:

```
NAME  IEEVSTAR  IEEVSTAR

VER   0B34  E2C7D3C5E5C5D37EF1616140

REP   0B34  E2C7C3D3C1E2E27ED6616140
```

(iii) The control section IEEVJCL in member IEEVSTAR in SYS1.LINKLIB was modified to allow the implementation of the program WAAXCTL (Section 7.11). This modification is the same as for release 19.6 except that the address has been changed to give the control cards:

```
NAME  IEEVSTAR  IEEVJCL

VER   0154  C9C5C5E5D9C3E3D3

REP   0154  E6C1C1E7C3E3D340
```

(iv) As four 3400 tape drives were specified in the system generation (Section 4.6) and the system was initially to run only with two tape drives expanding to three and then to four, the member DEVMASKT in SYS1.LINKLIB had to be modified to indicate that there were only two tape drives, namely 280 and 281 (Appendix G). The entries in DEVMASKT that were to be modified were for the following device types:

```
3400–4

2400

2400–3

2400–4

3400–3

SYSSQ

TAPE
```

7.5 System Management Facilities Exits

The release 19.6 system management facilities (SMF) exits were added to the release 21.6 system, with a modification to the alias structure, so that the aliases agreed with those given to the default SMF exits as shown in the stage one output. These were different from those specified as an up-to-date SMF manual for release 21.6 had not been supplied. A description of the SMF exits is given in the report on the release 19.6 modifications (Angus 1972).

7.6 Re-Linkage Edit the Nucleus

The nucleus member IEANUC09 was re-linkage edited to form the final system nucleus IEANUC01, keeping a copy of the original nucleus to be used as a base for future modifications.

7.7 IEEVLNKT – Program Authorisation Table

The module IEEVLNKT in SYS1.LINKLIB contains two tables:

(i) A table of names of programs that when started as an OS console task are given a protection key of zero, and

(ii) a table of names of programs that when started as an OS console task do not have enqueues issued for the data sets to which they refer.

To the first table were added two AAEC program names, WTRD and SVCMON, both of which require a protection key of zero to run. The program name IEFVMA (the ASB reader/interpreter) was added to the second table so that it would not enqueue upon the data set SYS1.PROCLIB thus allowing easier maintenance of SYS1.PROCLIB while the ASB reader is in use.

7.8 Procedure Library Modifications

The following modifications were made to SYS1.PROCLIB for release 21.6:

RDR – region size was increased to 74K from 68K and the output spooling generic device name was changed to SYSOUT

RDRNPL – as for RDR

SYSOFF – procedure was removed

SYSON – procedure was removed

SYSQSP – procedure was removed

WTR – region size was increased from 20K to 22K

WTRB – as for WTR

WTRO – as for WTR

In all the procedures that referred to UNIT=2400, this specification was replaced with UNIT=TAPE ready for the new 3400 tape drives.

7.9 Copy of System Catalogue

Just before swapping to release 21.6, the system catalogue was copied from the release 19.6 system to the release 21.6 system using the catalogue utility WATACTLG developed at Waterloo University, Canada.

7.10 AEFUDGIT – IPL Time Utility

The program AEFUDGIT is automatically started at IPL time to perform the following functions:

(i) increase the size of system queue area to the value specified in the parameter field, and

(ii) issue the following commands to the system:

V (240,248),OFFLINE*

V (007,00C,243,280,281),ONLINE*

to insure that the devices are correctly set up at IPL time.

7.11 WAAXCTL – Start Command Modification

The program WAAXCTL (Angus 1972) intercepts the job control statements of a console start command and passes them to the HASP internal reader. This module was modified for release 21.6 (Angus, private communication) and further modified to suit the AAEC jobcard conventions (Appendix J). A complete description of start command processing is given in the report on modifications to release 19.6 (Angus 1972).

7.12 WTRC – Plot and Paper Tape Output Writer

WTRC is the AAEC procedure (Appendix I) to direct plotter and paper tape output (SYSOUT=C) to the PDP9L 'buffered tape well' for plotting and punching respectively by the PDP9L computer system. This procedure was developed by R. P. Backstrom (unpublished AAEC report) for release 19.6 and has been modified by him to cope with a lengthened writer parameter list for release 21.6.

SYSOUT writer modules IEFSD080 and IEFSD070 were modified to allow for output to be sent to a backup data set (currently a series of twenty five 9-track tapes) at the same time as the data is sent to the PDP9L computer system for plotting and punching. The writer initialisation module IEFSD080 sets up an output data control block for the DDNAME IEFRDER followed by a 42-word parameter list area for use by the other writer modules, and AAEC modifications add a 17-word parameter and work area, output data control blocks for DDNAMES : BACKUP and SYSPRINT and a job file control block for the BACKUP data control block.

The backup data is identical to the data sent to the PDP9L except that a 24-byte job identification record (for later recovery purposes) is added. This record contains the jobname and the date and time of initiation of the job producing the SYSOUT=C information.

During writer initialisation, WTRC reads the first record on the backup volume and the date in this job identification record is compared to the current date. If it is seven or more days old, the backup output is written from the beginning of the file. Otherwise the data set is closed and re-opened for output with a disposition of MOD, thus adding the new output at the end of the file.

A printed list, indicating the jobnames and record counts contained in each SYSOUT=C data set, is also produced to help in the recovery of plotter or punched paper tape data.

An AAEC job separator routine (WTRCSEP) writes the job identification record onto the backup tape, the SYSPRINT listing and the console typewriter for the information of the operator. The actual output writing module (WTRCDUMY) is invoked as a user writer program as if specified on the DD card thus:

```
//...      DD SYSOUT=(C,WTRCDUMY)
```

but a modification to module IEFSD070 changes the writer module name from the IBM default name of IEFSD087 to WTRCDUMY if no user specified program name is present. In this way no user job control language changes were required for the implementation of this backup procedure, but the four modules:

IEFSD080

IEFSD070

WTRCSEP

WTRCDUMY

must be contained in the WTRC step library data set. All other writer modules, however, should be left unmodified in SYS1.LINKLIB.

7.13 Display Jobname Modifications

The display jobname module IEESD565 which prints out the message:

'jobname JOB SELECTED'

when a display jobname command is issued by the operator and the job is currently executing was modified to print out either:

'jobname TCB=xxxxxx JTU=ddd.dd TTG=ddd.dd RC=dddK UCC=dddK stepname initiator',

if the job is on the ready queue or,

'jobname JOB TASK NOT ON THE READY QUEUE'

if the job is not on the ready queue. The fields in the above message are:

TCB=xxxxxx	– hexadecimal address of task control block for the job.
JTU=ddd.dd	– cpu time used in minutes and seconds by all the previous steps of the job.
TTG=ddd.dd	– cpu time in minutes and seconds till the job will be abended with a system 332 for exceeding its specified time.
RC=dddK	– region requested for the job step currently executing.
UCC=dddK	– amount of jobs region unused at the time of the display.
stepname	– job step name.
initiator	– last five characters of the name of the initiator running the job.

In order to obtain some of the information for the display jobname message a modification was made to the module IEFSD263 to copy some information from the timer queue element and initiator identifier into the user area of the task control block.

These modifications were applied to release 19.6 but were rewritten for release 21.6 by I. L. Johnstone (unpublished AAEC report). Both modules IEFSD263 and IEESD565 are in SYS1.LINKLIB and IEFSD263 contains other assembly modules which should be included when replacing IEFSD263. The modifications to these modules are given in Appendix K.

7.14 AVR Superzap

Although the final system generated did not contain automatic volume recognition (AVR), a trial system was implemented which did contain this option. With this system it was found that the following modification was necessary for AVR to work correctly over the IBM360 to PDP9L link:

```
NAME  IEFXV001   IEFXV002

VER   02C4  00000001,  E5D6D3F1

REP   02C4  20000001
```

This superzap puts the SLI bit on in a rewind channel command word because the PDP9L link does not handle immediate commands normally.

7.15 QCBFIND –Queue Control Block Trace

The program QCBFIND and its associated procedure SYSDSN were added to the system with release 21.6. This program enables the operator to determine which jobs have hold of specific data sets and with what disposition. This enables the operator to decide what to reply to the system when a job is waiting for the allocation of a data set.

8. IBM PROGRAM TEMPORARY FIXES (PTFs)

The IBM program temporary fixes (PTFs) are supplied on magnetic tape with one file for each release. A program JCAMOD has been set up in two procedures PTFMOD and PTFSEL (Appendix H) for the updating of the AAEC PTF tape from the IBM distributed tape, and the selective running of PTFs, respectively.

The procedure PTFMOD has three parameters:

(i) FILE = the file on the IBM tape to be used,

(ii) TAPE = the volume serial of the AAEC PTF tape, and

(iii) DISP = NEW if this is the first use of the AAEC tape, or

MOD to add new PTFs after existing ones.

The defaults for these parameters are FILE=1,TAPE=PTF180,DISP=MOD.

The procedure PTFSEL has the single parameter:

OUT= 'UNIT=INTRDR' if the PTF is to be submitted as a job to be run, or

'SYSOUT=B' if the PTF is to be punched out for further modification.

PTFSEL requires a SYSIN input for the JCAMOD program which consists of statements of the form:

```
ACCT=(C1A90000,B1)

SELECT=(US00192,US01075)
```

to select both PTF US00192 and PTF US01075 where both the keywords ACCT and SELECT start

in column 11. Continuations of the select card are allowed in the normal IBM fashion, that is stop at a comma before column 72 and start the continuation in column 16.

A number of PTFs were applied to the release 21.6 system although not all these PTFs are on the final system.

8.1 US00820

Problem Description: P55451 – SVC 91 is not issued before the UCB is marked 'Not Ready'

Module: IGC0208B

Library: SYS1.SVCLIB

8.2 US01075

Problem Description: (a) The DEB built by IFDOLT35 is incorrect. Displacements are off by two bytes; this will cause abends and the abend codes will vary, depending on when the DEB is accessed.

(b) The CVT pointer can be overlayed if the test field entry contains a non-existent module, and re-entry of test is used.

Module: IFDOLT35

Library: SYS1.LINKLIB

This PTF was applied to the original release 21.6 system which had ONLNTEST specified as an option, but this option was later removed and hence the PTF is no longer applicable.

8.3 US00192

Problem Description: This PTF fixes many problems with the IBM loader (the reader is referred to the PTF cover sheet for further details).

Modules: IEWLOADR,IEWLDRGO

Library: SYS1.LINKLIB

8.4 US00922

Problem Description: This PTF contains 10 replacement modules for the catalogue management routines (the reader is referred to the PTF cover sheet for further details).

Modules: IGC0002F,IGG0CLC1, IGG0CLC2, IGG0CLC3, IGG0CLC4, IGG0CLC5, IGG0CLC6, IGG0CLC7, IGG0CLF2, IGC0002H.

Library: SYS1.SVCLIB

8.5 US01215

Problem Description: This PTF fixes three ABDUMP problems P54914, P54041 and P54361 (the reader is referred to the PTF cover sheet for further details).

Module: IGC0505A

Library: SYS1.SVCLIB

8.6 US00876

Problem Description: This PTF fixes many problems with DD DUMMY (the reader is referred to the PTF cover sheet for further details).

Modules: IGG0191C,IGG019AV

Library: SYS1.SVCLIB

N.B. After this PTF was applied it was found that a superzap for APAR P58703 was necessary. This superzap is:

```
NAME  IGG019AV

VER  0080  58201020,41220000,1222,4780F044,18F2

REP  0080  D40210211021,4780F044,58F01020,0700
```

and is very important as neither the linkage editor nor the loader work unless it is applied.

8.7 US01071

Problem Description: This PTF fixes many problems with IEHLIST (the reader is referred to the PTF cover sheet for further details).

Modules: IEHPRINT,IEHPRMSG

Library: SYS1.LINKLIB

8.8 US01109

Problem Description: Open module IFG0196M does not specifically test RECFM=D when no RECFM is specified and assumes RECFM=D thus causing an 013-70 abend error message IEC141I (mixed USASI and EBCDIC attributes).

Module: IFG0196M

Library: SYS1.SVCLIB

8.9 US01110

Problem Description: APAR P56436 – Abend 0C5 in IGG0192R due to EBCDIC code in register 5.

Module: IGG0192R

Library: SYS1.SVCLIB

8.10 US01475

Problem Description: This PTF fixes many problems with volume mounting (the reader is referred to PTF cover sheet for a detailed description).

Modules: IEFVMLS1, IEFWD000, IEFXT00D, IEFXT002, IEFXT003

Library: SYS1.LINKLIB

N.B. This PTF also requires a superzap for APAR 53458 (Appendix F).

8.11 US01379

Problem Description: The attach service routine does not free 32 bytes of system queue space which were allocated for a dummy program request block.

Module: IEAQAT

Library: SYS1.MODGEN

N.B. This PTF should be applied before running the stage two assemblies but can be applied after, by reassembling the IEAQAT module and rerunning the nucleus linkage edit step.

WARNING PTF US01379 as supplied by IBM is incorrect and will cause a master scheduler abend on an IBM360 unless the following modification is made to the PTF before running it. The modification is to add the card:

./ DELETE SEQ1=87640020,SEQ2=87720020 immediately after the ./ CHANGE card in the PTF update deck before running the PTF.

8.12 US01410

Problem Description: If an error occurs while loading an input/output ERP, the request queue element associated with the original input/output error will be lost and the device will be lost.

Module: IEAQNU

Library: SYS1.MODGEN

Module: IEAQTMON

Library: SYS1.SVCLIB

WARNING This PTF generates an unresolved external reference in the nucleus and thus was not applied to the final system. A replacement PTF US01320 is being supplied by IBM.

8.13 US01545

Problem Description: APAR 58489 – Back level module was shipped with release 21.6.

Module: IGC0003E

Library: SYS1.SVCLIB

WARNING A text card in the object deck was missing from the PTF and thus should not be applied to the system.

8.14 US00560

Problem Description: APAR P58019 – IFG0232D passes abend code not handled by IFG0230P. Module IFG0232D was modified in release 21.6 for APAR 0548558 which added codes X'8E', X'8F',X'90' and X'91'. Since IFG0230P was not modified, these codes are invalid.

Module: IFG0230P

Library: SYS1.LINKLIB

N.B. PTF US00560 which is supposedly a release 21 PTF may be applied to release 21.6 to update IFG0230P. Either the whole PTF or only the module IFG0230P may be applied.

9. SYSTEM PERFORMANCE EVALUATION

Before release 21.6 could be evaluated it was necessary to determine which modules in SVCLIB should be made resident via the IPL time parameters in SYS1.PARMLIB (Section 7.1). This was done by C. B. Mason (unpublished AAEC report) using statistics provided by the SVCMON program written by R. P. Backstrom (unpublished AAEC report). This 'tuning' process had a marked effect on the timing tests carried out on the release 21.6 system.

In the evaluation of release 21.6, two 'job streams' tests were used. The first job stream was a collection of jobs selected from user jobs normally run on the system while the second was a collection of thirty jobs all of which were FORTRAN 'compile – linkedit and go' and had negligible execution time. The latter job stream was used as a measure of overheads. The table below gives the timing results for 'tuned' release 19.6 and release 21.6 systems.

Release	19.6	21.6	
Job Stream One	42 min 30 sec	42 min 57 sec	End of CPU bound period.
	48 min 03 sec	45 min 14 sec	Total job stream.
Job Stream Two	18 min 39 sec	18 min 49 sec	

The figures show that there was a negligible increase in overhead associated with release 21.6 but that generally it was no slower and,in some cases, considerably faster than release 19.6. The reduced total time for Job Stream One time is a measure of improved tape performance. This job stream also pointed out the fact that the ASB reader was 30% faster under release 21.6 as compared with release 19.6.

The 3400 type tape drives recently introduced, and properly supported by release 21.6, speeded up the first job stream considerably under both releases. New features, facilities and hardware support provided since release 19.6, and the prospect of a stabilised IBM360 Operating System at release 21 level coupled with comparable performance made the implementation of release 21.6, for standard use, a worthwhile proposition.

10. CONCLUSIONS

The release 21.6 operating system, while taking more core space than the release 19.6 system, would appear from timing tests carried out to be marginally faster than release 19.6. This is due, in part, to improved catalogue management, an improved reader/interpreter and more efficient open and close modules.

The release 21.6 system gives much more meaningful error diagnostics, which is a great aid for program debugging, and supports the new 3400 series tape drives which release 19.6 did not.

Most of the time spent on implementation of release 21.6 went in reapplying existing modifications to the system, adding new modifications and applying IBM PTFs.

11. ACKNOWLEDGEMENTS

I would like to thank the members of the Applied Mathematics and Computing Section at the AAEC Research Establishment for their advice and help during the implementation of release 21.6.

12. REFERENCES

Angus, W.A. (1972) – AAEC Modifications and Additions to the IBM360 Operating System. AAEC/E235.

IBM (1971) – The HASP System.

IBM (1972 a) – OS System Generation – Release 21. IBM GC28–6554–11.

IBM (1972 b) – OS MVT Guide. IBM GC28–6720.

APPENDIX I

WTRC Procedure

```
./        ADD   LIST=ALL,NAME=WTRC
// D N=SOUT
//WTRC    PROC  TAPE=TAPE,ID=SCRTCH,OUT='DISP=OLD'
//*
//*       THIS PROCEDURE PROVIDES AUTOMATIC BACKUP ON THE
//*    9-TRACK TAPE SPECIFIED BY THE ID=VOLSER SYMBOLIC
//*    PARAMETER.  TO SUPPRESS DIRECT OUTPUT, CODE OUT=DUMMY
//*    ON THE WTRC START COMMAND.
//*
//IEFPROC EXEC PGM=IEFSD080,REGION=20K,PARM='PC,WTRCSEP'
//IEFRDER  DD  &OUT,UNIT=(243,,DEFER),VOL=SER=OUTPUT,DSN=SYSOUT,
//             DCB=(RECFM=U,BLKSIZE=800)
//BACKUP   DD  UNIT=(&TAPE,,DEFER),VOL=SER=&ID,DSN=SYSOUT,DISP=OLD,
//             DCB=(RECFM=U,BLKSIZE=800)
//STEPLIB  DD  DSN=SYS2.LINKLIB,DISP=SHR
//SYSPRINT DD  SYSOUT=A
//SYSUDUMP DD  SYSOUT=A
```

APPENDIX J

WAAXCTL

```
//  EXEC  ASMFCL,PARM.ASM='LOAD,DECK',PARM.LKED='XREF,RENT,LIST'
WAAXCTL  CSECT
         ENTRY XCTL002,R14
*********************************************************************
*  THIS ROUTINE INTERFACES BETWEEN THE OS ROUTINE IEEVJCL AND       *
*  IEEVRCTL. ITS PURPOSE IS TO INTERCEPT OS START COMMAND           *
*  PROCESSING AT THE STAGE WHEN OS HAS CREATED THE JCL FOR THE      *
*  SYSTEM TASK AND TO PASS THIS JCL TO THE HASP INTERNAL READER.    *
*                                                                   *
*  THE ROUTINE ENQUEUES UPON THE HASP INTERNAL READER TO PREVENT    *
*  THE JCL STATEMENTS FROM DIFFERENT START COMMANDS FROM INTER-     *
*  LEAVING.                                                         *
*                                                                   *
*  THIS ROUTINE ISSUES SVC200 TO TEST FOR THE PRESENCE OF HASP.     *
*                                                                   *
*                                          W.A.ANGUS                *
*                                          AAEC,1972                *
*                                                                   *
*********************************************************************
         USING *,15
         B     *+12
         DC    AL1(7)
         DC    CL7'WAAXCTL'
         LA    13,WAASAVE              SAVE AREA FOR FUTURE DEVELPMENTS
         LR    12,15
         DROP  15
         USING WAAXCTL,12
         ST    14,R14
         LR    5,1                     SAVE POINTER TO JSEL
         L     2,12(,1)                LOAD POINTER TO 1ST JCLS
         SR    1,1                     CLEAR R1 FOR THE HASP TEST
         SVC   200                     TEST OF HASP IS ACTIVE
         LTR   15,15                   IF ZERO THEN HASP IS NOT THERE
         BZ    XCTL002                 SO XCTL TO OS AS PER NORMAL
         CLC   8(5,2),=C'//WTR'        IS A WTR BEING STARTED
         BE    XCTL002
         CLC   8(5,2),=C'//RDR'        IS A RDR BEING STARTED
         BE    XCTL002
         CLC   8(6,2),=C'//INIT'       IS AN INITIATOR BEING STARTED
         BE    XCTL002
         CLC   8(5,2),=C'//SYS'        IS A SYSTEM PROC BEING STARTED
         BE    XCTL002
         CLC   8(5,2),=C'//HOS'        IS IT THE HASP ASB RDR
         BE    XCTL002
         CLC   8(5,2),=C'//TSO'        IS IT TSO BEING STARTED
         BE    XCTL002
         CLC   8(6,2),=C'//TCAM'       IS IT TCAM BEING STARTED  ??
         BE    XCTL002
         CLC   8(6,2),=C'//BRDR'       IS THE TSO BACKGROUND READER
         BE    XCTL002
         ENQ   (QNAME,RNAME,E,,SYSTEM) ENQ ON INTRDR
         MVC   23(L'ACCTNO,2),ACCTNO   MOVE IN AAEC JOB CARD DATA.
XCTL000  LTR   2,2                     IS IT LAST IN LIST
         BZ    XCTL001                 YES
         LA    3,8(,2)                 LOAD ADDRESS OF CARD IMAGE
         ST    3,XCTL005
         XC    XCTL005(1),XCTL005      CLEAR HIFH ORDER BYTE
         OC    HASPCCW(4),XCTL005      OR IN DATA ADDRESS INTO CCW
```

```
         LA    1,HASPBLOK              LOAD ADDRESS OF IOCPBLOCK
         L     15,=V(IO)               LOAD ADDRESS OF IO ROUTINE
         BALR  14,15                   TO WRITE TO INTRDR
         XC    HASPCCW+1(3),HASPCCW+1  CLEAR ADDRESS PORTION OF CCW
         L     2,0(,2)                 LOAD ADDRESS OF NEXT JCLS
         B     XCTL000                 LOOP
XCTL001  LA    3,EOF
         ST    3,XCTL005
         OC    HASPCCW(4),XCTL005
         LA    1,HASPBLOK
         L     15,=V(IO)
         BALR  14,15
         L     15,=V(IO)
         O     15,XCTL007              SET SIGN BIT TO CLOSE IOCP
         BALR  14,15                   BR TO FREEMAIN IN IO ROUTINE
         DEQ   (QNAME,RNAME,,SYSTEM)   DEQ INTRDR
         L     14,R14                  RESTORE 14 TO WHAT IT WAS ON
*                                       ENTRY - JUST IN CASE
         LR    1,11                    SET UP POINTER TO CSCB IN R1 AS
*                                       REQUIRED FOR IEEPRTN
         XCTL  EP=IEEPRTN              AND XCTL TO IEEPRTN
XCTL002  LR    1,5                     RESTORE POINTER TO JSEL AS
*                                       REQUIRED FOR IEEVCRTL
         XCTL      EP=IEEVRCTL         AND XCTL BACK TO OS IF NO HASP
R14      DC    F'0'
WAASAVE  DC      18F'0'
HASPBLOK EQU   *
HASP     DC    AL2(0)
HASPUNIT DC    X'0300'                 INTRDR ADDRESS
HASPCAW  DC    A(HASPCCW)
HASPCSW  DC    A(0),A(0)
HASPCCW  CCW   X'01',0,X'20',80
XCTL005  DC    F'0'
XCTL007  DC    X'80000000'
EOF      DC    CL6'/*EOF '             END OF INPUT STREAM INDICATOR
ACCTNO   DC    C'(C1E90000,XXX),CONSOLE.USE,CLASS=F,PRTY=9'
QNAME    DC    C'INTERNAL'
RNAME    DC    C'READER00'
         LTORG
IO       CSECT
         USING *,15
         B     *+10
         DC    AL1(5)
         DC    CL5'WAAIO'
         STM   14,12,12(13)
         ST    13,SAVEAREA+4
         LR    12,13
         LA    13,SAVEAREA
         ST    13,8(,12)
         LR    12,15
         DROP  15
         USING IO,12
         LTR   15,15
         BL    CLOSE
         LR    7,1                     SAVE IOCP BLOCK ADDRESS
         LH    2,2(0,1)
         UNPK  IO4A(5),2(3,1)          CONVERT TO
         TR    IO4A+1(3),TRHEX-240     EBCDIC
         LA    3,IO2A                  POINT TO DEVICE UNIT TABLE
IO1      CH    2,2(,3)                 COMPARE CURRENT DEV ADDRESS
```

```
         BE     I04                    WITH TABLE
         CLI    0(3),255               END OF TABLE?
         BE     I02
         LA     3,8(,3)                INCREMENT ALONG TABLE
         B      I01
I02      L      4,16                   CVT POINTER
         L      5,40(,4)               UCB LIST POINTER
I03      LH     6,0(,5)                LOAD AND TEST VALUE
         LA     5,2(,5)                OF UCB POINTER
         LTR    6,6
         BZ     I03
         CH     6,I03A                 END OF LIST?
         BE     IOEXIT1
         CLC    I04A+1(3),13(6)        COMPARE WITH DEVICE ADDRESS
         BNE    I03
         CLI    28(6),C' '             TEST CONCURRENT IOCP USE
         BE     IOEXIT5
         MVI    28(6),C' '             SET VOL SER TO BLANK
         ST     6,AEDEMOD              SET UCB POINTER
         MVI    AEDEMOD,3              SET MODE TO NOP
         MVC    AEDEAPP,21(4)          SET APPENDAGE TABLE ADDRESS
         GETMAIN R,LV=96,SP=0
         ST     2,0(,3)                STORE UNIT ADDRESS IN TABLE
         ST     1,4(,3)                STORE IOB ADDRESS IN TABLE
         MVC    0(96,1),AEDCB          MOVE COMPOSITE BLOCK
         L      2,4(,1)
         AR     2,1
         ST     2,4(,1)                RELOCATE ECB ADDRESS
         ST     1,20(,1)               RELOCATE 1ST. DCB REFERENCE
         L      2,44(,1)
         AR     2,1
         ST     2,44(,1)               RELOCATE DEB ADDRESS
         L      2,80(,1)
         AR     2,1
         ST     2,80(,1)               RELOCATE 2ND. DCB REFERENCE
         L      2,0(,4)                LOAD TCB POINTER
         L      2,4(,4)                LOAD CURRENT TCB ADDRESS
         MVZ    80(1,1),28(2)          MOVE PROTECT FLAGS INTO DEB
I04      L      1,4(,3)                LOAD IOB ADDRESS FROM TABLE
         L      6,88(,1)               LOAD UCB ADDR FRM GETMAINEDCORE
         L      2,4(,7)                LOAD IOCP CAW AND
         ST     2,16(,1)               MOVE INTO IOB IN GETMAINED CORE
         NI     0(1),X'BF'             CLEAR CHAINING BIT IN IOB
         TM     4(2),X'40'             TEST CHAINING BIT IN CCW
         BNO    I05
         OI     0(1),X'40'             SET CHAINING BIT IN IOB
I05      NI     6(6),X'BF'             SET UNIT READY IN UCB
I06      L      1,4(,3)                LOAD IOB ADDRESS
         SVC    0                      ISSUE EXCP
         L      1,4(,3)                RELOAD IOB ADDRESS
         LA     1,52(,1)               LOAD ECB ADDRESS POINTER
         LA     0,1                    AND
         SVC    1                      WAIT
         L      1,4(,3)                LOAD IOB ADDRESS AGAIN
         MVC    ECBCODE(1),4(1)        SAVE ECB CODE
         MVC    8(8,7),8(1)            MOVE CSW INTO IOCP BLOCK
         MVC    0(2,7),2(1)            MOVE 2 SENSE BYTES INTO IOCP BLK
         CLI    52(1),X'7F'            ERROR FREE?
         BE     IOEXIT20               YES, EXIT
         XC     52(4,1),52(1)          CLEAR ECB FOR NEXT IO OPERATION
```

```
         L     2,4(,7)                  ACCEPT ERROR & LOAD CCW FROM
*                                       IOCP BLOCK
*                                       ERROR MESSAGE TO BE PRINTED
IOEXIT20 L     1,4(,3)
         XC    52(4,1),52(1)            CLEAR ECB FOR NEXY IO
         L     13,4(,13)                RESTORE SAVE AREA POINTER
         LM    14,12,12(13)             RESTORE REGISTERS
         BR    14
IOEXIT1  WTO   'INTRDR ADDRESS NOT FOUND'
         L     13,4(,13)                RESTORE SAVE AREA POINTER
         L     15,=V(XCTL002)
         L     14,=V(R14)               LOAD ADDRESS OF R14 SAVE AREA
         L     14,0(,14)                LOAD VALUE OF SAVED REG14
         L     1,64(,13)                DSCB POINTER IN SAVED R11
         L     12,68(,13)               RESTORE BASE REG FOR WAAXCTL
         BR    15
IOEXIT5  WTO   'CONCURRENT INTRDR ACTIVITY'
         L     13,4(,13)                RESTORE SAVE AREA POINTER
         L     15,=V(XCTL002)
         L     14,=V(R14)               LOAD ADDRESS OF R14 SAVE AREA
         L     14,0(,14)                LOAD VALUE OF SAVED REG14
         L     1,60(,13)                RESTORE DSCB POINTER SAVED IN R
         L     12,68(,13)               RESTORE BASE REG FOR WAAXCTL
         BR    15
CLOSE    LA    3,I02A                   POINT TO UNIT TABLE
         L     1,4(,3)                  LOAD IOB ADDRESS
         L     1,88(,1)                 LOAD UCB ADDRESS
         MVI   28(1),0                  REMOVE THE X'40' DSN REFERENCE
         L     1,4(,3)                  RELOAD IOB ADDRESS
         FREEMAIN R,LV=96,A=(1),SP=0    FREE CORE USED BY COMPOSITE BLK
         B     IOEXIT20
I02A     DC    3F'-1'                   UNIT TABLE
I03A     DC    X'FFFF'
I04A     DC    X'000000000000'          WORK AREA
ECBCODE  DC    C' '
TRHEX    DC    C'0123456789ABCDEF'
SAVEAREA DC    18F'0'
AEDCB    DS    0D
AEIOB    DC    X'0200'                  UNRELATED REQUEST
         DC    X'0000'                  FIRST TWO SENSE BYTES
AEIOECP  DC    A(AEECB-AEDCB)           ECB ADDRESS
AEIOCSW  DC    2A(0)                    CHANNEL STATUS WORD
AEIOCCP  DC    A(0)                     CCW ADDRESS
AEIODCP  DC    A(AEDCB-AEDCB)           DCB ADDRESS
         DC    4A(0)
AEDCTIF  DC    H'0'                     TIOT FIELD
AEDCMCF  DC    H'0'                     MACRF FIELD
AEDCIFL  DC    X'0C'                    INPUT FLAGS
AEDCDEB  DC    AL3(AEDEB-AEDCB)         DEB ADDRESS
AEDCOFL  DC    A(0)                     OUTPUT FLAGS
AEECB    DC    A(0)                     ECB
AEDEB    EQU   *
AEDETCP  DC    A(0)                     TCB POINTER
AEDEDEP  DC    A(0)                     DEB POINTER
AEDEOPN  DC    X'12'                    OPEN FLAG
AEDEIRP  DC    AL3(0)                   IRB POINT
AEDEOPA  DC    X'00'                    OPEN ATTRIBUTES
AEDEPGP  DC    AL3(0)                   SYS PURGE CHAIN
AEDEXTN  DC    X'00'                    EXTENTS
AEDEUPP  DC    AL3(0)                   USER PURGE
```

```
AEDEPRY  DC     X'00'                   PRIORITY
AEDEPEP  DC     AL3(0)                  PURGE ECB
AEDEPRT  DC     X'0F'                   PROTECT TAG
AEDEDCB  DC     AL3(AEDCB-AEDCB)        DCB ADDRESS
AEDEXTS  DC     X'02'                   EXTENT SCALE
AEDEAPP  DC     AL3(0)                  APPENDAGE ADDRESS
AEDEMOD  DC     X'00'                   MODIFIER
AEDEUCP  DC     AL3(0)                  UCB POINTER
         LTORG
         END
/*
```

IEFSD263-MS/1 ATTACH MODULE

```
  LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                F01MAY72   2/25/74

000130 5810 0010             00010   309           L     R1,CVTPTR          GET CVT ADDRESS                MP65 02982018
000000                               310           USING CVTDSECT,R1        CVT ADDRESSABILITY             20032 02983020
000134 9104 1074       00074         311           TM    CVTDCB,MP65FLAG    TEST IF MULTIPROCESSOR         20032 02984020
                                     312           DROP  R1                                                20032 02985020
000138 4780 C144             00146   313           BZ    MPNDBYPS           NO, JOBSTEP NOT RUNNING        MP65 02986018
00013C 5800 C442             00444   314           L     R0,MPNDFLGS        PARM FOR STATUS SVC            MP65 02988018
000140 4110 B000             00000   315           LA    R1,0(,R11)         PASS JOBSTEP TCB ADDRESS       MP65 02990018
000144 0A4F                          316           SVC   STATUS             SET TCB NONDISPATCHABLE        MP65 02992018
000146                               317 MPNDBYPS  EQU   *                                                MP65 02994018
000146 5820 801C             0001C   318           L     R2,CANECBAD        ADDRESS OF CANCEL ECB          A28953 02997020
00014A 4100 4054             00054   319           LA    R0,LCTTMWRK+4            ADDRESS OF TIME INTERVAL        03000000
00014E 18A0                          320           LR    R10,R0                   PUT ADDRESS IN R10              03020000
000150 D503 C42E A000 00430  00000   321           CLC   HOURS24(4),0(R10)      CHECK FOR INDICATION THAT STEP  03040000
000156 4720 C166             00168   322           BH    SETTIME                IS NOT TO BE TIMED              03060000
00015A 4170 0001             00001   323           LA    R7,1                   SET SWITCH TO INDICATE TIMER    03080000
                                     324 *                                      WAS NOT SET                     03100000
00015E D203 A004 C432 00004  00434   325           MVC   4(4,R10),TUHRS24       SET TIME REMAINING FIELD OF     03120000
                                     326 *                                      TIMER WORK AREA TO 1440 MIN     03140000
                                     327 *                                      SO THAT IF THIS IS A CATALOGED  03160000
                                     328 *                                      PROCEDURE THE REMAINING STEPS   03180000
                                     329 *                                      WILL ALSO NOT BE TIMED          03200000
000164 47F0 C194             00196   330           B     BYPASS               BRANCH AROUND STIMER MACRO      03220000
000168 1B77                          331 SETTIME   SR    R7,R7                SET SWITCH TO INDICATE TIMER    03240000
                                     332 *                                      WAS SET                         03260000
                                     333           STIMER TASK,EXIT,BINTVL=(0)  SET TIMER                       03280000
00016A 1810                          334+          LR    1,(0) LOAD PARAMETER REG 1
00016C 4100 C418             0041A   335+          LA    0,EXIT LOAD PARAMETER REG 0
000170 41E0 0010             00010   336+          LA    14,16(0,0) LOAD FLAG BYTE
000174 89E0 0018             00018   337+          SLL   14,24(0) SHIFT TO HI-ORDER BYTE
000178 160E                          338+          OR    0,14 AND PACK WITHEXIT ADDR
00017A 0A2F                          339+          SVC   47 ISSUE STIMER SVC
                                     340 ********************************************************************** AAEC MOD
                                     341 *         AAEC MOD TO ADD TO AN AREA IN SQS ASSOCIATED WITH THE INIT-          *
                                     342 *         IATOR THE FOLLOWING FIELDS---                                        *
                                     343 *         THE TIMER WORK AREA IN LCT ASSOCIATED WITH JOB                       *
                                     344 *         THE INITIATOR'S TOE ADDRESS                                          *
                                     345 *         THE INITIATOR'S IDENTITY                                             *

00017C 5860 50A8             000A8   347 AECSTART L     R6,168(0,R5)             LOAD SPECIAL SQS ADDRESS
000180 1266                          348           LTR   R6,R6
000182 4780 C194             00196   349           BZ    BYPASS

000000                               351           USING AESQS,R6           ADDRESSING.
000186 D20F 602C 4050 0002C  00050   352           MVC   AELCT1(16),80(R4)   MOVE TIME WORK AREA INTO SQS
00018C D207 603C 414C 0003C  0014C   353           MVC   AEINIT(8),332(R4)   MOVE INIT IDENTITY INTO SQS
000192 5040 6000             00000   354           ST    R4,AELCT           SAVE LCT ADDRESS.

                                     356           DROP  R6

                                     358 ********************************************************************** AAEC MOD
000196                               359 BYPASS    EQU   *                                                      03300000
000196 5860 4024             00024   360           L     R6,LCTPARM1        ADDRESS OF SYS TASK PARM       I272 03301019
00019A 4166 0000             00000   361           LA    R6,X0(R6)          CLEAR HIGH ORDER BYTE          I272 03302019
00019E 1266                          362           LTR   R6,R6              TEST FOR SYSTEM TASK           I272 03303019
0001A0 4780 C1C0             001C2   363           BE    NONSYSTK           BRANCH NOT SYSTEM TASK         I272 03304019
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  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                                F01MAY72  2/25/74

000092 4240 2010              00010   222          STC   R4,XAE              SET MESSAGE CODE                          45600015
000096 D200 2028 701D 00028 0001D   223          MVC   XAU(1),CHUCMP           UCM ENTRY INDICATOR       M0417 45650018
00009C D201 202A 701E 0002A 0001E   224          MVC   XAJ(N2),CHTJID          TJID                      20030 45670020
0000A2 95AF 6058              00058 225          CLI   QSRDA+E8,AF             WAS COMMAND INVALID       M1191 45700018
0000A6 4780 90EC              000EE 226          BE    SYNERR                                              M1191 45800018
0000AA D207 2018 7020 00018 00020   227          MVC   XAV(8),CHBUF       MOVE JOBNAME TO MESSAGE AREA              46000015
                                    228 ********************************************************************** AAEC MOD
0000B0 D207 93FA 2018 003FC 00018   229          MVC   AAEJBN(8),XAV
                                    230 ********************************************************************** AAEC MOD
                                    231 ************************************************************            46002021
                                    232 * A CHECK IS MADE TO SEE IF A TPUT OF 'CANCEL COMMAND ACCEPTED' IS      46010021
                                    233 * BEING DONE. IN RELEASE 21 'JOBNAME JOB BEING CANCELLED' IS           46020021
                                    234 * REPLACING THIS MESSAGE AT A TSO TERMINAL. IF THESE CONDITIONS ARE    46022021
                                    235 * MET, THE MESSAGE CODE IS ALTERED AND IEE2103D IS LINKED TO FOR       46024021
                                    236 * THIS NEW MESSAGE. OTHERWISE PROCESSING IS NORMAL.                    46026021
                                    237 ************************************************************            46028021
000001                              238 CANACC   EQU   X'01'           CANCEL CMD ACCEPTED MSG CODE    A43607 46030021
0000B6 9501 2010       00010        239          CLI   XAE,CANACC      IS THIS THE MSG TO BE WRITTEN   A43607 46040021
0000BA 4770 9144              00146 240          BNE   STORE           NO, CONYINUE NORMAL PROCESSING  A43607 46050021
0000BE D501 202A 957E 0002A 00580   241          CLC   XAJ,ZEROTEST     YES, IS MSG GOING TO A TERMINAL A43607 46052021
0000C4 4780 9144              00146 242          BE    STORE           NO, CONTINUE NORMAL PROCESSING  A43607 46054021
00003B                              243 TPUTCAN  EQU   59              JOB BEING CANCELLED MSG CODE    A43607 46056021
0000C8 923B 2010       00010        244          MVI   XAE,TPUTCAN     ALTER FOR NEW MSG CODE          A43607 46058021
0000CC 90E4 6040              00040 245          STM   R14,R4,QSJN     SAVE REGISTERS                  A43607 46058421
                                    246          LINK  EP=IEE2103D     JOB BEING CANCELLED MSG         A43607 46058821
0000D0                              247+         CNOP  0,4
0000D0 45F0 90E2              000E4 248+         BAL   15,*+20 LOAD SUP.PARAMLIST ADR
0000D4 000000DC                     249+         DC    A(*+8) ADDR OF EP PARAMETER
0000D8 00000000                     250+         DC    A(0) DCB ADDRESS PARAMETER       LC0A
0000DC C9C5C5F2F1F0F3C4             251+         DC    CL8'IEE2103D' EP PARAMETER
0000E4 0A06                         252+         SVC   6 ISSUE LINK SVC
0000E6 98E4 6040              00040 253          LM    R14,R4,QSJN     RESTORE REGISTERS               A43607 46059221
0000EA 47F0 92C6              002C8 254          B     MSGEE           RESUME NORMAL PROCESS           A43607 46059621
0000EE 9240 2019       00019        255 SYNERR   MVI   XAV+1,C' '                                       M1191 46060018
0000F2 D205 201A 2019 0001A 00019   256          MVC   XAV+2(6),XAV+1                                   M1191 46090018
0000F8 9568 7004              00004 257          CLI   CHVCD,E68               DISPLAY                   M1191 46120018
0000FC 4780 9120              00122 258          BE    DPLY                                              M1191 46150018
000100 9548 7004       00004        259          CLI   CHVCD,E48               CANCEL                    M1191 46180018
000104 4780 912A              0012C 260          BE    CNCL                                              M1191 46210018
000108 9574 7004       00004        261          CLI   CHVCD,E74               RESET                     M1191 46240018
00010C 4780 913E              00140 262          BE    RST                                               M1191 46270018
000110 956C 7004       00004        263          CLI   CHVCD,E6C               HOLD                      M1191 46300018
000114 4780 9134              00136 264          BE    HLD                                               M1191 46330018
000118 D206 2018 95F0 00018 005F2   265          MVC   XAV(7),=C'RELEASE'                                M1191 46360018
00011E 47F0 9144              00146 266          B     STORE                                             M1191 46390018
000122 D206 2018 95F7 00018 005F9   267 DPLY      MVC   XAV(7),=C'DISPLAY'                               M1191 46420018
000128 47F0 9144              00146 268          B     STORE                                             M1191 46450018
00012C D205 2018 95EA 00018 005EC   269 CNCL      MVC   XAV(6),=C'CANCEL'                               M1191 46480018
000132 47F0 9144              00146 270          B     STORE                                             M1191 46510018
000136 D203 2018 95E6 00018 005E8   271 HLD       MVC   XAV(4),=C'HOLD'                                 M1191 46540018
00013C 47F0 9144              00146 272          B     STORE                                             M1191 46570018
000140 D204 2018 95FE 00018 00600   273 RST       MVC   XAV(5),=C'RESET'                                M1191 46600018
                                    274 ********************************************************************** AAEC MOD
000146 9511 2010       00010        275 STORE    CLI   XAE,17                JOB SELECTED MESSAGE ??
00014A 4780 9170              00172 276          BE    AAEJSLEC              --> YES GIVE AAEC MSG.
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  LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                F01MAY72   2/25/74

                                     277 ********************************************************************** AAEC MOD
00014E 90E4 6040             00040  278          STM   R14,R4,QSJN             SAVE REGS                  M1191 46630018
                                    279          LINK  EP=IEE0503D         LINK TO WRITE MESSAGE                46800015
000152 0700                         280+         CNOP  0,4
000154 45F0 9166             00168  281+         BAL   15,*+20 LOAD SUP,PARAMLIST ADR
000158 00000160                     282+         DC    A(*+8) ADDR OF EP PARAMETER
00015C 00000000                     283+         DC    A(0) DCB ADDRESS PARAMETER       LC0A
000160 C9C5C5F0F5F0F3C4             284+         DC    CL8'IEE0503D' EP PARAMETER
000168 0A06                         285+         SVC   6 ISSUE LINK SVC
00016A 98E4 6040             00040  286          LM    R14,R4,QSJN         RESTORE REGS                         47200015
00016E 47F0 92C6             002C8  287          B     MSGEE                   SKIP AAEC MODS.
                                    288 ***************************************************************AAEC MOD*
                                    289 *                                                              *AAEC MOD*
                                    290 *              AAEC ADDITION TO GIVE JOB INFORMATION.          *AAEC MOD*
                                    291 *              WHEN JOB IS SELECTED.                           *AAEC MOD*
                                    292 *              MESSAGE TYPE 17.                                *AAEC MOD*
                                    293 *                                                              *AAEC MOD*
                                    294 *              'XXXXXXXX JOB SELECTED'  MESSAGE IS NOT GIVEN   *AAEC MOD*
                                    295 *                                                              *AAEC MOD*
                                    296 ***************************************************************AAEC MOD*
000172 8000 9171       00173        297 AAEJSLEC SSM   *+1                      SET NON-INTERRUPTIABLE*AAEC MOD*
000176 90EC 944A             0044C  298          STM   R14,R12,AAESAVE         SAVE THE REGS.        *AAEC MOD*
00017A 5850 0010             00010  299          L     R5,16                   OBTAIN CVT ADDRESS.
00017E 5850 50A0             000A0  300          L     5,160(,5)                LOAD TOP TCB
000182 5850 5074             00074  301 AAELD    L     5,116(0,5)              LOAD NEXT TCB
000186 1255                         302          LTR   5,5
000188 4780 92BE             002C0  303          BC    8,AAECON
00018C 5870 50A8             000A8  304 AELOOP   L     7,168(,5)               LOAD SQS ADDRESS
000190 1277                         305          LTR   R7,R7
000192 4780 9180             00182  306          BZ    AAELD
000196 D507 93FA 7004 003FC  00004  307          CLC   AAEJBN(8),4(7)          COMPARE SQS INFO WITH CURRNT
00019C 4770 9180             00182  308          BNE   AAELD
000000                              309          USING AESQS,R7

0001A0 D503 9486 5088 00488  00088  311          CLC   AAEZETA(4),136(R5)      TEST FOR ZERO TCB ADRESS
0001A6 4770 91B6             001B8  312          BNE   AAEMVC
0001AA D225 9404 9549 00406  0054B  313          MVC   AAEWTO+14(38),AEMSG
0001B0 9234 93F7       003F9        314          MVI   AAEWTO+1,52             LENGTH.
0001B4 47F0 92B8             002BA  315          B     AEPRNT

                                    317 *              MOVE IN STEPNAME
0001B8 D207 9529 7044 0052B  00044  318 AAEMVC   MVC   AEOUT8,AESTEP
                                    319 *              MOVE IN INITIATOR IDENTIFIER
0001BE D204 9532 703F 00534  0003F  320          MVC   AEOUT9+1(5),AEINIT+3     "INIT?"
                                    321 *              MOVE IN TCB ADDRESS
0001C4 D237 94F1 94A9 004F3  004AB  322          MVC   AEOUT1(56),AEEDIT        MOVE IN EDIT FIELD
0001CA F133 949E 5088 004A0  00088  323          MVO   AEWRK(4),136(4,5)       MOVE OFFSET JOB TCB ADDRESS
0001D0 F373 949E 949E 004A0  004A0  324          UNPK  AEWRK(8),AEWRK(4)      UNPACK TCB ADDRESS
0001D6 92F0 949E       004A0        325          MVI   AEWRK,X'F0'             ZERO HI ORDER BYTE
0001DA 96F0 94A5       004A7        326          OI    AEWRK+7,X'F0'           OR IN CORRECT ZONE CODE
0001DE DC07 949E 9449 004A0  0044B  327          TR    AEWRK(8),AEHEX-240
0001E4 D205 94F5 94A0 004F7  004A2  328          MVC   AEOUT1+4(6),AEWRK+2     MOVE IN PRINTABLE TCB ADDRESS
                                    329 *              MOVE IN TIME USED TO START OF CURRENT JOB STEP
0001EA 41A0 0000             00000  330          LA    R10,0
0001EE 58B0 702C             0002C  331          L     R11,AELCT1              LOAD JTU TO DATE
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  LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                F01MAY72   2/25/74

0001F2 58C0 948E             00490   332           L     R12,AE6000
0001F6 1DAC                          333           DR    R10,R12
                                     334 *                                    R11 HAS MINUTES QUANTITY
                                     335 *                                    R10 HAS 1/100 SECS QUANTITY
0001F8 4EB0 949E             004A0   336           CVD   R11,AEWRK
0001FC DE02 9500 94A4 00502 004A6   337           ED    AEOUT3(3),AEWRK+6       EDIT IN MINS   MMM
000202 4EA0 949E             004A0   338           CVD   R10,AEWRK
000206 F127 94A6 949E 004A8 004A0   339           MVO   AEWRK2(3),AEWRK
00020C DE04 9504 94A6 00506 004A8   340           ED    AEOUT3+4(5),AEWRK2      EDIT IN SECS   SS.TH
000212 1BAA                         341           SR    R10,R10
000000                              342           USING AETQE,R8
000214 5880 5078             00078   343           L     R8,120(0,R5)        LOAD TQE ADDRESS
000218 9594 8000       00000         344 AAE       CLI   0(8),X'94'            IS TQE TASK TYPE
00021C 4770 9226             00228   345           BNE   AAEREAL
000220 58B0 800C             0000C   346           L     R11,TQEVAL            LOAD TASK TIME TO RUN IN STEP
000224 47F0 923A             0023C   347           B     AAE2
000228 9517 8000       00000         348 AAEREAL   CLI   0(8),X'17'            IS IT REAL TYPE
00022C 4770 9236             00238   349           BNE   AAE1                  IF NOT BR TO ZERO TIME LEFT
000230 58B0 8014             00014   350           L     R11,TQESAV            LOAD SAVED TASK TIME
000234 47F0 923A             0023C   351           B     AAE2
000238 41B0 0000             00000   352 AAE1      LA    R11,0
00023C 58C0 9492             00494   353 AAE2      L     R12,AE26
000240 1CAC                          354           MR    R10,R12         TIMER UNITS  X  26
000242 58C0 9496             00498   355           L     R12,AE10000
000246 1DAC                          356           DR    R10,R12         (TU X 26)/10000= T IN 1/100SECS
000248 89A0 0020             00020   357           SLL   R10,32              REMOVE REMAINDER
00024C 58C0 948E             00490   358           L     R12,AE6000
000250 1DAC                          359           DR    R10,R12
000252 4EB0 949E             004A0   360           CVD   R11,AEWRK
000256 DE02 950E 94A4 00510 004A6   361           ED    AEOUT5(3),AEWRK+6
00025C 4EA0 949E             004A0   362           CVD   R10,AEWRK
000260 F127 94A6 949E 004A8 004A0   363           MVO   AEWRK2(3),AEWRK
000266 DE04 9512 94A6 00514 004A8   364           ED    AEOUT5+4(5),AEWRK2
000000                              365           USING AETCT,R6
00026C 5860 50A4             000A4   366 AAETCT   L     R6,164(0,R5)            LOAD TCT ADDTESS
000270 4870 604A             0004A   367           LH    R7,TCTRSZ0
000274 8970 0001             00001   368           SLL   R7,1                    * 2
000278 4E70 949E             004A0   369           CVD   R7,AEWRK
00027C DE02 951B 94A4 0051D 004A6   370           ED    AEOUT7(3),AEWRK+6
000282 4870 6048             00048   371           LH    R7,TCTMINC0
000286 8970 0001             00001   372           SLL   R7,1                    * 2
00028A 4E70 949E             004A0   373           CVD   R7,AEWRK
00028E DE02 9524 94A4 00526 004A6   374           ED    AEOUT7+9(3),AEWRK+6
000294 4150 9500             00502   375           LA    R5,AEOUT3.
000298 4160 0001             00001   376           LA    R6,1
00029C 4170 9529             00528   377           LA    R7,AEOUT8
0002A0 9521 5000       00000         378 AECLI     CLI   0(R5),X'21'
0002A4 4720 92AA             002AC   379           BH    AELA
0002A8 92F0 5000       00000         380           MVI   0(R5),X'F0'
0002AC 8756 929E             002A0   381 AELA      BXLE  R5,R6,AECLI
0002B0 D246 9404 94F1 00406 004F3   382           MVC   AAEWTO+14(71),AEOUT1     MOVE EDITED OUTPUT TO WTO LIST
0002B6 9254 93F7       003F9         383           MVI   AAEWTO+1,84             LENGTH
                                     384 AEPRNT    WTO   MF=(E,AAEWTO)
0002BA 4110 93F6             003F8   385+AEPRNT    LA    1,AAEWTO LOAD PARAMETER REG 1
0002BE 0A23                          386+          SVC   35 ISSUE SVC
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 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                F01MAY72  2/25/74

0002C0 98EC 944A            0044C   387 AAECON  LM    R14,R12,AAESAVE       RESTORE REGS
000000                              388         USING QSDATA,R6             RE-ESTABLISH ADDRESSABILITY
000000                              389         USING CHNCSCB,R7            RE-ESTABLISH ADDRESSABILITY
0002C4 8000 93F2      003F4         390         SSM   AAEFF
                                    391 ********************************************************************** ********
0002C8 92EE 6058      00058         392 MSGEE   MVI   QSRDA+8,X'EE'          INDICATE MSG JUST WRITTEN  0C69 47260017
0002CC 45A0 92F4            002F6   393         BAL   R10,OC69TST             LINK                       0C69 47320017
0002D0 47F0 93C4            003C6   394         B     FRWK              GO FREE WORK AREA & EXIT                 47400015
                                    395         DROP  R2                                                       47600015
0002D4                              396 TESTHIT EQU   *                                                        47640015
0002D4 9104 6001      00001         397         TM    QST2,QSHIT          WAS SEARCH SUCCESSFUL?               47680015
0002D8 4710 93C4            003C6   398         BO    FRWK                BR YES- NO MESSAGE NEEDED            47720015
0002DC 4140 0010            00010   399         LA    R4,JNOTFND          SET JOB NOT FOUND MESSAGE            47740015
0002E0 9120 6001      00001         400         TM    QST2,QSJ            WAS THIS A JOBNAME SEARCH?           47760015
0002E4 07FE                 00012   401         BCR   7,R14                BR YES                               47780015
0002E6 4140 0012            00020   402         LA    R4,QEMPTY           SET QUEUE EMPTY MESSAGE              47800015
0002EA 9240 7020      00020         403         MVI   CHBUF,C' '          CLEAR OUT JOBNAME                    47820015
0002EE D206 7021 7020 00021 00020   404         MVC   CHBUF+1(7),CHBUF     FIELD IN CSCB FOR MESSAGE           47840015
0002F4 07FE                 00012   405         BR    R14                                                      47920015
0002F6                              406 OC69TST EQU   *                       TESTING SUBROUTINE         0C69 47922017
0002F6 D500 7004 9578 00004 0057D   407         CLC   CHVCD(1),RES116+1      IS COMMAND RESET            0C69 47924017
0002FC 077A                 0057E   408         BCR   7,R10                   NO   THEN RETURN           0C69 47926017
0002FE 9526 6003      00003         409         CLI   QSNUM+1,THR38        ID Q # EQUAL OR HIGHER THAN 38          47928017
000302 07AA                         410       BCR   10,R10                  YES THEN RETURN (NOT SYSOUT)          47930017
000304 9503 6003      00003         411         CLI   QSNUM+1,THR3           IS Q LOWER THAN 3                    47932017
000308 074A                 0058E   412         BCR   4,R10                  YES RETURN (NOT SYSOUT)    0C69 47934017
00030A 9140 6000      00000         413         TM    QST1,QSEL              IS IT SELECTIVE SEARCH     0C69 47936017
00030E 071A                 00000   414         BCR   1,R10                  YES RETURN                 0C69 47938017
000310 9180 6000      00000         415         TM    QST1,QSGEN             IS IT GENERAL SEARCH       0C69 47940017
000314 078A                 00000   416         BCR   8,R10                   NO RETURN                 0C69 47942017
000316 4940 957C            0057E   417         CH    R4,CON4               IS MESSAGE JOB RESEG                 47944017
00031A 077A                 00000   418         BCR   7,R10                  NO THEREFORE RETURN                   47946017
00031C 95DD 6058      00058         419         CLI   QSRDA+8,X'DD'           WAS ENQ OF SOUT PERFORMED  0C69 47948017
000320 4770 9388            0038A   420         BNE   MSGTST                   NO TEST MSG REQUIRED      0C69 47950017
000324 5800 93EE            003F0   421         L     R0,QIOBLGH                                           47952017
                                    422         GETMAIN R,LV=(0)              GET CORE FOR ECB/IOB     19774 47955019
000328 4510 932A            0032C   423+        BAL   1,*+4 INDICATE GETMAIN
00032C 0A0A                 00004   424+        SVC   10 ISSUE GETMAIN SVC
00032E 41C1 0004            00000   425         LA    R12,4(R1)                                              47958017
000332 5001 0000            00008   426         ST    R0,0(R1)                                               47960017
000336 D24B C000 959A 00000 0059C   427         MVC   0(QIOBL,R12),QMECB      MOVE BASIC ECB/IOB INTO CORE     47962017
00033C 50CC 0008            00040   428         ST    R12,QIOBA(R12)                                         47964017
000340 5030 6040            00010   429         ST    R3,QSJN                 SAVE REG 0           S20201 47964420
000344 5830 0010            0000C   430         L     R3,QMVEC                GET CVT ADDRESS      S20201 47964820
000348 5833 000C            00000   431         L     R3,QMRES(R3)            GET Q MNGR RES.CORE ADDR S20201 47965220
                                    432         USING QMRESAR,R3              ADDRESSABILITY FOR QMRES S20201 47965620
00034C 9110 3094      00094         433         TM    QMRPS,RPSON           IS JOBQ ON RPS DEVICE?     S20201 47966020
000350 47E0 936A            0036C   434         BNO   NORPS                  NO,BRANCH                  S20201 47966420
000354                              435 RPSSET  EQU   *                                                S20201 47966820
000354 411C 002C            0002C   436         LA    R1,QIOBC(R12)     GET ADDR OF 1ST CCW- SET       S20201 47967220
                                    437 *                               SECTOR  OP CODE              S20201 47967620
000358 501C 0014            00014   438         ST    R1,QIOBB(R12)     STORE  INTO  SLOT IN IOB     S20201 47968020
00035C 411C 0034            00034   439         LA    R1,QIOBD(R12)     GET ADDR OF SEARCH CCW AND   S20201 47968420
000360 501C 003C            0003C   440         ST    R1,QIOBH(R12)     STORE INTO DATA ADDR OF TIC  S20201 47968820
                                    441 *                               CCW (3RD CCW)                S20201 47969220
```

```
  LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                                F01MAY72   2/25/74

000364 9608 C03C       0003C          442           OI    QIOBH(R12),QMOPC1  RESET TIC OP CODE                S20201 47969620
000368 47F0 9378               0037A  443           B     SETSEEK                                            S20201 47970020
                                      444 NORPS     EQU   *                                                  S20201 47970420
00036C                                445           LA    R1,QIOBD(R12)       SET UP IOB TO POINT TO SEARCH S20201 47970820
00036C 411C 0034               00034  446           ST    R1,QIOBB(R12)       CCW; AVOID"SET SECTOR" CCW    S20201 47971220
000370 501C 0014               00014  447           MVC   QIOBE(QIOBF,R12),QIOBB+1(R12)    MOVE ADDR INTO   S20201 47971620
000374 D202 C03D C015 0003D    00015  448 *                                 DATA ADDRESS OF TIC CCW.       S20201 47972020
                                      449 SETSEEK   EQU   *                                                  S20201 47972420
00037A                                450           LA    R1,QIOBG(R12)       LOAD ADDR OF IOB SEEK PORTION S20201 47972820
00037A 411C 0027               00027  451 *                                 OF IOB PLUS 3                  S20201 47973220
                                      452           ST    R1,QIOBD(R12)      STORE THE ADDR IN THE DATA     S20201 47973620
00037E 501C 0034               00034  453 *                                 ADDRESS OF THE  SEARCH CCW     S20201 47974020
                                      454           OI    QIOBD(R12),QMCOP   RESTORE SEARCH ID EQ OPERATION S20201 47974420
000382 9631 C034       00034          455 *                                 CODE                           S20201 47974820
                                      456           L     R3,QSJN                 RESTORE REG 3            S20201 47975220
000386 5830 6040               00040  457 MSGTST    CLI   QSRDA+8,X'EE'          WAS A MSG JUST WRITTEN     0C69 47978017
00038A 95EE 6058       00058          458           BE    TCTL563                  YES XCTL TO IEESD563      0C69 47980017
00038E 4780 9398               0039A  459           TM    QST2,QSMG                IS A MSG INDICATED        0C69 47982017
000392 9110 6001       00001          460           BO    WRITE                    YES BRANCH TO WRITE       0C69 47984017
000396 4710 9080               00082  461 TCTL563   EQU   *                                                  0C69 47986017
00039A                                462           ENQ   MF=(E,IEFALTRA)                                     47988017
00039A 4110 9582               00584  463+          LA    1,IEFALTRA LOAD PARAMETER REG 1
00039E 0A38                           464+          SVC   56
0003A0 9200 6058       00058          465           MVI   QSRDA+8,X'00'            ZERO OUT INDICATOR FIELD  0C69 47990017
0003A4 9200 6006       00006          466           MVI   QSELA+2,X'00'           ZERO OUT NO PRTY OR Q CHGE FLD  47992017
0003A8 4120 0064               00064  467           LA    R2,100                 R2 MUST BE NONZERO        0C69 47994017
0003AC 4340 7004               00004  468           IC    R4,CHVCD               GET COMMAND CODE FROM CSCB 0C69 47995017
                                      469           XCTL  EP=IEESD563                                        47996017
0003B0                                470+          CNOP  0,4
0003B0 45F0 93C2               003C4  471+          BAL   15,*+20 LOAD SUP.PARAMLIST ADR
0003B4 000003BC                       472+          DC    A(*+8) ADDR OF EP PARAMETER
0003B8 00000000                       473+          DC    A(0) DCB ADDRESS PARAMETER       LC0A
0003BC C9C5C5E2C4F5F6F3               474+          DC    CL8'IEESD563' EP PARAMETER
0003C4 0A07                           475+          SVC   7 ISSUE XCTL SVC
0003C6                                476 FRWK      EQU   *                                                  48000015
0003C6 5800 93EA               003EC  477           L     R0,WKLGTH           SET SP252 & WORK AREA LENGTH       48400015
0003CA 58D0 603C               0003C  478           L     R13,QS13            GET CALLER'S SAVE AREA PT.         48800015
0003CE 1816                           479           LR    R1,R6              SET ADDR FOR FREEMAIN               49200015
                                      480           FREEMAIN R,LV=(0),A=(1)        FREE QSWORK AREA      19774 49600019
0003D0 4111 0000               00000  481+          LA    1,0(1) CLEAR THE HIGH ORDER BYTE
0003D4 0A0A                           482+          SVC   10 ISSUE FREEMAIN SVC          P2504
0003D6 1817                           483           LR    R1,R7                LOAD ORIGINAL INPUT  ADDRESS  50000015
000000                                484           USING CHNCSCB,R1           ADDRESSABILITY FOR CSCB         50400015
0003D8 9602 7006       00006          485           OI    CHSTS,CHFC           INDICATE 'FREE CORE' TO SVC 34 MOD  50800015
0003DC 1311                           486           LCR   R1,R1                COMPLEMENT ADDR IN R1  FOR THE MACRO 51200015
0003DE 1B00                           487           SR    R0,R0                INDICATE CSCB PROCESSING        51400018
                                      488           MGCR  (1)                  THIS WILL FREE  CSCB  CORE      51600015
0003E0 0A22                           489+          SVC   34 ISSUE MGCR SVC
                                      490           DROP  R1                                                 52000015
                                      491           RETURN (14,12),T                                         52400015
0003E2 98EC D00C               0000C  492+          LM    14,12,12(13) RESTORE THE REGISTERS
0003E6 92FF D00C       0000C          493+          MVI   12(13),X'FF' SET RETURN INDICATION
0003EA 07FE                           494+          BR    14 RETURN
0003EC                                495           DS    0F                                                 52800015
0003EC FC                             496 WKLGTH    DC    X'FC' 252          *SUBPOOL-THESE 4 DC'S          53200015
```

```
  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                F01MAY72   2/25/74

0003ED 0000E8                     497          DC    AL3(QSLGTH)       * MUST BE TOGETHER                53600015
0003F0                            498          DS    0F                                                  54000015
0003F0 FC                         499 QIOBLGH  DC    X'FC' 252         SUBPOOL                           54400015
0003F1 000058                     500          DC    AL3(QIOBL+12)         INCLUDE ECB AND SECTOR  S20201 54600020
                                  501 *                                   BYTES IN LENGTH         S20201 54800020
                                  502 *                                                             *      55200015
```

```
  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                              F01MAY72   2/25/74
                                    504 ******************************************************************** ********
                                    505 *                                                                              *
                                    506 **  ADDITIONAL  CONSTANTS  FOR  "AAEC"  MODIFICATIONS                         **
                                    507 *                                                                              *
                                    508 ******************************************************************** ********
0003F4 FE                           509 AAEFF    DC    X'FE'
                                    510 AAEWTO   WTO    '                                                     [
                                                                               ',MF=L
0003F8                              511+AAEWTO   DS    0F
0003F8 0054                         512+         DC    AL2(84) TEXT LENGTH
0003FA 0000                         513+         DC    B'0000000000000000' MCS FLAGS
                                    514+         DC    C'                                                     X
0003FC 4040404040404040                +
0003FC                              515          ORG   AAEWTO+4
0003FC                              516 AAEJBN   DS    CL8
00044C                              517          ORG
00044C 0000000000000000             518 AAESAVE  DC    15F'0'
000488 00000000                     519 AAEZETA  DC    F'0'
00048C 11                           520 AAE17    DC    X'11'
00048D 000000
000490 00001770                     521 AE6000   DC    F'6000'
000494 0000001A                     522 AE26     DC    F'26'
000498 00002710                     523 AE10000  DC    F'10000'
00049C 00000000
0004A0 0000000000000000             524 AEWRK    DC    D'0'
0004A8                              525 AEWRK2   DS    CL3
0004AB E3C3C27E40404040             526 AEEDIT   DC    C'TCB=       '
0004B6 D1E3E47E                     527 AE2      DC    C'JTU='
0004BA 212020D421204B20             528 AE3      DC    X'212020',C'M',X'2120',C'.',X'20',C'S '
0004C4 E3E3C77E                     529 AE4      DC    C'TTG='
0004C8 212020D421204B20             530 AE5      DC    X'212020',C'M',X'2120',C'.',X'20',C'S '
0004D2 D9C37E                       531 AE6      DC    C'RC='
0004D5 212020D26BE4E4C3             532 AE7      DC    X'212020',C'K,UUC=',X'212020',C'K '
0004E3 4040404040404040             533 AE8      DC    8C' '
0004EB 4040404040404040             534 AE9      DC    8C' '
0004F3                              535 AEOUT1   DS    11C
0004FE                              536 AEOUT2   DS    4C
000502                              537 AEOUT3   DS    10C
00050C                              538 AEOUT4   DS   4C
000510                              539 AEOUT5   DS    10C
00051A                              540 AEOUT6   DS    3C
00051D                              541 AEOUT7   DS    14C
00052B                              542 AEOUT8   DS    CL8
000533 4040404040404040             543 AEOUT9   DC    CL8' '
00053B F0F1F2F3F4F5F6F7             544 AEHEX    DC    C'0123456789ABCDEF'     TRANSLATE TABLE
00054B 404040D1D6C240E3             545 AEMSG    DC    CL38'   JOB TASK NOT ON THE READY QUEUE  !!'
                                    546 ******************************************************************** ********
```

```
  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                                F01MAY72   2/25/74

                                   1188 ********************************************************************************
                                   1189 *                                                                              *
                                   1190 *              DSECTS FOR AAEC SECTION                                         *
                                   1191 *              LINKAGE CONTROL TABLE,TIMING CONTROL TABLE                      *
                                   1192 *                                                                              *
                                   1193 *                                                                              *
000000                             1194 AETCT       DSECT
000000                             1195             DS    CL4
000004                             1196 TCTTCB      DS    CL4
000008                             1197             DS    CL4
00000C                             1198 TCTIOTBL    DS    CL4
000010                             1199 TCTPOOL     DS    CL4
000014                             1200 TCTUTL      DS    CL4
000018                             1201 TCTUDATA    DS    CL4
00001C                             1202 TCTJMR      DS    CL4
000020                             1203 TCTUSO      DS    CL4
000024                             1204 TCTSTOF     DS    CL4
000028                             1205 TCTSACT     DS    CL4
00002C                             1206 TCTWLMT     DS    CL4
000030                             1207             DS    CL16    ** 4 XTRA FIELDS FOR "21.6", OVER "19.6" **
                                   1208 * PROCESSOR STORAGE TABLE - HIERARCHY 0
000040                             1209 TCTLWM0     DS    CL4                      CURRENT  HI WTR MARK
000044                             1210 TCTHWM0     DS    CL4                      CURRENT  LO WTR MARK
000048                             1211 TCTMINC0    DS    CL2                      MINIMUM  DIFF BETWEEN HI & LO
00004A                             1212 TCTRS20     DS    CL2                      REGION REQUEST
00004C                             1213 TCTRBC0     DS    CL2
00004E                             1214 TCTMBC0     DS    CL2                      TOTAL ROLLOUT OBTAINED STORAGE
                                   1215 * PROCESSOR STORAGE TABLE - HIERARCHY 1
000050                             1216 TCTLWM1     DS    CL4                      CURRENT  HI WTR MARK
000054                             1217 TCTHWM1     DS    CL4                      CURRENT  LO WTR MARK
000058                             1218 TCTMINC1    DS    CL2                      MINIMUM  DIFF BETWEEN HI & LO
00005A                             1219 TCTRS21     DS    CL2                      REGION REQUEST
00005C                             1220 TCTRBC1     DS    CL2
00005E                             1221 TCTMBC1     DS    CL2                      TOTAL ROLLOUT OBTAINED STORAGE
                                   1222 * TCT I/O TABLE FOLLOWS.
000000                             1223 AETQE       DSECT
000000                             1224 TQEFLGS     DS    CL1
000001                             1225 TQETCB      DS    CL3
000004                             1226             DS    CL1
000005                             1227 TQEFLNK     DS    CL3
000008                             1228             DS    CL1
000009                             1229 TQEBLND     DS    CL3
00000C                             1230 TQEVAL      DS    CL4
000010                             1231 TQELHPSW    DS    CL4
000014                             1232 TQESAV      DS    CL4
000018                             1233 TQESAADR    DS    CL4
00001C                             1234             DS    CL1
00001D                             1235 TQEEXIT     DS    CL3
000020                             1236 TQEGRS      DS    18F
000000                             1237 AESQS       DSECT
000000                             1238 UNUSED      DS    4C     UNUSED
000004                             1239 AEJOB       DS    28C    8 BYTE JOB NAME, 20 BYTE PROGRAMMER NAME
000020                             1240 AERDR       DS    4C     READER START TIME (IN 1/100THS OF A SECOND)
000024                             1241 AEDATE      DS    4C     READER START DATE (FORMAT IS 00YYDDDF )
000028                             1242 AECC        DS    2C     HIGHEST CONDN. CODE ENCOUNTERED SO FAR IN JOB
```

```
HAS     IEESD565 - JOB ENQUEUE AND MESSAGE MODULE

                                                                                                    F01MAY72   2/25/74
  LOC  OBJECT CODE     ADDR1 ADDR2  STMT    SOURCE STATEMENT
00002A                              1243               DS     2C     UNUSED
00002C                              1244 AELCT1        DS     4C     CPU TIME USED BY PREVIOUS STEPS (1/100TH SEC)
000030                              1245 AELCT2        DS     4C     STEP TIME
000034                              1246 AELCT3        DS     4C     REMAINING STEP TIME (BEFORE A 322 ABEND)
000038                              1247 AELCT4        DS     4C     TIME USED (STEP)
00003C                              1248 AEINIT        DS     8C     IDENTIFIER OF INITIATOR RUNNING JOB
000044                              1249 AESTEP        DS     8C     NAME OF STEP CURRENT (SEE TIOT FOR PROCSTEP)
00004C                              1250 AEACT         DS     8C     USERHS ACCOUNT NUMBER (EBCDIC)
                                    1251 ***********************************************************************
                                    1252               END                                                          87600015
0005E8 C8D6D3C4                     1253                      =C'HOLD'
0005EC C3C1D5C3C5D3                 1254                      =C'CANCEL'
0005F2 D9C5D3C5C1E2C5               1255                      =C'RELEASE'
0005F9 C4C9E2D7D3C1E8               1256                      =C'DISPLAY'
000600 D9C5E2C5E3                   1257                      =C'RESET'
```

APPENDIX A

Pre-Stage One Modifications

```
//*********************************************************************
//*      AAEC UCB MODIFIER MACRO TO BE ADDED TO SYS1.GENLIB           *
//*********************************************************************
//UPD1 EXEC  PGM=IEBUPDTE,PARM=NEW
//SYSPRINT  DD  SYSOUT=A
//SYSUT2 DD DSN=SYS1.GENLIB,DISP=SHR
//SYSIN  DD  *
./  ADD  NAME=AEATTN,LIST=ALL,SSI=AAEC0004
.: NUMBE: NE:1=100019,I:C:=100000
         MACRO                                                  ***AAEC*** 00100000
         AEATTN &ATTN                                           ***AAEC*** 00200000
.*             AAEC UCB MODIFIER MACRO TO BE ADDED TO SYS1.GENLIB
         GBLC  &AAELINK                                         *AAEC MOD* 00250000
.*             MAXIMUM OF 50 DEVICES WITH ATTENTION UCB'S.
         GBLC  &AAECCHK(50)                                     ***AAEC*** 00300000
         GBLA  &AAECLST,&AAECN                                  ***AAEC*** 00400000
&AAECLST SETA  N'&ATTN                                          ***AAEC*** 00500000
.*  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
/*
```

```
//*********************************************************************
//*      AAEC MODIFICATIONS TO SGIEA2BK AND SGIEA2NP TO GENERATE      *
//*      THE AAEC LINK TCB                                            *
//*********************************************************************
//*      MODIFICATION TO VIRGIN IBM VERSION OF SGIEC202 ALLOWING      *
//*      THE EXTENDED AAEC UCB TO BE GENERATED                        *
//*********************************************************************
//UPD2   EXEC  PGM=IEBUPDTE
//SYSPRINT DD  SYSOUT=A
//SYSUT1 DD DSN=SYS1.GENLIB,DISP=SHR
//SYSUT2 DD DSN=SYS1.GENLIB,DISP=SHR
//SYSIN  DD  *
./     CHANGE  NAME=SGIEA2BK,LIST=ALL,SSI=AAEC0002
         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''                             C00249121
                     *AAEC MOD*'                                 *AAEC MOD* 00249221
.AAE010  ANOP                                                    *AAEC MOD* 00249321
./     CHANGE  NAME=SGIEA2NP,LIST=ALL,SSI=AAEC0003
         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
./  CHANGE  NAME=SGIEC202,LIST=ALL,SSI=AAEC0001
         GBLC  &AAECCHK(50)                                      ***AAEC*** 00050000
         GBLA  &AAECLST,&AAECN                                   ***AAEC*** 00055000
.*             TEST FOR ATTENTION DEVICE                         ***AAEC*** 14115021
&AAECN   SETA  0                                                 ***AAEC*** 14115121
.AAEC    ANOP                                                    ***AAEC*** 14115221
&AAECN   SETA  &AAECN+1                                          ***AAEC*** 14115321
         AIF   (&AAECN GT &AAECLST).AAE010                       ***AAEC*** 14115421
         AIF   ('&AAECCHK(&AAECN)' NE '&DEVAD').AAEC             ***AAEC*** 14115521
 PUNCH '          ORG   UCB&UCBNO+11                      UCBATI FIELD.***X14115621
               AAEC***'                                                    14115721
 PUNCH 'AEBIT&AAECN  DC  AL1(8)     DISP TO A(LINK ATTN HANDLER)    ***X14115821
               AAEC***'                                                    14115921
 PUNCH '**********     AAECRIT DOES NOT SHOW IN LISTING N.B.         ***X14116021
               AAEC***'                                                    14116121
 PUNCH '          ORG                                                     14116221
.*                          LOCATION COUNTER RESET                 ***AAEC*** 14116321
 PUNCH 'AEATT&AAECN  DC  32AL1(0)      ATTN EXTENDED UCB.              ***X14116421
               AAEC***'                                                    14116521
.AAE010  ANOP                                                    ***AAEC*** 14116621
/*
```

APPENDIX B

Stage One

```
//*********************************************************************
//*            R21.6 OS-MVT SYSGEN   -    OCTOBER, 1972              *
//*            TOTAL STAGE1 SYSGEN DECK - NUCLEUS, I/O AND PROCESSOR.*
//*********************************************************************
//ASM    EXEC  PGM=IEUASM,REGION=120K
//SYSLIB   DD  DSN=SYS1.GENLIB,DISP=SHR
//SYSUT1   DD  DSN=SYS1.UT1,UNIT=SYSDA,DISP=OLD
//SYSUT2   DD  DSN=SYS1.UT2,DISP=OLD
//SYSUT3   DD  DSN=SYS1.UT3,DISP=OLD
//SYSPRINT DD  SYSOUT=A
//SYSPUNCH DD DSN=SYS1.STAGE1,DISP=OLD
//SYSPUNCH DD  SYSOUT=B
//SYSPUNCH DD  SYSOUT=A
STG1     TITLE '*** RELEASE 21.6 TOTAL SYSGEN - JANUARY 1973 ***'
*            BECAUSE THIS SYSTEM REQUIRES MORE THAN 96 DEVICES
*        THE MEMBER NAMED SGGBLPAK SHOULD BE RENAMED SGPAK96 AND THE
*        MEMBER NAMED SGPAK248 SHOULD BE RENAMED SGGBLPAK AND THE NEXT
*        TWO ASSEMBLER STATEMENTS SHOULD BE ADDED.
         COPY  SGGBLPAK                ALLOW 248 DEVICES INSTEAD OF 96.
&LIMIT(1) SETB 1                       ALLOW 248 DEVICES INSTEAD OF 96.
*            THE NEXT ASSEMBLER STATEMENT USES THE FEATURE FOR THE
*        STARTER SYSTEM WHICH PUTS ALL NOT READY DEVICES OFFLINE AT
*        INITIAL PROGRAM LOAD TIME.
&SGMENTB(87) SETB 1                    PUT NOT READY DEV OFFLINE.
*            *****  CENTRAL PROCESSOR  *****
      SPACE
      CENPROCS MODEL=50,STORAGE=I
      SPACE
*            THE NEXT MACRO INDICATES THAT THE DEVICES LISTED ARE TO
*        HAVE EXTENDED UCB'S SO THAT THEY MAY PRESENT ASYNCHRONOUS
*        ATTENTION OVER THE LINK.
         AEATTN (240,248,24A,24C,250)  AAEC UCB MODIFIER.   ***AAEC****
*            ******  I/O EQUIPMENT  *****
*            *****  MULTIPLEXOR CHANNEL *****
     SPACE
MPX   CHANNEL  ADDRESS=0,TYPE=MULTIPLEXOR
      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
D120  IODEVICE UNIT=2314,ADDRESS=(120,7),IOREQUE=ORDERED
D127  IODEVICE UNIT=2314,ADDRESS=(127,1),IOREQUE=FIFO
D130  IODEVICE UNIT=2314,ADDRESS=(130,7),IOREQUE=ORDERED
D137  IODEVICE UNIT=2314,ADDRESS=(137,1),IOREQUE=FIFO
      SPACE
*            *****  SELECTOR CHANNEL 2  *****
      SPACE
SEL2  CHANNEL  ADDRESS=2,TYPE=SELECTOR
```

```
*               *** DATAWAY DEVICES ***
LINK   IOCONTRL UNIT=2803,MODEL=1,ADDRESS=24,FEATURE=(DATACONV,7-TRACK)
*               ***  PDP9L  ***
T240   IODEVICE UNIT=2401,MODEL=2,FEATURE=7-TRACK,ADDRESS=(240,4)
*               ***  NOVA1 AND NOVA2  ***
LINK2  IOCONTRL UNIT=2803,MODEL=1,ADDRESS=24,FEATURE=(DATACONV,7-TRACK)
T248   IODEVICE UNIT=2401,MODEL=2,FEATURE=7-TRACK,ADDRESS=(248,3)
*               ***  PDP15A  ***
T24C   IODEVICE UNIT=2401,MODEL=2,FEATURE=7-TRACK,ADDRESS=(24C,2)
LINK3  IOCONTRL UNIT=2803,MODEL=1,ADDRESS=25,FEATURE=(DATACONV,7-TRACK)
*               ****  PDP11A  **
T250   IODEVICE UNIT=2401,MODEL=2,FEATURE=7-TRACK,ADDRESS=(250,2)
*               *** 360 TAPE UNITS ***
TCTL   IOCONTRL UNIT=3803,MODEL=1,ADDRESS=28,FEATURE=800BPI
T280   IODEVICE UNIT=3420,MODEL=3,ADDRESS=(280,4),                      *
               FEATURE=(9-TRACK,DUALDENS)
       SPACE
*               ** HASP PSEUDO DEVICES **
       SPACE
*               ** DUMMY SELECTOR CHANNEL 3 **
       SPACE
HASP   CHANNEL  ADDRESS=3,TYPE=SELECTOR
IRDR   IODEVICE UNIT=DUMMY,ADDRESS=(300,5),DEVTYPE=50000805
RDR1   IODEVICE UNIT=DUMMY,ADDRESS=(310,16),DEVTYPE=50000801
RDR2   IODEVICE UNIT=DUMMY,ADDRESS=(320,10),DEVTYPE=50000801
PUN    IODEVICE UNIT=DUMMY,ADDRESS=(330,6),DEVTYPE=50000802
SFPRT  IODEVICE UNIT=DUMMY,ADDRESS=(380,10),DEVTYPE=5000080A
SFPUN  IODEVICE UNIT=DUMMY,ADDRESS=(390,2),DEVTYPE=50000803
PRNT1  IODEVICE UNIT=DUMMY,ADDRESS=(3A0,15),DEVTYPE=50000808
PRWTR  IODEVICE UNIT=DUMMY,ADDRESS=3AF,DEVTYPE=10000808
PRNT2  IODEVICE UNIT=DUMMY,ADDRESS=(3B0,4),DEVTYPE=50000808
       SPACE
       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=301,NAME=INTRDR
       UNITNAME UNIT=((330,6)),NAME=B
       UNITNAME UNIT=((3A0,15)),NAME=A
       UNITNAME UNIT=((380,4)),NAME=A
       UNITNAME UNIT=((120,8),(130,8)),NAME=DISK
       UNITNAME UNIT=((120,8),(130,8)),NAME=DISC
       UNITNAME UNIT=((120,8),(130,8)),NAME=SYSDA
       UNITNAME UNIT=((120,8),(130,8),(280,4)),NAME=SYSSQ
       UNITNAME UNIT=((280,4)),NAME=TAPE
       UNITNAME UNIT=240,NAME=PDP9L
       UNITNAME UNIT=248,NAME=NOVA1
       UNITNAME UNIT=24A,NAME=NOVA2
       UNITNAME UNIT=24C,NAME=PDP15A
       UNITNAME UNIT=250,NAME=PDP11A
       UNITNAME UNIT=((241,2)),NAME=TAPE7
       UNITNAME UNIT=((134,2),(124,2)),NAME=SYSOUT
       SPACE
*               *****    END OF MACHINE CONFIG  *****
       EJECT
*               *****  CONTROL PROGRAM (MVT)  *****
       SPACE
          CTRLPROG TYPE=MVT,                                            *
```

```
               MAXIO=50,                                              *
               QSPACE=15,                                             *
               ADDTRAN=1
         SCHEDULR TYPE=MVT,                                           *
               OPTIONS=NOLOG,                                         *
               ACCTRTN=SMF,                                           *
               WTOBFRS=10,                                            *
               REPLY=5,                                               *
               JOBQFMT=25,                                            *
               JOBQLMT=750,                                           *
               JOBQTMT=750,                                           *
               ESV=SMF,                                               *
               EVA=(5,5),                                             *
               JOBQWTP=4,                                             *
               MINPART=60,                                            *
               CONSOLE=009
         SPACE
         SUPRVSOR RESIDNT=(BLDLTAB,RENTCODE,TRSVC),                   *
               OPTIONS=(COMM,PROTECT),                                *
               TIMER=JOBSTEP,                                         *
               SER=SER1
               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
         RESMODS PDS=SYS1.AAECSVC,MEMBERS=(IGC244,                    *
               IGC200,                                                *
               AEALWAIT,                                              *
               AEINTATN,                                              *
               IGC246)
         SVCLIB PDS=SYS1.AAECSVC,MEMBERS=(IGC0025C,                   *
               IGC0125C,                                              *
               IGC0225C,                                              *
               IGC0325C,                                              *
               IGC0024G,                                              *
               IGC0024H,                                              *
               IGC0024I)
*              *****  DATA MANAGEMENT  *****
      SPACE
      DATAMGT  ACSMETH=(BDAM,ISAM)
      SPACE
*              *****  END OF DATA MANAGEMENT MACROS  *****
               EJECT
*              *****  PROCESSORS AND LIBRARIES  *****
      SPACE
      ASSEMBLR DESIGN=F
      EDITOR   DESIGN=F44
         EDITOR DESIGN=F88,SIZE=(88K,6K)
      EDITOR   DESIGN=F128,SIZE=(200K,100K)
         IMAGELIB
      LOADER   SIZE=450K,PARM=NORES
         MACLIB EXCLUDE=(BTAM,QTAM,TCAM,TSO,GPS,OCR)
```

```
   SYSUTIL5 SIZE=500K
SORTLIB  UNIT=2314,VOLNO=AAE002
SORTMERG RECTYPE=(VAR,FIXED,LONG),SORTDEV=(2314,2400),                X
         SIZE=200000,CNTLFLD=(SINGLE,MULTIPLE),MERGE=MERGONLY,        X
         MESSAGE=(ALL,PRINTER),SORTOPT=MODPRGM
         EJECT
   GENERATE GENTYPE=ALL,                                              *
         OBJPDS=SYS1.OBJMOD,                                          *
         UT1SDS=SYS1.UT1,                                             *
         UT2SDS=SYS1.UT2,                                             *
         UT3SDS=SYS1.UT3,                                             *
         UT4SDS=SYS1.UT4,                                             *
         INDEX=AAEC,                                                  *
         RESTYPE=2314,                                                *
         RESNAME=2314,                                                *
         RESVOL=AAE021,                                               *
         ASMPRT=ON,                                                   *
         LEPRT=(LIST,MAP),                                            *
         DIRDATA=PDS,                                                 *
         JOBSTMT=SUPPLIED
   END
/*
```

APPENDIX C

Pre-Stage Two Modifications

```
//*********************************************************************
//*      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.                                                       *
//*********************************************************************
//STP4   EXEC  PGM=IEBUPDTE
//SYSPRINT DD SYSOUT=A
//SYSUT1 DD DSN=SYS1.MODGEN2,DISP=SHR
//SYSUT2 DD DSN=SYS1.MODGEN2,DISP=SHR
./     CHANGE  NAME=IEAANIP,LIST=ALL,SSI=AAEC0006
         GBLC  &DATLINK                                          *AAEC MOD* 00060021
         AIF   ('&DATLINK' EQ ''),JONEG                          *AAEC MOD* 00750021
         EXTRN AEALTCB .              MVT LINK TCB ADDR          *AAEC MOD* 00751021
         AIF   ('&DATLINK' EQ ''),AEA020                         *AAEC MOD* 14631020
*   INITIALIZE LINK TCB                                          *AAEC MOD* 14632020
         L     10,AEATCB .            LOAD ADDR OF LINK TCB      *AAEC MOD* 14633020
         ST    2,152(,10) .           SET PTR TO PQE IN TCB      *AAEC MOD* 14634020
*   END OF AAEC MOD                                              *AAEC MOD* 14635020
.AEA020  ANOP                                                    *AAEC MOD* 14636020
         AIF   ((&STORAGE NE 4) OR ('&DATLINK' EQ '')),AEA050 AAEC MOD* 86565020
AEATCB   DC    A(AEALTCB) .           ADDR OF LINK TCB           *AAEC MOD* 86566020
.AEA050  ANOP                                                    *AAEC MOD* 86567020
//*********************************************************************
//*      MODIFICATION TO IEAQBK TO GENERATE AAEC LINK RB & TCB         *
//*      CODE BELOW ASSUMES A VIRGIN IBM VERSION OF IEAQBK             *
//*********************************************************************
//*      CHANGE TO IECIOS FOR AAEC ATTENTION ROUTINE                   *
//*      INSERTS ADCON  IN ATTENTION TABLE FOR AAEC LINK.              *
//*********************************************************************
//*      MODIFICATION TO IEAQNU TO COPE WITH AAEC SVC 255              *
//*      CODE BELOW ASSUMES A VIRGIN IBM VERSION OF IEAQNU             *
//*********************************************************************
//*            S G I E E 0 0 V  - SYS1.MODGEN
//*            PRODUCES IEEVIPL MODULE.
//*      MODIFICATIONS ARE TO AUTOMATICALLY START THE THREE PROCEDURES
//*      IPLTIME, AEFUDGIT AND HASP ON IPL.
//*            THE MODS ADD 3 MESSAGES TO BE GIVEN TO THE SYSTEM
//*      ON IPL.
//*********************************************************************
//ST3  EXEC  PGM=IEBUPDTE
//SYSPRINT  DD  SYSOUT=A
//SYSUT1 DD DSN=SYS1.MODGEN,DISP=SHR
//SYSUT2 DD DSN=SYS1.MODGEN,DISP=SHR
./     CHANGE  NAME=IEAQBK,LIST=ALL,SSI=AAEC0007
         GBLC  &DATLINK                                          *AAEC MOD* 00000035
         AIF   ('&JOBSTEP' EQ 'AEALTCB').AEC010                  *AAEC MOD* 00001655
.AEC010  ANOP                                                    *AAEC MOD* 00001742
*   DATAWAY/LINK COMMUNICATIONS PRB                              *AAEC MOD* 00001744
         AGO   .NOCVTCB                                          *AAEC MOD* 00001746
         AIF   ('&JOBSTEP' EQ 'AEALTCB').AEC030                  *AAEC MOD* 00001945
         AIF   ('&DATLINK' EQ ''),AEC015                         *AAEC MOD* 00002152
&RQUEUE  SETC  'AEALTCB'                                         *AAEC MOD* 00002154
         AGO   .TAG024                                           *AAEC MOD* 00002156
.AEC015  ANOP                                                    *AAEC MOD* 00002158
         AIF   ('&DATLINK' EQ ''),AEC020                         *AAEC MOD* 00002372
```

```
&RQUEUE  SETC   'AEALTCB'                                          *AAEC MOD* 00002374
         AGO    .AEC022                                            *AAEC MOD* 00002376
.AEC020  ANOP                                                      *AAEC MOD* 00002378
.AEC022  ANOP                                                      *AAEC MOD* 00002385
         AIF    ('&DATLINK' EQ '').AEC030                          *AAEC MOD* 00003051
         ENTRY  AEALTCB .                                          *AAEC MOD* 00003052
         EXTRN  AEALWAIT .                                         *AAEC MOD* 00003053
&SISTER  SETC   'IEAERTCH'                                         *AAEC MOD* 00003054
         AIF    ('&ROLLOUT' EQ '').AEC024                          *AAEC MOD* 00003055
&SISTER  SETC   'IEAROTCB'                                         *AAEC MOD* 00003056
.AEC024  ANOP                                                      *AAEC MOD* 00003057
&RQUEUE  SETC   'IEECVTCB'                                         *AAEC MOD* 00003058
&WAITCT  SETC   '00'                                               *AAEC MOD* 00003059
&JOBSTEP SETC   'AEALTCB'                                          *AAEC MOD* 00003060
&TCBNAME SETC   'AEALTCB'                                          *AAEC MOD* 00003061
&RBSIZE  SETC   '04'                                               *AAEC MOD* 00003062
&N       SETA   &N+1                                               *AAEC MOD* 00003063
*   DATAWAY/LINK COMMUNICATIONS TCB                                *AAEC MOD* 00003064
&TASK    SETC   'AEALTCB'                                          *AAEC MOD* 00003065
&PGM     SETC   'AEALWAIT'                                         *AAEC MOD* 00003066
         AGO    .BUILD1                                            *AAEC MOD* 00003067
.AEC030  ANOP                                                      *AAEC MOD* 00003068
&WAITCT  SETC   '01'                                               *AAEC MOD* 00003069
&PGM     SETC   'IEECVCTW'                                         *AAEC MOD* 00003070
&TASK    SETC   'IEECVTCB'                                         *AAEC MOD* 00003071
         AIF    ('&DATLINK' EQ '').AEC035                          *AAEC MOD* 00003072
&SISTER  SETC   'AEALTCB'                                          *AAEC MOD* 00003074
         AGO    .TAG038                                            *AAEC MOD* 00003076
.AEC035  ANOP                                                      *AAEC MOD* 00003078
./  CHANGE    NAME=IECIOS,LIST=ALL,SSI=AAEC0008
         AGO    .AAEIOS1                                           *AAEC MOD* 76600019
.AAEIOS1 DC     V(AEINTATN) AAEC ATTENTION ROUTINE                 ***AAEC*** 76660029
./       CHANGE  NAME=IEAQNU,LIST=ALL,SSI=AAEC0009
.*  AAEC MOD FOR COPING WITH SVC 255                               *AAEC MOD* 15460121
         CLI    SVCOPSW+3,255           IS IT SVC 255?             *AAEC MOD* 15460221
         BNE    *+26                    CONTINUE IF NOT            *AAEC MOD* 15460321
         MVC    SVCOPSW+2(2),SVCOPSW    SAVE MASK, KEY, STATE      *AAEC MOD* 15460421
         MVI    SVCOPSW,X'00'           SET MASK BITS TO ZERO      *AAEC MOD* 15460521
         NI     SVCOPSW+1,X'FE'         SET PSW TO SUPVSR          *AAEC MOD* 15460621
         L      2,IEASCSAV+8            RELOAD R2                  *AAEC MOD* 15460721
         LPSW   SVCOPSW                 LOAD PSW AND RETURN        *AAEC MOD* 15460821
         BALR   2,0           RESET BASE TO SCBASE                    *AAEC* 15460921
         USING  *,2            - JUST IN CASE:                        *AAEC* 15461021
./ CHANGE NAME=SGIEE00V,LIST=ALL,SSI=AAEC0010
CCIPLTIM DC     C'IEE103I S IPLTIME *' .START IPLTIME.             *AAEC MOD* 10891021
         DC     X'1000' .               DESCRIPTOR CODES.          *AAEC MOD* 10892021
         DC     X'8000' .               ROUTING CODES.             *AAEC MOD* 10893021
CLIPLTIM EQU    CCIPLTIM+80-* .         LENGTH TO GO.              *AAEC MOD* 10893521
         DC     CL(CLIPLTIM)' ' . PAD WITH BLANKS.                 *AAEC MOD* 10894021
CCFUDGIT DC     C'IEE103I S AEFUDGIT *' START AEFUDGIT             *AAEC MOD* 10895021
         DC     X'1000' .               DESCRIPTOR CODES.          *AAEC MOD* 10896021
         DC     X'8000' .               ROUTING CODES.             *AAEC MOD* 10897021
CLFUDGIT EQU    CCFUDGIT+80-* .         LENGTH TO GO.              *AAEC MOD* 10897521
         DC     CL(CLFUDGIT)' ' .&      PAD&WI:H&BLA:KS.           *AAEC MOD* 10898021
CCHASP   DC     C'IEE103I S HASP *' .   START HASP.                *AAEC MOD* 10899021
         DC     X'1000' .               DESCRIPTOR CODES.          *AAEC MOD* 10899221
         DC     X'8000' .               ROUTING CODES.             *AAEC MOD* 10899421
CLHASP   EQU    CCHASP+80-* .           LENGTH TO GO.              *AAEC MOD* 10899521
         DC     CL(C:HA:P)' ' .&        PAD WITH BLANKS.           *AAEC MOD* 10899621
```

APPENDIX D

Stage Two Select

```
//STG2 EXEC SNOBOL,REGION=240K
//FT08F001 DD DSN=SYS1.STAGE1,DISP=SHR
//FT09F001 DD UNIT=INTRDR
//FT09F001  DD  SYSOUT=B
//FT09F001 DD SYSOUT=A
         INPUT('STAGE1',8,80)
         OUTPUT('JOB',9,'(80A1)')
         &ANCHOR = 1
         SS = TRIM(INPUT)
         EXECPAT = '//SG' BREAK(' ') . N SPAN(' ') 'EXEC' SPAN(' ')
+              'PGM=' BREAK(', ') . PGM
READ     CARD = INPUT                        :F(OUT)
         OUTPUT = CARD
         CARD BREAK('-') . S1 '-' BREAK(' ') .&S2  :S(LOOP)
         CARD BREAK(' $') . S1 LEN(1) . IND      :F(ERR1)
         S2 = S1
LOOP     LE(S1,N)                            :S(ERR2)
         SS = SS + 1
         JOB = '//IJH' SS '   JOB (C1D23400,B1),I.J,HAYES, '
         JOB = '//             CLASS=F,TIME=12,TYPRUN=HOLD '
         IDENT(IND,'$')                      :S(LOOP1)
LOOP1    CARD = STAGE1                       :F(ERR3)
         CARD EXECPAT                        :F(LOOP1)
         LT(N,S1)                            :S(LOOP1)
         JOB = CARD
LOOP2    CARD = STAGE1                       :F(OUT)
         JOB = CARD
         CARD '/*'                           :F(LOOP2)
         LT(N,S2)                            :S(LOOP1)
         JOB = '//IJH' SS + 1 ' EXEC RELEASE,COND=(0,NE) '
         JOB = '// '
         JOB = '// '                                 :(READ)
OUT      JOB = '/*EOF '
         PUNCH = SS
         OUTPUT = '** END OF JOB **'    :(END)
ERR1     OUTPUT = '** INVALID CARD **' :(READ)
ERR2     OUTPUT = '** INVALID SEQUENCE **'       :(READ)
ERR3     OUTPUT = '** STEP NOT FOUND **'         :(END)
END
```

APPENDIX E

PARMLIB

```
./     ADD     LIST=ALL,NAME=PRESRES
AAE001,1,2,2314,N       RESERVED, PRIVATE
AAE002,0,2,2314,N       PERMANENTLY RESIDENT , PRIVATE
AAE003,0,2,2314,N       PERMANENTLY RESIDENT , PRIVATE
AAE004,1,0,2314,N       RESERVED,STORAGE
AAE005,1,2,2314,N       RESERVED,PRIVATE
AAE006,1,0,2314,N       RESERVED,STORAGE
AAE007,1,2,2314,N       RESERVED,PRIVATE
AAE008,1,0,2314,N       RESERVED,STORAGE
AAE009,1,2,2314,N       RESERVED,PRIVATE
AAE010,1,2,2314,N       RESERVED,PRIVATE
AAE011,1,2,2314,N       RESERVED,PRIVATE
AAE012,1,0,2314,N       RESERVED,STORAGE
AAE013,1,0,2314,N       RESERVED,STORAGE
AAE014,1,0,2314,N       RESERVED,STORAGE
AAE015,1,2,2314,N       RESERVED,PRIVATE
AAE016,1,2,2314,N       RESERVED,PRIVATE
AAE017,1,2,2314,N       RESERVED,PRIVATE
AAE018,1,2,2314,N       RESERVED,PRIVATE
AAE019,1,2,2314,N       RESERVED,PRIVATE
AAE020,1,2,2314,N       RESERVED,PRIVATE
AAE021,1,2,2314,N       RESERVED,PRIVATE
AAE022,1,2,2314,N       RESERVED,PRIVATE
AAE023,1,2,2314,N       RESERVED,PRIVATE
AAE024,1,2,2314,N       RESERVED,PRIVATE
AAE025,1,2,2314,N       RESERVED,PRIVATE
DLIB01,1,2,2314,N       RESERVED,PRIVATE
SPOOL1,1,2,2314,N       RESERVED,PRIVATE
./       ADD    NAME=IEA8LD00
 SYS1.LINKLIB  DEVMASKT,                                              *
               DEVNAMET,                                              *
               IEFSD062,                                              *
               IEFSD102,                                              *
               IEFSD104,                                              *
               IEFSD263,                                              *
               IEFWA000,                                              *
               IEFWD000,                                              *
               IEFW21SD,                                              *
               IEWSZOVR
./       ADD    NAME=IEAIGE00
SYS1.SVCLIB
./       ADD    NAME=IEAIGG00
 SYS1.SVCLIB   AEATNTSK,SADUMP,                                       *
               IGG019WS,          THIS IS ONLY 16 BYTES             X
               IGG019AB,IGG019AJ,IGG019AK,IGG019CF,IGG019AI,IGG019CE, *
               IGG019AA,IGG019AQ,IGG019AR,IGG019CD,                   *
               IGG019BC,IGG019CJ,IGG019CI,IGG019CL,IGG019CC,IGG019CH, *
               IGG019BA,IGG019BB
./       ADD    NAME=IEARSV00
 SYS1.SVCLIB   IFG0196L,IFG0196X,IFG0196J,IFG0198N,IFG0193A,          *
               IGC0001I,IGC0003D,IGC0006C,                            *
               IGC0003E,IGC0107B,IGC0007B
./       ADD    LIST=ALL,NAME=LNKLST00
 SYS1.LINKLIB,SYS2.LINKLIB,SYS1.PLINKLIB,DJR.LINKLIB
./  ADD  LIST=ALL,NAME=SMFDEFLT
 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
```

APPENDIX F

APAR Superzaps

```
//STEPA  EXEC  SPZAPPTF,REGION=60K
//PTF.SYSIN DD *
      NAME      IEHMVXSF IEHVOLMT
      VER       0542 4177,0004,4133,0001,4680,A0A0
      VER       0564 4182,0004,5087,0004,4267,0004,4166,0001
      VER       0574 4177,0004,4650,A0C2,4160,0004,1888
      VER       0582 4382,0000,4128,2000,47F0,A038
      REP       0542 1A38,8980,0002,1A78,4700,0000
      REP       0564 1255,4780,A0E0,4182,0004,5087,0004
      REP       0572 4267,0004,4166,0001,4177,0004
      REP       057E 4650,A0CC,4160,0004,47F0,A0AC
      IDRDATA   P55763
      NAME      IMAPTF01
      VER       055C 41000009
      REP       055C 4100000A
      IDRDATA   P56878
      NAME      IEWLF440 IEWLMRAT
      VER       041A 18081A0A
      REP       041A 47F0C92E
      REP       0930 18081A0A,D501,2312,22B6,4770C41C
      REP       093E 910821ED,4780C956,D50122B0,22B4
      REP       094C 4770C41C,4B00232A,47F0C41C
      REP       0958 D50123022B4,4770C41C,47F0C94E
      IDRDATA   P57133
      NAME      IEWLF440 IEWLMRAT
      VER       01CB 01
      REP       01CB 02
      VER       0287 01
      REP       0287 02
      IDRDATA   P53762
      NAME      IEWLF880 IEWLMRAT
      VER       041A 18081A0A
      REP       041A 47F0C92E
      REP       0930 18081A0A,D501,2312,22B6,4770C41C
      REP       093E 910821ED,4780C956,D50122B0,22B4
      REP       094C 4770C41C,4B00232A,47F0C41C
      REP       0958 D50123022B4,4770C41C,47F0C94E
      IDRDATA   P57133
      NAME      IEWLF880 IEWLMRAT
      VER       01CB 01
      REP       01CB 02
      VER       0287 01
      REP       0287 02
      IDRDATA   P53762
      NAME      IEWLF128 IEWLMRAT
      VER       041A 18081A0A
      REP       041A 47F0C92E
      REP       0930 18081A0A,D501,2312,22B6,4770C41C
      REP       093E 910821ED,4780C956,D50122B0,22B4
      REP       094C 4770C41C,4B00232A,47F0C41C
      REP       0958 D50123022B4,4770C41C,47F0C94E
      IDRDATA   P57133
      NAME      IEWLF128 IEWLMRAT
      VER       01CB 01
      REP       01CB 02
      VER       0287 01
      REP       0287 02
      IDRDATA   P53762
```

```
      NAME      IEFVMB   IEFVMB
      VER       0214 1865,4140,0001
      VER       021E 957E6000
      VER       0226 95406000
      VER       022E 956B6000
      VER       023E 1B65
      VER       024A 0660
      VER       024C 4460,BF54
      REP       0214 1845,4160,0001
      REP       021E 957E4000
      REP       0226 95404000
      REP       022E 956B4000
      REP       023E 1B45
      REP       024A 0640
      REP       024C 4440,BF54
      IDRDATA   P54004
/*
//STEPC  EXEC  SPZAPPTF,LIB1=SVCLIB,REGION=60K
//PTF.SYSIN DD *
      NAME      IFG0194F IFG0194F
      VER       0038 95404108,47703050,D20541D83232
      VER       0262 00000000
      REP       0038 91014103,47803050,47F03260,0700
      REP       0262 D50541D83232,47803044,47F03050
      IDRDATA   P53458
/*
```

APPENDIX G

Superzap to Allow for Non-Existent Tape Drives

```
//DEVMASK EXEC PGM=IMASPZAP,REGION=60K
//SYSPRINT DD SYSOUT=A
//SYSLIB DD DSN=SYS1.LINKLIB,DISP=SHR
 NAME DEVMASKT DEVMASKT
 VER 00AC 00000004
 VER 00BA E000
 VER 00C4 00000004
 VER 00D2 E000
 VER 00F4 00000004
 VER 0102 E000
 VER 010C 00000004
 VER 011A E000
 VER 0124 00000004
 VER 0132 E000
 VER 0244 00000014
 VER 0252 E000
 VER 025C 00000004
 VER 026A E000
 REP 00AC 00000003
 REP 00C4 00000003
 REP 00F4 00000003
 REP 010C 00000003
 REP 0124 00000003
 REP 0244 00000013
 REP 025C 00000003
 REP 00BA C000
 REP 00D2 C000
 REP 0102 C000
 REP 011A C000
 REP 0132 C000
 REP 0252 C000
 REP 026A C000
 IDRDATA AAEC0034
/*
```

APPENDIX H

PTFMOD and PTFSEL Procedures

```
./        ADD   NAME=PTFMOD
//PTFMOD PROC  FILE=,TAPE=PTF180,DISP=MOD
//GO     EXEC  PGM=JCAMOD,REGION=60K
//PTFMSG   DD  SYSOUT=A,DCB=(RECFM=F,BLKSIZE=121)
//PTFINPT  DD  UNIT=TAPE,VOL=SER=MINITP,DISP=OLD,
//             LABEL=(&FILE,NL,,IN),
//             DCB=(RECFM=FB,LRECL=80,BLKSIZE=3200)
//PTFOUT   DD  DSN=SYS1.R216PTFS,VOL=SER=&TAPE,UNIT=TAPE,LABEL=(1,SL),
//             DISP=(&DISP,KEEP),DCB=(RECFM=FB,LRECL=80,BLKSIZE=3200)
//PTFCNTRL DD  DDNAME=SYSIN
//SYSIN    DD  DSN=SYS1.PROCLIB(PTFMODC),DISP=SHR
./        ADD   NAME=PTFMODC
          RELEASE=S21.6
          SELECT=ALL
./        ADD   NAME=PTFSEL
//PTFSEL PROC  OUT='UNIT=INTRDR'
//GO     EXEC  PGM=JCAMOD,REGION=60K
//PTFMSG   DD  SYSOUT=A,DCB=(RECFM=F,BLKSIZE=121)
//PTFINPT  DD  DSN=SYS1.R216PTFS,DISP=SHR,VOL=SER=PTF180,UNIT=TAPE
//PTFOUT   DD  &OUT,DCB=(RECFM=F,BLKSIZE=80,BUFNO=1)
//PTFCNTRL DD  DDNAME=SYSIN
//EOF    EXEC  PGM=IEBGENER,REGION=40K
//SYSPRINT DD  SYSOUT=A
//SYSIN    DD  DUMMY
//SYSUT1   DD  DSN=SYS1.PROCLIB(SLASTEOF),DISP=SHR
//SYSUT2   DD  UNIT=INTRDR,DCB=(RECFM=F,BLKSIZE=80,BUFNO=1)
```