S/390 Software Usage Joint Study
Technical Customization Document

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About This Document

This document provides a detailed technical description of the MVS/ESA and OS/390 system customization and subsystem product customization required for participation in the S/390 Software Usage Joint Study being conducted by IBM with MVS/ESA and OS/390 customers. This document lists the specific products and product versions that we are most interested in for the joint study, although not having one or more of the products does not preclude eligibility for the study. The logistics of collecting data and sending it to IBM for analysis and how to contact IBM are also covered.

Document's Audience

This document is intended for use by IBM field reps to understand the technical details of the joint study's customization requirements.

This document is also intended for MVS/ESA and OS/390 customers who are considering participating in the S/390 Software Usage Joint Study. Participation in the joint study requires some degree of customization on the customer's part, with the degree of customization dependent on how closely the customer's MVS/ESA and OS/390 systems already conform to the study's minimal requirements. This document serves a guide to the customization process with suggestions, examples, and checklists. Customers should use this document to understand the customization necessary for participation in the study.

All customer questions about the joint study in general and about the procedures and guidelines contained in this document should be directed to the appropriate IBM representative. See Appendix A., "Contacting IBM Joint Study Support in the U.S." on page 37 for U.S. Customers. See Appendix B., "Contacting IBM Joint Study Support outside the U.S." on page 41 for non-U.S. Customers.

Related Information

This document references information in other IBM publications using shortened versions of the publication's title. The following table shows the shortened titles and the complete titles of the publications you might need while you are using this document.

Short title used in this document	Title
DFP Access Method Services	MVS/DFP: Access Method Services for the Integrated Catalog Facility
DFP Utilities	MVS/DFP: Utilities
JCL Guide	MVS/ESA JCL Guide
JCL Ref	MVS/ESA JCL Reference
MVS Init and Tuning Guide	MVS/ESA Initialization and Tuning Guide
MVS Init and Tuning Ref	MVS/ESA Initialization and Tuning Reference
MVS System Commands	MVS/ESA System Commands
RMF User's Guide	MVS/ESA Resource Measurement Facility User's Guide
System Management Facilities	MVS/ESA System Management Facilities
MVS/ESA MULC	MVS/ESA Support for Measured Usage License Charges

S/390 Software Usage Joint Study Customization

Overview

The primary objective of this joint study is to assess the current world wide usage of specific MVS/ESA and OS/390 subsystems, software products, and the use of PR/SM Logical Partitions. The subsystems and software products of most interest to IBM for this study are: CICS, DB2, IMS, MQSeries, Lotus Domino, COBOL, and PL/I.

A secondary objective is to understand software usage by the processors defined to be part of a SYSPLEX for Parallel SYSPLEX License Charge (PSLC) billing purposes.

This study will take advantage of existing MVS/ESA and OS/390 mechanisms to collect the system and subsystem usage statistics. Customers may be required to customize their systems and must provide information on their system configurations. RMF is a prerequisite product or prerequisite OS/390 feature for the joint study. BMC's CMF product is an acceptable substitution for RMF. RMF (or CMF) will be used to collect LPAR statistics and a portion of the usage statistics and write them to SMF for the entire length of the study.

The required joint study customization consists of:

1. ensuring that the operating system has the specified maintenance applied prior to starting data collection
2. ensuring that any of the current Usage Pricing Charge (ULC) and/or usage priced products have the specified maintenance applied prior to starting data collection.
3. enabling and collecting SMF type 0, 30-2, 30-3, 30-4, 70 and 89-1 records
4. generating RMF type 70 records synchronized to the hour

Although the current ULC products use the same SMF type 89-1 records as those collected in this study, the study's collection of these records will have no effect on a customer's current use or nonuse of usage pricing. Customers who use usage pricing need to continue to collect the required SMF type 89-1 records and provide IBM with required "Software Usage Report" on their existing measurement intervals.

While potentially requiring some customization on the customer's part, this joint study attempts to minimize such changes by attempting to coexist with and use as many of the customer's current system parameters and RMF options as is possible.

For planning purposes, the joint study estimates that the system overhead of adding SMF type 89 record collection for CICS, IMS and MQSeries will consume less than 1% of those systems with SMF collection already active. The overhead to collect SMF type 89 records for DB2 may be slightly larger than 1% of the total DB2 usage depending on the specific DB2 functions being used.

The system overhead of adding SMF type 30 interval and step completion record collection depends on the workload characteristics of the system being monitored. The primary consideration with SMF type 30 record collection is additional disk space needed to dump the records. The amount of disk space is dependent on the workload characteristics of the system being monitored. SMF exits that the customer might use to discard SMF 30 records before being written to disk should be disabled.

Potential participants should assess the impact of participating in this joint study on their operations and system performance.

S/390 Software Usage Joint Study Pre-Reqs

In order to participate in the S/390 Software Usage Joint Study, customers:

1. must have MVS/ESA SP5, OS/390 V1, or OS/390 V2 and the RMF (or CMF) version/release corresponding to the MVS/ESA or OS/390 release
2. must be able to send the usage data to IBM on 3480 or 3490 tape cartridges.

All subsystem products need ***not*** be present on a processor for that processor to participate in the joint study. However, all subsystem products that are present on the processor must participate in the joint study with the

possible exception of DB2. See "DB2" on page 17 for details. In order for a processor to participate, all MVS/ESA images, starting with MVS/ESA SP5.2.2, and all OS/390 images on that processor footprint, including test and development LPARs must participate. The study will collect usage data for subsystem versions that are earlier than the versions listed in Figure 1. See the specific subsystem section of this document for further product details, including required service levels for MVS/ESA, OS/390 and the subsystem products.

Additionally, if a participating MVS/ESA or OS/390 image is a part of a PSLC SYSPLEX, then all MVS/ESA or OS/390 images that are part of that PSLC SYSPLEX should participate in the joint study.

Major Usage Priced Subsystems		
Subsystem	**Product Name**	**Product Number**
CICS	CICS/ESA Version 4	5655-018
	CICS TS for OS/390 Version 1	5655-147
DB2	DB2 for OS/390 Version 5	5655-DB2
	DB2 UDB for OS/390 Version 6	5645-DB2
IMS	IMS/ESA Version 6	5695-158
	IMS/ESA Version 7	5655-B01
MQSeries	MQSeries for MVS/ESA Version 1	5695-137
	MQSeries for OS/390 Version 2	5655-A95
Other Products of Interest (Refer to Appendix E., "Product Names and Identifiers" on page 55 for a more extensive list.)		
	IBM COBOL for OS/390 & VM Version 2	5648-A25
	IBM COBOL for MVS & VM Version 1	5688-197
	IBM VisualAge PL/I for OS/390 Version 2	5655-B22
	PL/I for MVS & VM Version 1	5688-235
	Lotus Domino for S/390 Version 5	5655-B86

Figure 1. Major Subsystem Products and Software Products

Customer Obligations for Joint Study Participation

The customer agrees to make the changes described in this document to their participating MVS/ESA (SP5.2.2 or later) and OS/390 systems to collect the required usage data 24 hours a day, for the 30 contiguous days of the study, planned and unplanned system outages excepted. The customer must provide *Configuration Statement*s as described in "Configuration Statements" on page 21 and start data collection on all participating MVS/ESA and OS/390 systems no later than April 1, 2000. At the conclusion of the joint study, the *Configuration Statements* together with all the data collected during the study should be sent together on 3480 or 3490 tape cartridges to IBM via 2 day express delivery. A customization checklist is provided in, "Joint Study Check Lists" on page 47 for your convenience.

Note: All of the customization actions described in this document must be implemented on all participating MVS/ESA and OS/390 systems on a processor footprint before that footprint is considered participating in the study.

Processor Footprint Requirements

Since one of the objectives of the study is to understand subsystem usage by processor footprint, all the MVS/ESA and OS/390 systems running under PR/SM LPARs or VM (hereafter, referred to collectively as MVS/ESA and OS/390 images) on that processor footprint, including test and development LPARs, must participate in the study.

A further objective of the study is to understand usage by the processors defined to be part of a SYSPLEX for PSLC billing purposes. Therefore, if one of the MVS/ESA or OS/390 images is a member of a PSLC SYSPLEX, all OS/390 or MVS/ESA images that are part of that PSLC SYSPLEX should also participate in the study. This could potentially involve participation of processor footprints other than the footprints originally requested by this study.

Whenever a usage priced product executes on any MVS/ESA or OS/390 system on a participating processor footprint, all versions of that product, including earlier versions, must be customized on all images on that processor footprint. See each of the subsystem product sections for a list of the affected product versions and required customization.

The study must receive the **same** 30 days of data from all MVS/ESA and OS/390 systems on the participating footprint(s) and PSLC SYSPLEX(es). Although the customization and data collection can start on different days on each of the MVS/ESA and OS/390 images, the study doesn't begin until **all** of the OS/390 and MVS/ESA images on a particular processor footprint and in a particular PSLC SYSPLEX are collecting usage data starting at midnight. See the example in "Procedures for Sending SMF Data to IBM" on page 31 for instructions on how to send data for only the days in the study.

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MVS/ESA, OS/390, SMF Customization

MVS/ESA and OS/390

MVS/ESA and OS/390 Product Versions

In order for a processor to participate in the joint study, at least one executing system image must be an MVS/ESA SP5.2.2 or OS/390 system and must be running in an LPAR. Once a processor meets those requirements, all MVS/ESA system images, starting with MVS/ESA SP5.2.2, and all OS/390 system images on that processor must participate, including test and development systems.

MVS/ESA and OS/390 Service Pre-reqs

Figure 2 lists required and optional service specific to MVS/ESA and OS/390 for participation in the joint study. Note that most of the required service is fairly old and likely already installed on most customer systems. Note also that the Capacity Upgrade on Demand service is only available on OS/390.

R/O	APAR Number	Description	Releases Affected									Available
			MVS/ESA	OS/390								
			5.2.2	1.1.1	1.2.3	2.4.5	2.6.7	2.8.9				
O	OW16176	DB2 Queries from CICS	X	X								04/08/96
O	OW30153	IMS Queries from CICS	X	X	X	X	X					03/06/98
R	OW37091	SMF/MULC Capacity Upgrade on Demand Support		X	X	X	X	X	X	X		05/25/99
R	OW25609	SMF interval processing stopped. No type30 subtype2 or type23 records produced		X	X	X						08/07/97
R	OW38842	BPXESMF BPXAMSMF SMF type 30 record USS accounting data					X	X	X	X		06/02/99
R	OW41764	No SMF 30 EXN field after OW38842					X	X		X	X	12/27/99
R	OW25885	SMF type 30, subtype 2 records not collected for SUB=MSTR tasks	X	X		X						08/29/97
R	OW30802	SUP for OW25885 for V1 R3			X	X	X					03/20/98
R	OW23598	ABENDB78 after processing SMF type 30 record			X							01/15/97
R	OW23318	SUP for SMF YR2000 APAR OW15518	X	X		X						12/16/96
R	OW37254	RMF support for Capacity Upgrade on Demand			X	X	X	X	X	X		05/21/99

Figure 2. MVS/ESA and OS/390 Service for Joint Study

IPL Requirement

An IPL will be required if any service listed in Figure 2 is applied prior to beginning the joint study. An IPL may also be required if any of the subsystem service listed in "Subsystem Customization" on page 17 is applied.

SMF collection

1. The customer must collect SMF record types 0, 30-2, 30-3, 30-4, 70 and 89-1 from each OS/390 and MVS/ESA LPAR on a participating processor over the course of the **entire** joint study period. If the participating processor is part of a PSLC SYSPLEX, then the identified SMF record types should also be collected from all the OS/390 and MVS/ESA images on all processors in the PSLC SYSPLEX. The type 30 and 89-1 records must be collected from both the SYS and SUBSYS options. Many customers already meet all of these requirements. Additional record types can be collected at the customer's discretion but are not required by this joint study. The collection of SMF records is controlled by member SMFPRMxx in SYS1.PARMLIB. The SMFPRMxx member is described in *MVS Init and Tuning Ref* and *System Management Facilitie*s.

   Most customers have daily SMF dump jobs whose "Summary Activity Report", can be used to verify that SMF and RMF are producing the records required by the study. Figure 5 on page 11 contains a portion of a sample "Summary Activity Report". This report only lists the SMF records that have been written for the specified interval. The line with A indicates that a type 0 record was written. This will only occur as a result of an IPL and so will not appear on all reports. The lines with B should always be present, since these records should be collected for the study. Note that the appearance of type 89 records on this report is no guarantee that type 89 records are being collected from both the SYS and SUBSYS options.

2. The customer is required to use SMF interval accounting.
3. Use of the INTVAL and SYNCVAL parameters must meet two conditions:

   - An INTVAL value that divides evenly into 60
   - A SYNCVAL of 0 (or a SYNCVAL of 59 for MICS users)

   If the customer also uses the INTERVAL parameter with the INTVAL and SYNCVAL parameters, the study recommends that the INTERVAL parameter either use the SMF option or use a value that divides evenly into the INTVAL parameter. Each of the following three examples meet all the requirements.

   Example 1:

```
INTVAL(60)
SYNCVAL(00)
INTERVAL(SMF,SYNC)
```

   Example 2:

```
INTVAL(60)
SYNCVAL(00)
INTERVAL(006000)
```

   Example 3:

```
INTVAL(30)
SYNCVAL(59)
INTERVAL(SMF,SYNC)
```

4. New SMFPRMxx options can be instituted via an MVS SET command (e.g., SET SMF=xx where xx correspond to the suffix for the SMFPRMxx member) without the need for an MVS IPL.
5. The customer must make a good faith effort to save all the SMF data accumulated over the study and must be willing to provide it to IBM for analysis. See "Sending Joint Study Data to IBM" on page 31 before sending SMF data to IBM.
6. Since the customer has access to the original data, the SMF data provided to IBM will not be returned to the customer.
7. The customer is prohibited from deleting or modifying the SMF type 0, 30-2, 30-3, 30-4, 70 and 89-1 records, either through MVS system exits, RMF user exits or other means.

Note: Customers that do not currently collect all of these SMF type records should take into consideration the amount of additional SMF data that will be generated during the study period. This additional data volume may affect existing operational procedures for handling daily SMF data, especially the size of SMF archive datasets. Refer to "Suggested Changes to SMF Dump Jobs" on page 8 for recommendations on how to handle SMF data during the joint study.

Valid SMFPRMxx Options

Example 1: Minimum SMFPRMxx Options

The following sample includes an example of all the SMF options needed to enable the minimal SMF recording required for the joint study. Note that OS/390 introduced SMF Type 89 subtype 2 records. The subtype 2 records are not required by the study, but will be collected with the Type 89 subtype 1 records unless "89(1)" is specified. ***Customers not collecting SMF records prior to this study should consider using this sample to collect the minimum set of SMF records.***

```
ACTIVE                          /* ACTIVE SMF RECORDING */
DSNAME(SYS1.MANX,SYS1.MANY)     /* SMF DATASETS */
NOPROMPT                        /* DO NOT PROMPT THE OPERATOR */
MAXDORM(3000)                   /* WRITE AN IDLE BUFFER AFTER 30 MIN*/
SID(PROD)               /* SYSTEM ID FOR PROD SYSTEM */
LISTDSN                         /* LIST DATA SET STATUS AT IPL */
SYS(TYPE(0,30(2,3,4),70,89(1))) /* COLLECT ONLY JOINT STUDY RECORDS */
```

The following examples will focus only on the SYS and SUBSYS parameters of the SMFPRMxx member, since those are the most critical parameters.

Example 2: Coexistence with existing SYS Options

The following simple example shows existing SYS options which are already in use by the customer and which will collect the SMF record types required by the study, as well as additional record types deemed important by the customer. ***Customers not collecting SMF records prior to this study should not use this example due to the potentially large volume of SMF records produced.***

```
ACTIVE                  /* ACTIVE SMF RECORDING */
 ...
SYS(TYPE(0:255))        /* WRITE ALL RECORDS AS DEFAULT */
```

Example 3: Coexistence with existing SYS, SUBSYS and NOTYPE Options

The following more complex SYS and SUBSYS example uses the NOTYPE parameter and shows existing options are already in use by the customer. These options will collect the SMF record types required by the study, as well as additional record types deemed important by the customer.

```
ACTIVE                  /* ACTIVE SMF RECORDING */
 ...
SYS(NOTYPE(14,15,40,60,62,64),
 EXITS(IEFU83,IEFU84,IEFACTRT,IEFUJV,
       IEFUSI,IEFUTL,IEFU29),NOINTERVAL,DETAIL)

/* WRITE ALL RECORDS AS THE SYSTEM DEFAULT EXCEPT FOR
   THOSE SPECIFICALLY LISTED.  TAKE ALL KNOWN EXITS
   NOTE: JES EXITS CONTROLLED BY JES.  */

SUBSYS(STC,NOTYPE(14,15,40,57,60,62,64),
          EXITS(IEFU29,IEFU83,IEFU84))

/* WRITE ALL RECORDS AS THE SYSTEM DEFAULT EXCEPT FOR
   THOSE SPECIFICALLY LISTED.  TAKE ONLY THREE EXITS.
   NOTE: IEFU29 EXECUTES IN THE MASTER ASID WHICH IS A
   STC ADDRESS SPACE SO IEFU29 MUST BE ON FOR STC.
   USE ALL OTHER SYS PARAMETERS AS A DEFAULT */
```

Invalid SMFPRMxx SYS Options

*Example 4: **Invalid** SYS Options*

The following simple example shows an **incorrect** set of SYS options. This example **does not** provide for the collection of type 30 and type 89 records.

```
ACTIVE /* ACTIVE SMF RECORDING */
 ...
SYS(TYPE(0:70))
```

*Example 5: **Invalid** SYS Options*

The following complex example also shows an incorrect set of SYS options. This example **does not** provide for the collection of type 89 records for the system.

```
ACTIVE /* ACTIVE SMF RECORDING */
 ...
SYS(NOTYPE(14,15,40,60,62,64,82:255),
   EXITS(IEFU83,IEFU84,IEFACTRT,IEFUJV,
   IEFUSI,IEFUTL,IEFU29),NOINTERVAL,DETAIL)

/* WRITE ALL RECORDS AS THE SYSTEM DEFAULT EXCEPT FOR
   THOSE SPECIFICALLY LISTED.  TAKE ALL KNOWN EXITS
   NOTE: JES EXITS CONTROLLED BY JES.  */

SUBSYS(STC,NOTYPE(14,15,40,57,60,62,64),
   EXITS(IEFU29,IEFU83,IEFU84))

/* WRITE ALL RECORDS AS THE SYSTEM DEFAULT EXCEPT FOR
   THOSE SPECIFICALLY LISTED.  TAKE ONLY THREE EXITS.
   NOTE: IEFU29 EXECUTES IN THE MASTER ASID WHICH IS A
   STC ADDRESS SPACE SO IEFU29 MUST BE ON FOR STC.
   USE ALL OTHER SYS PARAMETERS AS A DEFAULT */
```

Suggested Changes to SMF Dump Jobs

Although the customer is free to choose the frequency with which the SMF data is dumped and the names used for saving the SMF files prior to placing them on the tape to be sent to IBM, this document will make recommendations in both areas. The sample JCL provided in this document will support the dumping and saving of the SMF data on a daily basis so that the customer's existing dumping jobs are impacted least. To facilitate the separation of the study's SMF data from the customer's own SMF data requirements, the customer's existing SMF dump job(s) can be modified to write the joint study's usage data directly to a pre-allocated joint study dataset, which is unique to the system being measured, as well as, to the customer's existing dataset(s).

If the customer is collecting records for the joint study that they do not normally collect, it is possible that the customer's existing dump datasets may not be large enough to accommodate the increased data volume. Writing the study's SMF records to a special usage dataset immediately after the SMF data is being dumped to the customer's usual dump dataset ensures that the usage data is saved through the entire study and eliminates the need to coordinate the activities of multiple MVS/ESA and OS/390 systems. Figure 3 on page 9 contains the sample JCL to pre-allocate a different usage dataset to hold the joint study's SMF data for each participating MVS/ESA or OS/390 system. Each of these joint study datasets will include the four character MVS system id, as defined by the SID parameter in the SMFPRMxx member of SYS1.PARMLIB, as one of the dataset's qualifying names. The space requirements in this example should be changed to reflect those of the data center. The suggested summary dataset naming convention is:

hlq.USAGE.*sysid*.SMFDATA

Where:

hlq corresponds to a high level qualifier chosen to conform to data center standards.

sysid corresponds to the MVS system id from which the data was collected. This is the same as the SID parameter defined in the SMFPRMxx member of SYS1.PARMLIB. See *MVS Init and Tuning Ref* or further details.

```
//.......  JOB ..........
//ALLOC1 EXEC PGM=IEFBR14
//DB2SUM DD DSN=hlq.USAGE.sysid.SMFDATA,DISP=(NEW,CATLG),
// UNIT=SYSDA,SPACE=(CYL,(75,25)),VOL=SER=xxxxx
// DCB=(RECFM=VBS,BLKSIZE=32760,LRECL=32760)
```

Figure 3. Sample job to allocate SMF usage dataset for the MVS/ESA system: *sysid*.

The space requirements for each MVS/ESA and OS/390 system can be approximated by determining the number of SMF Type 0, 30-2, 30-3, 30-4, 70 and 89-1 records typically collected over a 30 day period on each MVS/ESA and OS/390 system. This information can be obtained from the SYSPRINT listing of the jobs used to dump the active SMF datasets on each of the MVS/ESA and OS/390 systems. Multiply the number of SMF type 70 records calculated for 30 days for each system by the average record length for a type 70 record (obtained from the same SMF dump job). Repeat the process for the type 89 subtype 1 records, all the type 30 records and add the results together. This sum should represent the SMF usage requirements for the 30 day study on each system. Use this value to calculate the primary space allocation and use 10-50% of that value to calculate the secondary space allocation.

Be aware that the suggested usage datasets are deliberately allocated large enough to hold all the required data for the joint study. Data will constantly be appended to the end of these datasets throughout the study. These datasets will, therefore, appear to have too much space allocated at the start of the study and may have their 'free space' reclaimed by any of several storage management products. This should not be permitted to happen, since they may run out of usable extents (space) prior to the end of the study, thereby resulting in the loss of usage data. This is especially true of the usage study's suggested SMF dataset(s).

Note that suggested procedures and sample JCL, including the space allocations for datasets, presented in this document are guidelines only. It is the customer's responsibility to determine the guidelines' applicability to their data center operations.

We suggest alternatives for saving the joint study's SMF data depending on whether or note the customer wishes to save the joint study data to their existing dump datasets prior to dumping the required joint study records to the study's dump dataset.

- The customer saves all SMF data to their own dump datasets as usual, including all of the study's required SMF record types because the customer normally collects the study's required SMF record types.

  The study's data can be dumped from the customer's existing dump datasets to the joint study's pre-allocated dump dataset. This will have no impact on the size of the customer's existing dump datasets, although it requires adding a step to the existing dump jobs. Refer to **Dump Scenario 1** on page 10 for details.

- The customer saves all SMF data to their own dump datasets, including all of the study's required SMF record types. But the customer does not normally collect some or all of the joint study's required record types, so the customer may need to increase the size of their existing dump datasets to accommodate the increased data volume produced by the additional SMF records collected for the joint study.

  The study's data can be dumped from the customer's existing dump datasets to the joint study's pre-allocated dump dataset. The customer must ensure that their existing dump jobs save the required joint study SMF records to their existing dump datasets. Refer to **Dump Scenario 1** on page 10 for details.

- The customer saves their SMF data to their own dump datasets as usual. But the customer doesn't save some or all of the study's SMF records in their existing dump datasets because they don't normally collect some or all of the study's required SMF record types.

The study's data must be saved to the pre-allocated joint study dataset as part of the same dump step that is used to save the customers normal SMF data. Refer to **Dump Scenario 2** on page 11 for details.

Dump Scenario 1: Saving Joint Study Data from Existing Dump Datasets

Once the joint study dump datasets are allocated for each participating MVS/ESA and OS/390 image, the sample LASTSTEP JCL in Figure 4a on page 10 can be added to the customer's existing SMF dump job to continuously add that day's joint study data to the previous day's data, provided the original customer dump step doesn't exclude the study's SMF records from being saved. The example uses *.stepname.ddname to refer to the output file created by the original SMF dump step. If the customer's dump job uses a PROC to invoke the dump program, the backward reference should be of the form *.stepname.procstepname.ddname. See *JCL Re*f for additional information on backward references. The JCL in Figure 4a on page 10 is added as the last step to the customer's existing daily SMF dump jobs, and should not interfere with the existing SMF dump steps. Note that failure to allocate study datasets large enough to hold the specified SMF record types for the entire study or failure to prevent storage management tools from reclaiming the space can cause this job to fail. While the customer's data is correctly dumped, usage data is not saved on the usage dataset. Always check the dump step's return codes to ensure that the step ran OK.

```
//....  JOB ....
//*-------------------------------------------------------------
//* CUSTOMER'S EXISTING SMF DUMP JCL
//*-------------------------------------------------------------
//STEP1 EXEC PGM=IFASMFDP
//SYSPRINT DD ....
//DUMPIN DD ....
//DUMPOUT DD DSN=customer.dump.dataset,DISP=...
//SYSIN DD ....
 ...           ..   ....
//*-------------------------------------------------------------
//* NEW JOINT STUDY DUMP STEP
//*-------------------------------------------------------------
//LASTSTEP EXEC PGM=IFASMFDP
//SYSPRINT DD SYSOUT=A
//DUMPIN DD DSN=*.STEP1.DUMPOUT,DISP=SHR
//USAGE DD DSN=hlq.USAGE.sysid.SMFDATA,DISP=(MOD,KEEP)
//SYSIN DD *
       INDD(DUMPIN,OPTIONS(DUMP))
       OUTDD(USAGE,TYPE(0,30(2,3,4),70,89(1)))
```

Figure 4a. Sample job to write SMF usage data to separate dataset AFTER normal SMF dumping.

Customers who keep all their SMF records for at least 32 days, can avoid changing their existing SMF dump jobs, if they are willing to create a job to extract the study's SMF data from the 30 daily SMF datasets saved during the study and place the data in a single file on the tape cartridge being sent to IBM. Note that the SMF data must be extracted for each participating MVS/ESA and OS/390 image. The JCL for such a job can be modeled on the JCL in Figure 15 on page 32 with the appropriate dump dataset names being used for each of the DUMPIN DD statements.

Dump Scenario 2: Saving Joint Study Data from Existing Dump Datasets

Once the joint study dump datasets are allocated for each participating MVS/ESA and OS/390 image, the sample STEP1 JCL in Figure 4b on page 11 can be added to the customer's existing SMF dump job to continuously add that day's joint study data to the previous day's data as part of the original customer dump step. The JCL in Figure 4b on page 11 is added as part of the existing dump step of the customer's existing daily SMF dump jobs. **Note that failure to allocate study datasets large enough to hold the specified SMF record types for the entire study or failure to prevent storage management tools from reclaiming the space can cause the job to fail, affecting the normal dumping of SMF data to the customer's existing dump datasets. As a result, the customer's own data may not be correctly dumped and usage data is not saved in the usage dataset.** Always check the dump step's return codes to ensure that the step ran OK.

```
//....  JOB ....
//*-------------------------------------------------------------
//* CUSTOMER'S EXISTING SMF DUMP JCL MODIFIED TO
//* DUMP THE JOINT STUDY'S RECORDS DIRECTLY TO THE STUDY'S
//* DUMP DATASET AS PART OF NORMAL DUMP PROCESSING.
//*-------------------------------------------------------------
//STEP1 EXEC PGM=IFASMFDP
//SYSPRINT DD ....
//DUMPIN DD ....
//DUMPOUT DD DSN=customer.dump.dataset,DISP=...
//USAGE DD DSN=hlq.USAGE.sysid.SMFDATA,DISP=(MOD,KEEP)
//SYSIN DD ....
 ...           ..  ....
       OUTDD(USAGE,TYPE(0,30(2,3,4),70,89(1)))
```

Figure 4b. Sample job to write SMF usage data to separate dataset DURING normal SMF dumping.

```
                                  SUMMARY ACTIVITY REPORT

START DATE-TIME  11/09/1999-02:04:05                        END DATE-TIME  11/10/1999-02:00:08

RECORD       RECORDS         PERCENT      AVG. RECORD   MIN. RECORD   MAX. RECORD       RECORDS
  TYPE         READ        OF TOTAL           LENGTH        LENGTH        LENGTH       WRITTEN
A    0            1           .00 %            60.00            60            60             1

     2            0                                                                         1
     3            0                                                                         1

B    30       2,356         92.46 %        1,087.27           846        10,590         2,356

B    70          96          3.77 %        2,764.00         2,764         2,764            96

B    89          96          3.77 %          465.00           430           598            96

TOTAL         2,549           100 %        1,127.00            60        10,590         2,550


NUMBER OF RECORDS IN ERROR            0
```

Figure 5. Sample listing from IFASMFDP.

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RMF Customization

RMF Product Versions

The joint study requires the RMF version/release appropriate to the level of each of the individual MVS/ESA and OS/390 systems participating in the study.

Processors that do not have an RMF license can not participate in this study.

RMF Service Pre-reqs

RMF APAR OW37254 supports the new G5/G6 Capacity Upgrade on Demand (CUoD) feature became available 5/12/99 for OS/390 V1 and V2. This APAR is only required if the customer plans to perform a CUoD upgrade on the processor during the joint study data collection period.

RMF Product Customization

RMF must be customized as described in this section and run on all MVS/ESA and OS/390 system images participating in the study. Many customers already meet both of these requirements.

All the RMF parameters described in this section are described in *RMF User's Guid*e.

1. The customer must minimally run an RMF Monitor I Data Gathering session on each participating MVS/ESA and OS/390 system for the entire duration of the joint study.
2. The RMF Monitor I options required by the joint study should be a subset of those options already used by customers running RMF, and should be capable of coexisting with those options. For instance, the study requires that RMF records be written at least once an hour, but shorter intervals are acceptable when those shorter interval values can be divided evenly into 60 so that an interval always ends on the hour. Minimal RMF options include:

CPU Reports processor activity measurement. This is a required parameter.

INTERVAL Specifies the length of the reporting interval. Must be chosen so that an integral number of intervals fit within an hour. Values of 5M, 10M, 15M, 20M, 30M and 60M are acceptable for a SYNC value of 0.

NOREPORT Specifies that no RMF reports are to be generated at the end of the RMF reporting interval. The customer can elect to receive such reports by using the appropriate REPORT value.

NOSTOP Specifies that the RMF Monitor I session will only be terminated at the request of the operator.

RECORD Requests that RMF records be written to SMF dataset. This is a required parameter.

SYNC The joint study requires the synchronization of RMF reporting with each hour. The SYNC parameter specifies whether the RMF interval is synchronized with SMF global synchronization (i.e., SYNC(SMF)) or some offset relative to the hour (i.e., SYNC(RMF,mmM)). Since RMF recommends synchronizing with the SMF interval, the study will accept SYNC(SMF) provided the SMF INTVAL and SMF SYNCVAL options meet the RMF requirements described in this section (i.e., synchronized to the hour). Extreme caution must be exercised if RMF is synchronized with the SMF options, since any changes to those SMF options may result in changes to RMF reporting which may make the RMF data unacceptable to this study.

The joint study will also accept the SYNC(RMF,mmM) form of the SYNC parameter. Specifying a SYNC value of 0M together with any of the acceptable INTERVAL values documented above guarantees that the RMF records are properly synchronized with the hour. A value of 59M will also be accepted, since this is the recommended value for MICS users.

While other values may be acceptable for SYNC, they can often result in situations where RMF reporting does not end on an hour boundary and so should be avoided when possible.

Note: Prior to RMF 4.3.0, RMF's SYNC option syntax was SYNC(mmM). Customers running

pre-MVS/ESA SP4.3 systems on a processor participating in the joint study should be aware of this RMF difference on those systems when customizing RMF for the study.

NOWKLD/ WKLD Specifies whether or not workload activity data is to be collected and what type of activity data is to be collected. The study does not require workload activity data and therefore accepts the NOWKLD option, but will also accept the WKLD option with any of its sub-parameters.

Additional RMF options can be used at the customer's discretion but will not required by this study. A detailed description of all the RMF options can be found in the *RMF User's Guid*e.

Valid RMF Options

Example 1: Minimum RMF Options

The following set of options meet the minimal data collection requirements of this study.

```
CPU              /* COLLECT CPU STATISTICS */
INTERVAL(60M)    /* SUMMARIZE DATA ONCE EVERY HOUR */
NOREPORT         /* DON'T PRODUCE REPORT */
NOSTOP           /* REMAIN ACTIVE UNTIL OPERATOR STOP */
RECORD           /* WRITE RECORDS TO SMF */
SYNC(SMF)        /* SYNC REPORTING WITH SMF */
NOWKLD           /* DON'T COLLECT WORKLOAD ACTIVITY */
```

Example 2: Alternative RMF Options

The following set of options also meet the minimal data collection requirements of this study, but produce RMF records every 20 minutes instead of every 60 minutes.

```
CPU              /* COLLECT CPU STATISTICS */
INTERVAL(20M)    /* SUMMARIZE DATA EVERY 20 MINUTES */
NOREPORT         /* DON'T PRODUCE REPORT */
NOSTOP           /* REMAIN ACTIVE UNTIL OPERATOR STOP */
RECORD           /* WRITE RECORDS TO SMF */
SYNC(SMF)        /* SYNC REPORTING WITH SMF */
NOWKLD           /* DON'T COLLECT WORKLOAD ACTIVITY */
```

Example 3: Coexistence with existing customer options

The following set of existing customer options is perfectly acceptable, since it also meets the minimal RMF data collection requirements of this study, but captures more data than is required by the study. Note that the interval is synchronized to 1 minute before the hour as recommended for MICS users.

```
CHAN                     /* COLLECT CHANNEL STATISTICS */
CPU                      /* COLLECT CPU STATISTICS */
CYCLE(1000)              /* SAMPLE AT ONE SECOND INTERVALS*/
DEVICE(NOSG)             /* NO COLLECT STORAGE GROUP STATS*/
DEVICE(TAPE)             /* COLLECT TAPE DEVICE STATISTICS*/
DEVICE(DASD)             /* COLLECT DASD STATISTICS */
ENQ(DETAIL)              /* COLLECT ENQ STATISTICS */
EXITS                    /* TAKE USER EXITS */
IOQ(DASD,COMM)           /* COLLECT I/O QUEUING STATS */
INTERVAL(15M)            /* REPORT AT 15 MINUTE INTERVALS */
NOOPTIONS                /* OPERATOR MAY EXAMINE AND/OR
                            CHANGE THE RMF OPTIONS */
NOREPORT                 /* NO WRITTEN REPORTS */
NOSTOP                   /* REMAIN ACTIVE UNTIL OPER STOP */
PAGESP                   /* COLLECT PAGE SWAP STATISTICS */
PAGING                   /* COLLECT PAGING STATISTICS */
RECORD                   /* SMF RECORDING */
SYNC(RMF,59M)            /* SYNC FOR MICS */
SYSOUT(H)          /* INTERVAL REPORTS TO CLASS H */
```

```
VSTOR(D,CATALOG,VTAM)     /* COLLECT VIRTUAL STORAGE ACTIV */
WKLD(PERIOD,DOMAIN,GROUP) /* COLLECT WKLD STATISTICS */
```

Invalid RMF Options

*Example 4: **Invalid** RMF Options*

The following set of RMF options are invalid for the joint study for several reasons. The INTERVAL value is invalid, since the RMF interval will not end on each hour.

```
CPU /* COLLECT CPU STATISTICS */
INTERVAL(18M)             /* SUMMARIZE DATA EVERY 18 MINUTES */
NOREPORT                  /* DON'T PRODUCE REPORT */
NOSTOP                    /* REMAIN ACTIVE UNTIL OPERATOR STOP */
RECORD                    /* WRITE RECORDS TO SMF */
SYNC(SMF)           /* SYNC REPORTING TO START OF HOUR */
WKLD(PERIOD,DOMAIN,GROUP) /* COLLECT WKLD STATISTICS */
```

*Example 5: **Invalid** RMF Options*

The following set of RMF options are invalid for the joint study for several reasons. The NORECORD value is invalid, since none of the RMF statistics will be written to SMF. The SYNC value is invalid since the RMF interval will not end on the hour based on the INTERVAL value of 30 minutes.

```
CPU /* COLLECT CPU STATISTICS */
INTERVAL(30M)             /* SUMMARIZE DATA EVERY 30 MINUTES */
NOREPORT                  /* DON'T PRODUCE REPORT */
NOSTOP                    /* REMAIN ACTIVE UNTIL OPERATOR STOP */
NORECORD                  /* DON'T WRITE RECORDS TO SMF */
SYNC(RMF,5M)              /* SYNC REPORTING TO START 5 AFTER */
WKLD(PERIOD,DOMAIN,GROUP) /* COLLECT WKLD STATISTICS */
```

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Subsystem Customization

CICS

CICS Product Versions

In order for the CICS product to participate, the customer must have at least one copy of CICS/ESA Version 4 or CICS Transaction Server for OS/390 on a participating processor footprint. Once this condition is met, all CICS versions and releases running under all MVS/ESA and OS/390 systems on that participating processor footprint **must** participate in the joint study, including versions or releases no longer supported by IBM (e.g., CICS Versions 2 and 3). If any of the participating processors are part of a PSLC SYSPLEX, then all OS/390 or MVS/ESA images that are part of that PSLC SYSPLEX should participate and include all CICS versions and releases running under those OS/390 or MVS/ESA images.

CICS Service Pre-reqs

Figure 6 lists the required service specific to CICS for participation in the joint study. Note that the required service is fairly old and likely already installed on most customer systems.

R/O	Apar #	Description	Affected Releases	Available
R	PN53263	CICS support for SMF type 89s	CICS: 2.1.2, 3.2.1, 3.3	05/27/94
R	PN57061	CICS support for SMF type 89s	CICS: 4.1	07/01/94
O	PN71234	ABEND0C4 IN DFHJUP	CICS: 2.1.2, 3.2.1, 3.3	05/30/95
R - Required for participation in the joint study. **O** - Optional for participation in the joint study.				

Figure 6. CICS Service for Joint Study.

DB2

DB2 Product Versions

In order for the DB2 product to participate, the customer must have at least one copy of DB2 Version 5 or Version 6 executing on a participating processor footprint. Once this condition is met, all DB2 Version 2 Release 3 and higher DB2 versions running on that participating processor footprint **must** participate in the joint study. If any of the participating processors are part of a PSLC SYSPLEX, then all OS/390 or MVS/ESA images that are part of that PSLC SYSPLEX should participate and include all DB2 Version 2 Release 3 and higher DB2 versions running under those OS/390 or MVS/ESA images.

DB2 Service Pre-reqs

Figure 7 lists the required service specific to DB2 for participation in the joint study. Note that the required service is fairly old and likely already installed on most customer systems.

R/O	Apar #	Description	Affected Releases	Available
R	PN63615 PN64972	DB2 support for SMF type 89s	DB2: 2.3, 3.1	01/30/95
R	PQ12994	Incorrect PID in the MULC usage report	DB2: 5.1	03/30/98
R - Required for participation in the joint study. **O** - Optional for participation in the joint study.				

Figure 7. DB2 Service for Joint Study

DB2 Customization

If any DB2 subsystem was started while MVS's active SMFPRMxx member was not set to enable the recording of type 89 SMF records for both system and subsystem tasks, those DB2 subsystems must be reinitialized (i.e., be

terminated and restarted) after the SMFPRMxx member has been changed to request such type 89 recording and after those changes have been activated with a SET SMF=xx MVS operator command. Failure to reinitialize such DB2 subsystems will result in no SMF data being collected for those subsystems. For customers whose only qualifying subsystem is DB2 and who can not reinitialize all their DB2 subsystems on participating processors, DB2 will not participate in the joint study, since no usable usage information will be collected.

If the DB2 system is present on any of the participating MVS/ESA or OS/390 system images, the state of DB2's processor-wide participation must be reflected in columns 60-66 of the appropriate PROCESSOR Configuration Statement, as described in "**PROCESSOR**" on page 24. Note that each participating processor must indicate its DB2 status, even if DB2 is not present or is not reinitialized to collected SMF type 89 records.

IMS

IMS Product Versions

In order for the IMS products to participate, the customer must have at least one copy of IMS/ESA Version 5, Version 6, or Version 7 executing on a participating processor footprint. Once this condition is met, all IMS versions and releases running on that participating footprint **must** participate in the joint study, including versions or releases no longer supported by IBM (e.g., IMS DM Versions 3 and 4 and IMS TM Versions 3 and 4). If any of the participating processors are part of a PSLC SYSPLEX, then all OS/390 or MVS/ESA images that are part of that PSLC SYSPLEX should participate and include all IMS versions and releases running under those OS/390 or MVS/ESA images.

IMS Service Pre-reqs

Figure 8 lists the required service specific to IMS for participation in the joint study. Note that the required service is fairly old and likely already installed on most customer systems.

R/O	Apar #	Description	Affected Releases	Available
R	PN50024 PN50028	IMS support for SMF type 89s	IMS DM 3.1, IMS TM 3.1	05/27/94
R	PN50029 PN50030	IMS support for SMF type 89s	IMS DM 4.1, IMS TM 4.1	05/27/94
R - Required for participation in the joint study if respective versions running on participating processor footprints. **O** - Optional for participation in the joint study.				

Figure 8. IMS Service for Joint Study

MQSeries

MQSeries Product Versions

In order for the MQSeries product to participate, the customer must have at least one copy of MQSeries Version 1 or Version 2 executing under MVS/ESA or OS/390 on a participating processor footprint. Once this condition is met all, MQSeries products running under all MVS/ESA and OS/390 systems on that processor footprint **must** participate in the joint study. If any of the participating processors are part of a PSLC SYSPLEX, then all OS/390 or MVS/ESA images that are part of that PSLC SYSPLEX should participate and include all MQSeries versions and releases running under those OS/390 or MVS/ESA images.

MQSeries Service Pre-reqs

Figure 9 lists the required service specific to MQSeries for participation in the joint study. Note that the required service is fairly old and likely already installed on most customer systems.

R/O	Apar #	Description	Affected Releases	Available
R	PN58961	Support for SMF type 89s	MQSeries: 1.1	05/30/95
R	PN73811	High MQSeries usage	MQSeries: 1.1	11/30/95
R	PN80497	High MQSeries usage	MQSeries: 1.1	04/25/96
R	PQ30967	High MQSeries usage with 1000's connections	MQSeries: 2.1	11/11/99
R	PQ30441	High CPU usage in DBCS data conversion.	MQSeries: 2.1	09/22/99
R	PQ23908	Performance of frequent OPEN/CLOSE of cluster queues	MQSeries: 2.1	04/09/99
R - Required for participation in the joint study. **O** - Optional for participation in the joint study.				

Figure 9. MQSeries Service for Joint Study.

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Configuration Statements

Customers are required to create a set of *Configuration Statement*s to identify the customer and the customer's hardware and software configurations. This identification is accomplished by creating the control statements described in this section. ISPF can be used to allocate an FB (fixed block) dataset named: *useri*d.USAGE.CONFIG having a record length of 80 and a block size of 800 and to create the *Configuration Statements* described below. These *Configuration Statement*s will constitute the first file on the 3480/3490 tape cartridges being sent to IBM. ***Customers providing usage data from multiple data centers may create a set of Configuration Statements for each data center when each data center sends its usage data to IBM separately.***

Some statement fields will require data found on the "IBM Statement of Work for Special Projects - Joint Study" form, for the "S/390 Software Usage Joint Study", which was provided by IBM at the start of the study.

Order of Configuration Statements

```
* (comments can be placed anywhere)
CUSTOMERNBR
CUSTOMERNAME
LOCATION
COUNTRY
CONTACTNAME
CONTACTPHONE
CONTACTEMAIL
PROCESSOR
...PROCESSOR
...
SYSPLEX
...
SYSPLEX
FEATURE
...
FEATURE
PRODUCT
...
PRODUCT
DISASTER
...
DISASTER
```

Statements/Parameters

Comments Comment statements can be placed anywhere in the control statement input stream.	
Column	**Contents**
1	*
2-71	user comments

CUSTOMERNBR
The CUSTOMERNBR statement identifies the customer by IBM customer number. Only one CUSTOMERNBR statement is required regardless of the number of participating processors or participating MVS/ESA and OS/390 systems.

Column	Contents
1-11	CUSTOMERNBR
13-19	IBM Customer number (7 digits with leading zeros, if necessary). This is **not** the enterprise number and **not** the establishment number. This number is listed in the "Signature" Section from IBM's "Statement of Work for Special Projects - Joint Project" form. Use the number indicated by B in Figure 10 on page 22.

CUSTOMERNAME
The CUSTOMERNAME statement identifies the customer name that corresponds to the IBM customer number. Only one CUSTOMERNAME statement is required regardless of the number of participating processors or participating MVS/ESA and OS/390 systems.

Column	Contents
1-12	CUSTOMERNAME
14-43	Customer Name left justified for a maximum of 30 characters. Use the customer name indicated by A in Figure 10 on page 22 in the "Signature" Section from IBM's "Statement of Work for Special Projects - Joint Project" form.

Agreed to: Customer name**: Liberty Bell Services** A	*Agreed to:* **International Business Machine Corporation**
By _____ **Authorized signature**	By _____ **Authorized signature**
Name (type or print):	Name (type or print): Edward B. Morse
Date:	Date: December 18, 1999
Customer number: **0012345** B	IBM Customer Agreement Number: ...
Customer Address: 215 Liberty Ave. Philadelphia, PA	Statement of Work Number:
	IBM office Address: Somers, New York

Figure 10. "Signature" Section from customer's "Statement of Work" form

LOCATION

The LOCATION statement lists the data center location for the customer name listed on the CUSTOMERNAME statement. Only one LOCATION statement is required regardless of the number of participating processors or participating MVS/ESA and OS/390 systems from this data center.

Column	Contents
1-8	LOCATION
10-39	Customer data center location left justified for a maximum of 30 characters. The customer may use any description they choose to differentiate between customer data centers. This is typically a local address such as a city name.

COUNTRY

The COUNTRY statement lists the country in which the data center is located for the customer name listed on the CUSTOMERNAME statement. Only one COUNTRY statement is required regardless of the number of participating processors or participating MVS/ESA and OS/390 systems.

Column	Contents
1-7	COUNTRY
9-25	Country in which customer data center is located. Please use the exact country spelling as it appears in the following list: Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Israel, Italy, Jordan, Kuwait, Luxembourg, Netherlands, Norway, Poland, Portugal, Russia, Spain, Saudi Arabia, Serbia, Slovak Republic, South Africa, Switzerland, Turkey, United Kingdom, USA. If your country is not listed, please contact Joint Study Support to notify IBM.

CONTACTNAME

The CONTACTNAME statement identifies the customer's technical contact who can answer questions which IBM may have about these configuration statements. Only one CONTACTNAME statement should be provided regardless of the number of participating processors or participating MVS/ESA and OS/390 systems.

Column	Contents
1-11	CONTACTNAME
13-75	First and last name of the customer's technical contact.

CONTACTPHONE

The CONTACTPHONE statement identifies the phone number for the customer's technical contact. Only one CONTACTPHONE statement should be provided regardless of the number of participating processors or participating MVS/ESA and OS/390 systems.

Column	Contents
1-12	CONTACTPHONE
14-75	The technical contact's full phone number including country code and phone extension (if no direct outside line). North America customers need not provide the country code.

CONTACTEMAIL

The CONTACTEMAIL statement provides the e-mail address of the customer's technical contact. Only one CONTACTEMAIL statement should be provided regardless of the number of participating processors or participating MVS/ESA and OS/390 systems.

Column	Contents
1-12	CONTACTEMAIL
14-75	The technical contact's e-mail address. If no e-mail address is available, this statement can be omitted or have a value of "NONE".

PROCESSOR

The PROCESSOR statement identifies the processor(s) participating in the study. Each participating processor requires its own PROCESSOR statement. IBM requests that the processor(s), which are listed in the Products section of IBM's "Statement of Work for Special Projects - Joint Project" form for the "S/390 Software Usage Joint Study", be used in the study. Some processors listed on this form will be fully identified using processor type, model and serial number (e.g., 9672-R65, 00822). Others will simply be identified by the manufacturer, either with an incomplete model or no other information (e.g., Amdahl). When only the manufacturer is listed, and the customer only has one processor from that manufacturer, there should be no confusion over which processor the joint study is requesting, since only one processor matches that description. If multiple processors fit that description please contact the Joint Study support team for assistance as indicated in Appendix A., "Contacting IBM Joint Study Support in the U.S." on page 37 or Appendix B., "Contacting IBM Joint Study Support outside the U.S." on page 41. If the processor that IBM requested was upgraded or replaced by a different processor, IBM requests that the upgraded or replacement be used in the study and the proper code be entered in column 58 of the PROCESSOR Configuration Statement.

Column	Contents
1-9	PROCESSOR
11-20	First 10 digit serial number returned from the MVS "D M=CPU" command issued from any MVS system on the processor. See C in Figure 11 on page 25.
22-24	Manufacturer Id field, when present, in the CPU ND result of the MVS "D M=CPU" command issued above. See D in Figure 11 on page 25. Leave this field blank if it doesn't appear in field D. **Note that the CPU Node Descriptor is not supported in IBM processors earlier than the 9021 511 and 711 families**.
26-31	The last 6 digits of the CPC ND result, when present, from the MVS "D M=CPU" command issued above. See E in Figure 11 on page 25. Leave this field blank if it doesn't appear in field E. **Note that the CPU Node Descriptor is not supported in IBM processors earlier than the 9021 511 and 711 families**.
33-36	The processor's TYPE value, left justified, as found in the appropriate TYPE column of Figure 19 on page 54, based on the manufacturer's name for the processor family. If the processor manufacturer or the manufacturer's TYPE is not listed in Figure 19 on page 54 enter a value of "0000" in this field and place the first 8 characters of the processor manufacturer's name in columns 47-56.
38-46	The processor's MODEL value, left justified, as found in the appropriate MODEL column of Figure 19 on page 54, based on the manufacturer's model name for the processor. If the processor manufacturer is listed in Figure 19 on page 54, but the model is not, place the first 8 characters of the model's numeric designation in columns 38-45.
48-57	The first 10 characters of the processor manufacturer's name, when the processor manufacturer is **not** listed in Figure 19 on page 54, otherwise, leave this field blank.

59-59	When the processor being identified is listed on IBM's "Statement of Work for Special Projects - Joint Project" form, use the letter immediately following the CPU Serial # as indicated by F in Figure 12 on page 25. If the processor is an upgrade or replacement for the processor on IBM's Statement of Work form, place a "C" in column 59. If the processor being identified by this statement is not listed on IBM's Statement of Work form, place a "Z" in column 59. This will be the case when the customer chooses to collect data for processors in addition to or instead of those processors specified by IBM on the Statement of Work form.
61-67	The Julian date in the format yyyyddd representing the first full day on which all DB2 systems on all LPARs on this processor started collecting data for SMF type 89 records. • Use the date of the first **full day** of the study, if all DB2 LPARs on the processor are already collecting data for SMF type 89 records at the start of the study. • Use a value of "0000000" to indicate that **no** DB2 subsystems are run on any LPAR on this processor during the **entire** joint study. • Use a value of "9999999" to indicate that at least 1 DB2 subsystem could **not** collect SMF Type 89 records because it was required to be reinitialized and could not be reinitialized before the joint study ended.

```
IEE174I 14.04.53 DISPLAY M 395
 PROCESSOR STATUS
 ID  CPU                  SERIAL
 0    +                   0108229672  C
 1    +                   1108229672
 2    +                   2108229672
 3    +                   3108229672
 4    +                   4108229672
 5    +                   5108229672
 CPC ND = 009672.R65.IBM.02.000000000822
                      D             E
 CPC ID = 00
 + ONLINE   - OFFLINE    . DOES NOT EXIST
 CPC ND  CENTRAL PROCESSING COMPLEX NODE DESCRIPTOR
 CPC ID  CENTRAL PROCESSING COMPLEX IDENTIFIER
```

Figure 11. S/390 Software Usage Sample listing from D M=CPU.

3. Products

```
 ......
 CPU Serial #_9672-R65__00822_________________        A  F
                    _Amdahl___________________________ B
                    ____________________________________ ___
                    ____________________________________ ___
                    ____________________________________ ___
```

Figure 12. Section 3 from customer's "Statement of Work".

SYSPLEX

The SYSPLEX statement identifies the processors in the PSLC SYSPLEX(es), if any, for each processor participating in the study, and the associated SYSNAMEs of the systems in that SYSPLEX, regardless of whether those systems are on a participating processor or not. The SYSPLEX name and the SYSNAMEs of all its currently configured systems can be obtained by issuing the MVS "D XCF" command from any system in the SYSPLEX. The resulting IXC334I message lists the SYSPLEX name and the SYSNAMEs of all configured systems for that SYSPLEX. The "D XCF" command must be issued from one system in each SYSPLEX, if systems from multiple SYSPLEXes participate in the joint study. A SYSPLEX statement must be provided for each SYSPLEX name/SYSNAME combination. No SYSPLEX statement is required if no SYSPLEXes were present on any of the processors participating in the joint study.

Column	Contents
1-7	SYSPLEX
9-16	The 8 character SYSPLEX name from the MVS "D XCF" command, issued from any SYSPLEX system on each participating processor. If the system is not part of a technical SYSPLEX, but only a PSLC SYSPLEX, specify 'PSLC' as the SYSPLEX name. Otherwise, specify 'NONE'.
18-25	The system's 8 character name from the list of SYSNAMEs returned from the MVS "D XCF" command belonging to the SYSPLEX named in columns 9-16.
27-34	The 8 character PSLC SYSPLEX name assigned by the customer to indicate all the processors that belong to the same PSLC billing SYSPLEX. This name has no meaning outside this control statement. If PSLC is not applicable, specify 'NONE'.
36-39	4 character machine TYPE as described in the PROCESSOR statement (cols 33-36)
41-49	9 character machine MODEL as described in the PROCESSOR statement (cols 38-46)

FEATURE

The FEATURE statement identifies the OS/390 optional features activated on each OS/390 image. If there are no optional OS/390 features active, there is no need to include any FEATURE statements.

Column	Contents
1-7	FEATURE
9-16	The 8 character SYSPLEX name from the MVS "D XCF" command, issued from any SYSPLEX system on each participating processor. If the MVS/ESA or OS/390 system is not a member of a SYSPLEX, specify "NONE" as the SYSPLEX name.
18-25	The system's 8 character name from the list of SYSNAMEs returned from the MVS "D XCF" command belonging to the SYSPLEX named in columns 9-16, or MVS System ID.
27-75	The feature name as it appears in FEATURENAME column in Figure 21 on page 57

PRODUCT

The PRODUCT statement identifies the version and release of the non-usage products installed on each OS/390 or MVS/ESA image. There should be one PRODUCT statement for each unique ***non-usage priced product*** version/release running in each participating OS/390 or MVS image on each processor participating in the study.

Column	Contents
1-7	PRODUCT
9-16	The 8 character SYSPLEX name from the MVS "D XCF" command, issued from any SYSPLEX system on each participating processor. If the MVS/ESA or OS/390 system is not a member of a SYSPLEX, specify "NONE" as the SYSPLEX name.
18-25	The system's 8 character name from the list of SYSNAMEs returned from the MVS "D XCF" command belonging to the SYSPLEX named in columns 9-16, or MVS System ID.
27-34	The product ID/program number. Refer to Appendix E., "Product Names and Identifiers" on page 55 for a list of products and their Ids. For example, 5648-A25 for IBM COBOL for OS/390 &VM Version 2. If unknown, specify "NONE".
36-38	The product version number, left justified and prefixed by the character 'V': Vxx Specify "V99" if version is not known.
40-42	The product release number, left justified and prefixed by the character 'R': Ryy Specify "R99" if release is not known or not applicable.
Note: Please do <u>not</u> use notation such as V2R1 or V2.1 for product version and release.	
44-75	The product name left justified: COBOL, PL/I, DOMINO, IBM COBOL for OS/390 & VM, PL/I for MVS & VM.

DISASTER

The DISASTER statement identifies the processor and OS/390 or MVS/ESA system used for disaster recovery if a disaster situation was encountered during the joint study period. If no disasters occurred, there should be no DISASTER statements specified.

Column	Contents
1-8	DISASTER
10-13	The processor's TYPE value, left justified, as found in the appropriate TYPE column of Figure 19 on page 54, based on the manufacturer's name for the processor family. If the processor manufacturer or the manufacturer's TYPE is not listed in Figure 19 on page 54 enter a value of "0000" in this field.
15-23	The processor's MODEL value, left justified, as found in the appropriate MODEL column of Figure 19 on page 54, based on the manufacturer's model name for the processor. If the processor manufacturer is listed in Figure 19 on page 54, but the model is not, place the first 8 characters of the model's numeric designation in columns 14-21.
25-34	First 10 digit serial number returned from the MVS "D M=CPU" command issued from any MVS system on the processor. See **C** in Figure 11 on page 25.
36-43	The system's 8 character SYSNAME or MVS System name.
45-51	Disaster start date in the form *yyyyddd*
53-60	Disaster start time in the form *hh.mm.ss*

62-68	Disaster end date in the form *yyyyddd*
70-77	Disaster end time in the form *hh.mm.ss*
79-80	LPAR number of OS/390 or MVS/ESA system used for disaster recovery.

The sample configuration statements shown in Figure 13 are for the mythical Liberty Bell Services Company. The company has four processors participating in the joint study. The first two were requested by IBM and the third and fourth processors were requested by the Liberty Bell Services, itself.

The 9672-R65 processor was listed on IBM's "Statement of Work for Special Projects - Joint Project" form (see Figure 12 on page 25) and was followed by the letter "A". Several LPARs on that processor run DB2 subsystems. All of the DB2 subsystems were reinitialized after each corresponding OS/390's SMFPRMxx member was set to collect SMF Type 89 records and before the start of the joint study. As a consequence, the Julian date on which the processor started the joint study, was placed in columns 61-67.

The IBM Statement of Work form only listed "Amdahl" as the second processor. Since the customer only had one Amdahl processor, the Millennium Global Server 545E was the one used in the joint study. Since "Amdahl" was followed by a "B", "B" was placed in column 59. Several LPARs on that processor run DB2 subsystems. Some of the DB2 subsystems could not be reinitialized until after the joint study was underway. As a consequence, the Julian date for the first full day on which all the DB2 subsystems on all LPARs on that processor were reinitialized, was placed in columns 61-67.

Although not listed on IBM Statement of Work form, the customer chose to add their Hitachi Skyline 11 to the study. Since the Skyline was not on the Statement of Work form, a "Z" was placed in column 59. One of the DB2 subsystems on the Skyline could not be reinitialized until after the joint study over. As a consequence, a value of "9999999" was placed in columns 61-67.

Although not listed on IBM Statement of Work form, the customer also chose to add their Magnuson model M80/43 to the study. Since the MVS "D M=CPU" command did not list any information when issued from a Magnuson system, columns 22-31 were left blank. Since the Magnuson processor is not listed in Figure 19 on page 54, a value of "0000" was placed in columns 33-36, the manufacturer's model value of "M80/43" was placed in columns 38-46, and the value "MAGNUSON" was placed in columns 48-57. Since the Magnuson was not on the Statement of Work form, a "Z" was placed in column 59. Since this processor does not run any DB2 subsystems, a value of "0000000" was placed in columns 61-67.

Configuration Statements Example

```
*---+----1----+----2----+----3----+----4----+----5----+----6----+----7----*
CUSTOMERNBR 0012345
CUSTOMERNAME Liberty Bell Services
LOCATION Philadelphia, Pa
COUNTRY USA
*
CONTACTNAME Fred Smith
CONTACTPHONE (610) 555-2031 EX 3491
CONTACTEMAIL fred_smith@nsp.lbells.com
*
*-------------------------- PROCESSORS ---------------------------------
*---+----1----+----2----+----3----+----4----+----5----+----6----+----7----*
PROCESSOR 0108229672 IBM 000822 9672 R65                  A 1998152
PROCESSOR 0305710500 ADH 000571 0500 GS545E               B 1998172
PROCESSOR 0304989021 HTC 000498 HDS  SKY-11               Z 9999999
PROCESSOR 0232863090            0000 M80/43    MAGNUSON   Z 0000000
*
*----------------------------SYSPLEXS-----------------------------------
*---+----1----+----2----+----3----+----4----+----5----+----6----+----7----*
SYSPLEX REGIONS  REGION1  PSLC1    9672 R65
SYSPLEX REGIONS  REGION2  PSLC1    9672 R65
SYSPLEX REGIONS  REGION3  PSLC1    9672 R42
SYSPLEX REGIONS  REGION4  PSLC1    9672 R42
SYSPLEX INTERNAL BILLING  PSLC1    0500 GS545E
SYSPLEX INTERNAL RECEIVNG PSLC1    0500 GS545E
SYSPLEX INTERNAL MARKETNG PSLC1    HDS  SKY-11
SYSPLEX INTERNAL PAYROLL  PSLC1    HDS  SKY-11
*
*----- PRODUCTS that run multiple versions/releases on same system image ---
*---+----1----+----2----+----3----+----4----+----5----+----6----+----7----*
PRODUCT NONE     DEV1     5648-A25 V02 R01 IBM COBOL for OS/390 & VM
PRODUCT NONE     DEV1     NONE     V99 R99 IBM COBOL II
PRODUCT INTERNAL PAYROLL  5688-235 V01 R99 PL/I for MVS & VM
PRODUCT INTERNAL PAYROLL  5655-B22 V02 R01 IBM VisualAge PL/I for OS/390
```

Figure 13. Sample Configuration Statements for the Liberty Bell Services Company.

The customer has two technical SYSPLEXes, REGIONS and INTERNAL. The processors in both of these technical SYSPLEXes are aggregated together for the customer's PSLC prices. The single name PSLC1 was used to indicate that each OS/390 image belonged to the same PSLC SYSPLEX. The REGIONS SYSPLEX has systems with SYSNAMEs of REGION1, REGION2, REGION3 and REGION4. Note that REGION3 and REGION4 reside on a processor that did not participate in the joint study. The INTERNAL SYSPLEX has systems with SYSNAMEs of BILLING, RECEIVNG, MARKETNG and PAYROLL.

The customer has two versions of COBOL running on the DEV1 system and two versions of PL/I on the PAYROLL system. The DEV1 system is not a member of any SYSPLEX. Since COBOL and PL/I do not support usage pricing, there is potentially no way to differentiate the SMF type 30 records that get written when either of the two COBOL compilers are run. The PRODUCT statements provide the only way of knowing that the observed utilization of COBOL is potentially from two different products.

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Sending Joint Study Data to IBM

The *Configuration Statement*s and the SMF data collected during the joint study, must be copied to 3480 or 3490 tape cartridges using the sample JCL provided in this section and sent to IBM immediately after the conclusion of the study for analysis -- 31 days after the study started on all LPARs on the processor. Usage datasets from the same processor footprint should be placed on the same tape cartridge, space permitting. The datasets should be placed in the following order on the tape cartridge.

1. File the containing *Configuration Statement*s.
2. File containing the SMF data for all MVS/ESA and OS/390 images on all participating footprints.

Customers providing usage data from multiple data centers may create a set of** Configuration Statements **for each data center, when each data center sends its usage data to IBM, separately. The 3480/3490 tapes, when received, become the property of IBM and will not be returned.

General Instructions

The following steps should be followed when sending the data collected during the joint study to IBM.

1. Send only the data collected from processors participating in the joint study. Customers may have several processor footprints, some of which did not participate in the joint study. Do not send data from the processors that did not participate in the study.
2. The data must be placed on 3480 or 3490 tape cartridges and should use the IDRC (compression) feature, if possible. 3490E tape cartridges with IDRC are preferred. ***The study will not accept data sent on any other media.***
3. The 3480/3490 tape cartridges must have standard labels (SL) so that the file DCBs are placed on the internal tape cartridge labels. The joint study's SMF data from all participating MVS/ESA and OS/390 systems, should be placed in the same file on the same tape cartridge, space permitting. The customer may create separate SMF files for each processor and place them on the same tape cartridge, if space permits. Sample JCL for copying each of these different types of data to tape cartridges is included in this section.
4. Each tape cartridge **must** be accompanied by a completed ***S/390 Software Usage Joint Study Cartridge Form*** *found on page 35* so that all the files are properly identified.
5. The tape cartridge(s) should be sent using 2 day express mailer to IBM at the following address:

IBM Corp.
2455 South Rd.
Poughkeepsie, NY 12601-5400

Building 710 Loading Dock
ATTN: Jane Gartland
Department: S14A/7T Mail Station P351
Phone: (914) 435-3077

Cut out box to use as mailing label.

Procedures for Sending Configuration Statements to IBM

The *Configuration Statement*s, as defined in "Configuration Statements" on page 21, is the first set of data to be copied to the tape cartridge(s) being sent to IBM. There is only one set of *Configuration Statement*s per customer regardless of the number of participating processors. The sample job in Figure 14 on page 32 should be used to copy the *Configuration Statement*s to the joint study tape cartridges being sent to IBM at the conclusion of the joint study. The sample job uses the IEBGENER utility to copy the *Configuration Statement*s to the first file on the tape cartridge. IEBGENER is documented in *DFP Utilitie*s.

Procedures for Sending SMF Data to IBM

The SMF records will comprise the data on the second file of the tape cartridge(s) being sent to IBM. The study prefers that the SMF data from all the participating MVS/ESA and OS/390 images be merged into the second file. If the suggested SMF joint study datasets were created for each participating system per the guidelines in "SMF

collection" on page 6, then the sample job in Figure 15 can be used to transfer all the SMF data collected for the joint study to the second file on the tape cartridge. Note that the joint study strongly recommends using the IFASMFDP program to copy the SMF data to the tape cartridge rather than using IEBGENER or any other utility programs. ***Note that the following jobs must be run on an MVS/ESA SP5 or OS/390 system, even though some of the SMF data may have been collected on a pre-MVS/ESA SP5 system.***

```
//....  JOB ....
//*************************************************
//* CUSTOMER CONFIGURATION STATEMENTS
//*************************************************
//STEP1 EXEC PGM=IEBGENER
//SYSPRINT DD SYSOUT=A
//SYSUT1 DD DSN=userid.USAGE.CONFIG,DISP=SHR
//SYSUT2 DD DSN=USAGE.CONFIG,UNIT=tapeaddr,
// DCB=(RECFM=FB,LRECL=80,BLKSIZE=800),
// DISP=(NEW,KEEP),LABEL=(1,SL)
//SYSIN DD DUMMY,DCB=BLKSIZE=80
//
```

Figure 14. Sample JCL for copying *Configuration Statements*

Before using the sample JCL:

1. Determine the number of systems for which joint study data was collected.
2. Create a //DUMPINn DD statement for each system, substituting the appropriate *hl*q and *sysidn* values for each system.
3. For each //DUMPIN DD statement, create a matching INDD control card for SYSIN.
4. Change the *tapeaddr* value to your data center's UNIT value for a 3480 or 3490 tape drive or address.
5. Change the first set of yyyyddd values on the DATE statement of SYSIN to the first date on which all images on all processors were collecting SMF data for the study. Change the second set of yyyyddd values to the last date for which SMF data was collected for all processors.

```
//....  JOB ....
//FILE2 EXEC PGM=IFASMFDP
//SYSPRINT DD SYSOUT=A
//DUMPIN1 DD DSN=hlq.USAGE.sysid1.SMFDATA,DISP=SHR
//DUMPIN2 DD DSN=hlq.USAGE.sysid2.SMFDATA,DISP=SHR
//.......  DD .....................................
//DUMPINn DD DSN=hlq.USAGE.sysidn.SMFDATA,DISP=SHR
//DUMPOUT DD DSN=USAGE.SMFDATA,UNIT=tapeaddr,
// DISP=(NEW,KEEP),LABEL=(2,SL)
//SYSIN DD *
 INDD(DUMPIN1,OPTIONS(DUMP))
 INDD(DUMPIN2,OPTIONS(DUMP))
 ........................
 INDD(DUMPINn,OPTIONS(DUMP))
 OUTDD(DUMPOUT,TYPE(0,30(2,3,4),70,89(1)))
 DATE(yyyyddd,yyyyddd)
```

Figure 15. Sample JCL for copying all the SMF data to file 2 of the tape cartridge

If the customer prefers to combine the SMF data from each participating processor on a separate file on the tape cartridge, the sample JCL in Figure 16 on page 33 can be used to create separate files. Note that the joint study strongly recommends using the IFASMFDP program to copy the SMF data to the tape cartridge rather than using IEBGENER or any other utility programs. Also note that the same dataset name is used for all the SMF files on the tape cartridge.

Before using the sample JCL:

1. Determine the number of systems for which joint study data was collected for each participating processor.
2. Create a //DUMPIN DD statement for each system on the first processor, substituting the appropriate *hl*q and *sysidn* values for each.
3. For each //DUMPIN DD statement, create a matching INDD control card for SYSIN.
4. Change the *tapeaddr* value to your data center's UNIT value for a 3480 or 3490 tape drive or address.
5. Change the first set of yyyyddd values on the DATE SYSIN statement to the first date on which all images on that processor were collecting SMF data for the study. Change the second set of yyyyddd values to the last date for which SMF data was collected for all images on that processor.
6. Create a second job step for the second processor following the same directions as the first processor, changing the first value of the LABEL parameter of the //DUMPOUT DD statement to a value one higher than that used in the previous job step.
7. Create additional job steps as needed following the same procedure.

```
//....  JOB ....
//*-------------------------------------------------------
//* PROCESSOR 1
//*-------------------------------------------------------
//FILE2 EXEC PGM=IFASMFDP
//SYSPRINT DD SYSOUT=A
//DUMPIN1 DD DSN=hlq.USAGE.sysid1.SMFDATA,DISP=SHR
//DUMPIN2 DD DSN=hlq.USAGE.sysid2.SMFDATA,DISP=SHR
//.......  DD .......................................
//DUMPINn DD DSN=hlq.USAGE.sysidn.SMFDATA,DISP=SHR
//DUMPOUT DD DSN=USAGE.SMFDATA,UNIT=tapeaddr,
// DISP=(NEW,KEEP),LABEL=(2,SL)
//SYSIN DD *
 INDD(DUMPIN1,OPTIONS(DUMP))
 INDD(DUMPIN2,OPTIONS(DUMP))
 ........................
 INDD(DUMPINn,OPTIONS(DUMP))
 OUTDD(DUMPOUT,TYPE(0,30(2,3,4),70,89(1)))
 DATE(yyyyddd,yyyyddd)
//*-------------------------------------------------------
//* PROCESSOR 2
//*-------------------------------------------------------
//FILE3 EXEC PGM=IFASMFDP
//SYSPRINT DD SYSOUT=A
//DUMPIN1 DD DSN=hlq.USAGE.sysid1.SMFDATA,DISP=SHR
//DUMPIN2 DD DSN=hlq.USAGE.sysid2.SMFDATA,DISP=SHR
//.......  DD .......................................
//DUMPINn DD DSN=hlq.USAGE.sysidn.SMFDATA,DISP=SHR
//DUMPOUT DD DSN=USAGE.SMFDATA,UNIT=tapeaddr,
// DISP=(NEW,KEEP),LABEL=(3,SL)
//SYSIN DD *
 INDD(DUMPIN1,OPTIONS(DUMP))
 INDD(DUMPIN2,OPTIONS(DUMP))
 ........................
 INDD(DUMPINn,OPTIONS(DUMP))
 OUTDD(DUMPOUT,TYPE(0,30(2,3,4),70,89(1)))
 DATE(yyyyddd,yyyyddd)
//*-------------------------------------------------------
//* PROCESSOR 3
//*-------------------------------------------------------
//FILE4 EXEC PGM=IFASMFDP
//...
```

Figure 16. Sample JCL for consolidating SMF data on to **multiple** files of the tape cartridge

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S/390 Software Usage Joint Study Cartridge Form

Customer name:	IBM Customer number (see B in Figure 10 on page 22.)
Data center address (full mailing address)	
Data center operations contact	Phone number: ( ) Email:
External 3480/3490 VOLSER	Internal 3480/3490 VOLSER

	Config	SMF	Processor Serial Number(s)	Dataset Name	RECFM[1]	LRECL[1]	BLKSIZE[1]
File 1							
File 2							
File 3							
File 4							
File 5							
File 6							
File 7							
File 8							
File 9							
File 10							
File 11							

[1] Required only when IFASMFDP was not used to place the file on tape.

Appendix A. Contacting IBM Joint Study Support in the U.S.

The joint study support described in this appendix will be available on business days from 9 AM to 5 PM Eastern Daylight Savings Time. There is no off-shift, weekend or holiday support. The joint study team prefers e-mail questions to phone calls.

The following sections describe how to contact IBM for:

1. Staying current with joint study changes, if they occur.
2. Asking questions about the joint study's Statement of Work and customization.
3. Sending the signed Statement of Work to IBM and requesting a signed copy from IBM.
4. Sending customization changes to IBM for review.

Asking Questions About the Joint Study

Customers with questions about the joint study's statement of work or customization can contact the joint study by any of the following means (listed in the joint study's preferred order). Note that sending the IBM Statement of Work back to IBM and sending parmlib members to IBM for review are described in other sections in Appendix A.

Joint Study WEB Site

The joint study is creating a WEB site as the preferred means of communicating with joint study participants. Although the joint study WEB site is an extension of the IBM S/390 Service Update Facility (SUF), the customer need not be a registered SUF user to use the joint study's WEB site. The WEB site's URL is http://www.s390.ibm.com/suf/usage/ and has a target availability date of January 4, 2000. The WEB site can be used to:

1. Submit questions about the joint study
2. View changes to the joint study, if such changes occur
3. View Frequently Asked Questions (FAQs)
4. View the most current copy of *S/390 Software Usage Joint Study Technical Customization Documen*t online
5. Download the most current PostScript and PDF copies of the *S/390 Software Usage Joint Study Technical Customization Document.*

Joint Study E-Mail Address

Joint study questions can be sent to the joint study's e-mail address: usage@us.ibm.com.

1. Address your e-mail note to: "S/390 Software Usage Study" at address: usage@us.ibm.com.
2. Choose an appropriate category from the following list and place that choice on the SUBJECT line of your e-mail note:
   a. Statement of Work Question
   b. Technical or Customization Question
   c. Other Joint Study Question
3. Provide the following information in your e-mail note:
   a. Company name
   b. Address including City/State/Country
   c. IBM customer number (if known)
   d. Your name
   e. Your complete phone number, including country code and your extension, if you have no direct line.
4. State your joint study question(s)
5. Send the note to IBM.
6. IBM will return review comments to the e-mail address from which the original request was sent.

Joint Study Phone Number

Use the IBM Support Services phone number, 1-800-237-5511, to contact IBM for answers to joint study related questions. ***You need not subscribe to the "IBM Support Line" Service to ask a joint study question, as long as that question is routed to the correct "alias", as indicated in step 2.***

1. After reaching IBM Support Services choose Option 6 followed by Option 4 (OS/390, MVS, VM, VSE, AutoUNIX), from the automated phone menu.
2. Inform IBM that you have a question to be routed to the "**usage study**" alias.
3. IBM will request your name, phone number, etc.
4. You will ask IBM your question.
5. IBM will call you back with an answer to your question.

Returning the Statement of Work to IBM

Before returning the IBM Statement of Work form verify that:

1. The Statement of Work has an authorized signature. (Page 1)
2. The signer's name is printed below their signature. (Page 1)
3. The Statement of Work is dated. (Page 1)
4. CPU Serial #'s are changed or added, if necessary. (Page 2)
5. The name and address of the customer's joint study representative is provided. (Page 4)

When FAXing the Statement of Work to IBM at 1-914-432-9403

1. Use the "fine" mode on your FAX machine, if available.
2. The joint study prefers that you complete and use the FAX Cover Sheet on Figure 17 on page 43, when FAXing the Statement of Work.
   a. Please enter the date on which you expect to start collecting data for the study, so that the study can notify you when the study is over for that processor(s).
   b. Check off the box on Figure 17 on page 43, if you want IBM to FAX a copy of the completed Statement of Work back to you, and fill out the "return" information on that form.

Sending customization changes to IBM for review

The IBM joint study team will review changes to the customer's ERBRMFxx and SMFPRMxx members of SYS1.PARMLIB, if the customer requests such a review. ***Note that the joint study review will only assess whether the revised members meet the joint study's minimal requirements. No exhaustive syntax checking will be performed.***

The joint study team prefers that customers e-mail the members for review but will accept FAXes. Either or both ERBRMFxx and SMFPRMxx parmlib members can be sent for review. Follow one of the following procedures for sending parmlib members to IBM.

Review parmlib changes via E-mail

The following technique requires that your e-mail system must have the capability of attaching files to e-mail.

1. Transfer a copy of the revised parmlib member (ERBRMFxx or SMFPRMxx) from your MVS/ESA or OS/390 system to your PC treating your data as TEXT during the transfer process (i.e., convert it to ASCII). Use the member name as the file name and use .REV as the file extension (e.g., ERBRMF22.REV).
2. Transfer a copy of the original parmlib member (ERBRMFxx or SMFPRMxx) that your revised member was based on from your MVS/ESA or OS/390 system to your PC treating your data as TEXT during the transfer process (i.e., convert it to ASCII). Use the original member name as the file name and use .ORG as the file extension (e.g., ERBRMF12.ORG).
3. Repeat the process for the other members to be reviewed, if required.
4. Address your e-mail to: **usage@us.ibm.com**
5. Use "**Parmlib Review**" as the SUBJECT line of your e-mail.
6. Provide the following information in your e-mail:
   a. Company Name
   b. City/State Address
   c. IBM customer number (Can be found at B in Figure 10 on page 22.)

   d. Your Name
   e. Your complete phone number, including country code and your extension, if you have no direct line.
7. Attach to the e-mail the revised/original set(s) of PC files that were created above
8. Send the e-mail to IBM.
9. IBM will return review comments to the e-mail address from which the original request was sent.

Review parmlib changes via FAX:

1. Print a copy of the revised parmlib member (ERBRMFxx or SMFPRMxx) created for the study. Write "**REVISED**" at the top of the listing.
2. Print a copy of the original parmlib member (ERBRMFxx or SMFPRMxx) that your revised member was based on and write "**ORIGINAL**" at the top of the listing.
3. Repeat the process for other members to be reviewed, if required.
4. Make a copy of the FAX Cover Sheet from Figure 18 on page 45 and provide the following information as indicated on the Cover Sheet:
   a. Company Name
   b. City/State Address
   c. IBM customer number (Can be found at B in Figure 10 on page 22.)
   d. Your Name
   e. Your complete phone number, including country code and your extension, if you have no direct line.
   f. FAX number to return comments to.
5. Fax the cover sheet together with the parmlib listings to IBM at 1-800-319-5777.
6. IBM will return review comments to the FAX number indicated on the FAX Cover Sheet used to provide the data to IBM.

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Appendix B. Contacting IBM Joint Study Support outside the U.S.

Europe, Middle East, Africa (EMEA)

Please refer to the Joint Study web site for details on how to contact IBM Joint Study Support in EMEA.
http://www.s390.ibm.com/suf/usage/

Asia-Pacific (AP)

Please refer to the Joint Study web site for details on how to contact IBM Joint Study Support in AP.
http://www.s390.ibm.com/suf/usage/

Latin America (LA)

Please refer to the Joint Study web site for details on how to contact IBM Joint Study Support in LA.
http://www.s390.ibm.com/suf/usage/

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S/390 Software Usage Study - Statement of Work

FAX Cover Sheet

Date: _____

From: Company Name: _____

City/State Address: _____

IBM Customer No: _____

Date data collection starting: _____

To: IBM Usage Study: 1-914-432-9403

Total number of pages being transmitted: _____
(including cover sheet)

☐ Check if completed Statement of Work is to be returned

Attn: Name: _____

FAX Number: _____

COMMENTS:

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Figure 17. FAX Cover Sheet for returning completed Statement of Work to IBM.

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S/390 Software Usage Study - PARMLIB Review

FAX Cover Sheet

Date: _____

From: Company Name: _____

City/State Address: _____

IBM Customer No: _____

To: IBM Usage Study: 1-800-319-5777

Total number of pages being transmitted: _____
(including cover sheet)

Return review comments on parmlib members

To: Name: _____

Phone Number: _____

Fax Number: _____

COMMENTS:

_____

_____

_____

_____

_____

_____

_____

_____

Figure 18. FAX Cover Sheet for sending parmlib members to IBM for review.

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Appendix C. Joint Study Check Lists

Joint Study Customization Checklist

The following checklist is for ***each*** MVS/ESA and OS/390 system on a participating processor.
Note: All systems must start data collection no later than April 1, 2000.

IPL addr: _____
System id: _____
SYSNAME: _____
Sysplex name: _____
Processor: _____ (type/model/serial)
LPAR name: _____

1. Subsystem customization is complete:
   ___ a. Applied required CICS service to all applicable CICS releases.
   ___ b. Applied optional CICS service, if desired, to all applicable CICS releases.
   ___ c. Applied required DB2 service to all applicable DB2 releases. Otherwise, no DB2 data will be collected.
   ___ d. Applied required IMS service to all applicable IMS releases.
   ___ e. Applied required MQSeries service to all applicable MQSeries releases.

2. RMF customization is complete:
   ___ a. Created appropriate RMF Monitor I options for the joint study.
   ___ b. Instituted a process to ensure that RMF is started at IPL with study options.
   ___ c. Reset RMF Monitor I to joint study's options (no IPL needed).

3. MVS system customization is complete:
   ___ a. Applied required MVS/ESA and OS/390 service.
   ___ b. Applied optional MVS/ESA and OS/390 service, if desired.
   ___ c. Optional:
      ___ 1) Created suggested SMF datasets to hold the study's SMF records as described by "Suggested Changes to SMF Dump Jobs" on page 8.
      ___ 2) Modified and tested existing SMF dump jobs as described by "Suggested Changes to SMF Dump Jobs" on page 8.
      ___ 3) Verified that the study's SMF records are being collected by reviewing "Summary Activity Report" from the daily SMF dump job on this system. See Figure 5 on page 11 for a sample report.
   ___ d. Created an SMFPRMxx member with SMF options required by the joint study.
   ___ e. Ensured that the new SMFPRM member is used at IPL time.
   ___ f. IPLed the system, if MVS/ESA, OS/390, CICS, DB2, IMS or MQSeries service was applied and an IPL was required.
   ___ g. If **no** system IPL was required:
      ___ 1) Issued the MVS SET SMF=xx command to set SMF to the options required by the joint study.
      ___ 2) (optional) Reinitialized (e.g., restart) each DB2 subsystem, if the SMFPRM options had to be changed to produce type 89 records. Otherwise, no DB2 usage data will be collected.

4. Date/Time that the joint study's RMF & SMF collection started for this system.
   Date: _____ (No later than April 1, 2000)
   Time: _____

Joint Study Tape Cartridge Check List

Use the following check list after the joint study data collection has concluded (31days after it started on all LPARs on all joint study processors):

___ 1. Created appropriate *Configuration Statements* as described by "Configuration Statements" on page 21 and save *useri*d.USAGE.CONFIG as the first file on the tape cartridge being sent to IBM.

___ 2. Moved *useri*d.USAGE.CONFIG to the first file on the tape cartridge being sent to IBM, as described in "Sending Joint Study Data to IBM" on page 31.

___ 3. Moved the joint study's SMF data from each participating MVS/ESA and OS/390 system on every participating processor to file 2 (and possibly other files) on the tape cartridge being sent to IBM, as described in "Sending Joint Study Data to IBM" on page 31.

Processor: _____ System id: _____

Processor: _____ System id: _____

Processor: _____ System id: _____

Processor: _____ System id: _____

Processor: _____ System id: _____

Processor: _____ System id: _____

Processor: _____ System id: _____

Processor: _____ System id: _____

Processor: _____ System id: _____

Processor: _____ System id: _____

Processor: _____ System id: _____

Processor: _____ System id: _____

Processor: _____ System id: _____

Processor: _____ System id: _____

Processor: _____ System id: _____

Processor: _____ System id: _____

___ 4. Filled out an ***S/390 Software Usage Joint Study Cartridge Form*** *found on page 35* for every tape cartridge being sent to IBM.

___ 5. After all the joint study data has been moved to one or more 3480/3490 tape cartridges, mail those tape cartridges together with the ***S/390 Software Usage Joint Study Cartridge Form*** to IBM via 2 day express delivery.

Appendix D. Processor Type and Model Values

Selecting the correct TYPE and MODEL values to place in columns 33-36 and 38-46, respectively, of the PROCESSOR Configuration Statement:

1. Locate the table section for the appropriate processor manufacturer (i.e., IBM, Amdahl, Comparex, Hitachi, National Advanced Systems, Olivetti).
2. Locate the appropriate table entry for your processor
   a. For IBM processors locate your processor using both the TYPE and MODEL values listed in the IBM section of the table.
   b. For all other processors locate your processor using the MODEL designation provided by the processor manufacturer.
3. Use the TYPE and MODEL values from the table entry, which was located in Step 2 above, for columns 33-36 and 38-46 of the PROCESSOR Configuration Statement.

Figure 19. Type and Model values for PROCESSOR Configuration Statement

IBM Processors

Type	Model	Type	Model	Type	Model	Type	Model
2003	102	2003	124	2003	203	2003	225
2003	103	2003	125	2003	204	2003	227
2003	104	2003	126	2003	205	2003	237
2003	105	2003	135	2003	206	2003	246
2003	106	2003	136	2003	207	2003	247
2003	107	2003	146	2003	215	2003	257
2003	115	2003	156	2003	216	2003	2C5
2003	116	2003	1C5	2003	224		
3000	A10	3000	A20				
3090	15T	3090	150E	3090	200S	3090	380S
3090	17T	3090	150J	3090	250J	3090	400E
3090	18T	3090	150S	3090	250S	3090	400J
3090	25T	3090	170J	3090	280E	3090	400S
3090	28T	3090	170S	3090	280J	3090	500E
3090	100S	3090	180E	3090	280S	3090	500J
3090	110J	3090	180J	3090	300E	3090	500S
3090	120E	3090	180S	3090	300J	3090	600E
3090	120J	3090	200E	3090	300S	3090	600J
3090	120S	3090	200J	3090	380J	3090	600S
4381	90E	4381	91E	4382	92E		
9021	330	9021	660	9021	822	9021	942
9021	340	9021	711	9021	831	9021	952
9021	500	9021	720	9021	832	9021	962
9021	520	9021	740	9021	860	9021	972
9021	580	9021	820	9021	900	9021	982
9021	620	9021	821	9021	941	9021	9X2
9021	640						
9121	180	9121	320	9121	511	9121	621
9121	190	9121	411	9121	521	9121	622
9121	210	9121	440	9121	522	9121	732
9121	260	9121	480	9121	570	9121	742
9121	311	9121	490	9121	610		

Figure 19. Type and Model values for PROCESSOR Configuration Statement

9221 120	9221 170	9221 201	9221 421
9221 130	9221 191	9221 211	
9221 150	9221 200	9221 221	
9672 R11	9672 R55	9672 RB4	9672 X27
9672 R12	9672 R56	9672 RB5	9672 X37
9672 R14	9672 R61	9672 RB6	9672 X47
9672 R15	9672 R63	9672 RC4	9672 X57
9672 R16	9672 R64	9672 RC5	9672 X67
9672 R21	9672 R65	9672 RC6	9672 X77
9672 R22	9672 R66	9672 RD6	9672 X87
9672 R24	9672 R72	9672 RX3	9672 X97
9672 R25	9672 R73	9672 RX4	9672 XX7
9672 R26	9672 R74	9672 RX5	9672 XY7
9672 R31	9672 R75	9672 RX6	9672 XZ7
9672 R32	9672 R76	9672 RY4	9672 Z17
9672 R34	9672 R83	9672 RY5	9672 Z27
9672 R35	9672 R84	9672 RY6	9672 Z37
9672 R36	9672 R85	9672 Y36	9672 Z47
9672 R41	9672 R86	9672 Y46	9672 Z57
9672 R42	9672 R94	9672 Y56	9672 Z67
9672 R44	9672 R95	9672 Y66	9672 Z77
9672 R45	9672 R96	9672 Y76	9672 Z87
9672 R46	9672 RA2	9672 Y86	9672 Z97
9672 R51	9672 RA4	9672 Y96	9672 ZX7
9672 R52	9672 RA5	9672 YX6	9672 ZY7
9672 R53	9672 RA6	9672 X17	9672 ZZ7
9672 R54			

Amdahl Processors

Type Model	Type Model	Type Model	Type Model
0400 GS412	0400 GS415	0400 GS422	0400 GS425
0500 GS535	0500 GS545E	0500 GS565	0500 GS575E
0500 GS535E	0500 GS555	0500 GS565E	0500 GS585
0500 GS545	0500 GS555E	0500 GS575	0500 GS585E
0700 GS722	0700 GS744	0700 GS7Y4	0700 GS765
0700 GS732	0700 GS754	0700 GS7Z4	0700 GS775
0700 GS742	0700 GS764	0700 GS715	0700 GS785
0700 GS752	0700 GS774	0700 GS725	0700 GS795
0700 GS782	0700 GS784	0700 GS735	0700 GS7X5
0700 GS714	0700 GS794	0700 GS745	0700 GS7Y5
0700 GS724	0700 GS7X4	0700 GS755	0700 GS7Z5
0700 GS734			
0800 GS812	0800 GS817	0800 GS897	0800 GS858
0800 GS822	0800 GS827	0800 GS8X7	0800 GS868
0800 GS832	0800 GS837	0800 GS8Y7	0800 GS878
0800 GS862	0800 GS847	0800 GS8Z7	0800 GS888
0800 GS813	0800 GS857	0800 GS818	0800 GS898
0800 GS823	0800 GS867	0800 GS828	0800 GS8X8
0800 GS814	0800 GS877	0800 GS838	0800 GS8Y8
0800 GS824	0800 GS887	0800 GS848	0800 GS8Z8

Figure 19. Type and Model values for PROCESSOR Configuration Statement

2000 GS2012C	2000 GS2165C	2000 GS2037A	2000 GS2034E
2000 GS2022C	2000 GS201AA	2000 GS2047A	2000 GS2044E
2000 GS2032C	2000 GS2010A	2000 GS2057A	2000 GS2054E
2000 GS2042C	2000 GS2011A	2000 GS2067A	2000 GS2064E
2000 GS2052C	2000 GS2012A	2000 GS2077A	2000 GS2074E
2000 GS2062C	2000 GS2015A	2000 GS2087A	2000 GS2084E
2000 GS2072C	2000 GS2021A	2000 GS2097A	2000 GS2094E
2000 GS2082C	2000 GS2025A	2000 GS2107A	2000 GS2104E
2000 GS2092C	2000 GS2032A	2000 GS2117A	2000 GS2114E
2000 GS2102C	2000 GS2035A	2000 GS2127A	2000 GS2124E
2000 GS2112C	2000 GS2042A	2000 GS2014A	2000 GS2134E
2000 GS2122C	2000 GS2045A	2000 GS2024A	2000 GS2144E
2000 GS2132C	2000 GS2052A	2000 GS2034A	2000 GS2154E
2000 GS2142C	2000 GS2055A	2000 GS2044A	2000 GS2164E
2000 GS2152C	2000 GS2065A	2000 GS2064A	2000 GS2018E
2000 GS2162C	2000 GS2072A	2000 GS2104A	2000 GS2028E
2000 GS2015C	2000 GS2075A	2000 GS2018A	2000 GS2038E
2000 GS2025C	2000 GS2085A	2000 GS2028A	2000 GS2048E
2000 GS2035C	2000 GS2095A	2000 GS2038A	2000 GS2058E
2000 GS2045C	2000 GS2105A	2000 GS2048A	2000 GS2068E
2000 GS2055C	2000 GS2115A	2000 GS2058A	2000 GS2078E
2000 GS2065C	2000 GS2125A	2000 GS2068A	2000 GS2088E
2000 GS2075C	2000 GS2013A	2000 GS2078A	2000 GS2098E
2000 GS2085C	2000 GS2023A	2000 GS2088A	2000 GS2108E
2000 GS2095C	2000 GS2043A	2000 GS2098A	2000 GS2118E
2000 GS2105C	2000 GS2053A	2000 GS2108A	2000 GS2128E
2000 GS2115C	2000 GS2063A	2000 GS2118A	2000 GS2138E
2000 GS2125C	2000 GS2103A	2000 GS2128A	2000 GS2148E
2000 GS2135C	2000 GS2017A	2000 GS2014E	2000 GS2158E
2000 GS2145C	2000 GS2027A	2000 GS2024E	2000 GS2168E
2000 GS2155C			
5890 180E	5890 200E	5890 390E	5890 600E
5890 190E	5890 300E	5890 400E	
5990 250	5990 500	5990 790	5990 1400
5990 350	5990 700	5990 1100	
5995 250A	5995 2570M	5995 4650M-E	5995 7670M
5995 350A	5995 3550M	5995 4670M	5995 8650M
5995 500A	5995 3550M-E	5995 5570M	5995 8650M-E
5995 700A	5995 3570M	5995 5670M	5995 8670M
5995 790A	5995 4550M	5995 6570M	5995 8671M
5995 1100A	5995 4550M-E	5995 6650M	5995 10660M
5995 1400A	5995 4570M	5995 6650M-E	5995 10670M
5995 2550M-E	5995 4650M	5995 6670M	5995 12670M

Comparex Processors

Type Model	Type Model	Type Model	Type Model
CPX 7/90-1	CPX 7/90-3	CPX 7/90-6	CPX 7/90-11
CPX 7/90-2	CPX 7/90-4	CPX 7/90-8	CPX 7/90-22
CPX 8/80	CPX 8/87	CPX 8/91	CPX 8/94
CPX 8/81	CPX 8/89	CPX 8/92	CPX 8/95
CPX 8/83	CPX 8/90	CPX 8/93	CPX 8/96
CPX 8/85	CPX 8/90S	CPX 8/93S	CPX 8/98

Figure 19. Type and Model values for PROCESSOR Configuration Statement

CPX 8/800	CPX 8/815	CPX 8/840	CPX 8/870
CPX 8/805	CPX 8/820	CPX 8/850	CPX 8/880
CPX 8/810	CPX 8/830	CPX 8/860	CPX 8/890
CPX 9/810	CPX 9/825	CPX 9/920	CPX 9/940
CPX 9/815	CPX 9/830	CPX 9/922	CPX 9/950
CPX 9/820	CPX 9/840	CPX 9/930	CPX 9/960
CPX 9/822	CPX 9/910	CPX 9/932	
CPX 99/711	CPX 99/811	CPX 99/832	CPX 99/962
CPX 99/721	CPX 99/821	CPX 99/941	CPX 99/972
CPX 99/731	CPX 99/822	CPX 99/942	CPX 99/982
CPX 99/741	CPX 99/831	CPX 99/952	
CPX C2000113	CPX C2000724	CPX C2000726	CPX C2000528
CPX C2000113S	CPX C2000824	CPX C2000826	CPX C200052A
CPX C2000114	CPX C2000924	CPX C2000926	CPX C200062A
CPX C2000114S	CPX C2000A24	CPX C2000A26	CPX C200072A
CPX C2000213	CPX C2000A25	CPX C2000128	CPX C200082A
CPX C2000213S	CPX C2000126	CPX C200012A	CPX C200092A
CPX C2000214	CPX C2000225	CPX C2000228	CPX C2000A2A
CPX C2000214S	CPX C2000226	CPX C200022A	CPX C2000B2A
CPX C2000313	CPX C2000325	CPX C2000327	CPX C200072B
CPX C2000314	CPX C2000326	CPX C2000328	CPX C200082B
CPX C2000324	CPX C2000426	CPX C200032A	CPX C200092B
CPX C2000424	CPX C2000526	CPX C2000428	CPX C2000A2B
CPX C2000524	CPX C2000626	CPX C200042A	CPX C2000B2B
CPX C2000624			
CPX M2000113	CPX M2000228	CPX M2000413	CPX M2000528
CPX M2000115	CPX M2000313	CPX M2000415	CPX M2000625
CPX M2000211	CPX M2000315	CPX M2000418	CPX M2000628
CPX M2000213	CPX M2000318	CPX M2000423	CPX M2000725
CPX M2000215	CPX M2000323	CPX M2000425	CPX M2000728
CPX M2000218	CPX M2000325	CPX M2000428	CPX M2000825
CPX M2000225	CPX M2000328	CPX M2000525	CPX M2000828

Hitachi Processors

Type Model	Type Model	Type Model	Type Model
HDS GX6110	HDS GX8112	HDS GX8312	HDS GX8520
HDS GX6115	HDS GX8114	HDS GX8314	HDS GX8524
HDS GX6210	HDS GX8210	HDS GX8320	HDS GX8620
HDS GX6215	HDS GX8212	HDS GX8324	HDS GX8624
HDS GX6225	HDS GX8214	HDS GX8412	HDS GX8724
HDS GX6325	HDS GX8220	HDS GX8414	HDS GX8824
HDS GX6425	HDS GX8224	HDS GX8420	
HDS GX8110	HDS GX8310	HDS GX8424	

Figure 19. Type and Model values for PROCESSOR Configuration Statement

HDS PILOT08X	HDS PILOT28T	HDS PILOT49S	HDS PILOT88T
HDS PILOT14	HDS PILOT29S	HDS PILOT49T	HDS PILOT89S
HDS PILOT14S	HDS PILOT29T	HDS PILOT55	HDS PILOT89T
HDS PILOT15	HDS PILOT34	HDS PILOT57	HDS PILOT95
HDS PILOT15S	HDS PILOT35	HDS PILOT58R	HDS PILOT97
HDS PILOT17	HDS PILOT35H	HDS PILOT58S	HDS PILOT98S
HDS PILOT18E	HDS PILOT36	HDS PILOT58T	HDS PILOT98T
HDS PILOT18R	HDS PILOT37	HDS PILOT59S	HDS PILOT99S
HDS PILOT18R3	HDS PILOT38E	HDS PILOT59T	HDS PILOT99T
HDS PILOT18S	HDS PILOT38R	HDS PILOT65	HDS PILOTA5
HDS PILOT18T	HDS PILOT38S	HDS PILOT67	HDS PILOTA7
HDS PILOT19S	HDS PILOT38R5	HDS PILOT68S	HDS PILOTA8S
HDS PILOT19T	HDS PILOT38T	HDS PILOT68T	HDS PILOTA8T
HDS PILOT24	HDS PILOT39S	HDS PILOT69S	HDS PILOTA9S
HDS PILOT24S	HDS PILOT39T	HDS PILOT69T	HDS PILOTA9T
HDS PILOT25	HDS PILOT45	HDS PILOT75	HDS PILOTB5
HDS PILOT25S	HDS PILOT46	HDS PILOT77	HDS PILOTB8S
HDS PILOT26	HDS PILOT47	HDS PILOT78S	HDS PILOTB8T
HDS PILOT27	HDS PILOT48E	HDS PILOT78T	HDS PILOTB9S
HDS PILOT28E	HDS PILOT48R	HDS PILOT79S	HDS PILOTB9T
HDS PILOT28R	HDS PILOT48S	HDS PILOT79T	HDS PILOTC9S
HDS PILOT28R3	HDS PILOT48R5	HDS PILOT85	HDS PILOTC9T
HDS PILOT28S	HDS PILOT48T	HDS PILOT87	HDS PILOTD9S
		HDS PILOT88S	HDS PILOTD9T

HDS SKY-11	HDS SKY-215	HDS SKY-315	HDS SKY-527
HDS SKY-21	HDS SKY-217	HDS SKY-325	HDS SKY-625
HDS SKY-22	HDS SKY-225	HDS SKY-525	HDS SKY-6008
HDS SKY-31	HDS SKY-227	HDS SKY-527	HDS SKY-7008
HDS SKY-32	HDS SKY-313	HDS SKY-625	HDS SKY-8008
HDS SKY-41	HDS SKY-315	HDS SKY-627	HDS SKY-9008
HDS SKY-42	HDS SKY-317	HDS SKY-725	HDS SKY-A008
HDS SKY-52	HDS SKY-325	HDS SKY-727	HDS SKY-B008
HDS SKY-62	HDS SKY-327	HDS SKY-825	HDS SKY-C008
HDS SKY-72	HDS SKY-413	HDS SKY-827	HDS SKY-D008
HDS SKY-82	HDS SKY-415	HDS SKY-2008	HDS SKY-E008
HDS SKY-115	HDS SKY-417	HDS SKY-3008	HDS SKY-F008
HDS SKY-211	HDS SKY-425	HDS SKY-4008	HDS SKY-G008
HDS SKY-213	HDS SKY-427	HDS SKY-5008	

NAS Processors

Type Model	Type Model	Type Model	Type Model
NAS EX-10	NAS EX-35	NAS EX-75	NAS EX-310A
NAS EX-11	NAS EX-38	NAS EX-80	NAS EX-320
NAS EX-20	NAS EX-40	NAS EX-85	NAS EX-420
NAS EX-22	NAS EX-42	NAS EX-90	NAS EX-420A
NAS EX-25	NAS EX-44	NAS EX-95	NAS EX-520
NAS EX-27	NAS EX-50	NAS EX-100	NAS EX-620
NAS EX-30	NAS EX-60	NAS EX-210	
NAS EX-31	NAS EX-65	NAS EX-220	
NAS EX-33	NAS EX-70	NAS EX-310	

NAS XL-50	NAS XL-60M	NAS XL-80	
NAS XL-50M	NAS XL-70	NAS XL-90	
NAS XL-60	NAS XL-70M	NAS XL-100	

Figure 19. Type and Model values for PROCESSOR Configuration Statement

Olvetti Processors

Type	Model	Type	Model	Type	Model	Type	Model
OLV	PILOT08X	OLV	PILOT28T	OLV	PILOT49S	OLV	PILOT88T
OLV	PILOT14	OLV	PILOT29S	OLV	PILOT49T	OLV	PILOT89S
OLV	PILOT14S	OLV	PILOT29T	OLV	PILOT55	OLV	PILOT89T
OLV	PILOT15	OLV	PILOT34	OLV	PILOT57	OLV	PILOT95
OLV	PILOT15S	OLV	PILOT35	OLV	PILOT58R	OLV	PILOT97
OLV	PILOT17	OLV	PILOT35H	OLV	PILOT58S	OLV	PILOT98S
OLV	PILOT18E	OLV	PILOT36	OLV	PILOT58T	OLV	PILOT98T
OLV	PILOT18R	OLV	PILOT37	OLV	PILOT59S	OLV	PILOT99S
OLV	PILOT18R3	OLV	PILOT38E	OLV	PILOT59T	OLV	PILOT99T
OLV	PILOT18S	OLV	PILOT38R	OLV	PILOT65	OLV	PILOTA5
OLV	PILOT18T	OLV	PILOT38S	OLV	PILOT67	OLV	PILOTA7
OLV	PILOT19S	OLV	PILOT38R5	OLV	PILOT68S	OLV	PILOTA8S
OLV	PILOT19T	OLV	PILOT38T	OLV	PILOT68T	OLV	PILOTA8T
OLV	PILOT24	OLV	PILOT39S	OLV	PILOT69S	OLV	PILOTA9S
OLV	PILOT24S	OLV	PILOT39T	OLV	PILOT69T	OLV	PILOTA9T
OLV	PILOT25	OLV	PILOT45	OLV	PILOT75	OLV	PILOTB5
OLV	PILOT25S	OLV	PILOT46	OLV	PILOT77	OLV	PILOTB8S
OLV	PILOT26	OLV	PILOT47	OLV	PILOT78S	OLV	PILOTB8T
OLV	PILOT27	OLV	PILOT48E	OLV	PILOT78T	OLV	PILOTB9S
OLV	PILOT28E	OLV	PILOT48R	OLV	PILOT79S	OLV	PILOTB9T
OLV	PILOT28R	OLV	PILOT48S	OLV	PILOT79T	OLV	PILOTC9S
OLV	PILOT28R3	OLV	PILOT48R5	OLV	PILOT85	OLV	PILOTC9T
OLV	PILOT28S	OLV	PILOT48T	OLV	PILOT87	OLV	PILOTD9S
				OLV	PILOT88S	OLV	PILOTD9T
OLV	SKY-11	OLV	SKY-215	OLV	SKY-315	OLV	SKY-527
OLV	SKY-21	OLV	SKY-217	OLV	SKY-325	OLV	SKY-625
OLV	SKY-22	OLV	SKY-225	OLV	SKY-525	OLV	SKY-6008
OLV	SKY-31	OLV	SKY-227	OLV	SKY-527	OLV	SKY-7008
OLV	SKY-32	OLV	SKY-313	OLV	SKY-625	OLV	SKY-8008
OLV	SKY-41	OLV	SKY-315	OLV	SKY-627	OLV	SKY-9008
OLV	SKY-42	OLV	SKY-317	OLV	SKY-725	OLV	SKY-A008
OLV	SKY-52	OLV	SKY-325	OLV	SKY-727	OLV	SKY-B008
OLV	SKY-62	OLV	SKY-327	OLV	SKY-825	OLV	SKY-C008
OLV	SKY-72	OLV	SKY-413	OLV	SKY-827	OLV	SKY-D008
OLV	SKY-82	OLV	SKY-415	OLV	SKY-2008	OLV	SKY-E008
OLV	SKY-115	OLV	SKY-417	OLV	SKY-3008	OLV	SKY-F008
OLV	SKY-211	OLV	SKY-425	OLV	SKY-4008	OLV	SKY-G008
OLV	SKY-213	OLV	SKY-427	OLV	SKY-5008		

Appendix E. Product Names and Identifiers

The following table should be used to select Product Identifiers to be used as the product ID/program number for the PRODUCT statements in the customer configuration file. Refer to the **PRODUCT** statement on page 27 for details.

The information for this table is not yet complete. Please refer to the Joint Study web site at http://www.s390.ibm.com/suf/usage/ for updates.

A sample customer configuration file will be made available on the Joint Study web site as will as a text version of this table to make creating your customer configuration file easier.

Product Name	Version	Release	Product ID
COBOL for OS/390	2	all	5648-A25
COBOL for MVS	1	all	5688-197
VisualAge PL/I for OS/390	2	all	5655-B22
PL/I for MVS	1	all	5688-235
Lotus Domino for S/390	5	all	5655-B86

Figure 20. Product Identifiers for PRODUCT Configuration Statement

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Appendix F. OS/390 Priced Optional Features

The following table identifies the names for OS/390 priced optional features that should be used to specify activated features using the FEATURE configuration statements in the customer configuration file. Refer to Configuration Statements on page 21 for details on specifying the FEATURE configuration statement.

A sample customer configuration file will be made available on the Joint Study web site at http://www.s390.ibm.com/suf/usage/ as will text and HTML versions of this table to make creating your customer configuration file easier.

Name of Feature	**FEATURENAME** (for columns 27-74 of the FEATURE configuration statement)
BDT File-to-File	BDTFTF
BDT SNA-NJE	BDTNJE
BookManager BUILD	BOOKMGR_BUILD
C/C++ without Debug Tool	C/C++
C/C++ with Debug Tool	C/C++/DEBUG
DFSMSdss	DFSMSDSS
DFSMShsm	DFSMSHSM
DFSMSrmm	DFSMSRMM
DFSORT	DFSORT
GDDM-PGF	GDDM_PGF
GDDM-REXX	GDDM_REXX
HCM	HCM
HLASM Toolkit	TOOLKIT_DEBUGGER
Infoprint Server	INFOPRINT_SERVER
JES3	JES3
RMF	RMF
SDSF	SDSF
Security Server	SECURITY_SERVER
SOMobjects ADE	SOM/MVS_ADE
TCP/IP (includes the components TCP/IP Base, TCP/IP CICS, and TCP/IP IMS)	TCP/IP_BASE TCP/IP_CICS TCP/IP_IMS

Figure 21. OS/390 Priced Optional Feature Names for FEATURE Configuration Statement

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**** S/390 Software Usage Joint Study Technical Document end ****