INTEGRATED INFORMATION
SUPPORT SYSTEM (IISS)
Volume VII - Communications Subsystem
Part 3 - VAX IPC Product Specification

General Electric Company
Production Resources Consulting
One River Road
Schenectady, New York 12345

November 1985

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AIR FORCE SYSTEMS COMMAND
WRIGHT-PATTERSON AFB, OH 45433-6533
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This technical report has been reviewed and is approved for publication.

DAVID L. JUDSON, PROJECT MANAGER
AFWAL/MLTC
WRIGHT PATTERSON AFB OH 45433

DATE
5 Aug 1986

GERALD C. SHUMAKER, BRANCH CHIEF
AFWAL/MLTC
WRIGHT PATTERSON AFB OH 45433

DATE
7 Aug 86

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Copies of this report should not be returned unless return is required by security considerations, contractual obligations, or notice on a specific document.
This document defines the Product Specification for the Interprocess Communication Primitives (IPC) configuration item of the Integrated Information Support System (IISS) Test Bed. The Test Bed is an integrated hardware/software environment in which various Integrated Computer Aided Manufacturing (ICAM) Program applications will function cooperatively.
Integrated Information Support System (IISS)
Vol VII - Communications Subsystem
Part 3 - VAX IPC Product Specification

A S D 86 1438
17 Jul 1986
PREFACE

This product specification covers the work performed under Air Force Contract F33615-80-C-5155 (ICAM Project 6201). This contract is sponsored by the Materials Laboratory, Air Force Systems Command, Wright-Patterson Air Force Base, Ohio. It was administered under the technical direction of Mr. Gerald C. Shumaker, ICAM Program Manager, Manufacturing Technology Division, through Project Manager, Mr. David Judson. The Prime Contractor was Production Resources Consulting of the General Electric Company, Schenectady, New York, under the direction of Mr. Alan Rubenstein. The General Electric Project Manager was Mr. Myron Hurlbut of Industrial Automation Systems Department, Albany, New York.

Certain work aimed at improving Test Bed Technology has been performed by other contracts with Project 6201 performing integrating functions. This work consisted of enhancements to Test Bed software and establishment and operation of Test Bed hardware and communications for developers and other users. Documentation relating to the Test Bed from all of these contractors and projects have been integrated under Project 6201 for publication and treatment as an integrated set of documents. The particular contributors to each document are noted on the Report Documentation Page (DD1473). A listing and description of the entire project documentation system and how they are related is contained in document FTR620100001, Project Overview.

The subcontractors and their contributing activities were as follows:

**TASK 4.2**

<table>
<thead>
<tr>
<th>Subcontractors</th>
<th>Role</th>
</tr>
</thead>
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<tr>
<td>Boeing Military Aircraft Company (EMAC)</td>
<td>Reviewer.</td>
</tr>
<tr>
<td>D. Appleton Company (DACOM)</td>
<td>Responsible for IDEF support, state-of-the-art literature search.</td>
</tr>
<tr>
<td>General Dynamics/ Ft. Worth</td>
<td>Responsible for factory view function and information models.</td>
</tr>
</tbody>
</table>

iii
### Subcontractors Role

<table>
<thead>
<tr>
<th>Subcontractors</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Illinois Institute of Technology</strong></td>
<td>Responsible for factory view function research (IITRI) and information models of small and medium-size business.</td>
</tr>
<tr>
<td><strong>North American Rockwell</strong></td>
<td>Reviewer.</td>
</tr>
<tr>
<td><strong>Northrop Corporation</strong></td>
<td>Responsible for factory view function and information models.</td>
</tr>
<tr>
<td><strong>Pritsker and Associates</strong></td>
<td>Responsible for IDEF2 support.</td>
</tr>
<tr>
<td><strong>SofTech</strong></td>
<td>Responsible for IDEFO support.</td>
</tr>
</tbody>
</table>

### TASKS 4.3 – 4.9 (TEST BED)

<table>
<thead>
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<th>Subcontractors</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Boeing Military Aircraft Company (BMAC)</strong></td>
<td>Responsible for consultation on applications of the technology and on IBM computer technology.</td>
</tr>
<tr>
<td><strong>Computer Technology Associates (CTA)</strong></td>
<td>Assisted in the areas of communications systems, system design and integration methodology, and design of the Network Transaction Manager.</td>
</tr>
<tr>
<td><strong>Control Data Corporation (CDC)</strong></td>
<td>Responsible for the Common Data Model (CDM) implementation and part of the CDM design (shared with DACOM).</td>
</tr>
<tr>
<td><strong>D. Appleton Company (DACOM)</strong></td>
<td>Responsible for the overall CDM Subsystem design integration and test plan, as well as part of the design of the CDM (shared with CDC). DACOM also developed the Integration Methodology and did the schema mappings for the Application Subsystems.</td>
</tr>
</tbody>
</table>
Subcontractors | Role
--- | ---
Digital Equipment Corporation (DEC) | Consulting and support of the performance testing and on DEC software and computer systems operation.
McDonnell Douglas Automation Company (McAuto) | Responsible for the support and enhancements to the Network Transaction Manager Subsystem during 1984/1985 period.
On-Line Software International (OSI) | Responsible for programming the Communications Subsystem on the IBM and for consulting on the IBM.
Rath and Strong Systems Products (RSSP) (In 1985 became McCormack & Dodge) | Responsible for assistance in the implementation and use of the MRP II package (PIOS) that they supplied.
SofTech, Inc. | Responsible for the design and implementation of the Network Transaction Manager (NTM) in 1981/1984 period.
Software Performance Engineering (SPE) | Responsible for directing the work on performance evaluation and analysis.
Structural Dynamics Research Corporation (SDRC) | Responsible for the User Interface and Virtual Terminal Interface Subsystems.

Other prime contractors under other projects who have contributed to Test Bed Technology, their contributing activities and responsible projects are as follows:

<table>
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<tr>
<th>Contractors</th>
<th>ICAM Project</th>
<th>Contributing Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boeing Military Aircraft Company (BMAC)</td>
<td>1701, 2201, 2202</td>
<td>Enhancements for IBM node use. Technology Transfer to Integrated Sheet Metal Center (ISMC).</td>
</tr>
<tr>
<td>Contractors</td>
<td>ICAM Project</td>
<td>Contributing Activities</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>--------------</td>
<td>------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Control Data Corporation (CDC)</td>
<td>1502, 1701</td>
<td>IISS enhancements to Common Data Model Processor (CDMP).</td>
</tr>
<tr>
<td>D. Appleton Company (DACOM)</td>
<td>1502</td>
<td>IISS enhancements to Integration Methodology.</td>
</tr>
<tr>
<td>General Electric</td>
<td>1502</td>
<td>Operation of the Test Bed and communications equipment.</td>
</tr>
<tr>
<td>Hughes Aircraft Company (HAC)</td>
<td>1701</td>
<td>Test Bed enhancements.</td>
</tr>
<tr>
<td>Structural Dynamics Research Corporation (SDRC)</td>
<td>1502, 1701, 1703</td>
<td>IISS enhancements to User Interface/Virtual Terminal Interface (UI/VTI).</td>
</tr>
<tr>
<td>Systran</td>
<td>1502</td>
<td>Test Bed enhancements.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Operation of Test Bed.</td>
</tr>
</tbody>
</table>
TABLE OF CONTENTS

| SECTION 1.0 | SCOPE | ................................ | 1-1 |
| 1.1 | Identification | ................................ | 1-1 |
| 1.2 | Functional Summary | ................................ | 1-1 |

| SECTION 2.0 | DOCUMENTS | ................................ | 2-1 |
| 2.1 | Reference Documents | ................................ | 2-1 |
| 2.2 | Terms and Abbreviations | ................................ | 2-1 |

| SECTION 3.0 | REQUIREMENTS | ................................ | 3-1 |
| 3.1 | Structural Descriptions | ................................ | 3-1 |
| 3.1.1 | Create a Mailbox | ................................ | 3-1 |
| 3.1.2 | Send a Message to Another Program | ................................ | 3-1 |
| 3.1.3 | Receive a Message from Another Program | ................................ | 3-1 |
| 3.1.4 | Get a Message from Another Program | ................................ | 3-1 |
| 3.1.5 | Delete a Mailbox | ................................ | 3-1 |
| 3.1.6 | Release an Event Block | ................................ | 3-1 |
| 3.1.7 | Start a Timer | ................................ | 3-2 |
| 3.1.8 | Stop a Timer | ................................ | 3-2 |
| 3.1.9 | Wait for an Event to Occur | ................................ | 3-2 |
| 3.1.10 | Terminate a Run | ................................ | 3-2 |
| 3.2 | Functional Flow Description | ................................ | 3-2 |
| 3.3 | Interfaces | ................................ | 3-2 |
| 3.4 | Interrupts | ................................ | 3-3 |
| 3.5 | Timing and Sequence Description | ................................ | 3-3 |
| 3.6 | Special Control Features | ................................ | 3-3 |
| 3.7 | Storage Allocation | ................................ | 3-3 |
| 3.7.1 | Data Base Definition | ................................ | 3-3 |
| 3.7.1.1 | File Description | ................................ | 3-3 |
| 3.7.1.2 | Table Description | ................................ | 3-3 |
| 3.7.1.3 | Item and Constant Description | ................................ | 3-4 |
| 3.7.2 | CPC Relationship | ................................ | 3-4 |
| 3.8 | Object Code Creation | ................................ | 3-4 |
| 3.9 | Adaption Data | ................................ | 3-4 |
| 3.10 | Detailed Design Description | ................................ | 3-4 |
| 3.10.1 | Main Program List | ................................ | 3-4 |
| 3.10.2 | Module List | ................................ | 3-7 |
| 3.10.3 | External Routines List | ................................ | 3-10 |
| 3.10.4 | Include File List | ................................ | 3-12 |
| 3.10.5 | Where Include File Used List | ................................ | 3-14 |
| 3.10.6 | Where External Routine Used List | ................................ | 3-19 |
### TABLE OF CONTENTS (Continued)

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.10.7</td>
<td>Main Program Parts List</td>
<td>3-23</td>
</tr>
<tr>
<td>3.10.8</td>
<td>Module Documentation</td>
<td>3-36</td>
</tr>
<tr>
<td>3.10.9</td>
<td>Include File Description</td>
<td>3-81</td>
</tr>
<tr>
<td>3.10.10</td>
<td>Hierarchy Chart</td>
<td>3-91</td>
</tr>
<tr>
<td>3.11</td>
<td>Program Listings Comments</td>
<td>3-108</td>
</tr>
<tr>
<td>SECTION 4.0</td>
<td>QUALITY ASSURANCE PROVISIONS</td>
<td>4-1</td>
</tr>
<tr>
<td>4.1</td>
<td>Introduction and Definitions</td>
<td>4-1</td>
</tr>
<tr>
<td>4.2</td>
<td>Computer Programming and Test Evaluation</td>
<td>4-1</td>
</tr>
</tbody>
</table>
SECTION 1

SCOPE

1.1 Identification

This specification establishes the 'as built' design of the Interprocess Communication Primitives (IPC's).

1.2 Functional Summary

The IPC's are the lowest level of common services in the IISS. Their function is to supply a standard interface to operating system services normally required by complex application systems. The implementation of these routines, therefore, is highly system dependent.

The services they support are passing messages between two programs, starting and stopping a timer, and responding to a series of asynchronous events.
SECTION 2
DOCUMENTS

2.1 Reference Documents

The following pertinent reference materials are available at the ICAM Program Office.

1. Interim Reports

2. Life Cycle Documents
   (a) ITR620150002U Project Scope
   (b) PMP620150000 Master Plan and Schedule
   (c) SAD620150000 State-of-the-art Review
   (d) SRD620140000 System Requirements Document
   (e) SDS620140000 System Design Specifications
   (f) DS6201430000 Development Specification - Communications Subsystem

   The following reference materials are available from Digital Equipment Corporation.
   (a) VAX/VMS I/O User's Guide (Volume 1), Order No. AA-H540B-TE
   (b) VAX/VMS I/O User's Guide (Volume 2), Order No. AA-H541B-TE
   (c) VAX COBOL Language Reference Manual, Order No. AA-H631C-TE
   (d) VAX-11 FORTRAN Language Reference Manual, Order No. AA-D034C-TE

2.2 Terms and Abbreviations

   All the arguments for the IPC's are described in DS 620140004 for the Communication Subsystem; however, the more important ones are reiterated here.

1. Input Mailbox - the logical name for a section of memory from which a primitive obtains a message that was sent to a program

2. Target Mailbox - the logical name for a section of memory into which a primitive stores a message

3. Event Block - a block of contiguous memory, local to a program, into which primitives store system dependent
information needed to perform their tasks
SECTION 3
REQUIREMENTS

3.1 Structural Descriptions

The description of each IPC along with its calling sequence, its inputs and its outputs is given in Sections 3.2.7 and 3.5 of the Communication Subsystem Development Specification, DS620140004. Thus, only a list of the IPC's and their functions will be presented here.

3.1.1 Create a Mailbox

The routine CRTMBX creates a mailbox (global storage in memory) through which a program may receive messages from another program executing on the same computer at the same time.

3.1.2 Send a Message to Another Program

The routine SNDMSG sends a message to another program executing on the same computer at the same time by placing it in the input mailbox (memory) allocated to the other program.

3.1.3 Receive a Message from Another Program

The routine RCVMSG records the fact that the program will accept messages sent from other programs to its input mailbox. The routine returns to the program allowing it to execute while other programs send messages.

3.1.4 Get a Message from Another Program

The routine GETMSG removes a message from the input mailbox (memory) of a program and moves it to the given buffer.

3.1.5 Delete a Mailbox

The routine DELMBX removes the capability of receiving messages through the given input mailbox. Whether the memory is released for other uses at this time depends upon the computer and operating system under which IISS runs.

3.1.6 Release an Event Block

The routine RELEVB reinitializes an event block (local
program storage) enabling it to be used with other primitives. It is needed to clear an event block when the same event block is used with different target mailboxes.

3.1.7 Start a Timer

The routine SETTIM invokes a timing mechanism that will cause an event when the time interval has elapsed. After noting the time, the routine returns to the program allowing it to continue executing.

3.1.8 Stop a Timer

The routine CNLTIM terminates the timing mechanism initiated by the SETTIM routine.

3.1.9 Wait for an Event to Occur

The routine WAITnn (where nn is the maximum number of events possible) waits for the completion of one of the outstanding requests that are associated with the list of event blocks. The program is suspended until an event occurs.

3.1.10 Terminate a Run

The routine ENDRUN terminates the executing of the program.

3.2 Functional Flow Description

Since the implementation of the IPC's are system dependent, the functional flow description must be described in context of the computer and operating system. The IPC's were implemented on the IBM 3084 under CICS and under MVS. They were implemented on the Honeywell Level 6 under Mod 400 and on the VAX under VMS.

3.3 Interfaces

On the IBM, under CICS, the IPC's were implemented using some CICS command level and some macro level system interfaces. The command level was written in COBOL, while the macro level was in assembler. This mixed mode format was required because not all the necessary functions were available at the command level. There is no mailbox facility under CICS, so the concept of mailbox had to designed and implemented from scratch.
Under MVS, the IPC's were implemented in assembler as one task with different entry points for each routine. Again, there is no mailbox facility under MVS. The design developed for CICS was reimplemented for MVS.

On the Honeywell Level 6, the IPC's were again a mixture of COBOL and assembler because the only interface into the system services is through assembler. The Mod 400 operating system supports a mailbox facility so calls to it were used in the implementation of the IPC's.

The VAX also has a mailbox facility and its system services are accessible through high level languages. Therefore, the IPC's on the VAX were implemented using a combination of COBOL and FORTRAN.

3.4 **Interrupts**

This section does not apply to the IPS's.

3.5 **Timing and Sequence Description**

Timing and sequencing is only relevant to the Wait for an Event to Occur primitive, and then only when it is waiting on more than one event. If more than one event has occurred, the primitive will report to the program the one that has the highest priority based on event number.

3.6 **Special Control Features**

The Interprocess Communication Primitives do not include any special control features as defined in the ICAM Documentations Standards.

3.7 **Storage Allocation**

3.7.1 **Data Base Definition**

3.7.1.1 **File Description**

The IPC's do not use any files.

3.7.1.2 **Table Description**

The IPC's do not use any tables.
3.7.1.3 Item and Constant Description

The event block contains two variables that are common across all implementations. The first is the event type which indicates whether the block is being used by an IPC receive message, a timer, or a receive for the Communications Subsystem. The second variable indicates the possible states of the event—no event outstanding, event outstanding but not completed, event completed but not requested by the program.

3.7.2 CPC Relationship

The event block is used with every IPC except ENDRUN and LOCKEF.

3.8 Object Code Creation

To create the IPC's for the CICS environment requires the CICS preprocessor, the COBOL compiler, the Assembler and the standard link editor to create a load module that can be referenced when linking main modules. Except for the CICS preprocessor, the same mechanism applies for creating the IPC load library under MVS.

To create the IPC library on the Honeywell Level 6 requires the COBOL compiler, the Assembler and the standard linker.

To create the IPC library on the VAX requires the COBOL and FORTRAN compilers and the standard linker.

3.9 Adaption Data

The IPC's are system dependent; therefore, they must be reimplemented for each computer and/or operating system.

3.10 Detail Design Description

3.10.1 Main Program List

The following is a list of all "Main Programs" which are modules that are not called by any other module being documented here. These modules are either program entry points or, if they are hooked into another set of programs via subroutine calls, they are the points the external programs can call and therefore enter through. To differentiate between the two types of entry points, look at the individual Module.
Documentation (section 3.10.8) and look at Module Type for each of the Main Program modules listed. Note whether the routine is a Program, Subroutine, or Function. If it is a Program, it is truly a main program entry point. If not, then it is merely called by other programs not being documented here.
## IPC Main Program List

<table>
<thead>
<tr>
<th>Module Name</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNLTIM</td>
<td>CANCEL A TIMER</td>
</tr>
<tr>
<td>CRTMBX</td>
<td>CREATE A MAILBOX</td>
</tr>
<tr>
<td>DELMBX</td>
<td>DELETE A MAILBOX</td>
</tr>
<tr>
<td>ENDRUN</td>
<td>STOP THE PROGRAM</td>
</tr>
<tr>
<td>GETMSG</td>
<td>GET A MESSAGE FROM ANOTHER PROGRAM</td>
</tr>
<tr>
<td>LOCKEF</td>
<td>LOCK EVENT FLAG</td>
</tr>
<tr>
<td>RCVMSG</td>
<td>RECEIVE A MESSAGE FROM ANOTHER PROGRAM</td>
</tr>
<tr>
<td>RELEVB</td>
<td>RELEASE A TARGET EVENT BLOCK (CLEAR IT) AND</td>
</tr>
<tr>
<td>SETTIM</td>
<td>START A TIMER</td>
</tr>
<tr>
<td>SNDMSG</td>
<td>SEND A MESSAGE TO ANOTHER PROGRAM</td>
</tr>
<tr>
<td>WAIT01</td>
<td>WAIT FOR AN EVENT TO OCCUR</td>
</tr>
<tr>
<td>WAIT02</td>
<td>WAIT FOR AN EVENT TO OCCUR</td>
</tr>
<tr>
<td>WAIT03</td>
<td>WAIT FOR AN EVENT TO OCCUR</td>
</tr>
</tbody>
</table>
3.10.2 Module List

The following is a list of all the modules being documented here along with their purpose. Each module has a unique name, no matter what language it was written in.
**IPC Module List**

<table>
<thead>
<tr>
<th>Module Name</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNLTIM</td>
<td>CANCEL A TIMER</td>
</tr>
<tr>
<td>CNLTMR</td>
<td>CANCEL THE TIMER</td>
</tr>
<tr>
<td>CRTMBX</td>
<td>CREATE A MAILBOX</td>
</tr>
<tr>
<td>DELMBX</td>
<td>DELETE A MAILBOX</td>
</tr>
<tr>
<td>ENDRUN</td>
<td>STOP THE PROGRAM</td>
</tr>
<tr>
<td>ERRFTL</td>
<td>PROCESS FATAL ERROR</td>
</tr>
<tr>
<td>ERRPRO</td>
<td>PROCESS ERROR</td>
</tr>
<tr>
<td>FREVTF</td>
<td>FREE THE EVENT FLAG</td>
</tr>
<tr>
<td>GETMSG</td>
<td>GET A MESSAGE FROM ANOTHER PROGRAM</td>
</tr>
<tr>
<td>GETPNM</td>
<td>GET PROCESS NAME</td>
</tr>
<tr>
<td>LOCKEF</td>
<td>LOCK EVENT FLAG</td>
</tr>
<tr>
<td>RCVMSG</td>
<td>RECEIVE A MESSAGE FROM ANOTHER PROGRAM</td>
</tr>
<tr>
<td>RDMALF</td>
<td>READ THE MAILBOX FOR EVENT FLAG SET</td>
</tr>
<tr>
<td>RELEVB</td>
<td>RELEASE A TARGET EVENT BLOCK (CLEAR IT) AND</td>
</tr>
<tr>
<td>SASGCH</td>
<td>ASSIGN A CHANNEL TO A MAILBOX</td>
</tr>
<tr>
<td>SCRTMB</td>
<td>CREATE A MAILBOX</td>
</tr>
<tr>
<td>SDEACH</td>
<td>DEASSIGN CHANNEL FROM THE MAILBOX</td>
</tr>
<tr>
<td>SDELMB</td>
<td>DELETE THE MAILBOX</td>
</tr>
<tr>
<td>SETTIM</td>
<td>START A TIMER</td>
</tr>
<tr>
<td>SETTMR</td>
<td>SET A TIMER</td>
</tr>
</tbody>
</table>

3-8
<table>
<thead>
<tr>
<th>Module Name</th>
<th>Purpose</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SNDMSG</td>
<td>SEND A MESSAGE TO ANOTHER PROGRAM</td>
<td></td>
</tr>
<tr>
<td>SWEVTDF</td>
<td>WAIT FOR ONE OF POSSIBLY MANY EVENTS</td>
<td></td>
</tr>
<tr>
<td>VALMBE</td>
<td>VALIDATE THAT MAILBOX ALREADY EXISTS</td>
<td></td>
</tr>
<tr>
<td>WAIT01</td>
<td>WAIT FOR AN EVENT TO OCCUR</td>
<td></td>
</tr>
<tr>
<td>WAIT02</td>
<td>WAIT FOR AN EVENT TO OCCUR</td>
<td></td>
</tr>
<tr>
<td>WAIT03</td>
<td>WAIT FOR AN EVENT TO OCCUR</td>
<td></td>
</tr>
<tr>
<td>WRTERR</td>
<td>WRITE MESSAGE TO MAILBOX</td>
<td></td>
</tr>
<tr>
<td>WRTMAI</td>
<td>WRITE THE MESSAGE INTO THE MAILBOX</td>
<td></td>
</tr>
</tbody>
</table>
3.10.3 External Routines List

The following is a list of all routines or functions not documented here that are called by modules that are documented here. The first caller, in alphabetical order, is listed as well. The specification in which any module is documented may be found in the Module Documentation Index (Document Number CM 620100001). See section 3.10.6 for a list of the modules that call each of these external routines.
## IPC External Routines List

<table>
<thead>
<tr>
<th>Module Name</th>
<th>First User</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIB$FREE_EF</td>
<td>SWEVTF</td>
</tr>
<tr>
<td>LIB$GET_EF</td>
<td>WRTERR</td>
</tr>
<tr>
<td>SYS$ASSIGN</td>
<td>SASGCH</td>
</tr>
<tr>
<td>SYS$BINTIM</td>
<td>WRTERR</td>
</tr>
<tr>
<td>SYS$CANTIM</td>
<td>CNLTMR</td>
</tr>
<tr>
<td>SYS$CLREF</td>
<td>SWEVTF</td>
</tr>
<tr>
<td>SYS$CREMBX</td>
<td>SCRTMB</td>
</tr>
<tr>
<td>SYS$DASSGN</td>
<td>WRTERR</td>
</tr>
<tr>
<td>SYS$DELMBX</td>
<td>SDELMB</td>
</tr>
<tr>
<td>SYS$GETDEV</td>
<td>VALMBE</td>
</tr>
<tr>
<td>SYS$GETJPI</td>
<td>GETPNM</td>
</tr>
<tr>
<td>SYS$QIO</td>
<td>RDMALF</td>
</tr>
<tr>
<td>SYS$QIOW</td>
<td>WRTERR</td>
</tr>
<tr>
<td>SYS$SETIMR</td>
<td>SETTMR</td>
</tr>
<tr>
<td>SYS$SETRWM</td>
<td>SCRTMB</td>
</tr>
<tr>
<td>SYS$WAITFR</td>
<td>WRTERR</td>
</tr>
<tr>
<td>SYS$WFLOR</td>
<td>SWEVTF</td>
</tr>
</tbody>
</table>
3.10.4 Include File List

The following is a list of all include files called in by modules being documented here. Each include file has a unique name regardless of the language being used. The purpose of each include file is listed as well. A more complete description of each include file is given in section 3.10.9. The purpose listed is the one that is in the source code of the include file.

A purpose of "***** PURPOSE NOT FOUND BY STRIPPER *****" indicates that a purpose statement was not written into the include file itself. The most common reason for this is that the include file comes from system libraries that were not developed by the project, such as 'C' libraries that are provided with the 'C' compiler.

See section 3.10.6 for a set of lists which show all the modules which call in each of these include files.
### IPC Include File List

<table>
<thead>
<tr>
<th>File Name</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>($JPIDEF)</td>
<td>**** PURPOSE NOT FOUND BY STRIPPER ****</td>
</tr>
<tr>
<td>CHKSTS</td>
<td>CHKSTS.INC -- CHECK STATUS</td>
</tr>
<tr>
<td>ERRPRO</td>
<td>PROCESS ERROR INCLUDE FILE</td>
</tr>
<tr>
<td>ERRSTS</td>
<td>ERRSTS.INC -- IISS ERROR CODES</td>
</tr>
<tr>
<td>ERRSTS.INF</td>
<td>**** PURPOSE NOT FOUND BY STRIPPER ****</td>
</tr>
<tr>
<td>KIPC</td>
<td>KIPC.INC -- CONSTANT BLOCK FOR IPC PRIMITIVES</td>
</tr>
<tr>
<td>MBEBO1</td>
<td>MBEBO1.INC -- MAILBOX EVENT BLOCK DESCRIPTION</td>
</tr>
<tr>
<td>MBEBO2</td>
<td>MBEBO2.INC -- MAILBOX EVENT BLOCK DESCRIPTION</td>
</tr>
<tr>
<td>MBEBO3</td>
<td>MBEBO3.INC -- MAILBOX EVENT BLOCK DESCRIPTION</td>
</tr>
<tr>
<td>MBXEBK</td>
<td>MBXEBK.INC -- MAILBOX EVENT BLOCK DESCRIPTION</td>
</tr>
<tr>
<td>TIMREB</td>
<td>TIMREB.INC -- TIME EVENT BLOCK DESCRIPTION</td>
</tr>
</tbody>
</table>
3.10.5 Where Include File Used List

The following lists each include file from 3.10.4 and all the modules documented in this specification which include them. The purpose of each module is listed as well.
### IPC Where-include-file-used List

<table>
<thead>
<tr>
<th>Include File</th>
<th>Module Name</th>
<th>Module Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>-------------</td>
<td>-------------</td>
<td>----------------</td>
</tr>
</tbody>
</table>

($JPIDEF)$

**GETPNM**

GET PROCESS NAME

### CHKSTS

- **CNLTIM**: CANCEL A TIMER
- **CRTMBX**: CREATE A MAILBOX
- **DELMBX**: DELETE A MAILBOX
- **ERRFTL**: PROCESS FATAL ERROR
- **ERRPRO**: PROCESS ERROR
- **GETMSG**: GET A MESSAGE FROM ANOTHER PROGRAM
- **RCVMSG**: RECEIVE A MESSAGE FROM ANOTHER PROGRAM
- **RELLEV**: RELEASE A TARGET EVENT BLOCK (CLEAR IT) AND
- **SETTIM**: START A TIMER
- **SNDMSG**: SEND A MESSAGE TO ANOTHER PROGRAM
- **WAIT01**: WAIT FOR AN EVENT TO OCCUR
- **WAIT02**: WAIT FOR AN EVENT TO OCCUR
- **WAIT03**: WAIT FOR AN EVENT TO OCCUR

### ERRPRO

- **CNLTIM**: CANCEL A TIMER
- **CRTMBX**: CREATE A MAILBOX
- **DELMBX**: DELETE A MAILBOX
- **GETMSG**: GET A MESSAGE FROM ANOTHER PROGRAM
- **RCVMSG**: RECEIVE A MESSAGE FROM ANOTHER PROGRAM
- **RELLEV**: RELEASE A TARGET EVENT BLOCK (CLEAR IT) AND
- **SETTIM**: START A TIMER
- **SNDMSG**: SEND A MESSAGE TO ANOTHER PROGRAM
- **WAIT01**: WAIT FOR AN EVENT TO OCCUR
- **WAIT02**: WAIT FOR AN EVENT TO OCCUR
- **WAIT03**: WAIT FOR AN EVENT TO OCCUR

3-15
IPC Where-include-file-used List

<table>
<thead>
<tr>
<th>Include File</th>
<th>Module Name</th>
<th>Module Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERRSTS.INF</td>
<td>CNLTM</td>
<td>CANCEL A TIMER</td>
</tr>
<tr>
<td></td>
<td>CRTMBX</td>
<td>CREATE A MAILBOX</td>
</tr>
<tr>
<td></td>
<td>DELMBX</td>
<td>DELETE A MAILBOX</td>
</tr>
<tr>
<td></td>
<td>GETMSG</td>
<td>GET A MESSAGE FROM ANOTHER PROGRAM</td>
</tr>
<tr>
<td></td>
<td>RCVMSG</td>
<td>RECEIVE A MESSAGE FROM ANOTHER PROGRAM</td>
</tr>
<tr>
<td></td>
<td>RELEVB</td>
<td>RELEASE A TARGET EVENT BLOCK (CLEAR IT) AND</td>
</tr>
<tr>
<td></td>
<td>SETTIM</td>
<td>START A TIMER</td>
</tr>
<tr>
<td></td>
<td>SNDMSG</td>
<td>SEND A MESSAGE TO ANOTHER PROGRAM</td>
</tr>
<tr>
<td></td>
<td>WAIT01</td>
<td>WAIT FOR AN EVENT TO OCCUR</td>
</tr>
<tr>
<td></td>
<td>WAIT02</td>
<td>WAIT FOR AN EVENT TO OCCUR</td>
</tr>
<tr>
<td></td>
<td>WAIT03</td>
<td>WAIT FOR AN EVENT TO OCCUR</td>
</tr>
<tr>
<td></td>
<td>CNLTM</td>
<td>CANCEL THE TIMER</td>
</tr>
<tr>
<td></td>
<td>GETPNM</td>
<td>GET PROCESS NAME</td>
</tr>
<tr>
<td></td>
<td>LOCKEF</td>
<td>LOCK EVENT FLAG</td>
</tr>
<tr>
<td></td>
<td>RDMALF</td>
<td>READ THE MAILBOX FOR EVENT FLAG SET</td>
</tr>
<tr>
<td></td>
<td>SASGCH</td>
<td>ASSIGN A CHANNEL TO A MAILBOX</td>
</tr>
<tr>
<td></td>
<td>SCRTMB</td>
<td>CREATE A MAILBOX</td>
</tr>
<tr>
<td></td>
<td>SDEACH</td>
<td>DEASSIGN CHANNEL FROM THE MAILBOX</td>
</tr>
<tr>
<td></td>
<td>SDELMB</td>
<td>DELETE THE MAILBOX</td>
</tr>
<tr>
<td></td>
<td>SETTMR</td>
<td>SET A TIMER</td>
</tr>
<tr>
<td></td>
<td>VALMBE</td>
<td>VALIDATE THAT MAILBOX ALREADY EXISTS</td>
</tr>
<tr>
<td></td>
<td>WRTERR</td>
<td>WRITE MESSAGE TO MAILBOX</td>
</tr>
<tr>
<td></td>
<td>WRTMAI</td>
<td>WRITE THE MESSAGE INTO THE MAILBOX</td>
</tr>
</tbody>
</table>
# IPC Where-include-file-used List

<table>
<thead>
<tr>
<th>Include File</th>
<th>Module Name</th>
<th>Module Purpose</th>
</tr>
</thead>
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<tr>
<td>KIPC</td>
<td>CRTMBX</td>
<td>CREATE A MAILBOX</td>
</tr>
<tr>
<td></td>
<td>GETMSG</td>
<td>GET A MESSAGE FROM ANOTHER PROGRAM</td>
</tr>
<tr>
<td></td>
<td>RCVMSG</td>
<td>RECEIVE A MESSAGE FROM ANOTHER PROGRAM</td>
</tr>
<tr>
<td></td>
<td>SNDMSG</td>
<td>SEND A MESSAGE TO ANOTHER PROGRAM</td>
</tr>
<tr>
<td>MBEBO1</td>
<td>WAIT01</td>
<td>WAIT FOR AN EVENT TO OCCUR</td>
</tr>
<tr>
<td></td>
<td>WAIT02</td>
<td>WAIT FOR AN EVENT TO OCCUR</td>
</tr>
<tr>
<td></td>
<td>WAIT03</td>
<td>WAIT FOR AN EVENT TO OCCUR</td>
</tr>
<tr>
<td>MBEBO2</td>
<td>WAIT02</td>
<td>WAIT FOR AN EVENT TO OCCUR</td>
</tr>
<tr>
<td></td>
<td>WAIT03</td>
<td>WAIT FOR AN EVENT TO OCCUR</td>
</tr>
<tr>
<td>MBEBO3</td>
<td>WAIT03</td>
<td>WAIT FOR AN EVENT TO OCCUR</td>
</tr>
<tr>
<td>MBXEBK</td>
<td>CRTMBX</td>
<td>CREATE A MAILBOX</td>
</tr>
<tr>
<td></td>
<td>DELMBX</td>
<td>DELETE A MAILBOX</td>
</tr>
<tr>
<td></td>
<td>GETMSG</td>
<td>GET A MESSAGE FROM ANOTHER PROGRAM</td>
</tr>
<tr>
<td></td>
<td>RCVMSG</td>
<td>RECEIVE A MESSAGE FROM ANOTHER PROGRAM</td>
</tr>
<tr>
<td></td>
<td>RELEVB</td>
<td>RELEASE A TARGET EVENT BLOCK (CLEAR IT) AND</td>
</tr>
<tr>
<td></td>
<td>SNDMSG</td>
<td>SEND A MESSAGE TO ANOTHER PROGRAM</td>
</tr>
</tbody>
</table>

3-17
### IPC Where-include-file-used List

<table>
<thead>
<tr>
<th>Include File</th>
<th>Module Name</th>
<th>Module Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>TIMREB</td>
<td>CNLTIM</td>
<td>CANCEL A TIMER</td>
</tr>
<tr>
<td></td>
<td>SETTIM</td>
<td>START A TIMER</td>
</tr>
</tbody>
</table>
3.10.6 Where External Routine Used List

The following lists each external function or routine listed in 3.10.3 and all the documented modules which call it. The purpose of each module is listed as well.
### IPC Where-external-routine-used List

<table>
<thead>
<tr>
<th>System Module</th>
<th>Module Name</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LIB$FREE_EF</td>
<td>FREE THE EVENT FLAG</td>
</tr>
<tr>
<td></td>
<td>FREVTFT</td>
<td>WAIT FOR ONE OF POSSIBLY MANY EVENTS</td>
</tr>
<tr>
<td></td>
<td>SWEVTFT</td>
<td>WRITE MESSAGE TO MAILBOX</td>
</tr>
<tr>
<td></td>
<td>WRTERR</td>
<td>WRITE MESSAGE TO MAILBOX</td>
</tr>
<tr>
<td></td>
<td>LIB$GET_EF</td>
<td>LOCK EVENT FLAG</td>
</tr>
<tr>
<td></td>
<td>LOCKEF</td>
<td>READ THE MAILBOX FOR EVENT FLAG SET</td>
</tr>
<tr>
<td></td>
<td>RDMALF</td>
<td>SET A TIMER</td>
</tr>
<tr>
<td></td>
<td>SETTMR</td>
<td>WRITE MESSAGE TO MAILBOX</td>
</tr>
<tr>
<td></td>
<td>WRTERR</td>
<td>WRITE MESSAGE TO MAILBOX</td>
</tr>
<tr>
<td></td>
<td>SYS$ASSIGN</td>
<td>ASSIGN A CHANNEL TO A MAILBOX</td>
</tr>
<tr>
<td></td>
<td>SASGCH</td>
<td>WRITE MESSAGE TO MAILBOX</td>
</tr>
<tr>
<td></td>
<td>WRTERR</td>
<td>WRITE MESSAGE TO MAILBOX</td>
</tr>
<tr>
<td></td>
<td>SYS$BINTIM</td>
<td>SET A TIMER</td>
</tr>
<tr>
<td></td>
<td>SETTMR</td>
<td>WRITE MESSAGE TO MAILBOX</td>
</tr>
<tr>
<td></td>
<td>WRTERR</td>
<td>WRITE MESSAGE TO MAILBOX</td>
</tr>
<tr>
<td></td>
<td>SYS$CANTIM</td>
<td>CANCEL THE TIMER</td>
</tr>
<tr>
<td></td>
<td>CNLTMR</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SYS$CLREF</td>
<td>WAIT FOR ONE OF POSSIBLY MANY EVENTS</td>
</tr>
</tbody>
</table>
IPC Where-external-routine-used List

<table>
<thead>
<tr>
<th>System Module</th>
<th>Module Name</th>
<th>Module Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>SYS$CREMBX</td>
<td>SCRTMB</td>
<td>CREATE A MAILBOX</td>
</tr>
<tr>
<td>SYS$DASSGN</td>
<td>SDEACH</td>
<td>DEASSIGN CHANNEL FROM THE MAILBOX</td>
</tr>
<tr>
<td></td>
<td>WRTERR</td>
<td>WRITE MESSAGE TO MAILBOX</td>
</tr>
<tr>
<td>SYS$DELMBX</td>
<td>SDELMB</td>
<td>DELETE THE MAILBOX</td>
</tr>
<tr>
<td>SYS$GETDEV</td>
<td>VALMBE</td>
<td>VALIDATE THAT MAILBOX ALREADY EXISTS</td>
</tr>
<tr>
<td>SYS$GETJPI</td>
<td>GETPNM</td>
<td>GET PROCESS NAME</td>
</tr>
<tr>
<td>SYS$QIO</td>
<td>RDMALF</td>
<td>READ THE MAILBOX FOR EVENT FLAG SET</td>
</tr>
<tr>
<td>SYS$QIOW</td>
<td>WRTERR</td>
<td>WRITE MESSAGE TO MAILBOX</td>
</tr>
<tr>
<td></td>
<td>WRTMAI</td>
<td>WRITE THE MESSAGE INTO THE MAILBOX</td>
</tr>
</tbody>
</table>
### IPC Where-external-routine-used List

<table>
<thead>
<tr>
<th>System Module</th>
<th>Module Name</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>SYSSSETIMR</td>
<td>SETTMR</td>
<td>SET A TIMER</td>
</tr>
<tr>
<td></td>
<td>WRTERR</td>
<td>WRITE MESSAGE TO MAILBOX</td>
</tr>
<tr>
<td>SYSSSETRWM</td>
<td>SCRTMB</td>
<td>CREATE A MAILBOX</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SYSSWAITFR</td>
<td>WRTERR</td>
<td>WRITE MESSAGE TO MAILBOX</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SYSSWFLOR</td>
<td>SWEVTF</td>
<td>WAIT FOR ONE OF POSSIBLY MANY EVENTS</td>
</tr>
</tbody>
</table>
3.10.7 Main Program Parts List

The following lists each Main Program listed in 3.10.1 and all the modules which are called either by that module itself or by any of the documented modules which it calls. It is possible for a non-main module to be listed more than once if it is called by multiple modules. The called modules, in this case known as program parts, are marked as to whether they are documented here. If so, the phrase "well-defined module" appears by the module name, if not it is an "external routine". The Purpose of the Main Program module is listed as well.
### IPC Main Program Parts List

<table>
<thead>
<tr>
<th>Main Pgm Name</th>
<th>Module Name</th>
<th>Module Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNLTIM</td>
<td>Purpose-----, CANCEL A TIMER</td>
<td></td>
</tr>
<tr>
<td>CNLTMR</td>
<td>Well-defined module</td>
<td></td>
</tr>
<tr>
<td>ERRFTL</td>
<td>Well-defined module</td>
<td></td>
</tr>
<tr>
<td>ERRPRO</td>
<td>Well-defined module</td>
<td></td>
</tr>
<tr>
<td>FREVTF</td>
<td>Well-defined module</td>
<td></td>
</tr>
<tr>
<td>GETPNM</td>
<td>Well-defined module</td>
<td></td>
</tr>
<tr>
<td>LIB$FREE EF</td>
<td>External routine</td>
<td></td>
</tr>
<tr>
<td>LIB$GET EF</td>
<td>External routine</td>
<td></td>
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<tr>
<td>SYS$ASSIGN</td>
<td>External routine</td>
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<td>SYS$BINTIM</td>
<td>External routine</td>
<td></td>
</tr>
<tr>
<td>SYS$CANTIM</td>
<td>External routine</td>
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<td>SYS$DASSGN</td>
<td>External routine</td>
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<tr>
<td>SYS$GETJPI</td>
<td>External routine</td>
<td></td>
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<tr>
<td>SYS$QIOW</td>
<td>External routine</td>
<td></td>
</tr>
<tr>
<td>SYS$SETIMR</td>
<td>External routine</td>
<td></td>
</tr>
<tr>
<td>SYS$WAITFR</td>
<td>External routine</td>
<td></td>
</tr>
<tr>
<td>WRTERR</td>
<td>Well-defined module</td>
<td></td>
</tr>
<tr>
<td>Main Pgm Name</td>
<td>Module Name</td>
<td>Module Type</td>
</tr>
<tr>
<td>--------------</td>
<td>------------</td>
<td>------------------</td>
</tr>
<tr>
<td>CRTMBX</td>
<td>Purpose---CREATE A MAILBOX</td>
<td></td>
</tr>
<tr>
<td>ERRFTL</td>
<td>Well-defined module</td>
<td></td>
</tr>
<tr>
<td>ERRPRO</td>
<td>Well-defined module</td>
<td></td>
</tr>
<tr>
<td>GETPNM</td>
<td>Well-defined module</td>
<td></td>
</tr>
<tr>
<td>LIB$FREE EF</td>
<td>External routine</td>
<td></td>
</tr>
<tr>
<td>LIB$GET EF</td>
<td>External routine</td>
<td></td>
</tr>
<tr>
<td>SCRTMB</td>
<td>Well-defined module</td>
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<tr>
<td>SYS$ASSIGN</td>
<td>External routine</td>
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<td>SYS$BITIM</td>
<td>External routine</td>
<td></td>
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<tr>
<td>SYS$CREMBX</td>
<td>External routine</td>
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<tr>
<td>SYS$DASSGN</td>
<td>External routine</td>
<td></td>
</tr>
<tr>
<td>SYS$GETDEV</td>
<td>External routine</td>
<td></td>
</tr>
<tr>
<td>SYS$GETJPI</td>
<td>External routine</td>
<td></td>
</tr>
<tr>
<td>SYS$QIOW</td>
<td>External routine</td>
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<tr>
<td>SYS$SETIMR</td>
<td>External routine</td>
<td></td>
</tr>
<tr>
<td>SYS$SETRWM</td>
<td>External routine</td>
<td></td>
</tr>
<tr>
<td>SYS$WAITFR</td>
<td>External routine</td>
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<tr>
<td>VALMBE</td>
<td>Well-defined module</td>
<td></td>
</tr>
<tr>
<td>WRTERR</td>
<td>Well-defined module</td>
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</table>
## IPC Main Program Parts List

<table>
<thead>
<tr>
<th>Main Pgm Name</th>
<th>Module Name</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>DELMBX</td>
<td>Purpose—DELETE A MAILBOX</td>
<td></td>
</tr>
<tr>
<td>ERRFTL</td>
<td>Well-defined module</td>
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<tr>
<td>ERRPRO</td>
<td>Well-defined module</td>
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</tr>
<tr>
<td>GETPNM</td>
<td>Well-defined module</td>
<td></td>
</tr>
<tr>
<td>LIB$FREE_EF</td>
<td>External routine</td>
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<tr>
<td>LIB$GET_EF</td>
<td>External routine</td>
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<tr>
<td>SDEACH</td>
<td>Well-defined module</td>
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<tr>
<td>SDELMB</td>
<td>Well-defined module</td>
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<tr>
<td>SYS$ASSIGN</td>
<td>External routine</td>
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<td>SYS$BINTIM</td>
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<td>SYS$DASSGN</td>
<td>External routine</td>
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<tr>
<td>SYS$DELMBX</td>
<td>External routine</td>
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<tr>
<td>SYS$GETJPI</td>
<td>External routine</td>
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<tr>
<td>SYS$QIOW</td>
<td>External routine</td>
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</tr>
<tr>
<td>SYS$SETIMR</td>
<td>External routine</td>
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</tr>
<tr>
<td>SYS$WAITFR</td>
<td>External routine</td>
<td></td>
</tr>
<tr>
<td>WRTERR</td>
<td>Well-defined module</td>
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### IPC Main Program Parts List

<table>
<thead>
<tr>
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<th>Module Name</th>
<th>Module Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>GETMSG</td>
<td>Purpose---</td>
<td>GET A MESSAGE FROM ANOTHER PROGRAM</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ERRFTL</td>
<td>Well-defined module</td>
</tr>
<tr>
<td></td>
<td>ERRPRO</td>
<td>Well-defined module</td>
</tr>
<tr>
<td></td>
<td>FREVTFT</td>
<td>Well-defined module</td>
</tr>
<tr>
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<td>GETPNM</td>
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<td>LOCKEFT</td>
<td>Purpose -- LOCK EVENT FLAG</td>
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<td>RELEVY</td>
<td>Purpose----&gt;RELEASE A TARGET EVENT BLOCK</td>
<td>CLEAR IT AND</td>
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<td>Purpose--&gt;SEND A MESSAGE TO ANOTHER PROGRAM</td>
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3-35
3.10.8 Module Documentation

The following documentation describes information which is specific to each individual module being documented in this specification as listed in section 3.10.2. It provides a compact way of getting information that would be otherwise buried within each module's source code.

The specific items in this module documentation have the following meanings:

NAME: Name of program Module.
PURPOSE: Purpose of Module as detailed in the source code.
LANGUAGE: Programming language source code is written in.
The choices are:

VAX-11 FORTRAN
C (I/S-1 Workbench 'C')
VAX-11 COBOL

MODULE TYPE: Whether a Program, Subroutine, or Function.
SOURCE FILE: Name of Source File from file specification.
SOURCE FILE TYPE: Source File Extension from file specification.
HOST: Whether this is a host-dependent routine (VAX or IBM) or blank if host-independent.
SUBSYSTEM: IIS sub-system this file resides in.
SUBDIRECTORY: Sub-directory of that subsystem in which this file resides.
DOCUMENTATION GROUP: Name of documentation group of which this source file is a member.
DESCRIPTION: A description of the module as obtained
from the source code.

ARGUMENTS: The arguments with which this routine is called if it is a Subroutine or a Function.

INCLUDE FILES: A list of all the files that are included into this module as well as their purposes.

ROUTINES CALLED: Subroutines or Functions, either documented or external, called by this module, if any.

CALLED DIRECTLY BY: The documented routines which call this module, if any.

USED IN MAIN PROGRAM(S): The documented Main Programs which contain this module in their parts list according to the list in section 3.10.7.

The Module Documentation is arranged alphabetically according to Module Name.
NAME: CNLTIM
PURPOSE: CANCEL A TIMER
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: CNLTIM
SOURCE FILE TYPE: .COB
HOST: VAX
SUBSYSTEM: IPC
SUBDIRECTORY: DOCUMENTATION
DOCUMENTATION GROUP: IPC

DESCRIPTION:
-----------
CANCEL A RUNNING TIMER

ARGUMENTS:
-----------
TIMER-EVENT-BLOCK = RECRD
RET-STATUS = DSPLY [X(5)]

INCLUDE FILES:
---------------
CHKSTS - CHKSTS.INC -- CHECK STATUS
ERRSTS - ERRSTS.INC -- IISS ERROR CODES
TIMREB - TIMREB.INC -- TIME EVENT BLOCK DESCRIPTION
ERRPRO - PROCESS ERROR INCLUDE FILE

ROUTINES CALLED:
-----------------
FREVTF - FREE THE EVENT FLAG
CNLTMR - CANCEL THE TIMER
ERRPRO - PROCESS ERROR
IPC Module Documentation

NAME: CNLTM
PURPOSE: CANCEL THE TIMER
LANGUAGE: VAX-11 FORTRAN
MODULE TYPE: SUBROUTINE
SOURCE FILE: CNLTM
SOURCE FILE TYPE: .FOR
HOST: VAX
SUBSYSTEM: IPC
SUBDIRECTORY: DOCUMENTATION
DOCUMENTATION GROUP: IPC

DESCRIPTION:
-----------------
CANCEL IISS TIMER
REQUEST IDENTIFICATION IS 4

ARGUMENTS:
-------------
RSTATS = CHAR
    - RETURN STATUS

INCLUDE FILES:
---------------
ERRSTS.INF - """" PURPOSE NOT FOUND BY STRIPPER """

ROUTINES CALLED:
-------------------
ERRPRO - PROCESS ERROR
SYS$CANTIM

CALLED DIRECTLY BY:
---------------------
CNLTIM - CANCEL A TIMER

USED IN MAIN PROGRAM(S):
-------------------------
CNLTIM - CANCEL A TIMER

3-40
IPC Module Documentation

NAME: CRTMBX
PURPOSE: CREATE A MAILBOX
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: CRTMBX
SOURCE FILE TYPE: .COB
HOST: VAX
SUBSYSTEM: IPC
SUBDIRECTORY: DOCUMENTATION
DOCUMENTATION GROUP: IPC

DESCRIPTION:
----------------
IT CREATES A MAILBOX THROUGH WHICH THE
PROGRAM WILL RECEIVE MESSAGES FROM ANOTHER
PROGRAM RUNNING ON THE SAME COMPUTER.

ARGUMENTS:
-------------
INPUT-MAILBOX-NAME = DSPLY [X(14)]
MAILBOX-SIZE = DSPLY [9(5)]
MAILBOX-EVENT-BLOCK = RECRD
RET-STATUS = DSPLY [X(5)]

INCLUDE FILES:
-----------------
CHKSTS - CHKSTS.INC -- CHECK STATUS
ERRSTS - ERRSTS.INC -- I1SS ERROR CODES
KIPC - KIPC.INC -- CONSTANT BLOCK FOR IPC PRIMITIVES
MBXEBK - MBXEBK.INC -- MAILBOX EVENT BLOCK DESCRIPTION
ERRPRO - PROCESS ERROR INCLUDE FILE

ROUTINES CALLED:
------------------
VALMBE - VALIDATE THAT MAILBOX ALREADY EXISTS
SCRTMB - CREATE A MAILBOX
ERRPRO - PROCESS ERROR
IPC Module Documentation

NAME: DELMBX
PURPOSE: DELETE A MAILBOX
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: DELMBX
SOURCE FILE TYPE: .COB
HOST: VAX
SUBSYSTEM: IPC
SUBDIRECTORY: DOCUMENTATION
DOCUMENTATION GROUP: IPC

DESCRIPTION:
--------------
- IT DELETES A MAILBOX WHEREBY REMOVING THE ABILITY TO RECEIVE MESSAGES FROM ANOTHER PROGRAM THROUGH THE GIVEN INPUT MAILBOX

ARGUMENTS:
-----------

INPUT-MAILBOX-NAME = DSPLY [X(14)]
MAILBOX-EVENT-BLOCK = RECRD
RET-STATUS = DSPLY [X(5)]

INCLUDE FILES:
----------------

CHKSTS - CHKSTS.INC -- CHECK STATUS
ERRSTS - ERRSTS.INC -- IISS ERROR CODES
MBXEBK - MBXEBK.INC -- MAILBOX EVENT BLOCK DESCRIPTION
ERRPRO - PROCESS ERROR INCLUDE FILE

ROUTINES CALLED:
-----------------

SDELMB - DELETE THE MAILBOX
SDEACH - DEASSIGN CHANNEL FROM THE MAILBOX
ERRPRO - PROCESS ERROR
NAME: ENDRUN
PURPOSE: STOP THE PROGRAM
LANGUAGE: VAX-11 COBOL
MODULE TYPE: PROGRAM
SOURCE FILE: ENDRUN
SOURCE FILE TYPE: .COB
HOST: VAX
SUBSYSTEM: IPC
SUBDIRECTORY: DOCUMENTATION
DOCUMENTATION GROUP: IPC

DESCRIPTION:
-----
- THE IBM NEEDS A SPECIAL ROUTINE TO
  STOP THE PROGRAM, THEREFORE WE ALL DO.
NAME: ERRFTL
PURPOSE: PROCESS FATAL ERROR
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: ERRFTL
SOURCE FILE TYPE: .COB
HOST:
SUBSYSTEM: ERR
SUBDIRECTORY: DOCUMENTATION
DOCUMENTATION GROUP: IPC

DESCRIPTION:
- This module date and time stamps the error message, assigns a function code and writes the error message to a file called ERRFTL

ARGUMENTS:
- RET-STATUS = DSPLY [X(5)]
- MODULE-NAME = DSPLY [X(6)]
- MESG-DESC = DSPLY [X(60)]
- ORIGINAL-ERR-MSG = DSPLY [X(109)]

INCLUDE FILES:
- CHKSTS - CHKSTS.INC -- CHECK STATUS

ROUTINES CALLED:
- GETPNM - GET PROCESS NAME

CALLED DIRECTLY BY:
- ERRPRO - PROCESS ERROR
USED IN MAIN PROGRAM(S):
---------------------
CNLTIM       - CANCEL A TIMER
CRTMBX       - CREATE A MAILBOX
DELMBX       - DELETE A MAILBOX
GETMSG       - GET A MESSAGE FROM ANOTHER PROGRAM
LOCKEF       - LOCK EVENT FLAG
RCVMSG       - RECEIVE A MESSAGE FROM ANOTHER PROGRAM
RELEVFB      - RELEASE A TARGET EVENT BLOCK (CLEAR IT) AND
SETTIM       - START A TIMER
SNDMSG       - SEND A MESSAGE TO ANOTHER PROGRAM
WAIT01       - WAIT FOR AN EVENT TO OCCUR
WAIT02       - WAIT FOR AN EVENT TO OCCUR
WAIT03       - WAIT FOR AN EVENT TO OCCUR
IPC Module Documentation

NAME: ERRPRO
PURPOSE: PROCESS ERROR
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: ERRPRO
SOURCE FILE TYPE: .COB
HOST:
SUBSYSTEM: ERR
SUBDIRECTORY: DOCUMENTATION
DESCRIPTION: LANGUAGE: VAX-11 COBOL
DESCRIPTION:

ARGUMENTS:

RET-STATUS = DSPLY [X(5)]
MODULE-NAME = DSPLY [X(6)]
MESG-DESC = DSPLY [X(60)]

INCLUDE FILES:

chksts  - chksts.inc -- check status

ROUTINES CALLED:

GETPNM  - GET PROCESS NAME
WRTERR  - WRITE MESSAGE TO MAILBOX
ERRFTL  - PROCESS FATAL ERROR

CALLED DIRECTLY BY:

CNLTIM  - CANCEL A TIMER
CRTMBX  - CREATE A MAILBOX
DELMBX  - DELETE A MAILBOX

3-46
GETMSG - GET A MESSAGE FROM ANOTHER PROGRAM
RCVMSG - RECEIVE A MESSAGE FROM ANOTHER PROGRAM
RELEVB - RELEASE A TARGET EVENT BLOCK (CLEAR IT) AND
SETTIM - START A TIMER
SNDMSG - SEND A MESSAGE TO ANOTHER PROGRAM
WAIT01 - WAIT FOR AN EVENT TO OCCUR
WAIT02 - WAIT FOR AN EVENT TO OCCUR
WAIT03 - WAIT FOR AN EVENT TO OCCUR
CNLTMR - CANCEL THE TIMER
FREVTF - FREE THE EVENT FLAG
LOCKEF - LOCK EVENT FLAG
RDMALF - READ THE MAILBOX FOR EVENT FLAG SET
SASGCH - ASSIGN A CHANNEL TO A MAILBOX
SCRTMB - CREATE A MAILBOX
SDEACH - DEASSIGN CHANNEL FROM THE MAILBOX
SDELMB - DELETE THE MAILBOX
SETTMR - SET A TIMER
SWEVTF - WAIT FOR ONE OF POSSIBLY MANY EVENTS
VALMBE - VALIDATE THAT MAILBOX ALREADY EXISTS
WRTMAI - WRITE THE MESSAGE INTO THE MAILBOX

USED IN MAIN PROGRAM(S):

------------------------

CNLTIM - CANCEL A TIMER
CRTMBX - CREATE A MAILBOX
DELMBX - DELETE A MAILBOX
GETMSG - GET A MESSAGE FROM ANOTHER PROGRAM
LOCKEF - LOCK EVENT FLAG
RCVMSG - RECEIVE A MESSAGE FROM ANOTHER PROGRAM
RELEVB - RELEASE A TARGET EVENT BLOCK (CLEAR IT) AND
SETTIM - START A TIMER
SNDMSG - SEND A MESSAGE TO ANOTHER PROGRAM
WAIT01 - WAIT FOR AN EVENT TO OCCUR
WAIT02 - WAIT FOR AN EVENT TO OCCUR
WAIT03 - WAIT FOR AN EVENT TO OCCUR
NAME: FREVTF
PURPOSE: FREE THE EVENT FLAG
LANGUAGE: VAX-11 FORTRAN
MODULE TYPE: SUBROUTINE
SOURCE FILE: FREVTF
SOURCE FILE TYPE: .FOR
HOST: VAX
SUBSYSTEM: IPC
SUBDIRECTORY: DOCUMENTATION
DOCUMENTATION GROUP: IPC

DESCRIPTION:
-------------
: - THIS MODULE RELEASES AN EVENT FLAG THAT WAS PREVIOUSLY OBTAINED FROM THE SYSTEM.
: -

ARGUMENTS:
----------
---
EVTFLG = I*2
RSTATS = CHAR

ROUTINES CALLED:
-----------------
---------
ERRPRO - PROCESS ERROR
LIB$FREE_EF

CALLED DIRECTLY BY:
---------------------
-------------------
CNLTIM - CANCEL A TIMER
GETMSG - GET A MESSAGE FROM ANOTHER PROGRAM

USED IN MAIN PROGRAM(S):
-------------------------
-------------------------
CNLTIM - CANCEL A TIMER
GETMSG - GET A MESSAGE FROM ANOTHER PROGRAM
IPC Module Documentation

NAME: GETMSG
PURPOSE: GET A MESSAGE FROM ANOTHER PROGRAM
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: GETMSG
SOURCE FILE TYPE: .COB
HOST: VAX
SUBSYSTEM: IPC
SUBDIRECTORY: DOCUMENTATION
DOCUMENTATION GROUP: IPC

DESCRIPTION:
- IT ACCEPTS THE MESSAGE THAT WAS SENT FROM
  ANOTHER PROGRAM RUNNING ON THE SAME COMPUTER
  AND MOVES IT INTO THE GIVEN BUFFER.

ARGUMENTS:
- INPUT-MAILBOX-NAME = DSPLY [X(14)]
- BUFFER = DSPLY [X(2000)]
- BUFFER-SIZE = DSPLY [9(4)]
- NUMBER-OF-BYTES = DSPLY [9(4)]
- MAILBOX-EVENT-BLOCK = RECRD
- RET-STATUS = DSPLY [X(5)]

INCLUDE FILES:
- CHKSTS - CHKSTS.INC -- CHECK STATUS
- KIPC - KIPC.INC -- CONSTAND BLOCK FOR IPC PRIMITIVES
- ERRSTS - ERRSTS.INC -- IISS ERROR CODES
- MBXEBK - MBXEBK.INC -- MAILBOX EVENT BLOCK DESCRIPTION
- ERRPRO - PROCESS ERROR INCLUDE FILE

ROUTINES CALLED:
- FREVTF - FREE THE EVENT FLAG
- ERRPRO - PROCESS ERROR

3-49
NAME: GETPNM
PURPOSE: GET PROCESS NAME
LANGUAGE: VAX-11 FORTRAN
MODULE TYPE: SUBROUTINE
SOURCE FILE: GETPNM
SOURCE FILE TYPE: .FOR
HOST:
SUBSYSTEM: ERR
SUBDIRECTORY: DOCUMENTATION GROUP: IPC

DESCRIPTION:
----------------
GET THE NAME OF THE CALLING PROCESS

ARGUMENTS:
-----------
PRCNAM = CHAR
- Process name
RSTATS = CHAR
- Return status

INCLUDE FILES:
----------------
ERRSTS.INF - ***** PURPOSE NOT FOUND BY STRIPPER *****
($JPIDEF) - ***** PURPOSE NOT FOUND BY STRIPPER *****

ROUTINES CALLED:
-----------------
SYS$GETJPI

CALLED DIRECTLY BY:
---------------------
ERRFTL - PROCESS FATAL ERROR
ERRPRO - PROCESS ERROR

USED IN MAIN PROGRAM(S):
-------------------------
3-50
<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNLTIM</td>
<td>Cancel a timer</td>
</tr>
<tr>
<td>CRTMBX</td>
<td>Create a mailbox</td>
</tr>
<tr>
<td>DELMBX</td>
<td>Delete a mailbox</td>
</tr>
<tr>
<td>GETMSG</td>
<td>Get a message from another program</td>
</tr>
<tr>
<td>LOCKEF</td>
<td>Lock event flag</td>
</tr>
<tr>
<td>RCVMSG</td>
<td>Receive a message from another program</td>
</tr>
<tr>
<td>RELEVB</td>
<td>Release a target event block (clear it) and set timer</td>
</tr>
<tr>
<td>SETTIM</td>
<td>Start a timer</td>
</tr>
<tr>
<td>SNDMSG</td>
<td>Send a message to another program</td>
</tr>
<tr>
<td>WAIT01</td>
<td>Wait for an event to occur</td>
</tr>
<tr>
<td>WAIT02</td>
<td>Wait for an event to occur</td>
</tr>
<tr>
<td>WAIT03</td>
<td>Wait for an event to occur</td>
</tr>
</tbody>
</table>
IPC Module Documentation

NAME: LOCKEF
PURPOSE: LOCK EVENT FLAG
LANGUAGE: VAX-11 FORTRAN
MODULE TYPE: SUBROUTINE
SOURCE FILE: LOCKEF
SOURCE FILE TYPE: .FOR
HOST: VAX
SUBSYSTEM: IPC
SUBDIRECTORY: DOCUMENTATION
DOCUMENTATION GROUP: IPC

DESCRIPTION:

:-- LOCK EVENT FLAG FROM BEING USED UNTIL FREED.

INCLUDE FILES:

----------
ERRSTS.INF - **** PURPOSE NOT FOUND BY STRIPPER ****

ROUTINES CALLED:

----------
ERRPRO - PROCESS ERROR
LIB$GET_EF
**NAME:** RCVMSG  
**PURPOSE:** RECEIVE A MESSAGE FROM ANOTHER PROGRAM  
**LANGUAGE:** VAX-11 COBOL  
**MODULE TYPE:** SUBROUTINE  
**SOURCE FILE:** RCVMSG  
**SOURCE FILE TYPE:** .COB  
**HOST:** VAX  
**SUBSYSTEM:** IPC  
**SUBDIRECTORY:**  
**DOCUMENTATION GROUP:** IPC  

**DESCRIPTION:**  

**ARGUMENTS:**  

```
INPUT-MAILBOX-NAME = DSPLY [X(14)]
EVENT-NUMBER = DSPLY [99]
MAILBOX-EVENT-BLOCK = RECRD
RET-STATUS = DSPLY [X(5)]
```

**INCLUDE FILES:**  

```
CHKSTS - CHKSTS.INC -- CHECK STATUS
ERRSTS - ERRSTS.INC -- IISS ERROR CODES
KIPC - KIPC.INC -- CONSTANT BLOCK FOR IPC PRIMITIVES
MBXEBK - MBXEBK.INC -- MAILBOX EVENT BLOCK DESCRIPTION
ERRPRO - PROCESS ERROR INCLUDE FILE
```

**ROUTINES CALLED:**  

```
RDMALF - READ THE MAILBOX FOR EVENT FLAG SET
ERRPRO - PROCESS ERROR
```

3-53
IPC Module Documentation

NAME: RDMALF
PURPOSE: READ THE MAILBOX FOR EVENT FLAG SET
LANGUAGE: VAX-11 FORTRAN
MODULE TYPE: SUBROUTINE
SOURCE FILE: RDMALF
SOURCE FILE TYPE: .FOR
HOST: VAX
SUBSYSTEM: IPC
SUBDIRECTORY: 
DOCUMENTATION GROUP: IPC

DESCRIPTION:
-------------

: ISSUE QIO WITH EVENT FLAG TO READ MESSAGE
: FROM MAILBOX USING THE CHANNEL NUMBER

ARGUMENTS:
-----------

CHANNEL = I*2
-CHANNEL NUMBER
EVTFLG = I*2
-EVENT FLAG
EVTBLK = L*1 (1)
-MAILBOX EVENT BLOCK
BUFLEN = I*2
-MAXIMUM BUFFER LENGTH
RSTATS = CHAR
-RETURN STATUS

INCLUDE FILES:
---------------

ERRSTS.INF - **** PURPOSE NOT FOUND BY STRIPPER ****

ROUTINES CALLED:
-----------------

ERRPRO - PROCESS ERROR
LIB$GET_EF
SYS$QIO
CALLED DIRECTLY BY:
---------------------
RCVMSG           - RECEIVE A MESSAGE FROM ANOTHER PROGRAM

USED IN MAIN PROGRAM(S):
------------------------
RCVMSG           - RECEIVE A MESSAGE FROM ANOTHER PROGRAM
NAME: RELEVB
PURPOSE: RELEASE A TARGET EVENT BLOCK (CLEAR IT) AND
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: RELEVB
SOURCE FILE TYPE: .COB
HOST: VAX
SUBSYSTEM: IPC
SUBDIRECTORY: DOCUMENTATION
DOCUMENTATION GROUP: IPC

DESCRIPTION:
- DEASSIGN THE CHANNEL ASSIGNED TO THE TARGET MAILBOX.

ARGUMENTS:

TARGET-MAILBOX-NAME = DSPLY [X(14)]
MAILBOX-EVENT-BLOCK = RECRD
RET-STATUS = DSPLY [X(5)]

INCLUDE FILES:

ERRSTS - ERRSTS.INC -- IESS ERROR CODES
CHKSTS - CHKSTS.INC -- CHECK STATUS
MBXEBK - MBXEBK.INC -- MAILBOX EVENT BLOCK DESCRIPTION
ERRPRO - PROCESS ERROR INCLUDE FILE

ROUTINES CALLED:

SDEACH - DEASSIGN CHANNEL FROM THE MAILBOX
ERRPRO - PROCESS ERROR
IPC Module Documentation

NAME: SASGCH
PURPOSE: ASSIGN A CHANNEL TO A MAILBOX
LANGUAGE: VAX-11 FORTRAN
MODULE TYPE: SUBROUTINE
SOURCE FILE: SASGCH
SOURCE FILE TYPE: .FOR
HOST: VAX
SUBSYSTEM: IPC
SUBDIRECTORY: DOCUMENTATION GROUP: IPC

DESCRIPTION:
------------
: ASSIGN A CHANNEL NUMBER TO MAILBOX

ARGUMENTS:
----------
MBXNAM = CHAR
-MAILBOX NAME
CHANLN = 1*2
-CHANNEL NUMBER
RSTATS = CHAR
-RETURN STATUS

INCLUDE FILES:
---------------
ERRSTS.INF - **** PURPOSE NOT FOUND BY STRIPPER ****

ROUTINES CALLED:
----------------
ERRPRO - PROCESS ERROR
SYSS$ASSIGN

CALLED DIRECTLY BY:
---------------------
SNDMSG - SEND A MESSAGE TO ANOTHER PROGRAM

USED IN MAIN PROGRAM(S):
3-57
NAME: SCRTMB
PURPOSE: CREATE A MAILBOX
LANGUAGE: VAX-11 FORTRAN
MODULE TYPE: SUBROUTINE
SOURCE FILE: SCRTMB
SOURCE FILE TYPE: .FOR
HOST: VAX
SUBSYSTEM: IPC
SUBDIRECTORY: DOCUMENTATION
GROUP: IPC

DESCRIPTION:

----------
: TO CREATE A MAILBOX USING THE NAME AND THE SIZE SPECIFIED. IT ALSO DISABLES THE RESOURCE WAIT MODE TO ALLOW CONTROL RETURN TO CALLING PROGRAM IMMEDIATELY WITHOUT WAITING FOR THE RESOURCE TO BE AVAILABLE, SUCH AS THE MAILBOX FULL.

ARGUMENTS:

----------
MBXNAM = CHAR
  -MAILBOX NAME
MBXSIZ = I*2
  -MAILBOX SIZE
CHANLN = I*2
  -CHANNEL NUMBER
RSTATS = CHAR
  -RETURN STATUS

INCLUDE FILES:

----------
ERRSTS.INF - **** PURPOSE NOT FOUND BY STRIPPER ****

ROUTINES CALLED:

----------
ERRPRO - PROCESS ERROR
SYS$CREMBX
SYS$SETRWM
CALLED DIRECTLY BY:

----------------------------------
CRTMBX     - CREATE A MAILBOX

USED IN MAIN PROGRAM(S):

----------------------------------
CRTMBX     - CREATE A MAILBOX
IPC Module Documentation

NAME: SDEACH
PURPOSE: DEASSIGN CHANNEL FROM THE MAILBOX
LANGUAGE: VAX-11 FORTRAN
MODULE TYPE: SUBROUTINE
SOURCE FILE: SDEACH
SOURCE FILE TYPE: .FOR
HOST: VAX
SUBSYSTEM: IPC
SUBDIRECTORY: DOCUMENTATION
DOCUMENTATION GROUP: IPC

DESCRIPTION:
---
:-DEASSIGN A MAILBOX CHANNEL NUMBER

ARGUMENTS:
-------------
CHANNL = I*2
-CHANNEL NUMBER
RSTATS = CHAR
-RETURN STATUS

INCLUDE FILES:
-------------
ERRSTS.INF - **** PURPOSE NOT FOUND BY STRIPPER ****

ROUTINES CALLED:
-------------
ERRPRO - PROCESS ERROR
SYS$DASSGN

CALLED DIRECTLY BY:
-------------
DELMBX - DELETE A MAILBOX
RELEVB - RELEASE A TARGET EVENT BLOCK (CLEAR IT) AND

USED IN MAIN PROGRAM(S):
-------------
3-61
DELMBX - DELETE A MAILBOX
RELEVB - RELEASE A TARGET EVENT BLOCK (CLEAR IT) AND
NAME: SDELMB
PURPOSE: DELETE THE MAILBOX
LANGUAGE: VAX-11 FORTRAN
MODULE TYPE: SUBROUTINE
SOURCE FILE: SDELMB
SOURCE FILE TYPE: .FOR
HOST: VAX
SUBSYSTEM: IPC
SUBDIRECTORY: DOCUMENTATION
DOCUMENTATION GROUP: IPC

DESCRIPTION:
-------------
: - TO DELETE A MAILBOX USING THE CHANNEL NUMBER

ARGUMENTS:
----------

CHANNEL = I*2
-CHANNEL NUMBER
RSTATS = CHAR
-RETURN STATUS

INCLUDE FILES:
-----------------
ERRSTS.INF - **** PURPOSE NOT FOUND BY STRIPPER ****

ROUTINES CALLED:
-----------------
ERRPRO - PROCESS ERROR
SYS$DELMBX

CALLED DIRECTLY BY:
---------------------
DELMBX - DELETE A MAILBOX

USED IN MAIN PROGRAM(S):
-----------------------
DELMBX - DELETE A MAILBOX
NAME: SETTIM
PURPOSE: START A TIMER
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: SETTIM
SOURCE FILE TYPE: .COB
HOST: VAX
SUBSYSTEM: IPC
SUBDIRECTORY: DOCUMENTATION GROUP: IPC

DESCRIPTION:

REQUEST A TIMER TO START RUNNING. THE PROGRAM CONTINUES TO EXECUTE WITH THE ELAPSED TIME BEING DISCOVERED IN THE WAITEB PRIMITIVE.

ARGUMENTS:

TIME-INTERVAL = RECRD
EVENT-NUMBER = DSPLY [99]
TIMER-EVENT-BLOCK = RECRD
RET-STATUS = DSPLY [X(5)]

INCLUDE FILES:

CHKSTS - CHKSTS.INC -- CHECK STATUS
ERRSTS - ERRSTS.INC -- IISS ERROR CODES
TIMREB - TIMREB.INC -- TIME EVENT BLOCK DESCRIPTION
ERRPRO - PROCESS ERROR INCLUDE FILE

ROUTINES CALLED:

SETTMR - SET A TIMER
ERRPRO - PROCESS ERROR

3-64
IPC Module Documentation

NAME: SETTMR
PURPOSE: SET A TIMER
LANGUAGE: VAX-11 FORTRAN
MODULE TYPE: SUBROUTINE
SOURCE FILE: SETTMR
SOURCE FILE TYPE: .FOR
HOST: VAX
SUBSYSTEM: IPC
SUBDIRECTORY: DOCUMENTATION
DOCUMENTATION GROUP: IPC

DESCRIPTION:
-------------
SET A TIMER WITH AN EVENT FLAG REQUEST IDENTIFICATION IS 4

ARGUMENTS:
-----------

    INTVAL = CHAR
    - TIME INTERVAL - HHMMSS
    EVTFLG = I*2
    - EVENT FLAG NUMBER
    RSTATS = CHAR
    - RETURN STATUS

INCLUDE FILES:
-----------------
ERRSTS.INF - **** PURPOSE NOT FOUND BY STRIPPER ****

ROUTINES CALLED:
-----------------

    ERRPRO  - PROCESS ERROR
    LIB$GET EF
    SYS$BINTIM
    SYS$SETIMR

CALLED DIRECTLY BY:
---------------------

    SETTIM - START A TIMER

3-65
USED IN MAIN PROGRAM(S):

SETTIM - START A TIMER
IPC Module Documentation

NAME: SNDMSG
PURPOSE: SEND A MESSAGE TO ANOTHER PROGRAM
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: SNDMSG
SOURCE FILE TYPE: .COB
HOST: VAX
SUBSYSTEM: IPC
SUBDIRECTORY: DOCUMENTATION
DOCUMENTATION GROUP: IPC

DESCRIPTION:
- IT SENDS A MESSAGE TO ANOTHER PROGRAM
  RUNNING ON THE SAME COMPUTER THROUGH THE
  INPUT MAILBOX OF THE OTHER PROGRAM.

ARGUMENTS:
-------------
TARGET-MAILBOX-NAME = DSPLY [X(14)]
BUFFER = DSPLY [X(2000)]
NUMBER-OF-BYTES = DSPLY [9(4)]
MAILBOX-EVENT-BLOCK = RECRD
RET-STATUS = DSPLY [X(5)]

INCLUDE FILES:
----------------
CHKSTS - CHKSTS.INC -- CHECK STATUS
ERRSTS - ERRSTS.INC -- IISS ERROR CODES
KIPC - KIPC.INC -- CONSTANCE BLOCK FOR IPC PRIMITIVES
MBXEBK - MBXEBK.INC -- MAILBOX EVENT BLOCK DESCRIPTION
ERRPRO - PROCESS ERROR INCLUDE FILE

ROUTINES CALLED:
-------------------
WRTMAI - WRITE THE MESSAGE INTO THE MAILBOX
SASGCH - ASSIGN A CHANNEL TO A MAILBOX
ERRPRO - PROCESS ERROR
IPC Module Documentation

NAME: SWEVTTF
PURPOSE: WAIT FOR ONE OF POSSIBLY MANY EVENTS
LANGUAGE: VAX-11 FORTRAN
MODULE TYPE: SUBROUTINE
SOURCE FILE: SWEVTTF
SOURCE FILE TYPE: .FOR
HOST: VAX
SUBSYSTEM: IPC
SUBDIRECTORY: DOCUMENTATION
DOCUMENTATION GROUP: IPC

DESCRIPTION:

-------------
- THIS MODULE SET UP THE EVENT CLUSTER AND WAITS FOR ONE OF THE EVENT TO HAPPEN.
-------------

ARGUMENTS:

-------------
ENARRY = I*2 (22)
EVTFLG = I*2 (22)
EVTNUM = I*2
RSTATS = CHAR

ROUTINES CALLED:

-------------
ERRPRO - PROCESS ERROR
LIB$FREE EF
SYS$CLREF
SYS$WFLOR

CALLED DIRECTLY BY:

-------------
WAIT01 - WAIT FOR AN EVENT TO OCCUR
WAIT02 - WAIT FOR AN EVENT TO OCCUR
WAIT03 - WAIT FOR AN EVENT TO OCCUR

USED IN MAIN PROGRAM(S):

-------------
WAIT01 - WAIT FOR AN EVENT TO OCCUR

3-68
WAIT02 - WAIT FOR AN EVENT TO OCCUR
WAIT03 - WAIT FOR AN EVENT TO OCCUR
NAME: VALMBE
PURPOSE: VALIDATE THAT MAILBOX ALREADY EXISTS
LANGUAGE: VAX-11 FORTRAN
MODULE TYPE: SUBROUTINE
SOURCE FILE: VALMBE
SOURCE FILE TYPE: .FOR
HOST: VAX
SUBSYSTEM: IPC
SUBDIRECTORY: DOCUMENTATION
DOCUMENTATION GROUP: IPC

DESCRIPTION:
-------------
:- THIS MODULE CHECKS TO SEE IF MAILBOX
ALREADY EXISTS.

ARGUMENTS:
------------
INMBNM = CHAR
-INPUT MAILBOX NAME
RSTATS = CHAR
-RET STATUS

INCLUDE FILES:
---------------
ERRSTS.INF - **** PURPOSE NOT FOUND BY STRIPPER ****

ROUTINES CALLED:
-----------------
ERRPRO - PROCESS ERROR
SYS$GETDEV

CALLED DIRECTLY BY:
---------------------
CRTMBX - CREATE A MAILBOX

USED IN MAIN PROGRAM(S):
-------------------------

3-70
CRTMBX  - CREATE A MAILBOX
IPC Module Documentation

NAME:           WAIT01
PURPOSE:        WAIT FOR AN EVENT TO OCCUR
LANGUAGE:       VAX-11 COBOL
MODULE TYPE:    SUBROUTINE
SOURCE FILE:    WAIT01
SOURCE FILE TYPE: .COB
HOST:           VAX
SUBSYSTEM:      IPC
SUBDIRECTORY:
DOCUMENTATION GROUP: IPC

DESCRIPTION:

- IT WAITS FOR ONE OF OUTSTANDING REQUESTS THAT ARE ASSOCIATED WITH THE LIST OF EVENT BLOCKS TO BE SATISFIED. THE EVENT NUMBER ASSOCIATED WITH THE COMPLETED REQUEST IS RETURNED IN THE EVENT NUMBER VARIABLE.

ARGUMENTS:

EVENT-NUMBER = DSPLY [99]
RET-STATUS = DSPLY [X(5)]
NUMBER-OF-EVENT-BLOCKS = DSPLY [99]
MBX-EVENT-BLOCK-01 = RECRD

INCLUDE FILES:

CHKSTS - CHKSTS.INC -- CHECK STATUS
ERRSTS - ERRSTS.INC -- IISS ERROR CODES
MBEBO1 - MBEBO1.INC -- MAILBOX EVENT BLOCK DESCRIPTION
ERRPRO - PROCESS ERROR INCLUDE FILE

ROUTINES CALLED:

SWEVTF - WAIT FOR ONE OF POSSIBLY MANY EVENTS
ERRPRO - PROCESS ERROR

3-72
NAME: WAIT02
PURPOSE: WAIT FOR AN EVENT TO OCCUR
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: WAIT02
SOURCE FILE TYPE: .COB
HOST: VAX
SUBSYSTEM: IPC
SUBDIRECTORY: DOCUMENTATION
DOCUMENTATION GROUP: IPC

DESCRIPTION:
---------------------
- IT Waits for one of outstanding requests that are associated with the list of event blocks to be satisfied. The event number associated with the completed request is returned in the event number variable.

ARGUMENTS:
-------------
EVENT-NUMBER = DSPLY [99]
RET-STATUS = DSPLY [X(5)]
NUMBER-OF-EVENT-BLOCKS = DSPLY [99]
MBX-EVENT-BLOCK-01 = RECRD
MBX-EVENT-BLOCK-02 = RECRD

INCLUDE FILES:
---------------------
CHKS T S - CHKSTS.INC -- CHECK STATUS
ERRSTS - ERRSTS.INC -- IISS ERROR CODES
MBEB01 - MBEB01.INC -- MAILBOX EVENT BLOCK DESCRIPTION
MBEB02 - MBEB02.INC -- MAILBOX EVENT BLOCK DESCRIPTION
ERRPRO - PROCESS ERROR INCLUDE FILE

ROUTINES CALLED:
---------------------
SWEVT F - WAIT FOR ONE OF POSSIBLY MANY EVENTS

3-73
ERRPRO - PROCESS ERROR

PS 620143200
1 November 1985

3-74
IPC Module Documentation

NAME: WAIT03
PURPOSE: WAIT FOR AN EVENT TO OCCUR
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: WAIT03
SOURCE FILE TYPE: .COB
HOST: VAX
SUBSYSTEM: IPC
SUBDIRECTORY: DOCUMENTATION
DOCUMENTATION GROUP: IPC

DESCRIPTION:

- IT WAITS FOR ONE OF OUTSTANDING REQUESTS THAT ARE ASSOCIATED WITH THE LIST OF EVENT BLOCKS TO BE SATISFIED. THE EVENT NUMBER ASSOCIATED WITH THE COMPLETED REQUEST IS RETURNED IN THE EVENT NUMBER VARIABLE.

ARGUMENTS:

EVENT-NUMBER = DSPLY [99]
RET-STATUS = DSPLY [X(5)]
NUMBER-OF-EVENT-BLOCKS = DSPLY [99]
MBX-EVENT-BLOCK-01 = RECRD
MBX-EVENT-BLOCK-02 = RECRD
MBX-EVENT-BLOCK-03 = RECRD

INCLUDE FILES:

CHKSTS - CHKSTS.INC -- CHECK STATUS
ERRSTS - ERRSTS.INC -- IISS ERROR CODES
MBEB01 - MBEB01.INC -- MAILBOX EVENT BLOCK DESCRIPTION
MBEB02 - MBEB02.INC -- MAILBOX EVENT BLOCK DESCRIPTION
MBEB03 - MBEB03.INC -- MAILBOX EVENT BLOCK DESCRIPTION
ERRPRO - PROCESS ERROR INCLUDE FILE

ROUTINES CALLED:

3-75
SWEVT - WAIT FOR ONE OF POSSIBLY MANY EVENTS
ERRPRO - PROCESS ERROR
NAME: WRTERR
PURPOSE: WRITE MESSAGE TO MAILBOX
LANGUAGE: VAX-11 FORTRAN
MODULE TYPE: SUBROUTINE
SOURCE FILE: WRTERR
SOURCE FILE TYPE: .FOR
HOST:
SUBSYSTEM: ERR
SUBDIRECTORY: DOCUMENTATION
DOCUMENTATION GROUP: IPC

DESCRIPTION:
-------------
:- ISSUE QIO TO WRITE A MESSAGE TO MAILBOX

ARGUMENTS:
----------

MBXNAM = CHAR
-MAILBOX NAME
BUFLEN = I*2
-MAXIMUM BUFFER LENGTH
INBUF = L*1 (1)
-MESSAGE
RSTATS = CHAR
-RETURN STATUS

INCLUDE FILES:
--------------
ERRSTS.INF - **** PURPOSE NOT FOUND BY STRIPPER ****

ROUTINES CALLED:
-----------------

LIB$FREE_EF
LIB$GET_EF
SYS$ASSIGN
SYS$BININTIM
SYS$DASSGN
SYS$QIOW
SYS$SETIMR
SYS$WAITFR
CALLED DIRECTLY BY:

ERRPRO       - PROCESS ERROR

USED IN MAIN PROGRAM(S):

CNLTIM       - CANCEL A TIMER
CRTMBX       - CREATE A MAILBOX
DELMBX       - DELETE A MAILBOX
GETMSG       - GET A MESSAGE FROM ANOTHER PROGRAM
LOCKEF       - LOCK EVENT FLAG
RCVMSG       - RECEIVE A MESSAGE FROM ANOTHER PROGRAM
RELEVB       - RELEASE A TARGET EVENT BLOCK (CLEAR IT) AND
SETTIM       - START A TIMER
SNDMSG       - SEND A MESSAGE TO ANOTHER PROGRAM
WAIT01       - WAIT FOR AN EVENT TO OCCUR
WAIT02       - WAIT FOR AN EVENT TO OCCUR
WAIT03       - WAIT FOR AN EVENT TO OCCUR
IPC Module Documentation

NAME: WRTMAI
PURPOSE: WRITE THE MESSAGE INTO THE MAILBOX
LANGUAGE: VAX-11 FORTRAN
MODULE TYPE: SUBROUTINE
SOURCE FILE: WRTMAI
SOURCE FILE TYPE: .FOR
HOST: VAX
SUBSYSTEM: IPC
SUBDIRECTORY: DOCUMENTATION
DOCUMENTATION GROUP: IPC

DESCRIPTION:

:- ISSUE QIO TO WRITE A MESSAGE TO MAILBOX

ARGUMENTS:

CHANNL = I*2
-CHANNEL NUMBER
BUFLEN = I*2
-MAXIMUM BUFFER LENGTH
INBUF = L*1 (1)
-MESSAGE
RSTATS = CHAR
-RETURN STATUS

INCLUDE FILES:

--------
ERRSTS.INF - **** PURPOSE NOT FOUND BY STRIPPER ****

ROUTINES CALLED:

--------
ERRPRO - PROCESS ERROR
SYS$QIOW

CALLED DIRECTLY BY:

--------
SNDMSG - SEND A MESSAGE TO ANOTHER PROGRAM
USED IN MAIN PROGRAM(S):

SNDMSG - SEND A MESSAGE TO ANOTHER PROGRAM
3.10.9 Include File Descriptions

The following list contains a purpose and description of each include file listed in 3.10.4 as specified in the source code. The language it is written in is also given.
IPC Include File Description

FILE NAME: CHKSTS
PURPOSE: CHKSTS.INC -- CHECK STATUS
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

-------------
FILE NAME: ERRPRO
PURPOSE: PROCESS ERROR INCLUDE FILE
LANGUAGE: VAX-11 COBOL

DESCRIPTION: 
----------

3-83
IPC Include File Description

FILE NAME: ERRSTS
PURPOSE: ERRSTS.INC -- IISS ERROR CODES
LANGUAGE: VAX-11 COBOL

DESCRIPTION:
---------------------
THIS FILE CONTAINS ALL IISS ERROR CODES DEFINED IN COBOL FORMAT
IPC Include File Description

FILE NAME: KIPC
PURPOSE: KIPC.INC -- CONSTANT BLOCK FOR IPC PRIMITIVES
LANGUAGE: VAX-11 COBOL

DESCRIPTION:
---------------
THIS FILE CONTAINS ALL CONSTANT DATA ITEMS
USED IN THE IPC PRIMITIVES.
IPC Include File Description

FILE NAME: MBEBO1
PURPOSE: MBEBO1.INC -- MAILBOX EVENT BLOCK DESCRIPTION
LANGUAGE: VAX-11 COBOL

DESCRIPTION:
------------
IPC Include File Description

FILE NAME: MBEB02
PURPOSE: MBEBO2. INC -- MAILBOX EVENT BLOCK DESCRIPTION
LANGUAGE: VAX-11 COBOL

DESCRIPTION:
--------------
IPC Include File Description

FILE NAME: MEB03
PURPOSE: MEB03.INC -- MAILBOX EVENT BLOCK DESCRIPTION
LANGUAGE: VAX-11 COBOL

DESCRIPTION:
-------------
IPC Include File Description

FILE NAME: MBXEBK
PURPOSE: MBXEBK.INC -- MAILBOX EVENT BLOCK DESCRIPTION
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

--------------------
IPC Include File Description

FILE NAME: TIMREB
PURPOSE: TIMREB.INC -- TIME EVENT BLOCK DESCRIPTION
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

-----------
3.10.10 Hierarchy Chart

The following hierarchy charts show the relationships between all of the modules mentioned in the above documentation. A module may call a subroutine several times within its code, but the call will only be shown once as a single relationship on this hierarchy chart. All modules shown at the top of the first page are considered Main Programs as described in section 3.10.1 above.

There is an internal paging scheme as marked by the numbers in the upper right corner of each page. An index after the last page of the chart shows where a routine and its calls are first defined. If a routine has no page reference, it either makes no calls or is an external routine. A continuation box on the end of a tree limb shows where that the tree continues on the page numbered mentioned. A number in a box with a routine name points to the page where the routine is further defined within the hierarchy tree. If there is no number in a box, the routine either makes no calls or is an external routine.
PS 620143200
1 November 1985

+-------+
| WAIT01 |
+-------+

+-------+
| SWEVT1 |
+-------+ +-------+
| ERRPRO |
+-------+ +-------+

+-------+
| ERRPRO |
+-------+ +-------+
| 7+LIB$FREE_EF |
+-------+ +-------+
| SYS$CLREF |
+-------+ +-------+
| SYS$WFLOR |
+-------+ +-------+

3-104
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3.11 **Program Listings Comments**

This information is contained in the Module Descriptions in section 3.10.
SECTION 4
QUALITY ASSURANCE PROVISIONS

4.1 Introduction and Definitions

"Testing" is a systematic process that may be preplanned and explicitly stated. Test techniques and procedures may be defined in advance, and a sequence of test steps may be specified. "Debugging" is the process of isolation and correction of the cause of an error.

"Antibugging" is defined as the philosophy of writing programs in such a way as to make bugs less likely to occur and when they do occur, to make them more noticeable to the programmer and the user. In other words, as much error checking as is practical and possible in each routine should be performed.

4.2 Computer Programming Test and Evaluation

The quality assurance provisions for test consists of the normal testing techniques that are accomplished during the construction process. They consist of design and code walk-throughs, unit testing, and integration testing. These tests are performed by the design team. Structured design, design walk-through and the incorporation of "antibugging" facilitate this testing by exposing and addressing problem areas before they become coded "bugs."

4-1
END
8-87
DTIC