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GEOMETRIC MODELING APPLICATIONS INTERFACE PROGRAM

GMAP/PDDI SYSTEM COMPONENT PRODUCT SPECIFICATION (AS BUILT)

VOL. III - Model Access Software Listings

United Technologies Corporation
Pratt and Whitney
Government Products Division
P.O. Box 9600
West Palm Beach, Florida 33410-9600

NOVEMBER 1990

Final Report For Period August 1985 - March 1989

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MANUFACTURING TECHNOLOGY DIRECTORATE
WRIGHT RESEARCH AND DEVELOPMENT CENTER
AIR FORCE SYSTEMS COMMAND
WRIGHT-PATTERSON AIR FORCE, OHIO 45433-6533
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This technical report has been reviewed and is approved for publication.

Charles Gilman
Project Manager

Walter H. Reimann, Chief
Computer-Integrated Mfg. Branch

FOR THE COMMANDER

BRUCE A. RASMUSSEN
Chief, Integration Technology Division
Manufacturing Technology Directorate

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**Geometric Modeling Applications Interface Program (GMAP)**

This "As-Built" Product Specification establishes the "as-built" Computer Program Configuration Item (CPCI) identified as the GMAP/PDDI System Components under U.S. Air Force Contract F33615-85-C-5122. It includes descriptions of the structure, functions, language, database requirements, interfaces, and quality assurance provisions of the primary GMAP system components: the System Translator, Model Access Software with Name/Value Interface, and the Schema Manager.
18. Subject Terms (Continued)
   Product Life Cycle
   Engineering
   Manufacturing
   Interface
   Exchange Format
   CAD
   CAM
   CIM
   IBIS
   RFC
   System Translator
   Schema Manager
   Model Access Software
   Name/Value Interface
FOREWORD

This As-built Product Specification, divided into four volumes, covers work performed under Air Force Contract F33615-85-C-5122, Geometric Modeling Applications Interface Program (GMAP), covering the period 1 August 1985 to 31 March 1989. The document addresses the GMAP/PDDI System Components developed or enhanced under this contract which is sponsored by the Computer Integrated Manufacturing Branch, Materials Laboratory, Air Force Systems Command, Wright Air Force Base, Ohio 45433-6533. The GMAP Project Manager for the Air Force is Mr. Charles Gilman.

The primary contractor is Pratt & Whitney, an operating unit of United Technologies Corporation. Mr. Richard Lopatka is managing the GMAP project at Pratt & Whitney. Ms. Linda Phillips is the Program Integrator. Mr. John Hamill is the Deputy Program Manager.

McDonnell Aircraft Company was the subcontractor responsible for the PDDI System Component work. Mr. Jerry Weiss is the GMAP Program Manager at McDonnell Aircraft and Mr. Herb Ryan is the Deputy Program Manager.

Volume III of this Product Specification provides the Model Access Software with Name/Value Interface routine listings.

NOTE: The number and date in the upper right corner of each page in this document indicate that it has been prepared in accordance to the ICAM CM Life Cycle Documentation requirements for a Configuration Item (CI).
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DELPNLA - Deletes all non-"locked" APPL lists after a specified position in the LIST_OF_LISTS.

DELRLSM - Removes an entity from a system list.

DELRUL - Deletes an entity according to the delete rules.

DELTLSCH - Disconnects an internal item from the correct portion of the NDS superstructure.

DELTLSM - Removes the last non-vacant entity reference in a list.

DETCNST - Checks deletability of entity's constituents.

DETRUL - Tests delete of an entity according to the delete rules.

DIFLSM - Creates a system's list consisting of all entities in LIST1 that are not in LIST2.

DISPCRB - Disposes of CRB.

DISPEMM - Releases all space allocated to an entity.

DISPLSM - Deletes space allocated to a system list.

DISPNM - Removes all entities from the list and free the allocated space.

ELDNM - Creates a list with all duplicate entities eliminated.

ELMNODM - Returns an ENTBLOCK corresponding to a key.

EXCRBE - Exchanges two entries in the CRB.

EXPCLSM - Expands list with all of its constituents and places this expanded list in LISTOUT.

EXPCRBE - Expands the CRB.

EXPINDEX - Expands a system UDL.

EXPULSM - Places the expanded list with all of its users in LISTOUT.

FDSCH - Finds a Schema_Instance_Collector or Schema_Class entity on the specified Schema_Root's constituent list.

FNDCRBE - Finds a specific entry in the CRB.

FNDSKIND - Builds an array of kind value collected by a class or instance collector in the schema.

GTCRBE - Gets an entry in the CRB.

INDLSM - Locates an entity in a system list.

INITMGRA - Initializes the memory manager.

INNM - Indicates whether a list references an entity.

INTLSTM - Creates a list which is the intersection of two lists.

LSTLNMM - Returns the number of non-vacant entities in a system list.

LSTMXLNM - Returns the number of entries allocated to a system list.

MABRST - Reset the process and application flags for all entities.

MACPD - Update a specified application flag for the constituents of an entity or list of entities.

MAEA - Activates an entity.

MAEAI - Activates an entity or a list of entities and their inclusive constituents.

MAEAV - Finds the present value of the activation setting for an entity.

MAEC - Creates an application list of constituent entities.

MAECI - Creates an application list of inclusive constituent entities.
MAECIK - Creates a list of inclusive constituents by kind.
MAECMP - Determines which of it's constituents an entity compresses with.
MAECQY - Determines if an entity's user should compress with it.
MAECR - Creates an entity.
MAECRN - Create an entity with a constituent list of a given size.
MAECTK - Returns the number of "KIND" values in the WF model.
MAECXQ - Execute a procedure on a list, creating an output list.
MAED - Deletes an entity or list of entities.
MAEDI - Deletes inclusively an entity or list of entities.
MAEDT - Tests delete an entity or list of entities.
MAEDTI - Tests for inclusive deletion of an entity or list of entities and their direct and indirect constituents.
MAEDTS - Tests delete an entity or list of entities, and return three lists.
MAEGKN - Retrieves the KIND value of an entity.
MAEGTK - Retrieves the entity block which corresponds to KEYE.
MAEKND - Returns a "KIND" value from the list of KINDS in the WF model.
MAERST - Reset the specified flag in all entities in the WF model.
MAESCI - Set or reset the process flag for the inclusive constituents of an entity or list of entities.
MAESVL - Finds the current binary switch setting of an entity.
MAESWA - Sets the process bit "off" in all entities in the model.
MAESWT - Sets an entity switch or the switches for each entity in a list as requested by the user.
MAEU - Creates a list of user entity references.
MAEUD - Updates the entity block corresponding to a key.
MAEUI - Creates an application list of inclusive user entities.
MAEUIK - Creates a list of inclusive users by kind.
MAEUSR - Determines if an entity has any users.
MAEUXQ - Executes a procedure on the users of an entity.
MAEXEQ - Executes a procedure on an entity, or a list of entities.
MAINIT - Initializes the MAS network.
MAKCNT - Determines the number of entities of a specified kind in the WF model.
MAKILL - Deletes the WF model.
MAKXEQ - Executes a procedure on all entities of a specified kind.
MAL - Creates an empty list.
MALAND - Creates an application list of entities common to two input lists.
MALATC - Appends an entity of list (LIST2) to an entity or list (KEY1).
MALCPY - Makes a copy of a list.
MALD - Deletes an application list.
MALDA - Deletes all application lists that are not "locked".
MALDI - Deletes an application list and all lists after it that are not locked.
MALFND - Finds the position of an entity (KEY2) in an application list (KEY1).
MALGTK - Gets the Nth key from the list.
MALINS - Inserts an entity or list into a list.
MALK - Creates a list of all entities of a specified kind.
MALKC - Creates a list of constituents of a specified kind.
MALKL - Creates a list of entity kinds which are found within another list.
MALKU - Create a list of users of a specified kind.
MALN - Creates an empty list of a specified size.
MALNO - Counts the entities on the list.
MALNOT - Creates an application list of entities in KEY1 but not in KEY2.
MALOCK - Sets an application list for delete or non-delete status.
MALOR - Creates an application list from a BOOLEAN "OR" on two input lists.
MALRD - Reads the next entry in a directed list.
MALRDE - Removes duplicate entries in a list.
MALREP - Replaces a list.
MALRMV - Removes an entity from a list.
MALKOR - Reorders an application list in user-constituent order.
MALKORI - Put the application list in inclusive user to constituent order.
MALRPL - Replaces an entity in a list.
MALRRI - Put the application list in inclusive user to constituent order.
MALKOC - MAS memory management runtime.
MASDSP - Disposes of a MAS dynamically allocated memory area.
MASMSZ - Returns the actual model space used and the amount of the free space in the allocated memory blocks of the model.
MASNEW - Allocates a new dynamic memory area for MAS elements.
MASOVR - MAS Memory management runtime.
MAUPDT - Update the specified flag for an entity.
MIDBD - Deletes an entity without checking delete rules.
MIDBRV - Removes an entity from a list without checking delete rules.
MOVR - Moves entities between system lists.
MRGTLSM - Concatenates the entities in LIST2 to LIST1.
MRGTNM - Concatenates the entities in LIST2 to LIST1.
MRKNM - Marks the stack of lists so that the next release list will only destroy lists created after this mark operation.
MRSCR - Store a run-time subschema entry for the specified entity kind.
MSINIT - Initialize the Working Form with a specified minimum size.
MSTART - Generates start statistics.
MSTOP - Generates stop statistics.
NDSCHM - Defines dummy program.
NDSFCT - Computes the amount of used model space and the amount of free space in the allocated memory blocks.
NDSGBM - Dummy procedure for compile time initialization of NDS global area.
NDSRML - Releases all memory blocks allocated to the WF.
NEWCRB - Creates a CRB.
NEWEMM - Creates a new NDS object.
NEWIIM - Creates a new entity and copies into it the application ENTDATA.
NEWLSM - Initializes LISTREF and allocates enough space to hold size entities.
NEWNDM - Creates a new empty model in memory.
NEWNM - Creates an empty application list.
NEWNMM - Create an empty application list without adding it to the list of lists.
NEWNODE - Creates a new entity in the NDS and copies into it the application ENTDATA.
NEWNSI - Creates an empty schema instance collector attached to the schema root.
NEWNSR - Creates a new null schema root and attaches it to the NDS.
NEWSADB - Creates a new application data block.
NEWSCHI - Creates an empty schema instance collector entity attached to the schema root.
NEWSCHR - Creates an empty root collector entity attached to the NDS.
NODECNM - Creates a list which contains a copy of the entity's constituent list.
NODECNN - Create a copy of the entity's constituent list without adding it to the list of lists.
NODEUNM - Creates a list which contains a copy of the entity's user list.
OCOUNT - MAS memory management runtime.
ORDRLST - Reorders an application list.
ORDRLSTI - Put the application list in inclusive user to constituent order.
OSTART - MAS memory management runtime.
PASASM - Links to a user defined procedure.
RDLSM - Reads a system list as a first-in first-out order.
RDRLSM  - Reads the last entity key from LISTREF.
RDTLSM  - Reads the last entity key from LISTREF.
REVAADB - Assigns the value of a system UDB to an application ENTBLOCK.
REVNODM - Revises an entity's user data block.
REVRLSM - Changes an entity in a system list.
REVSADB - Replaces the value of a system ENTBLOCK with the value of ENTDEF.
RLSNM   - Releases all the lists on the current list of lists.
RSTLSM  - Resets position to indicate the beginning of a list.
RSTSFLG - Resets the requested position in the internal MAS process flag (MAPROB) in the IIT to the requested BOOLEAN value.
RVRLSM  - Copies an application list in the reverse order.
SETRULS - Sets delete flags according to user's dependence and strength rules.
SORTDLST- Gives an application list of entities to be deleted, DEL_LST returns a system list sorted in user_constituent order in SRT_LST.
SORTLSM - Sorts a system list.
SRTBYCNT - Creates an application list of inclusive constituents in constituent-user order.
UPDCRBE - Updates an entry in the CRB.
VERAPN  - Verifies legality of appending an entity or list of entities (KEY2) to an entity or list of entities (KEY1).
VERCN   - Verifies legality of connecting each entity on a list of users to each entity on a list of constituents.
VERCR   - Verifies legality of creating an entity with the user-supplied entity data block and list of constituents.
VERDEL  - Verifies legality of deleting an entity.
VERGT   - Verifies legality of retrieving an entity with the user-supplied entity key.
VERUD   - Verifies legality of updating an entity with the user-supplied entity key using the user-supplied entity data block and list of constituents.
XIEMM   - Deletes an entity.
3.10.2.2 Listings

(* %include adcrbm *)
(**)
PROCEDURE ADCRBM(VAR CRB:CRBPTR; CONST EKEY:ENTKEY;
CONST POS:LISTPSTN; CONST DIR:LISTDIR; VAR RR:RET_REC);EXTERNAL;
(**)
(*-------------------------------------------------------------------*)
(*)
(* AUTHOR: B. A. ULMER FRMI CREATED: 85/02/07 CC??*)
(* VERSION: XXXX REVISED: YY/MM/DD CC *)
(*)
(* FUNCTION: *)
(* ADD A NEW CRB ENTRY *)
(*)
(* ENVIRONMENT: *)
(* IBM PASCAL LANGUAGE *)
(* IBM 30XX, 43XX DEPENDENT CODE, OR OTHER APPROPRIATE H/W. *)
(*)
(* EXECUTION PROCEDURE: *)
(* HOW IS THIS ROUTINE/MODULE TO BE EXECUTED. *)
(*)
(* DESCRIPTION OF ARGUMENTS: *)
(* NAME I/O DESCRIPTION *)
(* CRB I/O CONSTITUENT READ BLOCK ADDRESS *)
(* EKEY I ENTITY CONTAINING THE CONSTITUENT LIST BEING *)
(* READ *)
(* POS I LIST POSITION SETTING *)
(* DIR I DIRECTION TO READ THE LIST (FORWARD OR REVERSE)*)
(* RR 0 ERROR CONDITION RETURN CODE *)
(* = 0 OK RETURN CODE *)
(* = 1 YOU BLEW IT *)
(* = 2 THE ROUTINE BLEW IT *)
(*)
(* COMMONS: *)
(* COM1 *)
(* VAR1 I VAR1 NAME MUST BE FILLED, CHARACTER DATA *)
(* MUST BE PROVIDED *)
(* VAR2 I VAR2 MUST BE SPECIFIED *)
(* COM2 *)
(* VAR3 I CHARACTER DATA MUST BE SPECIFIED *)
(*)
(* PROCESSING DESCRIPTION: *)
(* DETAILED DESCRIPTION OF HOW THIS ROUTINE WORKS, WHICH *)
(* FILES NEED TO BE OPENED/CLOSED, FILES USED, ETC. *)
(*)

3-631
(* COMMENTS: *
(* TEXT OF ANY FURTHER COMMENTS WHICH MIGHT HELP TO UNDERSTAND *)
(* THE FUNCTION/EXECUTION OF THIS ROUTINE. *)
(* CHANGE CONTROL: *)
(* YY/MM/DD CCZZ I. M. THECHANGER *)
(* DESCRIPTION OF LATEST CHANGE MADE. *)
(* YY/MM/DD CCYY I. M. THEPROGRAMMER *)
(* DESCRIPTION OF CHANGE MADE. IF LENGTHY, CONTINUE THE *)
(* NARRATION ON THE NEXT LINE. *)
(* YY/MM/DD CCXX I. M. APERSON *)
(* DESCRIPTION OF FIRST CHANGE MADE. *)
(* *)
(*------------------------------------------------------------*)
(**)
(* END %INCLUDE ADCRBM *)

(* %INCLUDE ADRLSM. *)

PROCEDURE ADRLSM(CONST INCREMENT:LISTSIZE;CONST POSITION:LISTPSTN; CONST KEYE:ENTKEY;VAR LISTREF:LISTPNTR;VAR RR:RET_REC);EXTERNAL;

(*--------------------------------------------------------------------*)
(*
(* $FUNCTION:
(* ADD AN ENTITY AFTER A RELATIVE POSITION IN A SYSTEM LIST.
(* A POSITION OF ZERO INDICATES THE TOP OF THE LIST. IF THE
(* LIST REQUIRES EXPANSION TO HOLD THE NEW ENTITY, IT IS
(* EXPANDED BY INCREMENT ENTRIES.
(*
(* $DESCRIPTION OF ARGUMENTS:
(*
<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>INCREMENT</td>
<td>I</td>
<td>NUMBER OF ENTITIES BY WHICH A LIST IS EXPANDED AT A TIME</td>
</tr>
<tr>
<td>POSITION</td>
<td>I</td>
<td>RELATIVE POSITION AFTER WHICH THE NEW ENTRY IS ADDED</td>
</tr>
<tr>
<td>KEYE</td>
<td>I</td>
<td>ENTITY TO BE ADDED.</td>
</tr>
<tr>
<td>LISTREF</td>
<td>O</td>
<td>POINTER TO THE SYSTEM LIST TO WHICH KEYE WAS ADDED</td>
</tr>
<tr>
<td>RC</td>
<td>O</td>
<td>EXTERNAL RETURN CODE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>= 0 OK RETURN CODE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>= 1 YOU BLEW IT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>= 2 THE ROUTINE BLEW IT</td>
</tr>
</tbody>
</table>
(*
(* $COMMONS:
(*
(* $ENVIRONMENT:
(* LANGUAGE: IBM PASCAL
(* HARDWARE SYSTEM: IBM 360/370/4341/4381
(*
(* $EXECUTION PROCEDURE:
(* INTERNAL PROCEDURE FOR THE MODEL ACCESS SOFTWARE
(*
(* $PROCESSING DESCRIPTION:
(* ADDS KEYE TO THE SYSTEM LIST LISTREF AT POSITION AFTER THE RELATIVE POSITION GIVEN
(*
(* $COMMENTS:
(*
(* $CHANGE CONTROL:
(*
<table>
<thead>
<tr>
<th>REVISED: 12/30/85</th>
<th>B. A. ULMER</th>
<th>FRMI</th>
</tr>
</thead>
</table>

3-633
(* ADD PROCESSING FOR LARGE LISTS *)
(* REVISED: 12/24/84 R. A. MCCLUSKEY FRMI *)
(* ADDED SYSTEM LIST CURRENT LENGTH INDICATOR -- LSTLN M *)
(* REVISED: 10/01/84 E. D. SHREVE FRMI *)
(* CORRECT THE MOVE OF ENTRIES FROM OLD TO NEW LIST WHEN OLD LIST *)
(* MUST BE EXPANDED *)
(* %INCLUDE ADSCH. *)

PROCEDURE ADSCH(CONST KEYE:ENTKEY;VAR RR:RET_REC);EXTERNAL;

(* $FUNCTION: (*)
CONNECT AN INTERNAL ITEM TO THE CORRECT PORTION OF THE
NDS SUPERSTRUCTURE.

(* $DESCRIPTION OF ARGUMENTS: *)

NAME I/O DESCRIPTION
==== === ===============
SCH_ROOT I KEY OF THE SCHEMA_ROOT TO WHICH THE
INTERNAL ITEM WILL BE ATTACHED
KEYE I KEY OF THE INTERNAL ITEM TO BE ATTACHED
RR O EXTERNAL RETURN CODE
    =0 OK
    >0 CRITICAL ERROR
    <0 WARNING

(* $COMMONS: *)

(* $ENVIRONMENT: *)
LANGUAGE: IBM PASCAL
HARDWARE SYSTEM: IBM 360/370/4341/4381

(* $EXECUTION PROCEDURE: *)
INTERNAL PROCEDURE FOR THE MODEL ACCESS SOFTWARE

(* $PROCESSING DESCRIPTION: *)
DESCRIPTION OF HOW THIS ROUTINE WORKS (INTERNAL ACTIONS)

(* $COMMENTS: *)

(* $CHANGE CONTROL: *)
REVISED: 06/19/86 B. A. ULMER FRMI
CHANGE CALLING PARAMETERS TO CRURUL - NEW DELETE RULES

REVISED: 09/09/85 B. A. ULMER FRMI
ADD TWO NEW PARAMETERS TO FNDURUL

REVISED: 02/18/85 B. A. ULMER FRMI
CHANGED STRUCTURE OF THE INTERNAL ITEM FOR IMPLEMENTATION OF THE CRB

3-635
(* REVISED: 10/04/84 E. D. SHREVE FRMI *)
(* TO CHANGE LIST INCREMENT WHEN ADDING TO THE INSTANCE COLLECTOR *)
(* CONSTITUENT LIST *)
(* *)
(* REVISED: 05/14/84 E. D. SHREVE FRMI *)
(* TO RESET THE SCH_INST 'KIND' TO 'SCH_INST' AFTER THE ENTITY *)
(* KIND IS PUT INTO THE STANDARD ARRAY OF THE SCHEMA_ROOT *)
(* )
(* %INCLUDE ADSCHR. *)

PROCEDURE ADSCHR(CONST KEYE:ENTKEY;VAR POSITION:LISTPSTN;
VAR RR:RET_REC);EXTERNAL;

(*---------------------------------------------------------------*)
(* */
(* FUNCTION */
(* CONNECT AN INTERNAL ITEM TO THE SCHEMA ROOT. */
(* */
(* LANGUAGE */
(* PASCAL. */
(* */
(* PACKAGE */
(* SCHEMA PACKAGE. */
(* */
(* ARGUMENTS */
(* INPUT */
(* KEYE - KEY OF THE INTERNAL ITEM TO BE ATTACHED. */
(* OUTPUT */
(* POSITION - RELATIVE POSITION OF THIS SCHEMA INSTANCE */
(* OR CLASS ENTITY IN THE SCHEMA ROOT'S */
(* CONSTITUENT LIST. */
(* RR - THE FUNCTION RETURN RECORD. */
(* */
(*---------------------------------------------------------------*)
(**/
(* END %INCLUDE ADSCHR. *)
(* %INCLUDE ADTLSM. *)
(*)
PROCEDURE ADTLSM(CONST INCREMENT:LISTSIZE;CONST KEYE:ENTKEY;
       VAR LISTREF:LISTPNTR;VAR RR:RET_REC);EXTERNAL;
(*)
(*FUNCTION
(*   ADD AN ENTITY TO A SYSTEM LIST. IF LISTREF IS NIL, THEN
(*   THE LIST IS EMPTY. IF NO ROOM IS AVAILABLE, THEN THE LIST
(*   IS EXPANDED BY INCREMENT ENTITIES.
(*)
(*LANGUAGE
(*  PASCAL.
(*)
(*PACKAGE
(*  LIST PACKAGE.
(*)
(*ARGUMENTS
(*  INPUT
(*   INCREMENT - THE NUMBER OF ENTITIES BY WHICH A LIST IS
(*     EXPANDED AT A TIME.
(*   KEYE - KEY OF THE ENTITY TO BE ADDED.
(*   LISTREF - A POINTER TO A SYSTEM LIST.
(*  OUTPUT
(*   LISTREF - POINTER TO THE SYSTEM LIST TO WHICH KEYE
(*     WAS ADDED.
(*   RR - THE FUNCTION RETURN RECORD.
(*)
(*END %INCLUDE ADTLSM.*)
(* %INCLUDE ADTNM *)

PROCEDURE ADTNM(CONST KEYE:ENTKEY;VAR KEYL:LISTKEY;
                 VAR RR:RET_REC);EXTERNAL;

(*----------------------------------------------------------------*)
(* AUTHOR: UNKNOWN CADD CREATED: YY/MM/DD CC *)
(* VERSION: MAS VER 2 REVISED: 84/10/11 CC *)

(* FUNCTION: *)
(* ADD AN ENTITY TO THE END OF AN APPLICATION LIST. *)

(* ENVIRONMENT: *)
(* IBM PASCAL LANGUAGE *)
(* IBM 30XX, 43XX, DEC VAX 11/780 *)

(* DESCRIPTION OF ARGUMENTS: *)
(* NAME I/O DESCRIPTION *)
(* KEYE I KEY OF ENTITY TO BE ADDED. *)
(* KEYL I KEY OF THE APPLICATION LIST TO WHICH THE *)
(* ENTITY IS ADDED. *)
(* KEYL O THE KEY OF THE LIST WITH THE ENTITY ADDED TO *)
(* THE END. *)
(* RR O ERROR CONDITION RETURN CODE. *)
(* = 0 NORMAL RETURN CODE. *)

(* COMMONS: *)

(* PROCESSING DESCRIPTION: *)

(* COMMENTS: *)

(* CHANGE CONTROL: *)
(* 84/10/11 MAS VER 2 D. J. KERCHNER *)
(* UPDATED DOCUMENTATION. *)
(* 84/10/04 MAS VER 2 E. D. SHREVE *)
(* CHANGED DECLARATION OF KEYL TO VAR. *)

(*----------------------------------------------------------------*)

(* END %INCLUDE ADTNM *)

3-639
(* %INCLUDE BIGCREMM. *)

PROCEDURE BIGCREMM(CONST KEYEU:ENTKEY;CONST KEYEC:ENTKEY;
       CONST NUM:INTEGER;VAR RR:RET_REC);EXTERNAL;

(*---------------------------------------------------------------------*)
(* FUNCTION                                *)
(* CREATE A USER-CONSTITUENT RELATION BETWEEN ENTITIES            *)
(* WITH A CONSTITUENT LIST OF A GIVEN SIZE.                      *)
(* LANGUAGE                                           *)
(* PASCAL.                                              *)
(* PACKAGE                                             *)
(* ENTITY PACKAGE.                                      *)
(* ARGUMENTS                                           *)
(* INPUT                                              *)
(* KEYEU      - KEY OF ENTITY TO BE THE USER.              *)
(* KEYEC      - KEY OF ENTITY TO BE THE CONSTITUENT.        *)
(* NUM        - LENGTH OF THE CONSTITUENT LIST.            *)
(* OUTPUT                                             *)
(* RR        - THE FUNCTION RETURN RECORD.                 *)
(*---------------------------------------------------------------------*)

(* END %INCLUDE BIGCREMM. *)
/* %INCLUDE CHKDEL */

PROCEDURE CHKDEL(CONST KEYE:ENTKEY; VAR TEMPDELLIST:LISTPNTR;
                             VAR MARKLIST:LISTKEY; VAR RR:RETREC);EXTERNAL;

(* $FUNCTION:

CHECK DELETABILITY OF A GIVEN ENTITY BASED ON THE RELATIONSHIP BETWEEN ITS USERS AND ITSELF

$DESCRIPTION OF ARGUMENTS:

<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEYE</td>
<td>I</td>
<td>ENTITY WHOSE DELETABILITY IS TO BE CHECKED</td>
</tr>
<tr>
<td>TEMPDELLIST</td>
<td>I/O</td>
<td>LIST WHICH CONTAINS ENTITIES THAT ARE ELIGIBLE FOR DELETE</td>
</tr>
<tr>
<td>MARKLIST</td>
<td>I/O</td>
<td>LIST WHICH CONTAINS ENTITIES THAT ARE MARKED</td>
</tr>
<tr>
<td>RR</td>
<td>O</td>
<td>RETURN CODE</td>
</tr>
</tbody>
</table>

$COMMONS:

$ENVIRONMENT:

LANGUAGE: IBM PASCAL
HARDWARE SYSTEM: IBM 360/370/4341/4381

$EXECUTION PROCEDURE:
INTERNAL PROCEDURE FOR THE MODEL ACCESS SOFTWARE

$PROCESSING DESCRIPTION:

$COMMENTS:

$CHANGE CONTROL:

3-641
(* INCLUDE CHKTDEL *)

PROCEDURE CHKTDEL(CONST KEYE:ENTKEY; VAR MARKLIST:LISTKEY; 
VAR TEMP_DEL_LIST:LISTKEY; VAR RR:RET_REC);EXTERNAL;

(*$FUNCTION:
CHECK DELETABILITY OF A GIVEN ENTITY BASED ON THE RELATIONSHIP BETWEEN ITS USERS AND ITSELF

(*$DESCRIPTION OF ARGUMENTS:

<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEYE</td>
<td>I</td>
<td>ENTITY WHOSE DELETABILITY IS TO BE CHECKED</td>
</tr>
<tr>
<td>MARK_LIST</td>
<td>I/O</td>
<td>LIST WHICH CONTAINS ENTITIES THAT ARE TO BE MARKED</td>
</tr>
<tr>
<td>TEMP_DEL_LIST</td>
<td>I/O</td>
<td>LIST WHICH CONTAINS ENTITIES THAT ARE ELIGIBLE</td>
</tr>
</tbody>
</table>

(*$COMMONS:

(*$ENVIRONMENT:

LANGUAGE: IBM PASCAL
HARDWARE SYSTEM: IBM 360/370/4341/4381

(*$EXECUTION PROCEDURE:
INTERNAL PROCEDURE FOR THE MODEL ACCESS SOFTWARE

(*$PROCESSING DESCRIPTION:

(*$COMMENTS:

(*$CHANGE CONTROL:

3-642
(* %INCLUDE CMPCRB *)

PROCEDURE CMPCRB(VAR CRB:CRBPTR; VAR RR:RET_REC);EXTERNAL;

(*-----------------------------------------------------------------------*)

(*
* AUTHOR: B. A. ULMER FRMI CREATED: 85/02/08 CC??*)
(* VERSION: XXXX REVISED: YY/MM/DD CC *)

(* FUNCTION: *)
(* COMPREE THE CRB *)

(* ENVIRONMENT: *)
(* IBM PASCAL LANGUAGE *)
(* IBM 30XX, 43XX DEPENDENT CODE, OR OTHER APPROPRIATE H/W. *)

(* EXECUTION PROCEDURE: *)
(* HOW IS THIS ROUTINE/MODULE TO BE EXECUTED. *)

(* DESCRIPTION OF ARGUMENTS: *)
(* NAME I/O DESCRIPTION *)
(* CRB I/O CONSTITUENT READ BLOCK ADDRESS *)
(* RR 0 ERROR CONDITION RETURN CODE *)
(* = 0 OK RETURN CODE *)
(* = 1 YOU BLEW IT *)
(* = 2 THE ROUTINE BLEW IT *)

(* COMMONS: *)
(* COM1 *)
(* VAR1 I VAR1 NAME MUST BE FILLED, CHARACTER DATA *)
(* VAR2 I VAR2 MUST BE SPECIFIED *)
(* COM2 *)
(* VAR3 I CHARACTER DATA MUST BE SPECIFIED *)

(* PROCESSING DESCRIPTION: *)
(* DETAILED DESCRIPTION OF HOW THIS ROUTINE WORKS, WHICH *)
(* FILES NEED TO BE OPENED/CLOSED, FILES USED, ETC. *)

(* COMMENTS: *)
(* TEXT OF ANY FURTHER COMMENTS WHICH MIGHT HELP TO UNDERSTAND*)
(* THE FUNCTION/EXECUTION OF THIS ROUTINE. *)

(* CHANGE CONTROL: *)
(* YY/MM/DD CCZZ I. M. THECHANGER *)
(* DESCRIPTION OF LATEST CHANGE MADE. *)
(* YY/MM/DD CCYY I. M. THEPROGRAMMER *)
(* DESCRIPTION OF CHANGE MADE. IF LENGTHY, CONTINUE THE *)
(* NARRATION ON THE NEXT LINE. *)
(* YY/MM/DD CCXX I. M. APERSO *)
(* DESCRIPTION OF FIRST CHANGE MADE. *)
(* *)
(*-----------------------------------------------*)
(**)
(* END %INCLUDE CMPCR *)
(* %INCLUDE CNNODM. *)

PROCEDURE CNNODM(CONST KEYEU:ENTKEY;CONST KEYEC:ENTKEY;
VAR RR:RET_REC);EXTERNAL;

(*-----------------------------------------------*)
(*  *  *)
(*  FUNCTION*)
(*  *  *)
(*  CONNECT TWO ENTITIES. *)
(*  *  *)
(*  LANGUAGE *)
(*  PASCAL. *)
(*  *  *)
(*  PACKAGE *)
(*  ENTITY PACKAGE. *)
(*  *  *)
(*  ARGUMENTS *)
(*  *  *)
(*  INPUT *)
(*  KEYEU - THE KEY OF THE ENTITY TO BE THE USER. *)
(*  KEYEC - THE KEY OF THE ENTITY TO BE THE CONSTITUENT. *)
(*  OUTPUT *)
(*  RR - THE FUNCTION RETURN CODE. *)
(*  *  *)
(*-----------------------------------------------*)
(*  *  *)
(* END %INCLUDE CNNODM. *)
PROCEDURE CNNODMN(CONST KEYEU:ENTKEY; CONST KEYEC:ENTKEY;
VAR NUM:INTEGER;VAR RR:RET_REC);EXTERNAL;

FUNCTION
CONNECT TWO ENTITIES AND CREATE A CONSTITUENT LIST OF A
GIVEN SIZE

LANGUAGE
PASCAL.

PACKAGE
ENTITY PACKAGE.

ARGUMENTS
INPUT
KEYEU  - THE KEY OF THE ENTITY TO BE THE USER.
KEYEC  - THE KEY OF THE ENTITY TO BE THE CONSTITUENT.
OUTPUT
RR    - THE FUNCTION RETURN CODE.

(* END %INCLUDE CNNODMN. *)

3-646
PROCEDURE CNVOSP(VAR RR:RET_REC;CONST ID:INTEGER;  
CONST THIS_ROUTINE:PGMNAME; VAR RC:EXT_RET_CODE);EXTERNAL;

(*%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%***)

(* $FUNCTION: *)
(* CONVERT THE OUT OF CORE SPACE CONDITION TO A APPLICATION USER RECOGNIZABLE FORM *)

(* DESCRIPTION OF ARGUMENTS: *)
(* NAME  I/O  DESCRIPTION *)
(*======  ===  ============== *)
(* RR    I    RETURN RECORD TO BE CONVERTED *)
(* ID    I    INTEGER ID OF THE MAS INTERFACE ROUTINE *)
(* THIS_ROUTINE  I  CHARACTER REPRESENTATION OF THE INTERFACE ROUTINE *)
(* RC    O    EXTERNAL RETURN CODE *)
(* = 0  OK *)
(* > 0  CRITICAL ERROR *)
(* < 0  WARNING *)

(* COMMONS: *)

(* $ENVIRONMENT: *)
(* LANGUAGE: IBM PASCAL *)
(* HARDWARE SYSTEM: IBM 360/370/4341/4381 *)

(* $EXECUTION PROCEDURE: *)
(* INTERNAL PROCEDURE FOR THE MODEL ACCESS SOFTWARE *)

(* $PROCESSING DESCRIPTION: *)
(* CONVERTS THE OUT OF CORE SPACE CONDITION TO APPLICATION USER RECOGNIZABLE FORM *)

(* $COMMENTS: *)

(* $CHANGE CONTROL: *)

3-647
(* %INCLUDE CNVRR. *)

PROCEDURE CNVRR(CONST RR:RET_REC;CONST PGM_ID:INTEGER;
    CONST PGM_NAME: PGMNAME; VAR RC:EXT_RET_CODE);EXTERNAL;

(* $FUNCTION:
    * GET THE EXTERNAL RETURN CODE CORRESPONDING TO THE INTERNAL
    * FORMAT.
    *)

(* $DESCRIPTION OF ARGUMENTS:
    *)

<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>RR</td>
<td>I</td>
<td>RETURN RECORD TO BE CONVERTED</td>
</tr>
<tr>
<td>PGM_ID</td>
<td>I</td>
<td>INTEGER ID OF THE MAS INTERFACE ROUTINE THAT ISSUED THE RETURN CODE</td>
</tr>
<tr>
<td>RC</td>
<td>O</td>
<td>EXTERNAL RETURN CODE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RC</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>= 0</td>
<td>OK</td>
</tr>
<tr>
<td>&gt; 0</td>
<td>CRITICAL ERROR</td>
</tr>
<tr>
<td>&lt; 0</td>
<td>WARNING</td>
</tr>
</tbody>
</table>

(* $COMMONS:
    *)

(* $ENVIRONMENT:
    *)

    LANGUAGE: IBM PASCAL
    HARDWARE SYSTEM: IBM 360/370/4341/4381

(* $EXECUTION PROCEDURE:
    *)

    INTERNAL PROCEDURE FOR THE MODEL ACCESS SOFTWARE

(* $PROCESSING DESCRIPTION:
    *)

    CONVERTS THE INTERNAL RETURN CODE TO EXTERNAL RETURN CODE

(* $COMMENTS:
    *)

(* $CHANGE CONTROL:
    *)

    REVISED: 85/07/11    B. A. ULMER    FRMI
    CHANGED TO ADD ERROR MESSAGE AND PROGRAM NAME TO MSTATUS COMMON
    WHEN AN INTERFACE GETS A NONE ZERO RETURN CODE
(* %INCLUDE CPYAUDB *)
(**)
PROCEDURE CPYAUDB(VAR ENTBPNTR:ENTPNTR;VAR ENTDEF:ENTBLOCK;
VAR RR:RETREC);EXTERNAL;
(**)
(*---------------------------------------------------------------*)
(*)
(* AUTHOR: UNKNOWN CADD CREATED: YY/MM/DD CC *)
(* VERSION: MAS VER 2 REVISED: 84/10/11 CC *)
(*)
(* FUNCTION: *)
(* STORE THE VALUE OF AN APPLICATION ENTITY BLOCK IN AN *)
(* UNINITIALIZED SYSTEM UDB. *)
(*)
(* ENVIRONMENT: *)
(* IBM PASCAL LANGUAGE *)
(* IBM 30XX, 43XX, DEC VAX 11/780 *)
(*)
(* DESCRIPTION OF ARGUMENTS: *)
(* NAME I/O DESCRIPTION *)
(* ENTDEF I ENTBLOCK CONTAINING THE VALUES TO STORE. *)
(* ENTBPNTR O POINTER TO ENTBLOCK CREATED. *)
(* RR O ERROR CONDITION RETURN CODE. *)
(* = 0 NORMAL RETURN CODE. *)
(*)
(* COMMONS: *)
(*)
(* PROCESSING DESCRIPTION: *)
(* CPYAUDB USES AMPXMOVE A SYSTEM ROUTINE. AMPXMOVE MOVES *)
(* DATA FROM MEMORY TO MEMORY (THE NUMBER OF BYTES TO MOVE *)
(* MUST BE SPECIFIED). *)
(*)
(* COMMENTS: *)
(*)
(* CHANGE CONTROL: *)
(* 84/10/11 MAS VER 2 D. J. KERCHNER *)
(* UPDATED DOCUMENTATION. *)
(* 84/10/04 MAS VER 2 E. D. SHREVE *)
(* CHANGED DECLARATION OF ENTDEF TO VAR. *)
(*)
(*---------------------------------------------------------------*)
(**)
(* END %INCLUDE CPYAUDB *)
(* %INCLUDE CPYCST. *)

PROCEDURE CPYCST(CONST SCHKEY : ENTed:;
VAR KEY1 : LISTED:
VAR LIST_LENG : LISTSIZE;
VAR RR : RET_REC); EXTERNAL;

(*---------------------------------------------------------------*)

(* FUNCTION *)
(* ADD THE ENTITIES IN A CONSTITUENT LIST INTO A LIST. *)

(* LANGUAGE *)
(* PASCAL *)

(* PACKAGE *)
(* LIST PACKAGE. *)

(* ARGUMENTS *)
(* INPUT *)
(* SCH-KEY - KEY OF A CLASS OR ENTITY COLLECTOR. *)
(* KEY1 - KEY OF THE LIST ONTO WHICH THE ENTITIES *)
(* WILL BE ADDED. *)

(* OUTPUT *)
(* LIST_LENG - TOTAL LENGTH OF ALL CNST ADDED TO LIST. *)
(* RR - THE FUNCTION RETURN RECORD. *)

(* METHOD *)
(* IF SCH-KEY IS AN ENTITY COLLECTOR, THEN ALL CONSTITUENTS *)
(* ARE ADDED TO THE LIST. IF SCH-KEY IS A CLASS COLLECTOR, *)
(* 'CPYCST' IS CALLED RECURSIVELY TO PROCESS THE ENTITY *)
(* COLLECTORS THAT ARE CONSTITUENTS OF SCH-KEY. LIST_LENG IS *)
(* ACCUMULATED FOR ALL RECURSIONS. *)

(*---------------------------------------------------------------*)

(* END %INCLUDE CPYCST *)
(* %INCLUDE CPYLSM. *)

PROCEDURE CPYLSM(CONST LISTFROM : LISTPNTR;
         VAR POSITION : LISTPSTN;
         VAR LISTTO : LISTPNTR;
         VAR RR : RET_REC); EXTERNAL;

(*-----------------------------------------------*)
(* FUNCTION *)
(* COPY THE NON-VACANT ELEMENTS OF LISTFROM TO LISTTO. IF *)
(* LISTTO WAS INITIALIZED, IT IS DELETED PRIOR TO COPYING.*)
(* POSITION IS SET TO THE BEGINNING OF LISTTO. CURRENT LENGTH *)
(* OF OF LISTTO IS SET TO CURRENT LENGTH OF LISTFROM. *)

(* LANGUAGE *)
(* PASCAL. *)

(* PACKAGE *)
(* LIST PACKAGE. *)

(* ARGUMENTS *)
(* INPUT *)
(* LISTFROM - POINTER TO SYSTEM LIST TO BE COPIED.*)
(* OUTPUT *)
(* LISTTO - POINTER TO SYSTEM LIST TO WHICH COPY IS MADE.*)
(* POSITION - SET TO INDICATE THE BEGINNING OF LISTTO. *)
(* RR - THE FUNCTION RETURN RECORD. *)

(*-----------------------------------------------*)

(* END %INCLUDE CPYLSM. *)
(* %INCLUDE CPYNM. *)
(*)
PROCEDURE CPYNM(CONST KEYL:LISTKEY;VAR KEYLOUT:LISTKEY;
VAR RR:RET_REC);EXTERNAL;
(*)
(* FUNCTION (*)
(* CREATE A NEW LIST WHICH CONTAINS A COPY OF THE ENTITIES (*)
(* REFERENCED BY KEYL. (*)
(* (*)
(* LANGUAGE (*)
(* PASCAL. (*)
(* (*)
(* PACKAGE (*)
(* LIST PACKAGE. (*)
(* (*)
(* ARGUMENTS (*)
(* INPUT (*)
(* KEYL - KEY OF THE LIST TO BE COPIED. (*)
(* OUTPUT (*)
(* KEYLOUT - KEY OF THE NEW LIST WHICH IS A COPY OF THE (*)
(* INPUT LIST. (*)
(* RR - THE FUNCTION RETURN RECORD. (*)
(* (*)
(*--------------------------------------------------------*)
(*)
(* END %INCLUDE CPYNM. *)
(*
PROCEDURE CRCLST(CONST KEYE:ENTKEY;CONST LISTREF:LISTPNTR;
VAR RR:RET_REC);EXTERNAL;

FUNCTION
CREATE RELATIONS BETWEEN A USER ENTITY AND A LIST OF
CONSTITUENTS.

LANGUAGE
PASCAL.

PACKAGE
LIST PACKAGE.

ARGUMENTS
INPUT
KEYE - KEY OF THE USER ENTITY OF THE RELATIONS.
LISTREF - POINTER TO SYSTEM LIST OF CONSTITUENTS.
OUTPUT
RR - THE FUNCTION RETURN RECORD.
(* %INCLUDE CRCLSTN. *)

PROCEDURE CRCLSTN(CONST KEYE:ENTKEY; CONST LISTREF:LISTPNTR;
VAR NUM:INTEGER; VAR RR:RET_REC); EXTERNAL;

(* FUNCTION
* CREATE RELATIONS BETWEEN A USER ENTITY AND A LIST OF
* CONSTITUENTS.
* LANGUAGE
* PASCAL.
* PACKAGE
* LIST PACKAGE.
* ARGUMENTS
* INPUT
* KEYE - KEY OF THE USER ENTITY OF THE RELATIONS.
* LISTREF - POINTER TO SYSTEM LIST OF CONSTITUENTS.
* NUM - THE LENGTH OF THE CONSTITUENT LIST.
* OUTPUT
* RR - THE FUNCTION RETURN RECORD.

(* END %INCLUDE CRCLSTN. *)
(* %INCLUDE CRCNM. *)

PROCEDURE CRCNM(CONST KEYE:ENTKEY;CONST KEYL:LISTKEY;
VAR RR:RET_REC);EXTERNAL;

(*---------------------------------------------------------------------*)
(* FUNCTION *)
(* CREATE RELATIONS BETWEEN A USER ENTITY AND A LIST OF *)
(* CONSTITUENTS. *)
(* LANGUAGES *)
(* PASCAL. *)
(* PACKAGE *)
(* LIST PACKAGE. *)
(* ARGUMENTS *)
(* INPUT *)
(* KEYE - KEY OF THE USER ENTITY OF THE RELATIONS. *)
(* KEYL - KEY OF LIST OF CONSTITUENT ENTITIES. *)
(* OUTPUT *)
(* RR - THE FUNCTION RETURN RECORD. *)
(* END %INCLUDE CRCNM. *)
(* %INCLUDE CRDLST *)
(*
PROCEDURE CRDLST(CONST KEY1:ANYKEY;VAR CNSTS_SRTLST:LISTPNTR;
VAR RR:RETREC);EXTERNAL;
(*
(* $FUNCTION:
(* CREATE A SORTED INCLUSIVE LIST OF AN ENTITY OR A LIST OF
(* ENTITIES AND THEIR DIRECT AND INDIRECT CONSTITUENTS.
(*
(* $DESCRIPTION OF ARGUMENTS:
(* NAME I/O DESCRIPTION
(* === === =============
(* KEY1 I AN ENTITY OR LIST OF ENTITIES TO BE PUT
(* ON A LIST WITH THEIR CONSTITUENTS.
(* CNSTS_SRTLST O AN INCLUSIVE LIST OF AN ENTITY OR LIST
(* AND THEIR DIRECT AND INDIRECT CONSTS. IN
(* USER-CONSTITUENT ORDER.
(* RC 0 EXTERNAL RETURN CODE
(* = 0 OK RETURN CODE
(* > 0 CRITICAL ERROR
(* < 0 WARNING
(*
(* $COMMONS:
(* NONE
(*
(* $ENVIRONMENT:
(* LANGUAGE: IBM PASCAL
(* HARDWARE SYSTEM: IBM 360/370/4341/4381
(*
(* $EXECUTION PROCEDURE:
(* INTERNAL PROCEDURE FOR THE MODEL ACCESS SOFTWARE
(*
(* $PROCESSING DESCRIPTION:
(* IF KEY1 IS AN ENTKEY THEN
(* AN INCLUSIVE LIST OF THE ENTITIES CONSTITUENTS IS BUILT
(* INCLUDING KEY1.
(* IF KEY1 IS A LIST THEN
(* A LIST OF THE INCLUSIVE CONSTITUENTS OF THE ENTITIES ON
(* KEY1 IS CREATED, INCLUDING THE ENTITIES ON KEY1.
(*
(* $COMMENTS:
(* THE OUTPUT LIST IS SORTED IN USER-CONSTITUENT ORDER.
(*
(* $CHANGE CONTROL:
(*
3-656
(* INCLUDE CREMM. *)

PROCEDURE CREMM(CONST KEYEU:ENTKEY;CONST KEYEC:ENTKEY;
    VAR RR:RET_REC);EXTERNAL;

(*--------------------------------------------------------------*)
(* FUNCTION *)
(* CREATE A USER-CONSTITUENT RELATION BETWEEN ENTITIES. *)
(* )
(* LANGUAGE *)
(* PASCAL. *)
(* )
(* PACKAGE *)
(* ENTITY PACKAGE. *)
(* )
(* ARGUMENTS *)
(* INPUT *)
(* KEYEU - KEY OF ENTITY TO BE THE USER. *)
(* KEYEC - KEY OF ENTITY TO BE THE CONSTITUENT. *)
(* OUTPUT *)
(* RR - THE FUNCTION RETURN RECORD. *)
(*--------------------------------------------------------------*)
(* )
(* END INCLUDE CREMM. *)
(* %INCLUDE CRURUL. *)
(**)
PROCEDURE CRURUL(CONST ENTITY_TYPE:ORD_KIND;VAR GROUP:T_GROUP_ARRAY;
VAR NUM_GROUP:LISTPSTN; VAR MIN_CNST:LISTPSTN);EXTERNAL;
(**)
(*-----------------------------------------------*)
(*
(* $FUNCTION:
(* CREATES THE USER'S RULES. RULES OF CONNECTIVITY USED TO
(* DETERMINE DELETABILITY OF ENTITIES.
(*
(* $DESCRIPTION OF ARGUMENTS:
(*
NAME I/O DESCRIPTION
==== === ===============
ENTITY_TYPE I ENTITY KIND VALUE WHICH WILL HAVE THE *
DELETE RULE
GROUP 0 ARRAY THAT WILL BE FILLED WITH THE RULES *
AND NUMBER OF CONSTITUENTS OF EACH *
DIFFERENT RELATIONSHIP THAT THIS ENTITY *
KIND CAN HAVE WITH ITS CONSTITUENTS *
NUM_GROUP 0 NUMBER OF DIFFERENT RELATIONSHIPS THIS *
ENTITY CAN HAVE WITH ITS CONSTITUENTS *
MIN_CNST 0 MINIMUM NUMBER OF CONSTITUENTS THAT THIS *
ENTITY CAN HAVE WHEN IT HAS A GROUP OF *
CONSTITUENTS THAT ARE "SECONDARY" *
RG 0 EXTERNAL RETURN CODE *
= 0 OK RETURN CODE *
> 0 CRITICAL ERROR *
< 0 WARNING *
(*
(* $COMMONS:
(*
(* $ENVIRONMENT:
(* LANGUAGE: IBM PASCAL *
(* HARDWARE SYSTEM: IBM 360/370/4341/4381 *
(*
(* $EXECUTION PROCEDURE:
(* INTERNAL PROCEDURE FOR THE MODEL ACCESS SOFTWARE *
(*
(* $PROCESSING DESCRIPTION:
(* ???????ARE SET TO INDICATE IF THE RELATIONSHIP BETWEEN THE *
(* USER AND ITS CONSTITUTES IS DEPENDENT OR INDEPENDENT AND *
(* STRONG OR WEAK.
(* DEFAULT RULE IS DEPENDENT/STRONG.
(*
(* $COMMENTS:
(*
3-659
(*) $CHANGE CONTROL: *
(* *)
(* REVISED: 06/19/86 B. A. ULMER FRMI *)
(* REDO LOGIC OF HOW CRURUL WORKS BASED ON THE NEW DELETE RULES *)
(* *)
(* REVISED: 09/ /85 B. A. ULMER FRMI *)
(* ADD ENTITY KINDS SO AS TO TEST THE NEW DELETE RULES (2070, *)
(* 2080, 2090) *)
(* *)
(* REVISED: 09/ /85 B. A. ULMER FRMI *)
(* ADD PARAMETERS TO HANDLE THE TWO NEW DELETE RULES *)
(* *)
(* REVISED: 09/18/84 D. J. KERCHNER FRMI *)
(* ADDED I/S RULE FOR THE PICK ENTITY *)
(*)
(* INCLUDE DELCNST *)

PROCEDURE DELCNST(CONST KEYE:ENTKEY; VAR TEMP_DEL_LIST:LISTPNTR;
                     VAR MARK_LIST:LISTKEY; VAR RR:RET_REC);EXTERNAL;

(* $FUNCTION:
    DETERMINES THE DELETABILITY OF GIVEN ENTITY'S CONSTITUENTS 
    BASED ON THE RELATIONSHIP THE CONSTITUENT HAS WITH ITS USERS *)

(* $DESCRIPTION OF ARGUMENTS:

<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEYE</td>
<td>I</td>
<td>ENTITY WHOSE CONSTITUENTS WILL HAVE THEIR DELETABILITY DETERMINED</td>
</tr>
<tr>
<td>TEMP_DEL_LIST</td>
<td>I/O</td>
<td>LIST WHICH CONTAINS ENTITIES THAT ARE ELIGIBLE FOR DELETE</td>
</tr>
<tr>
<td>MARK_LIST</td>
<td>I/O</td>
<td>LIST WHICH CONTAINS ENTITIES THAT ARE MARKED</td>
</tr>
<tr>
<td>RR</td>
<td>0</td>
<td>RETURN CODE</td>
</tr>
</tbody>
</table>

(* $COMMONS: *)

(* $ENVIRONMENT: *)

<table>
<thead>
<tr>
<th>LANGUAGE: IBM PASCAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>HARDWARE SYSTEM: IBM 360/370/4341/4381</td>
</tr>
</tbody>
</table>

(* $EXECUTION PROCEDURE: *)

| INTERNAL PROCEDURE FOR THE MODEL ACCESS SOFTWARE |

(* $PROCESSING DESCRIPTION: *)

(* $COMMENTS: *)

(* $CHANGE CONTROL: *)
(* %INCLUDE DELCRBE *)
PROCEDURE DELCRBE(VAR CRB:CRBPNTR; CONST EKEY:ENTKEY;
VAR RR:RET_REC);EXTERNAL;

(*----------------------------------------------------------------------*)
(*    AUTHOR: B. A. ULMER     FRMI     CREATED: 85/02/08 CC??*)
(*    VERSION: XXXX            REVISED: YY/MM/DD CC     *)

(* FUNCTION: *)
(* DELETE A CRB ENTRY *)

(* ENVIRONMENT: *)
(* IBM PASCAL LANGUAGE *)
(* IBM 30XX, 43XX DEPENDENT CODE, OR OTHER APPROPRIATE H/W. *)

(* EXECUTION PROCEDURE: *)
(* HOW IS THIS ROUTINE/MODULE TO BE EXECUTED. *)

(* DESCRIPTION OF ARGUMENTS: *)

<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRB</td>
<td>I/O</td>
<td>CONSTITUENT READ BLOCK ADDRESS</td>
</tr>
<tr>
<td>EKEY</td>
<td>I</td>
<td>ENTITY KEY OF ENTRY TO BE DELETED</td>
</tr>
<tr>
<td>RR</td>
<td>O</td>
<td>ERROR CONDITION RETURN CODE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>= 0 OK RETURN CODE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>= 1 YOU BLEW IT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>= 2 THE ROUTINE BLEW IT</td>
</tr>
</tbody>
</table>

(* COMMS: *)

<table>
<thead>
<tr>
<th>COM1</th>
</tr>
</thead>
<tbody>
<tr>
<td>VAR1 I VAR1 NAME MUST BE FILLED, CHARACTER DATA</td>
</tr>
<tr>
<td>VAR2 I VAR2 MUST BE SPECIFIED</td>
</tr>
<tr>
<td>COM2</td>
</tr>
<tr>
<td>VAR3 I CHARACTER DATA MUST BE SPECIFIED</td>
</tr>
</tbody>
</table>

(* PROCESSING DESCRIPTION: *)
(* DETAILED DESCRIPTION OF HOW THIS ROUTINE WORKS, WHICH FILES NEED TO BE OPENED/CLOSED, FILES USED, ETC. *)

(* COMMENTS: *)
(* TEXT OF ANY FURTHER COMMENTS WHICH MIGHT HELP TO UNDERSTAND THE FUNCTION/EXECUTION OF THIS ROUTINE. *)

(* CHANGE CONTROL: *)
(* YY/MM/DD CCZZ I. M. THECHANGER *)

3-662
(* DESCRIPTION OF LATEST CHANGE MADE. *)
(* YY/MM/DD CCYY I. M. THEPROGRAMMER *)
(* DESCRIPTION OF CHANGE MADE. IF LENGTHY, CONTINUE THE *)
(* NARRATION ON THE NEXT LINE. *)
(* YY/MM/DD CCXX I. M. APERSON *)
(* DESCRIPTION OF FIRST CHANGE MADE. *)
(* *)
(*---------------------------------------------------------------*)
(**)
(* END %INCLUDE DELCRBE *)
(* %INCLUDE DELEMM. *)

PROCEDURE DELEMM(VAR KEYE:ENTKEY;VAR RR:RET_REC); EXTERNAL;

(* FUNCTION
   DELETE ALL REFERENCES TO THIS ENTITY FROM ALL APPLICATION
   LISTS AND DISPOSE OF THE ENTITY. TO COMPLETE DELETE ACTION
   REQUIRES BREAKING ALL USER AND CONSTITUENT CONNECTIONS. *)

(* LANGUAGE *)
(PASCAL. *)
(* PACKAGE
   ENTITY PACKAGE. *)
(* ARGUMENTS
   INPUT
   KEYE - KEY OF THE ENTITY TO BE DELETED. *)
(* OUTPUT
   RR - THE FUNCTION RETURN RECORD. *)
(* METHOD
   AN ENTRY IN AN APPLICATION LIST HAS A FORM OF INT_ITEM. *)
(* ALL REFERENCES TO IT WILL BE DELETED. THE USER WILL NEVER *)
(* DIRECTLY DELETE ENTITIES OF FORM INT_ROOT. THESE ARE ONLY *)
(* DELETED AS A RESULT OF THE CLEANUP ASSOCIATED WITH THE *)
(* DELETION OF AN NDS. *)
(* )
(* END %INCLUDE DELEMM. *)
(* %INCLUDE DELPLST. *)

PROCEDURE DELPLST(CONST INCREMENT:LISTSIZE;CONST IPOS:LISTINDX;
VAR POSITION:LISTPSTN;VAR LISTREF:LISTPNTR;VAR RR:RET_REC);
EXTERNAL;

(*-----------------------------------------------*)
(*                                              *)
(* $FUNCTION:                                    *)
(* REMOVE AN ENTITY FROM A SPECIFIED POSITION IN A SYSTEM LIST *)
(*                                              *)
(* $DESCRIPTION OF ARGUMENTS:                   *)
(* NAME           I/O DESCRIPTION               *)
(*  INCREMENT    I  NUMBER OF ENTITIES BY WHICH SYSTEM LIST *)
(*  IPOS         I  POSITION IN THE LIST FROM WHICH THE *)
(*  POSITION     I/O LAST LOCATION ON THE SYSTEM LIST THAT WAS*)
(*  LISTREF      I  POINTER TO SYSTEM LIST FROM WHICH ENTITY *)
(*  RC           0  EXTERNAL RETURN CODE         *)
(*                                              *)
(* #$COMMONS:                                       *)
(*                                              *)
(* #$ENVIRONMENT:                                 *)
(* LANGUAGE: IBM PASCAL                           *)
(* HARDWARE SYSTEM: IBM 360/370/4341/4381         *)
(*                                              *)
(* #$EXECUTION PROCEDURE:                         *)
(* INTERNAL PROCEDURE FOR THE MODEL ACCESS SOFTWARE *)
(*                                              *)
(* #$PROCESSING DESCRIPTION:                    *)
(* SHIFT ALL FOLLOWING ENTITIES UP UNTIL ALL VACANT ENTRIES *)
(* ARE AT THE END OF THE LIST. RECALCULATE THE POSITION IF *)
(* IT WAS AFFECTED BY THIS REMOVAL. IF MORE THAN INCREMENT *)
(* ENTITIES ARE VACANT, THEN COMPRESS THE LIST BY REMOVING *)
(* THE INCREMENT ENTITIES.                       *)
(*                                              *)
(* #$COMMENTS:                                     *)
(*                                              *)
(* #$CHANGE CONTROL:                              *)
(*                                              *)
PROCEDURE DELPNLA(VAR POSITION: LISTPSTN; VAR LISTA: LISTPNTR;
VAR RR: RET_REC); EXTERNAL;

*---------------------------------------------------------------------*
(* $FUNCTION
(* DELETE ALL APPL LISTS AFTER A SPECIFIED POSITION IN THE
(* LIST_OF_LISTS EXCEPT THOSE THAT ARE 'LOCKED'.
(*
(* $DESCRIPTION OF ARGUMENTS
(*
<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>POSITION</td>
<td>I/O</td>
<td>POSITION IN LISTA TO START DELETE.</td>
</tr>
<tr>
<td>LISTA</td>
<td>I</td>
<td>LIST_OF_LISTS SYSTEM LIST</td>
</tr>
<tr>
<td>RR</td>
<td>O</td>
<td>RETURN CODE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>=0  GOOD RETURN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt;0  CRITICAL ERROR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;0  WARNING</td>
</tr>
</tbody>
</table>
(*
(* $COMMONS
(*
(* $ENVIRONMENT:
(* LANGUAGE: IBM PASCAL                                                |
| HARDWARE SYSTEM: IBM 360/370/4341/4381                                |
(*
(* $EXECUTION PROCEDURE:
(* INTERNAL PROCEDURE OF THE MODEL ACCESS SOFTWARE                    |
(*
(* $PROCESSING DESCRIPTION:
(* STARTING WITH THE INPUT POSITION, EACH APPL LIST ON THE
(* INPUT LIST_OF_LISTS (LISTA) IS PROCESSED. IF THE LIST
(* IS 'LOCKED' (DELTFLG = NODEL), THE LISTKEY IS PLACED ON A
(* TEMPORARY LIST; ELSE, THE LIST IS DELETED. AFTER ALL
(* ENTRIES ARE PROCESSED, THE TEMPORARY LIST IS MERGED WITH
(* ANY ENTRIES STILL REMAINING ON LISTA.                               |
(*
(* $CHANGE CONTROL:
(*
| ORIGINATED: 04/23/85 E. D. SHREVE W315                                |
(*---------------------------------------------------------------------*)

(*END %INCLUDE DELPNLA.*)
(* %INCLUDE DELRLSM. *)
(**)
PROCEDURE DELRLSM(CONST INCREMENT:LISTSIZE;CONST KEYE:ENTKEY;
VAR POSITION:LISTPSTN;VAR LISTREF:LISTPNTR;VAR RR:RET_REC);
EXTERNAL;
(**)
(* $FUNCTION:
REMOVE AN ENTITY FROM A SYSTEM LIST.*)
(* $DESCRIPTION OF ARGUMENTS:
NAME I/O DESCRIPTION
INCREMENT I NUMBER OF ENTITIES BY WHICH A SYSTEM LIST*)
LIST IS EXPANDED OR REDUCED
KEYE I KEY OF THE ENTITY TO BE REMOVED FROM THE LIST
POSITION I/O LOCATION ON THE SYSTEM LIST OF ENTITY TO BE PROCESSED — UPDATED LOCATION OF ENTITY ORIGINALLY INDICATED BY POSITION
LISTREF I POINTER TO SYSTEM LIST FROM WHICH ENTITY WILL BE REMOVED
RC 0 EXTERNAL RETURN CODE
= 0 OK RETURN CODE
= 1 YOU BLEW IT
= 2 THE ROUTINE BLEW IT
(*$COMMONS:*)
(*$ENVIRONMENT:
LANGUAGE: IBM PASCAL
HARDWARE SYSTEM: IBM 360/370/4341/4381
(*$EXECUTION PROCEDURE:
INTERNAL PROCEDURE FOR THE MODEL ACCESS SOFTWARE
(*$PROCESSING DESCRIPTION:
SHIFT ALL FOLLOWING ENTITIES UP UNTIL ALL VACANT ENTITIES ARE AT THE END OF THE LIST. RECALCULATE THE POSITION IF IT WAS AFFECTED BY THIS REMOVAL. IF MORE THAN INCREMENT ENTITIES ARE VACANT, THEN COMPRESS THE LIST BY REMOVING THE INCREMENT ENTITIES.
(*$COMMENTS:
(*$CHANGE CONTROL:
3-668
(* REVISED: 12/30/85 B. A. ULMER FRMI *)
(* ADD PROCESSING FOR LARGE LISTS *)
(* *)
(* REVISED: 12/24/84 R. A. MCCLUSKEY FRMI *)
(* ADDED SYSTEM LIST CURRENT LIST INDICATOR -- LSTLNLM *)
(* *)

3-669
(* %INCLUDE DELRUL *)

PROCEDURE DELRUL(VAR KEYE:ENTKEY;VAR DEL_LIST:LISTPNTR;VAR
MARK_LIST:LISTKEY;VAR RR:RETREC);EXTERNAL:

(*$FUNCTION:
DELETE AN ENTITY ACCORDING TO THE DELETE RULES.

(*$DESCRIPTION OF ARGUMENTS:

<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEYE</td>
<td>I</td>
<td>ENTITY TO BE DELETED OR MARKED FOR</td>
</tr>
<tr>
<td>DELETION</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DEL_LIST</td>
<td>I</td>
<td>LIST OF KEYS THAT ARE ELIGIBLE FOR</td>
</tr>
<tr>
<td>DELETION</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MARK_LIST</td>
<td>O</td>
<td>LIST OF ENTITIES WHICH HAVE BEEN MARKED</td>
</tr>
<tr>
<td>RC</td>
<td>O</td>
<td>EXTERNAL RETURN CODE</td>
</tr>
<tr>
<td>= 0</td>
<td>OK RETURN CODE</td>
<td></td>
</tr>
<tr>
<td>&gt; 0</td>
<td>CRITICAL ERROR</td>
<td></td>
</tr>
<tr>
<td>&lt; 0</td>
<td>WARNING</td>
<td></td>
</tr>
</tbody>
</table>

(*$COMMONS:

(*$ENVIRONMENT:

| LANGUAGE: IBM PASCAL |
| HARDWARE SYSTEM: IBM 360/370/4341/4381 |

(*$EXECUTION PROCEDURE:

INTERNAL PROCEDURE FOR THE MODEL ACCESS SOFTWARE

(*$PROCESSING DESCRIPTION:

??????? TY'S USER LIST IS READ AND THE DELETE RULES FOR
EACH USER ARE CHECKED TO DETERMINE IF ENTITY CAN BE DELETED. *
IF UNABLE TO DELETE THE ENTITY THEN CHECK IF THE USER IS ON *
THE DELETE LIST. IF ON THE LIST THEN DELETE THE ENTITY ELSE *
MARK IT FOR DELETE. IF UNABLE TO MARK FOR DELETE THEN ADD *
ENTITY TO THE EXCEPTION LIST.

(*$COMMENTS:

THE DELETE RULES ARE STORED IN THE INSTANCE COLLECTOR OF AN *
ENTITY'S USER AS DEPENDENCE AND STRENGTH FLAGS. DEPENDENCE *
IS DEFINED AS DEPENDENT (TRUE) OR INDEPENDENT (FALSE). *
STRENGTH IS DEFINED AS DEPENDENT (TRUE) OR INDEPENDENT *
(FALSE).
IF THERE EXISTS A DEPENDENT/STRONG USER CONNECTION, THEN

3-670
THE ENTITY MAY NOT BE DELETED.

IF THERE EXISTS A DEPENDENT/WEAK USER CONNECTION, BUT NO DEPENDENT/STRONG CONNECTION THEN THE ENTITY IS MARKED FOR DELETION AND IF ANY OF ITS USER CONNECTIONS WERE INDEPENDENT/WEAK, THEN IT IS DISCONNECTED FROM THOSE INDEPENDENT/WEAK USER CONNECTIONS.

IF THERE ARE NO DEPENDENT/STRONG NOR DEPENDENT/WEAK USER CONNECTIONS OR NO USERS AT ALL, THEN THE ENTITY IS DELETED AND ITS CONSTITUENTS ARE PROCESSED THE SAME AS THE ENTITY WAS.

$CHANGE CONTROL:

REVISED: 09/02/86  B. A. ULMER
REMOVE DUPLICATE ENTITIES FROM DELETE LIST - CAUSES A PROBLEM
WHEN AN ENTITY HAS THE SAME CNST TWICE

REVISED: 06/19/86  B. A. ULMER
MAJOR REWRITE DUE TO NEW DELETE RULES

REVISED: 12/17/85  B. A. ULMER
FIX PROBLEM WITH CODE FOR NEW DELETE RULES

REVISED: 09/05/85  B. A. ULMER
ADD CODE TO HANDLE THE TWO NEW DELETE RULES

ORIGINATED: 06/15/84  C. J. SAMPLE

%PAGE

DATA STRUCTURES/MAJOR VARIABLES:

END %INCLUDE DELRUL. *
(* %INCLUDE DELSCH. *)
(**)
PROCEDURE DELSCH(CONST KEYE:ENTKEY;VAR RR:RET_REC);EXTERNAL;
(**)

(*-----------------------------------------------*)
(*                                  *)
(* FUNCTION *)
(* DISCONNECT AN INTERNAL ITEM FROM THE CORRECT PORTION OF *)
(* THE NDS SUPERSTRUCTURE. *)
(*                                  *)
(* LANGUAGE *)
(* PASCAL. *)
(*          *)
(* PACKAGE *)
(* SCHEMA PACKAGE. *)
(*          *)
(* ARGUMENTS *)
(* INPUT *)
(* KEYE - KEY OF THE INTERNAL ITEM TO BE DETACHED. *)
(* OUTPUT *)
(* RR - THE FUNCTION RETURN RECORD. *)
(*          *)
(* CHANGE CONTROL *)
(* CHANGED: 12/14/84 E. SHREVE - TO DELETE THE INSTANCE *)
(* COLLECTOR IF ALL IT'S CNSTS ARE DELETED. *)
(* -----------------------------------------------*)
(**)
(* END %INCLUDE DELSCH. *)
(* %INCLUDE DELTLSM. *)

(**) PROCEDURE DELTLSM(CONST INCREMENT:LISTSIZE;VAR LISTREF:LISTPNTR;
VAR RR:RET_REC);EXTERNAL;

(**)

(*-*)

(* $FUNCTION:

(* REMOVES THE LAST NON-VACANT ENTITY REFERENCE IN A LIST.
(* IF THIS REMOVAL PRODUCES MORE THAN INCREMENT VACANT
(* ENTITIES AT THE BOTTOM OF THE LIST, THEN THE VACANT
(* ENTITIES ARE ELIMINATED.

(* $DESCRIPTION OF ARGUMENTS:

(* NAME I/O DESCRIPTION
(* === === ===============*
(* LISTREF I LIST WHOSE LAST ENTITY IS TO BE REMOVED *
(* INCREMENT I MAXIMUM NUMBER OF VACANT ENTITIES THE *)
(* LAST MIGHT CONTAIN *
(* RC 0 EXTERNAL RETURN CODE *
(* = 0 OK RETURN CODE *
(* = 1 YOU BLEW IT *
(* = 2 THE ROUTINE BLEW IT

(* $COMMONS:

(* $ENVIRONMENT:

(* LANGUAGE: IBM PASCAL *
(* HARDWARE SYSTEM: IBM 360/370/4341/4381 *

(* $EXECUTION PROCEDURE:

(* INTERNAL PROCEDURE FOR THE MODEL ACCESS SOFTWARE

(* $PROCESSING DESCRIPTION:

(* $COMMENTS:

(* $CHANGE CONTROL:

(* REVISED: 12/30/85 B. A. ULMER FRMI *
(* ADD PROCESSING FOR LARGE LISTS *

(* REVISED: 12/24/84 R. A. MCCLUSKEY FRMI *
(* ADDED SYSTEM LIST CURRENT LENGTH INDICATOR -- LSTLN

3-673
(* %INCLUDE DETCNST *)
(**)
PROCEDURE DETCNST(CONST KEYE:ENTKEY; VAR MARK_LIST:LISTKEY;
VAR TEMP_DEL_LIST:LISTKEY; VAR RR:RET_REC);EXTERNAL;
(**)
(*---------------------------------------------------------------*)
(*
(* $FUNCTION:
(* DETERMINES THE DELETABILITY OF GIVEN ENTITY'S CONSTITUENTS *)
(* BASED ON THE RELATIONSHIP THE CONSTITUENT HAS WITH ITS USERS*)
(*
(* $DESCRIPTION OF ARGUMENTS:
(* NAME I/O DESCRIPTION
(* === === ===============
(* KEYE I ENTITY WHOSE CONSTITUENTS WILL HAVE THEIR
(* DELETABILITY DETERMINED
(* MARK_LIST I/O LIST WHICH CONTAINS ENTITIES THAT ARE
(* MARKED
(* TEMP_DEL_LIST I/O LIST WHICH CONTAINS ENTITIES THAT ARE
(* ELIGIBLE FOR DELETE
(* RR 0 RETURN CODE
(*
(* $COMMONS:
(*
(* $ENVIRONMENT:
(* LANGUAGE: IBM PASCAL
(* HARDWARE SYSTEM: IBM 360/370/4341/4381
(*
(* $EXECUTION PROCEDURE:
(* INTERNAL PROCEDURE FOR THE MODEL ACCESS SOFTWARE
(*
(* $PROCESSING DESCRIPTION:
(*
(* $COMMENTS:
(*
(* $CHANGE CONTROL:
(*

3-674
PROCEDURE DETRUL(CONST KEYE:ENTKEY;VAR MARK_LIST:LISTKEY; VAR DEL_LIST:LISTKEY;VAR RR:RET_REC);EXTERNAL;

(* $FUNCTION: *)
(* TEST DELETE OF AN ENTITY ACCORDING TO THE DELETE RULES. *)
(* $DESCRIPTION OF ARGUMENTS: *)
(* NAME I/O DESCRIPTION *)
(* === === =========== *)
(* KEYE I ENTITY TO TESTED FOR DELETION OR MARK FOR DELETION *)
(* MLIST I/O LIST OF ENTITIES WHICH MAY BE MARKED *)
(* DLIST I/O LIST OF ENTITIES WHICH MAY BE DELETED *)
(* RC 0 EXTERNAL RETURN CODE *)
(* = 0 OK RETURN CODE *)
(* > 0 CRITICAL ERROR *)
(* < 0 WARNING *)

(* $COMMONS: *)

(* $ENVIRONMENT: *)
(* LANGUAGE: IBM PASCAL *)
(* HARDWARE SYSTEM: IBM 360/370/4341/4381 *)

(* $EXECUTION PROCEDURE: *)
(* INTERNAL PROCEDURE FOR THE MODEL ACCESS SOFTWARE *)

(* $PROCESSING DESCRIPTION: *)
(* ??? TITY'S USERS LIST IS READ AND THE DELETE RULES FOR *)
(* EACH USER ARE CHECKED TO DETERMINE IF THE ENTITY CAN BE *)
(* DELETED. *)
(* THE DELETE RULES ARE STORED IN THE INSTANCE COLLECTOR OF AN *)
(* ENTITY'S USER AS DEPENDENCE AND STRENGTH FLAGS. DEPENDENCE *)
(* IS DEFINED AS DEPENDENT (TRUE) OR INDEPENDENT (FALSE). *)
(* STRENGTH IS DEFINED AS DEPENDENT (TRUE) OR INDEPENDENT *)
(* (FALSE). *)
(* IF THERE EXISTS A DEPENDENT/STRONG USER CONNECTION, THEN *)
(* THE ENTITY MAY NOT BE DELETED AND IT IS ADDED TO THE *)
(* EXCEPTION LIST. *)
(* IF THERE EXISTS A DEPENDENT/WEAK USER CONNECTION, BUT NO *)
(* DEPENDENT/STRONG CONNECTION THEN THE ENTITY CAN BE *)
(* MARKED FOR DELETION AND ADDED TO THE MARK LIST. *)
(* IF THERE ARE NO DEPENDENT/STRONG USER CONNECTIONS, *)
NO DEPENDENT/WEAK USER CONNECTIONS,
NO USERS AT ALL, OR
ALL USERS ARE ON THE DELETE LIST,
THEN
THE ENTITY IS DELETABLE AND ADDED TO THE DELETE LIST.
IF THE ENTITY IS MARKED FOR DELETION OR
IS ON THE MARK LIST,
THEN
ITS CONSTITUENTS ARE PROCESSED THE SAME AS THE ENTITY.

$COMMENTS:

$CHANGE CONTROL:

REVISED: 06/19/86 B. A. ULMER FRMI *
MAJOR REWRITE DUE TO THE NEW DELETE RULES *

REVISED: 04/18/86 E. D. SHREVE FRMI *
TO SET DELETE RULES ONLY WHEN USER IS NOT IN DELIST *

REVISED: 09/06/85 B. A. ULMER FRMI *
ADDED CODE TO HANDLE THE TWO NEW DELETE RULES *

ORIGINATED: 06/28/84 C. J. SAMPLE FRMI *

DATA STRUCTURES/MAJOR VARIABLES:

END-.include detrul.*

END %include detrul. *)
(* %INCLUDE DIFLSM. *)
(**)
PROCEDURE DIFLSM(CONST LIST1:LISTPNTR;CONST LIST2:LISTPNTR;
VAR POSITION:LISTPSTN;VAR LISTOUT:LISTPNTR;VAR RR:RET_REC);
EXTERNAL;
(**)
(*---------------------------------------------------------------*)
(*
(* FUNCTION
(* CREATE A SYSTEMS LIST CONSISTING OF ALL ENTITIES IN LIST1
(* THAT ARE NOT IN LIST2.
(*
(* LANGUAGE
(* PASCAL.
(*
(* PACKAGE
(* LIST PACKAGE.
(*
(* ARGUMENTS
(* INPUT
(* LIST1, LIST2 - THE LISTS WHOSE DIFFERENCE IS TO BE FOUND.*)
(* OUTPUT
(* LISTOUT - LIST CONTAINING THE DIFFERENCE OF THE
(* TWO LISTS.
(* POSITION - INTEGER INDICATING BEGINNING OF LISTOUT.
(* RR - THE FUNCTION RETURN RECORD.
(*
(*---------------------------------------------------------------*)
(**)
(* END %INCLUDE DIFLSM. *)

3-677
(* %INCLUDE DISPCRB *)

PROCEDURE DISPCRB(VAR CRB:CRBPNTR; VAR RR:RET_REC);EXTERNAL;

(*-----------------------------------------------*)

(* AUTHOR: B. A. ULMER FRMI CREATED: 85/02/08 CC??*)

(* VERSION: XXXX REVISED: YY/MM/DD CC *)

(* FUNCTION: *)
(* DISPOSE OF CRB *)

(* ENVIRONMENT: *)
(* IBM PASCAL LANGUAGE *)
(* IBM 30XX, 43XX DEPENDENT CODE, OR OTHER APPROPRIATE H/W. *)

(* EXECUTION PROCEDURE: *)
(* HOW IS THIS ROUTINE/MODULE TO BE EXECUTED. *)

(* DESCRIPTION OF ARGUMENTS: *)

(* NAME I/O DESCRIPTION *)
(* CRB I/O CONSTITUENT READ BLOCK ADDRESS *)
(* RR 0 ERROR CONDITION RETURN CODE *)
(* = 0 OK RETURN CODE *)
(* = 1 YOU BLEW IT *)
(* = 2 THE ROUTINE BLEW IT *)

(* COMMONS: *)
(* COM1 *)
(* VAR1 I VAR1 NAME MUST BE FILLED, CHARACTER DATA MUST BE PROVIDED *)
(* VAR2 I VAR2 MUST BE SPECIFIED *)
(* COM2 *)
(* VAR3 I CHARACTER DATA MUST BE SPECIFIED *)

(* PROCESSING DESCRIPTION: *)
(* DETAILED DESCRIPTION OF HOW THIS ROUTINE WORKS, WHICH FILES NEED TO BE OPENED/CLOSED, FILES USED, ETC. *)

(* COMMENTS: *)
(* TEXT OF ANY FURTHER COMMENTS WHICH MIGHT HELP TO UNDERSTAND THE FUNCTION/EXECUTION OF THIS ROUTINE. *)

(* CHANGE CONTROL: *)
(* YY/MM/DD CCZZ I. M. THECHANGER *)
(* DESCRIPTION OF LATEST CHANGE MADE. *)
(* YY/MM/DD CCYY I. M. THEPROGRAMMER *)

3-678
DESCRIPTION OF CHANGE MADE. IF LENGTHY, CONTINUE THE NARRATION ON THE NEXT LINE.

YY/MM/DD  CCXX  I. M. APERSON

DESCRIPTION OF FIRST CHANGE MADE.

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

(**)

(* END %INCLUDE DISPCRB *)
(* %INCLUDE DISPEMM. *)

FUNCTION

RELEASE ALL SPACE ALLOCATED TO AN ENTITY. NO DANGLING REFERENCES TO THIS ENTITY SHOULD EXIST IN AN NDS OR NODELIST.

LANGUAGE

PASCAL.

PACKAGE

ENTITY PACKAGE.

ARGUMENTS

INPUT

KEYE - KEY OF THE ENTITY TO BE DISPOSED.

OUTPUT

KEYE - SET TO NIL.

RR - THE FUNCTION RETURN RECORD.

CHANGE CONTROL

CHANGED: 12/10/84 J. JOHNSON - TO CALL 'MASDSP'

(* END %INCLUDE DISPEMM. *)
PROCEDURE DISPLSM(VAR POSITION:LISTPSTN;VAR LISTREF:LISTPNTR; VAR RR:RET_REC);EXTERNAL;

FUNCTION DELETE SPACE ALLOCATED TO A SYSTEM LIST.
LANGUAGE PASCAL.
PACKAGE LIST PACKAGE.
ARGUMENTS
INPUT
LISTREF - POINTER TO A SYSTEM LIST WHOSE SPACE IS TO BE DEALLOCATED.
OUTPUT
LISTREF - POINTER TO A SYSTEM LIST WITH ZERO SIZE.
POSITION - POSITION IS SET TO ZERO INDICATING START OF SYSTEM LIST.
RR - THE FUNCTION RETURN RECORD.

CHANGE CONTROL:
CHANGED: 12/10/84 J. JOHNSON - CALL MASDSP.

END %INCLUDE DISPLSM. *
(* %INCLUDE DISPNM. *)

PROCEDURE DISPNM(VAR KEYL:LISTKEY;VAR RR:RET_REC);EXTERNAL;

(*-----------------------------------------------*)
(* (*)
(* FUNCTION
(* REMOVE ALL ENTITIES FROM THE LIST AND FREE THE ALLOCATED
(* SPACE. THE EMPTY LIST IS ALSO DELETED AND REMOVED FROM THE
(* LIST OF LISTS.
(*
(* LANGUAGE
(* PASCAL.
(*
(* PACKAGE
(* LIST PACKAGE.
(*
(* ARGUMENTS
(* INPUT
(* KEYL - KEY OF THE LIST WHOSE ENTITIES ARE TO BE REMOVED.
(*
(* OUTPUT
(* RR - THE FUNCTION RETURN RECORD.
(*
(* METHOD
(* THE STACK_OF LISTS IS READ. FOR EACH LIST_OF LISTS ON THE
(* STACK_OF LISTS, KEYL IS REMOVED FROM THE LIST. WHEN ALL
(* LISTS HAVE BEEN SEARCHED, KEYL IS DISPOSED.
(*
(*-----------------------------------------------*)
(* END %INCLUDE DISPNM. *)
PROCEDURE ELDNM(VAR KEYL:LISTKEY;VAR RR:RET_REC) EXTERNAL;

FUNCTION:
CREATE A LIST WITH ALL DUPLICATE ENTITIES ELIMINATED.
THE FIRST REFERENCE IS MAINTAINED AND ALL SUBSEQUENT
ENTITIES ARE REMOVED.

DESCRIPTION OF ARGUMENTS:
NAME I/O DESCRIPTION
KEYL I - KEY OF THE LIST WHICH MAY CONTAIN DUPLICATE
ENTITIES. THE LIST WILL HAVE ALL DUPLICATES
REMOVED.
RR 0 - THE FUNCTION RETURN RECORD.

ENVIRONMENT:
LANGUAGE: IBM PASCAL
HARDWARE: IBM 360/370/43XX

PROCESSING DESCRIPTION:
EACH ENTRY ON THE SYSTEM LIST IS READ. THE ADB.PROBIT IS
SET ON, AND THE ENTITY KEY IS PLACED ON THE NEW SYSTEM LIST.
IF THE ADB.PROBIT IS ALREADY SET ON, THEN THE ENTITY IS A
DUPLICATE AND NOT PLACED ON THE NEW LIST.
THE NEW LIST REPLACES THE OLD SYSTEM LIST IN THE APPL-
ICATION 'IST. ALL PROBITS ARE THEN RESET TO 'OFF'.

CHANGE CONTROL:
REVISED: 09/02/86 B. A. ULMER W315
TO USE MAS INTERNAL PROCESS FLAG (MAPROB2) INSTEAD OF
MAPROB (CONFLICT WITH DELRUL).
REVISED: 04/26/85 E. D. SHREVE W315
TO USE MAS INTERNAL PROCESS FLAG (MAPROB).
REVISED: 02/07/85 E. D. SHREVE W315
REWRITTEN TO PROCESS MORE EFFICIENTLY.
(* %INCLUDE ELMNODM. *)
(******)
PROCEDURE ELMNODM(CONST KEYE:ENTKEY;VAR ENTDEF:ENTBLOCK;
VAR RR:RET_REC);EXTERNAL;
(******)
(*---------------------------------------------------------------*)
(*
(* FUNCTION
(* RETURN AN ENTBLOCK CORRESPONDING TO A KEY.
(*
(* LANGUAGE
(* PASCAL.
(*
(* PACKAGE
(* ENTITY PACKAGE.
(*
(* ARGUMENTS
(* INPUT
(*  KEYE  - THE KEY OF THE ENTITY.
(*  ENTDEF - THE CORRESPONDING ENTBLOCK.
(*  RR    - THE FUNCTION RETURN RECORD.
(*
(*---------------------------------------------------------------*)
(******)
(* END %INCLUDE ELMNODM. *)

3-684
(*) %INCLUDE EXCRBE *

PROCEDURE EXCRBE(CONST CRB:CRBPTR; CONST POS1:RDBSIZE;
CONST POS2:RDBSIZE; VAR RR:RET_REC);EXTERNAL;

(*---------------------------------------------*)

(*
* AUTHOR: B. A. ULMER FRMI CREATED: 85/02/08 CC??*
* VERSION: XXXX REVISED: YY/MM/DD CC *
(*
* FUNCTION:
* EXCHANGE TWO ENTRIES IN THE CRB
(*
* ENVIRONMENT:
* IBM PASCAL LANGUAGE
* IBM 30XX, 43XX DEPENDENT CODE, OR OTHER APPROPRIATE H/W.
(*
* EXECUTION PROCEDURE:
* HOW IS THIS ROUTINE/MODULE TO BE EXECUTED.
(*
* DESCRIPTION OF ARGUMENTS:
* NAME I/O DESCRIPTION
* CRB I/O CONSTITUENT READ BLOCK ADDRESS
* POS1 I POSITION OF FIRST ENTRY TO EXCHANGE
* POS2 I POSITION OF SECOND ENTRY TO EXCHANGE
* RR 0 ERROR CONDITION RETURN CODE
* = 0 OK RETURN CODE
* = 1 YOU BLEW IT
* = 2 THE ROUTINE BLEW IT
(*
* COMMONS:
* COM1
* VAR1 I VAR1 NAME MUST BE FILLED, CHARACTER DATA
* MUST BE PROVIDED
* VAR2 I VAR2 MUST BE SPECIFIED
* COM2
* VAR3 I CHARACTER DATA MUST BE SPECIFIED
(*
* PROCESSING DESCRIPTION:
* DETAILED DESCRIPTION OF HOW THIS ROUTINE WORKS, WHICH
* FILES NEED TO BE OPENED/CLOSED, FILES USED, ETC.
(*
* COMMENTS:
* TEXT OF ANY FURTHER COMMENTS WHICH MIGHT HELP TO UNDERSTAND*
* THE FUNCTION/EXECUTION OF THIS ROUTINE.
(*
* CHANGE CONTROL:

3-685
(* YY/MM/DD CCZZ I. M. THECHANGER *)
(* DESCRIPTION OF LATEST CHANGE MADE. *)
(* YY/MM/DD CCYY I. M. THEPROGRAMMER *)
(* DESCRIPTION OF CHANGE MADE. IF LENGTHY, CONTINUE THE *)
(* NARRATION ON THE NEXT LINE. *)
(* YY/MM/DD CCXX I. M. APerson *)
(* DESCRIPTION OF FIRST CHANGE MADE. *)
(* *)
(*---------------------------------------------*)
(**)
(* END %INCLUDE EXCRBE *)
(* %INCLUDE EXPCLSM. *)
(***)
PROCEDURE EXPCLSM(CONST LISTIN:LISTPNTR;VAR LISTOUT:LISTPNTR;
VAR LSTFLG:BOOLEAN; VAR RR:RET_REC);EXTERNAL;
(***)
(*-------------------------------------------------------------*)
(*
(* $FUNCTION:
(* EXPAND LIST WITH ALL OF ITS CONSTITUENTS AND PLACE THIS
(* EXPANDED LIST IN LISTOUT.
(*
(* $DESCRIPTION OF ARGUMENTS:
(*
| NAME | I/O | DESCRIPTION |
(* | === | === | ========= |
(* | LISTIN | I | LIST CONTAINING ENTITIES TO BE |
(* | | | EXPANDED. |
(* | LISTOUT | 0 | LIST OF INCLUSIVE CONSTITUENTS |
(* | LSTFLG | I | FLAG TO TELL IF FIRST TIME THRU |
(* | RR | 0 | FUNCTION RETURN CODE. |
(* | | = 0 GOOD RETURN |
(* | | > 0 CRITICAL ERROR |
(* | | < 0 WARNING |
(*
(* $COMMONS:
(* NONE
(*
(* $ENVIRONMENT:
(* LANGUAGE: IBM PASCAL
(* HARDWARE SYSTEM: IBM 360,370,43XX
(*
(* $EXECUTION PROCEDURE:
(* INTERNAL PROCEDURE FOR THE MODEL ACCESS SOFTWARE
(*
(* $PROCESSING DESCRIPTION:
(* THIS ROUTINE INVOKES ITSELF RECURSIVELY AND FILLS LISTOUT
(* BY ADDING EACH NEST OF CONSTITUENTS DIRECTLY AFTER THE
(* PARENT ENTITY.
(*
(* $CHANGE CONTROL:
(* REVISED: 01/10/86 B. A. ULMER W315
(* FIX BUG DEALING WITH PREVIOUS FIX
(*
(* REVISED: 05/21/85 B. A. ULMER W315
(* FIX INCONSISTENCY IN OUTPUT LIST PROCESSING
(*
(* REVISED: 04/26/85 E.D. SHREVE W315
(* TO USE INTERNAL MAS PROCESS FLAG MAPROB
(*
3-687
(* REVISED: 02/18/85 B.A. ULMER W315 *)
(* IMPLEMENT THE CNST READ BLOCK *)
(* CREATED: 06/13/84 D.J. KERCHNER W315 *)
(*------------------------------------------*)
(**)
(* END %INCLUDE EXPCLSM. *)
(* %INCLUDE EXPCRB *)

PROCEDURE EXPCRB(VAR CRB:CRBPNTR; VAR RR:RET_REC);EXTERNAL;

(* -----------------------------------------------*)

(*
AUTHOR:  B. A. ULMER  FRMI  CREATED: 85/02/08  CC??
VERSION: XXXX  REVISED: YY/MM/DD  CC *

FUNCTION:
EXPAND THE CRB

ENVIRONMENT:
IBM PASCAL LANGUAGE
IBM 30XX, 43XX DEPENDENT CODE, OR OTHER APPROPRIATE H/W.

EXECUTION PROCEDURE:
HOW IS THIS ROUTINE/MODULE TO BE EXECUTED.

DESCRIPTION OF ARGUMENTS:
NAME  I/O  DESCRIPTION
CRB  I/O  CONSTITUENT READ BLOCK ADDRESS
RR  0  ERROR CONDITION RETURN CODE
    = 0  OK RETURN CODE
    = 1  YOU BLEW IT
    = 2  THE ROUTINE BLEW IT

COMMUNS:
COM1
VAR1  I  VAR1 NAME MUST BE FILLED, CHARACTER DATA MUST BE PROVIDED
VAR2  I  VAR2 MUST BE SPECIFIED
COM2
VAR3  I  CHARACTER DATA MUST BE SPECIFIED

PROCESSING DESCRIPTION:
DETAILED DESCRIPTION OF HOW THIS ROUTINE WORKS, WHICH FILES NEED TO BE OPENED/CLOSED, FILES USED, ETC.

COMMENTS:
TEXT OF ANY FURTHER COMMENTS WHICH MIGHT HELP TO UNDERSTAND THE FUNCTION/EXECUTION OF THIS ROUTINE.

CHANGE CONTROL:
YY/MM/DD  CCZZ  I. M. THECHANGER
DESCRIPTION OF LATEST CHANGE MADE.
YY/MM/DD  CCYY  I. M. THEPROGRAMMER
DESCRIPTION OF CHANGE MADE.  IF LENGTHY, CONTINUE THE
NARRATION ON THE NEXT LINE.
YY/MM/DD CCXX I. M. APERSO
DESCRIPTION OF FIRST CHANGE MADE.

(* END %INCLUDE EXPCRB *)
(* %INCLUDE EXPSUDB *)
(**)
PROCEDURE EXPSUDB(VAR ENTBNTR:ENTPNTR;CONST OLDSIZE:ENTSIZE;
CONST NEWSIZE:ENTSIZE;VAR RR:RET_REC);EXTERNAL;
(**)
(* $FUNCTION:
EXPAND A SYSTEM UDB (USER DATA BLOCK)
(* $DESCRIPTION OF ARGUMENTS:
(* NAME I/O DESCRIPTION
(* ===== === =============
(* OLDSIZE I SIZE OF THE AREA TO BE EXPANDED
(* NEWSIZE I SIZE OF THE OUTPUT DATA AREA FOR THE
(* EXPANDED ENTPBLOCK
(* ENTBNTR I POINTER TO THE ENTPBLOCK TO BE EXPANDED
(* ENTBNTR O POINTER TO THE EXPANDED ENTPBLOCK
(* RC O EXTERNAL RETURN CODE
(* = 0 OK
(* > 0 CRITICAL ERROR
(* < 0 WARNING
(*
(* $COMMONS:
(*
(* $ENVIRONMENT:
(* LANGUAGE: IBM PASCAL
(* HARDWARE SYSTEM: IBM 360/370/4341/4381
(*
(* $EXECUTION PROCEDURE:
(* INTERNAL PROCEDURE FOR THE MODEL ACCESS SOFTWARE
(*
(* $PROCESSING DESCRIPTION:
(* EXPAND THE USER DATA BLOCK (UDB)
(*
(* $COMMENTS:
(*
(* $CHANGE CONTROL:
(*
(* REVISED: 07/09/85 B. A. ULMER FRMI
(* CHANGE TO MAKE THIS ROUTINE MORE VAX COMPATIBLE - TAKE OUT THE
(* MIN FUNCTION
(*
(* REVISED: 12/10/84 J. JOHNSON
(* TO CALL MASDSP
(*
*)
(* %INCLUDE EXPULSM. *)

PROCEDURE EXPULSM(CONST LISTIN:LISTPNTR; VAR LISTOUT:LISTPNTR;
VAR LSTFLG:BOOLEAN; VAR RR:RETREC);EXTERNAL;

(* $FUNCTION:
PLACE THE EXPANDED LIST WITH ALL OF ITS USERS IN LISTOUT. *)

(* $DESCRIPTION OF ARGUMENTS:

<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>LISTIN</td>
<td>I</td>
<td>LIST TO BE EXPANDED.</td>
</tr>
<tr>
<td>LISTOUT</td>
<td>O</td>
<td>EXPANDED LIST.</td>
</tr>
<tr>
<td>LSTFLG</td>
<td>I</td>
<td>FLAG TO TELL IF FIRST TIME THRU</td>
</tr>
<tr>
<td>RR</td>
<td>O</td>
<td>FUNCTION RETURN RECORD.</td>
</tr>
</tbody>
</table>

(* = 0 GOOD RETURN |
| > 0 CRITICAL ERROR |
| < 0 WARNING |

(* $COMMONS:
NONE |

(* $ENVIRONMENT:
LANGUAGE: IBM PASCAL |
HARDWARE SYSTEM: IBM 360,370,43XX |

(* $EXECUTION PROCEDURE:
INTERNAL PROCEDURE FOR THE MODEL ACCESS SOFTWARE. |

(* $PROCESSING DESCRIPTION:
THIS ROUTINE INVOKES ITSELF RECURSIVELY AND FILLS LISTOUT |
BY ADDING EACH NEST OF USERS DIRECTLY AFTER ITS USER |
REFERENCE. |

(* $CHANGE CONTROL:
REVISED: 01/10/86 B. A. ULMER W315 |
FIX BUG DEALING WITH PREVIOUS FIX |
REVISED: 05/21/85 B. A. ULMER W315 |
FIX INCONSISTENCY IN OUTPUT LIST PROCESSING |
REVISED: 04/26/85 E. D. SHREVE W315 |
TO USE INTERNAL MAS PROCESS FLAG MAPROB |
(*) ORIGINATED: 06/13/84  D. J. KERCHNER    W315 (*)
(*) (*)
(*)----------------------------------------------(*)
(**)
(*) END %INCLUDE EXPULSM. (*)
(* %INCLUDE EXPULSMI.*)

PROCEDURE EXPULSMI(CONST ENTITY:ENTKEY; VAR LISTOUT:LISTPNTR;
                     VAR RR:RET_REC);EXTERNAL;

(*) $FUNCTION:
(*     PLACE THE EXPANDED LIST WITH ALL OF ITS USERS IN LISTOUT. *)

(*) $DESCRIPTION OF ARGUMENTS:
(*     NAME  I/O  DESCRIPTION
(*     ===  ===  =========
(*     LISTIN     I   LIST TO BE EXPANDED.
(*     LISTOUT    O   EXPANDED LIST.
(*     LSTFLG     I   FLAG TO TELL IF FIRST TIME THRU
(*     RR         O   FUNCTION RETURN RECORD.
(*           = 0  GOOD RETURN
(*           > 0  CRITICAL ERROR
(*           < 0  WARNING

(*) $COMMONS:
(*     NONE

(*) $ENVIRONMENT:
(*     LANGUAGE: IBM PASCAL
(*     HARDWARE SYSTEM: IBM 360,370,43XX

(*) $EXECUTION PROCEDURE:
(*     INTERNAL PROCEDURE FOR THE MODEL ACCESS SOFTWARE.

(*) $PROCESSING DESCRIPTION:
(*     THIS ROUTINE INVOKES ITSELF RECURSIVELY AND FILLS LISTOUT
(*     BY ADDING EACH NEST OF USERS DIRECTLY AFTER ITS USER
(*     REFERENCE.

(*) $CHANGE CONTROL:
(*     CHANGED: 11/19/86  K. M. ROSS
(*     REASON: INCORRECT ORDER ON OUTPUT
(*     CHANGE: CHECK IF FIRST ELEMENT IN LIST ALREADY
(*     PROCESSED I.E. DELETED FROM USER LIST

(*) CHANGED: 11/10/86  K. M. ROSS
(*     REASON: INCORRECT ORDER ON OUTPUT
(*     CHANGE: CHECK LISTIN LENGTH AFTER LOOP TO RE
(*     MOVE USERS ALREADY PROCESSED

3-694
(* CHANGED: 11/06/86 K M ROSS *)
(* REASON: TOO SLOW *)
(* CHANGE: REDESIGN USER LIST CREATION, BY BREADTH *)
(* WISE INSTEAD OF LENGTHWISE *)

(* REvised: 01/10/86 B. A. ULMER W315 *)
(* FIX BUG DEALING WITH PREVIOUS FIX *)

(* REvised: 05/21/85 B. A. ULMER W315 *)
(* FIX INCONSISTENCY IN OUTPUT LIST PROCESSING *)

(* REvised: 04/26/85 E. D. SHREVE W315 *)
(* TO USE INTERNAL MAS PROCESS FLAG MAPROB *)

(* ORiginated: 06/13/84 D. J. KERCHNER W315 *)

(* End %include expulsmi. *)

3-695
(* %INCLUDE FDSCH. *)
(*
PROCEDURE FDSCH(CONST SCH_ROOT:ENTKEY;CONST KIND:ORD_KIND;
VAR SCH_PTR:ENTKEY;VAR POSITION:LISTPSTN;
VAR RR:RET_REC); EXTERNAL;
(*
(* FUNCTION
(* FIND A SCHEMA_INSTANCE_COLLECTOR OR SCHEMA_CLASS ENTITY ON
(* THE SPECIFIED SCHEMA_ROOT'S CONSTITUENT LIST.
(*
(* LANGUAGE
(* PASCAL.
(*
(* PACKAGE
(* SCHEMA PACKAGE.
(*
(* ARGUMENTS
(* INPUT
(* NDSREM - THE NETWORK TO BE SEARCHED.
(* KIND - VALUE TO BE SEARCHED FOR IN THE ENTBLOCK OF
(* THE CLASS OR INSTANCE COLLECTOR NODE. THIS
(* IS THE KIND OF THE COLLECTED INSTANCES FOR
(* INSTANCE COLLECTORS.
(*
(* OUTPUT
(* SCH_PTR - POINTER TO THE FOUND ENTITY WITH SPECIFIED
(* DATA.KIND.
(* POSITION - POSITION IN THE CONSTITUENT LIST OF THE LAST
(* SCHEMA CLASS OR INSTANCE COLLECTOR ENTITY
(* WITH HEADER.KIND LESS THAN OR EQUAL TO THE
(* SPECIFIED KIND.
(* RR - THE FUNCTION RETURN RECORD.
(*
(*-----------------------------------------------*)
(*
(* END %INCLUDE FDSCH. *)
(*
(*-----------------------------------------------*)
(*
(*-----------------------------------------------*)
(*%INCLUDE FNDCRBE*)
(**)
PROCEDURE FNDCRBE(CONST CRB:CRBNTR; CONST EKEY:ENTKEY;
VAR CRBPOS:RDBSIZE;VAR RR:RET_REC);EXTERNAL;
(**)
(*-------------------------------------------------------------------*)
(*
(* AUTHOR: B. A. ULMER FRMI CREATED: 85/02/08 CC??*)
(* VERSION: XXXX REVISED: YY/MM/DD CC *)
(*
(* FUNCTION:
(* FIND A SPECIFIC ENTRY IN THE CRB
(*
(* ENVIRONMENT:
(* IBM PASCAL LANGUAGE
(* IBM 30XX, 43XX DEPENDENT CODE, OR OTHER APPROPRIATE H/W.
(*
(* EXECUTION PROCEDURE:
(* HOW IS THIS ROUTINE/MODULE TO BE EXECUTED.
(*
(* DESCRIPTION OF ARGUMENTS:
(*
(* NAME I/O DESCRIPTION
(* CRB I/O CONSTITUENT READ BLOCK ADDRESS
(* EKEY I ENTITY KEY WHICH IS TO BE FOUND IN THE CRB
(* CRBPOS 0 POSITION IN CRB WHERE EKEY WAS FOUND
(* RR 0 ERROR CONDITION RETURN CODE
(*
(* = 0 OK RETURN CODE
(* = 1 YOU BLEW IT
(* = 2 THE ROUTINE BLEW IT
(*
(* COMMONS:
(*
(* COM1
(* VAR1 I VAR1 NAME MUST BE FILLED, CHARACTER DATA
(*
(* VAR2 I VAR2 MUST BE SPECIFIED
(*
(* COM2
(* VAR3 I CHARACTER DATA MUST BE SPECIFIED
(*
(* PROCESSING DESCRIPTION:
(* DETAILED DESCRIPTION OF HOW THIS ROUTINE WORKS, WHICH
(* FILES NEED TO BE OPENED/CLOSED, FILES USED, ETC.
(*
(* COMMENTS:
(* TEXT OF ANY FURTHER COMMENTS WHICH MIGHT HELP TO UNDERSTAND
(* THE FUNCTION/EXECUTION OF THIS ROUTINE.
(*
(* 3-697
(* CHANGE CONTROL: *)
(* YY/MM/DD CCZZ I. M. THECHANGER *)
(* DESCRIPTION OF LATEST CHANGE MADE. *)
(* YY/MM/DD CCYY I. M. THEPROGRAMMER *)
(* DESCRIPTION OF CHANGE MADE. IF LENGTHY, CONTINUE THE *)
(* NARRATION ON THE NEXT LINE. *)
(* YY/MM/DD CCXX I. M. APERSO *)
(* DESCRIPTION OF FIRST CHANGE MADE. *)
(* )
(*----------------------------------------------------------*)
(**)
(* END %INCLUDE FNDCRBE *)
(* %INCLUDE FNDSKIND *)
(**)
PROCEDURE FNDSKIND(CONST SCHKEY:ENTKEY;VAR KINDARY:KIND_ARRAY;
VAR NUMKIND:INTEGER;VAR RR:RET_REC);EXTERNAL;
(**)
(*---------------------------------------------------------------*)
(*
**     FUNCTION
**     BUILD AN ARRAY OF KIND VALUE COLLECTED BY A CLASS OR
**     INSTANCE COLLECTOR IN THE SCHEMA.
**
**     LANGUAGE
**     PASCAL
**
**     PACKAGE
**     LIST PACKAGE.
**
**     ARGUMENTS
**     INPUT
**       SCHKEY       - KEY OF THE CLASS OR INSTANCE COLLECTOR NODE.
**       KINDARY      - ARRAY TO STORE THE COLLECTED KINDS.
**
**     OUTPUT
**       NUMKIND     - NUMBER OF KIND VALUES PUT INTO KINDARY.
**       RR          - THE FUNCTION RETURN RECORD.
**
**     METHOD
**     1. IF SCHKEY IS AN INSTANCE COLLECTOR, THE KIND VALUE FROM
**        THE 1ST CONSTITUENT'S ADB IS PUT INTO KINDARY.
**     2. IF SCHKEY IS A CLASS COLLECTOR, ALL INCLUSIVE INSTANCE
**        COLLECTORS ARE FOUND AND THEIR KINDS PUT IN KINDARY.
**        THIS IS ACCOMPLISHED BY RECURSIVE CALLS TO FNDSKIND.
**
---------------------------------------------------------------*)
(**)
(* END %INCLUDE FNDSKIND *)
(* %INCLUDE GTCRBE *)

PROCEDURE GTCRBE(CONST CRB:CRBPNTR; VAR CRBPOS: RDBSIZE;
               CONST EKEY:ENTKEY; VAR POS:LISTPSTN; VAR DIR:LISTDIR;
               VAR RR:RETREC);EXTERNAL;

(*-------------------------------------------------------------------------------)
(*
(*   AUTHOR: B. A. ULMER   FRMI   CREATED: 85/02/08   CC??*)
(*   VERSION: XXXX   REVISION: YY/MM/DD   CC   *)
(*
(*   FUNCTION:   *)
(*      GET AN ENTRY IN THE CRB   *)
(*
(*   ENVIRONMENT:   *)
(*      IBM PASCAL LANGUAGE   *)
(*      IBM 30XX, 43XX DEPENDENT CODE, OR OTHER APPROPRIATE H/W.   *)
(*
(*   EXECUTION PROCEDURE:   *)
(*      HOW IS THIS ROUTINE/MODULE TO BE EXECUTED.   *)
(*
(*   DESCRIPTION OF ARGUMENTS:   *)
(*
(*      NAME     I/O   DESCRIPTION   *)
(*      CRB     I/O   CONSTITUENT READ BLOCK ADDRESS   *)
(*      CRBPOS    I   POSITION IN CRB OF ENTRY REQUESTED   *)
(*      EKEY      O   KEY OF ENTITY CONTAINING THE CONSTITUENT LIST   *)
(*      POS       O   LIST POSITION SETTING   *)
(*      DIR       O   DIRECTION TO READ OF LIST (FORWARD OR REVERSE)   *)
(*      RR        O   ERROR CONDITION RETURN CODE   *)
(*      = 0   OK RETURN CODE   *)
(*      = 1   YOU BLEW IT   *)
(*      = 2   THE ROUTINE BLEW IT   *)
(*
(*   COMMONS:   *)
(*      COM1   *)
(*      VAR1     I   VAR1 NAME MUST BE FILLED, CHARACTER DATA   *)
(*      = MUST BE PROVIDED   *)
(*      VAR2     I   VAR2 MUST BE SPECIFIED   *)
(*      COM2   *)
(*      VAR3     I   CHARACTER DATA MUST BE SPECIFIED   *)
(*
(*   PROCESSING DESCRIPTION:   *)
(*      DETAILED DESCRIPTION OF HOW THIS ROUTINE WORKS, WHICH   *)
(*      FILES NEED TO BE OPENED/CLOSED, FILES USED, ETC.   *)
(*
(*   COMMENTS:   *)
(*
3-700
(* %INCLUDE INDLSM *)

PROCEDURE INDLSM(CONST KEYE:ENTKEY;CONST LISTREF:LISTPNTR;
VAR POSITION:LISTPSTN;VAR INLST:BOOLEAN;VAR RR:RET_REC);
EXTERNAL;

(* )

(* AUTHOR: UNKNOWN CADD CREATED: YY/MM/DD CC *)
(* VERSION: MAS VER 2 REVISED: 84/10/11 CC *)

(* FUNCTION: *)
(* LOCATE AN ENTITY IN A SYSTEM LIST. *)

(* ENVIRONMENT: *)
(* IBM PASCAL LANGUAGE *)
(* IBM 30XX, 43XX, DEC VAX 11/780 *)

(* DESCRIPTION OF ARGUMENTS: *)
(* NAME I/O DESCRIPTION *)
(* KEYE I ENTITY TO BE LOCATED. *)
(* LISTREF I LIST TO BE SEARCHED. *)
(* POSITION 0 POSITION OF ENTITY IN SYSTEM LIST. *)
(* INLST 0 TRUE IF AN ENTITY IN THE LIST CORRESPONDS *)
(* TO KEYE ELSE FALSE. *)
(* RR 0 ERROR CONDITION RETURN CODE. *)
(* = 0 NORMAL RETURN CODE. *)

(* COMMONS: *)

(* PROCESSING DESCRIPTION: *)

(* COMMENTS: *)

(* CHANGE CONTROL: *)
(* 84/10/11 MAS VER 2 D. J. KERCHNER *)
(* UPDATED DOCUMENTATION. *)
(* 84/10/04 MAS VER 2 E. D. SHREVE *)
(* CHANGED DECLARATION OF KEYL TO VAR. *)

(* )

(* END %INCLUDE INDLSM *)
%INCLUDE PCMGT
DEF
$PCMGR: T_$PCMGR;

VALUE
  $PCMGR.SIZE := 32768;
  $PCMGR.PTR := NIL;
  $PCMGR.OVERFLOW := NIL;
  $PCMGR.INIT.SIZE := 32768;
  $PCMGR.MAP := 0;

(* ADDED A VALUE STATEMENT FOR THE OVERFLOW BLOCK USAGE FLAG *)
(* %INCLUDE INNM. *)
(**)
FUNCTION INNM(CONST KEYE:ENTKEY;CONST KEYL:LISTKEY;
VAR RR:RET_REC):BOOLEAN; EXTERNAL;
(**)
(*---------------------------------------------------------------*)
(*
FUNCTION
(* INDICATE WHETHER A LIST REFERENCES AN ENTITY.
(*
LANGUAGE
(* PASCAL.
(*
PACKAGE
(* LIST PACKAGE.
(*
ARGUMENTS
(* INPUT
(* KEYE - KEY TO LOOK FOR IN THE LIST.
(* KEYL - THE KEY OF THE LIST TO EXAMINE.
(* OUTPUT
(* RR - THE FUNCTION RETURN RECORD.
(* FUNCTION VALUE - TRUE IF ENTITY IS IN LIST ELSE FALSE.
(*
*)---------------------------------------------------------------*)
(**)
(* END %INCLUDE INNM. *)
(* %INCLUDE INTLSM. *)

PROCEDURE INTLSM(CONST LIST1:LISTPNTR;CONST LIST2:LISTPNTR;
VAR POSITION:LISTPSTN;VAR LISTOUT:LISTPNTR;
VAR RR:RET_REC);EXTERNAL;

(*--------------------------------------------------------------*)

(* $FUNCTION:
(* CREATE A LIST WHICH IS THE INTERSECTION OF TWO LISTS.
(*
(* $DESCRIPTION OF ARGUMENTS:
(*
NAME I/O DESCRIPTION
(*)
LIST1 I LIST TO BE INTERSECTED WITH THE SECOND
LIST1 I LIST TO BE INTERSECTED WITH THE FIRST
POSITION I INTEGER INDICATING THE POSITION ON
LISTOUT
LISTOUT
LISTOUT
LISTOUT
LISTOUT
LISTOUT
RC 0 EXTERNAL RETURN CODE
0 OK
> 0 CRITICAL ERROR
< 0 WARNING

(* $COMMONS:
(*
(* $ENVIRONMENT:
(* LANGUAGE: IBM PASCAL
(* HARDWARE SYSTEM: IBM 360/370/4341/4381
(*
(* $EXECUTION PROCEDURE:
(* INTERNAL PROCEDURE FOR THE MODEL ACCESS SOFTWARE
(*
(* $PROCESSING DESCRIPTION:
(* FIND THOSE ENTITIES WHICH ARE COMMON TO BOTH INPUT LISTS
(*
(* $COMMENTS:
(*
(* $CHANGE CONTROL:
(* REvised: 07/01/85 B. A. ULMER FRMI
(* ELIMINATE THE MIN FUNCTION TO IMPROVE COMPATABILITY WITH VAX
(*
(* REvised: 02/22/85 B. A. ULMER FRMI
(* FIXED EMPTY LIST ELEMENT PROBLEM

3-705
(*) REVISED: 12/24/85 B. A. ULMER FRMI (*)
(*) ADDED SYSTEM LIST CURRENT LENGTH INDICATOR -- LSTLNMD (*)
(*)
FUNCTION LSTLNM(CONST LISTREF: LISTPNT; VAR RR: RET_REC): LISTSIZE;
EXTERNAL;

(* FUNCTION RETURN THE NUMBER OF NON-VACANT ENTITIES IN A SYSTEM LIST. *)
(* LANGUAGE PASCAL. *)
(* PACKAGE LIST PACKAGE. *)
(* ARGUMENTS *)
(* INPUT *)
(* LISTREF - POINTER TO A SYSTEM LIST. *)
(* OUTPUT *)
(* RR - THE FUNCTION RETURN RECORD. *)
(* FUNCTION VALUE - NUMBER OF ENTITIES IN THE SYSTEM LIST. *)
(* *)
(* END %INCLUDE LSTLNM. *)
(* %INCLUDE LSTMXLNM. *)

FUNCTION LSTMXLNM(CONST LISTREF:LISTPNTR;VAR RR:RET_REC):LISTSIZE;
  EXTERNAL:

(*-----------------------------*)
(* FUNCTION *)
(* RETURN THE NUMBER OF ENTRIES ALLOCATED TO A SYSTEM LIST. *)
(* LANGUAGE *)
(* PASCAL. *)
(* PACKAGE *)
(* LIST PACKAGE. *)
(* ARGUMENTS *)
(* INPUT *)
(* LISTREF - POINTER TO A SYSTEM LIST. *)
(* OUTPUT *)
(* FUNCTION VALUE - SIZE OF SYSTEM LIST. *)
(* RR - THE FUNCTION RETURN RECORD. *)

(*-----------------------------*)

(* END %INCLUDE LSTMXLNM. *)
PROCEDURE MABRST(VAR RC:EXT_RET_CODE);
  SUBPROGRAM;

$FUNCTION:
RESET THE PROCESS AND APPLICATION FLAGS FOR ALL ENTITIES IN
THE WORKING FORM MODEL.

$DESCRIPTION OF ARGUMENTS:

<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>RC</td>
<td>0</td>
<td>EXTERNAL RETURN CODE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>= 0 OK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 0 CRITICAL ERROR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt; 0 WARNING</td>
</tr>
</tbody>
</table>

$COMMONS:
NDSREM
VAR1 I VAR1 NAME MUST BE FILLED, CHARACTER DATA MUST BE PROVIDED

$ENVIRONMENT:
LANGUAGE: IBM PASCAL
HARDWARE SYSTEM: IBM 360/370/4341/4381

$EXECUTION PROCEDURE:
MODEL ACCESS SOFTWARE INTERFACE ROUTINE

$PROCESSING DESCRIPTION:

$COMMENTS:

$CHANGE CONTROL:
ORIGINATED: 03/07/87 K. M. ROSS DBMA

DATA STRUCTURES/MAJOR VARIABLES:

END %INCLUDE MABRST *
(* %INCLUDE MACPDT *)

PROCEDURE MACPDT(CONST KEY1:ANYKEY; CONST FLGNAME:NAMTYP; CONST FLGVAL:INTEGER; VAR RC:EXT_RET_CODE);SUBPROGRAM;

(* $FUNCTION: *)
(* UPDATE A SPECIFIED APPLICATION ACCESSIBLE FLAG VALUE *)
(* FOR THE CONSTITUENTS OF AN ENTITY OR A LIST OF ENTITIES *)

(* $DESCRIPTION OF ARGUMENTS: *)
(* NAME I/O DESCRIPTION *)
(* === === ======== *)
(* KEY1 I ENTITY OR LIST OF ENTITIES WHOSE *)
(* SPECIFIED FLAG VALUE IS TO BE UPDATED *)
(* FLGNAME I FLAG NAME (STRING(6)) *)
(* FLGVAL I VALUE TO BE USED WHEN UPDATING THE FLAG *)
(* = 1 TRUE *)
(* = 0 FALSE *)
(* RC 0 EXTERNAL RETURN CODE *)
(* = 0 OK RETURN CODE *)
(* = 0 WARNING *)
(* > 0 CRITICAL ERROR *)

(* $COMMONS: *)

(* $ENVIRONMENT: *)
(* LANGUAGE: IBM PASCAL *)
(* HARDWARE SYSTEM: IBM 360/370/4341/4381 *)

(* $EXECUTION PROCEDURE: *)
(* MODEL ACCESS SOFTWARE INTERFACE ROUTINE *)

(* $PROCESSING DESCRIPTION: *)
(* DETERMINE WHICH OF THE APPLICATION ACCESSIBLE FLAGS IS TO BE *)
(* UPDATED AND THEN UPDATE IT WITH THE INPUT VALUE *)

(* $COMMENTS: *)

(* $CHANGE CONTROL: *)
(* ORIGINATED: 03/07/87 K. M. ROSS DBMA *)

(* END %INCLUDE MACPDT *)
(* %INCLUDE MAEA. *)
(*
PROCEDURE MAEA(CONST KEY1:ANYKEY;VAR RC:EXT_RET_CODE);SUBPROGRAM;
*)
(*)
(* $FUNCTION: *)
(* ACTIVATE AN ENTITY. *)
(*)
(* $DESCRIPTION OF ARGUMENTS: *)
(* NAME I/O DESCRIPTION *)
(* KEY1 I KEY OF THE ENTITY OR LIST OF ENTITIES TO *)
(* BE ACTIVATED *)
(* RC O EXTERNAL RETURN CODE *)
(* = 0 OK *)
(* > 0 CRITICAL ERROR *)
(* < 0 WARNING *)
(*)
(* $COMMONS: *)
(*)
(* $ENVIRONMENT: *)
(* LANGUAGE: IBM PASCAL *)
(* HARDWARE SYSTEM: IBM 360/370/4341/4381 *)
(*)
(* $EXECUTION PROCEDURE: *)
(* MODEL ACCESS SOFTWARE INTERFACE ROUTINE *)
(*)
(* $PROCESSING DESCRIPTION: *)
(* FOR EACH KEY, AS AN ENTITY OR A MEMBER OF A LIST *)
(* RESET THE DELETE FLAG *)
(*)
(* $COMMENTS: *)
(*)
(* $CHANGE CONTROL: *)
(*)
(* REVISED: 04/30/86 B. A. ULMER FRMI *)
(* ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION *)
(* TO USER RECOGNIZEABLE FORM *)
(*)
(* REVISED: 07/11/85 B. A. ULMER FRMI *)
(* ADD NEW PARAMETER TO CNVRR FOR ERROR HANDLING AND DEBUGGING *)
(*)
(* PURPOSES *)
(*)
(* REVISED: 08/14/86 K. M. ROSS DBMA *)

3-711
(* ADDED A CHECK FOR NIL POINTER ON KEY1 PURPOSES *)

(* ORIGINATED: 07/25/84 D. J. KERCHNER FRMI *)

(*-----------------------------------------------*)

/*PAGE

(* DATA STRUCTURES/MAJOR VARIABLES:*)

/*-----------------------------------------------*

(*END-----------------------------------------------*)

(**)

(* END %INCLUDE MAEA. *)

(**)
(* %INCLUDE MAEAI *)
(*)
PROCEDURE MAEAI(CONST KEY1:ANYKEY;VAR RC:EXT Ret_CODE);SUBPROGRAM;
(*)
(* $FUNCTION:
(*) ACTIVATE AN ENTITY OR A LIST OF ENTITIES AND THEIR
(*) INCLUSIVE CONSTITUENTS.
(*)
(* $DESCRIPTION OF ARGUMENTS:
(*) NAME I/O DESCRIPTION
(*) KEY1 I KEY OF THE ENTITY OR LIST OF ENTITIES TO
(*) BE ACTIVATED.
(*) RC 0 THE FUNCTION RETURN CODE.
(*) = 0 GOOD RETURN
(*) > 0 CRITICAL ERROR
(*) < 0 WARNING
(*)
(* $COMMONS:
(*) NONE
(*)
(* $ENVIRONMENT:
(*) LANGUAGE: IBM PASCAL
(*) HARDWARE SYSTEM: IBM 360,370,43XX
(*)
(* $EXECUTION PROCEDURE:
(*) MODEL ACCESS SOFTWARE INTERFACE ROUTINE
(*)
(* $PROCESSING DESCRIPTION:
(*) IF KEY1 IS AN ENTITY, THEN THAT ENTITY AND ITS INCLUSIVE
(*) CONSTITUENT LIST WILL BE ACTIVATED.
(*) IF KEY1 IS A LIST KEY, THEN THE INCLUSIVE CONSTITUENT LISTS
(*) OF EACH ENTITY WILL BE ACTIVATED.
(*) NOW USES THE INTERNAL MAS PROCESS FLAG (MAPROB) IN THE
(*) T_ELEMENT.IIT.
(*)
(* $CHANGE CONTROL:
(*) REVISED: 05/01/86 B. A. ULMER W315
(*) ADDED A CALL CNVOSP TO CONVERT AN "OUT OF MEMORY"
(*) CONDITION TO USER RECOGNIZEABLE FORM
(*)
(*) REVISED: 07/11/85 B. A. ULMER W315
(*) ADD NEW PARAMETER TO CNVRR FOR ERROR HANDLING AND
(*) DEBUGGING PURPOSES
(*)
3-713
REVISED: 04/26/85 E. D. SHREVE W315 *)
(* TO USE THE INTERNAL MAS PROCESS FLAG AND TO CALL *)
(* EXPCLST INSTEAD OF EXPALST *)
(*)
(* REVISED: 02/18/85 B. A. ULMER W315 *)
(* STRUCTURE CHANGE FOR THE CNST. READ BLOCK. *)
(*)
(* REVISED: 08/14/86 K. M. ROSS W315 *)
(* ADDED NIL POINTER CHECK FOR KEY1. *)
(*)
(* ORIGINATED: 07/26/84 D. J. KERCHNER W315 *)
(*-------------------------------------------------*)
(**)
(* END %INCLUDE MAEAI *)

3-714
(* %INCLUDE MAEAV *)

(*)
PROCEDURE MAEAV(CONST KEY1:ENTKEY;VAR IAVAL:INTEGER;
VAR RC:EXT_RET_CODE);SUBPROGRAM;
(*)

(*$FUNCTION:
*)(* FIND THE PRESENT VALUE OF THE ACTIVATION SETTING FOR AN ENTITY. *)

(*$DESCRIPTION OF ARGUMENTS:
)(* NAME I/O DESCRIPTION *)
(* === === =========== *)
(* KEY1 I KEY OF THE ENTITY WHOSE ACTIVATION SETTING IS TO BE CHECKED *)
(* IVAL O VALUE OF THE SWITCH *= 1 TRUE *)
(* *= 0 FALSE *)
(* RC O EXTERNAL RETURN CODE *= 0 OK RETURN CODE *)
(* *= 1 YOU BLEW IT *)
(* *= 2 THE ROUTINE BLEW IT *)

(*$COMMONS:
(*

(*$ENVIRONMENT:
*)(* LANGUAGE: IBM PASCAL *)
(* HARDWARE SYSTEM: IBM 360/370/4341/4381 *)

(*$EXECUTION PROCEDURE:
*)(* MODEL ACCESS SOFTWARE INTERFACE ROUTINE *)

(*$PROCESSING DESCRIPTION:
*)(* THE ACTIVITY STATUS OF THE ENTITY IS TO BE CHECKED. *)

(* IF THE ENTITY IS ACTIVE (NOT MARKED FOR DELETE), THEN THE ACTIVITY STATUS IS TRUE AND AN INTEGER FLAG VALUE OF (1) WILL BE RETURNED. *)

(* IF THE ENTITY IS INACTIVE (MARKED FOR DELETE), THEN THE ACTIVITY STATUS IS FALSE AND AN INTEGER FLAG VALUE OF (0) WILL BE RETURNED. *)

(*$COMMENTS:
(*

3-715
(* $CHANGE CONTROL: *)
(* *)
(* REVISED: 05/01/86 B. A. ULMER FRMI *)
(* ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF MEMORY" CONDITION *)
(* TO USER RECOGNIZABLE FORM *)
(* *)
(* REVISED: 07/11/85 B. A. ULMER FRMI *)
(* ADD A NEW PARAMETER TO CNVRR FOR ERROR HANDLING AND DEBUGGING *)
(* PURPOSES *)
(* *)
(* ORIGINATED: 07/27/85 D. J. KERCHNER FRMI *)
(* *)
(* ------------------------------------------ *)
(* %PAGE *)
(* ------------------------------------------ *)
(* DATA STRUCTURES/MAJOR VARIABLES: *)
(* ------------------------------------------ *)
(* *)
(* END----------------------------------------*)
(**)
(* END %INCLUDE MAEAV *)
(**)
PROCEDURE MAEC(CONST KEY1:ANYKEY;VAR KEY2:LISTKEY;
VAR RC:EXT_RET_CODE);SUBPROGRAM;

(* $FUNCTION: *)
CREATE AN APPLICATIONS LIST OF CONSTITUENT ENTITIES.

(* $DESCRIPTION OF ARGUMENTS: *)

<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEY1</td>
<td>I</td>
<td>KEY OF AN ENTITY OR A LIST.</td>
</tr>
<tr>
<td>KEY2</td>
<td>O</td>
<td>RETURNED KEY OF THE APPLICATION LIST.</td>
</tr>
<tr>
<td>RC</td>
<td>O</td>
<td>EXTERNAL RETURN CODE</td>
</tr>
</tbody>
</table>

< 0 WARNING
= 0 OK
> 0 CRITICAL ERROR

(* $COMMONS: *)

(* $ENVIRONMENT: *)

LANGUAGE: IBM PASCAL
HARDWARE SYSTEM: IBM 360/370/4341/4381

(* $EXECUTION PROCEDURE: *)
MODEL ACCESS SOFTWARE INTERFACE ROUTINE

(* $PROCESSING DESCRIPTION: *)
KEY2 IS CREATED (EMPTY LIST).
IF KEY1 IS AN ENTITY, THEN THE CONSTITUENT LIST OF KEY1
WILL BE COPIED INTO KEY2.
IF KEY1 IS A LIST KEY, THEN THE CONSTITUENT LISTS OF EACH
ENTITY WILL BE COPIED INTO KEY2.

(* $COMMENTS: *)

(* $CHANGE CONTROL: *)
REVISED: 05/01/86 B. A. ULMER W315
ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF MEMORY" CONDITION
TO USER RECOGNIZABLE FORM

REVISED: 07/11/85 B. A. ULMER W315
ADD A NEW PARAMETER TO CNVRR FOR ERROR HANDLING AND DEBUGGING PURPOSES
(* REVISED: 05/15/85 B. A. ULMER W315 *)
(* FIX INCONSISTENCY IN OUTPUT LIST PROCESSING *)
(* *)
(* REVISED: 02/18/85 B. A. ULMER W315 *)
(* CHANGED THE STRUCTURE OF THE INTERNAL ITEM FOR IMPLEMENTATION *)
(* OF THE CRB *)
(* *)
(* REVISED: 08/14/86 K. M. ROSS W315 *)
(* ADDED A CHECK FOR NIL POINTER FOR KEY1 *)
(* *)
(* ORIGINATED: 06/08/84 D. J. KERCHNER W315 *)
(* *)
(*-------------------------------*)
(* PAGE *)
(* END %INCLUDE MAEC *)
(* %INCLUDE MAECI *)

PROCEDURE MAECI(CONST KEY1:ANYKEY;VAR KEY2:LISTKEY;
VAR RC:EXT_RET_CODE);SUBPROGRAM;
(*

(* $FUNCTION:
CREATE AN APPLICATION LIST OF INCLUSIVE CONSTITUENT ENTRIES.
(*
(* $DESCRIPTION OF ARGUMENTS:
(*
<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEY1</td>
<td>I</td>
<td>KEY OF AN ENTITY OR A LIST.</td>
</tr>
<tr>
<td>KEY2</td>
<td>O</td>
<td>KEY OF THE CREATED APPLICATION LIST.</td>
</tr>
<tr>
<td>RC</td>
<td>O</td>
<td>FUNCTION RETURN CODE.</td>
</tr>
</tbody>
</table>
(*
(* $COMMONS:
NONE
(*
(* $ENVIRONMENT:
(*
LANGUAGE: IBM PASCAL
*|
HARDWARE SYSTEM: IBM 360, 370, 43XX
(*
(* $EXECUTION PROCEDURE:
(*
MODEL ACCESS SOFTWARE INTERFACE ROUTINE
(*
(* $PROCESSING DESCRIPTION:
(*
KEY2 IS CREATED (EMPTY LIST).
(*
IF KEY1 IS AN ENTITY, THEN THE INCLUSIVE CONSTITUENT LIST
OF KEY1 WILL BE COPIED INTO KEY2.
(*
IF KEY1 IS A LIST KEY, THEN THE INCLUSIVE CONSTITUENT LISTS
OF EACH ENTITY WILL BE COPIED INTO KEY2.
(*
IT IS ASSUMED THAT THE MAPROB FLAG IS INITIALLY SET TO
FALSE. AFTER PROCESSING, MAPROB FLAG IS RESET.
(*
(* $CHANGE CONTROL:
(*
REVISED: 05/01/86 B.A. ULMER W315
(*
ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF MEMORY"
CONDITION TO USER RECOGNIZABLE FORM
(*
(*
REVISED: 01/20/85 B.A. ULMER W315
(*

3-719
FIX BUG DEALING WITH PREVIOUS FIX

REVISED: 11/04/85 B.A. ULMER W315

NOT ALLOW ENTITIES THAT ARE ON THE APPLICATION INPUT*

LIST TO BE ON THE APPLICATION OUTPUT LIST (FIX THE *)

INCONSISTENCY IN THE PROCESSING

REVISED: 07/11/85 B.A. ULMER W315

ADD A NEW PARAMETER TO CNVRR FOR ERROR HANDLING *

AND DEBUGGING PURPOSES

REVISED: 05/15/85 B.A. ULMER W315

FIX INCONSISTENCY IN OUTPUT LIST PROCESSING

REVISED: 04/29/85 E.D. SHREVE W315

TO USE THE INTERNAL MAPROB FLAG

REVISED: 02/18/85 B.A. ULMER W315

IMPLEMENT CRB STRUCTURE CHANGE

REVISED: 08/14/86 K.M. ROSS W315

ADDED A NIL POINTER CHECK FOR KEY1

ORIGINATED: 07/26/84 D.J. KERCHNER W315

END %INCLUDE MA201 *)
(* %INCLUDE MAECIK *)

PROCEDURE MAECIK(CONST KEY1:ANYKEY; CONST ENTKIND:ORD_KIND;
VAR KEY2:LISTKEY; VAR RC:EXT_RET_CODE); SUBPROGRAM;

(*-----------------------------------------------*)

(* $FUNCTION: *)
(* CREATE A LIST OF INCLUSIVE CONSTITUENTS BY KIND. *)

(* $DESCRIPTION OF ARGUMENTS: *)
(* NAME   I/O   DESCRIPTION *)
(* ====   ===   =========*)
(* KEY1   I     THE KEY OF AN ENTITY OR A LIST OR ENTITIES *)
(* WHOSE INCLUSIVE CONSTITUENTS ARE TO BE *)
(* SEARCHED FOR THE SPECIFIED KIND. *)
(* KIND   I     THE KIND CODE OF AN ENTITY OR AN ENTITY *)
(* CLASS. *)
(* KEY2   O     THE KEY OF THE LIST WHICH WILL CONTAIN ALL *)
(* ENTITIES OF THE SPECIFIED KIND FOUND WITHIN *)
(* THE INCLUSIVE CONSTITUENTS OF KEY1. *)
(* RC     O     THE FUNCTION RETURN CODE. *)
(* = 0   GOOD RETURN *)
(* > 0   CRITICAL ERROR *)
(* < 0   WARNING *)

(* $COMMONS: *)
(* NONE *)

(* $ENVIRONMENT: *)
(* LANGUAGE: IBM PASCAL *)
(* HARDWARE SYSTEM: IBM 360, 370, 43XX *)

(* $EXECUTION PROCEDURE: *)
(* MODEL ACCESS SOFTWARE INTERFACE ROUTINE *)

(* $PROCESSING DESCRIPTION: *)
(* A NEW LIST IS CREATED TO CONTAIN THE INCLUSIVE CONSTITUENTS, *)
(* OR LIST MEMBERS. FOR EACH LIST MEMBER WHOSE KIND MATCHES *)
(* THE GIVEN KIND, THAT MEMBER IS ADDED TO THE OUTPUT LIST *)
(* POINTED TO BY KEY2. *)

(* $CHANGE CONTROL: *)
(* REVISED: 05/01/86 B.A. ULMER W315 *)
(* ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF MEMORY" *)
(* CONDITION TO USER RECOGNIZABLE FORM *)

3-721
REVISED: 07/11/85 B.A. ULMER W315 *)
ADD A NEW PARAMETER TO CNVRR FOR ERROR HANDLING *)
AND DEBUGGING PURPOSES *)
REVISED: 05/15/85 B.A. ULMER W315 *)
FIX INCONSISTENCY IN OUTPUT LIST PROCESSING *)
REVISED: 04/29/85 E.D. SHREVE W315 *)
TO USE INTERNAL MAS PROCESS FLAG (MAPROB) *)
REVISED: 02/18/85 B.A. ULMER W315 *)
TO IMPLEMENT NEW CRB STRUCTURE *)
REVISED: 09/11/84 R.A. MCCLUSKEY W315 *)
CHANGED PROCESSING OF SYSUSE FLAG. DROPPED *)
ROUTINE EXPCLSTK TO USE EXPCLST INSTEAD. *)
REVISED: 08/14/86 K.M. ROSS W315 *)
ADDED A NIL POINTER CHECK FOR KEY1 *)
ORIGINATED: 08/20/84 R.A. MCCLUSKEY W315 *)
---------------------------------------------------------------------------
(*)
(**)
(* END %INCLUDE MAECIK *)
(* %INCLUDE MAECMP *)

PROCEDURE MAECMP(CONST KEY1:ENTKEY;VAR KEY2:LISTKEY;
VAR RC:EXT_RET_CODE);SUBPROGRAM;

(* $FUNCTION:
GIVEN AN ENTITY DETERMINE WHICH OF ITS CONSTITUENTS IT
COMPRESSES WITH*)

(* $DESCRIPTION OF ARGUMENTS:

<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEY1</td>
<td>I</td>
<td>USER ENTITY WHOSE COMPRESSIBILITY IS DETERMINED BY THE CONSTITUENT ENTITY</td>
</tr>
<tr>
<td>KEY2</td>
<td>I</td>
<td>CONSTITUENT ENTITY BEING COMPRESSED</td>
</tr>
<tr>
<td>RC</td>
<td>O</td>
<td>EXTERNAL RETURN CODE</td>
</tr>
</tbody>
</table>

= 0  OK RETURN CODE
< 0  WARNING
> 0  CRITICAL ERROR |

(* $COMMONS: *)

(* $ENVIRONMENT:
LANGUAGE: IBM PASCAL
HARDWARE SYSTEM: IBM 360/370/4341/4381 |

(* $EXECUTION PROCEDURE:
MODEL ACCESS SOFTWARE INTERFACE ROUTINE |

(* $PROCESSING DESCRIPTION:

(* $COMMENTS:

(* $CHANGE CONTROL:

3-723
(* %INCLUDE MAECQY *)
(**)  
PROCEDURE MAECQY(CONST KEY1:ENTKEY;CONST KEY2:ENTKEY;VAR CMPFLG:
  INTEGER;VAR RC:EXT_RET_CODE):SUBPROGRAM;
(**)  
(*-----------------------------------------------------------------------*)
(*
(* $FUNCTION:
(*  GIVEN AN ENTITY AND ITS USER DETERMINE IF THE USER SHOULD BE
(*  COMPRESSED WITH THE ENTITY WHEN THE ENTITY IS COMPRESSED
(*
(* $DESCRIPTION OF ARGUMENTS:
(*
(*   NAME     I/O DESCRIPTION
(*   ====     === ==========
(*   KEY1     I USER ENTITY WHOSE COMPRESSIBILITY IS
(*       DETERMINED BY THE CONSTITUENT ENTITY
(*   KEY2     I CONSTITUENT ENTITY BEING COMPRESSED
(*   CMPFLG   O FLAG WHICH TELLS IF THE USER IS
(*       COMPRESSED WITH THE CONSTITUENT
(*   RC       O EXTERNAL RETURN CODE
(*       = 0 OK RETURN CODE
(*       < 0 WARNING
(*       > 0 CRITICAL ERROR
(*
(* $COMMONS:
(*
(* $ENVIRONMENT:
(*  LANGUAGE: IBM PASCAL
(*  HARDWARE SYSTEM: IBM 360/370/4341/4381
(*
(* $EXECUTION PROCEDURE:
(*  MODEL ACCESS SOFTWARE INTERFACE ROUTINE
(*
(* $PROCESSING DESCRIPTION:
(*
(* $COMMENTS:
(*
(* $CHANGE CONTROL:
(*
(* ) 1
PROCEDURE MAECR(VAR ENTDEF:ENTBLOCK;CONST KEYC:ANYKEY;
VAR KEYE:ENTKEY;VAR RC:EXT_RET_CODE);SUBPROGRAM;

$FUNCTION:
CREATE AN ENTITY.

$DESCRIPTION OF ARGUMENTS:

<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENTDEF</td>
<td>I</td>
<td>APPLICATION DATA DEFINING THE ENTITY TO BE CREATED</td>
</tr>
<tr>
<td>KEYC</td>
<td>I</td>
<td>CONSTITUENT OR LIST OF CONSTITUENTS TO BE CONNECTED TO THE ENTITY</td>
</tr>
<tr>
<td>KEYE</td>
<td>I</td>
<td>KEY OF CREATES ENTITY</td>
</tr>
<tr>
<td>RC</td>
<td>O</td>
<td>EXTERNAL RETURN CODE</td>
</tr>
<tr>
<td></td>
<td>= 0</td>
<td>OK</td>
</tr>
<tr>
<td></td>
<td>&gt; 0</td>
<td>CRITICAL ERROR</td>
</tr>
<tr>
<td></td>
<td>&lt; 0</td>
<td>WARNING</td>
</tr>
</tbody>
</table>

$ENVIRONMENT:
LANGUAGE: IBM PASCAL
HARDWARE SYSTEM: IBM 360/370/4341/4381

$EXECUTION PROCEDURE:
MODEL ACCESS SOFTWARE INTERFACE ROUTINE

$PROCESSING DESCRIPTION:

$COMMENTS:

$CHANGE CONTROL:
REVISED: 05/01/86 B. A. ULMER FRMI
ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION TO USER RECOGNIZEABLE FORM

REVISED: 07/11/85 B. A. ULMER FRMI
ADD A NEW PARAMETER TO CNVRR FOR ERROR HANDLING AND DEBUGGING PURPOSES

REVISED: 10/11/84 D. J. KERCHNER FRMI
UPDATE DOCUMENTATION

REVISED: 10/04/84  E. D. SHREVE  FRMI

INPUT PARAMETER ENTDEF CHANGED TO VAR FROM CONST FOR COMPATABILITY WITH THE DEC VAC SYSTEM
PROCEDURE MAECRN(VAR ENTDEF:ENTBLOCK;CONST KEYC:ANYKEY;
VAR KEYE:ENTKEY;VAR NUM:INTEGER;VAR RC:EXT_RET_CODE);SUBPROGRAM;

(* $FUNCTION: *)
(* CREATE AN ENTITY WITH A CONSTITUENT LIST OF A GIVEN SIZE. *)
(* $DESCRIPTION OF ARGUMENTS: *)
(* NAME I/O DESCRIPTION *)
(* ENTDEF I APPLICATION DATA DEFINING THE ENTITY TO BE CREATED *)
(* KEYC I CONSTITUENT OR LIST OF CONSTITUENTS TO BE CONNECTED TO THE ENTITY *)
(* KEYE O KEY OF CREATED ENTITY *)
(* NUM I THE LENGTH OF THE CONSTITUENT LIST *)
(* RC O EXTERNAL RETURN CODE *)
(* RC = 0 OK *)
(* RC > 0 CRITICAL ERROR *)
(* RC < 0 WARNING *)

(* $COMMONS: *)

(* $ENVIRONMENT: *)
(* LANGUAGE: IBM PASCAL *)
(* HARDWARE SYSTEM: IBM 360/370/4341/4381 *)

(* $EXECUTION PROCEDURE: *)
(* MODEL ACCESS SOFTWARE INTERFACE ROUTINE *)

(* $PROCESSING DESCRIPTION: *)

(* $COMMENTS: *)

(* $CHANGE CONTROL: *)
(* ORIGINATED: 03/07/87 K. M. ROSS DBMA *)

(* DATA STRUCTURES/MAJOR VARIABLES: *)

(* END----------------------------------------*)
(* END %INCLUDE MAECRN *)
(*----------------------------------------*)
(* %INCLUDE MAECTK *)

PROCEDURE MAECTK(VAR KNDCNT:LISTSIZE;VAR RC:EXT_RET_CODE);
SUBPROGRAM;

(*-----------------------------------------------*)
(*
(* $FUNCTION:
(* TO RETURN THE NUMBER OF 'KIND' VALUES IN THE
(* WORKING-FORM MODEL.
(*
(* $DESCRIPTION OF ARGUMENTS:
(* NAME I/O DESCRIPTION
(* === === ===========
(* KNDCNT 0 COUNT OF THE NUMBER OF ENTITIES IN THIS
(* WORKING FORM MODEL OF A SPECIFIC KIND
(* RC 0 EXTERNAL RETURN CODE
(* = 0 OK
(* > 0 CRITICAL ERROR
(* < 0 WARNING
(*
(* $COMMONS:
(* NDSREM
(* KEY I KEY OF THE ROOT ELEMENT - MUST BE
(* PROVIDED
(*
(* $ENVIRONMENT:
(* LANGUAGE: IBM PASCAL
(* HARDWARE SYSTEM: IBM 360/370/4341/4381
(*
(* $EXECUTION PROCEDURE:
(* MODEL ACCESS SOFTWARE INTERFACE ROUTINE
(*
(* $PROCESSING DESCRIPTION:
(* RETRIEVES THE VALUE OF THE STD.ARY_USED_LENGTH IN THE
(* ADB OF THE SCHEMA_ROOT ELEMENT.
(*
(* $COMMENTS:
(*
(* $CHANGE CONTROL:
(*
(* REVISED: 05/01/86 B. A. ULMER FRMI
(* ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION
(* TO USER RECOGNIZEABLE FORM
(*
(* REVISED: 07/11/85 B. A. ULMER FRMI
(*

3-728
(* ADD A NEW PARMETER TO CNVRR FOR ERROR HANDLING AND DEBUGGING *)
(* PURPOSES *)
(* ORIGINATED: 10/26/84   E. D. SHREVE   FRMI *)
(* )
(* -----------------------------------------------*)
%PAGE *
(* -----------------------------------------------*)
(* DATA STRUCTURES/MAJOR VARIABLES: *)
(* -----------------------------------------------*)
(* )
(*END-----------------------------------------------*)
(**)
(* END %INCLUDE MAECTK *)
(* %INCLUDE MAECXQ *)

PROCEDURE MAECXQ(CONST KEY1:ANYKEY;VAR DATAREC:BLKDATA;
              CONST PROCNAME:ROUTINE;VAR KEY2:LISTKEY;VAR RCC:EXT_RET_CODE;
              VAR RC:EXT_RET_CODE);SUBPROGRAM;

(* $FUNCTION: *)
(* EXECUTE A PROCEDURE ON THE CONSTITUENTS OF AN ENTITY, OR LIST*)
(* OF ENTITIES. IF AN OUTPUT LIST IS NOT PASSED, CONSTRUCT ONE *)
(* IN ORDER TO PUT ENTITIES ON IT AS DETERMINED BY THE *)
(* APPLICATION PROCEDURE. *)

(* $DESCRIPTION OF ARGUMENTS: *)
(* NAME        I/O DESCRIPTION *)
(* ----------- === ========= *)
(* KEY1        I ENTITY OR LIST OF ENTITIES WHOSE CONSTITUENTS ARE TO BE PROCESSED *)
(* DATAREC     I/O APPLICATION DEFINED DATA STRUCTURE WHICH EITHER SUPPLIES OR RECEIVES VALUES OPERATED ON BY THE APPLICATION PROCEDURE *)
(* PROC        I ENTRY POINT OF APPLICATION DEFINED PROCEDURE *)
(* KEY2        0 KEY OF THE LIST CREATED FOR THIS ROUTINE *)
(* RCC         0 USER DEFINED PROCEDURE RETURN CODE = 0-1 OK RETURN CODE = 2-7 PROCEDURE WARNING CODE = 8-15 PROCEDURE ERROR CODE *)
(* RC          0 EXTERNAL RETURN CODE = 0 OK RETURN CODE < 0 WARNING > 0 CRITICAL ERROR *)

(* $COMMONS: *)
(* $ENVIRONMENT: *)
(* LANGUAGE: IBM PASCAL *)
(* HARDWARE SYSTEM: IBM 360/370/4341/4381 *)

(* $EXECUTION PROCEDURE: *)
(* MODEL ACCESS SOFTWARE INTERFACE ROUTINE *)
(*)
(* $PROCESSING DESCRIPTION: *)
(* THE USER SENDS IN THE NECESSARY INFORMATION, THEN THIS *)

3-730
(* %INCLUDE MAED. *)
(*)
(* $FUNCTION: *)
(* DELETE AN ENTITY OR LIST OF ENTITIES. *)
(*)
(* $DESCRIPTION OF ARGUMENTS: *)
(* NAME I/O DESCRIPTION *)
(* === === =========== *)
(* KEY1 1 ENTITY OR LIST OF ENTITIES TO BE DELETED *)
(* KEYL 0 LIST OF ENTITIES UNABLE TO DELETE *)
(* RC 0 EXTERNAL RETURN CODE *)
(* = 0 OK RETURN CODE *)
(* < 0 WARNING *)
(* > 0 CRITICAL ERROR *)
(*)
(* $COMMONS: *)
(*)
(* $ENVIRONMENT: *)
(* LANGUAGE: IBM PASCAL *)
(* HARDWARE SYSTEM: IBM 360/370/4341/4381 *)
(*)
(* $EXECUTION PROCEDURE: *)
(* MODEL ACCESS SOFTWARE INTERFACE ROUTINE *)
(*)
(* $PROCESSING DESCRIPTION: *)
(* IF KEY1 IS AN ENTKEY THEN *)
(* TRY TO DELETE THE ENTITY ACCORDING TO IT'S USER'S RULES. *)
(* IF KEY1 IS A LISTKEY THEN *)
(* SORT THE LIST IN A DELETABLE ORDER. *)
(* TRY TO DELETE EACH ENTITY ON THE LIST ACCORDING TO ITS *)
(* USER'S DELETE RULES. *)
(*)
(* $COMMENTS: *)
(*)
(* $CHANGE CONTROL: *)
(*)
(* REVISED: 5/01/86 B. A. ULMER W315 *)
(* ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION *)
(* TO USER RECOGNIZABLE FORM *)
(*)
(* REVISED: 4/11/86 E. D. SHREVE W315 *)
(* CHANGED TO TEST FOR NIL LIST POINTER BEFORE READING SORTLIST.. *)
(*)
(* REVISED: 12/30/85 B. A. ULMER W315 *)
(* CHANGE TO READ THE SORT LIST IN REVERSE ORDER - REMOVE THE *)
CALLS TO ELDNL AND CPYNL (NO LONGER NECESSARY SINCE SORTDLST HAS BEEN IMPROVED FOR EFFICIENCY)

REVISED: 09/85 B. A. ULMER W315
ADD CODE TO HANDLE THE TWO NEW DELETE RULES

REVISED: 08/85 L. J. BEHAN W315
ADD A NEW PARAMETER TO DELRUL, DELENTRY TO HANDLE APPLICATION
LIST POSITION PROBLEM

REVISED: 07/11/85 B. A. ULMER W315
ADD A NEW PARAMETER TO CNVRR FOR ERROR HANDLING AND DEBUGGING
PURPOSES

REVISED: 05/15/85 B. A. ULMER W315
FIX INCONSISTENCY IN OUTPUT LIST PROCESSING

ORIGINATED: 03/08/84 C. J. SAMPLE W315

*END %INCLUDE MAED.*
(* %INCLUDE MAEDI. *)

PROCEDURE MAEDI(CONST KEY1:ANYKEY; VAR KEY2:LISTKEY;
VAR RC:EXT_RET_CODE);SUBPROGRAM;

(* $FUNCTION:
(*) DELETE INCLUSIVELY AN ENTITY OR LIST OF ENTITIES.
(*) ENTITIES AND THEIR DIRECT AND INDIRECT CONSTITUENTS WILL
(*) BE DELETED.
(*)
(* $DESCRIPTION OF ARGUMENTS:
(* NAME I/O DESCRIPTION
**** == === =========
(* KEY1 I ENTITY OR LIST OF ENTITIES TO BE
INCLUSIVELY DELETED
(* KEY2 0 LIST OF ENTITIES UNABLE TO DELETE
(* RC 0 EXTERNAL RETURN CODE
  = 0 OK RETURN CODE
  < 0 WARNING
  > 0 CRITICAL ERROR
(*
(* $COMMONS:
(*
(* $ENVIRONMENT:
(* LANGUAGE: IBM PASCAL
(* HARDWARE SYSTEM: IBM 360/370/4341/4381
(*
(* $EXECUTION PROCEDURE:
(* MODEL ACCESS SOFTWARE INTERFACE ROUTINE
(*
(* $PROCESSING DESCRIPTION:
(* IF KEY1 IS AN ENTKEY THEN
(* AN INCLUSIVE LIST OF THE ENTITY'S CONSTITUENTS IS CREATED
(* AND THE ENTITY IS ALSO PLACED ON THE INCLUSIVE LIST.
(*
(* IF KEY1 IS A LISTKEY THEN
(* AN INCLUSIVE LIST OF THE LIST OF ENTITIES' CONSTITUENTS
(* IS CREATED AND THE LIST OF ENTITIES ARE ALSO PLACED ON THE
(* INCLUSIVE LIST.
(*
(* THE INCLUSIVE LIST IS SORTED IN A USER-CONSTITUENT ORDER.
(*
(* FOR EACH ENTITY ON THE INCLUSIVE LIST, AN ATTEMPT IS MADE
(* TO DELETE THE ENTITY ACCORDING TO THE DELETE RULES OF
(* THEIR USERS.
(*
(*
(*)
3-734
(* $COMMENTS: * )

(* $CHANGE CONTROL: * )

(* REVISED: 05/01/86 B. A. ULMER W315 *)
(* ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION *)
(* TO USER RECOGNIZABLE FORM *)

(* REVISED: 12/30/85 B. A. ULMER W315 *)
(* CHANGE TO READ SORT LIST IN REVERSE ORDER *)

(* REVISED: 09/ /85 B. A. ULMER W315 *)
(* ADD CODE TO HANDLE THE TWO NEW DELETE RULES *)
(* PURPOSES *)

(* REVISED: 08/ /85 L. J. BEHAN W315 *)
(* ADD A NEW PARAMETER TO DELRUL, DELENTRY TO HANDLE APPLICATION *)
(* LIST POSITION PROBLEM *)

(* REVISED: 07/11/85 B. A. ULMER W315 *)
(* ADD A NEW PARAMETER TO CNVRR FOR ERROR HANDLING AND DEBUGGING *)
(* PURPOSES *)

(* REVISED: 05/15/85 B. A. ULMER W315 *)
(* FIX INCONSISTENCY IN OUTPUT LIST PROCESSING *)

(* ORIGINATED: 08/20/84 C. J. SAMPLE W315 *)

(* *---------------------------------------------*)

%PAGE
(**)
(* END %INCLUDE MAEDI. *) 1
(* %INCLUDE MAEDT. *)

(* *)
PROCEDURE MAEDT(CONST KEY1: ANYKEY; VAR KEYDL: LISTKEY;
VAR KEYML: LISTKEY; VAR RC: EXT_RET_CODE); SUBPROGRAM;

(* *)

(* $FUNCTION: *)
(* TEST DELETE AN ENTITY OR LIST OF ENTITIES. *)

(* $DESCRIPTION OF ARGUMENTS: *)
(* NAME I/O DESCRIPTION *)
(* KEY1 I ENTITY OR LIST OF ENTITIES TO BE TEST *)
(* DELETED *)
(* KEYDL O LIST OF ENTITIES WHICH WOULD BE DELETED *)
(* OR MARKED FOR DELETE BY MAED *)
(* KEYML O LIST OF ENTITIES WHICH WOULD BE MARKED *)
(* MAED *)
(* RC O EXTERNAL RETURN CODE *)
(* = 0 OK RETURN CODE *)
(* < 0 WARNING *)
(* > 0 CRITICAL ERROR *)

(* $COMMONS: *)

(* $ENVIRONMENT: *)
(* LANGUAGE: IBM PASCAL *)
(* HARDWARE SYSTEM: IBM 360/370/4341/4381 *)

(* $EXECUTION PROCEDURE: *)
(* MODEL ACCESS SOFTWARE INTERFACE ROUTINE *)

(* $PROCESSING DESCRIPTION: *)
(* SIMILAR TO MAED, EXCEPT NO DELETION NOR MARK FOR DELETION IS PERFORMED. *)

(* $COMMENTS: *)

(* $CHANGE CONTROL: *)
(* REVISED: 06/19/86 B. A. ULMER W315 *)
(* CHANGE DETRUL CALLING PARAMETERS & EXCEPTION LIST TO MARK LIST *)
(* TO USER RECOGNIZEABLE FORM *)
(* REVISED: 05/01/86 B. A. ULMER W315 *)

3-736
(*) ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION (*)
(*) TO USER RECOGNIZEABLE FORM (*)
(*) (*)
(*) REVISED: 12/30/85 B. A. ULMER W315 (*)
(*) CHANGE TO READ THE SORT LIST IN REVERSE ORDER - REMOVE THE (*)
(*) CALLS TO ELDNL AND CPYNL (NOT NECESSARY SORTDLST HAS BEEN (*)
(*) IMPROVED FOR EFFICIENCY) (*)
(*) (*)
(*) REVISED: 07/11/85 B. A. ULMER W315 (*)
(*) ADD A NEW PARAMETER TO CNVRR FOR ERROR HANDLING AND DEBUGGING (*)
(*) PURPOSES (*)
(*) (*)
(*) REVISED: 05/15/85 B. A. ULMER W315 (*)
(*) FIX INCONSISTENCY IN OUTPUT LIST PROCESSING (*)
(*) (*)
(*) ORIGINATED: 06/27/84 C. J. SAMPLE W315 (*)
(*) (*)
(*)-----------------------------------------------*)
%PAGE (*)
(**)
(*) END %INCLUDE MAEDT. *)
(* %INCLUDE MAEDTI. *)

(*\)  PROCEDURE MAEDTI(CONST KEY1:ANYKEY;VAR KEYDL:LISTKEY;
VAR KEYML:LISTKEY;VAR RC:EXT_RET_CODE);SUBPROGRAM;
(*\)

(* \$FUNCTION:\n* \$TEST FOR INCLUSIVE DELETION OF AN ENTITY OR LIST OF ENTITIES *
* ENTITIES AND THEIR DIRECT AND INDIRECT CONSTITUENTS WILL BE *
* TESTED FOR DELETION.
* \*)

(* $DESCRIPTION OF ARGUMENTS:
(* NAME I/O DESCRIPTION
(* === === ================
(* KEY1 I ENTITY OR LIST OF ENTITIES TO BE INCLUSIVELY TEST DELETED
(* KEYDL O LIST OF ENTITIES WHICH WOULD BE DELETED BY MAEDI
(* KEYML O LIST OF ENTITIES WHICH WOULD BE MARKED BY MAEDI
(* RC O EXTERNAL RETURN CODE
(* = 0 OK RETURN CODE
(* < 0 WARNING
(* > 0 CRITICAL ERROR
(*

(* $COMMONS:
(*

(* $ENVIRONMENT:
(* LANGUAGE: IBM PASCAL
(* HARDWARE SYSTEM: IBM 360/370/4341/4381
(*
(* $EXECUTION PROCEDURE:
(* MODEL ACCESS SOFTWARE INTERFACE ROUTINE
(*
(* $PROCESSING DESCRIPTION:
(* IF KEY1 IS AN ENTKEY THEN
(* AN INCLUSIVE LIST OF THE ENTITY'S CONSTITUENTS IS CREATED
(* AND THE ENTITY IS ALSO PLACED ON THE INCLUSIVE LIST.
(*
(* IF KEY1 IS A LISTKEY THEN
(* AN INCLUSIVE LIST OF THE LIST OF ENTITIES' CONSTITUENTS
(* IS CREATED AND THE LIST OF ENTITIES ARE ALSO PLACED ON THE
(* INCLUSIVE LIST.
(* THE INCLUSIVE LIST IS SORTED IN A USER-CONSTITUENT ORDER.
(*

3-738
FOR EACH ENTITY ON THE INCLUSIVE LIST, AN ATTEMPT IS MADE TO TEST DELETE THE ENTITY ACCORDING TO THE DELETE RULES OF THEIR USERS.

THE LIST OF MARKABLE ENTITIES IS MERGED WITH THE LIST OF NON DELETABLE ENTITIES.

$COMMENTS:

$CHANGE CONTROL

REVISED: 05/01/86 B. A. ULMER W315
ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION TO USER RECOGNIZABLE FORM

REVISED: 06/19/86 B. A. ULMER W315
CHANGE PARAMETERS TO DETRUL AND EXCEPTION LIST TO MARK LIST

REVISED: 01/13/85 E. D. SHREVE W315
CHANGED TO INITIALIZE A LIST POSITION VARIABLE

REVISED: 12/30/85 B. A. ULMER W315
CHANGE TO READ SORT LIST IN REVERSE ORDER

REVISED: 07/11/85 B. A. ULMER W315
ADD A NEW PARAMETER TO CNVRR FOR ERROR HANDLING AND DEBUGGING PURPOSES

REVISED: 05/15/85 B. A. ULMER W315
FIX INCONSISTENCY IN OUTPUT LIST PROCESSING

ORIGINATED: 08/21/84 C. J. SAMPLE W315

*--------------------*
(* %INCLUDE MAEDTS. *)
(**)
PROCEDURE MAEDTS(CONST KEY1:ANYKEY;VAR KEYDL:LISTKEY;
VAR KEYEL:LISTKEY;VAR KEYML:LISTKEY;
VAR RC:EXT_RET_CODE);SUBPROGRAM;
(**)
(*-----------------*)
(*$FUNCTION:* )
(*TEST DELETE AN ENTITY OR LIST OF ENTITIES, AND RETURN THREE*)
(*LISTS.*)
(*$DESCRIPTION OF ARGUMENTS:* )
(*$NAME* I/O *DESCRIPTION*)
(*----- === =============*)
(* KEY1 I ENTITY OR LIST OF ENTITIES TO BE TEST *)
(* KEYDL O LIST OF ENTITIES WHICH WOULD BE DELETED *)
(* KEYEL O LIST OF ENTITIES WHICH WOULD NOT BE *)
(* KEYML O LIST OF ENTITIES WHICH WOULD BE MARKED_ *)
(* FOR_DELETE BY MAED *)
(* RC O EXTERNAL RETURN CODE *)
(* = 0 OK RETURN CODE *)
(* < 0 WARNING *)
(* > 0 CRITICAL ERROR *)
(*$COMMONS:* )
(*$ENVIRONMENT:* )
(*LANGUAGE: IBM PASCAL *)
(*HARDWARE SYSTEM: IBM 360/370/4341/4381 *)
(*$EXECUTION PROCEDURE:* )
(*MODEL ACCESS SOFTWARE INTERFACE ROUTINE *)
(*$PROCESSING DESCRIPTION:* )
(*SIMILAR TO MAEDT, EXCEPT THREE LISTS ARE RETURNED. KEYDL AND *)
(*KEYML CAN BE SUBMITTED TO DIRECTLY DELETE AND MARK ENTITIES *)
(*USING MAS DELETE ROUTINES THAT DO NOT CHECK THE DELETE RULES.*)
(*$COMMENTS:* )
(*$CHANGE CONTROL:* )
(*3-740*)
PROCEDURE MAEGKN(CONST KEYE:ENTKEY;VAR KIND:INTEGER;
VAR RC:EXT_RET_CODE);SUBPROGRAM;

(* $FUNCTION:
RETRIEVE THE KIND VALUE OF AN ENTITY.
(*
(* $DESCRIPTION OF ARGUMENTS:
(*
<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEYE</td>
<td>I</td>
<td>KEY OF AN ENTITY</td>
</tr>
<tr>
<td>KIND</td>
<td>O</td>
<td>KIND VALUE OF THE ENTITY (INTEGER)</td>
</tr>
<tr>
<td>RC</td>
<td>O</td>
<td>EXTERNAL RETURN CODE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>= 0 OK RETURN CODE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 0 CRITICAL ERROR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt; 0 WARNING</td>
</tr>
</tbody>
</table>
(*
(* $COMMONS:
NONE |
(*
(* $ENVIRONMENT:
LANGUAGE: IBM PASCAL |
HARDWARE SYSTEM: IBM 360/370/4341/4381 |
(*
(* $EXECUTION PROCEDURE:
MODEL ACCESS SOFTWARE INTERFACE ROUTINE |
(*
(* $PROCESSING DESCRIPTION:
ACCESS THE KIND VALUE FROM THE ENTITY ADB AND RETURN IT. |
(*
(* $COMMENTS:
NONE |
(*
(* $CHANGE CONTROL:
REVISED: 05/01/86 B. A. ULMER W315 |
ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION TO USER RECOGNIZEABLE FORM |
(*
REVISED: 07/11/85 B. A. ULMER W315 |
ADD A NEW PARAMETER TO CNVRR FOR ERROR HANDLING AND DEBUGGING |
PURPOSES
(* ORIGINATED: 03/25/85 E. D. SHREVE W315 *)
(* END INCLUDE MAEGKN *)
(* %INCLUDE MAEGTK *)

**PROCEDURE MAEGTK(CONST KEYE:ENTKEY;VAR ENTDEF:ENTBLOCK;
  VAR RC:EXT_RET_CODE);SUBPROGRAM;**

(*---------------------------------------------*)

(* $FUNCTION: *) (*
(* RETRIEVE THE ENTITY BLOCK WHICH CORRESPONDS TO KEYE.*) (*
(* $DESCRIPTION OF ARGUMENTS: *) (*
(* NAME I/O DESCRIPTION *) (*
(* KEYE I KEY OD TH ENENTITY TO BE RETRIEVED *) (*
(* ENTDEF 0 APPLICATION DATA ASSOCIATED WITH KEYE *) (*
(* RC 0 EXTERNAL RETURN CODE *) (*
(* = 0 OK *) (*
(* > 0 CRITICAL ERROR *) (*
(* < 0 WARNING *) (*

(* $COMMONS: *) (*

(* $ENVIRONMENT: *) (*
(* LANGUAGE: IBM PASCAL *) (*
(* HARDWARE SYSTEM: IBM 360/370/4341/4381 *) (*

(* $EXECUTION PROCEDURE: *) (*
(* MODEL ACCESS SOFTWARE INTERFACE ROUTINE *) (*

(* $PROCESSING DESCRIPTION: *) (*
(* APPLICATION PROVIDES ENTITY KEY. MAS WILL RETRIEVE THE *) (*
(* ENTITY *) (*

(* $COMMENTS: *) (*

(* $CHANGE CONTROL: *) (*
(* REVISED: 08/14/86 K. M. ROSS DBMA *) (*
(* 07/01/86 B. A. ULMER FRMI *) (*
(* 07/11/85 B. A. ULMER FRMI *) (*
(* 07/15/84 D. J. KERCHNER FRMI *) (*
(* CHECK FOR VALID ENTITY KEY IF NOT RETURN RC < 0 *

3-744
(* %INCLUDE MAEKND *)

**

PROCEDURE MAEKND(CONST KNDPOS:LISTINDX;VAR KNDVAL:ORD_KIND;
VAR RC:EXT RET_CODE);SUBPROGRAM;

**

(*--------------------------------------------------------------------------*)
(*
(* $FUNCTION:
(* TO RETURN A 'KIND' VALUE FROM THE LIST OF KINDS IN THE
(* WORKING-FORM MODEL.
(*
(* $DESCRIPTION OF ARGUMENTS:
(*
<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>KNDPOS</td>
<td>I</td>
<td>SEQUENCE # OF THE KIND VALUE REQUESTED</td>
</tr>
<tr>
<td>KNDVAL</td>
<td>O</td>
<td>KIND VALUE AT THE 'KNDPOS' POSITION</td>
</tr>
<tr>
<td>RC</td>
<td>O</td>
<td>EXTERNAL RETURN CODE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>= 0 OK RETURN CODE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>= 1 YOU BLEW IT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>= 2 THE ROUTINE BLEW IT</td>
</tr>
</tbody>
</table>
(*
(* $COMMONS:
(*
| NDSREM |
| KEY | I | KEY OF THE ROOT ELEMENT |
| MUST BE PROVIDED |
(*
(*
(* $ENVIRONMENT:
(*
| LANGUAGE: IBM PASCAL |
| HARDWARE SYSTEM: IBM 360/370/4341/4381 |
(*
(*
(* $EXECUTION PROCEDURE:
(*
| MODEL ACCESS SOFTWARE INTERFACE ROUTINE |
(*
(*
(* $PROCESSING DESCRIPTION:
(*
| RETRIEVES THE 'KIND' VALUE STORED AT THE 'KNDPOS' POSITION |
| IN THE STD_ARRAY OF THE SCH_ROOT ADB. |
(*
(*
(* $COMMENTS:
(*
(*
(* $CHANGE CONTROL:
(*
| REVISED: 05/01/86 B. A. ULMER W315 |
| ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION |
| TO USER RECOGNIZEABLE FORM |
(*
(*
| ORIGINATED: 10/26/84 E. D. SHREVE FRMI |
(*--------------------------------------------------------------------------*)

3-745
DATA STRUCTURES/MAJOR VARIABLES:

*EN*

*END

(* END %INCLUDE MAEKN *)

(**)
(* %INCLUDE MAERST *)

PROCEDURE MAERST(CONST FLGNAME:NAMTYP; VAR RC:EXT_RET_CODE);

SUBPROGRAM;

(*---------------------------------------------------------------*)

(*
(* $FUNCTION: /*
(* RESET THE GIVEN FLAG IN ALL ENTITIES IN THE WORKING FORM */
(* MODEL */
(*
(* $DESCRIPTION OF ARGUMENTS: *)
(*
(* NAME I/O DESCRIPTION *)
(*
(* ===== === ================ *)
(*
(* FLGNAME I THE NAME OF THE FLAG WHICH WILL BE RESET *)
(*
(* RC 0 EXTERNAL RETURN CODE *)
(*
(* = 0 OK *)
(*
(* > 0 CRITICAL ERROR *)
(*
(* < 0 WARNING *)
(*
(*
(* $COMMONS: /*
(* NDSREM *)
(*
(* VAR1 I VAR1 NAME MUST BE FILLED, CHARACTER DATA *)
(* MUST BE PROVIDED *)
(*
(*
(* $ENVIRONMENT: /*
(* LANGUAGE: IBM PASCAL *)
(* HARDWARE SYSTEM: IBM 360/370/4341/4381 *)
(* DDNAMES USED WITH STANDARD FILES: *)
(*
(* $EXECUTION PROCEDURE: /*
(* MODEL ACCESS SOFTWARE INTERFACE ROUTINE *)
(*
(* $PROCESSING DESCRIPTION: *)
(*
(* $COMMENTS: *)
(*
(* $CHANGE CONTROL: *)
(*
(* REVISED: 05/01/86 B. A. ULMER FRMI *)
(* ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION *)
(* TO USER RECOGNIZEABLE FORM *)
(*
(* ORIGINATED: 08/12/85 B. A. ULMER FRMI *)
(*
(*---------------------------------------------------------------*)

3-747
(*---------------------------------------------*)
(*    DATA STRUCTURES/MAJOR VARIABLES:          *)
(*---------------------------------------------*)
(*                                           *)
(*END----------------------------------------*)
(* END %INCLUDE MAERST *)
(* %INCLUDE MAESCI. *)

PROCEDURE MAESCI(CONST KEY1:ANYKEY;CONST ISWT:INTEGER;
VAR RC:EXT_RET_CODE);SUBPROGRAM;

(* ---------------------------------------------------------------*)
(* $FUNCTION: *)
(* SET OR RESET THE PROCESS FLAG FOR THE INCLUSIVE CONSTITUENTS*)
(* OF AN ENTITY OR A LIST ENTITIES. *)

(* $DESCRIPTION OF ARGUMENTS: *)
(* NAME I/O DESCRIPTION *)
(* ==== === =========== *)
(* KEY1 I KEY OF THE ENTITY WHOSE SWITCH IS TO BE *)
(* SET OR KEY OF THE LIST ALL OF WHOSE *)
(* ENTITY SWITCHES ARE TO BE SET *)
(* ISWT I SWITCH VALUE REQUESTED *)
(* RC 0 EXTERNAL RETURN CODE *)
(* = 0 OK *)
(* > 0 CRITICAL ERROR *)
(* < 0 WARNING *)

(* $COMMONS: *)

(* $ENVIRONMENT: *)
(* LANGUAGE: IBM PASCAL *)
(* HARDWARE SYSTEM: IBM 360/370/4341/4381 *)

(* $EXECUTION PROCEDURE: *)
(* MODEL ACCESS SOFTWARE INTERFACE ROUTINE *)

(* $PROCESSING DESCRIPTION: *)
(* THE TYPE OF KEY IS CHECKED FOR. *)
(* THE INCLUSIVE CONSTITUENTS ARE COLLECTED FOR AN ENTITY OR *)
(* A LIST OF ENTITIES. FOR THE COLLECTED ENTITIES THE SWITCH *)
(* IS SET OR RESET. *)

(* $COMMENTS: *)

(* $CHANGE CONTROL: *)
(* ORIGINATED: 03/07/87 K. M. ROSS DBMA *)

3-749
(* DATA STRUCTURES/MAJOR VARIABLES: *)
(*------------------------------------------------------------*)
(*------------------------------------------------------------*)
(*END-----------------------------------------------------------------*
(* END %INCLUDE MAESCI. *)
(**)
(* %INCLUDE MAESVL. *)
(*)
PROCEDURE MAESVL(CONST KEY1:ENTKEY;VAR ISET:INTEGER;
VAR RC:EXT_RETURN_CODE);SUBPROGRAM;
(*)
(* FUNCTION: *)
(* FIND THE CURRENT BINARY SWITCH SETTING OF AN ENTITY. *)
(*)
(* DESCRIPTION OF ARGUMENTS: *)
(* NAME I/O DESCRIPTION *)
(* === === =============== *)
(* KEY1 I KEY OF THE ENTITY WHOSE SETTING IS TO BE DETERMINED *)
(* RC O EXTERNAL RETURN CODE *)
(* = 0 OK *)
(* > 0 CRITICAL ERROR *)
(* < 0 WARNING *)
(*)
(* COMMONS: *)
(*)
(* ENVIRONMENT: *)
(* LANGUAGE: IBM PASCAL *)
(* HARDWARE SYSTEM: IBM 360/370/4341/4381 *)
(*)
(* EXECUTION PROCEDURE: *)
(* MODEL ACCESS SOFTWARE INTERFACE ROUTINE *)
(*)
(* PROCESSING DESCRIPTION: *)
(* THE INPUT KEY MUST BE AN ENTITY KEY. IF THE SWITCH IS TRUE, THEN THE VALUE "1" IS RETURNED. IF THE SWITCH IS FALSE, THEN THE VALUE "0" IS RETURNED. *)
(*)
(* COMMENTS: *)
(*)
(* CHANGE CONTROL: *)
(*)
(* REVISED: 05/01/86 B. A. ULMER FRMI *)
(* ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION TO USER RECOGNIZABLE FORM *)
(*)
(* REVISED: 07/11/85 B. A. ULMER FRMI *)
(* ADD A NEW PARAMETER TO CNVRRT FOR ERROR HANDLING AND DEBUGGING PURPOSES *)
(*)
(* REVISED: 08/14/86 K. M. ROSS DBMA *)
(* ADDED A CHECK FOR NIL POINTER FOR KEY1 *)

3-751
(* %INCLUDE MAESWA *)

** PROCEDURE MAESWA(VAR RC:EXT_RET_CODE);SUBPROGRAM; **

(*) (*
(*) $FUNCTION:
(*) SETS THE PROCESS BIT 'OFF' IN ALL ENTITIES IN THE MODEL.
(*) *
(*) $DESCRIPTION OF ARGUMENTS:
(*)
(*) NAME I/O DESCRIPTION
(*) == === == = ===
(*) RC 0 EXTERNAL RETURN CODE
(*) = 0 OK
(*) > 0 CRITICAL ERROR
(*) < 0 WARNING
(*) *
(*) $COMONS:
(*) NDSREM
(*) KEY I KEY OF THE MODEL ROOT ELEMENT
(*) *
(*) $ENVIRONMENT:
(*) LANGUAGE: IBM PASCAL
(*) HARDWARE SYSTEM: IBM 360/370/4341/4381
(*) *
(*) $EXECUTION PROCEDURE:
(*) MODEL ACCESS SOFTWARE INTERFACE ROUTINE
(*) *
(*) $PROCESSING DESCRIPTION:
(*) EACH ENTRY IN THE SCHEMA-ROOT CONSTITUENT LIST IS READ.
(*) IF IT IS AN INSTANCE_COLLECTOR NODE, THEN EACH ENTITY
(*) ON THE CONSTITUENT LIST OF THE COLLECTOR NODE IS READ
(*) AND THE ADB.SYSUSE FIELD IS SET TO 'TRUE'.
(*) *
(*) $COMENTS:
(*) *
(*) $CHANGE CONTROL:
(*)
(*) REVISED: 05/01/86 B. A. ULMER FRMI
(*) ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION
(*) TO USER RECOGNIZEABLE FORM
(*)
(*) REVISED: 07/11/85 B. A. ULMER FRMI
(*) ADD A NEW PARAMETER TO CNVRR FOR ERROR HANDLING AND DEBUGGING
(*) PURPOSES
(*)

3-752
(* ORIGINATED: 02/06/85 CCWW E. D. SHREVE FRMI *)
(* *)
(* DATA STRUCTURES/MAJOR VARIABLES: *)
(* *)
(* *)
(*END*)
(* END %INCLUDE MAESWA *)
(**)
(* %INCLUDE MAESWT. *)

PROCEDURE MAESWT(CONST KEY1:ANYKEY;CONST ISWT:INTEGER;
VAR RC:EXT_RET_CODE);SUBPROGRAM;

(* $FUNCTION: *)
(* SET AN ENTITY SWITCH OR THE SWITCHES FOR EACH ENTITY IN A *)
(* LIST AS REQUESTED BY THE USER. *)

(* $DESCRIPTION OF ARGUMENTS: *)
(* NAME I/O DESCRIPTION *)
(* ==== == ========= *)
(* KEY1 I KEY OF THE ENTITY WHOSE SWITCH IS TO BE *)
(* SET OR KEY OF THE LIST ALL OF WHOSE *)
(* ENTITY SWITCHES ARE TO BE SET *)
(* ISWT I SWITCH VALUE REQUESTED *)
(* RC O EXTERNAL RETURN CODE *)
(* = 0 OK *)
(* > 0 CRITICAL ERROR *)
(* < 0 WARNING *)

(* $COMMONS: *)

(* $ENVIRONMENT: *)
(* LANGUAGE: IBM PASCAL *)
(* HARDWARE SYSTEM: IBM 360/370/4341/4381 *)

(* $EXECUTION PROCEDURE: *)
(* MODEL ACCESS SOFTWARE INTERFACE ROUTINE *)

(* $PROCESSING DESCRIPTION: *)
(* THE TYPE OF KEY IS CHECKED FOR. *)
(* IF AN ENTITY, THEN THE ENTITY'S SWITCH IS RESET. *)
(* IF A LIST, THEN EACH ENTITY ON THE LIST HAS ITS SWITCH *)
(* RESET. *)

(* $COMMENTS: *)

(* $CHANGE CONTROL: *)
(* REVISED: 05/01/86 B. A. ULMER FRMI *)
(* ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION *)
(* TO USER RECOGNIZABLE FORM *)
(* REVISED: 07/11/85 B. A. ULMER FRMI *)
(* ADD A NEW PARAMETER TO CNVRR FOR ERROR HANDLING AND DEBUGGING *)
(*) INCLUDE MAEU. (*)

PROCEDURE MAEU(CONST KEY1:ANYKEY;VAR KEY2:LISTKEY;
VAR RC:EXT_RET_CODE);SUBPROGRAM;

(*)$FUNCTION:
CREATE A LIST OF USER ENTITY REFERENCES.
(*)$DESCRIPTION OF ARGUMENTS:
(*) NAME I/O DESCRIPTION
(*) ===== === ===========
(*) KEY1 I ENTITY OR LIST OF ENTITIES FOR WHICH A
(*) LIST OF DIRECT USERS IS REQUESTED
(*) PARM2 O LIST OF USER REFERENCES
(*) RC O EXTERNAL RETURN CODE
(*) = 0 OK RETURN CODE
(*) < 0 WARNING
(*) > 0 CRITICAL ERROR
(*)$COMMONS:

$ENVIRONMENT:
LANGUAGE: IBM PASCAL
HARDWARE SYSTEM: IBM 360/370/4341/4381

$EXECUTION PROCEDURE:
MODEL ACCESS SOFTWARE INTERFACE ROUTINE

$PROCESSING DESCRIPTION:
A NEW LIST, KEY2, IS CREATED THAT CONTAINS THE LIST OF
DIRECT USERS. IF KEY1 IS AN ENTITY KEY, THE DIRECT USERS
OF KEY1 ARE PLACED IN THE LIST. IF KEY1 IS A LISTKEY, THE
DIRECT USERS OF ALL ENTITIES IN THE LIST ARE PLACED INTO
KEY2.

$COMMENTS:

$CHANGE CONTROL:
REVISED: 05/01/86 B. A. ULMER W315
ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION
TO USER RECOGNIZABLE FORM

REVISED: 07/11/85 B. A. ULMER W315
ADD A NEW PARAMETER TO CNVRR FOR ERROR HANDLING AND DEBUGGING

3-755
(* PURPOSES *)
(* REVISED: 05/15/85 B. A. ULMER W315 *)
(* FIX INCONSISTENCY IN OUTPUT LIST PROCESSING *)
(* REVISED: 08/14/86 K. M. ROSS W315 *)
(* ADDED A CHECK FOR NIL POINTER FOR KEY1 *)
(* ORIGINATED: 06/21/84 D. J. KERCHNER W315 *)
(* ------------------------------------------ *)
%PAGE
(**)
(* END %INCLUDE MAEU. *)
(* %INCLUDE MAEUD *)

PROCEDURE MAEUD(VAR KEYE:ENTKEY;VAR ENTDEF:ENTBLOCK;
VAR RC:EXT_RET_CODE);SUBPROGRAM;

(*)

$FUNCTION:
UPDATE THE ENTITY BLOCK CORRESPONDING TO A KEY.

$DESCRIPTION OF ARGUMENTS:

<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEYE</td>
<td>I</td>
<td>KEY OF THE ENTITY TO BE UPDATED</td>
</tr>
<tr>
<td>ENTDEF</td>
<td>I</td>
<td>APPLICATION DATA ASSOCIATED WITH KEYE</td>
</tr>
<tr>
<td>RC</td>
<td>O</td>
<td>EXTERNAL RETURN CODE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>= 0 OK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 0 CRITICAL ERROR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt; 0 WARNING</td>
</tr>
</tbody>
</table>

$COMMONS:

$ENVIRONMENT:
LANGUAGE: IBM PASCAL
HARDWARE SYSTEM: IBM 360/370/4341/4381

$EXECUTION PROCEDURE:
MODEL ACCESS SOFTWARE INTERFACE ROUTINE

$PROCESSING DESCRIPTION:
CALL REVNODM

$COMMENTS:
IT IS ILLEGAL FOR THE APPLICATION TO CHANGE KIND ON UPDATE.

$CHANGE CONTROL:

REVISED: 05/01/86 B. A. ULMER FRMI
ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION TO USER RECOGNIZEABLE FORM

REVISED: 07/11/85 B. A. ULMER FRMI
ADD A NEW PARAMETER TO CNVRP FOR ERROR HANDLING AND DEBUGGING PURPOSES

REVISED: 10/11/84 D. J. KERCHNER FRMI

3-757
UPDATED THE INCLUDE DOCUMENTATION

REVISED: 10/04/84 E. D. SHREVE FRMI
CHANGED THE DECLARATION FOR KEYE AND ENTDEF TO VAR

REVISED: 08/14/86 K. M. ROSS DBMA
ADDED A CHECK FOR NIL POINTER FOR KEY1
(* %INCLUDE MAEUI *)
(*)
PROCEDURE MAEUI(CONST KEY1:ANYKEY;VAR KEY2:LISTKEY;
VAR RC:EXT_RET_CODE);SUBPROGRAM;
(*)

(* $FUNCTION: *)
(* CREATE AN APPLICATION LIST OF INCLUSIVE USER ENTITIES. *)
(*)

(* $DESCRIPTION OF ARGUMENTS: *)
(* NAME  I/O  DESCRIPTION *)
(* ===  ===  ============= *)
(* KEY1  I   KEY OF AN ENTITY OR A LIST. *)
(* KEY2  O   RETURNED KEY OF THE APPLICATION LIST. *)
(* RC    O   FUNCTION RETURN CODE. *)
(*      = 0 GOOD RETURN *)
(*      > 0 CRITICAL ERROR *)
(*      < 0 WARNING *)
(*)

(* $ENVIRONMENT: *)
(* LANGUAGE: IBM PASCAL *)
(* HARDWARE SYSTEM: IBM 360, 370, 43XX *)
(*)

(* $EXECUTION PROCEDURE: *)
(* MODEL ACCESS SOFTWARE INTERFACE PROCEDURE *)
(*)

(* $PROCESSING DESCRIPTION: *)
(* KEY2 IS CREATED (EMPTY LIST). *)
(* IF KEY1 IS AN ENTITY, THEN THE INCLUSIVE USER LIST OF KEY1 *)
(* WILL BE COPIED INTO KEY2. *)
(* IF KEY1 IS A LIST KEY, THEN THE INCLUSIVE USER LISTS OF *)
(* EACH ENTITY WILL BE COPIED INTO KEY2. *)
(*)

(* $CHANGE CONTROL: *)
(* REVISED: 05/01/86 B. A. ULMER W315 *)
(* ADDED TO CNVOSP TO CONVERT AN "OUT OF SPACE" *)
(* CONDITION TO USER RECOGNIZABLE FORM *)
(* REVISED: 11/08/85 B. A. ULMER W315 *)
(* FIX BUG DEALING WITH PREVIOUS FIX *)
(* REVISED: 11/08/85 B. A. ULMER W315 *)
(* NOT ALLOW ENTITIES THAT ARE ON THE APPLICATION *)
(* INPUT LIST TO BE ON THE APPLICATION OUTPUT LIST *)
(* (FIX THE INCONSISTENCIES IN THE PROCESSING) *)
(* REVISED: 07/11/85 B. A. ULMER W315 *)
(* ADD A NEW PARAMETER TO CNVRR FOR ERROR HANDLING *)

3-759
AND DEBUGGING PURPOSES

REVISFN 05/15/85 B. A. ULMER W315

FIX INCONSISTENCY IN OUTPUT LIST PROCESSING

REVISED: 04/29/85 E. D. SHREVE W315

TO USE MAS INTERNAL PROCESS FLAG (MAPROB)

REVISED: 08/14/86 K. M. ROSS W315

ADDED A NIL POINTER CHECK FOR KEY1

ORIGINATED: 06/13/84 D. J. KERCHNER W315

(* END %INCLUDE MAEUI *)
PROCEDURE MAEUIK(CONST KEY1:ANYKEY;CONST ENTKIND:ORD_KIND;
VAR KEY2:LISTKEY;VAR RC:EXT_RET_CODE);SUBPROGRAM;

$FUNCTION:
CREATE A LIST OF INCLUSIVE USERS BY KIND.

$DESCRIPTION OF ARGUMENTS:

<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEY1</td>
<td>I</td>
<td>THE KEY OF AN ENTITY OR A LIST OF ENTITIES WHOSE INCLUSIVE USERS ARE TO BE SEARCHED FOR THE SPECIFIED KIND.</td>
</tr>
<tr>
<td>KIND</td>
<td>I</td>
<td>THE KIND CODE OF AN ENTitiEY OR AN ENTITY CLASS.</td>
</tr>
<tr>
<td>KEY2</td>
<td>O</td>
<td>THE KEY OF THE LIST WHICH WILL CONTAIN ALL ENTITIES OF THE SPECIFIED KIND FOUND WITHIN THE INCLUSIVE USERS OF KEY1.</td>
</tr>
<tr>
<td>RC</td>
<td>O</td>
<td>THE FUNCTION RETURN CODE.</td>
</tr>
</tbody>
</table>

= 0 GOOD RETURN
> 0 CRITICAL ERROR
< 0 WARNING

$COMMONS:
NONE

$ENVIRONMENT:
LANGUAGE: IBM PASCAL
HARDWARE SYSTEM: IBM 360, 370, 43XX

$EXECUTION PROCEDURE:
MODEL ACCESS SOFTWARE INTERFACE ROUTINE.

$PROCESSING DESCRIPTION:
FOR THE GIVEN ENTKEY OR LISTKEY EXPAND ITS USERS INCLUSIVELY. FOR EACH MEMBER OF THE EXPANDED LIST WHOSE KIND MATCHES THE KIND VALUE DESIRED ADD IT TO THE LIST POINTED TO BY KEY2.

$CHANGE CONTROL:
REVISED: 05/01/86 B.A. ULMER W315
ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION TO USER RECOGNIZEABLE FORM

3-761
(* INCLUDE MAEUSR *)

PROCEDURE MAEUSR(CONST KEYE:ENTKEY; VAR UEXIST:INTEGER; VAR RC:EXT_RET_CODE);SUBPROGRAM;

(*-----------------------------------------------------------------------------*)
(*)
(* $FUNCTION: *)
(* DETERMINES IF AN ENTITY HAS ANY USERS. *)
(*)
(* $DESCRIPTION OF ARGUMENTS: *)
(* NAME I/O DESCRIPTION *)
(* KEYE I ENTITY KEY *)
(* UEXIST O INTEGER VALUE INDICATING IF KEYE HAS *)
(* ANY USERS. *)
(* = 0 NO USERS EXIST *)
(* = 1 USERS EXIST *)
(* RC O EXTERNAL RETURN CODE *)
(* = 0 OK RETURN CODE *)
(* > 0 CRITICAL ERROR *)
(* < 0 WARNING MESSAGE *)
(*)
(* $COMMONS: *)
(* NONE *)
(* $ENVIRONMENT: *)
(* LANGUAGE: IBM PASCAL *)
(* HARDWARE SYSTEM: IBM 360/370/4341/4381 *)
(* $EXECUTION PROCEDURE: *)
(* MODEL ACCESS SOFTWARE INTERFACE ROUTINE. *)
(* $PROCESSING DESCRIPTION: *)
(*Evaluator the user pointer in the entity block for a nil. *)
(* IF NIL, THEN NO USERS EXIST. *)
(* $COMMENTS: *)
(* THIS PROCEDURE DEVELOPED SPECIFICALLY FOR THE IDB PACKAGE *)
(* BUT IS FUNCTIONAL FOR ALL APPLICATIONS. *)
(* $CHANGE CONTROL: *)
(* REVISED: 05/01/86 B. A. ULMER *)
(* ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION *)
(* TO USER RECOGNIZEABLE FORM*)

3-763
(Rev: 04/07/85 B. A. Ulmer)

* CHANGED TO CHECK FOR THE SYSTEM LIST HAVING NO ENTRIES - IF IT *

* DOES, THEN NO USERS EXIST *

(Rev: 07/11/86 B. A. Ulmer)

* ADD A NEW PARAMETER TO CNVRR FOR ERROR HANDLING AND DEBUGGING *

* PURPOSES *

(Orig: 03/25/85 E. D. Shreve)

(End: %INCLUDE MAEUSR *)
(* %INCLUDE MAEUXQ *)

PROCEDURE MAEUXQ(CONST KEY1:ANYKEY;VAR DATAREC:BLKDATA;
   CONST PROCNAME:ROUTINE;VAR KEY2:LISTKEY;VAR RCC:EXT_RET_CODE;
   VAR RC:EXT_RET_CODE);SUBPROGRAM;

(* $DESCRIPTION OF ARGUMENTS: *)
(* NAME I/O DESCRIPTION *)
(* ===== ==== =========== *)
(* KEY1 I ENTITY OR LIST OF ENTITIES WHOSE USERS *)
(* ARE TO BE PROCESSED *)
(* DATAREC I/O APPLICATION DEFINED DATA STRUCTURE WHICH *)
(* EITHER SUPPLIES OR RECEIVES VALUES *)
(* PROC I ENTRY POINT OF APPLICATION DEFINED *)
(* KEY2 O KEY OF THE LIST CREATED *)
(* FOR THIS ROUTINE *)
(* RCC O USER DEFINED PROCEDURE RETURN CODE *)
   = 0,1 OK RETURN CODE
   = 2-7 PROCEDURE WARNING CODE
   = 8-15 PROCEDURE ERROR CODE
(* RC O EXTERNAL RETURN CODE *)
   = 0 OK RETURN CODE
   < 0 WARNING
   > 0 CRITICAL ERROR

(* $COMMONS: *)

(* $ENVIRONMENT: *)
(* LANGUAGE: IBM PASCAL *)
(* HARDWARE SYSTEM: IBM 360/370/4341/4381 *)

(* $EXECUTION PROCEDURE: *)
(* MODEL ACCESS SOFTWARE INTERFACE ROUTINE *)

(* $PROCESSING DESCRIPTION: *)
(* THE USER SENDS IN THE NECESSARY INFORMATION, THEN THIS *)
(* ROUTINE REFERENCES THE USER'S SPECIFIED PROCEDURE TO ACT *)
UPON THE INFORMATION HE HAS SUPPLIED TO THE PROCEDURE.

$COMMENTS:

$CHANGE CONTROL:

REVISED: 09/09/86    B. A. ULMER    DBMA
FIX PROBLEM WITH DELETING EMPTY PASSED IN APPL LIST

ORIGINATED: 06/16/86    B. A. ULMER    W315

%PAGE

(* END %INCLUDE MAEUXQ *)
PROCEDURE MAEXEQ(CONST KEYI: ANYKEY; VAR DATAREC: BLKDATA;
CONST PROCNAME: ROUTINE; VAR RCC: EXT_RET_CODE;
VAR RC: EXT_RET_CODE); SUBPROGRAM;

(* $FUNCTION: *)
(* $DESCRIPTION OF ARGUMENTS: *)
(* NAME I/O DESCRIPTION *)
(* ===== === =============== *)
(* KEYI I THE KEY OF THE ENTITY OR APPLICATION LIST *)
(* OF ENTITIES TO BE PROCESSED *)
(* DATAREC I/O THE APPLICATION DEFINED DATA STRUCTURE *)
(* WHICH EITHER SUPPLIES OR RECEIVES VALUES *)
(* OPERATED ON BY THE APPLICATION USER *)
(* PROCNAME I THE NAME OF THE USER DEFINED PROCEDURE *)
(* RCC O THE USER DEFINED PROCEDURE'S RETURN CODE *)
(* RCC < 0 & RCC > 15 PROC_OUT_OF_RANGE *)
(* RCC >= 0 & RCC < 7 CONTINUE PROCESSING *)
(* RCC >= 8 & RCC < 15 PROC_CODE_ERROR *)
(* RC O EXTERNAL RETURN CODE *)
(* = 0 OK *)
(* > 0 CRITICAL ERROR *)
(* < 0 WARNING *)

(* $COMMONS: *)
(* $ENVIRONMENT: *)
(* LANGUAGE: IBM PASCAL *)
(* HARDWARE SYSTEM: IBM 360/370/4341/4381 *)

(* $EXECUTION PROCEDURE: *)
(* MODEL ACCESS SOFTWARE INTERFACE ROUTINE *)

(* $PROCESSING DESCRIPTION: *)
(* THE USER SENDS IN THE NECESSARY INFORMATION, THEN THIS *)
(* ROUTINE REFERENCES THE USER'S SPECIFIED PROCEDURE TO ACT *)
(* UPON THE INFORMATION HE HAS SUPPLIED TO THE PROCEDURE. *)
(* THE PROCEDURE RETURNS ITS OWN RETURN CODE TO THE USER. *)

(* $COMMENTS: *)
(* $CHANGE CONTROL: *)
(* REVISED: 05/01/86 B. A. ULMER FRMI *)
(* ADDED A CALL TO CVNOSP TO CONVERT AN "OUT OF SPACE" CONDITION *)
(* TO USER RECOGNIZEABLE FORM *)
(* *)
(* REVISED: 01/20/86 B. A. ULMER FRMI *)
(* ADD NEW CAPABILITY TO ALLOW READING LIST IN REVERSE IN ORDER *)
(* TO PROCESS *)
(* *)
(* REVISED: 07/11/85 B. A. ULMER FRMI *)
(* ADD A NEW PARAMETER TO CVNRR FOR ERROR HANDLING AND DEBUGGING *)
(* PURPOSES *)
(* *)
(* REVISED: 03/06/85 B. A. ULMER FRMI *)
(* FIXED APPLICATION LIST PROBLEM *)
(* *)
(* REVISED: 11/28/84 D. J. KERCHNER FRMI *)
(* CHANGED MANNER OF ACCESSING USER DEFINED PROCEDURE - NOW *)
(* ACCESSED VIA ASSEMBLER CSECT PASASM *)
(* *)
(* ORIGINATED: 04/11/84 D. J. KERCHNER FRMI *)
(* *)
(*-----------------------------------------------------------------*)
%PAGE *
(*)-------------------------------------*
(* DATA STRUCTURES/MAJOR VARIABLES: *)
(*)-------------------------------------*
(*)-------------------------------------*
(* END %INCLUDE MAEXEQ *)
(**)
(* %INCLUDE MAINIT. *)
(*
PROCEDURE MAINIT(VAR RC:EXT_RET_CODE);SUBPROGRAM;
(*
(* $FUNCTION:
  INITIALIZE THE MAS NETWORK.
(*
(* $DESCRIPTION OF ARGUMENTS:
(*
  NAME  I/O  DESCRIPTION
(*
  RC  0  EXTERNAL RETURN CODE
(*
   = 0 OK RETURN CODE
(*
   < 0 WARNING
(*
   > 0 CRITICAL ERROR
(*
(*
(* $COMMONS:
(*
(*
(* $ENVIRONMENT:
(*
  LANGUAGE: IBM PASCAL
(*
  HARDWARE SYSTEM: IBM 360/370/4341/4381
(*
(*
(* $EXECUTION PROCEDURE:
(*
  MODEL ACCESS SOFTWARE INTERFACE ROUTINE
(*
(*
(* $PROCESSING DESCRIPTION:
(*
(*
(* $COMMENTS:
(*
(*
(* $CHANGE CONTROL:
(*
  REVISED: 05/01/86  B. A. ULMER  W315
(*
  ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION TO USER RECOGNIZABLE FORM
(*
  REVISED: 07/11/85  B. A. ULMER  W315
(*
  ADD A NEW PARAMETER TO CNVRR FOR ERROR HANDLING AND DEBUGGING PURPOSES
(*
  REVISED: 05/21/85  B. A. ULMER  W315
(*
  ADD CALL TO INITIALIZE THE APPLICATION ACCESSIBLE FLAC TABLE
(*
  ORIGINATED: 03/08/84  D. J. KERCHNER  W315
(*
(*
(* (%PAGE)
(* %PRINT ON
(* END %INCLUDE MAINIT *)

3-769
(* %INCLUDE MAKCNT *)
(**) PROCEDURE MAKCNT(CONST KINDX:INTEGER; VAR COUNT:INTEGER;
                VAR RC:EXT_RET_CODE);SUBPROGRAM;
(**) (*-----------------------------------------------------------*)
(* (* $FUNCTION: *) (* DETERMINE THE NUMBER OF ENTITIES IN THE WORKING FORM MODEL *)
(* Of A SPECIFIED KIND *)
(* (* $DESCRIPTION OF ARGUMENTS: *) (* )
(* NAME I/O DESCRIPTION *)
(* ==== === =============== *)
(* KINDX I KIND VALUE FOR WHICH A COUNT IS TO BE DETERMINED *)
(* COUNT 0 NUMBER OF ENTITIES IN THE MODEL OF THE SPECIFIED KIND *)
(* RC 0 EXTERNAL RETURN CODE *)
(* = 0 OK RETURN CODE *)
(* > 0 CRITICAL ERROR *)
(* < 0 WARNING *)
(* )
(* $COMMONS: *)
(* NONE *)
(* )
(* $ENVIRONMENT: *)
(* LANGUAGE: IBM PASCAL *)
(* HARDWARE SYSTEM: IBM 360/370/4341/4381 *)
(* )
(* $EXECUTION PROCEDURE: *)
(* MODEL ACCESS SOFTWARE INTERFACE ROUTINE *)
(* )
(* $PROCESSING DESCRIPTION: *)
(* DETERMINE IF THE KIND SPECIFIED IS IN THE WORKING FORM MODEL. IF SO, RETURN THE LENGTH VALUE OF THE CONSTITUENT LIST FOR THE COUNT. IF NOT, RETURN A VALUE OF ZERO FOR THE COUNT. *)
(* )
(* $COMMENTS: *)
(* NONE *)
(* )
(* $CHANGE CONTROL: *)
(* )
(* REVISED: 05/01/86 B. A. ULMER W315 *)
(* ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION TO USER RECOGNIZEABLE FORM *)
3-770
(* REVISED: 07/11/85       B. A. ULMER       W315 *)
(* ADD A NEW PARAMETER TO CNVRR FOR ERROR HANDLING AND DEBUGGING *)
(* PURPOSES *)
(* *)
(* ORIGINATED: 05/10/85       B. A. ULMER       W315 *)
(* *)
(*END-------------------------------------------------------------------*)
(* END %INCLUDE MAKCNT *)
(* INCLUDE MAKILL. *)

PROCEDURE MAKILL(VAR RC:EXT_RET_CODE);SUBPROGRAM;

(* $FUNCTION: *)
DELETE THE WORKING FORM MODEL.

(* $DESCRIPTION OF ARGUMENTS: *)

<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>RC</td>
<td>O</td>
<td>EXTERNAL RETURN CODE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>= 0 OK RETURN CODE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt; 0 WARNING</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 0 CRITICAL ERROR</td>
</tr>
</tbody>
</table>

(* $COMMONS: *)

<table>
<thead>
<tr>
<th>NDSAVER</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIST_OF_ROOTS O POINTER TO LIST OF ROOTS</td>
</tr>
<tr>
<td>STACK_OF_LISTS O POINTER TO STACK_OF_ROOTS</td>
</tr>
<tr>
<td>NDSREM</td>
</tr>
<tr>
<td>KEY O POINTER TO THE WORKING FORM ROOT NODE</td>
</tr>
</tbody>
</table>

(* $ENVIRONMENT: *)

<table>
<thead>
<tr>
<th>LANGUAGE</th>
<th>IBM PASCAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>HARDWARE SYSTEM</td>
<td>IBM 360/370/4341/4381</td>
</tr>
</tbody>
</table>

(* $EXECUTION PROCEDURE: *)

| MODEL ACCESS SOFTWARE INTERFACE ROUTINE. |
| THIS VERSION USED WITH THE MAS MEMORY MANAGER. |

(* $PROCESSING DESCRIPTION: *)

| DELETES THE WORKING FORM USING PROCEDURE 'NDSREL'. |
| RESETS POINTERS IN THE COMMONS TO NIL. |

(* $COMMENTS: *)

| THIS VERSION FOR USE WITH THE MAS MEMORY MANAGER. THE OLD |
| VERSION MUST BE USED IF THE PASCAL MEMORY MANAGER IS USED. |

(* $CHANGE CONTROL: *)

| REVISED: 05/01/86 B. A. ULMER W315 |
| ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION |
| TO USER RECOGNIZEABLE FORM |

3-772
(* REVISED: 07/11/85  B. A. ULMER  W315  *)
(*        ADD A NEW PARAMETER TO CNVRR FOR ERROR HANDLING AND DEBUGGING *)
(*        PURPOSES *)
(*        *)
(* REVISED: 04/05/85  E. D. SHREVE  W315  *)
(*  CHANGED TO DELETE THE WORKING FORM USING 'NDSREL'. *)
(*        *)
(* ORIGINATED: 02/02/84  D. KERCHNER  K315  *)
(*        *)
(*---------------------------------------------------------------*)
(*END---------------------------------------------------------------*)
(*PRINT ON*)
(* END %INCLUDE MAKILL *)
(* %INCLUDE MAKXEQ *)

PROCEDURE MAKXEQ(CONST KIND:ORD_KIND;VAR DATAREC:BLKDATA;
                 CONST PROCNAME:ROUTINE;VAR RCC:EXT_RETCODE;
                 VAR RC:EXT_RETCODE);SUBPROGRAM;

(*-----------------------------------------------------------------------*)
(* $FUNCTION *)
(* EXECUTE A PROCEDURE ON ALL ENTITIES OF A SPECIFIED KIND. *)
(* $DESCRIPTION OF ARGUMENTS *)
(* NAME   I/O   DESCRIPTION *)
(* ===== === =========== *)
(* KIND   I    KIND VALUE OF THE ENTITIES TO BE PROCESSED. *)
(* DATAREC I    THE APPLICATION DEFINED DATA STRUCTURE WHICH *)
(*         I    EITHER SUPPLIES OR RECEIVES VALUES OPERATED *)
(*         I    ON BY THE APPLICATION DEFINED PROCEDURE. *)
(* PROCNAME I    THE NAME OF THE USER DEFINED PROCEDURE. *)
(* DATAREC O    THE DATA STRUCTURE THAT RESULTS FROM USING *)
(*         O    THE USER DEFINED PROCEDURE. *)
(* RCC       O    THE USER DEFINED PROCEDURE'S RETURN CODE. *)
(* RC        O    THE FUNCTION RETURN CODE. *)
(* =0 EXPECTED RESULT *)
(* >0 CRITICAL ERROR *)
(* <0 WARNING *)

(* $COMMONS: *)
(* NONE *)

(* $ENVIRONMENT: *)
(* LANGUAGE: IBM PASCAL *)
(* HARDWARE SYSTEM: IBM 360/370 *)

(* $EXECUTION PROCEDURE: *)
(* MODEL ACCESS SOFTWARE INTERFACE ROUTINE. *)

(* $PROCESSING DESCRIPTION: *)
(* THE CONSITUENT LIST OF THE INPUT 'KIND' INSTANCE COLLECTOR *)
(* IS READ IN LIFO ORDER AND THE INPUT PROCEDURE IS CALLED *)
(* WITH EACH ENTRY IN THE CONSTITUENT LIST. *)

(* $COMMENTS: *)
(* THE ROUTINE PASASM IS CALLED TO PROVIDE A METHOD OF PASSING *)
(* ARGUMENTS FROM A FORTRAN ROUTINE. *)
(* THE LIST IS READ IN LIFO ORDER IN CASE THE INPUT PROCEDURE *)
(* DELETES ENTITIES THAT AFFECT THE LIST BEING READ. WITH THE *)
(* LIFO ORDER, THE LIST POSITION IS NOT AFFECTED. *)
$CHANGE CONTROL:

REvised: 05/01/86 B. A. ULMER

ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION TO USER RECOGNIZEABLE FORM

REvised: 07/29/85 B. A. ULMER

FIX LOCAL LIST PROBLEM

REvised: 07/11/85 B. A. ULMER

ADD A NEW PARAMETER TO CNVRR FOR ERROR HANDLING AND DEBUGGING PURPOSES

REvised: 03/27/85 E. SHREVE

TO READ THE LIST IN LIFO ORDER

REvised: 03/11/85 B. ULmer

FIX PROBLEM OF LIST POSITION.

REvised: 02/18/85 B. ULmer

CHANGED THE STRUCTURE OF THE INTERNAL ITEM FOR IMPLEMENTATION OF THE CRB

ORIGInATED: 01/20/85 E. SHREVE

*---------------------------------------------------------------*

(* END %INCLUDE MAKXEQ *)
PROCEDURE MAL(VAR KEYL:LISTKEY;VAR RC:EXT_RET_CODE);SUBPROGRAM;

(* FUNCTION: *)
(* CREATE AN EMPTY LIST. *)

(* DESCRIPTION OF ARGUMENTS: *)
(* NAME I/O DESCRIPTION *)
(* RC 0 EXTERNAL RETURN CODE *)
(* = 0 OK *)
(* > 0 CRITICAL ERROR *)
(* < 0 WARNING *)

(* COMMONS: *)

(* ENVIRONMENT: *)
(* LANGUAGE: IBM PASCAL *)
(* HARDWARE SYSTEM: IBM 360/370/4341/4381 *)

(* EXECUTION PROCEDURE: *)
(* MODEL ACCESS SOFTWARE INTERFACE ROUTINE *)

(* PROCESSING DESCRIPTION: *)

(* COMMENTS: *)

(* CHANGE CONTROL: *)
(* REVISED: 05/01/86 B. A. ULMER FRMI *)
(* ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION *)
(* TO USER RECOGNIZEABLE FORM *)
(* INCLUDE MALAND. *)

**PROCEDURE MALAND(CONST KEY1:ANYKEY;CONST KEY2:ANYKEY;
VAR KEY3:LISTKEY;VAR RC:EXT_RET_CODE) ;SUBPROGRAM;**

(* $FUNCTION:
CREATE AN APPLICATION LIST OF ENTITIES COMMON TO TWO INPUT
LISTS. *)

(* $DESCRIPTION OF ARGUMENTS:

<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEY1</td>
<td>I</td>
<td>ENTITY OR LIST OF ENTITIES WHICH WILL BE 'ANDED' - IF ENTITY, USE CONSTITUENT LIST*</td>
</tr>
<tr>
<td>KEY2</td>
<td>I</td>
<td>ENTITY OR LIST OF ENTITIES WHICH WILL BE 'ANDED' - IF ENTITY, USE CONSTITUENT LIST*</td>
</tr>
<tr>
<td>KEY3</td>
<td>O</td>
<td>LIST OF ENTITIES COMMON TO KEY1 AND KEY2 *</td>
</tr>
<tr>
<td>RC</td>
<td>O</td>
<td>EXTERNAL RETURN CODE</td>
</tr>
</tbody>
</table>

(*) = 0 OK RETURN CODE
(*) < 0 WARNING
(*) > 0 CRITICAL ERROR

(* $COMMONS: *)

(* $ENVIRONMENT:
LANGUAGE: IBM PASCAL
HARDWARE SYSTEM: IBM 360/370/4341/4381

(* $EXECUTION PROCEDURE:
MODEL ACCESS SOFTWARE INTERFACE ROUTINE

(* $PROCESSING DESCRIPTION:
THE INPUT LIST KEY1 WILL BE COMPARED WITH THE INPUT LIST KEY2. THOSE ENTITIES WHICH APPEAR ON KEY1 AND KEY2 WILL BE PUT ON THE OUTPUT LIST KEY3.

(* $COMMENTS:

(* $CHANGE CONTROL:
REVISED: 05/01/86 B. A. ULMER W315
(*) ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION TO USER RECOGNIZEABLE FORM
(*) REVISED: 07/11/85 B. A. ULMER W315
(*) ADD A NEW PARAMETER TO CNVRR FOR ERROR HANDLING AND DEBUGGING

3-777
(*) REVISION: 08/14/86 K. M. ROSS W315 (*)
(*) ADDED A NIL POINTER CHECK FOR KEY1 (*)
(*) ORIGINATED: 03/09/84 D. J. KERCHNER W315 (*)
(*) ------------------------------------------------- (*)
%PAGE (*)
(**) (*)
(* END %INCLUDE MALAND. *)
(* %INCLUDE MALATC *)

PROCEDURE MALATC(VAR KEY1:ANYKEY;CONST KEY2:ANYKEY;
VAR RC:EXT_RET_CODE);SUBPROGRAM;

(*)

(* $FUNCTION: *)
(* APPEND AN ENTITY OR LIST (KEY2) TO AN ENTITY OR LIST (KEY1). *)

(*)

(* $DESCRIPTION OF ARGUMENTS: *)
(* NAME I/O DESCRIPTION *)
(* ===== === =========== *)
(* KEY1 I THE KEY OF THE ENTITY OR LIST OF ENTITIES *)
(* TO WHICH KEY2 IS APPENDED *)
(* KEY2 I THE KEY OF THE ENTITY OR LIST OF ENTITIES *)
(* TO BE APPENDED TO KEY1 *)
(* RC O EXTERNAL RETURN CODE *)
(* = 0 OK RETURN CODE *)
(* = 1 YOU BLEW IT *)
(* = 2 THE ROUTINE BLEW IT *)

(* $COMMONS: *)

(* $ENVIRONMENT: *)
(* LANGUAGE: IBM PASCAL *)
(* HARDWARE SYSTEM: IBM 360/370/4341/4381 *)

(* $EXECUTION PROCEDURE: *)
(* MODEL ACCESS SOFTWARE INTERFACE ROUTINE *)

(* $PROCESSING DESCRIPTION: *)
(* IF KEY1 AND KEY2 ARE BOTH ENTITIES, THEN *)
(* KEY2 IS ADDED TO THE CONSTITUENT LIST OF KEY1. *)
(* IF KEY1 IS AN ENTITY AND KEY2 IS A LIST, THEN *)
(* ALL ENTITIES OF KEY2 ARE ADDED TO THE CONSTITUENT LIST *)
(* OF KEY1. *)
(* IF KEY1 IS A LIST AND KEY2 IS AN ENTITY, THEN *)
(* KEY2 IS ADDED TO THE END OF KEY1. *)
(* IF KEY1 AND KEY2 ARE BOTH LISTS, THEN *)
(* ALL ENTITIES OF KEY2 ARE ADDED TO THE END OF KEY1. *)

(* $COMMENTS: *)

(* $CHANGE CONTROL: *)

3-779
(* %INCLUDE MALCPY. *)
(**)
PROCEDURE MALCPY(CONST KEY1:LISTKEY;VAR KEY2:LISTKEY;
VAR RC:EXT_RET_CODE);SUBPROGRAM;
(**)
(*---------------------------------------------------------------*)
(*)
(* $FUNCTION: *)
(* MAKE A COPY OF A LIST. *)
(*)
(* $DESCRIPTION OF ARGUMENTS: *)
(* $FUNCTION: *)
(* NAME  I/O DESCRIPTION *)
(* =-==== === ===========*)
(* KEY1 I THE KEY OF THE LIST TO BE COPIED *)
(* KEY2 I THE KEY OF THE NEW LIST THAT WILL CONTAIN*)
(* A COPY OF KEY1 *)
(* RC  O EXTERNAL RETURN CODE *)
(* = 0 OK *)
(* > 0 CRITICAL ERROR *)
(* < 0 WARNING *)
(*)
(* $COMMONS: *)
(*)
(* $ENVIRONMENT: *)
(* LANGUAGE: IBM PASCAL *)
(* HARDWARE SYSTEM: IBM 360/370/4341/4381 *)
(*)
(* $EXECUTION PROCEDURE: *)
(* MODEL ACCESS SOFTWARE INTERFACE ROUTINE *)
(*)
(* $PROCESSING DESCRIPTION: *)
(*)
(* $COMMONS: *)
(*)
(* $CHANGE CONTROL: *)
(*)
(* REVISED: 05/01/86 B. A. ULMER FRMI *)
(* ADD A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION *)
(* TO USER RECOGNIZEABLE FORM *)
(*)
(* REVISED: 07/11/85 B. A. ULMER FRMI *)
(* ADD A NEW PARAMETER TO CNVRRR FOR ERROR HANDLING AND DEBUGGING *)
(* PURPOSES *)
(*)
3-781
(* INCLUDE MALD. *)

PROCEDURE MALD(CONST KEY1:LISTKEY;VAR RC:EXT_RET_CODE);SUBPROGRAM;

(*)

(* $FUNCTION:*)
(* DELETE AN APPLICATION LIST.*)

(* $DESCRIPTION OF ARGUMENTS:*)

(* NAME I/O DESCRIPTION*)

<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEY1</td>
<td>I</td>
<td>THE KEY OF THE APPLICATION LIST TO BE DELETED</td>
</tr>
<tr>
<td>RC</td>
<td>O</td>
<td>EXTERNAL RETURN CODE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>= 0 OK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 0 CRITICAL ERROR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt; 0 WARNING</td>
</tr>
</tbody>
</table>

(* $COMMONS:*)

(* $ENVIRONMENT:*)
LANGUAGE: IBM PASCAL
HARDWARE SYSTEM: IBM 360/370/4341/4381

(* $EXECUTION PROCEDURE:*)
MODEL ACCESS SOFTWARE INTERFACE ROUTINE

(* $PROCESSING DESCRIPTION:*)
1. KEY1 MUST BE A LISTKEY.
2. KEY1 IS DELETED AND CAN NOT BE RECOVERED.

(* $COMMENTS:*)

(* $CHANGE CONTROL:*)
REVISED: 05/01/86 B. A. ULMER FRMI
ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION TO USER RECOGNIZABLE FORM

REVISED: 07/11/85 B. A. ULMER FRMI
ADD A NEW PARAMETER TO CNVRRR FOR ERROR HANDLING AND DEBUGGING PURPOSES

REVISED: 08/14/86 K. M. ROSS DBMA
ADDED A NIL POINTER CHECK FOR KEY1 PURPOSES

3-782
(* %INCLUDE MALDA *)

PROCEDURE MALDA(VAR RC:EXT_RET_CODE);SUBPROGRAM;

(*--------------------------------------------------------------*)

(* $FUNCTION: *)
(*   DELETE ALL APPLICATION LISTS THAT ARE NOT 'LOCKED'. *)

(* $DESCRIPTION OF ARGUMENTS: *)
(*   NAME               I/O   DESCRIPTION *)
(*     ====             ===    ========= )
(*     RC   0   EXTERNAL RETURN CODE *)
(*        = 0   OK RETURN CODE *)
(*       > 0   CRITICAL ERROR *)
(*       < 0   WARNING MESSAGE *)
(*     STACK_OF_LISTS  I    KEY OF STACK_OF_LISTS *)

(* $COMMONS: *)
(*   NDSGVR *)
(*   STACK_OF_LISTS  I    KEY OF STACK_OF_LISTS *)

(* $ENVIRONMENT: *)
(*   LANGUAGE: IBM PASCAL *)
(*   HARDWARE SYSTEM: IBM 360/370/4341/4381 *)

(* $EXECUTION PROCEDURE: *)
(*   MODEL ACCESS SOFTWARE INTERFACE ROUTINE. *)

(* $PROCESSING DESCRIPTION: *)
(*   READS THE STACK_OF_LISTS AND CALLS THE APPROPRIATE ROUTINE *)
(*   TO DELETE ALL LISTS FROM THE LIST_OF_LISTS. IF THE LIST_ *)
(*   OP_LISTS IS EMPTY, THE SYSTEM LIST IS DISPOSED. *)

(* $COMMENTS: *)
(*   ONLY APPLICATION LISTS THAT ARE NOT LOCKED (DELTFLG = 0) *)
(*   ARE DELETED. *)

(* $CHANGE CONTROL: *)
(*   REVISED: 05/01/86       B. A. ULMER       W315  *)
(*   ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION*)
(* TO USER RECOGNIZABLE FORM *)
(*   REVISED: 07/11/85       B. A. ULMER       W315  *)
(*   ADD A NEW PARAMETER TO CNVRR FOR ERROR HANDLING AND DEBUGGING*)
(* PURPOSES *)

3-783
(*) REVISED: 04/23/85               E.D. SHREVE       W315       *
(*) TO DELETE ONLY UN_LOCKED APPLICATION LISTS.        *
(*) ORIGINATED: 03/21/84              R. A. MCCLUSKEY   W315       *
(*)                                                   *
(*)                                                   *
(*)END-------------------------------------------------*
(*) END %INCLUDE MALDA *)
PROCEDURE MALDI(CONST KEY1:ANYKEY;VAR RC:EXT_RET_CODE);SUBPROGRAM;

*FUNCTION:
DETERMINE AN APPLICATION LIST AND ALL LISTS AFTER IT THAT ARE
NOT LOCKED.

*DESCRIPTION OF ARGUMENTS:

<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEY1</td>
<td>I</td>
<td>LIST TO START THE DELETE</td>
</tr>
<tr>
<td>RC</td>
<td>0</td>
<td>EXTERNAL RETURN CODE</td>
</tr>
<tr>
<td>= 0</td>
<td>OK</td>
<td>RETURN CODE</td>
</tr>
<tr>
<td>&gt; 0</td>
<td>CRITICAL ERROR</td>
<td></td>
</tr>
<tr>
<td>&lt; 0</td>
<td>WARNING MESSAGE</td>
<td></td>
</tr>
</tbody>
</table>

$COMMONS:
NDSGVR
STACK_OF_LISTS I KEY OF STACK_OF_LISTS

$ENVIRONMENT:
LANGUAGE: IBM PASCAL
HARDWARE SYSTEM: IBM 360/370/4341/4381

$EXECUTION PROCEDURE:
MODEL ACCESS SOFTWARE INTERFACE ROUTINE.

$PROCESSING DESCRIPTION:
READS THE STACK_OF_LISTS AND CALLS THE APPROPRIATE ROUTINE
TO DELETE ALL LISTS FROM THE LIST_OF_LISTS AFTER A SPECIFIED LIST.

$COMMENTS:
ONLY APPLICATION LISTS THAT ARE NOT LOCKED (DELTFLG = 0)
ARE DELETED.

$CHANGE CONTROL:
REVISED: 05/01/86 B. A. ULMER W315
ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION
TO USER RECOGNIZEABLE FORM

REVISED: 07/11/85 B. A. ULMER W315
ADD A NEW PARAMETER TO CNVRR FOR ERROR HANDLING AND DEBUGGING
PURPOSES

3-785
(* REVISED: 04/23/85       E.D. SHREVE       W315 *)
(* TO DELETE ONLY UN_LOCKED APPLICATION LISTS. *)
(* REVISED: 84/09/27       D. KERCHNER     *)
(* CHG TO DECREMENT POSITION FOR READ FROM LIST, CHG TO *)
(* CHECK FOR VALID POSITION NUMBER, CHG TO DELETE EACH *)
(* EACH ENTITY FROM LIST_OF_LISTS. *)
(* REVISED: 86/08/14       K. ROSS         *)
(* ADDED A NIL POINTER CHECK FOR KEY1 *)
(* ORIGINATED: 03/21/84    R. A. MGCLUSKEY W315 *)
(* END----------------------------------------------------------------------*)
(* END %INCLUDE MALDI *)
PROCEDURE MALFND(CONST KEY1:ANYKEY;CONST KEY2:ENTKEY;
    CONST IFIRST:LISTPSTN;VAR IPOS:LISTPSTN;VAR RC:EXT_RET_CODE);
SUBPROGRAM;

(* $FUNCTION *)
(* FIND THE POSITION OF AN ENTITY (KEY2) IN AN APPLICATION LIST (KEY1).
  IF KEY1 IS AN ENTITY THEN FIND ITS POSITION IN THE CONSTITUENT LIST
  OF THAT ENTITY. *)

(* $DESCRIPTION OF ARGUMENTS: *)
(* NAME I/O DESCRIPTION *)
(* ----- === ========= *)
(* KEY1 I  THE KEY OF THE LIST IN WHICH KEY2 IS TO BE FOUND. *)
(* KEY2 I  THE KEY OF THE ENTITY TO BE FOUND IN KEY1. *)
(* IFIRST I  THE POSITION IN KEY1 WHERE THE FIND OPERATION IS TO START. *)
(* IPOS I  THE POSITION IN KEY1 WHERE KEY2 IS FOUND. *)
(* RC O  THE FUNCTION RETURN CODE. *)

(* $COMMONS *)
(* NONE *)

(* $ENVIRONMENT: *)
(* LANGUAGE: IBM PASCAL *)
(* HARDWARE SYSTEM: IBM 360/370 *)

(* $EXECUTION PROCEDURE: *)
(* INTERNAL MODEL ACCESS SOFTWARE PROCEDURE *)

(* $PROCESSING DESCRIPTION: *)
(* KEY1 IS EITHER AN ENTITY KEY OR A LIST KEY. IF KEY1 IS A LIST, THEN KEY2 IS FOUND IN THE LIST. IF KEY1 IS AN ENTITY THE SEARCH STARTS AT POSITION IFIRST. EACH ENTITY IN KEY1 IS CHECKED FOR A MATCH WITH KEY2. IF MATCHED, THEN THE POSITION IS RETURNED IN IPOS. IF NO MATCH, THEN IPOS IS RETURNED AS ZERO AND THE RETURN CODE SIGNALS AN ERROR. *)

(* $CHANGE CONTROL: *)
(* REVISED: 05/01/86 B. A. ULMER W315 *)
ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION TO USER RECOGNIZEABLE FORM

REVISED: 07/11/85 B. A. ULMER W315
ADD A NEW PARAMETER TO CNVRR FOR ERROR HANDLING AND DEBUGGING PURPOSES

REVISED: 03/25/85 E.D. SHREVE W315
TO CALL RDLST FROM OUTSIDE THE WHILE LOOP TO SET THE EOL.

REVISED: 08/14/86 K.M. ROSS W315
ADDED A NIL POINTER CHECK FOR KEY1

ORIGINATED: 05/07/85 D. KERCHNER W315

END %INCLUDE MALFND. *
(*%INCLUDE MALGTK.*
(**)
PROCEDURE MALGTK(CONST KEY1:ANYKEY;CONST IPOS:INTEGER;
VAR KEY2:ENTKEY; VAR RC:EXT_RET_CODE);SUBPROGRAM;
(**)
(*------------------------------*)
(*
(* $FUNCTION:
****
GET THE NTH KEY FROM A LIST.
(*
(* $DESCRIPTION OF ARGUMENTS:
(*
<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEY1</td>
<td>I</td>
<td>THE KEY OF ENTITY OF LIST OF ENTITIES</td>
</tr>
<tr>
<td>IPOS</td>
<td>I</td>
<td>POSITION IN THE LIST WHERE THE TARGET ENTRY IS LOCATED</td>
</tr>
<tr>
<td>KEY2</td>
<td>O</td>
<td>THE KSY OF THE ENTITY AT THE NTH POSITION</td>
</tr>
<tr>
<td>RC</td>
<td>O</td>
<td>EXTERNAL RETURN CODE</td>
</tr>
</tbody>
</table>
(*
| = 0 | OK RETURN CODE |
| = 1 | YOU BLEW IT |
| = 2 | THE ROUTINE BLEW IT |
(*
(* $COMMONS:
(*
(* $ENVIRONMENT:
(*
| LANGUAGE: IBM PASCAL |
| HARDWARE SYSTEM: IBM 360/370/4341/4381 |
(*
(* $EXECUTION PROCEDURE:
(*
| MODEL ACCESS SOFTWARE INTERFACE ROUTINE |
(*
(* $PROCESSING DESCRIPTION:
(*
| 1. IF KEY1 IS A LIST, GET THE IPOS ENTRY FROM THE LIST. |
| 2. IF KEY2 IS AN ENTITY, GET THE IPOS ENTRY IN THE CONSTITUENT LIST OF KEY1. |
(*
(* $COMMENTS:
(*
(* $CHANGE CONTROL:
(*
| REVISED: 05/01/86 B. A. ULMER FRMI |
| ADDIED A CALL TO CCNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION |
| TO USER RECOGNIZEABLE FORM |
(*
| REVISED: 08/28/85 B. A. ULMER FRMI |
(*
(*
3-789
(* CHANGE WHEN KEY2 IS SET TO NIL - BU FIX FOR HANDLING 1ST AND *)
(* 3RD PARAMETERS AS SAME KEY *)
(* REvised: 07/11/85 B. A. Ulmer FRMI *)
(* ADD A NEW PARAMETER TO CNVRR FOR ERROR HANDLING AND DEBUGGING *)
(* PURPOSES *)
(* *)
(* %INCLUDE MALINS. *)

PROCEDURE MALINS(CONST KEY1:ANYKEY;CONST KEY2:ANYKEY;
                CONST IPOS:INTEGER;VAR RC:EXT_RET_CODE);SUBPROGRAM;

(*---------------------------------------------------------------*)
(* $FUNCTION: *)
(* INSERT AN ENTITY OR LIST INTO A LIST. *)
(*
(* $DESCRIPTION OF ARGUMENTS: *)
(*
<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEY1</td>
<td>I</td>
<td>THE KEY OF ENTITY OR LIST OF ENTITIES</td>
</tr>
<tr>
<td>KEY2</td>
<td>I</td>
<td>THE KEY OF ENTITY OR LIST OF ENTITIES TO</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BE INSERTED INTO KEY1</td>
</tr>
<tr>
<td>IPOS</td>
<td>I</td>
<td>THE POSITION IN KEY1 TO INSERT KEY2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(NOTE: THE INSERT BEGINS AT IPOS-1)</td>
</tr>
<tr>
<td>RC</td>
<td>O</td>
<td>EXTERNAL RETURN CODE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>= 0 OK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 0 CRITICAL ERROR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt; 0 WARNING</td>
</tr>
</tbody>
</table>
(*
(* $COMMONS: *)
(*
(* $ENVIRONMENT: *)
(* LANGUAGE: IBM PASCAL *)
(* HARDWARE SYSTEM: IBM 360/370/4341/4381 *)
(*
(* $EXECUTION PROCEDURE: *)
(* MODEL ACCESS SOFTWARE INTERFACE ROUTINE *)
(*
(* $PROCESSING DESCRIPTION: *)
(* 1. KEY1 AND KEY2 MAY BE LIST OR ENTITY KEYS. *)
(* 2. IF KEY1 IS AN ENTITY KEY, KEY2 IS INSERTED INTO THE *)
(* CONSTITUENT LIST OF KEY1. *)
(* 3. IF KEY2 IS A LIST KEY, ALL ENTITIES IN THE LIST ARE *)
(* INSERTED INTO KEY1. *)
(* 4. THE INSERT TAKES PLACE STARTING AT THE POSITION 'BEFORE' *)
(* IPOS IN KEY1. *)
(*
(* $COMMENTS: *)
(*
(* $CHANGE CONTROL: *)
(*
3-791
(*) REVISED: 05/01/86 B. A. ULMER FRMI *)
(*) ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION *)
(*) TO USER RECOGNIZABLE FORM *)
(*)
(*) REVISED: 07/11/85 B. A. ULMER FRMI *)
(*) ADD A NEW PARAMETER TO CNVRR FOR ERROR HANDLING AND DEBUGGING *)
(*) PURPOSES *)
(**)
PROCEDURE MALK(CONST KIND:ORD_KIND;VAR KEY1:LISTKEY;
VAR RC:EXT_RET_CODE);SUBPROGRAM;

(* $FUNCTION:
CREATE A LIST OF ALL ENTITIES OF A SPECIFIED KIND.
(* $DESCRIPTION OF ARGUMENTS:
(* NAME I/O DESCRIPTION
(* KIND I KIND CODE OF A CLASS COLLECTOR OR AN
INSTANCE COLLECTOR
(* KEY1 O KEY OF THE CREATED LIST OF ENTITIES
(* RC O EXTERNAL RETURN CODE
(* = 0 OK RETURN CODE
(* < 0 WARNING
(* > 0 CRITICAL ERROR

(* $COMMONS:
(* $ENVIRONMENT:
(* LANGUAGE: IBM PASCAL
(* HARDWARE SYSTEM: IBM 360/370/4341/4381
(* $EXECUTION PROCEDURE:
(* MODEL ACCESS SOFTWARE INTERFACE ROUTINE
(* $PROCESSING DESCRIPTION:
(* THE ELEMENTS OF THE LIST WILL BE A CONCATENATION OF THE
(* CONTENT OF EACH ENTITY CLASS AS THEY ARE ENCOUNTERED IN
(* THE ENTITY CLASS STRUCTURE.
(* $COMMENTS:
(* $CHANGE CONTROL:
(* REVISED: 05/01/86 B. A. ULMER W315
(* ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION
(* TO USER RECOGNIZEABLE FORM
(* REVISED: 07/11/85 B. A. ULMER W315
(* ADD A NEW PARAMETER TO CNVRR FOR ERROR HANDLING AND DEBUGGING
(* PURPOSES

3-793
(* REVISED: 05/15/85  B. A. ULMER  W315 *)
(* FIX INCONSISTENCY IN OUTPUT LIST PROCESSING *)
(* ORIGINATED: 04/24/84  D. J. KERCHNER  W315 *)
(* *)
(*-----------------------------------------------*)
(*PAGE*)
(**)
(* END %INCLUDE MALK. *)

3-794
(* %INCLUDE MALKC. *)

PROCEDURE MALKC(CONST KEY1:ANYKEY;CONST KIND:ORD_KIND;
VAR KEY2:LISTKEY;VAR RC:EXT_RET_CODE);SUBPROGRAM;

(* $FUNCTION:
CREATE A LIST OF AN ENTITY KIND WHICH ARE FOUND WITHIN
THE CONSTITUENT LIST OF AN ENTITY OR A LIST OF ENTITIES. *)

(* $DESCRIPTION OF ARGUMENTS:

<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEY1</td>
<td>I</td>
<td>THE KEY OF ENTITY OR LIST OF ENTITIES WHOSE USER LISTS ARE TO BE SEARCHED</td>
</tr>
<tr>
<td>KIND</td>
<td>I</td>
<td>THE KIND VALUE OF AN ENTITY OR CLASS</td>
</tr>
<tr>
<td>KEY2</td>
<td>O</td>
<td>THE KEY OF THE LIST THAT CONTAINS THE SELECTED ENTITIES</td>
</tr>
<tr>
<td>RC</td>
<td>O</td>
<td>EXTERNAL RETURN CODE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>= 0 OK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 0 CRITICAL ERROR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt; 0 WARNING</td>
</tr>
</tbody>
</table>

(* $COMMONS: *)

(* $ENVIRONMENT: *)

| LANGUAGE: IBM PASCAL |
| HARDWARE SYSTEM: IBM 360/370/4341/4381 |

(* $EXECUTION PROCEDURE: *)

| MODEL ACCESS SOFTWARE INTERFACE ROUTINE |

(* $PROCESSING DESCRIPTION: *)

1. IF KEY1 IS AN ENRTKEY, THEN ALL USERS OF KEY1 ARE PUT INTO KEY2 THAT ARE OF THE GIVEN KIND.
2. IF KEY1 IS A LISTKEY, THEN ALL THE USERS OF EACH ENTITY ON THE LIST IS PUT INTO KEY2 THAT ARE OF THE GIVEN KIND.

(* $COMMENTS: *)

(* $CHANGE CONTROL: *)

(* ORIGINATED: 03/07/87 K. M. ROSS DBMA *)
DATA STRUCTURES/MAJOR VARIABLES:

(* INCLUDE MALKC. *)

(* END %INCLUDE MALKC. *)

(* END *)
(* %INCLUDE MALKL. *)

PROCEDURE MALKL(CONST KEY1:ANYKEY;CONST KIND:ORD_KIND;
VAR KEY2:LISTKEY;VAR RC:EXT_RETCODE);SUBPROGRAM;

(*
* $FUNCTION:
* CREATE A LIST OF AN ENTITY KIND WHICH ARE FOUND WITHIN
* ANOTHER LIST.
*
* $DESCRIPTION OF ARGUMENTS:
* NAME   I/O DESCRIPTION
* ----- === =============
* Key1   I  THE KEY OF ENTITY OR LIST OF ENTITIES
*        WHOSE IMMEDIATE CONSTITUENTS ARE TO BE
*        SEARCHED
* Kind   I  THE KIND VALUE OF AN ENTITY OR CLASS
* Key2   O  THE KEY OF THE LIST THAT CONTAINS THE
*        SELECTED ENTITIES
* RC     O  EXTERNAL RETURN CODE
*        = 0 OK
*        > 0 CRITICAL ERROR
*        < 0 WARNING
*
* $COMMONS:
*
* $ENVIRONMENT:
* LANGUAGE: IBM PASCAL
* HARDWARE SYSTEM: IBM 360/370/4341/4381
*
* $EXECUTION PROCEDURE:
* MODEL ACCESS SOFTWARE INTERFACE ROUTINE
*
* $PROCESSING DESCRIPTION:
* 1. IF KEY1 IS AN ENTKEY, THEN ALL CONSTITUENTS OF KEY1
*    THAT MATCH ON KIND ARE PUT INTO KEY2.
* 2. IF KEY1 IS A LISTKEY, THEN ALL ENTITIES ON KEY1 THAT
*    MATCH ON KIND ARE PUT INTO KEY2.
*
* $COMMENTS:
*
* $CHANGE CONTROL:
* REVISED: 05/01/86           B. A. ULMER          FRMI
* ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION
(* TO USER RECOGNIZEABLE FORM *)
(* *)
(* REVISED: 12/10/85 B. A. ULMER FRMI *)
(* RETURN WARNING WHEN OUTPUT LIST IS NIL *)
(* *)
(* REVISED: 07/11/85 B. A. ULMER FRMI *)
(* ADD A NEW PARAMETER TO CNVRR FOR ERROR HANDLING AND DEBUGGING *)
(* PURPOSES *)
(* *)
(* %INCLUDE MALKU. *)
(*)
PROCEDURE MALKU(CONST KEY1:ANYKEY;CONST KIND:ORD_KIND;
    VAR KEY2:LISTKEY;VAR RC:EXT_RET_CODE):SUBPROGRAM;
(*)
(* $FUNCTION: (*)
    CREATE A LIST OF AN ENTITY KIND WHICH ARE FOUND WITHIN (*)
    THE USER LIST OF AN ENTITY OR A LIST OF ENTITIES.
    (*)

(* $DESCRIPTION OF ARGUMENTS: *)
(* NAME I/O DESCRIPTION *)
(*=======*************)
(* KEY1 I THE KEY OF ENTITY OR LIST OF ENTITIES *)
(* WHOSE USER LISTS ARE TO BE SEARCHED *)
(* KIND I THE KIND VALUE OF AN ENTITY OR CLASS *)
(* KEY2 O THE KEY OF THE LIST THAT CONTAINS THE *)
(* SELECTED ENTITIES *)
(* RC O EXTERNAL RETURN CODE *)
(* = 0 OK *)
(* > 0 CRITICAL ERROR *)
(* < 0 WARNING *)
(*)
(* $COMMONS: *)
(*)
(* $ENVIRONMENT: *)
(* LANGUAGE: IBM PASCAL *)
(* HARDWARE SYSTEM: IBM 360/370/4341/4381 *)
(*)
(* $EXECUTION PROCEDURE: *)
(* MODEL ACCESS SOFTWARE INTERFACE ROUTINE *)
(*)
(* $PROCESSING DESCRIPTION: *)
(* 1. IF KEY1 IS AN ENKEY, THEN ALL USERS OF KEY1 ARE PUT *)
(* INTO KEY2 THAT ARE OF THE GIVEN KIND. *)
(* 2. IF KEY1 IS A LISTKEY, THEN ALL THE USERS OF EACH ENTITY *)
(* ON THE LIST IS PUT INTO KEY2 THAT ARE OF THE GIVEN KIND. *)
(*)
(* $COMMENTS: *)
(*)
(* $CHANGE CONTROL: *)
(*)
(* ORIGINATED: 03/07/87 K. M. ROSS DBMA *)

3-799
DATA STRUCTURES/MAJOR VARIABLES:

END %INCLUDE MALKU.

***
(* %INCLUDE MALN *)

PROCEDURE MALN(CONST LSIZE:INTEGER;VAR KEYL:LISTKEY;
VAR RC:EXT_RET_CODE);SUBPROGRAM;

(*

$FUNCTION:
CREATE AN EMPTY LIST OF A SPECIFIED SIZE.

$DESCRIPTION OF ARGUMENTS:

<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>LSIZE</td>
<td>I</td>
<td>NUMBER OF ENTITIES IN THE LIST</td>
</tr>
<tr>
<td>KEYL</td>
<td>O</td>
<td>INITIALIZED TO KEY OF EMPTY LIST</td>
</tr>
<tr>
<td>RC</td>
<td>O</td>
<td>EXTERNAL RETURN CODE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>= 0 OK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 0 CRITICAL ERROR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt; 0 WARNING</td>
</tr>
</tbody>
</table>

$COMMONS:

$ENVIRONMENT:

LANGUAGE: IBM PASCAL
HARDWARE SYSTEM: IBM 360/370/4341/4381

$EXECUTION PROCEDURE:
MODEL ACCESS SOFTWARE INTERFACE ROUTINE

$PROCESSING DESCRIPTION:

A NEW APPLICATION LIST WILL BE CREATED, WITH SUFFICIENT
SPACE TO ACCOMODATE 'LSIZE' ENTRIES. ALL ENTRIES ARE
INITIALIZED TO NIL.

$COMMENTS:

$CHANGE CONTROL:

REVISED: 05/01/86 B. A. ULMER FRMI
ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION
TO USER RECOGNIZEABLE FORM

REVISED: 07/11/85 B. A. ULMER FRMI
ADD A NEW PARAMETER TO CNVRR FOR ERROR HANDLING AND DEBUGGING
PURPOSES

3-801
(* %INCLUDE MALNO. *)
(**)
PROCEDURE MALNO(CONST KEY1:ANYKEY;VAR KOUNT:INTEGER;
VAR RC:EXT_RET_CODE);SUBPROGRAM;
(**)
(*---------------------------------------------------------------*)
(*
(* $FUNCTION:
(* COUNT THE ENTITIES ON A LIST.
(*
(* $DESCRIPTION OF ARGUMENTS:
(*
<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEY1</td>
<td>I</td>
<td>THE LIST WHOSE ENTRIES ARE TO BE COUNTED</td>
</tr>
<tr>
<td>KOUNT</td>
<td>O</td>
<td>THE NUMBER OF ENTRIES IN KEY1</td>
</tr>
<tr>
<td>PC</td>
<td>O</td>
<td>EXTERNAL RETURN CODE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>= 0 = OK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 0 = CRITICAL ERROR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt; 0 = WARNING</td>
</tr>
</tbody>
</table>
(*
(* $COMMONS:
(*
(* $ENVIRONMENT:
(*
| LANGUAGE: IBM PASCAL |
| HARDWARE SYSTEM: IBM 360/370/4341/4381 |
(*
(* $EXECUTION PROCEDURE:
(*
| MODEL ACCESS SOFTWARE INTERFACE ROUTINE |
(*
(* $PROCESSING DESCRIPTION:
(*
| IF KEY1 IS A LIST, RETURN THE NUMBER ON THE LIST. IF KEY1 |
| IS AN ENTITY, RETURN THE NUMBER OF CONSTITUENTS. |
(*
(* $COMMENTS:
(*
(* $CHANGE CONTROL:
(*
| REVISED: 05/01/86 B. A. ULMER FRMI |
| ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION |
| TO USER RECOGNIZEABLE FORM |
| REVISED: 07/11/85 B. A. ULMER FRMI |
| ADD A NEW PARAMETER TO CNVRR FOR ERROR HANDLING AND DEBUGGING |
| PURPOSES |
(*
3-802
(* %INCLUDE MALNOT. *)

PROCEDURE MALNOT(CONST KEY1:ANYKEY;CONST KEY2:ANYKEY;
VAR KEY3:LISTKEY;VAR RC:EXT_RET_CODE);SUBPROGRAM;

(*--------------------------------------------------------*)
(*)
(*) $FUNCTION:
(*) CREATE AN APPLICATION LIST OF ENTITIES IN KEY1 BUT NOT IN
(*) KEY2.
(*)
(*) $DESCRIPTION OF ARGUMENTS:
(*)
(*) NAME     I/O   DESCRIPTION
(*) ===      ===  =========
(*) KEY1     I    ENTITY OR LIST OF ENTITIES WHICH WILL BE *)
(*)   'NOTED' - IF ENTITY, USE CONSTITUENT LIST*
(*) KEY2     I    ENTITY OR LIST OF ENTITIES WHICH WILL BE *)
(*)   'NOTED' - IF ENTITY, USE CONSTITUENT LIST*
(*) KEY3     O    LIST OF ENTITIES WHICH KEY1 HAS BUT KEY2 *
(*)   DOES NOT *
(*) RC       O    EXTERNAL RETURN CODE
(*)   = 0 OK RETURN CODE *
(*)   = 1 YOU BLEW IT *
(*)   = 2 THE ROUTINE BLEW IT *
(*)
(*) $COMMONS:
(*)
(*) $ENVIRONMENT:
(*)
(*)   LANGUAGE: IBM PASCAL *
(*)   HARDWARE SYSTEM: IBM 360/370/4341/4381 *
(*)
(*) $EXECUTION PROCEDURE:
(*)
(*)   MODEL ACCESS SOFTWARE INTERFACE ROUTINE *
(*)
(*) $PROCESSING DESCRIPTION:
(*)
(*)   THE KEY1 LIST IS COMPARED TO THE KEY2 LIST. IF AN ENTITY *
(*)   IS IN THE KEY1 LIST, THEN IT IS PUT ON THE OUTPUT KEY3 *
(*)   LIST. THE OUTPUT LIST WILL CONSIST OF ONLY THOSE ENTITIES *
(*)   FOUND IN KEY1 BUT NOT IN KEY2.
(*)
(*) $COMMENTS:
(*)
(*) $CHANGE CONTROL:
(*)
(*)   REVISED: 05/01/86  B. A. ULMER  W315 *
(*)   ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION *
(*)   TO USER RECOGNIZABLE FORM
(* REVISED: 07/11/85   B. A. ULMER   W315 *)
(* ADD A NEW PARAMETER TO CNVRR FOR ERROR HANDLING AND DEBUGGING *)
(* PURPOSES *)
(* *)
(* REVISED: 05/15/85   B. A. ULMER   W315 *)
(* FIX INCONSISTENCY IN OUTPUTLIST PROCESSING *)
(* *)
(* REVISED: 08/14/86   K. M. ROSS   W315 *)
(* ADDED NIL POINTER CHECK FOR KEY1 *)
(* *)
(* ORIGINATED: 03/09/84   D. J. KERCHNER   W315 *)
(* *)
(*-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-*)

%PAGE
(**)
(* END %INCLUDE MALNOT. *)
(* %INCLUDE MALOCK *)

PROCEDURE MALOCK(VAR LKEY:LISTKEY;CONST LOCK:INTEGER;
                   VAR RC:EXT_RET_CODE);SUBPROGRAM;

(*)

(* $FUNCTION:
SET AN APPLICATION LIST FOR DELETE OR NON-DELETE STATUS.
(*
(* $DESCRIPTION OF ARGUMENTS:
(*
NAME I/O DESCRIPTION
==== === ===============
LKEY I LISTKEY
LOCK I INTEGER VALUE INDICATING LOCK SETTING
   = 0 SET TO 'DELETE'
   = 1 SET TO 'NON-DELETE'
RC 0 EXTERNAL RETURN CODE
   = 0 OK RETURN CODE
   > 0 CRITICAL ERROR
   < 0 WARNING MESSAGE

(* $COMMONS:
NONE
(*
(* $ENVIRONMENT:
LANGUAGE: IBM PASCAL
HARDWARE SYSTEM: IBM 360/370/4341/4381
(*
(* $EXECUTION PROCEDURE:
MODEL ACCESS SOFTWARE INTERFACE ROUTINE.
(*
(* $PROCESSING DESCRIPTION:
SETS A FLAG IN THE INPUT LIST TO DELETE OR NON-DELETE.
(*
(* $COMMENTS:
THE DELETE/NON-DELETE STATUS AFFECTS ONLY THE MALDA AND
MALDI INTERFACE ROUTINES. THESE ROUTINES WILL CHECK THE
STATUS AND NOT DELETE THE LIST IF STATUS = 1. ALL OTHER
DELETE FUNCTIONS (EG. MALD) DO NOT CHECK THE STATUS WHEN
DELETING.
(*
(* $CHANGE CONTROL:
REVISED: 05/01/86 B. A. ULMER
ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION TO USER RECOGNIZEABLE FORM

3-805
(* REVISED: 07/11/85  B. A. ULMER *)
(* ADD A NEW PARAMETER TO CNVRR FOR ERROR HANDLING AND DEBUGGING *)
(* PURPOSES *)
(* ORIGINATED: 04/23/85  E. D. SHREVE *)
(* )
(*END---------------------------------------------------------------------*)
(* END %INCLUDE MALOCK *)
(* %INCLUDE MALOR *)
(*)
PROCEDURE MALOR(CONST KEY1:ANYKEY;CONST KEY2:ANYKEY;
VAR KEY3:LISTKEY;VAR RC:EXT_RET_CODE);SUBPROGRAM;
(*)
(* $FUNCTION:
(* CREATE AN APPLICATION LIST FROM A BOOLEAN 'OR' ON TWO
(* INPUT LISTS.
(*
(* $DESCRIPTION OF ARGUMENTS:
(*
<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEY1</td>
<td>I</td>
<td>ENTITY OR LIST OF ENTITIES WHICH WILL BE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>'ORED' - IF ENTITY, USE CONSTITUENT LIST</td>
</tr>
<tr>
<td>KEY2</td>
<td>I</td>
<td>ENTITY OR LIST OF ENTITIES WHICH WILL BE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>'ORED' - IF ENTITY, USE CONSTITUENT LIST</td>
</tr>
<tr>
<td>KEY3</td>
<td>O</td>
<td>LIST OF ENTITIES WHICH ARE EITHER IN KEY1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OR KEY2</td>
</tr>
<tr>
<td></td>
<td>O</td>
<td>EXTERNAL RETURN CODE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>= 0 OK RETURN CODE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt; 0 WARNING</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 0 CRITICAL ERROR</td>
</tr>
</tbody>
</table>
(*)
(* $COMMONS:
(*
(* $ENVIRONMENT:
(*
| LANGUAGE: IBM PASCAL |
| HARDWARE SYSTEM: IBM 360/370/4341/4381 |
(*
(*)
(* $EXECUTION PROCEDURE:
(*
| MODEL ACCESS SOFTWARE INTERFACE ROUTINE |
(*
(*)
(* $PROCESSING DESCRIPTION:
(*
| KEY1 AND KEY2 MAY BE EITHER ENTKEYS OR LISTKEYS. |
| IF KEY1 IS AN ENTITY KEY, THEN ITS CONSTITUENT LIST WILL BE |
| 'ORED WITH KEY2. |
| IF KEY2 IS AN ENTITY KEY, THEN ITS CONSTITUENT LIST WILL BE |
| 'ORED WITH KEY1. |
| CREATE AN APPLICATION LIST, KEY3, CONTAINING ALL ENTITIES |
| IN EITHER OR BOTH OF TWO INPUT LISTS. |
(*)
(*)
(* $COMMENTS:
(*
(*)
(* $CHANGE CONTROL:
(*)
(*)
(*)
(*)
3-807
(* REVISED: 05/01/86          B. A. ULMER   W315  *)
(* ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION *)
(* TO USER RECOGNIZEABLE FORM *)
(*                      *)
(* REVISED: 07/11/85       B. A. ULMER   W315  *)
(* ADD A NEW PARAMETER TO CNVRR FOR ERROR HANDLING AND DEBUGGING *)
(* PURPOSES              *)
(*                      *)
(* REVISED: 05/15/85       B. A. ULMER   W315  *)
(* FIX INCONSISTENCY IN OUTPUT LIST PROCESSING *)
(*                      *)
(* REVISED: 08/14/86       K. M. ROSS   W315  *)
(* ADDED A NIL POINTER CHECK FOR KEY1 *)
(*                      *)
(* ORIGINATED: 03/09/85    D. J. KERCHNER W315 *)
(*                      *)
(*---------------------------------------------------------------*)
%PAGE
(**)
(* END %INCLUDE MALOR *)
PROCEDURE MALRD(CONST KEY1:ANYKEY;VAR KEY2:ENTKEY;
VAR RC:EXT_RET_CODE);SUBPROGRAM;

(* FUNCTION: *)
(* READ THE NEXT ENTRY IN A DIRECTED LIST. *)

(* DESCRIPTION OF ARGUMENTS: *)
(* NAME I/O DESCRIPTION *)
(* === === ======== *)
(* KEY1 1 THE KEY OF THE DIRECTED LIST TO BE READ *)
(* KEY2 0 KEY OF THE ENTITY READ *)
(* RC 0 EXTERNAL RETURN CODE *)
(* = 0 OK *)
(* > 0 CRITICAL ERROR *)
(* < 0 WARNING *)

(* COMMONS: *)

(* ENVIRONMENT: *)
(* LANGUAGE: IBM PASCAL *)
(* HARDWARE SYSTEM: IBM 360/370/4341/4381 *)

(* EXECUTION PROCEDURE: *)
(* MODEL ACCESS SOFTWARE INTERFACE ROUTINE *)

(* PROCESSING DESCRIPTION: *)
(* THE LIST IS READ IN THE DIRECTION AS SET BY MALSTF OR *)
(* MALSTR. IF KEY1 IS AN ENTKEY THEN THE NEXT CONSTITUENT *)
(* IS READ. IF KEY1 IS AN APPLICATION LIST THE NEXT ENTITY *)
(* IS READ. *)

(* COMMENTS: *)

(* CHANGE CONTROL: *)
(* REVISED: 05/01/86 B. A. ULMER FRMI *)
(* ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION *)
(* TO USER RECOGNIZABLE FORM *)

(* REVISED: 07/11/85 B. A. ULMER FRMI *)
(* ADD A NEW PARAMETER TO CNVRR FOR ERROR HANDLING AND DEBUGGING *)
(* PURPOSES *)
(* %INCLUDE MALRDE. *)

PROCEDURE MALRDE(CONST KEYL:LISTKEY;
VAR RC:EXT_RR_CODE);SUBPROGRAM;

(*

$FUNCTION:
REMOVE DUPLICATE ENTRIES IN A LIST.

$DESCRIPTION OF ARGUMENTS:
NAME I/O DESCRIPTION
==== === ==============
KEYL I THE KEY OF THE LIST WHOSE DUPLICATE
ENTITIES WILL BE REMOVED
RC O EXTERNAL RETURN CODE
= 0 OK
> 0 CRITICAL ERROR
< 0 WARNING

$COMMONS:

$ENVIRONMENT:
LANGUAGE: IBM PASCAL
HARDWARE SYSTEM: IBM 360/370/4341/4381

$EXECUTION PROCEDURE:
MODEL ACCESS SOFTWARE INTERFACE ROUTINE

$PROCESSING DESCRIPTION:
ANY DUPLICATE ENTITIES FOUND IN THE INPUT LIST WILL BE
REMOVED. THE CHANGE IS MADE IN-PLACE.
CALLS ELDNL IN THE NDS PACKAGE.

$COMMENTS:

$CHANGE CONTROL:
REVISED: 05/01/86 B. A. ULMER FRMI
ADDED A CALL TO CNVSOSP TO CONVERT AN "OUT OF SPACE" CONDITION
TO USER RECOGNIZABLE FORM

REVISED: 07/11/85 B. A. ULMER FRMI
ADD A NEW PARAMETER TO CNVRR FOR ERROR HANDLING AND DEBUGGING
PURPOSES
(* %INCLUDE MALREP *)

PROCEDURE MALREP(CONST KEY1:ANYKEY; CONST KEY2:ANYKEY;
                  VAR RC:EXT_RET_CODE);SUBPROGRAM;

(*----------------------------------------------------------------------*)
(* $FUNCTION:
(* REPLACE A LIST. IF KEY1 IS AN ENTITY, THEN REPLACE THE
(* CONSTITUENT LIST OF THAT ENTITY.

(* $DESCRIPTION OF ARGUMENTS:
(* NAME I/O DESCRIPTION
(* ====== ========
(* KEY1 I THE KEY OF THE ENTITY OR LIST OF ENTITIES*
(* TO BE REPLACED - IF AN ENTITY, THEN *
(* USE THE CONSTITUENT LIST OF KEY1 *
(* KEY2 I THE KEY OF THE ENTITY OR LIST OF ENTITIES*
(* TO REPLACE KEY1 - IF AN ENTITY, THEN *
(* USE THE CONSTITUENT LIST OF KEY1 *
(* RC O EXTERNAL RETURN CODE
(* = 0 OK
(* > 0 CRITICAL ERROR
(* < 0 WARNING
(*

(* $COMMONS:
(*

(* $ENVIRONMENT:
(* LANGUAGE: IBM PASCAL
(* HARDWARE SYSTEM: IBM 360/370/4341/4381
(*

(* $EXECUTION PROCEDURE:
(* MODEL ACCESS SOFTWARE INTERFACE ROUTINE
(*

(* $PROCESSING DESCRIPTION:
(* KEY1 MAY BE EITHER AN ENTITY KEY OR A LIST KEY.
(* IF KEY1 IS A LIST KEY, THEN KEY2 REPLACES KEY1.
(* IF KEY1 IS AN ENTITY, THEN THE CONSTITUENT LIST OF KEY1 IS
(* REPLACED BY KEY2.
(* KEY2 MAY BE EITHER AN ENTITY KEY OR A LIST KEY.
(* IF KEY2 IS A LIST KEY, THEN KEY2 REPLACES KEY1.
(* IF KEY2 IS AN ENTITY, THEN THE CONSTITUENT LIST OF KEY2
(* REPLACES KEY1.
(*

(* $COMMENTS:
(*

(* $CHANGE CONTROL:
(*

3-811
(* REVISED: 05/01/86  B. A. ULMER  FRMI *)
(* ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION *)
(* TO USER RECOGNIZEABLE FORM *)
(* REVISED: 10/30/85  B. A. ULMER  FRMI *)
(* TAKE OUT CHECK OF DELETE RULES *)
(* REVISED: 09/05/85  B. A. ULMER  FRMI *)
(* ADDED NEW PARAMETERS TO FNDURUL FOR THE TWO NEW DELETE RULES. *)
(* REVISED: 07/11/85  B. A. ULMER  FRMI *)
(* ADD A NEW PARAMETER TO CNVRR FOR ERROR HANDLING AND DEBUGGING *)
(* PURPOSES *)
(* REVISED: 08/14/86  K. M. ROSS  DBMA *)
(* ADDED A NIL POINTER CHECK KEY1 *)

3-812
(* %INCLUDE MALRMV *)

PROCEDURE MALRMV(CONST KEY1:ANYKEY;CONST IPOS:LISTINDX;
    VAR RC:EXT_RET_CODE);SUBPROGRAM;

(*-----------------------------------------------*)

(* $FUNCTION:
   REMOVE AN ENTITY FROM A LIST.
   *)

(* $DESCRIPTION OF ARGUMENTS:
   *)

<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEY1</td>
<td>I</td>
<td>THE KEY OF ENTITY OF LIST OF ENTITIES</td>
</tr>
<tr>
<td>IPOS</td>
<td>I</td>
<td>THE POSITION IN KEY1 LIST WHICH THE ENTITY WILL BE REMOVED</td>
</tr>
<tr>
<td>RC</td>
<td>0</td>
<td>EXTERNAL RETURN CODE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RC</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>= 0</td>
<td>OK</td>
</tr>
<tr>
<td>&gt; 0</td>
<td>CRITICAL ERROR</td>
</tr>
<tr>
<td>&lt; 0</td>
<td>WARNING</td>
</tr>
</tbody>
</table>

(* $COMMONS:
   *)

(* $ENVIRONMENT:
   *)

    LANGUAGE: IBM PASCAL
    HARDWARE SYSTEM: IBM 360/370/4341/4381

(* $EXECUTION PROCEDURE:
   *)

    MODEL ACCESS SOFTWARE INTERFACE ROUTINE

(* $PROCESSING DESCRIPTION:
   *)

1. KEY1 MAY BE AN ENTITY OR LIST KEY.
2. IF KEY1 IS A LIST KEY, THEN AN ENTITY IS REMOVED FROM THE LIST.
3. IF KEY1 IS AN ENTITY KEY, THEN AN ENTITY IS REMOVED FROM THE CONSTITUENT LIST OF KEY1. THE DELETE RULES FOR KEY1 ARE TESTED TO INSURE THAT THE REMOVAL FROM KEY1 IS PERMITTED.
4. IPOS IS THE POSITION NUMBER OF THE ENTITY TO BE REMOVED.

(* $COMMENTS:
   *)

(* $CHANGE CONTROL:
   *)

3-813
(* REVISED: 05/01/86  B. A. ULMER  FRMI *)
(* ADDED A CALL TO CNVOSP TO CONVERT AAN "OUT OF SPACE" CONDITION *)
(* TO USER RECOGNIZABLE FORM *)
(* )
(* REVISED: 09/05/85  B. A. ULMER  FRMI *)
(* ADDED NEW PARAMETERS TO FNDURUL FOR THE TWO NEW DELETE RULES. *)
(* )
(* REVISED: 07/11/85  B. A. ULMER  FRMI *)
(* ADD A NEW PARAMETER TO CNVRR FOR ERROR HANDLING AND DEBUGGING *)
(* PURPOSES *)
(* )
(* REVISED: 10/31/84  D. J. KERCHNER  FRMI *)
(* INITIALIZED THE POSITION TO AN ARBITRARY #100 FOR THE DELRLST *)
(* AND DELPLST CALLS *)
(* )
(* REVISED: 02/06/85  E. D. SHREVE  FRMI *)
(* TEST FOR INVALID IPOS ARGUMENT *)
(* )
(* ORIGINATED: 06/28/84  E. D. SHREVE  FRMI *)
(* )
(* %PAGE *)
(* DATA STRUCTURES/MAJOR VARIABLES: *)
(* )
(*END %INCLUDE MALRMV *)
(* END %INCLUDE MALRMV *)
(**)
(* %INCLUDE MALROR *)
(**)
PROCEDURE MALROR(VAR KEYL: LISTKEY; VAR RC: EXT_RET_CODE); SUBPROGRAM;
(**)
(*----------------------------------------------------------------*)
(*
(* $FUNCTION:
(* REORDER THE APPLICATION LIST IN USER CONSTITUENT ORDER
(*
(* $DESCRIPTION OF ARGUMENTS:
(*
<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEYL</td>
<td>I/O</td>
<td>LIST TO BE REORDERED</td>
</tr>
<tr>
<td>RC</td>
<td>O</td>
<td>EXTERNAL RETURN CODE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>= 0 OK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 0 CRITICAL ERROR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt; 0 WARNING</td>
</tr>
</tbody>
</table>
(*
(* $COMMONS:
(*
(* $ENVIRONMENT:
(* LANGUAGE: IBM PASCAL
(* HARDWARE SYSTEM: IBM 360/370/4341/4381
(*
(* $EXECUTION PROCEDURE:
(* MODEL ACCESS SOFTWARE INTERFACE ROUTINE
(*
(* $PROCESSING DESCRIPTION:
(*
(* $COMMENTS:
(*
(* $CHANGE CONTROL:
(*

3-815
(* %INCLUDE MALRORI *)

PROCEDURE MALRORI(VAR KEYL:LISKEY;VAR RC:EXTRET_CODE);SUBPROGRAM;

(*---------------------------------------------------------------*)
(*
(* $FUNCTION:
(* REORDER THE APPLICATION LIST IN INCLUSIVE USER TO
(* CONSTITUENT ORDER
(*
(* $DESCRIPTION OF ARGUMENTS:
(* NAME I/O DESCRIPTION
(*==== === ===========
(* KEYL I/O LIST TO BE REORDERED
(* RC 0 EXTERNAL RETURN CODE
(*   = 0 OK
(* > 0 CRITICAL ERROR
(* < 0 WARNING
(*
(* $COMMENTS:
(*
(* $ENVIRONMENT:
(* LANGUAGE: IBM PASCAL
(* HARDWARE SYSTEM: IBM 360/370/4341/4381
(*
(* $EXECUTION PROCEDURE:
(* MODEL ACCESS SOFTWARE INTERFACE ROUTINE
(*
(* $PROCESSING DESCRIPTION:
(*
(* $COMMENTS:
(*
(* $CHANGE CONTROL:
(*
(* REVISED: MM/DD/YY CCRR I. M. THECHANGE'R GROUP_ID *
(* DESCRIPTION OF LATEST CHANGE MADE.
(*
(* ORIGINATED: 10/14/86 K.M. ROSS DBMA *
(*
(*---------------------------------------------------------------*)
(* DATA STRUCTURES/MAJOR VARIABLES:
(*---------------------------------------------------------------*)
(*
(* END %INCLUDE MALRORI *)
(**)
(* %INCLUDE MALRPL. *)

PROCEDURE MALRPL(CONST KEY1:ANYKEY;CONST KEY2:ENTKEY;
CONST IPOS:LISTPSTN;VAR RC:EXT_RET_CODE);SUBPROGRAM;

(*
* $FUNCTION:
* REPLACE AN ENTITY IN A LIST.
* *
* $DESCRIPTION OF ARGUMENTS:
* NAME I/O DESCRIPTION
* ==== === ================
* KEY1 I THE KEY OF AN ENTITY OR LIST OF ENTITIES WHICH WILL BE REPLACED
* KEY2 I KEY OF THE ENTITY TO BE MOVED INTO KEY1
* IPOS I THE POSITION IN KEY1 WHERE KEY2 IS TO BE PLACED
* RC 0 EXTERNAL RETURN CODE
* *= 0 OK
* > 0 CRITICAL ERROR
* < 0 WARNING
* *
* $COMMONS:
* *
* $ENVIRONMENT:
* LANGUAGE: IBM PASCAL
* HARDWARE SYSTEM: IBM 360/370/4341/4381
* *
* $EXECUTION PROCEDURE:
* MODEL ACCESS SOFTWARE INTERFACE ROUTINE
* *
* $PROCESSING DESCRIPTION:
* 1. KEY1 MAY BE AN ENTITY OR LIST KEY.
* 2. IF KEY1 IS AN ENTITY KEY, THEN KEY2 WILL REPLACE THE ENTITY AT IPOS IN KEY1'S CONSTITUENT LIST.
* 3. THE KEY AT IPOS POSITION IN THE LIST IS REPLACED.
* *
* $COMMENTS:
* IF THE ENTITY BEING REPLACED IN A CONSTITUENT LIST IS 'MARKED FOR DELETE', THEN AN ATTEMPT WILL BE MADE TO DELETE THE ENTITY.
* *
* $CHANGE CONTROL:
* 3-817
*
(* REVISED: 05/01/86  B. A. ULMER  FRMI *)
(* ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION *)
(* TO USER RECOGNIZEABLE FORM *)
(* *)
(* REVISED: 03/20/86  B. A. ULMER  FRMI *)
(* CHANGE DELRLST TO INDLST AND DELPLST WHEN TRYING TO REMOVE *)
(* THE USER KEY FROM THE REPLACED ENTITY'S USER LIST *)
(* *)
(* REVISED: 08/ /85  L. J. BEHAN  FRMI *)
(* ADD NEW PARAMETER TO DELRUL, DELENTY TO HANDLE APPLICATION *)
(* LIST POSITION PROBLEM *)
(* *)
(* REVISED: 07/11/85  B. A. ULMER  FRMI *)
(* ADD A NEW PARAMETER TO CNVRR FOR ERROR HANDLING AND DEBUGGING *)
(* PURPOSES *)
(* *)
(* %INCLUDE MALRRRI *)

PROCEDURE MALRRRI(VAR KEYL:LISTKEY;VAR RC:EXT_RET_CODE);SUBPROGRAM;

(* $FUNCTION:
REORDER THE APPLICATION LIST IN INCLUSIVE USING TO
CONSTITUENT ORDER
(*
(*
(* $DESCRIPTION OF ARGUMENTS:
(*
<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEYL</td>
<td>I/O</td>
<td>LIST TO BE REORDERED</td>
</tr>
<tr>
<td>RC</td>
<td>0</td>
<td>EXTERNAL RETURN CODE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>= 0 OK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 0 CRITICAL ERROR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt; 0 WARNING</td>
</tr>
</tbody>
</table>
(*
(*
(* $COMMONS:
(*
(* $ENVIRONMENT:
(*
| LANGUAGE: IBM PASCAL |
| HARDWARE SYSTEM: IBM 360/370/4341/4381 |
(*
(*
(* $EXECUTION PROCEDURE:
(*
| MODEL ACCESS SOFTWARE INTERFACE ROUTINE |
(*
(*
(* $PROCESSING DESCRIPTION:
(*
(*
(* $COMMENTS:
(*
(*
(* $CHANGE CONTROL:
(*
| REVISED: MM/DD/YY CRRR I. M. THECHANGER GROUP_ID |
| DESCRIPTION OF LATEST CHANGE MADE. |
(*
(*
| ORIGINATED: 10/14/86 K.M. ROSS DBMA |
(*
(*
(* DATA STRUCTURES/MAJOR VARIABLES:
(*
(*
(*END %INCLUDE MALRRRI *)
(**)
(* %INCLUDE MALRST *)

PROCEDURE MALRST(CONST KEYE:LISTKEY;
VAR RC:EXT_RET_CODE);SUBPROGRAM;

(*FUNCTION:
REMOVES ALL ENTITIES FROM AN APPLICATION LIST

*DESCRIPTION OF ARGUMENTS:
NAME I/O DESCRIPTION
==== ==== =========
KEYE I LIST KEY
RC 0 EXTERNAL RETURN CODE

*= 0 OK RETURN CODE
*> 0 CRITICAL ERROR
< 0 WARNING MESSAGE

*COMMONS:
NONE

*ENVIRONMENT:
LANGUAGE: IBM PASCAL
HARDWARE SYSTEM: IBM 360/370/4341/4381

*EXECUTION PROCEDURE:
MODEL ACCESS SOFTWARE INTERFACE ROUTINE.

*PROCESSING DESCRIPTION:
GIVEN AN APPLICATION LIST ALL ENTITIES ARE REMOVED LEAVING
THE LIST SIZE INTACT

*COMMENTS:
THIS PROCEDURE DEVELOPED SPECIFICALLY FOR THE IDB PACKAGE
BUT IS FUNCTIONAL FOR ALL APPLICATIONS.

*CHANGE CONTROL:
ORIGINATED: 08/14/87  K. M. ROSS

* END %INCLUDE MALRST *)
(* %INCLUDE MALRVS.*)
(**)
PROCEDURE MALRVS(VAR KEYA:ANYKEY; VAR RC:EXT_RET_CODE);SUBPROGRAM;
(**)
(*---------------------------------------------*)
(*
(* $FUNCTION:
(* REVERSE THE ORDER OF THE INPUT LIST.
(*
(* $DESCRIPTION OF ARGUMENTS:
(*
<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEYA</td>
<td>I/O</td>
<td>A LIST OR ENTITY KEY</td>
</tr>
<tr>
<td>RC</td>
<td>0</td>
<td>EXTERNAL RETURN CODE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>= 0 OK RETURN CODE</td>
</tr>
</tbody>
</table>
(*
(* $COMMONS:
(* NONE
(*
(* $ENVIRONMENT:
(* LANGUAGE: IBM PASCAL
(* HARDWARE SYSTEM: IBM 360/370/4341/4381
(*
(* $EXECUTION PROCEDURE:
(* MODEL ACCESS SOFTWARE INTERFACE ROUTINE
(*
(* $PROCESSING DESCRIPTION:
(* IF THE INPUT KEY IS AN APPLICATION LIST, THE LIST IS
(* REVERSED. IF THE INPUT IS AN ENTITY, THE CONSTITUENT
(* LIST OF THE ENTITY IS REVERSED.
(*
(* $COMMENTS:
(* NONE
(*
(* $CHANGE CONTROL:
(*
(* REVISED: 05/01/86 B. A. ULMER W315
(* ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION
(* TO USER RECOGNIZEABLE FORM
(*
(* ORIGINATED: 04/11/86 MAS2 E. D. SHREVE W315
(*
(*)--------------------------------------------------------------------
(* ENDE---------------------------------------------*  
(*) END %INCLUDE MALRVS. *)
(* %INCLUDE MALSRT *)

PROCEDURE MALSRT(CONST KEY:ANYKEY; CONST PROCNAME:ROUTINE;
                  VAR RC:EXT_RET_CODE);SUBPROGRAM;

(* ---------------------------------------------------------------*)
(*                          *)
(* $FUNCTION: GIVEN THE USER DEFINED ORDER FUNCTION THE LIST PASSED*)
(* IN AS INPUT WILL BE SORTED USING THIS FUNCTION               *)
(*                          *)
(* $DESCRIPTION OF ARGUMENTS:                                     *)
(*                     NAME   I/O DESCRIPTION                   *)
(*                     ====   ===========*)
(*     KEY     I     THE KEY OF THE ENTITY OR APPLICATION LIST*)
(*                      OF ENTITIES TO BE SORTED               *)
(*      PROCNAME I     THE NAME OF THE USER DEFINED FUNCTION    *)
(*                       FOR THE ORDERING OF THE LIST           *)
(*       RC      O     EXTERNAL RETURN CODE                     *)
(*             = 0   OK                                         *)
(*             > 0   CRITICAL ERROR                             *)
(*             < 0   WARNING                                     *)
(*                          *)
(* $COMMONS:                                                       *)
(*                          *)
(* $ENVIRONMENT:                                                    *)
(*                     LANGUAGE: IBM PASCAL                      *)
(*                     HARDWARE SYSTEM: IBM 360/370/4341/4381      *)
(*                          *)
(* $EXECUTION PROCEDURE:                                           *)
(*                     MODEL ACCESS SOFTWARE INTERFACE ROUTINE     *)
(*                          *)
(* $PROCESSING DESCRIPTION:                                        *)
(*                     THE USER SENDS IN THE ORDER FUNCTION, THEN THIS ROUTINES *)
(*                     REFERENCES THE USER DEFINED FUNCTION TO ACT UPON THE ENTITIES*)
(*                     BEING SORTED.                              *)
(*                          *)
(* $COMMENTS:                                                       *)
(*                          *)
(* $CHANGE CONTROL:                                                *)
(*                     REVISED: MM/DD/YY                             *)
(*                     I M THECHANGER GROUP                       *)
(*                     REASON FOR CHANGING THE ROUTINE             *)
(*                     *)
(*                     ORIGINATED: 04/ /86                          *)
(*                     B. A. ULMER FRMI                          *)
(*                          *)
(*---------------------------------------------------------------*)
(* DATA STRUCTURES/MAJOR VARIABLES: *)
(* END %INCLUDE MALSRT *)
(**)

3-823
(* INCLUDE MALSTF *)

PROCEDURE MALSTF(CONST KEYI:ANYKEY;VAR RC:EXT_RET_CODE);SUBPROGRAM;

(* --------------------------------------------------------------- *)

(* $FUNCTION: *)
(* INITIALIZE FOR READING A DIRECTED LIST IN FORWARD ORDER. *)

(* $DESCRIPTION OF ARGUMENTS: *)
(* NAME I/O DESCRIPTION *)
(* KEYI I THE KEY OF AN ENTITY OR LIST OF ENTITIES *)
(* whose read direction will be set to *)
(* FORWARD *)
(* RC O EXTERNAL RETURN CODE *)
(* = 0 OK *)
(* > 0 CRITICAL ERROR *)
(* < 0 WARNING *)

(* $COMMONS: *)

(* $ENVIRONMENT: *)
(* LANGUAGE: IBM PASCAL *)
(* HARDWARE SYSTEM: IBM 360/370/4341/4381 *)

(* $EXECUTION PROCEDURE: *)
(* MODEL ACCESS SOFTWARE INTERFACE ROUTINE *)

(* $PROCESSING DESCRIPTION: *)
(* IF KEYI IS AN ENTITY THEN THE CONSTITUENT LIST OF KEYI *)
(* WILL BE INITIALIZED. IF KEYI IS A LISTKEY THEN THE LIST *)
(* POINTED TO WILL BE INITIALIZED. IN EITHER CASE THE *)
(* <.POSITION> ELEMENT IS SET TO THE VALUE 1 AND THE *)
(* <.DIRECTION> ELEMENT IS SET TO THE VALUE <FORWARD>. *)

(* $COMMENTS: *)
(* USES NDS FUNCTION LSTLN M. *)

(* $CHANGE CONTROL: *)
(* REVISED: 05/01/86 B. A. ULMER FRMI *)
(* REVISED: 07/11/85 B. A. ULMER FRMI *)

3-824
ADD A NEW PARAMETER TO CNVRR FOR ERROR HANDLING AND DEBUGGING
PURPOSES

REVISED: 08/14/86  K. M. ROSS
ADDED A NIL POINTER CHECK FOR KEY1

3-825
(* %INCLUDE MALSTR *)

PROCEDURE MALSTR(CONST KEY1:ANYKEY;VAR RC:EXT_RET_CODE);SUBPROGRAM;

(*---------------------------------------------------------------*)

(* $FUNCTION:
INITIALIZE FOR READING A DIRECTED LIST IN REVERSE ORDER.
MAS INTERFACE PACKAGE.
(*
(* $DESCRIPTION OF ARGUMENTS:
(*
<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEY1</td>
<td>I</td>
<td>THE KEY OF AN ENTITY OR LIST OF ENTITIES</td>
</tr>
<tr>
<td></td>
<td></td>
<td>WHOSE READ DIRECTION WILL BE SET TO</td>
</tr>
<tr>
<td></td>
<td></td>
<td>REVERSE</td>
</tr>
<tr>
<td>RC</td>
<td>O</td>
<td>EXTERNAL RETURN CODE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>= 0 OK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 0 CRITICAL ERROR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt; 0 WARNING</td>
</tr>
</tbody>
</table>

(* $COMMONS:
(*
(* $ENVIRONMENT:
(*
| LANGUAGE: IBM PASCAL |
| HARDWARE SYSTEM: IBM 360/370/4341/4381 |

(* $EXECUTION PROCEDURE:
(*
| MODEL ACCESS SOFTWARE INTERFACE ROUTINE |

(* $PROCESSING DESCRIPTION:
(*
| IF KEY1 IS AN ENTITY THEN THE CONSTITUENT LIST OF KEY1 |
| WILL BE INITIALIZED. IF KEY1 IS A LISTKEY THEN THE LIST |
| POINTED TO WILL BE INITIALIZED. IN EITHER CASE THE |
| .POSITION> ELEMENT IS SET TO THE LENGTH OF THE LIST AND |
| THE .DIRECTION> ELEMENT IS SET TO THE VALUE <REVERSE>.

(* $COMMENTS:
(*
| USES NDS FUNCTION LSTLN.

(* $CHANGE CONTROL:
(*
| REVISED: 05/01/86 B. A. ULMER FRMI *
| ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION |
| TO USER RECOGNIZEABLE FORM *
(*
| REVISED: 08/14/86 K. M. ROSS DBMA *
| ADDED A NIL POINTER CHECK FOR KEY1 *

3-826
(* %INCLUDE MALXEQ *)

PROCEDURE MALXEQ(CONST KEY1:ANYKEY;VAR DATAREC:BLKDATA;
  CONST PROCNAME:ROUTINE;VAR KEY2:LISTKEY;VAR RCC:EXT_RET_CODE;
  VAR RC:EXT_RET_CODE);SUBPROGRAM;

(* $FUNCTION:
(*) EXECUTE A PROCEDURE ON AN ENTITY, OR A LIST OF ENTITIES.  *
(*) CONSTRUCT AN OUTPUT LIST OF ENTITIES AS DETERMINED BY THE
(*) APPLICATION PROCEDURE.
(*)
(* $DESCRIPTION OF ARGUMENTS:
(*) NAME I/O DESCRIPTION
(*) KEY1 I ENTITY OR LIST OF ENTITIES TO BE
(*) PROCESSED
(*) DATAREC I/O APPLICATION DEFINED DATA STRUCTURE WHICH
(*) EITHER SUPPLIES OR RECEIVES VALUES
(*) PROCEDUED ON BY THE APPLICATION PROCEDURE
(*) PROC ENTRY POINT OF APPLICATION DEFINED
(*) PROCEDURE
(*) KEY2 0 KEY OF THE LIST CREATED
(*) FOR THIS ROUTINE
(*) RCC 0 USER DEFINED PROCEDURE RETURN CODE
(*) = 0-1 OK RETURN CODE
(*) = 2-7 PROCEDURE WARNING CODE
(*) = 8-15 PROCEDURE ERROR CODE
(*) RC 0 EXTERNAL RETURN CODE
(*) = 0 OK RETURN CODE
(*) < 0 WARNING
(*) > 0 CRITICAL ERROR
(*)
(* $COMMONS:
(*)
(* $ENVIRONMENT:
(*) LANGUAGE: IBM PASCAL
(*) HARDWARE SYSTEM: IBM 360/370/4341/4381
(*)
(* $EXECUTION PROCEDURE:
(*) MODEL ACCESS SOFTWARE INTERFACE ROUTINE
(*)
(* $PROCESSING DESCRIPTION:
(*) THE USER SENDS IN THE NECESSARY INFORMATION, THEN THIS
(*) ROUTINE REFERENCES THE USER'S SPECIFIED PROCEDURE TO ACT
(*)

3-827
UPON THE INFORMATION HE HAS SUPPLIED TO THE PROCEDURE.

$COMMENTS:

$CHANGE CONTROL:

REVISED: 05/01/86 B. A. ULMER W315
ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION
TO USER RECOGNIZEABLE FORM

REVISED: 01/20/86 B. A. ULMER W315
ADD CAPABILITY TO READ THE INPUT LIST IN REVERSE IN ORDER TO PROCESS

REVISED: 07/11/85 B. A. ULMER W315
ADD A NEW PARAMETER TO CNVRR FOR ERROR HANDLING AND DEBUGGING PURPOSES

REVISED: 05/15/85 B. A. ULMER W315
FIX INCONSISTENCY IN OUTPUT LIST PROCESSING

REVISED: 03/06/85 B. A. ULMER W315
FIX APPLICATION LIST PROBLEM

REVISED: 11/28/84 D. J. KERCHNER W315
MALXEQ MADE FORTRAN CALLABLE BY USING INTERMEDIATE ASSEMBLER ROUTINE (PASASM)

ORIGINATED: 04/24/84 D. J. KERCHNER W315

%PAGE

(* END %INCLUDE MALXEQ *)
PROCEDURE MAQURY(CONST KEY1:ENTKEY; CONST FLGNAME:NAMTYP; VAR FLGVAL:INTEGER; VAR RC:EXT RET CODE);SUBPROGRAM;

$FUNCTION: DESCRIPTION OF WHAT THIS ROUTINE DOES.

$DESCRIPTION OF ARGUMENTS:

<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEY1</td>
<td>I</td>
<td>ENTITY WHOSE SPECIFIED FLAG VALUE IS TO DETERMINED</td>
</tr>
<tr>
<td>FLGNAME</td>
<td>I</td>
<td>FLAG NAME (STRING(6))</td>
</tr>
<tr>
<td>FLGVAL</td>
<td>O</td>
<td>VALUE OF THE SPECIFIED FLAG</td>
</tr>
<tr>
<td>RC</td>
<td>O</td>
<td>EXTERNAL RETURN CODE</td>
</tr>
</tbody>
</table>

$COMMONS:

$ENVIRONMENT:

| LANGUAGE: IBM PASCAL |
| HARDWARE SYSTEM: IBM 360/370/4341/4381 |

$EXECUTION PROCEDURE:

MODEL ACCESS SOFTWARE INTERFACE ROUTINE

$PROCESSING DESCRIPTION:

DETERMINE WHICH APPLICATION ACCESSIBLE FLAG'S VALUE IS TO BE GOTTEN AND THEN GET THE FLAG VALUE

$COMMENTS:

$CHANGE CONTROL:

REVISED: 05/01/86 B. A. ULMER W315
ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION TO USER RECOGNIZABLE FORM

REVISED: 07/11/85 B. A. ULMER W315
ADD A NEW PARAMETER TO CNVRR FOR ERROR HANDLING AND DEBUGGING
PURPOSES

ORIGINATED: 05/21/85    B. A. ULMER    W315

%PAGE

*END %INCLUDE MAQURY *)
(* %INCLUDE MARDLT *)

(**) PROCEDURE MARDLT(CONST KIND:ORD_KIND;VAR RC:EXT_RET_CODE);SUBPROGRAM;

%PAGE

(*------------------- ------------------------------------------*)
(* %INCLUDE MARSCT *)

(**)
PROCEDURE MARSCT(CONST KIND:ORD_KIND; VAR SCHPTR:T_SCHEMA_POINTER;
VAR RC:EXT_RET_CODE);SUBPROGRAM;

(*-----------)
(*
(* $FUNCTION:
(*
(* $DESCRIPTION OF ARGUMENTS:
(*
<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>KIND</td>
<td>I</td>
<td>KIND VALUE FOR WHICH THE SUBSCHEMA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DEFINITION WILL BE CREATED</td>
</tr>
<tr>
<td>SCHPTR</td>
<td>I/O</td>
<td>KEY TO THE DATA DEFINING THE SUBSCHEMA TO</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BE CREATED</td>
</tr>
<tr>
<td>RC</td>
<td>0</td>
<td>EXTERNAL RETURN CODE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt; 0 WARNING</td>
</tr>
<tr>
<td></td>
<td></td>
<td>= 0 OK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 0 CRITICAL ERROR</td>
</tr>
</tbody>
</table>
(*
(* $COMMONS:
(*
(* $ENVIRONMENT:
(* LANGUAGE: IBM PASCAL
(* HARDWARE SYSTEM: IBM 360/370/4341/4381
(*
(* $EXECUTION PROCEDURE:
(* MODEL ACCESS SOFTWARE INTERFACE ROUTINE
(*
(* $PROCESSING DESCRIPTION:
(*
(* $COMMENTS:
(*
(* $CHANGE CONTROL:
(* REVISED: 05/01/86 B. A. ULMER W315
(* ADDED A CALL TO CVNOSP TO CONVERT AN "OUT OF SPACE" CONDITION
(* TO USER RECOGNIZEABLE FORM
(* ORIGINATED: 10/18/85 B. A. ULMER W315
(*
(*-----------)
(* END %INCLUDE MARSCT *)

3-832
(* %INCLUDE MASALOC *)
(**)
    PROCEDURE MASALOC(CONST SIZE:INTEGER; VAR REGVAL:POINTER;
        VAR RC:INTEGER);FORTRAN;
(**)
(* END %INCLUDE MASALOC *)
(* %INCLUDE MASDSP *)

PROCEDURE MASDSP( VAR ENTPTR: POINTER;
                CONST TYPE_SIZE: INTEGER); EXTERNAL;

(* $FUNCTION:
  DISPOSE OF A MAS DYNAMICALLY ALLOCATED MEMORY AREA. *)

(* $DESCRIPTION OF ARGUMENTS:
  NAME I/O DESCRIPTION
  TYPE SIZE I THE SIZE OF THE AREA TO BE DISPOSED
  ENTPTR I POINTER TO THE MEMORY AREA TO BE DISPOSED
  RC O EXTERNAL RETURN CODE
  = 0 OK
  > 0 CRITICAL ERROR
  < 0 WARNING

$COMMONS:
  $PCMGR HOLDS THE DESCRIPTORS FOR THE MAS MEMORY AREAS.

$ENVIRONMENT:
  LANGUAGE: IBM PASCAL
  HARDWARE SYSTEM: IBM 360/370/4341/4381

$EXECUTION PROCEDURE:
  MODEL ACCESS SOFTWARE INTERFACE ROUTINE

$PROCESSING DESCRIPTION:
  DELETE A BLOCK AND COMBINE IT WITH ANY CONTIGUOUS BLOCKS
  OF FREED MEMORY.

$COMMENTS:

$CHANGE CONTROL:

REVISED: 02/06/86 B. A. ULMER FRMI
  ADDED CODE TO HANDLE WHEN THE 8K OVERFLOW BLOCK NEEDS FREED
  (JUST REMOVE IF FROM THE BLOCK CHAIN AND SET OVERFLOW FLAG TO
  FALSE)

REVISED: 08/1985 B. A. ULMER FRMI
  FIX BUG DEALING WITH THE PRESENCE OF AN INFINITE LOOP
(* REVISED: 07/11/85 B. A. ULMER FRMI *)
(* ELIMINATE THE LEAVE AND MAX FUNCTIONS FOR BETTER COMPATABILITY *)
(* WITH THE DEC VAX *)
(* ORIGINATED: 12/10/84 J. J. JOHNSON FRMI *)
(* )
(*---------------------------------------------------------------------*)
(* )
(* %PAGE *)
(*---------------------------------------------------------------------*)
(* DATA STRUCTURES/MAJOR VARIABLES: *)
(*---------------------------------------------------------------------*)
(* END %INCLUDE MASDSP *)
(* END %INCLUDE MASDSP *)
(* ** *)

3-835
(* %INCLUDE MASMSZ *)

(**)

PROCEDURE MASMSZ(VAR MODSIZ:INTEGER; VAR FRESIZ:INTEGER;
VAR RC:EXTRET_CODE);SUBPROGRAM;

(**)

(*---------------------------------------------------------------------*)

(* $FUNCTION: *)
(* RETURNS THE ACTUAL MODEL SPACE USED AND THE AMOUNT OF *)
(* FREE SPACE IN THE ALLOCATED MEMORY BLOCKS OF THE MODEL. *)

(* $DESCRIPTION OF ARGUMENTS: *)

(* NAME I/O DESCRIPTION *)

(* NAME I/O DESCRIPTION *)

(* MODESIZ 0 TOTAL BYTES OF USED MODEL SPACE *)

(* FRESIZ 0 TOTAL BYTES OF FREE SPACE IN THE *)

(* ALLOCATED MODEL BLOCKS. *)

(* RC 0 EXTERNAL RETURN CODE *)

(* 0 OK RETURN CODE *)

(* > 0 CRITICAL ERROR *)

(* < 0 WARNING *)

(* $COMMONS: *)

(* NONE *)

(* $ENVIRONMENT: *)

(* LANGUAGE: IBM PASCAL *)

(* HARDWARE SYSTEM: IBM 360/370/4341/4381 *)

(* $EXECUTION PROCEDURE: *)

(* MODEL ACCESS SOFTWARE INTERFACE ROUTINE *)

(* USED ONLY WITH THE MAS MEMORY MANAGER. CAN NOT BE USED *)

(* WITH THE PASCAL MEMORY MANAGER. *)

(* $PROCESSING DESCRIPTION: *)

(* CALLS THE INTERNAL MAS ROUTINES THAT CALCULATE FREESPACE *)

(* AND MODEL SPACE USING THE MAS MEMORY MANAGER CONTROL BLOCKS. *)

(* $COMMENTS: *)

(* IF THIS PROCEDURE IS TO BE USED WITH THE PASCAL MEMORY *)

(* MANAGER, THEN A SPECIAL PROCEDURE 'NDSFCT' IS REQUIRED. *)

(* $CHANGE CONTROL: *)

(* REVISED: 05/01/86 B. A. ULMER W315 *)

(* ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION *)

3-836
(*) TO USER RECOGNIZEABLE FORM (*)
(*) ORIGINATED: 04/09/85  E. SHREVE (*)
(*) ____________________________________________ (*)
(*) ____________________________________________ (*)
(*) END ______________________________________ (*)
(*) END %INCLUDE MASMSZ (*)
(* %INCLUDE MASNEW *)
(**)
PROCEDURE MASNEW( VAR ENTPTR: POINTER;
               CONST TYPE_SIZE: INTEGER;
               VAR RR: RETREC); EXTERNAL;
(**)
(*-----------------------------------------------*)
(*
(* $FUNCTION:
(*) ALLOCATES A NEW DYNAMIC MEMORY AREA FOR MAS ELEMENTS.
(*
(* $DESCRIPTION OF ARGUMENTS:
(*
<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYP_SIZE</td>
<td>I</td>
<td>THE SIZE OF THE MEMORY REGION REQUIRED</td>
</tr>
<tr>
<td>ENT_PTR</td>
<td>O</td>
<td>POINTER TO THE AREA OBTAINED</td>
</tr>
<tr>
<td>RR</td>
<td>O</td>
<td>EXTERNAL RETURN CODE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>= 0 OK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 0 CRITICAL ERROR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt; 0 WARNING</td>
</tr>
</tbody>
</table>
(*
(* $COMMONS:
(*
| $PCMGR    | HOLDS THE DESCRIPTORS FOR THE MAS MEMORY SPACE. |
(*
(* $ENVIRONMENT:
(*
| LANGUAGE: IBM PASCAL |
| HARDWARE SYSTEM: IBM 360/370/4341/4381 |
(*
(* $EXECUTION PROCEDURE:
(*
| MODEL ACCESS SOFTWARE INTERFACE ROUTINE |
(*
(* $PROCESSING DESCRIPTION:
(*
| ATTEMPTS TO LOCATE A FREE SPACE, STARTING AT THE FIRST |
| ALLOCATED REGION, AND CONTINUES THRU ALL ALLOCATED REGIONS. |
| IF FOUND, IT REMOVES THE REGION FROM THE FREE SPACE CHAIN. |
| IF NO SPACE EXISTS, IT ALLOCATES A NEW REGION AND CONNECTS |
| THE NEW REGION TO THE LAST. |
(*
(* $COMMENTS:
(*
(* $CHANGE CONTROL:
(*
| REVISED: 02/06/86 B. A. ULMER FRMI |
| ADDED CODE TO HANDLE A FAILURE ON GETMAIN IN ROUTINE MASALOC |
| AND PROCESSING OF 8K OVERFLOW BLOCK |
(*
3-838
(* REVISED: 07/11/85 B. A. ULMER FRMI *)
(* ELIMINATE THE LEAVE AND MAX FUNCTIONS TO BETTER COMPATIBILITY *)
(* WITH THE DEC VAX *)
(* *)
(* ORIGINATED: 12/10/84 J. J. JOHNSON FMRI *)
(* *)
(* -----------------------------------------------*)
(* PAGE *)
(* -----------------------------------------------*)
(* DATA STRUCTURES/MAJOR VARIABLES: *)
(* -----------------------------------------------*)
(* END INCLUDE MASNEW *)
(* **)
(* %INCLUDE MASOVR *)
(**)
PROCEDURE MASOVR( CONST SIZE: INTEGER; VAR ENT_PTR: POINTER;
   VAR OSPACE: $CBP);EXTERNAL;
(**)
(* $FUNCTION:
  (**)  
(* $DESCRIPTION OF ARGUMENTS:
  (* NAME I/O DESCRIPTION
  (****)
  (*) RC  0 EXTERNAL RETURN CODE
  = 0 OK
  > 0 CRITICAL ERROR
  < 0 WARNING
  (*)  
(* $COMMONS:
  (*) $PCMGR HOLDS THE DESCRIPTORS FOR THE MAS MEMORY AREAS.
  (*)  
(* $ENVIRONMENT:
  (*) LANGUAGE: IBM PASCAL
  (*) HARDWARE SYSTEM: IBM 360/370/4341/4381
  (*)  
(* $EXECUTION PROCEDURE:
  (*)  
(* $PROCESSING DESCRIPTION:
  (*)  
(* $COMMENTS:
  (*)  
(* $CHANGE CONTROL:
  (*)  
(* REVISED: 07/11/85 B. A. ULMER FRMI *)
(* ELIMINATE THE LEAVE AND MAX FUNCTIONS FOR BETTER COMPATIBILITY *)
(* WITH THE DEC VAX *)
(* ORIGINATED: 3/21/86 B. A. ULMER FRMI *)
(*)  
(* %INCLUDE MASDSP *)
(**)
PROCEDURE MAUPDT(VAR KEY1:ANYKEY; CONST FLGNAME:NAMTYP; CONST FLGVAL:INTEGER; VAR RC:EXT_RET_CODE);SUBPROGRAM;

(* $FUNCTION:
   UPDATE A SPECIFIED APPLICATION ACCESSIBLE FLAG VALUE

(* $DESCRIPTION OF ARGUMENTS:

<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEY1</td>
<td>I</td>
<td>ENTITY OR LIST OF ENTITIES WHOSE SPECIFIED FLAG VALUE IS TO BE UPDATED</td>
</tr>
<tr>
<td>FLGNAME</td>
<td>I</td>
<td>FLAG NAME (STRING(6))</td>
</tr>
<tr>
<td>FLGVAL</td>
<td>I</td>
<td>VALUE TO BE USED WHEN UPDATING THE FLAG</td>
</tr>
<tr>
<td></td>
<td></td>
<td>= 1 TRUE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>= 0 FALSE</td>
</tr>
<tr>
<td>RC</td>
<td>O</td>
<td>EXTERNAL RETURN CODE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>= 0 OK RETURN CODE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt; 0 WARNING</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 0 CRITICAL ERROR</td>
</tr>
</tbody>
</table>

(* $COMMONS:

(* $ENVIRONMENT:
   LANGUAGE: IBM PASCAL
   HARDWARE SYSTEM: IBM 360/370/4341/4381

(* $EXECUTION PROCEDURE:
   MODEL ACCESS SOFTWARE INTERFACE ROUTINE

(* $PROCESSING DESCRIPTION:
   DETERMINE WHICH OF THE APPLICATION ACCESSIBLE FLAGS IS TO BE UPDATED AND THEN UPDATE IT WITH THE INPUT VALUE

(* $COMMENTS:

(* $CHANGE CONTROL:
   REVISED: 08/21/85 B. A. ULMER FRMI
   CHANGED TO NOT ALLOW APPLICATION TO SET AN ENTITY FOR MARK DELETE

   REVISED: 07/11/85 B. A. ULMER FRMI
   ADD A NEW PARAMETER TO CNVRR FOR ERROR HANDLING AND DEBUGGING PURPOSES

3-841
PROCEDURE MIDBD(VAR KEY1:ANYKEY; VAR RC:EXT_RET_CODE);SUBPROGRAM;

(* WARNING: FOR IDB USE ONLY *)
(* MAY CONTAMINATE MODEL IF USING DELETE WITH NO DELETE RULES *)

(* $FUNCTION: *)
(* DELETE AN ENTITY OR LIST OF ENTITIES BUT DO NOT CONSIDER *)
(* THE DELETE RULES *)

(* $DESCRIPTION OF ARGUMENTS: *)
(* NAME I/O DESCRIPTION *)
(* KEY1 I ENTITY OR LIST OF ENTITIES TO BE DELETED *)
(* RC O EXTERNAL RETURN CODE *)
(* = 0 OK RETURN CODE *)
(* < 0 WARNING *)
(* > 0 CRITICAL ERROR *)

(* $COMMONS: *)

(* $ENVIRONMENT: *)
(* LANGUAGE: IBM PASCAL *)
(* HARDWARE SYSTEM: IBM 360/370/4341/4381 *)

(* $EXECUTION PROCEDURE: *)
(* MODEL ACCESS SOFTWARE INTERFACE ROUTINE *)

(* $PROCESSING DESCRIPTION: *)
(* IF KEY1 IS AN ENTKEY THEN *)
(* DELETE THE ENTITY *)
(* IF KEY1 IS A LISTKEY THEN *)
(* DELETE EACH ENTITY ON THE LIST *)

(* $COMMENTS: *)

(* $CHANGE CONTROL: *)
(* REVISED: 05/01/86 B. A. ULMER W315 *)
(* ADDED A CALL TO CNVOSP TO CONVERT AN "OUT OF SPACE" CONDITION *)
(* TO USER RECOGNIZABLE FORM *)
(* REVISED: 04/22/86 E. D. SHREVE W315 *)
(* CHANGED TO CALL XIELM INSTEAD OF DELENTY TO PERFORM THE DELETE *)
(* AND CHANGE INPUT TO VAR. *)
(* *)
(* REVISED: 08/04/85 L. J. BEHAN W315 *)
(* ADD NEW PARAMETER TO DELENTY FOR HANDLING OF APPLICATION *)
(* LIST POSITION PROBLEM *)
(* *)
(* REVISED: 07/11/85 B. A. ULMER W315 *)
(* ADD A NEW PARAMETER TO CNVRR FOR ERROR HANDLING AND DEBUGGING *)
(* PURPOSES *)
(* *)
(* ORIGINATED: 06/17/85 B. A. ULMER W315 *)
(* *)
(* _________________________________ *)
(**)
(* END %INCLUDE MIDBD. *)
(*)
(*)
PROCEDURE MIDBRV(CONST KEY1:ANYKEY;CONST IPOS:LISTINDX;
VAR RC:EXT RET_CODE);SUBPROGRAM;

(* WARNING: FOR IDB USE ONLY *)
(* MAY CONTAMINATE MODEL IF USING REMOVE WITHOUT DELETE RULES *)
(* $FUNCTION: (*
REMOVE AN ENTITY FROM A LIST WITHOUT CONSIDERING THE (*)
DELETE RULES *)
(* $DESCRIPTION OF ARGUMENTS: *)
(* NAME I/O DESCRIPTION *)
(* KEY1 I THE KEY OF AN ENTITY OR LIST OF ENTITIES *)
(* FROM WHICH AN ENTITY WILL BE REMOVED *)
(* IPOS I THE POSITION IN KEY1 FROM WHICH THE *)
(* ENTITY WILL BE REMOVED *)
(* RC O EXTERNAL RETURN CODE *)
(* = 0 OK *)
(* > 0 CRITICAL ERROR *)
(* < 0 WARNING *)
(* $COMMONS: *)
(* $ENVIRONMENT: *)
(* LANGUAGE: IBM PASCAL *)
(* HARDWARE SYSTEM: IBM 360/370/4341/4381 *)
(* $EXECUTION PROCEDURE: *)
(* MODEL ACCESS SOFTWARE INTERFACE ROUTINE *)
(* $PROCESSING DESCRIPTION: *)
(* 1. KEY1 MAY BE AN ENTITY OR LIST KEY. *)
(* 2. IF KEY1 IS A LIST KEY, THEN AN ENTITY IS REMOVED *)
(* FROM THE LIST. *)
(* 3. IF KEY1 IS AN ENTITY KEY, THEN AN ENTITY IS REMOVED *)
(* FROM THE CONSTITUENT LIST OF KEY1. *)
(* 4. IPOS IS THE POSITION NUMBER OF THE ENTITY TO BE *)
(* REMOVED. *)
(* $COMMENTS: *)
(* $CHANGE CONTROL: *)
(* %INCLUDE MOVRLSM *)
(**)
PROCEDURE MOVRLSM(CONST FROM_LIST:LISTPNTR;
                 CONST FROM_POSITION:LISTPSTN;VAR TO_LIST:LISTPNTR;
                 CONST TO_POSITION:LISTPSTN;CONST ENTCOUNT:LISTSIZE;
                 VAR RR:RET_REC);EXTERNAL;
(**)
(*------------------------------------------*-----------------------*)
(*
(* AUTHOR: UNKNOWN CADD CREATED: YY/MM/DD CC *)
(* VERSION: MAS VER 2 REVISED: 84/10/11 CC *)
(*
(* FUNCTION:)
(*    MOVE ENTITIES BETWEEN SYSTEM LISTS. *)
(*
(* ENVIRONMENT:)
(*    IBM PASCAL LANGUAGE *)
(*    IBM 30XX, 43XX, DEC VAX 11/780 *)
(*
(* DESCRIPTION OF ARGUMENTS:)
(*
NAME I/O DESCRIPTION
FROM_LIST I POINTER TO A SYSTEM LIST.
FROM_POSITION I THE RELATIVE POSITION OF THE FIRST ENTITY TO
BE MOVED.
TO_LIST I POINTER TO A SYSTEM LIST.
TO_POSITION I THE RELATIVE POSITION IN THE LIST TO WHICH
THE ENTITIES WILL BE MOVED.
ENTCOUNT I THE NUMBER OF ENTITIES TO MOVE.
RR 0 ERROR CONDITION RETURN CODE.
  = 0 NORMAL RETURN CODE.
  = 14 BAD_LIST_POSITION
  = 16 BAD_LIST_MOVE_COUNT
  = 17 BAD_LIST_REFERENCE
(*
(* COMMONS:
(*
(* PROCESSING DESCRIPTION:
(* MOVRLSM USES AMPXMOVE A SYSTEM ROUTINE. AMPXMOVE MOVES
DATA FROM MEMORY TO MEMORY (NUMBER OF BYTES TO BE MOVED
HAS TO BE SPECIFIED). (*)
(*
(* COMMENTS:
(*
3-847
CHANGE CONTROL:

84/10/11 MAS VER 2 D. J. KERCHNER

UPDTE DOCUMENTATION.

84/10/04 MAS VER 2 E. D. SHREVE

CHANGED DECLARATION OF 'TO_LIST' TO VAR.

*------------------------------*
(* %INCLUDE MRGTLSM. *)

PROCEDURE MRGTLSM(VAR LIST1:LISTPNTR;CONST LIST2:LISTPNTR;
VAR RR:RET_REC);EXTERNAL;

(*---------------------------------------------*)
(*  FUNCTION *
(*  CONCATENATE THE ENTITIES IN LIST2 TO LIST1. *)
(*  LANGUAGE *
(*  PASCAL. *)
(*  PACKAGE *
(*  LIST PACKAGE. *)
(*  ARGUMENTS *
(*  INPUT *
(*   LIST1, LIST2 - TWO LIST POINTERS. *)
(*  OUTPUT *
(*   RR      - THE FUNCTION RETURN RECORD. *)
(*---------------------------------------------*)

(* END %INCLUDE MRGTLSM. *)
(* %INCLUDE MRGTNM. *)
(**)
PROCEDURE MRGTNM(CONST KEYL1:LISTKEY;CONST KEYL2:LISTKEY;
VAR RR:RET_REC); EXTERNAL;
(**)
(*-----------------------------------------------*)
(*)
(* FUNCTION                                      *)
(* CONCATENATE THE ENTITIES IN LIST2 TO LIST1.    *)
(*)
(* LANGUAGE                                      *)
(* PASCAL.                                       *)
(*)
(* PACKAGE                                       *)
(* LIST PACKAGE.                                 *)
(*)
(* ARGUMENTS                                     *)
(* INPUT                                         *)
(* KEYE1  - KEY OF THE APPLICATION LIST. IF ENTITY KEY, *)
(* THEN USE CONSTITUENT LIST.                    *)
(* KEYE2  - KEY OF THE APPLICATION LIST TO BE     *)
(* CONCATENATED. IF ENTITY KEY, THEN USE         *)
(* CONSTITUENT LIST.                            *)
(*)
(* OUTPUT                                        *)
(* RR    - THE FUNCTION RETURN RECORD.           *)
(*)
(*-----------------------------------------------*)
(**)
(* END %INCLUDE MRGTNM. *)

PROCEDURE MRKNM(VAR RR:RET_REC);EXTERNAL;

FUNCTION
MARK THE STACK OF LISTS SO THAT THE NEXT RELEASE LIST
WILL ONLY DESTROY LISTS CREATED AFTER THIS MARK OPERATION.

LANGUAGE
PASCAL.

PACKAGE
LIST PACKAGE.

ARGUMENTS
INPUT
NONE
OUTPUT
RR - THE FUNCTION RETURN RECORD.
PROCEDURE MRSCR(CONST KIND:ORD_KIND; VAR SCH_SIZE:INTEGER;
    VAR RTSS:T_SCHEMA_POINTER;VAR RC:EXT_RET_CODE);SUBPROGRAM;

(* $FUNCTION:
(* THIS SUBPROGRAM IS GIVEN A COPY OF THE RUNTIME SUBSCHEMA FOR
(* A PARTICULAR KIND THIS COPY IS APPENDED TO THE ADB FOR THE
(* KIND COLLECTOR AND ITS OFFSET INTO IT IS RETURNED
(*
(* $DESCRIPTION OF ARGUMENTS:
(*
<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>KIND</td>
<td>I</td>
<td>KIND VALUE FOR WHICH THE SUBSCHEMA</td>
</tr>
<tr>
<td>SCH_SIZE</td>
<td>I</td>
<td>SIZE OF THE RUN-TIME SUBSCHEMA</td>
</tr>
<tr>
<td>RTSS</td>
<td>I/O</td>
<td>KEY OF RUNTIME SUBSCHEMA TO BE ATTACHED</td>
</tr>
<tr>
<td>RC</td>
<td>O</td>
<td>RETURN CODE</td>
</tr>
</tbody>
</table>

(* $COMMONS:
(*
(* $ENVIROMENT:
(* LANGUAGE: IBM PASCAL
(* HARDWARE SYSTEM: IBM 360/370/4341/4381
(*
(* $EXECUTION PROCEDURE:
(* MODEL ACCESS SOFTWARE INTERFACE ROUTINE
(*
(* $PROCESSING DESCRIPTION:
(*
(* $COMMENTS:
(*
(* $CHANGE CONTROL:
(* ORIGINATED: 03/07/87 K. M. ROSS W315
(*
(* END %INCLUDE MRSCR *)

3-852
(* %INCLUDE MSINIT. *)
(*)
PROCEDURE MSINIT(VAR SIZE:INTEGER;
VAR RC:EXT_RET_CODE);SUBPROGRAM;
(*)
(* $FUNCTION: *)
(* INITIALIZE THE MAS NETWORK WITH AN INITIAL MODEL SIZE. *)
(*)
(* $DESCRIPTION OF ARGUMENTS: *)
(* NAME I/O DESCRIPTION *)
(* SIZE I A NUMBER REPRESENTING HOW LARGE AN *)
(* INITIAL MODEL SIZE TO CREATE *)
(* RC O EXTERNAL RETURN CODE *)
(* = 0 OK RETURN CODE *)
(* < 0 WARNING *)
(* > 0 CRITICAL ERROR *)
(*)
(* $COMMONS: *)
(*)
(* $ENVIRONMENT: *)
(* LANGUAGE: IBM PASCAL *)
(* HARDWARE SYSTEM: IBM 360/370/4341/4381 *)
(*)
(* $EXECUTION PROCEDURE: *)
(* MODEL ACCESS SOFTWARE INTERFACE ROUTINE *)
(*)
(* $PROCESSING DESCRIPTION: *)
(*)
(* $COMMENTS: *)
(*)
(* $CHANGE CONTROL: *)
(* REVISED: *)
(* CHANGE : *)
(* ORIGINATED: 02/17/88 K. M. ROSS W315 *)
(*)
(*-----------------------------------------------------------*)
%PRINT ON
(* END %INCLUDE MSINIT *)
(* %INCLUDE MSTART. *)

PROCEDURE MSTART(CONST ID:INTEGER);SUBPROGRAM;

(* ----------------------------------------------- *)

(* $FUNCTION: *)
(* START STATISTICS GENERATION. *)

(* $DESCRIPTION OF ARGUMENTS: *)
(* NAME I/O DESCRIPTION *)
(* == === ========= *)
(* ID I INDICATION OF THE STATISTICS BEING KEPT *)
(* THIS FIELD MUST CORRESPOND TO ID INPUT *)
(* TO MSTOP *)
(* RC O EXTERNAL RETURN CODE *)
(* = 0 OK *)
(* > 0 CRITICAL ERROR *)
(* < 0 WARNING *)

(* $COMMONS: *)

(* $ENVIRONMENT: *)
(* LANGUAGE: IBM PASCAL *)
(* HARDWARE SYSTEM: IBM 360/370/4341/4381 *)

(* $EXECUTION PROCEDURE: *)
(* MODEL ACCESS SOFTWARE INTERFACE ROUTINE *)

(* $PROCESSING DESCRIPTION: *)
(* WHEN MSTART IS CALLED, THE INTEGER EQUIVALENT VALUE OF THE *)
(* MAS ROUTINE ID IS ENTERED INTO A COMMON FIELD. ALSO, A *)
(* FLAG IS SET TO ON INDICATING THAT THIS PARTICULAR MAS *)
(* ROUTINE IS THE ONE CURRENTLY BEING PROCESSED. *)

(* $COMMENTS: *)

(* $CHANGE CONTROL: *)
(* REVISED: 07/24/86 B. A. ULMER FRMI *)
(* CHANGE ID_FLAG FIELD OF MSTATUS TO AN INTEGER SO THAT AN APPL. *)
(* USER CAN KNOW HOW MANY LEVELS HE IS NESTED *)
(* *)
(* REVISED: 07/11/85 B. A. ULMER FRMI *)
(* ADD A NEW PARAMETER TO CNVR for ERROR HANDLING AND DEBUGGING *)
(* PURPOSES *)

3-854
(* %INCLUDE MSTOP. *)
(**)
PROCEDURE MSTOP(CONST ID:INTEGER);SUBPROGRAM;
(**)
(* --------------------------------------------------------*)
(* )
(* FUNCTION )
(* STOP STATISTICS GENERATION. )
(* )
(* LANGUAGE )
(* PASCAL. )
(* )
(* PACKAGE )
(* STATISTICS PACKAGE. )
(* )
(* ARGUMENTS )
(* INPUT )
(* ID - INDICATION OF TYPE OF STATISTICS BEING KEPT. *)
(* THIS FIELD MUST CORRESPOND TO ID INPUT TO *)
(* CALL TO MSTART. *)
(* )
(* OUTPUT )
(* NONE - *)
(* )
(* METHOD )
(* WHEN MSTOP IS CALLED, THE INTEGER EQUIVALENT VALUE OF THE *)
(* MAS ROUTINE ID IS ENTERED INTO A COMMON FIELD. ALSO, A *)
(* FLAG IS SET TO OFF INDICATING THAT THIS PARTICULAR MAS *)
(* ROUTINE IS NO LONGER ACTIVELY BEING PROCESSED, BUT THE ID *)
(* WILL INDICATE THAT IT WAS THE LAST ONE CALLED. *)
(* )
(* --------------------------------------------------------*)
(**)
(* END %INCLUDE MSTOP. *)
(* %INCLUDE NDSCMM. *)
(**)
PROCEDURE NDSCMM;EXTERNAL;
(**)
(*-----------------------------------------------*)
(*
(* FUNCTION
(*    DUMMY PROGRAM DEFINES NDSREM COMMON.
(*    USED AS THE 'SEED' OF THE MAS NDS.
(*
(*
(* LANGUAGE
(*    PASCAL.
(*
(* PACKAGE
(*    NETWORK PACKAGE.
(*
(* ARGUMENTS
(*    INPUT
(*      NONE
(*
(*    OUTPUT
(*      NONE
(*
(* METHOD
(*    SYSTEM INCONGRUITIES FORCE NESTING OF DEF WITHIN A
(*    PROCEDURE.
(*
(*-----------------------------------------------*)
(**)
(* END %INCLUDE NDSCMM. *)
(* %INCLUDE NDSFCT *)

PROCEDURE NDSFCT(VAR MODSIZ:INTEGER; VAR FRESIZ:INTEGER;
VAR RR:RET_REC);EXTERNAL;

(* $FUNCTION:
  COMPUTES THE AMOUNT OF USED MODEL SPACE AND THE AMOUNT OF
  FREESPACE IN THE ALLOCATED MEMORY BLOCKS.

(* $DESCRIPTION OF ARGUMENTS:
  NAME   I/O     DESCRIPTION
  MODSIZ 0       TOTAL BYTES OF USED MODEL SPACE
  FRESIZ 0       NUMBER OF BYTES OF FREE SPACE.
  RR     0       RETURN CODE
       = 0  OK RETURN CODE
          > 0 CRITICAL ERROR
          < 0 WARNING

(* $COMMONS:
  PCMGT
  PTR   I  POINTER TO THE 1ST ALLOCATED MEMORY BLOCK.

(* $ENVIRONMENT:
  LANGUAGE: IBM PASCAL
  HARDWARE SYSTEM: IBM 360/370/4341/4381

(* $EXECUTION PROCEDURE:
  INTERNAL PROCEDURE FOR THE MODEL ACCESS SOFTWARE
  USED ONLY WITH THE MAS MEMORY MANAGER. CAN NOT BE USED
  WITH THE PASCAL MEMORY MANAGER.

(* $PROCESSING DESCRIPTION:
  EACH ALLOCATED BLOCK IS FOUND USING THE BLOCK CHAIN OF THE
  SPACE CONTROL BLOCK ($CB). THE FREE CHAIN IS USED TO SUM
  THE SIZE OF EACH FREED ENTRY. THE BLOCK SIZES OF ALL
  ALLOCATED BLOCKS ARE ALSO TOTALED.
  MODSIZ = TOTAL SPACE ALLOCATED - FREESIZE

(* $COMMENTS:
  THE STRUCTURE OF THE MEMORY MANAGER CONTROL BLOCKS ARE
  DESCRIBED IN THE INCLUDE MEMBER 'PCMGT'.

(* $CHANGE CONTROL:

3-857
(* CHANGED: 07/16/85 B. A. ULMER W315 *)
(* REASON: CHANGED $PCMGT TO PCMGT FOR VAX COMPATABILITY *)
(* ORIGINATED: 04/09/85 E. SHREVE W315 *)
(* END %INCLUDE NDSFCT *)
(* %INCLUDE NDSGBM. *)

PROCEDURE NDSGBM;EXTERNAL;

(*-----------------------------------------------*)
(*
(* FUNCTION
(* DUMMY PROCEDURE FOR COMPILATE TIME INITIALIZATION OF NDS
(* GLOBAL AREA. CONTAINS NDS GLOBAL VARIABLE.
(*
(* LANGUAGE
(* PASCAL.
(*
(* PACKAGE
(* NETWORK PACKAGE.
(*
(* ARGUMENTS
(* INPUT
(* NONE --
(*
(* OUTPUT
(* NONE --
(*
(* COMMENT
(* DEFINED WITHIN THIS PROCEDURE ARE THE LIST OF ALL NETWORKS
(* AND THE LIST OF ALL LISTS.
(*
(*-----------------------------------------------*)
(* END %INCLUDE NDSGBM. *)
(* %INCLUDE NDSRML *)

PROCEDURE NDSRML;EXTERNAL;

(*-------------------------------------------------------------*)
(*
(* $FUNCTION:
(* RELEASE ALL MEMORY BLOCKS ALLOCATED TO THE WORKING FORM.
(*
(* $DESCRIPTION OF ARGUMENTS:
(* NAME  I/O DESCRIPTION
(* ====  === ===========
(* NONE
(*
(* $COMMONS:
(* $PCMGR
(* PTR I  POINTER TO THE FIRST ALLOCATED BLOCK.
(*
(* $ENVIRONMENT:
(* LANGUAGE: IBM PASCAL
(* HARDWARE SYSTEM: IBM 360/370/4341/4381 - MAS PACKAGE USING
(*   THE MODEL ACCESS MEMORY MANAGER.
(*
(* $EXECUTION PROCEDURE:
(* INTERNAL PROCEDURE FOR THE MODFL ACCESS SOFTWARE
(* THIS ROUTINE CAN ONLY BE USED WITH THE MAS MEMORY MANAGER.
(* IF THE PASCAL MEMORY MANAGER IS USED, THE ROUTINE DISPNDM
(* MUST BE SUBSTITUTED FOR NDSRML.
(*
(* $PROCESSING DESCRIPTION:
(* BEGINNING WITH THE POINTER IN $PCMGR, EACH MEMORY BLOCK
(* ALLOCATED TO THE WORKING FORM IS LOCATED AND FREED.
(*
(* $COMMENTS:
(* THE 1ST WORD OF EACH MEMORY AREA CONTAINS THE POINTER THAT
(* CHAINS ALL WORKING FORM MEMORY AREAS.
(*
(* $CHANGE CONTROL:
(* REVISED: 07/11/85    B. A. ULMER W315
(* CHANGED $PCMGT TO PCMGT FOR VAX COMPATABILITY
(*
(* ORIGINATED: 04/05/85    E.D. SHREVE W315
(*
(*-------------------------------------------------------------*)
(* DATA STRUCTURES/MAJOR VARIABLES: *)
(* THE INCLUDE MEMBER `$PCMGR' DESCRIBES THE STRUCTURE OF THE *)
(* CONTROL BLOCKS THAT CONTROL THE MEMORY AREAS AND LINKS THEM *)
(* TOGETHER. *)
(* END ---*)
(* END %INCLUDE NDSRML *)
(* %INCLUDE NEWCRB *)

PROCEDURE NEWCRB(VAR CRB:CRBPNTR; VAR RR:RET_REC);EXTERNAL;

(* *)

(* AUTHOR: B. A. ULMER FRMI CREATED: 85/02/08 CC??*)

(* VERSION: XXXX REVISED: YY/MM/DD CC *)

(* *)

FUNCTION:

CREATE A CRB

(* *)

ENVIRONMENT:

IBM PASCAL LANGUAGE

IBM 30XX, 43XX DEPENDENT CODE, OR OTHER APPROPRIATE H/W.

(* *)

EXECUTION PROCEDURE:

HOW IS THIS ROUTINE/MODULE TO BE EXECUTED.

(* *)

DESCRIPTION OF ARGUMENTS:

NAME I/O DESCRIPTION

CRB I/O CONSTITUENT READ BLOCK ADDRESS

RR O ERROR CONDITION RETURN CODE

= 0 OK RETURN CODE

= 1 YOU BLEW IT

= 2 THE ROUTINE BLEW IT

(* *)

COMMONS:

COM1

VAR1 I VAR1 NAME MUST BE FILLED, CHARACTER DATA MUST BE PROVIDED

VAR2 I VAR2 MUST BE SPECIFIED

COM2

VAR3 I CHARACTER DATA MUST BE SPECIFIED

(* *)

PROCESSING DESCRIPTION:

DETAILED DESCRIPTION OF HOW THIS ROUTINE WORKS, WHICH FILES NEED TO BE OPENED/CLOSED, FILES USED, ETC.

(* *)

COMMENTS:

TEXT OF ANY FURTHER COMMENTS WHICH MIGHT HELP TO UNDERSTAND THE FUNCTION/EXECUTION OF THIS ROUTINE.

(* *)

CHANGE CONTROL:

YY/MM/DD CCZZ I. M. THECHANGER

DESCRIPTION OF LATEST CHANGE MADE.

(* *)

3-862
(* %INCLUDE NEWEMM. *)

PROCEDURE NEWEMM(VAR KEYE:ENTKEY;CONST FORM:ENTITIES; VAR RR:RET_REC);EXTERNAL;

(*---------------------------------------------------------------*)
(* FUNCTION *)
(* CREATE A NEW NDS OBJECT. FORM DETERMINES WHAT IS CREATED. *)
(* LANGUAGE *)
(* PASCAL. *)
(* PACKAGE *)
(* ENTITY PACKAGE. *)
(* ARGUMENTS *)
(* INPUT *)
(* FORM - THE FORM OF THE ENTITY TO CREATE. *)
(* OUTPUT *)
(* KEYE - THE POINT TO THE CREATED ENTITY. *)
(* RR - THE FUNCTION RETURN RECORD. *)
(* CHANGE CONTROL: *)
(* CHANGED: 12/10/84 J. JOHNSON - TO CALL 'MASNEW'. *)
(*---------------------------------------------------------------*)

(* END %INCLUDE NEWEMM. *)
PROCEDURE NEWIIM(CONST ROOT:ENTKEY;VAR KEYE:ENTKEY;
VAR ENTDEF:ENTBLOCK;VAR RR:RETREC);EXTERNAL;

(* DESCRIPTION OF ARGUMENTS: *)
(* NAME I/O DESCRIPTION *)
(* ROOT I THE NDS INTERNAL ROOT TO BE THE OWNER OF *)
(* THE ENTITY. *)
(* ENTDEF I CONTAINS THE DATA TO BE COPIED INTO THE *)
(* NEW ENTITY. *)
(* KEYE 0 THE KEY OF THE NEW ENTITY. *)
(* RR 0 ERROR CONDITION RETURN CODE. *)
(* = 0 NORMAL RETURN CODE. *)

(* PROCESSING DESCRIPTION: *)
(* ALLOCATES A NEW T_ENTITY AND CREATES EMPTY USER AND CNSTS *)
(* LISTS AND POINTS TO THEM. IT CREATES THE ADB. *)

(* COMMENTS: *)

(* CHANGE CONTROL: *)
(* 04/26/85 E. D. SHREVE W315 *)
(* TO INITIALIZE THE CRBEXIT AND MAPROB FIELDS *)
(* *)
(* 84/10/11 MAS VER 2 D. J. KERCHNER *)
(* UPDATED DOCUMENTATION *)
(* 84/10/04 MAS VER 2 E. D. SHREVE *)
(* CHANGED DECLARATION OF ENTDEF TO VAR. *)

(* END %INCLUDE NEWIIM *)
(* %INCLUDE NEWLSM. *)

(**)
PROCEDURE NEWLSM(CONST SIZE:LISTSIZE;VAR POSITION:LISTPSTN;
VAR LISTREF:LISTPNTR; VAR RR:RET_REC);EXTERNAL;

(**)
(*---------------------------------------------------------------*)
(*
(* FUNCTION
(* LISTREF IS INITIALIZED AND ALLOCATED ENOUGH SPACE TO HOLD
(* SIZE ENTITIES. IF ALREADY INITIALIZED, LISTREF IS DELETED
(* PRIOR TO ALLOCATION OF SPACE. IF SIZE IS ZERO, NO SPACE
(* IS ALLOCATED.
(*
(* LANGUAGE
(* PASCAL.
(*
(* PACKAGE
(* LIST PACKAGE.
(*
(* ARGUMENTS
(* INPUT
(* SIZE - NUMBER OF ENTITIES TO BE ALLOCATED.
(*
(* OUTPUT
(* POSITION - POSITION OF LIST.
(* LISTREF - POINTER TO A SYSTEM LIST WITH SIZE ENTITIES
(* ALLOCATED TO IT.
(* RR - THE FUNCTION RETURN RECORD.
(*
(* CHANGE CONTROL
(* CHANGED: 12/10/84 J. JOHNSON - TO CALL 'MASNEW'.
(*---------------------------------------------------------------*)
(**)
(* END %INCLUDE NEWLSM. *)
(* %INCLUDE NEWNDM. *)
(*
PROCEDURE NEWNDM(VAR NDSREM:NDS;VAR RR:RET_REC);EXTERNAL;
(*)
(*---------------------------------------------------------------*)
(*
FUNCTION
(* CREATE A NEW EMPTY MODEL IN MEMORY.
(*
(* LANGUAGE
(* PASCAL.
(*
(* PACKAGE
(* NETWORK PACKAGE.
(*
(* ARGUMENTS
(* INPUT
(* NONE -
(*
(* OUTPUT
(* NDSREM - CONNECTED TO THE NEW NDS.
(* RR - THE FUNCTION RETURN RECORD.
(*
(* CHANGE CONTROL:
(* EDS - MAS VERSION 2 - 9/17/84 REMOVE 'MARK' FUNCTION.
(*
(*---------------------------------------------------------------*)
(*
(* END %INCLUDE NEWNDM. *)
(*

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April 1990

3-867
(* %INCLUDE NEWNM. *)
(***)
PROCEDURE NEWNM(VAR KEYL:LISTKEY;VAR RR:RET_REC);EXTERNAL;
(***)
(*---------------------------------------------------------------------*)
(*
(* $FUNCTION
(* CREATE AN EMPTY APPLICATION LIST.
(*
(* $DESCRIPTION OF ARGUMENTS
(*
<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEYL</td>
<td>0</td>
<td>KEY OF THE CREATED APPL LIST</td>
</tr>
<tr>
<td>RR</td>
<td>0</td>
<td>RETURN CODE</td>
</tr>
</tbody>
</table>
(*
(* =0 GOOD RETURN
(* >0 CRITICAL ERROR
(* <0 WARNING
(*
(* $COMMONS
(* NDDGVM
(* STACK_OF_LISTS I USED TO FIND LIST_OF_LISTS TO ADD THE NEW LIST KSY.
(*
(* $ENVIRONMENT:
(* LANGUAGE: IBM PASCAL
(* HARDWARE SYSTEM: IBM 360/370/4341/4381
(*
(* $EXECUTION PROCEDURE:
(* INTERNAL PROCEDURE OF THE MODEL ACCESS SOFTWARE
(*
(* $PROCESSING DESCRIPTION:
(* CREATES A NEW APPLICATION LIST ELEMENT AND ATTACHES IT TO THE LIST_OF_LISTS. IT CREATES A NEW SYSTEM LIST THAT IS EMPTY AND ATTACHES IT TO THE APPLICATION LIST ELEMENT. THE FIELDS OF THE ELEMENTS ARE INITIALIZED.
(*
(* $CHANGE CONTROL:
(* REVISED: 04/23/85 E.D. SHREVE W315
(* CHANGED TO INITIALIZE THE NEW 'DELTFLG' FIELD.
(*
(* ORIGINATED: ORIGINAL NDS PACKAGE
(*---------------------------------------------------------------------*)
(**)
(*END %INCLUDE NEWNM. *)
(* %INCLUDE NEWNMM. *)

PROCEDURE NEWNMM(VAR KEYL:LISTKEY;VAR RR:RET_REC);EXTERNAL;

(*------------------------------------------------------------------------)
(*
(* $FUNCTION
(* CREATE AN EMPTY APPLICATION LIST WITHOUT ADDING IT TO THE
(* LIST OF LISTS
(*
(* $DESCRIPTION OF ARGUMENTS
(*
NAME I/O DESCRIPTION
==== === =============
KEYL 0 KEY OF THE CREATED APPL LIST
RR 0 RETURN CODE
(* =0 GOOD RETURN
(* >0 CRITICAL ERROR
(* <0 WARNING
(*
(* $COMMONS
(*
(* $ENVIRONMENT:
(* LANGUAGE: IBM PASCAL
(* HARDWARE SYSTEM: IBM 360/370/4341/4381
(*
(* $EXECUTION PROCEDURE:
(* INTERNAL PROCEDURE OF THE MODEL ACCESS SOFTWARE
(*
(* $PROCESSING DESCRIPTION:
(* CREATE A NEW APPLICATION LIST ELEMENT AND ATTACHES IT
(* TO THE LIST_OF_LISTS. IT CREATES A NEW SYSTEM LIST THAT
(* IS EMPTY AND ATTACHES IT TO THE APPLICATION LIST ELEMENT.
(* THE FIELDS OF THE ELEMENTS ARE INITIALIZED.
(*
(* $CHANGE CONTROL:
(* REVISED: 04/23/85 E.D. SHREVE W315
(* CHANGED TO INITIALIZE THE NEW 'DELTFLG' FIELD.
(*
(* ORIGINATED: ORIGINAL NDS PACKAGE
(*------------------------------------------------------------------------)
(*
(*END %INCLUDE NEWNMM. *)

3-869
(* %INCLUDE NEWNODE *)
(**)
PROCEDURE NEWNODE(CONST NDSREM:NDS;VAR KEYE:ENTKEY;
VAR ENTDEF:ENTBLOCK;VAR RR:RETREC);EXTERNAL;
(**)
(*-----------------------------------------------*)
(*)
(* AUTHOR: UNKNOWN CADD CREATED: YY/MM/DD CC *)
(* VERSION: MAS VER 2 REVISED: 84/10/11 CC *)
(*)
(* FUNCTION: *)
(* CREATE A NEW ENTITY IN THE NDS AND COPY THE APPLICATION *)
(* ENTDATA INTO IT. *)
(*)
(* ENVIRONMENT: *)
(* IBM PASCAL LANGUAGE *)
(* IBM 30XX, 43XX, DEC VAX 11/780 *)
(*)
(* DESCRIPTION OF ARGUMENTS: *)
(* NAME I/O DESCRIPTION *)
(* NDSREM I THE NDS TO BE THE OWNER OF THE ENTITY. *)
(* ENTDEF I CONTAINS THE DATA TO BE COPIED INTO THE *)
(* NEW ENTITY. *)
(* KEYE O THE KEY OF THE NEW ENTITY. *)
(* RR O ERROR CONDITION RETURN CODE. *)
(* = 0 NORMAL RETURN CODE. *)
(*)
(* COMMONS: *)
(*)
(* PROCESSING DESCRIPTION: *)
(*)
(* COMMENTS: *)
(*)
(* CHANGE CONTROL: *)
(* 84/10/11 MAS VER 2 D. J. KERCHNER *)
(* UPDATED DOCUMENTATION. *)
(* 84/10/04 MAS VER 2 E. D. SHREVE *)
(* CHANGED DECLARATION FOR ENTDEF TO VAR. *)
(*)
(*-----------------------------------------------*)
(**)
(* END %INCLUDE NEWNODE *)

3-870
(* %INCLUDE NEWNSI. *)

(**)
PROCEDURE NEWNSI(VAR ROOT:ENTKEY;VAR KEYE:ENTKEY;VAR RR:RET_REC);
EXTERNAL;
(**)
(*---------------------------------------------------------------*)
(*
(* FUNCTION
(* CREATE AN EMPTY SCHEMA INSTANCE COLLECTOR ATTACHED TO THE
(* SCHEMA ROOT.
(*
(* LANGUAGE
(* PASCAL.
(*
(* PACKAGE
(* SCHEMA PACKAGE.
(*
(* ARGUMENTS
(* INPUT
(* ROOT - THE INTERNAL ROOT TO WHICH THE CREATED
(* INSTANCE COLLECTOR WILL BE ATTACHED.
(*
(* OUTPUT
(* KEYE - KEY OF THE CREATED INSTANCE COLLECTOR ENTITY.
(* RR - THE FUNCTION RETURN RECORD.
(*
(* METHOD
(* THIS PROGRAM IS CALLED FOR NO OTHER REASON THAN TO AVOID
(* PASCAL TYPE CHECKING BY USING A DIFFERENT DEFINITION OF
(* ENTBLOCK.
(*
(*---------------------------------------------------------------*)
(**)
(* END %INCLUDE NEWNSI. *)

3-871
PROCEDURE NEWNSR(VAR ROOT:ENTKEY;VAR RR:RET_REC);EXTERNAL;

FUNCTION
CREATE A NEW NULL SCHEMA ROOT AND ATTACH IT TO THE NDS.

LANGUAGE
PASCAL.

PACKAGE
SCHEMA PACKAGE.

ARGUMENTS
INPUT
ROOT - THE INTERNAL ROOT TO WHICH THE CREATED
SCHEMA ROOT WILL BE ATTACHED.

OUTPUT
RR - THE FUNCTION RETURN RECORD.

METHOD
THIS PROGRAM IS CALLED FOR NO OTHER REASON THAN TO AVOID
PASCAL TYPE CHECKING BY USING A DIFFERENT DEFINITION OF
ENTBLOCK.
(* %INCLUDE NEWSADB *)

PROCEDURE NEWSADB(CONST SIZE:ENTSIZE;VAR ENTBPNT:ENTPNTR;
VAR RR:RET_REC); EXTERNAL;

(*---------------------------------------------------------------*)
(*                      *)
(* AUTHOR: UNKNOWN      CADD CREATED: YY/MM/DD CC *)
(* VERSION: MAS VER 1   REVISED: 12/10/84 *)
(* FUNCTION: *)
(* ALLOCATE SPACE FOR DATA TO A SYSTEM UDB. *)
(* ENVIRONMENT: *)
(* IBM PASCAL LANGUAGE *)
(* IBM 30XX, 43XX, DEC VAX 11/780 *)
(* DESCRIPTION OF ARGUMENTS: *)
(* NAME I/O DESCRIPTION *)
(* SIZE I SIZE OF ENTDATA TO BE COPIED. *)
(* ENTBPNTR O POINTER TO ENTBLOCK CREATED. *)
(* RR O ERROR CONDITION RETURN CODE. *)
(* = 0 NORMAL RETURN CODE. *)
(* COMMONS: *)
(* PROCESSING DESCRIPTION: *)
(* NEWSADB USES THE PASCAL/VS COMPILER SUPPORT ROUTINE AMPXNEW.*)
(* COMMENTS: *)
(* CHANGE CONTROL: *)
(* 84/10/11 MAS VER 2 D. J. KERCHNER *)
(* UPDATED DOCUMENTATION. *)
(* 84/12/10 MAS VER 2 J. JOHNSON *)
(* TO CALL MASNEW. *)
(*---------------------------------------------------------------*)

(* END %INCLUDE NEWSADB *)

3-873
(* %INCLUDE NEWSCHI. *)

PROCEDURE NEWSCHI(CONST ROOT:ENTKEY;VAR KEYE:ENTKEY;
VAR ENTDEF:ENTBLOCK;VAR RR:RET_REC);EXTERNAL;

(*-----------------------------------------------*)
(* FUNCION                                          *)
(* CREATE AN EMPTY SCHEMA INSTANCE COLLECTOR ENTITY ATTACHED *)
(* TO THE SCHEMA ROOT.                               *)
(* LANGUAGE                                         *)
(* PASCAL.                                         *)
(* PACKAGE                                         *)
(* SCHEMA PACKAGE.                                  *)
(* ARGUMENTS                                        *)
(* INPUT                                           *)
(* ROOT - THE INTERNAL ROOT TO WHICH THE CREATED   *)
(* INSTANCE COLLECTOR WILL BE ATTACHED.            *)
(* OUTPUT                                          *)
(* KEYE - KEY OF THE INITIALIZED ENTITY.            *)
(* ENTDEF - WORK AREA TO PASS TO NEWIIM.            *)
(* SCH_PTR - POINTER TO THE CREATED INSTANCE COLLECTOR ENTITY. *)
(* RR - THE FUNCTION RETURN RECORD.                *)
(*-----------------------------------------------*)

(* END %INCLUDE NEWSCHI. *)

3-874
PROCEDURE NEWSCHR(VAR ROOT:ENTKEY;VAR ENTDEF:ENTBLOCK;
VAR RR:RET_REC);EXTERNAL;

(*-----------------------------------------------*)
(*                        *)
(* FUNCTION                  *)
(* CREATE AN EMPTY ROOT COLLECTOR ENTITY ATTACHED TO THE NDS. *)
(*                        *)
(*                        *)
(* LANGUAGE                *)
(* PASCAL.                  *)
(*                        *)
(* PACKAGE                 *)
(* SCHEMA PACKAGE.          *)
(*                        *)
(* ARGUMENTS               *)
(* INPUT                   *)
(* ROOT                   - THE INTERNAL ROOT TO WHICH THE CREATED *)
(*                       SCHEMA_ROOT WILL BE ATTACHED. *)
(*                        *)
(* OUTPUT                 *)
(* ENTDEF                 - WORK AREA TO BE PASSED TO NEWIM. *)
(* RR                    - THE FUNCTION RETURN RECORD. *)
(*                        *)
(*-----------------------------------------------*)
(*                        *)
(* END %INCLUDE NEWSCHR. *)
(*                        *)
(* %INCLUDE NODECNM. *)

(**)
PROCEDURE NODECNM(CONST KEYE:ENTKEY;VAR KEYLOUT:LISTKEY;
VAR RR:RET_REC);EXTERNAL;

(**)
(*-----------------------------------------------------------------------*)
(*
(* $FUNCTION:
(* CREATE A LIST WHICH CONTAINS A COPY OF THE ENTITY'S
(* CONSTITUENT LIST.
(*
(* $DESCRIPTION OF ARGUMENTS:
(*
<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEYE</td>
<td>I</td>
<td>KEY OF THE ENTITY.</td>
</tr>
<tr>
<td>KEYLOUT</td>
<td>O</td>
<td>LIST OF THE ENTITY'S CONSTITUENT ENTITIES*</td>
</tr>
<tr>
<td>RR</td>
<td>O</td>
<td>THE FUNCTION RETURN RECORD.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>= 0 OK RETURN CODE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>= 1 YOU BLEW IT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>= 2 THE ROUTINE BLEW IT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>= ? ERRORS FROM INTERNALLY CALLED FUNCTIONS</td>
</tr>
</tbody>
</table>
(*
(* $COMMONS:
(*
(* $ENVIRONMENT:
(* LANGUAGE: IBM PASCAL
(* HARDWARE SYSTEM: IBM 360/370/4341/4381
(*
(* $EXECUTION PROCEDURE:
(* MODEL ACCESS SOFTWARE INTERFACE ROUTINE
(* OR
(* INTERNAL PROCEDURE FOR THE MODEL ACCESS SOFTWARE
(*
(* $PROCESSING DESCRIPTION:
(*
(* $COMMENTS:
(*
(* $CHANGE CONTROL:
(*
(* REVISED: 06/28/85 CCXX B. A. ULMER FRMI
(* CHANGE THE RETURN CODE FROM (END_OF_LIST TO NO_LIST_CREATED)
(*)

3-876
(* %INCLUDE NODECNN. *)

** PROCEDURE NODECNN(CONST KEYE:ENTKEY;VAR KEYLOUT:LISTPNTR;
VAR RR:RET_REC);EXTERNAL;

**

(* $FUNCTION: *)
(* CREATE A LIST WHICH CONTAINS A COPY OF THE ENTITY'S *)
(* CONSTITUENT LIST WITHOUT ADDING AN ENTRY IN THE LIST OF LISTS*)

(* $DESCRIPTION OF ARGUMENTS: *)
(* NAME I/O DESCRIPTION *)
(* KEYE I KEY OF THE ENTITY. *)
(* KEYLOUT O LIST OF THE ENTITY'S CONSTITUENT ENTITIES*)
(* RR O THE FUNCTION RETURN RECORD. *)
(* = 0 OK RETURN CODE *)
(* = 1 YOU BLEW IT *)
(* = 2 THE ROUTINE BLEW IT *)
(* = ? ERRORS FROM INTERNALLY CALLED FUNCTIONS *)

(* $COMMONS: *)

(* $ENVIRONMENT: *)
(* LANGUAGE: IBM PASCAL *)
(* HARDWARE SYSTEM: IBM 360/370/4341/4381 *)

(* $EXECUTION PROCEDURE: *)
(* MODEL ACCESS SOFTWARE INTERFACE ROUTINE *)
(* OR *)
(* INTERNAL PROCEDURE FOR THE MODEL ACCESS SOFTWARE *)

(* $PROCESSING DESCRIPTION: *)

(* $COMMENTS: *)

(* $CHANGE CONTROL: *)
(* ORIGINATED: 03/07/87 K. M. ROSS DBMA *)

(* DATA STRUCTURES/MAJOR VARIABLES: *)

(* END -- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - *)

(*)

(* END %INCLUDE NODECNN. *)
(*/INCLUDE MODERIM.*/)

(*PROCEDURE MODERIM(CONST FEYE:ENTF;VAR FEYD:LISTF;*
*VAR BEK:REC) ;EXTERNAL;*)

(*$FUNCTION:*)
(*CREATE A LIST WHICH CONTAINS A COPY OF THE ENTITY'S*)
(*USER LIST.*)

(*$DESCRIPTION OF ARGUMENTS:*)

<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEYE</td>
<td>I</td>
<td>FEY OF THE ENTITY.</td>
</tr>
<tr>
<td>FEYD</td>
<td>O</td>
<td>LIST OF THE ENTITY'S USER LIST.</td>
</tr>
<tr>
<td>BEK</td>
<td>O</td>
<td>THE FUNCTION RETURNS REC.</td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>- 0</td>
<td>OF RETURN CODE</td>
</tr>
<tr>
<td>- 1</td>
<td>YOU BLEW IT</td>
</tr>
<tr>
<td>- 2</td>
<td>THE ROUTINE BLEW IT</td>
</tr>
<tr>
<td>- 3</td>
<td>ERRORS FROM INTERNALLY CALLED FUNCTIONS</td>
</tr>
</tbody>
</table>

(*$COMMONS:*)

(*$ENVIRONMENT:*)

<table>
<thead>
<tr>
<th>LANGUAGE:</th>
<th>IBM PASCAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>HARDWARE SYSTEM:</td>
<td>IBM 160/170/441/401</td>
</tr>
</tbody>
</table>

(*$EXECUTION PROCEDURE:*)

| MODEL ACCESS SOFTWARE INTERFACE ROUTINE OR |
| INTERNAL PROCEDURE FOR THE MODEL ACCESS SOFTWARE |

(*$PROCESSING DESCRIPTION:*)

(*$COMMENTS:*)

(*$CHANGE CONTROL:*)

<table>
<thead>
<tr>
<th>REVIS: 06/28/85 CXX</th>
<th>R. A. ULMER</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHANGE THE RETURN CODE FROM (END OF LIST TO NO LIST CREATED)</td>
<td></td>
</tr>
</tbody>
</table>

(*R/R*)
(* %INCLUDE OCOUNT *)

** PROCEDURE OCOUNT(VAR SIZE:INTEGER);EXTERNAL; **

(*)

(*) AUTHOR: B. A. ULMER FRMI CREATED: 86/03/13 CC??*)
(*) VERSION: XXXX REVISED: YY/MM/DD CC *)
(*
(*) FUNCTION:
(*) COUNT THE NUMBER OF TIMES THE OVERFLOW BUFFER HAS BEEN USED *)
(*
(*) ENVIRONMENT:
(*) IBM PASCAL LANGUAGE *)
(*) IBM 30XX, 43XX DEPENDENT CODE, OR OTHER APPROPRIATE H/W. *)
(*
(*) EXECUTION PROCEDURE:
(*) HOW IS THIS ROUTINE/MODULE TO BE EXECUTED.
(*)
(*) DESCRIPTION OF ARGUMENTS:
(*) NAME I/O DESCRIPTION
(*) SIZE I/O SIZE TO BE STORED IN THE REQUESTED SIZE ARRAY IN THE MSTATUS COMMON
(*)
(*) COMMONS:
(*) MSTATUS
(*)
(*) PROCESSING DESCRIPTION:
(*) DETAILED DESCRIPTION OF HOW THIS ROUTINE WORKS, WHICH FILES NEED TO BE OPENED/CLOSED, FILES USED, ETC.
(*)
(*) COMMENTS:
(*) TEXT OF ANY FURTHER COMMENTS WHICH MIGHT HELP TO UNDERSTAND THE FUNCTION/EXECUTION OF THIS ROUTINE.
(*)
(*) CHANGE CONTROL:
(*) YY/MM/DD CCZZ I. M. THECHANGER
(*) DESCRIPTION OF LATEST CHANGE MADE.
(*) YY/MM/DD CCYY I. M. THEPROGRAMMER
(*) DESCRIPTION OF CHANGE MADE. IF LENGTHY, CONTINUE THE NARRATION ON THE NEXT LINE.
(*) YY/MM/DD CCXX I. M. APERSOON
(*) DESCRIPTION OF FIRST CHANGE MADE.
(*)
(*)

(**)

(* END %INCLUDE OCOUNT *)

3-879
(* %INCLUDE ORDRLST. *)
(**)
PROCEDURE ORDRLST(VAR IN_LIST:LISTPNTR; VAR RR:RET_REC);EXTERNAL;
(**)
(*-----------------------------------------------*)
(*
(* $FUNCTION:
(*  GIVEN AN APPLICATION LIST OF ENTITIES REORDER THEN SO THAT
(*  THEY ARE IN USER TO CONSTITUENT ORDER
(*
(*
(* $DESCRIPTION OF ARGUMENTS:
(*
  NAME     I/O     DESCRIPTION
  =====    ===     =========
  IN_LIST  I       SYSTEM LIST THAT IS TO BE REORDERED
  RC       0       EXTERNAL RETURN CODE
  = 0 OK
  > 0 CRITICAL ERROR
  < 0 WARNING
(*
(*
(* $COMMONS:
(*
(*
(* $ENVIRONMENT:
(*
  LANGUAGE: IBM PASCAL
  HARDWARE SYSTEM: IBM 360/370/4341/4381
(*
(*
(* $EXECUTION PROCEDURE:
(*
  INTERNAL PROCEDURE FOR THE MODEL ACCESS SOFTWARE
(*
(*
(* $PROCESSING DESCRIPTION:
(*
  CREATE A COPY OF IN_LIST IN SRT_LIST.
  REPEAT FOR EACH ENTITY OF SRT_LIST:
  GET ALL USERS OF I-TH ENTITY OF SRT_LIST.
  IF A USER OF SRT_LIST(I) APPEARS AT SRT_LIST(J) AND I<J
  THEN
  SWAP SRT_LIST(I) AND SRT_LIST(J).
  ELSE
  GET NEXT SRT_LIST(I)
  UNTIL END OF LIST IN SRT_LIST.
(*
(*
(* $COMMENTS:
(*
(*
(* $CHANGE CONTROL:
(*
(*
(*
(*
(*
3-880
(* %INCLUDE ORDRLSTI. *)
(*)
PROCEDURE ORDRLSTI(VAR IN_LIST:LISTPNTR; VAR RR:RET_REC);EXTERNAL;
(*)
(* $FUNCTION:
GIVEN AN APPLICATION LIST OF ENTITIES REORDER THEN SO THAT
THEY ARE IN INCLUSIVE USER TO CONSTITUEN ORDER
(*)
(* $DESCRIPTION OF ARGUMENTS:
NAME I/O DESCRIPTION
==== === ===========
IN_LIST I SYSTEM LIST THAT IS TO BE REORDERED
RC 0 EXTERNAL RETURN CODE
  = 0 OK
  > 0 CRITICAL ERROR
  < 0 WARNING
(*)
(* $COMMONS:
(*)
(* $ENVIRONMENT:
LANGUAGE: IBM PASCAL
HARDWARE SYSTEM: IBM 360/370/4341/4381
(*)
(* $EXECUTION PROCEDURE:
INTERNAL PROCEDURE FOR THE MODEL ACCESS SOFTWARE
(*)
(* $PROCESSING DESCRIPTION:
(*
REPEAT FOR EACH ENTITY OF SRT_LST:
(*
CREATE THE LIST OF INCLUSIVE USERS
(*
ADD INCLUSIVE USERS NOT ALREADY PROCESSED TO THE OUTPUT LIST
(*
(*
WITH THE ORDERED INCLUSIVE USER LIST REMOVE MEMBERS OF THE INPUT LIST AND ADD TO THE OUTPUT LIST
(*
(*
(* $COMMENTS:
(*
(* $CHANGE CONTROL:
(*
REVISED: MM/DD/YY I. M. CHANGER FRMI
(*)
3-881
(* COMMENTS AS NECESSARY *)

(* ORIGINATED: 10/14/86 K. M. ROSS DBMA *)

(* CHANGED: K. M. ROSS 10/24/86 *)

(* REASON: APPLICATIONS ABENDING SOC4 *)

(* CHANGE: INITIALIZE POINTERS *)

(* CHANGED: K. M. ROSS 10/24/86 *)

(* REASON: SLOW RESPONSE WITH LARGE LISTS *)

(* CHANGE: OPTIMIZE ALGORITHM, CREATE 'USERS LISTS FOR EACH ELEMENT *)

(* ONCE *)

(* END %INCLUDE ORDRLSTI. *)

(**)

(**)
(* %INCLUDE OSTART *)
(**) PROCEDURE OSTART; EXTERNAL;
(**)
(*)--------------------------------------------------------------------------(*)
(*)
(*) AUTHOR: B. A. ULMER FRMI CREATED: 86/03/13 CC??*)
(*) VERSION: XXXX REVIS: YY/MM/DD CC *)
(*)
(*) FUNCTION:  
(*) INITIALIZE THE INFORMATION DEALING WITH THE OVERFLOW BUFFER *)
(*) IN THE MSTATUS COMMON *)
(*)
(*) ENVIRONMENT:
(*) IBM PASCAL LANGUAGE *)
(*) IBM 30XX, 43XX DEPENDENT CODE, OR OTHER APPROPRIATE H/W. *)
(*)
(*) EXECUTION PROCEDURE: 
(*) HOW IS THIS ROUTINE/MODULE TO BE EXECUTED. *)
(*)
(*) DESCRIPTION OF ARGUMENTS:
(*) NAME I/O DESCRIPTION *)
(*)
(*) COMMONS: 
(*) MSTATUS *)
(*)
(*) PROCESSING DESCRIPTION: 
(*) DETAILED DESCRIPTION OF HOW THIS ROUTINE WORKS, WHICH *)
(*) FILES NEED TO BE OPENED/CLOSED, FILES USED, ETC. *)
(*)
(*) COMMENTS: 
(*) TEXT OF ANY FURTHER COMMENTS WHICH MIGHT HELP TO UNDERSTAND*)
(*) THE FUNCTION/EXECUTION OF THIS ROUTINE. *)
(*)
(*) CHANGE CONTROL:
(*) YY/MM/DD CCZZ I. M. THECHANGER *)
(*) DESCRIPTION OF LATEST CHANGE MADE. *)
(*) YY/MM/DD CCYY I. M. THEPROGRAMMER *)
(*) DESCRIPTION OF CHANGE MADE. IF LENGTHY, CONTINUE THE *)
(*) NARRATION ON THE NEXT LINE. *)
(*) YY/MM/DD CXXX I. M. APerson *)
(*) DESCRIPTION OF FIRST CHANGE MADE. *)
(*)
(*)--------------------------------------------------------------------------(*)
(**)
(* END %INCLUDE OSTART *)

3-883
(* %INCLUDE PASASM. *)

PROCEDURE PASASM(CONST KEYP:ENTKEY; VAR BLOCK:ENTBLOCK; VAR
DATAREC:BLKDATA;
    VAR RC:EXT_RET_CODE; CONST NAME:ROUTINE);FORTRAN;

(*---------------------------------------------------------------------*)
(*
(*  AUTHOR: D. KERCHNER  PDDI  CREATED: 84/09/11  *)
(*  VERSION: MAS2  REVISI ED: YY/MM/DD  *)
(*
(*  FUNCTION:  
(*      THIS ROUTINE SERVES AS A LINK ROUTINE BETWEEN THE MAS  *)
(*      INTERFACE PACKAGE AND THE USER'S APPLICATION DEFINED  *)
(*      PROCEDURE MAKING IT FORTRAN CALLABLE  *)
(*
(*  ENVIRONMENT:  
(*      IBM ASSEMBLER LANGUAGE  *)
(*      IBM 4341/3083 VAX 11/780 SYSTEMS  *)
(*
(*  EXECUTION PROCEDURE:  
(*      THIS ROUTINE IS INVOKED BY A CALL FROM A MAS INTERFACE  *)
(*      ROUTINE SUCH AS MALXEQ OR MAEXEQ, IN ORDER TO INVOKE A  *)
(*      USER DEFINED PROCEDURE WHICH IS IN THE USER'S MODULE  *)
(*
(*  DESCRIPTION OF ARGUMENTS:  
(*    NAME  TYPE  I/O  DESCRIPTION  *)
(*    KEYP  I  ENTITY KEY  *)
(*    EN TBL OCK  I  APPLICATION DEFINED BLOCK  *)
(*    DATAREC  I/O  USER PASSED DATA (I/O)  *)
(*    RC  0  ERROR CONDITION RETURN CODE (PASSED  *)
(*        ONLY, NOT PASSED  *)
(*    ROUTINE  I  NAME OF THE USER DEFINED PROCEDURE  *)
(*
(*  COMMONS:  
(*
(*  PROCESSING DESCRIPTION:  
(*    PASAM RECEIVES CALL FROM MAS PASCAL ROUTINE. THIS  *)
(*    ASSEMBLER CSECT THEN BRANCHES TO THE USER DEFINED ROUTINE  *)
(*    BY PASSING THE ADDRESS OF THAT ROUTINE IN A BRANCH REGISTER  *)
(*    INSTRUCTION. WHEN THE USER ROUTINE COMPLETES PROCESSING,  *)
(*    CONTROL IS RETURNED TO THE MAS PASCAL ROUTINE VIA THE  *)
(*    USER DEFINED ROUTINE.  *)
(*
(*  COMMENTS:  
(*    VARIABLES ARE NOT ACCESSED, BUT ARE PASSED THROUGH TO THE *)

3-884
USER DEFINED ROUTINE.

DATA STRUCTURES/MAJOR VARIABLES:

REGISTER USAGE:

R1 - PARAMETER LIST
R15 - BRANCHING REGISTER

CHANGE CONTROL:

END %INCLUDE PASASM
(* %INCLUDE RDLSM. *)

(**) PROCEDURE RDLSM(VAR POSITION: LISTPSTN; CONST LISTREF: LISTPNTR;
VAR KEYE: ENTKEY; VAR EOL: BOOLEAN; VAR RR: RET_REC); EXTERNAL;

(*) (* 
(*) FUNCTION
(*) READ A SYSTEM LIST AS A FIRST IN FIRST OUT ORDER.
(*) (* LANGUAGE
(*) PASCAL.
(*) Package
(*) LIST PACKAGE.
(*) (*) ARGUMENTS
(*) (*) INPUT
(*) POSITION - INDICATING NEXT ENTITY IN LISTREF TO BE READ.*
(*) LISTREF - LIST TO BE READ.
(*) (*) OUTPUT
(*) POSITION - UPDATED TO NEXT ENTITY.
(*) KEYE - ENTITY READ FROM LIST.
(*) EOL - TRUE IF ENTITY WAS READ ELSE FALSE.
(*) RR - THE FUNCTION RETURN RECORD.
(*) (*) METHOD
(*) IF THERE IS AN ENTITY AT INDICATED POSITION THEN PLACE
(*) NEXT ENTITY INDICATED BY POSITION IN KEYE, ADJUST
(*) POSITION TO INDICATE NEXT ENTITY, RETURN EOL SET TO
(*) FALSE,
(*) ELSE
(*) RETURN EOL SET TO TRUE.
(*) (*) END %INCLUDE RDLSM. *)
(* %INCLUDE RDRLSM. *)

(* @) PROCEDURE RDRLSM(CONST POSITION:LISTPSTN;CONST LISTREF:LISTPNTR;
VAR KEYE:ENTKEY;VAR EOL:BOOLEAN;VAR RR:RET_REC);EXTERNAL;
(* @)
(*-----------------------------------------------*)
(* @) (* FUNCTION *@
(* @) READ THE LAST ENTITY KEY FROM LISTREF. *@
(* @) (* LANGUAGE *@
(* @) PASCAL. *@
(* @) (* PACKAGE *@
(* @) LIST PACKAGE. *@
(* @) (* ARGUMENTS *@
(* @) (* INPUT *@
(* @) POSITION - RELATIVE POSITION IN LISTREF OF ENTITY TO BE READ. *@
(* @) LISTREF - LIST WHOSE POSITION-TH ENTITY IS TO BE READ. *@
(* @) (* OUTPUT *@
(* @) KEYE - KEY OF POSITION-TH ENTITY IN LISTREF. *@
(* @) EOL - TRUE IF NO POSITION-TH ENTITY IN LISTREF. *@
(* @) RR - THE FUNCTION RETURN RECORD. *@
(* @)-----------------------------------------------*)
(* @)
(* END %INCLUDE RDRLSM. *)

3-887
(* %INCLUDE RDTLSM. *)
(**)
PROCEDURE RDTLSM(CONST LISTREF:LISTPNTR;VAR KEYE:ENTKEY;
VAR EMPTY:BOOLEAN;VAR RR:RET_REC);EXTERNAL;
(**)
(*------------------------------------------------------------------------*)
(*)
(* FUNCTION)
(* READ THE LAST ENTITY KEY FROM LISTREF.
(*)
(* LANGUAGE)
(* PASCAL.
(*)
(* PACKAGE)
(* LIST PACKAGE.
(*)
(* ARGUMENTS)
(* INPUT
(* LISTREF  - LIST WHOSE LAST ENTITY IS TO BE READ.
(*)
(* OUTPUT
(* KEYE    - RETURNS LAST ENTITY IN LISTREF.
(* EMPTY   - TRUE IF NO ENTITIES IN LIST, ELSE FALSE.
(* RR      - THE FUNCTION RETURN RECORD.
(*)
(*------------------------------------------------------------------------*)
(**)
(* END %INCLUDE RDTLSM. *)
(* %INCLUDE REVAADB. *)

PROCEDURE REVAADB(CONST ENTBPNT:ENTPNTR;VAR ENTDEF:ENTBLOCK;
VAR RR:RET_REC);EXTERNAL;

(* FUNCTION
* ASSIGN THE VALUE OF A SYSTEM UDB TO AN APPLICATION ENTBLOCK.*

(* LANGUAGE
* PASCAL.

(* PACKAGE
* UDB PACKAGE.

(* ARGUMENTS
* INPUT
* ENTBPNT - POINTER TO ENTBLOCK CREATED.

(* OUTPUT
* ENTDEF - THE ENTBLOCK WITH THE VALUE OF SYSUDB
ASSIGNED TO IT.
* RR - THE FUNCTION RETURN RECORD.

(* METHOD
* REVAADB USES SYSTEM ROUTINE AMPXMOVE TO MOVE DATA IN
MEMORY. THE NUMBER OF BYTES TO MOVE MUST BE SPECIFIED.

(* END %INCLUDE REVAADB. *)
(* %INCLUDE REVNODM *)

PROCEDURE REVNODM(VAR KEYE:ENTKEY;VAR ENTDEF:ENTBLOCK;
VAR RR:RET_REC);EXTERNAL;

(*---------------------------------------------------------------*)
(*
(* AUTHOR: UNKNOWN CADD CREATED: YY/MM/DD CC *)
(* VERSION: MAS VER 2 REVISED: 84/10/11 CC *)
(*
(* FUNCTION:
REVISE AN ENTITY'S USER DATA BLOCK.
(*
(* ENVIRONMENT:
(* IBM PASCAL LANGUAGE
(* IBM 30XX, 43XX, DEC VAX 11/780
(*
(* DESCRIPTION OF ARGUMENTS:
(*
NAME I/O DESCRIPTION
(*
KEYE I KEY OF ENTITY TO BE REVISED.
(*
ENTDEF I NEW DATA FOR ENTITY TO BE REVISED.
(*
RR 0 ERROR CONDITION RETURN CODE.
(*)
= 0 NORMAL RETURN CODE.
(*
(*
COMMONS:
(*
(*
PROCESSING DESCRIPTION:
(*
(*
COMMENTS:
(*
(*
CHANGE CONTROL:
(*
84/10/11 MAS VER 2 D. J. KERCHNER
(*
UPDATED DOCUMENTATION.
(*
84/10/04 MAS VER 2 E. D. SHREVE
(*
CHANGED DECLARATION ON KEYE AND ENTDEF TO VAR.
(*
(*
(*---------------------------------------------------------------*)
(*
(* END %INCLUDE REVNODM *)

3-890
(*) %INCLUDE REVRLSM. (*)
(**)
PROCEDURE REVRLSM(CONST POSITION:LISTPSTN;CONST KEYE:ENTKEY;
CONST LISTREF:LISTPNTR;VAR RR:RET_REC);EXTERNAL;
(**)
(*------------------------------------------------------------------*)
(*
(* FUNCTION
(* CHANGE AN ENTITY IN A SYSTEM LIST.
(*
(* LANGUAGE
(* PASCAL.
(*
(* PACKAGE
(* LIST PACKAGE.
(*
(* ARGUMENTS
(* INPUT
(* POSITION  - THE RELATIVE POSITION OF THE ENTITY IN
THE LIST.
(* KEYE  - THE NEW ENTITY KEY.
(* LISTREF  - A POINTER TO A SYSTEM LIST.
(*
(* OUTPUT
(* RR  - THE FUNCTION RETURN RECORD.
(*
(*------------------------------------------------------------------*)
(**)
(* END %INCLUDE REVRLSM. *)

3-891
(* %INCLUDE REVSADB *)
(**)
PROCEDURE REVSADB(VAR ENTDEF:ENTBLOCK;VAR ENTBNTR:ENTPNTR;
VAR RR:RETREC);EXTERNAL;
(**)
(*---------------------------------------------------------------------*)
(*
(* AUTHOR: UNKNOWN CADD CREATED: YY/MM/DD CC *)
(* VERSION: MAS VER 2 REVISSED: 84/10/11 CC *)
(* REVISSED: 84/12/10 *)
(*)
(* FUNCTION: *)
(* REPLACE THE VALUE OF A SYSTEM ENTBLOCK WITH THE VALUE OF *)
(* ENTDEF. *)
(*)
(* ENVIRONMENT: *)
(* IBM PASCAL LANGUAGE *)
(* IBM 30XX, 43XX, DEC VAX 11/780 *)
(*)
(* DESCRIPTION OF ARGUMENTS: *)
(* NAME I/O DESCRIPTION *)
(* ENTDEF I THE APPLICATION ENTBLOCK VALUE TO ASSIGN *)
(* TO A SYSTEM ENTBLOCK. *)
(* ENTBNTR O POINTER TO THE SYSTEM ENTBLOCK TO BE REVISED. *)
(* RR O ERROR CONDITION RETURN CODE. *)
(* = 0 NORMAL RETURN CODE. *)
(*)
(* COMMONS: *)
(*)
(* PROCESSING DESCRIPTION: *)
(* REVSADB USES SYSTEM ROUTINE AMPXMOVE TO MOVE DATA IN *)
(* MEMORY. THE NUMBER OF BYTES TO MOVE MUST BE SPECIFIED. *)
(*)
(* COMMENTS: *)
(*)
(* CHANGE CONTROL: *)
(* 84/10/11 MAS VER 2 D. J. KERCHNER *)
(* UPDATED DOCUMENTATION. *)
(* 84/10/04 MAS VER 2 E. D. SHREVE *)
(* CHANGED ENTDEF FROM CONST TO VAR. *)
(* 84/12/10 MAS VER 2 J. JOHNSON *)
(* TO CALL MASDSP. *)
(*)
(*---------------------------------------------------------------------*)
(*)
(* END %INCLUDE REVSADB *)

3-892
(* %INCLUDE RLSNM. *)

PROCEDURE RLSNM(VAR RR:RET_REC);EXTERNAL;

(*)

(* FUNCTION
(* RELEASE ALL THE LISTS ON THE CURRENT LIST OF LISTS.
(*
(* LANGUAGe
(* PASCAL.
(*
(* PACKAGE
(* LIST PACKAGE.
(*
(* ARGUMENTS
(* INPUT
(* NONE
(*
(* OUTPUT
(* RR - THE FUNCTION RETURN RECORD.
(*
(*)

(* END %INCLUDE RLSNM. *)
(* %INCLUDE RSTLSM. *)

PROCEDURE RSTLSM(VAR POSITION:LISTPSTN;CONST LISTREF:LISTPNTR;
   VAR RR:RET_REC);EXTERNAL;

(*-----------------------------------------------*)
(* FUNCTION                                          *)
(* Resets POSITION to indicate the beginning of a list. *)
(* LANGUAGE                                          *)
(* PASCAL.                                           *)
(* PACKAGE                                          *)
(* LIST PACKAGE.                                     *)
(* ARGUMENTS                                         *)
(* INPUT                                            *)
(* LISTREF   - pointer to a list.                    *)
(* OUTPUT                                           *)
(* POSITION  - reset to indicate beginning of list.  *)
(* RR       - the function return record.            *)
(*-----------------------------------------------*)

(* END %INCLUDE RSTLSM. *)
PROCEDURE RSTSFLG(CONST LISTP:LISTPNTR;
               CONST SETTING:BOOLEAN;VAR RR:RET_REC);EXTERNAL;

(* $FUNCTION:
 * RESET THE REQUESTED POSITION IN THE INTERNAL MAS PROCESS
 * FLAG (MAPROB) IN THE IIT TO THE REQUESTED BOOLEAN VALUE.
 (*
 (* $DESCRIPTION OF ARGUMENTS:
 (*
 NAME I/O DESCRIPTION
 ==== === ===============
 LISTP I THE LIST OF ENTITIES THAT ARE TO HAVE A BYTE
 * IN THE SYSUSE FLAG SET. *
 SETTING I BOOLEAN VALUE THE SYSUSE(FLG_POS) BYTE IS TO
 * BE SET TO. (IE: TRUE OR FALSE) *
 RR 0 FUNCTION RETURN CODE
 * = 0 GOOD RETURN *
 * > 0 CRITICAL ERROR *
 * < 0 WARNING *

(* $COMMONS
 * NONE
 (*
 (* $ENVIRONMENT:
 (*
 LANGUAGE: IBM PASCAL
 HARDWARE SYSTEM: IBM 360,370,43XX
 (*
 (* $EXECUTION PROCEDURE:
 (*
 INTERNAL PROCEDURE FOR THE MODEL ACCESS SOFTWARE
 (*
 (* $PROCESSING DESCRIPTION:
 (*
 FOR EACH ENTITY ON THE LIST OF ENTITIES, THE MAPROB
 * BYTE IS SET TO THE INPUT SETTING.
 (*
 (* $COMMENTS
 * USES THE MAPROB FLAG IN THE T_ENTITY.
 (*
 (* $CHANGE CONTROL:
 (*
 REVISED: 04/26/85 E.D. SHREVE W315
 * TO SET THE MAPROB BYTE IN THE T_ENTITY INSTEAD
 * OF THE SYSUSE OF THE ADB. FOR INTERNAL MAS.
 (*
 ORIGINATED: 07/10/84 C. J. SAMPLE W315
 (*

(* END %INCLUDE RSTSFLG *)
PROCEDURE RVRLSM(VAR KEYIN:LISTPNTR; VAR KEYOUT:LISTPNTR;
VAR RR:RET_REC);EXTERNAL;

$FUNCTION:
CREATE AN OUTPUT LIST THAT CONTAINS THE ENTITIES ON THE
INPUT LIST IN REVERSE ORDER.

$DESCRIPTION OF ARGUMENTS:

<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEYIN</td>
<td>I</td>
<td>LIST TO COPY FROM</td>
</tr>
<tr>
<td>KEYOUT</td>
<td>O</td>
<td>NEW LIST WITH ENTITY'S REVERSED</td>
</tr>
<tr>
<td>RR</td>
<td>O</td>
<td>EXTERNAL RETURN CODE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>= 0 OK RETURN CODE</td>
</tr>
</tbody>
</table>

$COMMONS:
NONE

$ENVIRONMENT:
LANGUAGE: IBM PASCAL
HARDWARE SYSTEM: IBM 360/370/4341/4381

$EXECUTION PROCEDURE:
INTERNAL MODEL ACCESS SOFTWARE ROUTINE

$PROCESSING DESCRIPTION:
IF THE INPUT LIST IS NOT EMPTY, A NEW OUTPUT LIST IS
CREATED. THEN THE ENTITIES ARE MOVED INTO THE NEW LIST
IN REVERSE ORDER.

$COMMENTS:
NONE

$CHANGE CONTROL:
ORIGINATED: 04/11/86 MAS2 E. D. SHREVE W315
(* %INCLUDE SETRULS. *)

PROCEDURE SETRULS(CONST USER:ENTKEY; CONST CNST:ENTKEY; CONST DEL_LIST:LISTPNTR; VAR RULE:T_RULE; VAR MIN_CNST:LISTPSTN; VAR RR:RET_REC);EXTERNAL;

%PAGE

(*

$FUNCTION:
SET DELETE FLAGS ACCORDING TO USER'S DEPENDENCE & STRENGTH RULES.

$DESCRIPTION OF ARGUMENTS:

<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>USER</td>
<td>I</td>
<td>USER WHOSE RULES ARE TO BE FOUND BASED ON THE RELATIONSHIP WITH CNST</td>
</tr>
<tr>
<td>CNST</td>
<td>I</td>
<td>CNST WHOSE RULES ARE TO BE FOUND BASED ON THE RELATIONSHIP WITH USER</td>
</tr>
<tr>
<td>DELLST</td>
<td>I</td>
<td>LIST OF KEYS THAT ARE ELIGIBLE FOR DELETION</td>
</tr>
<tr>
<td>RULE</td>
<td>O</td>
<td>INDICATES WHICH DELETE AND COMPRESS RULES ARE VALID FOR THIS RELATIONSHIP</td>
</tr>
<tr>
<td>MIN_CNST</td>
<td>O</td>
<td>MINIMUM NUMBER OF CONSTITUENTS FOR USER</td>
</tr>
<tr>
<td>RR</td>
<td>O</td>
<td>THE FUNCTION RETURN CODE.</td>
</tr>
</tbody>
</table>

$COMMONS:

$ENVIRONMENT:
LANGUAGE: IBM PASCAL
HARDWARE SYSTEM: IBM 360/370/4341/4381

$EXECUTION PROCEDURE:
INTERNAL PROCEDURE FOR THE MODEL ACCESS SOFTWARE

$PROCESSING DESCRIPTION:
IF THE USER IS IN THE DEL_LST THEN EXIT
ELSE
THE RULES OF THE CONNECTION ARE FOUND AND THE RULE SET IS FILLED APPROPRIATELY

$COMMENTS:

$CHANGE CONTROL:

3-897
(* REVISED: 06/17/86       B. A. ULMER       FRMI *)
(* ADD NEW PARAMETERS TO SETRULES AND CHANGE PROCESSING TO HANDLE *)
(* THE NEW DELETE RULES - MAJOR REWRITE *)
(* REVISED: 09/85          B. A. ULMER       FRMI *)
(* ADD NEW PARAMETERS TO FNDURUL TO HANDLE TWO NEW DELETE RULES *)
(* %INCLUDE SORTDLST. *)

PROCEDURE SORTDLST(CONST DELLST:LISTKEY;VAR SRTLST:LISTPNTR;
VAR RR:RET_REC);EXTERNAL;

(*)--------------------------------------------------------------------------(*)
(* $FUNCTION:
(*) GIVEN AN APPLICATION LIST OF ENTITIES TO BE DELETED,
(*) DELLST RETURNS A SYSTEM LIST SORTED IN USER-CONSTITUENT ORDER IN SRT_LST.
(*)
(* $DESCRIPTION OF ARGUMENTS:
(*) NAME I/O DESCRIPTION
(*) === === ===============
(*) DEL_LST I APPLICATION LIST CONTAINING THE LISTKEY OF THE ENTITIES TO BE DELETED
(*) SRTLST O POINTER TO A SYSTEM LIST CONTAINING THE ENTITIES OF THE DEL_LST SORTED IN USER-CONSTITUENT ORDER
(*) RC O EXTERNAL RETURN CODE
(*) = 0 OK
(*) > 0 CRITICAL ERROR
(*) < 0 WARNING
(*)
(* $COMMONS:
(*)
(* $ENVIRONMENT:
(*) LANGUAGE: IBM PASCAL
(*) HARDWARE SYSTEM: IBM 360/370/4341/4381
(*)
(* $EXECUTION PROCEDURE:
(*) INTERNAL PROCEDURE FOR THE MODEL ACCESS SOFTWARE
(*)
(* $PROCESSING DESCRIPTION:
(*) SET MAPROB FLAG ON FOR ALL ENTITIES IN THE DEL-LST THAT ARE NOT 'MARKED FOR DELETE'
(*) REPEAT FOR EACH ENTITY IN DEL_LST IF NOT PROCESSED (MAPROB = FALSE)
(*) CALL SRTBYUSR TO PUT ALL USER ENTITIES ON THE SRTLST BEFORE ADDING THE ENTITY.
(*) RESET MAPROB AND MAPROB2
(*)
(* $COMMENTS:
(*) USES NDS PROCEDURES &STLSM, RDLSM, NEWLSM AND SRTBYUSR
*)

3-899
(*) $CHANGE CONTROL: (*)
(* * REVISIONED: 12/17/85 B. A. ULMER FRMI *)
(* (* CHANGE SRTBYSR TO SRTBYCNT - SORT LIST NOW IN CONSTITUENT TO *)
(* (* USER ORDER *)
(* *)
(* * REVISIONED: 12/03/85 E. D. SHREVE FRMI *)
(* (* REWRITTEN TO REPLACE THE COMPARE SORT WITH A SUBROUTINE THAT *)
(* (* USES THE SYSTEM FLAGS (MAPROB AND MAPROB2) FOR SORTING *)
(* *)
(* * REVISIONED: 07/01/85 B. A. ULMER FRMI *)
(* (* ELIMINATE THE LEAVE FUNCTION TO IMPROVE COMPATABILITY WITH VAX *)
(* *)
(* * REVISIONED: 04/10/85 B. A. ULMER FRMI *)
(* (* DO NOT PROCESS THE ALREADY "MARKED FOR DELETE" ENTITIES *)
(* *)
(* * ORIGINATED: 06/19/84 R. A. MCCLUSKEY FRMI *)
(* *)
(* *----------------------------------------------------------------------------* *)
%PAGE
(* *----------------------------------------------------------------------------* *)
(* DATA STRUCTURES/MAJOR VARIABLES: *)
(* *----------------------------------------------------------------------------* *)
(* * "*="*)
(* "*="*)
(* END %INCLUDE SORTDLST. *)
(* "*="*)
(* %INCLUDE SORTLSM. *)

(**)
PROCEDURE SORTLSM(VAR LISTREF:LISTPNTR; CONST PROCNAME:ROUTINE;
VAR RR:RETREC);EXTERNAL;

(**)

(* FUNCTION
SORT A SYSTEM LIST.

(* LANGUAGE
PASCAL.

(* PACKAGE
LIST PACKAGE.

(* ARGUMENTS
(* INPUT
LISTREF - LIST TO BE SORTED.

(* OUTPUT
RR - THE FUNCTION RETURN RECORD.

(* METHOD
THE SYSTEM LIST LISTREF IS SORTED IN APPLICATION DEFINED ORDER. THE ORDER IS DETERMINED BY A USER DEFINED FUNCTION;
ORDER. ORDER RETURNS FALSE IF TWO ENTITIES ARE IN ORDER ELSE IT RETURNS TRUE. IF LISTREF HAS LESS THAN TWELVE ENTITIES, THE BUBBLE SORT ALGORITHM IS USED. IF LISTREF CONTAINS MORE THAN ELEVEN ENTITIES A SLIGHT VARIATION OF QUICK SORT IS USED WHEN THE SUBLISTS CREATED BY STANDARD QUICK SORT CONTAIN LESS THAN TWELVE ENTITIES, SORTLSM REVERTS BACK TO BUBBLE SORT. IN GENERAL SORTLSM IS FASTER THAN EITHER BUBBLE SORT OR QUICK SORT.

(*)

(* END %INCLUDE SORTLSM. *)

3-901
(* %INCLUDE SRTBYCNT. *)

PROCEDURE SRTBYCNT(VAR KEY1:ENTKEY;VAR SRTLST:LISTPNTR;
VAR RR:RETREC);EXTERNAL;

(* $FUNCTION:
THIS IS A RECURSIVE ROUTINE THAT PLACES THE CNST ENTITIES
OF KEY1, THAT ARE ON THE DELETE LIST, INTO THE SRTLST
BEFORE KEY1 IS ADDED.

$DESCRIPTION OF ARGUMENTS:
NAME I/O DESCRIPTION
----- ---- ===============
* KEY1 I THE ENTITY THAT WILL BE PLACED ON THE OUTPUT LIST ALONG WITH ITS CONSTITUENTS
* SRTLST 0 POINTER TO A SYSTEM LIST CONTAINING THE ENTITIES OF THE DEL_LST SORTED IN CONSTITUENT-USER ORDER
* RC 0 EXTERNAL RETURN CODE
  = 0 OK
  > 0 CRITICAL ERROR
  < 0 WARNING

$COMMONS:

$ENVIRONMENT:
LANGUAGE: IBM PASCAL
HARDWARE SYSTEM: IBM 360/370/4341/4381

$EXECUTION PROCEDURE:
INTERNAL PROCEDURE FOR THE MODEL ACCESS SOFTWARE

$PROCESSING DESCRIPTION:
(ALL ENTITIES THAT WERE ON THE ORIGINAL DELETE LIST HAVE BEEN FLAGGED IN THE ENTITY BLOCK (MAPROB = TRUE))
EACH CNST OF KEY1 IS PROCESSED:
IF NOT PROCESSED (MAPROB2 = FALSE) AND IN THE DELETE LIST (MAPROB = TRUE) THEN
CALL SRTBYCNT TO PUT THE CNST ENTITY ON SRTLST
ADD KEY1 TO THE SRTLST.
SET KEY1 (MAPROB2 = TRUE)

$COMMENTS:
USES NDS PROCEDURES RSTLSM, RDLSM, AND SRTBYCNT

$CHANGE CONTROL:

CREATED: 12/17/85 B. A. ULMER FRMI

THIS ROUTINE IS USED BY SORTDLST FOR SORTING. IT REPLACES
THE COMPARE SORT IN THE OLD SORTDLST WHICH WAS INEFFICIENT.

DATA STRUCTURES/MAJOR VARIABLES:
THESE ARE DESCRIBED IN THE NDSDLCL INCLUDE MEMBER.

END %INCLUDE SRTBYCNT.

(*)
(* %INCLUDE UPDCRBE *)

PROCEDURE UPDCRBE(CONST CRB:CRBPTR; CONST EKEY:ENTKEY;
VAR POS:LISTPSTN; VAR DIR:LISTDIR; VAR RR:RET_REC);EXTERNAL;

(*------------------------------------------------------------------*)
(* AUTHOR: B. A. ULMER FRMI CREATED: 85/02/08 CC??*)
(* VERSION: XXXX REVISED: YY/MM/DD CC *)
(*------------------------------------------------------------------*)

(* FUNCTION: *)
(* UPDATE AN ENTRY IN THE CRB *)
(*------------------------------------------------------------------*)

(* ENVIRONMENT: *)
(* IBM PASCAL LANGUAGE *)
(* IBM 30XX, 43XX DEPENDENT CODE, OR OTHER APPROPRIATE H/W. *)
(*------------------------------------------------------------------*)

(* EXECUTION PROCEDURE: *)
(* HOW IS THIS ROUTINE/MODULE TO BE EXECUTED. *)
(*------------------------------------------------------------------*)

(* DESCRIPTION OF ARGUMENTS: *)
(* NAME I/O DESCRIPTION *)
(* CRB I/O CONSTITUENT READ BLOCK ADDRESS *)
(* EKEY I ENTITY KEY OF ENTRY TO UPDATE *)
(* POS I NEW LIST POSITION SETTING *)
(* DIR I NEW DIRECTION OF LIST (FORWARD OR REVERSE) *)
(* RR 0 ERROR CONDITION RETURN CODE *)
(* = 0 OK RETURN CODE *)
(* = 1 YOU BLEW IT *)
(* = 2 THE ROUTINE BLEW IT *)
(*------------------------------------------------------------------*)

(* COMMONS: *)
(* COM1 *)
(* VAR1 I VAR1 NAME MUST BE FILLED, CHARACTER DATA *)
(* MUST BE PROVIDED *)
(* VAR2 I VAR2 MUST BE SPECIFIED *)
(* COM2 *)
(* VAR3 I CHARACTER DATA MUST BE SPECIFIED *)
(*------------------------------------------------------------------*)

(* PROCESSING DESCRIPTION: *)
(* DETAILED DESCRIPTION OF HOW THIS ROUTINE WORKS, WHICH *)
(* FILES NEED TO BE OPENED/CLOSED, FILES USED, ETC. *)
(*------------------------------------------------------------------*)

(* COMMENTS: *)
(* TEXT OF ANY FURTHER COMMENTS WHICH MIGHT HELP TO UNDERSTAND*)
(* THE FUNCTION/EXECUTION OF THIS ROUTINE. *)

3-904
(* %INCLUDE VERAPN. *)

PROCEDURE VERAPN(CONST KEY1:ANYKEY;CONST KEY2:ANYKEY;
VAR RR:RET_REC);EXTERNAL;

(* FUNCTION
VERIFY LEGALITY OF APPENDING AN ENTITY OR LIST OF ENTITIES
(KEY2) TO AN ENTITY OR LIST OF ENTITIES (KEY1).
*
(* LANGUAGE
PASCAL.
(* PACKAGE
VERIFY PACKAGE.
(* ARGUMENTS
(* INPUT
(* KEY1 - KEY OF APPLICATION LIST TO WHICH ENTITIES
ARE TO BE APPENDED. IF ENTITY KEY, THEN
ADD TO CONSTITUENT LIST.
(* KEY2 - KEY OF APPLICATION LIST OF ENTITIES TO
APPEND. IF ENTITY KEY, THEN ADD ENTITY
TO LIST.
(* OUTPUT
(* RR - THE FUNCTION RETURN RECORD.
(*
(* END %INCLUDE VERAPN. *)
(* %INCLUDE VERCN. *)

**

PROCEDURE VERCN(CONST KEYLU:LISTKEY;CONST KEYLC:LISTKEY;
VAR RR:RET_REC);EXTERNAL;

(**)

(* FUNCTION
(* VERIFY LEGALITY OF CONNECTING EACH ENTITY ON A LIST OF
(* USERS TO EACH ENTITY ON A LIST OF CONSTITUENTS.
(*
(* LANGUAGE
(* PASCAL.
(*
(* PACKAGE
(* VERIFY PACKAGE.
(*
(* ARGUMENTS
(* INPUT
(* KEYLU - KEY OF LIST OF USERS.
(* KEYLC - KEY OF LIST OF CONSTITUENTS.
(*
(* OUTPUT
(* RR - THE FUNCTION RETURN RECORD.
(*

(* END %INCLUDE VERCN. *)
PROCEDURE VERCR(VAR ENTDEF:ENTBLOCK;CONST KEYE:ANYKEY;
VAR RR:RET_REC);EXTERNAL;

FUNCTION:
VERIFY LEGALITY OF CREATING AN ENTITY WITH THE USER
SUPPLIED ENTITY DATA BLOCK AND LIST OF CONSTITUENTS.

ENVIRONMENT:
IBM PASCAL LANGUAGE
IBM 30XX, 43XX, DEC VAX 11/780

DESCRIPTION OF ARGUMENTS:
NAME   I/O   DESCRIPTION
ENTDEF I     USER SUPPLIED DATA FOR ENTITY BLOCK.
KEYE   I     KEY OF ENTITY OR APPLICATIONS LIST OF
ENTITIES TO BE CONSTITUENTS OF THIS ENTITY.
RR     O     ERROR CONDITION RETURN CODE.
        = 0 NORMAL RETURN CODE.

COMMENTS:
PROCESSING DESCRIPTION:

CHANGE CONTROL:
84/10/11 MAS VER 2 D. J. KERCHNER
UPDATED DOCUMENTATION.
84/10/04 MAS VER 2 E. D. SHREVE
CHANGED ENTDEF FROM CONST TO VAR.
(* %INCLUDE VERDEL. *)
(**)
PROCEDURE VERDEL(CONST KEYE:ANYKEY;VAR RR:RET_REC);EXTERNAL;
(**)
(*-------------------------------------------------------------*)
(*)
(* FUNCTION *)
(* VERIFY LEGALITY OF DELETING AN ENTITY. *)
(*)
(* LANGUAGE *)
(* PASCAL. *)
(*)
(* PACKAGE *)
(* VERIFY PACKAGE. *)
(*)
(* ARGUMENTS *)
(* INPUT *)
(* KEYE - KEY OF ENTITY TO BE DELETED FROM NETWORK. *)
(*)
(* OUTPUT *)
(* RR - THE FUNCTION RETURN RECORD. *)
(*)
(*-------------------------------------------------------------*)
(**)
(* END %INCLUDE VERDEL. *)
(* %INCLUDE VERGT. *)

PROCEDURE VERGT(CONST KEYE:ENTKEY;VAR RR:RET_REC);EXTERNAL;

(* ----------------------------------------------- *)
(* *)
(* FUNCTION *)
(* VERIFY LEGALITY OF RETRIEVING AN ENTITY WITH THE USER *)
(* SUPPLIED ENTITY KEY. *)
(* (*) Language *)
(* PASCAL. *)
(* (*) Package *)
(* VERIFY PACKAGE. *)
(* (*) Arguments *)
(* Input *)
(* KEYE - KEY OF ENTITY TO BE RETRIEVED FROM NETWORK. *)
(* Output *)
(* RR - THE FUNCTION RETURN RECORD. *)
(* ----------------------------------------------- *)
(* *)
(* END %INCLUDE VERGT. *)
(* INCLUDE VERUD *)
(* (VERFORM) VERIFY ROUTINE FORMALS. *)
(**)
PROCEDURE VERUD(CONST KEYE:ENTKEY;VAR ENTDEF:ENTBLOCK;
VAR RR:RET_REC);EXTERNAL;
(**)
(*-----------------------------------------------------------------*)
(*
(* AUTHOR: UNKNOWN CADD CREATED: YY/MM/DD CC *)
(* VERSION: MAS VER 2 REVISED: 84/10/11 CC *)
(*
(* FUNCTION:
(* VERIFY LEGALITY OF UPDATING AN ENTITY WITH THE USER
(* SUPPLIED ENTITY KEY USING THE USER SUPPLIED ENTITY DATA
(* BLOCK AND LIST OF CONSTITUENTS. 
(*
(* ENVIRONMENT:
(* IBM PASCAL LANGUAGE
(* IBM 30XX, 43XX, DEC VAX 11/780
(*
(* DESCRIPTION OF ARGUMENTS:
(* NAME I/O DESCRIPTION
(* KEYE I KEY OF EXISTING ENTITY.
(* ENTDEF I USER SUPPLIED DATA FOR NEW ENTITY BLOCK.
(* KEYL I KEY OF LIST OF CONSTITUENTS TO BE CONNECTED
(* TO THIS ENTITY.
(* RR 0 ERROR CONDITION RETURN CODE.
(* = 0 NORMAL RETURN CODE.
(*
(* COMMONS:
(*
(* PROCESSING DESCRIPTION:
(*
(* COMMENTS:
(*
(* CHANGE CONTROL:
(* 84/10/11 MAS VER 2 D. J. KERCHNER
(* UPDATED DOCUMENTATION.
(* 84/10/04 MAS VER 2 E. D. SHREVE
(* CHANGED ENTDEF FROM CONST TO VAR.
(*
(*-----------------------------------------------------------------*)
(**)
(* END INCLUDE VERUD *)

3-911
(* %INCLUDE XIEMM. *)

PROEDURE XIEMM(VAR KEYE:ENTKEY;VAR RR:RET_REC);EXTERNAL;

(*---------------------------------------------------------------*)
(*
(* FUNCTION:
(* TO DELETE AN ENTITY.
(*
(* DESCRIPTION OF ARGUMENTS:
(* NAME I/O DESCRIPTION
(*
(* KEYE I/O KEY OF ENTITY TO BE DELETED, WILL BE
(* SET TO NIL.
(*
(* RR  O TH: FUNCTION RETURN CODE.
(*
(* COMONS:
(*
(* ENVIRONMENT:
(* LANGUAGE: IBM PASCAL
(* HARDWARE SYSTEM: IBM 360/370/4341/4381
(*
(* EXECUTION PROCEDURE:
(* INTERNAL PROCEDURE FOR THE MODEL ACCESS SOFTWARE
(*
(* PROCESSING DESCRIPTION:
(*
(* COMMENTS:
(*
(* CHANGE CONTROL:
(*
(* REVISED: 09/13/85 L. J. BEHAN FRMI *)
(* CHANGED TO ENSURE THE DECREMENTING OF THE READ POSITION OF A
(* USER ENTITY CONSTITUENT LIST
(*
(* REVISED: 02/18/85 B. A. ULMER FRMI *)
(* CHANGED THE STRUCTURE OF THE INTERNAL ITEM FOR THE
(* IMPLEMENTATION OF THE CRB
(*
(* REVISED: 10/05/84 E. D. SHREVE FRMI *)
(* CHANGED THE KEYE PARMS FOR XULST AND XCLST TO VAR
(*
*)

3-912
### 3.10.3 Name/Value Interface

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</tr>
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3.10.3.2 Listings

(* BEGIN %INCLUDE ADBLOCA *********************************************)
(*
FUNCTION ADBLOCA ( CONST ENTITY_POINTER : ENTPNTR;
CONST OFFSET : INTEGER)
: T_VARIANT_POINTER;
EXTERNAL;
(*
(* $FUNCTION:
(* DETERMINE THE LOCATION OF THE REQUESTED ENTITY ATTRIBUTE. *)
(*
(* $DESCRIPTION OF ARGUMENTS:
(*
<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
<tr>
<td>OFFSET</td>
<td>I</td>
<td>OFFSET TO ATTRIBUTE VALUE</td>
</tr>
<tr>
<td>ADBLOCA</td>
<td>O</td>
<td>POINTER TO ATTRIBUTE VALUE</td>
</tr>
</tbody>
</table>
(*
(* $COMMONS:
(*
(* $ENVIRONMENT:
(*
| LANGUAGE: IBM PASCAL (SEGMENT SUBPROGRAM) |
| HARDWARE SYSTEM: IBM 360/370/4341/4381 |
(*
(* $EXECUTION PROCEDURE:
(*
| NAME/VALUE INTERFACE |
| CALLED FROM EITHER PASCAL OR FORTRAN APPLICATION PROGRAM |
(*
(* $PROCESSING DESCRIPTION:
(*
| POINT TO ATTRIBUTE LOCATION |
(*
(* $COMMENTS:
(*
(* $CHANGE CONTROL:
(*
| REVISED: (DATE, NAME, GROUP, REASON/DESCRIPTION) |
| ORIGINATED: 06 NOVEMBER 1986, M. H. CHOI, DBMA |
(*
(* END %INCLUDE ADBLOCA *********************************************)

3-914
(* BEGIN %INCLUDE ENUMLOCA **********************************************)
(*
FUNCTION ENUMLOCA ( CONST ENTITY_POINTER : ENTPNTR;
     CONST INDEX : INTEGER;
     CONST SCHEMA : T_SCHEMA_POINTER )
     : T_VARIANT_POINTER;
EXTERNAL;
(*
(* $FUNCTION:
(* DETERMINE THE LOCATION OF THE ENUMERATION TYPE.
(*
(* $DESCRIPTION OF ARGUMENTS:
(*
<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
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</tbody>
</table>
(*
(* $COMMONS:
(*
(* $ENVIRONMENT:
(* LANGUAGE: IBM PASCAL (SEGMENT SUBPROGRAM)
(* HARDWARE SYSTEM: IBM 360/370/4341/4381
(*
(* $EXECUTION PROCEDURE:
(* NAME/VALUE INTERFACE
(* CALLED FROM EITHER PASCAL OR FORTRAN APPLICATION PROGRAM
(*
(* $PROCESSING DESCRIPTION:
(* REQUEST POINTER TO SELECTOR IN ADB OF ENTITY INSTANCE
(* POINT TO ENUMERATION INDEX TABLE IN RUN-TIME SUBSCHEMA
(* POINT TO ENUMERATION VALUES TABLE IN RUN-TIME SUBSCHEMA
(* POINT TO ATTRIBUTE VALUE
(*
(* $COMMENTS:
(*
(* $CHANGE CONTROL:
(* REVISED: (DATE, NAME, GROUP, REASON/DESCRIPTION)
(* ORIGINATED: 06 NOVEMBER 1986, M. H. CHOI, DBMA
(*
(* END %INCLUDE ENUMLOCA **********************************************)
(* BEGIN %INCLUDE GETDD *************************************************************)
(*)
PROCEDURE GETDD ( CONST KIND : INTEGER; CONST MAX_AVAIL : INTEGER; CONST ATTRIBUTE_ORDER : CHAR; VAR USER_ARRAY : T_USER_ARRAY; VAR MAX_ACTUAL : INTEGER; VAR RETURN_CODE : INTEGER );

EXTERNAL;

(* $FUNCTION: *)
READ THE DATA DICTIONARY INTO THE APPLICATION PROGRAM.

(* $DESCRIPTION OF ARGUMENTS: *)
(* NAME I/O DESCRIPTION *)
(* ===== === ========= *)
(* ATTRIBUTE_ORDER I SPECIFICATION OF THE ORDER FOR Attributes in the entity definition *)
(* KIND I A kind number of entity *)
(* MAX_ACTUAL 0 An actual number of records in entity definition *)
(* MAX_AVAIL I A number of 80 character records available in caller to hole entity definition *)
(* USER_ARRAY 0 An entity definition *)
(* RETURN_CODE 0 Return code *)

(* -1 = Actual size greater than space available *)
(* 0 = Success *)
(* 1 = Kind not in data dictionary *)

(* $COMMONS: *)

(* $ENVIRONMENT: *)
LANGUAGE: IBM PASCAL (SEGMENT SUBPROGRAM)
HARDWARE SYSTEM: IBM 360/370/4341/4381

(* $EXECUTION PROCEDURE: *)
CALLED FROM EITHER PASCAL OR FORTRAN APPLICATION PROGRAM

(* $PROCESSING DESCRIPTION: *)
LOOP THROUGH DATA DICTIONARY INDEX FILE
IF KIND IN DATA DICTIONARY THEN
GET ENTITY DEFINITION FROM DDFILE
FILL UP THE ARRAY OF ENTITY DEFINITIONS UP TO NUMBER

3-916
(* OF RECORDS AVAILABLE IN CALLER *)
(* END IF *)
(* END LOOP *)
(* $COMMENTS: *)
(* $CHANGE CONTROL: *)
(* ORIGINATED: 23 MARCH 1987, M. H. CHOI, DBMA *)
(* END %INCLUDE GETDD ***:------------------------------------------*)
PROCEDURE GETDDBN (CONST ENTITY_NAME : T_ENTITY_NAME;
CONST MAX_AVAIL : INTEGER;
CONST ATTRIBUTE_ORDER : CHAR;
VAR USER_ARRAY : T_USER_ARRAY;
VAR MAX_ACTUAL : INTEGER;
VAR RETURN_CODE : INTEGER);

EXTERNAL;

(* $FUNCTION: *)
(* READ THE DATA DICTIONARY INTO THE APPLICATION PROGRAM, *)
(* GIVEN THE ENTITY NAME. *)

(* $DESCRIPTION OF ARGUMENTS: *)
(* NAME I/O DESCRIPTION *)
(* ===== = = = = = = = = = = )
(* ATTRIBUTE_ORDER I SPECIFICATION OF THE ORDER FOR *)
(* ATTRIBUTES IN THE ENTITY *)
(* ENTITY_NAME I AN ENTITY NAME *)
(* MAX_ACTUAL 0 AN ACTUAL NUMBER OF RECORDS IN *)
(* ENTITY DEFINITION *)
(* MAX_AVAIL I A NUMBER OF 80 CHARACTER RECORDS *)
(* AVAILABLE IN CALLER TO HOLE *)
(* ENTITY DEFINITION *)
(* USER_ARRAY 0 AN ENTITY DEFINITION *)
(* RETURN_CODE 0 RETURN CODE *)
(* -1 = ACTUAL SIZE GREATER THAN *)
(* SPACE AVAILABLE *)
(* 0 = SUCCESS *)
(* 1 = KIND NOT IN DATA DICTIONARY *)

(* $COMMONS: *)
(* $ENVIRONMENT: *)
(* LANGUAGE: IBM PASCAL (SEGMENT SUBPROGRAM) *)
(* HARDWARE SYSTEM: IBM 360/370/4341/4381 *)

(* $EXECUTION PROCEDURE: *)
(* CALLED FROM EITHER PASCAL OR FORTRAN APPLICATION PROGRAM *)

(* $PROCESSING DESCRIPTION: *)
(* LOOP THROUGH DATA DICTIONARY INDEX FILE *)
(* IF ENTITY NAME IN DATA DICTIONARY THEN *)
(* GET ENTITY DEFINITION FROM DDFILE *)

3-918
(* FILL UP THE ARRAY OF ENTITY DEFINITIONS UP TO NUMBER *)
(* OF RECORDS AVAILABLE IN CALLER *)
(* END IF *)
(* END LOOP *)
(* $COMMENTS: *)
(* $CHANGE CONTROL: *)
(* ORIGINATED: 24 NOVEMBER 1987, M. H. Choi, DBMA *)
(* END $INCLUDE GETDDBN *****************************************************)
PROCEDURE NVCPATAV ( VAR OUTPUT_VALUE : TWORD; 
    CONST INPUT_VALUE  : TWORD; 
    CONST SIZE_OF_VALUE : INTEGER);

EXTERNAL;

$FUNCTION:
COPY A VALUE OF ARBITRARY SIZE.

$DESCRIPTION OF ARGUMENTS:

<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>INPUT_VALUE</td>
<td>I</td>
<td>INPUT VALUE OF ARBITRARY SIZE</td>
</tr>
<tr>
<td>OUTPUT_VALUE</td>
<td>O</td>
<td>OUTPUT VALUE OF ARBITRARY SIZE</td>
</tr>
<tr>
<td>SIZE_OF_VALUE</td>
<td>I</td>
<td>SIZE OF VALUE TO BE COPIED</td>
</tr>
</tbody>
</table>

$COMMONS:

$ENVIRONMENT:
LANGUAGE: IBM PASCAL (SEGMENT SUBPROGRAM)
HARDWARE SYSTEM: IBM 360/370/4341/4381

$EXECUTION PROCEDURE:
NAME/VALUE INTERFACE

$PROCESSING DESCRIPTION:
CALL MACHINE DEPENDENT ROUTINE TO COPY ATTRIBUTE VALUE

$COMMENTS:

$CHANGE CONTROL:
ORIGINATED: 14 DECEMBER 1987, M. H. CHOI, DBMA

(* END %INCLUDE NVCPATAV *****************************)
(* BEGIN %INCLUDE NVCPAV **********************************************)

PROCEDURE NVCPAV (VAR OUTPUT_VALUE: T_VALUE;
                   CONST INPUT_VALUE: T_VALUE;
                   CONST SIZE_OF_VALUE: INTEGER);

   EXTERNAL;

(* $FUNCTION: *)
COPY A VALUE OF ARBITRARY SIZE.

(* $DESCRIPTION OF ARGUMENTS: *)

(* NAME I/O DESCRIPTION *)
(* ===== == =========== *)
(* INPUT_VALUE I INPUT VALUE OF ARBITRARY SIZE *)
(* OUTPUT_VALUE O OUTPUT VALUE OF ARBITRARY SIZE *)
(* SIZE_OF_VALUE I SIZE OF VALUE TO BE COPIED *)

(* $COMMONS: *)

(* $ENVIRONMENT: *)

(* LANGUAGE: IBM PASCAL (SEGMENT SUBPROGRAM) *)
(* HARDWARE SYSTEM: IBM 360/370/4341/4381 *)

(* $EXECUTION PROCEDURE: *)

(* NAME/VALUE INTERFACE *)

(* $PROCESSING DESCRIPTION: *)

(* CALL MACHINE DEPENDENT ROUTINE TO COPY ATTRIBUTE VALUE *)

(* $COMMENTS: *)

(* $CHANGE CONTROL: *)

(* REVISED: 16 MAY 1986, GEORGE A. WHITE, FRMI, REORGANIZED *)
(* GLOBAL DECLARATIONS INTO 'NVITYP'. *)
(* ORIGINATED: 15 OCTOBER 1985, G. A. WHITE, FRMI *)

(* END %INCLUDE NVCPAV **********************************************)
(* BEGIN %INCLUDE NVCRTM *******************************************************)
PROCEDURE NVCRTM ( CONST NAME_STRING : T_ATTRIBUTE_NAME;
                 VAR NAME_ROOT     : T_NAME_POINTER;
                 VAR TRAVERSAL_DEPTH : INTEGER );

SUBPROGRAM;

(* $FUNCTION:
  ENTER ATTRIBUTE NAMES INTO TRAVERSAL MAP. *)

(* $DESCRIPTION OF ARGUMENTS:
  NAME I/O DESCRIPTION
  ==== === ===========
  NAME_STRING I SCHEMA NAME FOR THE ATTRIBUTE WHICH
               IS TERMINATED BY A NULL (HEX '00').
  NAME_ROOT   O POINTER TO TRAVERSAL MAP WHICH
               CONTAINS ATTRIBUTE NAMES AND THE
               CORRESPONDING SCHEMA DEFINITIONS.
  NO_OF_DIMENSION O NUMBER OF ARRAY DIMENSION
  TRAVERSAL_DEPTH O NUMBER OF NAMES

(* $COMMONS:

(* $ENVIRONMENT:
  LANGUAGE: IBM PASCAL (SEGMENT SUBPROGRAM)
  HARDWARE SYSTEM: IBM 360/370/4341/4381

(* $EXECUTION PROCEDURE:
  NAME/VALUE INTERFACE

(* $PROCESSING DESCRIPTION:
  LOOP THROUGH ATTRIBUTE NAME STRING
  OBTAIN ATTRIBUTE NAME FROM ATTRIBUTE NAME STRING
  STORE ATTRIBUTE NAME IN THE TRAVERSAL MAP
  INCREMENT TRAVERSAL_DEPTH
  ENDOLOOP

(* $COMMENTS:

(* $CHANGE CONTROL:
  REVISED: (DATE, NAME, GROUP, REASON/DESCRIPTION)
  ORIGINATED: 05 MAY 1986, M. H. CHOI, FRMI

(* END %INCLUDE NVCRTM *******************************************************)
PROCEDURE NVDLTM ( VAR NAME_ROOT : T_NAME_POINTER;
VAR TRAVERSAL_SIZE : INTEGER );

SUBPROGRAM;

$FUNCTION:
DELETE TRAVERSAL MAP.

$DESCRIPTION OF ARGUMENTS:

NAME_ROOT I/O DESCRIPTION
Name_ROOT I POINTER TO TRAVERSAL MAP WHICH
CONTAINS ATTRIBUTE NAMES AND THEIR
CORRESPONDING SCHEMA DEFINITIONS.

TRAVERSAL_SIZE 0 NUMBER OF NAMES

$COMMONS:

$ENVIRONMENT:

LANGUAGE: IBM PASCAL (SEGMENT SUBPROGRAM)
HARDWARE SYSTEM: IBM 360/370/4341/4381

$EXECUTION PROCEDURE:
NAME/VALUE INTERFACE

$PROCESSING DESCRIPTION:

LOOP THROUGH ATTRIBUTE NAMES
LOOP THROUGH SCHEMA DEFINITIONS FOR ATTRIBUTE NAME
DELETE ATTRIBUTE DEFINITION
INCREMENT TRAVERSAL MAP SIZE
ENDLOOP
DELETE ATTRIBUTE NAME
ENDLOOP

$COMMENTS:

$CHANGE CONTROL:

REVISED: (DATE, NAME, GROUP, REASON/DESCRIPTION)
ORIGINATED: 05 MAY 1986, M. H. CHOI, FRMI

END %INCLUDE NVDLTM
(* BEGIN %INCLUDE NVDQAN ***********************************************
PROCEDURE NVDQAN(CONST ENTITY_KEY : ENTKEY;
     CONST NAME_STRING : T_ATTRIBUTE_NAME;
     CONST DIMEN_VALUE : T_DIMEN_VALUE;
     VAR ATTRIBUTE_VALUE : T_ATTRIBUTE_VALUE;
     VAR NVI_RETURN_CODE : EXT_RET_CODE);

SUBPROGRAM;

(* $FUNCTION:
RETRIEVE THE VALUE OF THE REQUESTED ENTITY ATTRIBUTE.

(* $DESCRIPTION OF ARGUMENTS:
(* NAME I/O DESCRIPTION
(* ===== === ===========
(* ATTRIBUTE_VALUE 0 VALUE OF THE ATTRIBUTE
(* DIMEN_VALUE 1 VALUE OF ARRAY SUBSCRIPT
(* ENTITY_KEY 1 POINTER TO THE ENTITY INSTANCE
(* NAME_STRING 1 SCHEMA NAME FOR THE ATTRIBUTE (OR
(* CONCATENATED SCHEMA NAME FOR THE
(* ATTRIBUTE OF A CONSTITUENT) WHICH IS
(* TERMINATED BY A NULL (HEX'00')
(* NVI_RETURN_CODE 0 EXTERNAL RETURN CODE
(* = 0 SUCCESS
(* > 0 CRITICAL ERROR:
(* 1 KIND NOT IN RUN-TIME SUBSCHEMA
(* 2 ATTRIBUTE NOT IN ENTITY

(* $COMMONS:

(* $ENVIRONMENT:
(* LANGUAGE: IBM PASCAL (SEGMENT SUBPROGRAM)
(* HARDWARE SYSTEM: IBM 360/370/4341/4381
(*
(* $EXECUTION PROCEDURE:
(* NAME/VALUE INTERFACE
(* CALLED FROM EITHER PASCAL OR FORTRAN APPLICATION PROGRAM
(*
(* $PROCESSING DESCRIPTION:
(* REQUEST ATTRIBUTE LOCATION
(* IF ATTRIBUTE LOCATION OBTAINED THEN
(* COPY ATTRIBUTE VALUE
(* RETURN SUCCESS
(* ELSE
(* RETURN FAILURE
(* ENDF

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$COMMENTS:

$CHANGE CONTROL:

REVISED: 26 FEBRUARY 1987, M. H. CHOI, DBMA
HANDLE ARRAY ATTRIBUTES

REVISED: 16 MAY 1986, GEORGE A. WHITE, FRMI, REORGANIZED
GLOBAL DECLARATIONS INTO 'NVITYP'.

REVISED: 21 MARCH 1986, G. A. WHITE, FRMI,
DETECT NIL ENTITY KEY AS ERROR

ORIGINATED: 15 OCTOBER 1985, G. A. WHITE, FRMI

END %INCLUDE NVDQAN ********************************************************************
FUNCTION NVDQARLO (  
  CONST ENTITY_INSTANCE : T_INT_ITEM;  
  CONST INDEX : INTEGER;  
  CONST SCHEMA : T_SCHEMA_POINTER;  
  CONST DIMEN_VALUE : T_DIMEN_VALUE;  
  CONST NO_OF_DIMENSION : INTEGER;  
  VAR ARRAY_SIZE : INTEGER;  
  VAR ATTRIBUTE_VALUE : T_ATTRIBUTE_VALUE;  
  VAR ARRAY_TYPE : INTEGER;  
  VAR DIMEN_COUNT : INTEGER;  
  VAR NVI_RETURN_CODE : EXT_RET_CODE )  
  : T_VARIANT_POINTER;

EXTERNAL;

(* $FUNCTION: *)
(* DETERMINE THE LOCATION OF THE REQUESTED ENTITY ATTRIBUTE *)
(* OF ARRAY TYPE.*)

(* $DESCRIPTION OF ARGUMENTS: *)
(* NAME I/O DESCRIPTION *)
(* ==== === ========= *)
(* NVDQARLO 0 POINTER TO ATTRIBUTE VALUE *)
(* ARRAY_SIZE 0 SIZE OF THE ATTRIBUTE VALUE *)
(* DIMEN_VALUE I VALUE OF ARRAY SUBSCRIPT *)
(* ENTITY_INSTANCE I POINTER TO ADB OF ENTITY INSTANCE *)
(* INDEX I INDEX OF THE CURRENT SEGMENT *)
(* NO_OF_DIMENSION I NUMBER OF ARRAY DIMENSIONS *)
(* SCHEMA I RUN-TIME SUBSCHEMA ENTITY *)

(* $COMMONS: *)
(* $ENVIRONMENT: *)
(* LANGUAGE: IBM PASCAL (SEGMENT SUBPROGRAM) *)
(* HARDWARE SYSTEM: IBM 360/370/4341/4381 *)

(* $EXECUTION PROCEDURE: *)
(* NAME/VALUE INTERFACE *)
(* CALLED FROM EITHER PASCAL OR FORTRAN APPLICATION PROGRAM *)

(* $PROCESSING DESCRIPTION: *)
(* REQUEST POINTER TO SELECTOR IN ADB OF ENTITY INSTANCE *)
(* POINT TO ARRAY INDEX TABLE IN RUN-TIME SUBSCHEMA *)
(* POINT TO ARRAY LIST TABLE IN RUN-TIME SUBSCHEMA *)
(* POINT TO ATTRIBUTE LOCATION *)
PROCEDURE NVDQARPT ( CONST ENTITY : ENTKEY;
    VAR VALUE_INDEX : INTEGER;
    VAR ATTRIBUTE_VALUE : T_ATTRIBUTE_VALUE );

EXTERNAL;

$FUNCTION:
DETERMINE THE LOCATION OF THE ARRAY OF POINTER.

$DESCRIPTION OF ARGUMENTS:

<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNST_LIST</td>
<td>0</td>
<td>ENTITIES IN THE CONSTITUENT LIST</td>
</tr>
<tr>
<td>ENTITY</td>
<td>1</td>
<td>POINTER TO ADB OF ENTITY INSTANCE</td>
</tr>
<tr>
<td>NO_OF_CL</td>
<td>0</td>
<td>NUMBER OF INSTANCES IN THE CONSTITUENT LIST</td>
</tr>
</tbody>
</table>

$COMMONS:

$ENVIRONMENT:

| LANGUAGE: IBM PASCAL (SEGMENT SUBPROGRAM) |
| HARDWARE SYSTEM: IBM 360/370/4341/4381    |

$EXECUTION PROCEDURE:

NAME/VALUE INTERFACE
CALLED FROM EITHER PASCAL OR FORTRAN APPLICATION PROGRAM

$PROCESSING DESCRIPTION:

LOOP THROUGH NUMBER OF INSTANCES IN THE CONSTITUENT LIST
WHILE CONSTITUENT KIND <> 1100 THEN
POINT TO CONSTITUENT KEY
END LOOP

$COMMENTS:

$CHANGE CONTROL:

REVISED: (DATE, NAME, GROUP, REASON/DESCRIPTION)
ORIGINATED: 18 FEBRUARY 1987, M. H. CHOI, DBMA

(* END %INCLUDE NVDQARPT ***********************************************)
/* BEGIN %INCLUDE NVDQGTAV ***********************************************/
/* */
PROCEDURE NVDQGTAV ( CONST ENTITY_INSTANCE : T_INT_ITEM;
        CONST NAME_STRING : T_ATTRIBUTE_NAME;
        CONST DIMEN_VALUE : T_DIMEN_VALUE;
        VAR POSITION : INTEGER;
        VAR POINTER : T_VARIANT_POINTER;
        VAR ATTRIBUTE_SIZE : INTEGER;
        VAR ATTRIBUTE_VALUE : T_ATTRIBUTE_VALUE;
        VAR DIMEN_COUNT : INTEGER;
        VAR NVI_RETURN_CODE : EXT_RET_CODE);

EXTERNAL;
/* */
/* $FUNCTION: */
/* DETERMINE THE LOCATION OF THE REQUESTED ENTITY ATTRIBUTE. */
/* */
/* $DESCRIPTION OF ARGUMENTS: */
/* */
/* NAME I/O DESCRIPTION */
/* ==== === =========== */
/* ATTRIBUTE_SIZE 0 SIZE OF THE ATTRIBUTE (BYTES) */
/* DIMEN_VALUE 1 VALUE OF ARRAY SUBSCRIPT */
/* ENTITY_INSTANCE 1 ENTITY INSTANCE NODE */
/* NAME_STRING 1 SCHEMA NAME FOR THE ATTRIBUTE (OR */
/* CONCATENATED SCHEMA NAME FOR THE */
/* ATTRIBUTE OF A CONSTITUENT) WHICH IS */
/* TERMINATED BY A NULL (HEX'00') */
/* NVI_RETURN_CODE 0 EXTERNAL RETURN CODE */
/* = 0 SUCCESS */
/* > 0 CRITICAL ERROR: */
/* 1 KIND NOT IN RUN-TIME SUBSCHEMA */
/* 2 ATTRIBUTE NOT IN ENTITY */
/* POINTER 0 POINTER TO ATTRIBUTE VALUE */
/* POSITION I/O LOCATION OF ATTRIBUTE NAME IN NAME */
/* STRING (FOR REFERING TO ATTRIBUTE */
/* NAME OF A CONSTITUENT ENTITY) */
/* */
/* $COMMONS: */
/* */
/* $ENVIRONMENT: */
/* LANGUAGE: IBM PASCAL (SEGMENT EXTERNAL) */
/* HARDWARE SYSTEM: IBM 360/370/4341/4381 */
/* */
/* $EXECUTION PROCEDURE: */
/* NAME/VALUE INTERFACE */
/* CALLED FROM SUBPROGRAM NVDQAN ORIGINALLY, WILL CALL ITSELF */
/* RECURSIVELY FOR POINTER ATTRIBUTES */
/* */
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(* $PROCESSING DESCRIPTION:
(*) REQUEST RUN-TIME SUBSCHEMA DEFINITION OF ENTITY
(*) IF RUN-TIME SUBSCHEMA ENTITY DEFINITION OBTAINED THEN
(*) OBTAIN ATTRIBUTE NAME FROM ATTRIBUTE NAME STRING
(*) IF ATTRIBUTE NAME OBTAINED THEN
(*) SEARCH SCHEMA ENTITY DEFINITION FOR ATTRIBUTE NAME
(*) IF ATTRIBUTE NAME FOUND THEN
(*) POINT TO ATTRIBUTE LOCATION
(*) OBTAIN ATTRIBUTE SIZE
(*) RETURN SUCCESS
(*) ELSE
(*) RETURN FAILURE
(*) ENDIF
(*) ELSE
(*) POINT TO APPLICATION DATA BLOCK
(*) OBTAIN APPLICATION DATA BLOCK SIZE
(*) RETURN SUCCESS
(*) ENDIF
(*) ELSE
(*) RETURN FAILURE
(*) ENDIF
(*) $COMMENTS:
(*) $CHANGE CONTROL:
(*) REVISED: 26 FEBRUARY 1987, M. H. CHOI, DBMA
(*) HANDLE ARRAY ATTRIBUTES
(*) REVISED: 16 MAY 1986, GEORGE A. WHITE, FRMI, REORGANIZED
(*) GLOBAL DECLARATIONS INTO 'FVITYP'.
(*) ORIGINATED: OCTOBER 1985, G. A. WHITE, FRMI
(*)
(*) END %INCLUDE NVDQGTAV **********************************************)
FUNCTION NVDSARLO ( CONST ENTITY_INSTANCE : T_INT_ITEM;
    CONST INDEX : INTEGER;
    CONST SCHEMA : T_SCHEMA_POINTER;
    CONST DIMEN_VALUE : T_DIMEN_VALUE;
    CONST NO_OF_DIMENSION : INTEGER;
    VAR ARRAY_SIZE : INTEGER;
    VAR ATTRIBUTE_VALUE : T_ATTRIBUTE_VALUE;
    VAR ARRAY_TYPE : INTEGER;
    VAR DIMEN_COUNT : INTEGER;
    VAR NVI_RETURN_CODE : EXT_RET_CODE )
    : T_VARIANT_POINTER;
EXTERNAL;

(* $FUNCTION: *)
(* DETERMINE THE LOCATION OF THE REQUESTED ENTITY ATTRIBUTE *)
(* OF ARRAY TYPE. *)

(* $DESCRIPTION OF ARGUMENTS: *)
(* NAME I/O DESCRIPTION *)
(* NVDSARLO 0 POINTER TO ATTRIBUTE VALUE *)
(* ARRAY_SIZE 0 SIZE OF THE ATTRIBUTE VALUE *)
(* DIMEN_VALUE I VALUE OF ARRAY SUBSCRIPT *)
(* ENTITY_INSTANCE I POINTER TO ADB OF ENTITY INSTANCE *)
(* INDEX I INDEX OF THE CURRENT SEGMENT *)
(* NO_OF_DIMENSION I NUMBER OF ARRAY DIMENSIONS *)
(* SCHEMA I RUN-TIME SUBSCHEMA ENTITY *)

(* $COMMONS: *)
(* $ENVIRONMENT: *)
(* LANGUAGE: IBM PASCAL (SEGMENT SUBPROGRAM) *)
(* HARDWARE SYSTEM: IBM 360/370/4341/4381 *)

(* $EXECUTION PROCEDURE: *)
(* NAME/VALUE INTERFACE *)
(* CALLED FROM EITHER PASCAL OR FORTRAN APPLICATION PROGRAM *)
(* $PROCESSING DESCRIPTION: *)
(* REQUEST POINTER TO SELECTOR IN ADB OF ENTITY INSTANCE *)
(* POINT TO ARRAY INDEX TABLE IN RUN-TIME SUBSCHEMA *)
(* POINT TO ARRAY LIST TABLE IN RUN-TIME SUBSCHEMA *)
(* POINT TO ATTRIBUTE LOCATION *)
(* $COMMENTS: *)
(* $CHANGE CONTROL: *)
(* REVISED: (DATE, NAME, GROUP, REASON/DESCRIPTION) *)
(* ORIGINATED: 14 DECEMBER 1987, M. H. CHOI, DBMA *)
(* *)
(* END %INCLUDE NVDSARLO *************************************)
(* BEGIN %INCLUDE NVDSARPT *********************************************)
PROCEDURE NVDSARPT ( CONST ENTITY_0 : ENTKEY;
VAR VALUE_INDEX : INTEGER;
VAR ATTRIBUTE_VALUE : T_ATTRIBUTE_VALUE );

EXTERNAL;

(* $FUNCTION: *)
(* DETERMINE THE LOCATION OF THE ARRAY OF POINTER. *)

(* $DESCRIPTION OF ARGUMENTS: *)
(* NAME I/O DESCRIPTION *)
(* ===== === ============= *)
(* CNST_LIST 0 ENTITIES IN THE CONSTITUENT LIST *)
(* ENTITY 1 POINTER TO ADB OF ENTITY INSTANCE *)
(* NO_OF_CL 0 NUMBER OF INSTANCES IN THE CONSTITUENT LIST *)

(* $COMMONS: *)

(* $ENVIRONMENT: *)
(* LANGUAGE: IBM PASCAL (SEGMENT SUBPROGRAM) *)
(* HARDWARE SYSTEM: IBM 360/370/4341/4381 *)

(* $EXECUTION PROCEDURE: *)
(* NAME/VALUE INTERFACE *)
(* CALLED FROM EITHER PASCAL OR FORTRAN APPLICATION PROGRAM *)

(* $PROCESSING DESCRIPTION: *)
(* LOOP THROUGH NUMBER OF INSTANCES IN THE CONSTITUENT LIST *)
(* WHILE CONSTITUENT KIND <> 1100 THEN *)
(* POINT TO CONSTITUENT KEY *)
(* END LOOP *)

(* $COMMENTS: *)

(* $CHANGE CONTROL: *)
(* REVISED: (DATE, NAME, GROUP, REASON/DESCRIPTION) *)
(* ORIGINATED: 14 DECEMBER 1987, M. H. CHOI, DBMA *)

(* END %INCLUDE NVDSARPT *********************************************)}
(* BEGIN %INCLUDE NVDSAV **********************************************)

PROCEDURE NVDSAV(CONST ENTITY_KEY : ENTKEY;
                  CONST NAME_STRING : T_ATTRIB_NAME;
                  CONST DIMEN_VALUE : T_DIMEN_VALUE;
                  VAR ATTRIBUTE_VALUE : T_ATTRIBUTE_VALUE;
                  VAR NVI_RETURN_CODE : EXT_RET_CODE);

(* $FUNCTION:
   REPLACE THE VALUE OF THE REQUESTED ENTITY ATTRIBUTE. *)

(* $DESCRIPTION OF ARGUMENTS:

   NAME    I/O  DESCRIPTION
   ======  ===  ===========
   ATTRIBUTE_VALUE    I    VALUE OF THE ATTRIBUTE
   DIMEN_VALUE        I    VALUE OF ARRAY SUBSCRIPT
   ENTITY_KEY         I    POINTER TO THE ENTITY INSTANCE
   NAME_STRING        I    SCHEMA NAME FOR THE ATTRIBUTE (OR
                          CONCATENATED SCHEMA NAME FOR THE
                          ATTRIBUTE OF A CONSTITUENT) WHICH IS
                          TERMINATED BY A NULL (HEX'00')
   NVI_RETURN_CODE    0    EXTERNAL RETURN CODE

   = 0 SUCCESS
   > 0 CRITICAL ERROR:
   0 CRITICAL ERROR:
     1 KIND NOT IN RUN-TIME SUBSCHEMA
     2 ATTRIBUTE NOT IN ENTITY
     3 NIL ENTITY KEY

(* $COMMONS:

(* $ENVIRONMENT:
   LANGUAGE: IBM PASCAL (SEGMENT SUBPROGRAM)
   HARDWARE SYSTEM: IBM 360/370/4341/4381

(* $EXECUTION PROCEDURE:
   NAME/VALUE INTERFACE
   CALLED FROM EITHER PASCAL OR FORTRAN APPLICATION PROGRAM

(* $PROCESSING DESCRIPTION:
   REQUEST ATTRIBUTE LOCATION
   IF ATTRIBUTE LOCATION OBTAINED THEN
     REPLACE ATTRIBUTE VALUE
     RETURN SUCCESS
   ELSE
     RETURN FAILURE

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ENDIF

(* $COMMENTS: *)

(* $CHANGE CONTROL: *)

(* REVISED : 26 FEBRUARY 1987, M. H. CHOI, DBMA *)

(* HANDLE ARRAY ATTRIBUTES *)

(* ORIGINATED: 09 SEPTEMBER 1986, M. H. CHOI, DBMA *)

(* END %INCLUDE NVDSAV *****************************************)
FUNCTION NVDSENLO (CONST ENTITY_POINTER : ENTPNTR;
               CONST INDEX : INTEGER;
               CONST SCHEMA : T_SCHEMA_POINTER;
               CONST VALUE_NAME : T_SCHEMA_NAME;
               VAR SCALAR : T_SCHEMA_NAME;
               VAR RETURN_CODE : EXT_RET_CODE)
               : T_VARIANT_POINTER;

EXTERNAL;

$FUNCTION:
DETERMINE THE LOCATION OF THE ENUMERATION TYPE.

$DESCRIPTION OF ARGUMENTS:

<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENTITY_POINTER</td>
<td>I</td>
<td>POINTER TO ADB OF ENTITY INSTANCE</td>
</tr>
<tr>
<td>NVDSENLO</td>
<td>I</td>
<td>POINTER TO ATTRIBUTE VALUE</td>
</tr>
<tr>
<td>INDEX</td>
<td>I</td>
<td>INDEX OF THE CURRENT SEGMENT</td>
</tr>
<tr>
<td>SCHEMA</td>
<td>I</td>
<td>RUN-TIME SUBSCHEMA ENTITY</td>
</tr>
</tbody>
</table>

$COMMONS:

$ENVIRONMENT:
LANGUAGE: IBM PASCAL (SEGMENT SUBPROGRAM)
HARDWARE SYSTEM: IBM 360/370/4341/4381

$EXECUTION PROCEDURE:
NAME/VALUE INTERFACE
CALLED FROM EITHER PASCAL OR FORTRAN APPLICATION PROGRAM

$PROCESSING DESCRIPTION:
REQUEST POINTER TO SELECTOR IN ADB OF ENTITY INSTANCE
POINT TO ENUMERATION INDEX TABLE IN RUN-TIME SUBSCHEMA
POINT TO ENUMERATION VALUES TABLE IN RUN-TIME SUBSCHEMA
POINT TO ATTRIBUTE VALUE

$COMMENTS:

$CHANGE CONTROL:
REVISED: (DATE, NAME, GROUP, REASON/DESCRIPTION)
ORIGINATED: 12 DECEMBER 1987, M. H. CHOI, DBMA

(* END %INCLUDE NVDSENLO *************************************************
(* BEGIN %INCLUDE NVDSGTAV ************************************************************************* *)
(**)
PROCEDURE NVDSGTAV ( CONST ENTITY_INSTANCE : T_INT_ITEM;
                    CONST NAME_STRING : T_ATTRIBUTE_NAME;
                    CONST DIMEN_VALUE : T_DIMEN_VALUE;
                    VAR POSITION : INTEGER;
                    VAR POINTER : T_VARIANT_POINTER;
                    VAR ATTRIBUTE_VALUE : T_ATTRIBUTE_VALUE;
                    VAR ATTRIBUTE_SIZE : INTEGER;
                    VAR DIMEN_COUNT : INTEGER;
                    VAR NVI_RETURN_CODE : EXT_RET_CODE);

EXTERNAL;

(*$FUNCTION:
  DETERMINE THE LOCATION OF THE REQUESTED ENTITY ATTRIBUTE. *)

(*$DESCRIPTION OF ARGUMENTS:
  NAME  I/O DESCRIPTION
  ===== === ========
  ATTRIBUTE_SIZE 0 SIZE OF THE ATTRIBUTE (BYTES) *
  DIMEN_VALUE 1 VALUE OF ARRAY SUBSCRIPT *
  ENTITY_INSTANCE 1 ENTITY INSTANCE NODE *
  NAME_STRING 1 SCHEMA NAME FOR THE ATTRIBUTE (OR *
  ATTRIBUTE OF A CONSTITUENT) WHICH IS *
  TERMINATED BY A NULL (HEX'00') *
  NVI_RETURN_CODE 0 EXTERNAL RETURN CODE *
  = 0 SUCCESS *
  > 0 CRITICAL ERROR: *
  1 KIND NOT IN RUN-TIME SUBSCHEMA *
  2 ATTRIBUTE NOT IN ENTITY *
  POINTER 0 POINTER TO ATTRIBUTE VALUE *
  POSITION I/O LOCATION OF ATTRIBUTE NAME IN NAME *
  STRING (FOR REFERRING TO ATTRIBUTE *
  NAME OF A CONSTITUENT ENTITY) *

*$COMMONS:

*$ENVIRONMENT:
  LANGUAGE: IBM PASCAL (SEGMENT EXTERNAL) *
  HARDWARE SYSTEM: IBM 360/370/4341/4381 *

*$EXECUTION PROCEDURE:
  NAME/VALUE INTERFACE *
  CALLED FROM SUBPROGRAM NVDQAN ORIGINALLY, WILL CALL ITSELF *
  RECURSIVELY FOR POINTER ATTRIBUTES *

3-937
(* $PROCESSING DESCRIPTION: *)
(* REQUEST RUN-TIME SUBSCHEMA DEFINITION OF ENTITY *)
(* IF RUN-TIME SUBSCHEMA ENTITY DEFINITION OBTAINED THEN *)
(* OBTAIN ATTRIBUTE NAME FROM ATTRIBUTE NAME STRING *)
(* IF ATTRIBUTE NAME OBTAINED THEN *)
(* SEARCH SCHEMA ENTITY DEFINITION FOR ATTRIBUTE NAME *)
(* IF ATTRIBUTE NAME FOUND THEN *)
(* POINT TO ATTRIBUTE LOCATION *)
(* OBTAIN ATTRIBUTE SIZE *)
(* RETURN SUCCESS *)
(* ELSE *)
(* RETURN FAILURE *)
(* ENDIF *)
(* ELSE *)
(* POINT TO APPLICATION DATA BLOCK *)
(* OBTAIN APPLICATION DATA BLOCK SIZE *)
(* RETURN SUCCESS *)
(* ENDIF *)
(* ELSE *)
(* RETURN FAILURE *)
(* ENDIF *)
(* $COMMENTS: *)
(* $CHANGE CONTROL: *)
(* ORIGINATED: 12 DECEMBER 1987, M. H. CHOI, DBMA *)
(* END $INCLUDE NVDSGTAV ***********************************************)
PROCEDURE NVEQAV (CONST SELECTED_ENTITY: ENTKEY;
CONST ATTRIBUTE_DATA_BLOCK: ENTBLOCK;
VAR DATAREC: T_DATAREC;
VAR NVI_RETURN_CODE: EXT_RET_CODE);

SUBPROGRAM;

(* $FUNCTION:
(* IF ATTRIBUTE VALUE FOR ENTITY INSTANCE OR CONSTITUENT
(* EQUAL SPECIFIED VALUE THEN ADD ENTITY TO LIST.
(*
(* $DESCRIPTION OF ARGUMENTS:
(* NAME I/O DESCRIPTION
(* ==== === ==========
(* SELECTED_ENTITY I ENTITY INSTANCE KEY
(*
(* ATTRIBUTE_DATA_BLOCK I SUPPLIED BY MAKSEQ BUT NOT USED
(*
(* DATAREC I/O A RECORD STRUCTURE PASSED THROUGH
(* MAEXEQ WHICH CONTAINS THE PARAMETERS
(* FROM NVPQAV : NAME_ROOT
(* LIST_ROOT
(* ATTRIBUTE_VALUE
(*
(* NVI_RETURN_CODE 0 EXTERNAL RETURN CODE
(*
(* $COMMONS:
(*
(* $ENVIRONMENT:
(* LANGUAGE: IBM PASCAL (SEGMENT SUBPROGRAM)
(* HARDWARE SYSTEM: IBM 360/370/4341/4381
(*
(* $EXECUTION PROCEDURE:
(* NAME/VALUE INTERFACE
(* CALLED VIA MAEXEQ FROM NVPQAV FOR EACH INSTANCE.
(*
(* $PROCESSING DESCRIPTION:
(* IF ATTRIBUTE VALUE FOUND THEN
(* IF ATTRIBUTE VALUE EQUAL SPECIFIED VALUE THEN
(* ADD SELECTED ENTITY TO LIST
(* ENDF
(* ENDF
(*
(* $COMMENTS:
(*
(* 3-939
(* BEGIN %INCLUDE NVGEAV ***********************************************************************)
(* PROCEDURE NVGEAV ( CONST SELECTEDENTITY : ENTKEY; *)
*  CONST ATTRIBUTE_DATA_BLOCK : ENTBLOCK; *)
*  VAR DATAREC : T_DATAREC; *)
*  VAR NVI_RETURN_CODE : EXT_RET_CODE ); *)
SUBPROGRAM;
(*
(*) $FUNCTION:
(*) IF ATTRIBUTE VALUE FOR ENTITY INSTANCE OR CONSTITUENT IS *)
(*) GREATER THAN OR EQUAL TO SPECIFIED VALUE THEN ADD ENTITY *)
(*) TO LIST. *)
(*
(*) $DESCRIPTION OF ARGUMENTS:
(*) NAME I/O DESCRIPTION *)
(*) SELECTEDENTITY I ENTITY INSTANCE KEY *)
(*) ATTRIBUTE_DATA_BLOCK I SUPPLIED BY MAEXEQ BUT NOT USED *)
(*) DATAREC I/O A RECORD STRUCTURE PASSED THROUGH *)
(*) MAEXEQ WHICH CONTAINS THE PARAMETERS *)
(*) FROM NVPQAV : NAME_ROOT *)
(*) LIST_ROOT *)
(*) ATTRIBUTE_VALUE *)
(*) NVI_RETURN_CODE 0 EXTERNAL RETURN CODE *)
(*)
(*) $COMMONS: *)
(*)
(*) $ENVIRONMENT:
(*) LANGUAGE: IBM PASCAL (SEGMENT SUBPROGRAM) *)
(*) HARDWARE SYSTEM: IBM 360/370/4341/4381 *)
(*)
(*) $EXECUTION PROCEDURE:
(*) NAME/VALUE INTERFACE *)
(*) CALLED VIA MAEXEQ FROM NVPQAV FOR EACH INSTANCE. *)
(*)
(*) $PROCESSING DESCRIPTION:
(*) IF ATTRIBUTE VALUE FOUND THEN *)
(*) IF ATTRIBUTE VALUE GREATER THAN OR EQUAL *)
(*) SPECIFIED VALUE THEN *)
(*) ADD SELECTED ENTITY TO LIST *)
(*) ENDIF *)
(*) ENDIF *)
(*)
3-941
Procedure NVGRAV

(* BEGIN %INCLUDE NVGRAV **********************************************)
PROCEDURE NVGRAV ( CONST SELECTEDENTITY : ENTKEY;
   CONST ATTRIBUTE_DATA_BLOCK : ENTBLOCK;
   VAR DATABlock : T_DATAREC;
   VAR NVI_RETURN_CODE : EXT_RET_CODE);
SUBPROGRAM;

(* $FUNCTION:
   IF ATTRIBUTE VALUE FOR ENTITY INSTANCE OR CONSTITUENT IS
   GREATER THAN SPECIFIED VALUE THEN ADD ENTITY TO LIST. *)

(* $DESCRIPTION OF ARGUMENTS:
   NAME   I/O  DESCRIPTION
   SELECTEDENTITY I  ENTITY INSTANCE KEY
   ATTRIBUTE_DATA_BLOCK I  SUPPLIED BY MAKXEQ BUT NOT USED
   DATABlock I/O  A RECORD STRUCTURE PASSED THROUGH
   MAKXEQ WHICH CONTAINS THE PARAMETERS
   FROM NVPQAV : NAME_ROOT
   LIST_ROOT
   ATTRIBUTE_VALUE
   NVI_RETURN_CODE 0  EXTERNAL RETURN CODE

(* $COMMONS:

(* $ENVIRONMENT:
   LANGUAGE: IBM PASCAL (SEGMENT SUBPROGRAM)
   HARDWARE SYSTEM: IBM 360/370/4341/4381

(* $EXECUTION PROCEDURE:
   NAME/VALUE INTERFACE
   CALLED VIA MAEXEQ FROM NVPQAV FOR EACH INSTANCE.

(* $PROCESSING DESCRIPTION:
   IF ATTRIBUTE VALUE FOUND THEN
   IF ATTRIBUTE VALUE GREATER THAN SPECIFIED VALUE THEN
   ADD SELECTED ENTITY TO LIST
   ENDF

(* ENDIF

(* $COMMENTS:

3-943
(* BEGIN %INCLUDE NVGTAN ***************************************************************)

PROCEDURE NVGTAN(CONST NAME_STRING : T_ATTRIBUTE_NAME;
    VAR NO_OF_DIMENSION : INTEGER;
    VAR POSITION : INTEGER;
    VAR NAME : T_SCHEMA_NAME);

EXTERNAL;

(*

$FUNCTION:

EXTRACT ATTRIBUTE NAME FROM ATTRIBUTE NAME STRING, STARTING AT STRING POSITION.

$DESCRIPTION OF ARGUMENTS:

<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAME_STRING</td>
<td>O</td>
<td>CURRENT SEGMENT OF ATTRIBUTE NAME</td>
</tr>
<tr>
<td>NAME</td>
<td>I</td>
<td>FULLY QUALIFIED ATTRIBUTE NAME</td>
</tr>
<tr>
<td>NO_OF_DIMENSION</td>
<td>I/O</td>
<td>NUMBER OF ARRAY DIMENSIONS</td>
</tr>
<tr>
<td>POSITION</td>
<td>I/O</td>
<td>POSITION OF THE CURRENT SEGMENT</td>
</tr>
</tbody>
</table>

$COMMONS:

$ENVIRONMENT:

LANGUAGE: IBM PASCAL (SEGMENT EXTERNAL)

HARDWARE SYSTEM: IBM 360/370/4341/4381

$EXECUTION PROCEDURE:

NAME/VALUE INTERFACE

$PROCESSING DESCRIPTION:

COPY ATTRIBUTE NAME FROM ATTRIBUTE NAME STRING

UPDATE POSITION IN STRING

$COMMENTS:

$CHANGE CONTROL:

REVISED: 31 MARCH 1987, M. H. CHOI, DBMA
ADDED A NO_OF_DIMENSION PARAMETER TO HANDLE ARRAY

REVISED: 16 MAY 1986, GEORGE A. WHITE, FRMI, REORGANIZED
GLOBAL DECLARATIONS INTO 'NVITYP'.

ORIGINATED: 4 NOVEMBER 1985, G. A. WHITE, FRMI

(* END %INCLUDE NVGTAN ***************************************************************)
PROCEDURE NVGTAT (CONST KIND: INTEGER;
CONST ATTRIBUTE_NAME: T_ATTRIBUTE_NAME;
VAR DATA_TYPE: T_DATA_TYPE;
VAR SIZE: INTEGER;
VAR RETURN_CODE: INTEGER);

EXTERNAL;

/* $FUNCTION: * /
/* OBTAIN THE DATA TYPE AND THE ATTRIBUTE SIZE FOR THE */
/* REQUESTED ENTITY ATTRIBUTE. */

/* $DESCRIPTION OF ARGUMENTS: */
/* NAME I/O DESCRIPTION */
/* ==== === =========== */
/* KIND I KIND NUMBER */
/* ATTRIBUTE_NAME I SCHEMA NAME FOR THE ATTRIBUTE (OR */
/* CONCATENATED SCHEMA NAME FOR THE */
/* ATTRIBUTE OF A CONSTITUENT) WHICH IS */
/* TERMINATED BY A NULL (HEX'00') */
/* DATA_TYPE 0 ENTITY ATTRIBUTE DATA TYPE */
/* SIZE 0 SIZE OF ENTITY ATTRIBUTE */
/* RETURN_CODE 0 EXTERNAL RETURN CODE */
/* = 0 SUCCESS */
/* > 0 CRITICAL ERROR: */
/* 1 KIND NOT IN RUN-TIME SUBSCHEMA */
/* 2 ATTRIBUTE NOT IN ENTITY */

/* $COMMONS: */

/* $ENVIRONMENT: */
/* LANGUAGE: IBM PASCAL (SEGMENT EXTERNAL) */
/* HARDWARE SYSTEM: IBM 360/370/4341/4381 */

/* $EXECUTION PROCEDURE: */
/* NAME/VALUE INTERFACE */

/* $PROCESSING DESCRIPTION: */
/* REQUEST RUN-TIME SUBSCHEMA DEFINITION OF ENTITY */
/* IF RUN-TIME SUBSCHEMA ENTITY DEFINITION OBTAINED THEN */
/* OBTAIN ATTRIBUTE NAME FROM ATTRIBUTE NAME STRING */
/* IF ATTRIBUTE NAME OBTAINED THEN */
/* SEARCH SCHEMA ENTITY DEFINITION FOR ATTRIBUTE NAME */
/* IF ATTRIBUTE NAME FOUND THEN */
/* OBTAIN DATA TYPE */

3-946
(* OBTAIN ATTRIBUTE SIZE *)
(* END IF *)
(* END IF *)
(* END IF *)

(* $COMMENTS: *)
(* $CHANGE CONTROL: *)
(* ORIGINATED: 13 NOVEMBER 1987, M. H. CHOI, DBMA *)
(* END %INCLUDE NVCTAT *********************************)
procedure NVGTDD (const kind_of_entity : ord_kind;
    var schema_pointer : t_schema_pointer;
    var nvi_return_code : ext_ret_code);

subprogram;

(* $function:*

get data dictionary entity definition

(* $description of arguments:*

(* name i/o description

==== ==== ===========

(* kind_of_entity i kind value of the entity for which the
    run-time subschema is to be obtained

(* nvi_return_code o return code

    = 0 success

    > 0 critical error:

    1 kind not in run-time subschema

(* schema_pointer o pointer to the run-time subschema entity

    definition after it is stored into the

    working form.

(* $commons:*

(* $environment:

    language: ibm pascal (segment subprogram)

    hardware system: ibm 360/370/4341/4381

(* $execution procedure:

    run-time subschema

    called from the name/value interface

(* $processing description:

    request pointer to run-time subschema

    if run-time subschema not in working form then

        request data dictionary from schema model

    if data dictionary obtained then

        store data dictionary in working form

        request pointer to run-time subschema

    else

        return failure

    endif

    endif

3-948
(* BEGIN INCLUDE NVGTED *************************************************************** *)

PROCEDURE NVGTED ( 
  CONST ENTITY_NAME : T_ATTRIBUTE_NAME;
  VAR ENTITY_KIND : ORD_KIND;
  VAR ADB_SIZE : INTEGER;
  VAR CL_LENGTH : INTEGER;
  VAR RETURN_CODE : EXT_RET_CODE );

SUBPROGRAM;

(* $FUNCTION: *)
(* OBTAIN THE ENTITY KIND, ADB SIZE AND NUMBER OF CONSTITUENTS *)
(* FOR THE REQUESTED ENTITY NAME. *)

(* $DESCRIPTION OF ARGUMENTS: *)
(* NAME I/O DESCRIPTION *)
(* ==== === ========= *)
(* ENTITY_NAME I AN ENTITY NAME *)
(* ENTITY_KIND O KIND NUMBER *)
(* ADB_SIZE 0 TOTAL SIZE OF THE ADB *)
(* CL_LENGTH 0 NUMBER OF CONSTITUENTS *)
(* RETURN_CODE 0 EXTERNAL RETURN CODE *)
(* = 0 SUCCESS *)
(* > 0 CRITICAL ERROR: *)

(* $COMMONS: *)

(* $ENVIRONMENT: *)
(* LANGUAGE: IBM PASCAL (SEGMENT EXTERNAL) *)
(* HARDWARE SYSTEM: IBM 360/370/4341/4381 *)

(* $EXECUTION PROCEDURE: *)
(* NAME/VALUE INTERFACE *)

(* $PROCESSING DESCRIPTION: *)
(* OBTAIN ENTITY NAME FROM ENTITY NAME STRING *)
(* REQUEST DATA DICTIONARY GIVEN ENTITY NAME *)
(* IF DATA DICTIONARY ENTITY DEFINITION OBTAINED THEN *)
(* OBTAIN ENTITY KIND *)
(* LOOP THROUGH THE ENTITY DEFINITION *)
(* IF ATTRIBUTE IN ADB THEN *)
(* OBTAIN THE LARGEST PHYSICAL SCHEMA ORDER *)
(* ELSE *)
(* OBTAIN THE LARGEST CONSTITUENT LIST POSITION *)
(* END IF *)
(* END LOOP *)
(* CALCULATE THE TOTAL ADB SIZE *)

3-950
PROCEDURE NVGTRS ( CONST KINDOFENTITY : ORD_KIND;
               VAR SCHEMA_POINTER : T_SCHEMA_POINTER;
               VAR NVI_RETURN_CODE : EXT_RET_CODE );

(**************************************************************************
(**************************************************************************)

$FUNCTION:
GET RUN-TIME SUBSCHEMA ENTITY DEFINITION

$DESCRIPTION OF ARGUMENTS:

<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>KINDOFENTITY</td>
<td>I</td>
<td>KIND VALUE OF THE ENTITY FOR WHICH THE RUN-TIME SUBSCHEMA IS TO BE OBTAINED</td>
</tr>
<tr>
<td>NVI_RETURN_CODE</td>
<td>O</td>
<td>RETURN CODE</td>
</tr>
<tr>
<td>= 0 SUCCESS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; 0 CRITICAL ERROR:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 KIND NOT IN RUN-TIME SUBSCHEMA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCHEMA_POINTER</td>
<td>O</td>
<td>POINTER TO THE RUN-TIME SUBSCHEMA ENTITY AFTER IT IS STORED INTO THE WORKING FORM</td>
</tr>
</tbody>
</table>

$ENVIRONMENT:
LANGUAGE: IBM PASCAL (SEGMENT SUBPROGRAM)
HARDWARE SYSTEM: IBM 360/370/4341/4381

$EXECUTION PROCEDURE:
RUN-TIME SUBSCHEMA CALLED FROM THE NAME/VALUE INTERFACE

$PROCESSING DESCRIPTION:
REQUEST POINTER TO RUNTIME SUBSCHEMA
IF RUN-TIME SUBSCHEMA NOT IN WORKING FORM THEN
REQUEST RUN-TIME SUBSCHEMA FROM SCHEMA MODEL
IF RUN-TIME SUBSCHEMA OBTAINED THEN
STORE RUN-TIME SUBSCHEMA IN WORKING FORM
REQUEST POINTER TO RUN_TIME SUBSCHEMA
ELSE
RETURN FAILURE
ENDIF
ENDIF
(* $COMMENTS: *)
(* $CHANGE CONTROL: *)
(* REVISED: 16 MAY 1986, GEORGE A. WHITE, FRMI, REORGANIZED *)
(* GLOBAL DECLARATIONS INTO 'NVITYP'. *)
(* ORIGINATED 23 JANUARY 1986, G. A. WHITE, FRMI *)
(* *)
(* END %INCLUDE NVGTRS *********************************************)

3-953
(* BEGIN %INCLUDE NVLCAV **************************************************)

FUNCTION NVLCAV ( CONST selected_entity : ENTKEY;
VAR datarec : T_DATAREC;
VAR pointer : T_VARIANT_POINTER;
VAR attribute_size : INTEGER;
VAR data_type : INTEGER;
VAR nvi_return_code : EXT_RET_CODE).

: BOOLEAN;
EXTERNAL;

(* $FUNCTION:
LOCATE ATTRIBUTE VALUE USING TRAVERSAL MAP.
*)

(* $DESCRIPTION OF ARGUMENTS:
NAME I/O DESCRIPTION
**** === ===========
SELECTED_ENTITY I ENTITY INSTANCE KEY

NAME_ROOT I POINTER TO TRAVERSAL MAP WHICH
CONTAINS ATTRIBUTE NAMES AND THE
CORRESPONDING SCHEMA DEFINITIONS

POINTER O POINTER TO ATTRIBUTE VALUE

ATTRIBUTE_SIZE 0 SIZE OF THE ATTRIBUTE (BYTES)

NVIRETURNCODE 0 EXTERNAL RETURN CODE

*)

(* $COMMONS:
*
*)

(* $ENVIRONMENT:
* LANGUAGE: IBM PASCAL (SEGMENT SUBPROGRAM)
* HARDWARE SYSTEM: IBM 360/370/4341/4381
*
*)

(* $EXECUTION PROCEDURE:
* NAME/VALUE INTERFACE
*
*)

(* $PROCESSING DESCRIPTION:
* START WITH SPECIFIED KIND
* LOOP THROUGH ATTRIBUTE NAMES IN TRAVERSAL MAP
* IF ATTRIBUTE DEFINITION EXISTS FOR NAME/KIND THEN
* CASE ATTRIBUTE DATA TYPE OF
* IN_CL : OBTAIN CONSTITUENT
* USE CONSTITUENT KIND
* OBTAIN DEFINITION OF CONSTITUENT
*
*)

3-954
ATTRIBUTE

IN_STRUCTURE : OBTAIN DEFINITION OF STRUCTURE ELEMENT

OTHERWISE : TERMINATE TRAVERSAL

DETERMINE LOCATION OF ATTRIBUTE VALUE

ATTRIBUTE VALUE FOUND

END CASE

ELSE

TERMINATE TRAVERSAL

ATTRIBUTE VALUE NOT FOUND

ENDIF

ENDLOOP

(* $COMMENTS:

*$CHANGE CONTROL:

REVISED: 31 MARCH 1987, M. H. CHOI, DBMA

ADDED A DIMENSION VALUE PARAMETER TO HANDLE ARRAY

OF POINTER.

ORIGINATED: 12 MAY 1986, G. A. WHITE, FRMI

(* END %INCLUDE NVLCAV ***********************************************)
PROCEDURE NVLEAV ( CONST SELECTED_ENTITY : ENTKEY;
    CONST ATTRIBUTE_DATA_BLOCK : ENT_BLOCK;
    VAR DATEREC : T_DATAREC;
    VAR NVI_RETURN_CODE : EXT_RET_CODE );

SUBPROGRAM;

$FUNCTION:
IF ATTRIBUTE VALUE FOR ENTITY INSTANCE OR CONSTITUENT IS
LESS THAN OR EQUAL TO SPECIFIED VALUE THEN ADD ENTITY TO
LIST.

$DESCRIPTION OF ARGUMENTS:
NAME I/O DESCRIPTION
SELECTED_ENTITY I ENTITY INSTANCE KEY
ATTRIBUTEDATA_BLOCK I SUPPLIED BY MAKXEQ BUT NOT USED
DATEREC I/O A RECORD STRUCTURE PASSED THROUGH
MAEXEQ WHICH CONTAINS THE PARAMETERS
FROM NVPQAV : NAME_ROOT
    LIST_ROOT
    ATTRIBUTE_VALUE
NVI_RETURN_CODE 0 EXTERNAL RETURN CODE

$COMMONS:

$ENVIRONMENT:
LANGUAGE: IBM PASCAL (SEGMENT SUBPROGRAM)
HARDWARE SYSTEM: IBM 360/370/4341/4381

$EXECUTION PROCEDURE:
NAME/VALUE INTERFACE
CALLED VIA MAEXEQ FROM NVPQAV FOR EACH INSTANCE.

$PROCESSING DESCRIPTION:
IF ATTRIBUTE VALUE FOUND THEN
    IF ATTRIBUTE VALUE LESS THAN OR EQUAL SPECIFIED VALUE THEN
        ADD SELECTED ENTITY TO LIST
ENDIF
ENDIF
(* $COMMENTS: *)
(* $CHANGE CONTROL: *)
(* ORIGINATED: 15 JULY 1987, M. H. CHOI, DBMA *)
(* *)
(* END %INCLUDE NVLEAV *******************************************)
PROCEDURE NVLTAV (CONST SELECTED_ENTITY : ENTKEY;
    CONST ATTRIBUTE_DATA_BLOCK : ENTBLOCK;
    VAR DATAREC : T_DATAREC;
    VAR NVI_RETURN_CODE : EXT_RET_CODE);

SUBPROGRAM;

$FUNCTION:

IF ATTRIBUTE VALUE FOR ENTITY INSTANCE OR CONSTITUENT IS LESS THAN SPECIFIED VALUE THEN ADD ENTITY TO LIST.

$DESCRIPTION OF ARGUMENTS:

<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>SELECTED_ENTITY</td>
<td>I</td>
<td>ENTITY INSTANCE KEY</td>
</tr>
<tr>
<td>ATTRIBUTE_DATA_BLOCK</td>
<td>I</td>
<td>SUPPLIED BY MAKXEQ BUT NOT USED</td>
</tr>
<tr>
<td>DATAREC</td>
<td>I/O</td>
<td>A RECORD STRUCTURE PASSED THROUGH MAEXEQ WHICH CONTAINS THE PARAMETERS FROM NVPQAV : NAME_ROOT LIST_ROOT ATTRIBUTE_VALUE</td>
</tr>
</tbody>
</table>

NVI_RETURN_CODE 0 EXTERNAL RETURN CODE

$COMMONS:

$ENVIRONMENT:

LANGUAGE: IBM PASCAL (SEGMENT SUBPROGRAM)
HARDWARE SYSTEM: IBM 360/370/4341/4381

$EXECUTION PROCEDURE:

NAME/VALUE INTERFACE CALLED VIA MAEXEQ FROM NVPQAV FOR EACH INSTANCE.

$PROCESSING DESCRIPTION:

IF ATTRIBUTE VALUE FOUND THEN
    IF ATTRIBUTE VALUE LESS THAN SPECIFIED VALUE THEN
        ADD SELECTED ENTITY TO LIST
    ENDIF
ENDIF

$COMMENTS:

3-958
(* BEGIN %INCLUDE NVNEAV **************************************************************************************************************)
PROCEDURE NVNEAV ( CONST SELECTED_ENTITY : ENTKEY;
CONSTR ATTRIBUTE_DATA_BLOCK : ENTBLOCK;
VAR DATAREC : T_DATAREC;
VAR NVI_RETURN_CODE : EXT_RET_CODE );
SUBPROGRAM;
(*
(* $FUNCTION:
(* IF ATTRIBUTE VALUE FOR ENTITY INSTANCE OR CONSTITUENT
(* IS NOT EQUAL TO SPECIFIED VALUE THEN ADD ENTITY TO LIST.
(*
(*
(* $DESCRIPTION OF ARGUMENTS:
(* NAME I/O DESCRIPTION
(* === === ========
(* SELECTED_ENTITY I ENTITY INSTANCE KEY
(*
(* ATTRIBUTE_DATA_BLOCK I SUPPLIED BY MAKXEQ BUT NOT USED
(*
(* DATAREC I/O A RECORD STRUCTURE PASSED THROUGH
(* MAEXEQ WHICH CONTAINS THE PARAMETERS
(* FROM NVPQAV : NAME_ROOT
(* LIST_ROOT
(* ATTRIBUTE_VALUE
(*
(* NVI_RETURN_CODE O EXTERNAL RETURN CODE
(*
(* $COMMONS:
(*
(* $ENVIRONMENT:
(* LANGUAGE: IBM PASCAL (SEGMENT SUBPROGRAM)
(* HARDWARE SYSTEM: IBM 360/370/4341/4381
(*
(* $EXECUTION PROCEDURE:
(* NAME/VALUE INTERFACE
(* CALLED VIA MAEXEQ FROM NVPQAV FOR EACH INSTANCE.
(*
(* $PROCESSING DESCRIPTION:
(* IF ATTRIBUTE VALUE FOUND THEN
(* IF ATTRIBUTE VALUE NOT EQUAL SPECIFIED VALUE THEN
(* ADD SELECTED ENTITY TO LIST
(* ENDF
(* ENDF
(*
(* $COMMENTS:
(*
(*
3-960
(* BEGIN %INCLUDE NVPQARLO *******************************)

FUNCTION NVPQARLO ( CONST ENTITYINSTANCE : T_INT_ITEM;
  CONST INDEX : INTEGER;
  CONST SCHEMA : T_SCHEMA_POINTER;
  CONST DIMEN_VALUE : T_DIMEN_VALUE;
  CONST NO_OF_DIMENSION : INTEGER;
  VAR ATTRIBUTESIZE : INTEGER;
  VAR ATTRIBUTEVALUE : T_ATTRIBUTE_VALUE;
  VAR ARRAY_TYPE : INTEGER;
  VAR DIMEN_COUNT : INTEGER;
  VAR NVI_RETURN_CODE : EXT_RETURN_CODE )
    : T_VARIANT_POINTER;
EXTERNAL;

(* $FUNCTION:
  DETERMINE THE LOCATION OF THE REQUESTED ENTITY ATTRIBUTE
  OF ARRAY TYPE.
)

(* $DESCRIPTION OF ARGUMENTS:

(* NAME  I/O  DESCRIPTION

  NVPQARLO 0  POINTER TO ATTRIBUTE VALUE
  ARRAY_SIZE 0  SIZE OF THE ATTRIBUTE VALUE
  DIMEN_VALUE I  VALUE OF ARRAY SUBSCRIPT
  ENTITY_INSTANCE I  POINTER TO ADB OF ENTITY INSTANCE
  INDEX I  INDEX OF THE CURRENT SEGMENT
  NO_OF_DIMENSION I  NUMBER OF ARRAY DIMENSIONS
  SCHEMA I  RUN-TIME SUBSCHEMA ENTITY

(* $COMMONS:

(* $ENVIRONMENT:
  LANGUAGE: IBM PASCAL (SEGMENT SUBPROGRAM)
  HARDWARE SYSTEM: IBM 360/370/4341/4381

(* $EXECUTION PROCEDURE:
  NAME/VALUE INTERFACE
  CALLED FROM EITHER PASCAL OR FORTRAN APPLICATION PROGRAM

(* $PROCESSING DESCRIPTION:
  REQUEST POINTER TO SELECTOR IN ADB OF ENTITY INSTANCE
  POINT TO ARRAY INDEX TABLE IN RUN-TIME SUBSCHEMA
  POINT TO ARRAY LIST TABLE IN RUN-TIME SUBSCHEMA
  POINT TO ATTRIBUTE LOCATION

3-962
(* $COMMENTS: *)
(* $CHANGE CONTROL: *)
(* REVISED: (DATE, NAME, GROUP, REASON/DESCRIPTION) *)
(* ORIGINATED: 10 MARCH 1988, M. H. CHOI, DBMA *)
(* *)
(* END %INCLUDE NVPQARLO *********************************************)
PROCEDURE NVPQARPT (CONST ENTITY : ENTKEY;
VAR VALUE_INDEX : INTEGER;
VAR ARRAY_SIZE : INTEGER;
VAR ATTRIBUTE_VALUE : T_ATTRIBUTE_VALUE);

EXTERNAL;

(* $FUNCTION:
Determine the location of the array of pointer. *)

(* $DESCRIPTION OF ARGUMENTS:
NAME I/O DESCRIPTION
--- --- ===============
CNST_LIST 0 ENTITIES IN THE CONSTITUENT LIST
ENTITY I POINTER TO ADB OF ENTITY INSTANCE
NO_OF_CL 0 NUMBER OF INSTANCES IN THE CONSTITUENT LIST

$COMMONS:

$ENVIRONMENT:
LANGUAGE: IBM PASCAL (SEGMENT SUBPROGRAM)
HARDWARE SYSTEM: IBM 360/370/4341/4381

$EXECUTION PROCEDURE:
NAME/VALUE INTERFACE
CALLED FROM EITHER PASCAL OR FORTRAN APPLICATION PROGRAM

$PROCESSING DESCRIPTION:
LOOP THROUGH NUMBER OF INSTANCES IN THE CONSTITUENT LIST
WHILE CONSTITUENT KIND <> 1100 THEN
POINT TO CONSTITUENT KEY

$COMMENTS:

$CHANGE CONTROL:
REVISED: (DATE, NAME, GROUP, REASON/DESCRIPTION)
ORIGINATED: 10 MARCH 1988, M. H. CHOI, DBMA

(* END %INCLUDE NVPQARPT **************************************************)
(* BEGIN %INCLUDE NVPQAV ***********************************************)

PROCEDURE NVPQAV ( CONST APPLICATION_LIST : LISTKEY;
CONST NAME_STRING : T_ATTRIBUTE_NAME;
CONST ATTRIBUTE_VALUE : T_ATTRIBUTEVALUE;
CONST DIMEN_VALUE : T_DIMEN_VALUE;
CONST SIGN : INTEGER;
VAR ENTITY_LIST : LISTKEY;
VAR NVI_RETURN_CODE : EXT_RET_CODE );

SUBPROGRAM;

(* $FUNCTION:
CREATE LIST OF ENTITIES WITH THE SPECIFIED VALUE FOR THE
SPECIFIED ATTRIBUTE FOR THE SPECIFIED KIND OF ENTITY.
*)

(* $DESCRIPTION OF ARGUMENTS:
NAME I/O DESCRIPTION
**** === =============
APPLICATION_LIST I LIST OF ENTITY KEYS
* /
ATTRIBUTE_VALUE I VALUE OF THE ATTRIBUTE
* /
NAME_STRING I SCHEMA NAME FOR THE ATTRIBUTE WHICH
IS TERMINATED BY A NULL (HEX '00')
* /
ENTITY_KEY O ENTITY INSTANCE
* /
NVI_RETURN_CODE O EXTERNAL RETURN CODE
* /
*)

(* $COMMONS:
* /
(* $ENVIRONMENT:
LANGUAGE: IBM PASCAL (SEGMENT SUBPROGRAM)
HARDWARE SYSTEM: IBM 360/370/4341/4381
* /
*)

(* $EXECUTION PROCEDURE:
NAME/VALUE INTERFACE
CALLED FROM EITHER PASCAL OR FORTRAN APPLICATION PROGRAM
*)

(* $PROCESSING DESCRIPTION:
CREATE TRAVERSAL MAP
LOOP THROUGH ALL ENTITY INSTANCES IN APPLICATION LIST
MAKE A LIST OF INSTANCES WITH SPECIFIED ATTRIBUTE VALUE
ENDLOOP
DELETE TRAVERSAL MAP
RETURN LIST OF INSTANCES WITH THE SPECIFIED ATTRIBUTE VALUE
*)
(* $COMMENTS: *)
(* $CHANGE CONTROL: *)
(* REVISED: 27 JULY 1987, M. H. CHOI, DBMA *)
(* ADDED A SIGN PARAMETER TO ALLOW A CHOICE OF THE *)
(* RELATIONAL OPERATOR. *)
(* REVISED: 31 MARCH 1987, M. H. CHOI, DBMA *)
(* ADDED A DIMENSION VALUE PARAMETER TO HANDLE ARRAY *)
(* OF POINTERS. *)
(* ORIGINATED: 05 MAY 1986, M. H. CHOI, FRMI *)
(* *)
(* END %INCLUDE NVPQAV *********************************************)
(* BEGIN %INCLUDE NVRTVRS ***********************************************************)

PROCEDURE NVRTVRS ( CONST KIND : INTEGER;
     VAR RUNTIME : T_RUNTIME;
     VAR RUNTIME_SIZE : INTEGER;
     VAR RETURN_CODE : INTEGER );

SUBPROGRAM;

(*
$FUNCTION:
RETRIEVE ENTITY DEFINITIONS FROM THE FILE
(*
$DESCRIPTION OF ARGUMENTS:
(*
<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>KIND</td>
<td>I</td>
<td></td>
</tr>
<tr>
<td>RUNTIME</td>
<td>0</td>
<td>RUN-TIME SUBSCHEMA WHICH CONTAINS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>THE ENTITY DEFINITION, ALONG WITH</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ANY ENUMERATION VALUES AND ANY ARRAY</td>
</tr>
<tr>
<td></td>
<td></td>
<td>INFORMATIONS, IN A COMPACTED FORM.</td>
</tr>
<tr>
<td>RUNTIME_SIZE</td>
<td>0</td>
<td>THE NUMBER OF BYTES ACTUALLY REQUIRED</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FOR THE COMPACTED RUN-TIME SUBSCHEMA.</td>
</tr>
</tbody>
</table>

$COMMONS:

$ENVIRONMENT:
LANGUAGE: IBM PASCAL (SEGMENT SUBPROGRAM)
HARDWARE SYSTEM: IBM 360/370/4341/4381

$EXECUTION PROCEDURE:
NAME/VALUE INTERFACE
CALLED FROM EITHER PASCAL OR FORTRAN APPLICATION PROGRAM

$PROCESSING DESCRIPTION:
LOOP THROUGH INXFILE
    IF KIND FOUND IN INXFILE THEN
        LOOP THROUGH DATAFILE
            IF KIND FOUND IN DATAFILE THEN
                STORE ENTITY DEFINITION IN TEMPORARY WORK AREA
            END IF
        END LOOP
    END IF
END LOOP
STORE ENTITY DEFINITION INTO RUN-TIME SUBSCHEMA
STORE SIZE OF ENTITY DEFINITION INTO RUN-TIME SUBSCHEMA

$COMMENTS:

3-967
(* $CHANGE CONTROL: *)
(* ORIGINATED: 21 OCTOBER 1986, M. H. CHOI, DBMA *)
(* END %INCLUDE NVRTVRS ***********************************************)
(* BEGIN %INCLUDE RSCPAI *********************************************)

PROCEDURE RSCPAI ( VAR OUTPUT_VALUE : T_DATA_VALUE;
                   CONST INPUT_VALUE : T_ARRAY_INDEX;
                   CONST SIZE_OF_VALUE : INTEGER);

EXTERNAL;

(* $FUNCTION: *)
COPY THE ARRAY INDEX TABLE INFORMATION INTO THE RUN-TIME SUBSCHEMA.

(* $DESCRIPTION OF ARGUMENTS: *)

<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>INPUT_VALUE</td>
<td>I</td>
<td>INPUT VALUE OF ARBITRARY SIZE</td>
</tr>
<tr>
<td>OUTPUT_VALUE</td>
<td>O</td>
<td>OUTPUT VALUE OF ARBITRARY SIZE</td>
</tr>
<tr>
<td>SIZE_OF_VALUE</td>
<td>I</td>
<td>SIZE OF VALUE TO BE COPIED</td>
</tr>
</tbody>
</table>

(* $COMMONS: *)

(* $ENVIRONMENT: *)
LANGUAGE: IBM PASCAL (SEGMENT SUBPROGRAM)
HARDWARE SYSTEM: IBM 360/370/4341/4381

(* $EXECUTION PROCEDURE: *)
RUN-TIME SUBSCHEMA

(* $PROCESSING DESCRIPTION: *)
CALL MACHINE DEPENDENT ROUTINE TO COPY ARRAY TABLE INFO

(* $COMMENTS: *)

(* $CHANGE CONTROL: *)
ORIGINATED: 01 OCTOBER 1986, M. H. CHOI, DBMA

(* END %INCLUDE RSCPAI *********************************************)
PROCEDURE RSCPAT ( VAR OUTPUT_VALUE : T_DATA_VALUE;
CONST INPUT_VALUE : T_ARRAY_LIST;
CONST SIZE_OF_VALUE : INTEGER);

EXTERNAL;

$FUNCTION:
COPY THE SIZE AND THE LOWER BOUND OF THE ARRAY INTO THE
RUN-TIME SUBSCHEMA.

$DESCRIPTION OF ARGUMENTS:

<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>INPUT_VALUE</td>
<td>I</td>
<td>INPUT VALUE OF ARBITRARY SIZE</td>
</tr>
<tr>
<td>OUTPUT_VALUE</td>
<td>O</td>
<td>OUTPUT VALUE OF ARBITRARY SIZE</td>
</tr>
<tr>
<td>SIZE_OF_VALUE</td>
<td>I</td>
<td>SIZE OF VALUE TO BE COPIED</td>
</tr>
</tbody>
</table>

$COMMONS:

$ENVIRONMENT:
LANGUAGE: IBM PASCAL (SEGMENT SUBPROGRAM)
HARDWARE SYSTEM: IBM 360/370/4341/4381

$EXECUTION PROCEDURE:
RUN-TIME SUBSCHEMA

$PROCESSING DESCRIPTION:
CALL MACHINE DEPENDENT ROUTINE TO COPY THE SIZE AND THE
LOWER BOUND OF THE ARRAY

$COMMENTS:

$CHANGE CONTROL:
ORIGINATED: 01 OCTOBER 1986, M. H. CHOI, DBMA

(* END %INCLUDE RSCPAT *)
(* BEGIN %INCLUDE RSCPCI ***************************************************************)

(*)
PROCEDURE RSCPCI ( VAR OUTPUT_VALUE : T_DATA_VALUE;
                   CONST INPUT_VALUE : T_CL_INDEX;
                   CONST SIZE_OF_VALUE : INTEGER);
                   
EXTERNAL;

(*)
($FUNCTION:
(*
    COPY THE POINTER INDEX TABLE INFORMATION INTO THE
(*
    RUN-TIME SUBSCHEMA.
(*

(* $DESCRIPTION OF ARGUMENTS:
(*
  NAME   I/O DESCRIPTION
(*)
  ========
  INPUT_VALUE   I INPUT VALUE OF ARBITRARY SIZE
  OUTPUT_VALUE  O OUTPUT VALUE OF ARBITRARY SIZE
  SIZE_OF_VALUE I SIZE OF VALUE TO BE COPIED

(* $COMMENTS:
(*

(* $ENVIRONMENT:
(*
    LANGUAGE: IBM PASCAL (SEGMENT SUBPROGRAM)
(*
    HARDWARE SYSTEM: IBM 360/370/4341/4381
(*

(* $EXECUTION PROCEDURE:
(*
    RUN-TIME SUBSCHEMA
(*

(* $PROCESSING DESCRIPTION:
(*
    CALL MACHINE DEPENDENT ROUTINE TO COPY CL INDEX INFO
(*

(* $COMMENTS:
(*

(* $CHANGE CONTROL:
(*
    ORIGINATED: 29 JANUARY 1987, M. H. CHOI, DBMA
(*

(* END %INCLUDE RSCPCI ***************************************************************)
PROCEDURE RSCPCT ( VAR OUTPUT_VALUE : T_DATA_VALUE;
               CONST INPUT_VALUE : T_CL_KINDS;
               CONST SIZE_OF_VALUE : INTEGER);
               EXTERNAL;

$FUNCTION:
COPY THE KINDS OF POINTERS INTO THE RUN-TIME SUBSCHEMA.

$DESCRIPTION OF ARGUMENTS:

<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>INPUT_VALUE</td>
<td>I</td>
<td>INPUT VALUE OF ARBITRARY SIZE</td>
</tr>
<tr>
<td>OUTPUT_VALUE</td>
<td>O</td>
<td>OUTPUT VALUE OF ARBITRARY SIZE</td>
</tr>
<tr>
<td>SIZE_OF_VALUE</td>
<td>I</td>
<td>SIZE OF VALUE TO BE COPIED</td>
</tr>
</tbody>
</table>

$COMMENTS:

$ENVIRONMENT:

<table>
<thead>
<tr>
<th>LANGUAGE: IBM PASCAL (SEGMENT SUBPROGRAM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HARDWARE SYSTEM: IBM 360/370/4341/4381</td>
</tr>
</tbody>
</table>

$EXECUTION PROCEDURE:

RUN-TIME SUBSCHEMA

$PROCESSING DESCRIPTION:

CALL MACHINE DEPENDENT ROUTINE TO COPY KINDS OF POINTER

$CHANGE CONTROL:

ORIGINATED: 29 JANUARY 1987, M. H. CHOI, DBMA
PROCEDURE RSCPEI (VAR OUTPUT_VALUE : T_DATA_VALUE;
    CONST INPUT_VALUE : T_ENUM_INDEX;
    CONST SIZE_OF_VALUE : INTEGER);

EXTERNAL;

$FUNCTION:
COPY THE ENUMERATION INDEX TABLE INFORMATION INTO THE
RUN-TIME SUBSCHEMA.

$DESCRIPTION OF ARGUMENTS:

<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>INPUT_VALUE</td>
<td>I</td>
<td>INPUT VALUE OF ARBITRARY SIZE</td>
</tr>
<tr>
<td>OUTPUT_VALUE</td>
<td>O</td>
<td>OUTPUT VALUE OF ARBITRARY SIZE</td>
</tr>
<tr>
<td>SIZE_OF_VALUE</td>
<td>I</td>
<td>SIZE OF VALUE TO BE COPIED</td>
</tr>
</tbody>
</table>

$COMMONS:

$ENVIRONMENT:
LANGUAGE: IBM PASCAL (SEGMENT SUBPROGRAM)
HARDWARE SYSTEM: IBM 360/370/4341/4381

$EXECUTION PROCEDURE:
RUN-TIME SUBSCHEMA

$PROCESSING DESCRIPTION:
CALL MACHINE DEPENDENT ROUTINE TO COPY ENUMERATION INFO

$COMMENTS:

$CHANGE CONTROL:
ORIGINATED: 01 OCTOBER 1986, M. H. CHOI, DBMA

(* END %INCLUDE RSCPEI ***************)}
(* BEGIN %INCLUDE RSCPET ***********************************************)

PROCEDURE RSCPET (VAR OUTPUT_VALUE: T_DATA_VALUE;
                  CONST INPUT_VALUE: T_ENUMERATION;
                  CONST SIZE_OF_VALUE: INTEGER);

EXTERNAL;

(* $FUNCTION: *)
COPY THE ENUMERATION VALUES INTO THE RUN-TIME SUBSCHEMA.

(* $DESCRIPTION OF ARGUMENTS: *)

<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>INPUT_VALUE:</td>
<td>I</td>
<td>INPUT VALUE OF ARBITRARY SIZE</td>
</tr>
<tr>
<td>OUTPUT_VALUE:</td>
<td>O</td>
<td>OUTPUT VALUE OF ARBITRARY SIZE</td>
</tr>
<tr>
<td>SIZE_OF_VALUE</td>
<td>I</td>
<td>SIZE OF VALUE TO Be COPIED</td>
</tr>
</tbody>
</table>

(* $COMMONS: *)

(* $ENVIRONMENT: *)
LANGUAGE: IBM PASCAL (SEGMENT SUBPROGRAM)
HARDWARE SYSTEM: IBM 360/370/4341/4381

(* $EXECUTION PROCEDURE: *)
RUN-TIME SUBSCHEMA

(* $PROCESSING DESCRIPTION: *)
CALL MACHINE DEPENDENT ROUTINE TO COPY ENUMERATION TABLE

(* $COMMENTS: *)

(* $CHANGE CONTROL: *)
REVISED: 16 MAY 1986, GEORGE A. WHITE, FRMI, REORGANIZED
GLOBAL DECLARATIONS INTO 'NVITYP'.
ORIGINATED: 15 OCTOBER 1985, G. A. WHITE, FRMI

(* END %INCLUDE RSCPET ***********************************************)
(* BEGIN %INCLUDE RSGTDD *******************************************************************)
(*
PROCEDURE RSGTDD ( CONST KINDOFENTITY : INTEGER;
    VAR RUN_TIME : T_RUN_TIME;
    VAR RUN_TIME_SIZE : INTEGER;
    VAR RTS_RETURN_CODE : INTEGER );
SUBPROGRAM;
(*
(* $FUNCTION:
(* BUILD RUN-TIME SUBSCHEMA FROM DATA DICTIONARY ENTRY
(*
(* $DESCRIPTION OF ARGUMENTS:
(*
<table>
<thead>
<tr>
<th>NAME</th>
<th>I/O</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>KINDOFENTITY</td>
<td>I</td>
<td>KIND VALUE OF THE ENTITY FOR WHICH THE RUN-TIME SUBSCHEMA WILL BE BUILT.</td>
</tr>
</tbody>
</table>
| RTS_RETURN_CODE | 0      | RETURN CODE
|             |        | = 0 SUCCESS
|             |        | > 0 CRITICAL ERROR:
| RUN_TIME   | 0      | RUN-TIME SUBSCHEMA WHICH CONTAINS THE ENTITY DEFINITION, ALONG WITH ANY ENUMERATION VALUES, CONSTITUENT LIST KINDS, AND ARRAY INFORMATION, IN A COMPACTED FORM. |
| RUN_TIME_SIZE | 0      | THE NUMBER OF BYTES ACTUALLY REQUIRED FOR THE COMPACTED RUN-TIME SUBSCHEMA. |

(* $COMMONS:
(*
(* $ENVIRONMENT:
(* LANGUAGE: IBM PASCAL (SEGMENT SUBPROGRAM)
(* HARDWARE SYSTEM: IBM 360/370/4341/4381
(*
(* $EXECUTION PROCEDURE:
(* RUN-TIME SUBSCHEMA (TEMPORARY ROUTINE)
(* CALLED FROM THE NAME/VALUE INTERFACE
(*
(* $PROCESSING DESCRIPTION:
(* IF KIND NUMBER EXIST IN DATA DICTIONARY THEN
(* TRANSLATE DATA DICTIONARY ENTRY INTO ENTITY ATTRIBUTES, ENUMERATION VALUES, CONSTITUENT LIST KINDS AND ARRAY INFORMATIONS (LOWER BOUND AND SIZE OF EACH DIMENSIONS)
(* IF THERE WERE ANY ENUMERATION ATTRIBUTES THEN
(* CALCULATE THE STARTING POSITION OF THE ENUMERATION INDEX TABLE AND STORE INTO RUN-TIME SUBSCHEMA
(* DETERMINE THE ACTUAL SIZE OF THE ENUMERATION INDEX TABLE
(*

3-975
COPY ENUMERATION INDEX TABLE INFORMATION INTO RUN-TIME SUBSCHEMA
CALCULATE THE STARTING POSITION OF THE ENUMERATION VALUE TABLE AND STORE INTO RUN-TIME SUBSCHEMA
DETERMINE THE ACTUAL SIZE OF THE ENUMERATION VALUE TABLE
COPY THE ENUMERATION VALUES INTO THE RUN-TIME SUBSCHEMA
ENDIF

IF THERE WERE ANY ARRAY ATTRIBUTES THEN
CALCULATE THE STARTING POSITION OF THE ARRAY INDEX TABLE AND STORE INTO RUN-TIME SUBSCHEMA
DETERMINE THE ACTUAL SIZE OF THE ARRAY INDEX TABLE
COPY ARRAY TABLE INDEX INFORMATION INTO RUN-TIME SUBSCHEMA
CALCULATE THE STARTING POSITION OF THE ARRAY LIST TABLE AND STORE INTO RUN-TIME SUBSCHEMA
DETERMINE THE ACTUAL SIZE OF THE ARRAY LIST TABLE
COPY ARRAY LIST INFORMATION INTO RUN-TIME SUBSCHEMA
ENDIF

IF THERE WERE ANY POINTER ATTRIBUTES THEN
CALCULATE THE STARTING POSITION OF THE CL INDEX TABLE AND STORE INTO RUN-TIME SUBSCHEMA
DETERMINE THE ACTUAL SIZE OF THE CL INDEX TABLE
COPY CL TABLE INDEX INFORMATION INTO RUN-TIME SUBSCHEMA
CALCULATE THE STARTING POSITION OF THE CL LIST TABLE AND STORE INTO RUN-TIME SUBSCHEMA
DETERMINE THE ACTUAL SIZE OF THE CL LIST TABLE
COPY ELIG. KINDS INFORMATION INTO RUN-TIME SUBSCHEMA
ENDIF
ELSE
RETURN FAILURE
ENDIF

$COMMENTS:

$CHANGE CONTROL:
ORIGINATED: 29 APRIL 1987, M. H. CHOI, DBMA

END INCLUDE RSGTDD

3-976
PROCEDURE RSTRDD (CONST KIND_OF_ENTITY: INTEGER;
VAR ENTITY: T_SCHEMA;
VAR ENUM: T_ENUM_COMPACTOR;
VAR ENUM_INDEX: T_ENUM_INX_COMPACTOR;
VAR ARRAY_LIST: T_ARRAY_LIST_COMPACTOR;
VAR ARRAY_INDEX: T_ARRAY_INX_COMPACTOR;
VAR CL_INDEX: T_CL_INDEX_COMPACTOR;
VAR CL_LIST: T_CL_KINDS_COMPACTOR;
VAR RTS_RETURN_CODE: INTEGER);

SUBPROGRAM;

$FUNCTION:
TRANSLATE A DATA DICTIONARY ENTRY INTO A RUN-TIME SUBSCHEMA.*
ENTITY, ENUMERATION TABLE, ARRAY INFO TABLE, AND CL TABLE.*

$DESCRIPTION OF ARGUMENTS:
NAME I/O DESCRIPTION
ARRAY_INDEX 0 RUN-TIME SUBSCHEMA ARRAY TABLE INDEX*
ARRAY_LIST 0 RUN-TIME SUBSCHEMA ARRAY TABLE AND COMPACTION INFORMATION.*
ENUM 0 RUN-TIME SUBSCHEMA ENUMERATION TABLE*
ENUM_INDEX 0 RUN-TIME SUBSCHEMA ENUMERATION TABLE INDEX INFORMATION.*
ENTITY 0 RUN-TIME SUBSCHEMA ENTITY DEFINITION.*
KIND_OF_ENTITY I KIND VALUE OF THE ENTITY FOR WHICH THE TRANSLATION WILL BE PERFORMED.*
RTS_RETURN_CODE 0 RETURN CODE
= 0 SUCCESS
> 0 CRITICAL ERROR:

$COMMONS:

$ENVIRONMENT:
LANGUAGE: IBM PASCAL (SEGMENT SUBPROGRAM)
HARDWARE SYSTEM: IBM 360/370/4341/4381

$EXECUTION PROCEDURE:
NAME/VALUE INTERFACE CALLED FROM THE NAME/VALUE INTERFACE

$PROCESSING DESCRIPTION:
OBTAIN ENTITY NAME AND KIND FROM DATA DICTIONARY
STORE ENTITY NAME AND KIND INTO RUN-TIME SUBSCHEMA

3-977
LOOP THROUGH DATA DICTIONARY ENTRIES

OBTAIN ATTRIBUTE ENTRY FROM DATA DICTIONARY

CASE DATA TYPE OF

INTEGER, REAL, STRING, LOGICAL:

APPLICATION_DATA_BLOCK_ATTRIBUTE, PROCEDURE (1)

POINTER : CONSTITUENT_LIST_ATTRIBUTE, PROCEDURE (2)

ENUMERATION: ENUMERATION_ATTRIBUTE, PROCEDURE (3)

ENDCASE

ENDLOOP

PROCEDURE (1) : APPLICATION_DATA_BLOCK_ATTRIBUTE

STORE ATTRIBUTE DEFINITION FOR TYPE IN DATA DICTIONARY ENTRY

PROCEDURE (2) : CONSTITUENT_LIST_ATTRIBUTE

OBTAIN CONSTITUENT LIST POSITION FROM SCHEMA MODEL

STORE ATTRIBUTE DEFINITION FOR TYPE IN SCHEMA MODEL ENTRY

PROCEDURE (3) : ENUMERATION_ATTRIBUTE

STORE ATTRIBUTE DEFINITION FOR ENUMERATION TYPE

OBTAIN NUMBER OF ENUMERATION VALUES FROM SCHEMA MODEL

STORE NUMBER OF ENUMERATION VALUE IN ENUMERATION INDEX TABLE

STORE ENUMERATION VALUE TABLE INDEX POSITION IN ENUMERATION

INDEX TABLE

LOOP THROUGH ENUMERATION VALUES

OBTAIN ENUMERATION VALUE FROM SCHEMA MODEL

STORE ENUMERATION VALUE IN ENUMERATION VALUE TABLE

END LOOP

PROCEDURE (4) : ARRAY_ATTRIBUTE

DETERMINE THE NUMBER OF ARRAY DIMENSIONS

STORE ARRAY INFORMATION INTO RUN-TIME SUBSCHEMA

STORE TABLE INDEX POSITION FOR ARRAY LIST TABLE AND THE

NUMBER OF DIMENSIONS INTO ARRAY INDEX TABLE

CALCULATE TOTAL SIZE OF THE ARRAY AND STORE INTO ARRAY

INDEX TABLE

FOR THE NUMBER OF ARRAY DIMENSIONS

CALCULATE THE SIZE OF EACH ARRAY

STORE SIZE AND LOW-BOUND INTO ARRAY LIST TABLE

END LOOP

$COMMENTS:

$CHANGE CONTROL:

REVISED: (DATE, NAME, GROUP, REASON/DESCRIPTION)

ORIGINATED: 29 APRIL 1987, M. H. CHOI, DBMA

END $INCLUDE RSTRDD **************************************************