

RECORD MAPPING

INTRODUCTION TO RECORD MAPPING

TABLES/AS has facilities for mapping table fields in the following ways:

- Convert quantity fields with a sign and decimal to:
 - Zoned decimal format
 - Packed decimal format
 - Binary decimal format
- Convert date fields in one format to any of 21 valid date formats.
- Map data fields into any of the following field formats:
 - Character
 - Zoned
 - Packed
 - Binary
- Convert formatted fields into non-formatted fields.
- Convert elementary fields to group fields.
- Convert repeating groups into single group occurrences.
- Convert single group occurrences into repeating group occurrences.

The TABLES/AS Screen Processor facility allows you to:

- Perform all the conversions listed above
- Specify search operator fields
- Specify function code fields
- Specify which fields of a given screen are being mapped/switched
- Specify the uses (add, change, delete, inquire) of the map
- Specify limits on IMS, VSAM, DB2, or TABLES/MS records retrieved for one execution of the TABLES/AS Screen Processor facility
- Validate requirements for A, D, C processing against the mapped table
- VSAM KSDS file access specifications which define the characteristics of the table
- SSA (segment search argument) data necessary to define the path to the specific segment being updated or retrieved. This is required only when accessing an IMS/DB segment other than TABLES/MS. Map all segments which are in the path from the root to this target segment.

MAPPING PROCESS

The mapping process is initiated by specifying a table to map to. Once the source is identified, a screen is presented showing the field names used presently and the field names in the table. Relating a field name on screen to a field name in table is called mapping.

If the TABLES/AS Screen Processor is being used, the required table processing needs to be defined under the option allow functions. Some possible reasons for mapping are:

- To validate an existing record to insure the record is present/absent.
- For performing functions such as: adding, changing, deleting, or inquiring against a table.
- For switching data from one screen to another.

GENERAL INFORMATION**TABLE TYPES TO MAP TO****VSAM files from:**

- COBOL copy code member
- PL1 copy code member

IMS segments from:

- COBOL copy code member
- PL1 copy code member

DB2 tables from:

- DB2 catalog
- COBOL copy code member
- PL1 copy code member

TABLES/MS tables from:

- TABLES/MS table definitions
- COBOL copy code member
- PL1 copy code member

Working storage areas from:

- COBOL copy code member
- PL1 copy code member

REQUIREMENTS FOR MAPPING

IMS/VSAM, DB2, or TABLES/MS definitions that contain group level fields must have the name of a copy code member containing the breakdown of the group fields so the individual level fields can be mapped.

For IMS/VSAM segments, map entirely using COBOL or PL1 copy code.

Before Mapping:

- Insure the copy code member exists in a copy code library with all of the elementary fields defined, if required.
- Run batch job JCL401MC to bring the copy code member into TABLES/AS (See the TABLES/MS and TABLES/AS Technical Guides).

Copy Code Limitations:

All redefined statements and subordinate levels within the statements are discarded. The elementary level breakdown desired must not be within redefine.

The picture clause for numeric fields must not contain more than four digit

- Acceptable: PIC 9(10)
- Unacceptable: PIC 9(00010)

Binary fields must be half words or full words. Double word binary fields are ignored.

The 01 levels with a picture clause do not extract. The 01 level is a name only followed by one or more elementary level items below it.

Only the first three levels within copy code are extracted.
 01, 05, 10 or 01, 02, 05 etc.

VALID MAPPING CONDITIONS

FROM FIELD TYPE -----	TO FIELD TYPE -----	COMMENTS -----
NUMERIC	NUMERIC	
NUMERIC	ALPHANUMERIC	
NUMERIC	QUANTITY	
NUMERIC	DATE	IF NO DATE CODE USED
ALPHANUMERIC	ALPHANUMERIC	
QUANTITY	QUANTITY	

INVALID MAPPING CONDITIONS

FROM -----	TO -----	COMMENTS -----
NUMERIC	DATE	IF DATE CODE USED
ALPHANUMERIC	NUMERIC	
ALPHANUMERIC	QUANTITY	
ALPHANUMERIC	DATE	IF DATE CODE USED
QUANTITY	DATE	IF DATE CODE USED

Mapping Possibilities:

FLD1	FLD2	FLD3	FLD4	FLD5
XX	XX	XX	XX	XX
			XX	XX
			XX	XX
			XX	XX

TABLE FORMATS POSSIBLE FROM THE ABOVE SCREEN FORMAT

FORMAT 1

FLD1 FLD2 FLD3 Map fields 1-3 to a table format.

FORMAT 2

FLD4 FLD5
 FLD4 FLD5 Map fields 4-5 to a table format.
 FLD4 FLD5 Only 1 map is required to generate the 4 records.
 FLD4 FLD6

FORMAT 3

FLD1 FLD2 FLD3 FLD4 FLD5
 FLD1 FLD2 FLD3 FLD4 FLD5 Map fields 1-5 to a table format.
 FLD1 FLD2 FLD3 FLD4 FLD5 Only 1 map is required to generate
 FLD1 FLD2 FLD3 FLD4 FLD5 the 4 records.

FORMAT 4

FLD1 FLD2 FLD3 FLD4 FLD5 FLD4 FLD5 FLD4 FLD5 FLD4 FLD5
 Map all fields on the screen to a table format.

MAPPING REPEATING GROUPS

TABLES/AS makes a distinction between types of repeating groups and handles each type differently in the mapping process.

1. Horizontal repeating group - has the same field name assigned two or more times, consecutively within the copy code.

Jan. Sales Feb. Sales March Sales April Sales

OR

Jan. Sales
 Feb. Sales
 March Sales
 April Sales

The copy code contains an occurrences clause for each occurrence of this field. To map this group, the first occurrence of the field name from the screen is mapped to the field name of the occurrence clause. The remaining occurrences are automatically adjusted by the mapping process.

2. Vertical repeating group - has the same set of field names assigned two or more times consecutively within the copy code.

Item Quantity Tax Item Quantity Tax

OR

Item Quantity Tax
 Item Quantity Tax

OR

Item Quantity Tax Item Quantity Tax
 Item Quantity Tax

All of the fields repeat as a set. Map the first set of field names from the screen to the field names in the copy code. The remaining occurrences are automatically adjusted by the mapping process.

3. Vertical and horizontal repeating groups are combined.

Employee Jan. Feb. Jan. Feb. Net
 Salary Salary IRA IRA Salary

Employee Jan. Feb. Jan. Feb. Net
 Salary Salary IRA IRA Salary

January/February Salary and January/February IRA are horizontal groups.

Employee, January/February Salary, January/February IRA, and Net Salary is one set of a vertical group.

PRIMARY OPTION MENU OPTION ==> 3 - RECORD MAPPING

When you select Option 3, the system presents the TABLES/AS Record Mapping menu. See Figure 2-48.

```

..... TABLES/AS RECORD MAPPING MENU .....
SELECT OPTION ==>                               SCREEN
A - ADD a New Map                               D - DELETE a Map
C - CHANGE a Map                                V - VIEW a Map

Enter MAP to process from the list below:
MAP NUMBER ==>                                (BOTH DIGITS ARE REQUIRED)

.....
MAP#  MAP NAME  MAPPED FROM  TABLE NAME
.....
PF 1=HELP      2=      3=END      4=RETURN      5=      6=
PF 7=         8=      9=      10=         11=     12=CANCEL
  
```

Figure 2-48

The options are:

A - ADD A NEW MAP

Specify the table types and sources for mapping each table

C - CHANGE A MAP

Change mapping definitions for a previously mapped table

D - DELETE A MAP

Delete all the mapping and processing for a mapped table

V - VIEW A MAP

View the current definition of a mapped table

PF KEYS

PF3 Return to the TABLES/AS Primary Option menu

PF4 Return to the TABLES/AS Primary Option menu

PF12 Return to the TABLES/AS Primary Option menu

MAP NUMBER ==>

To perform Options C, D, or V, the desired map number must be supplied from the list appearing on the bottom half of the screen.

MAP COLUMN

A list of the automatically assigned numbers appears here when new maps are added.

MAP NAME COLUMN

As tables are defined for mapping, a name is automatically generated by TABLES/AS based on the source of the mapping.

MAPPED FROM COLUMN

The name of the source used for mapping is automatically generated by TABLES/AS (TABLES Field Definitions DB2, IMS/VSAM or Copy Code Source Member).

TABLE NAME COLUMN

The name of the table for which the map is defined.

OPTION ==> A - ADD A NEW MAP

When you wish to add a new map, you must identify the source. The system displays the TABLES/AS Mapping - Source Definition screen. This screen is slightly different between CICS and IMS systems.

Figure 2-49 shows the CICS version.

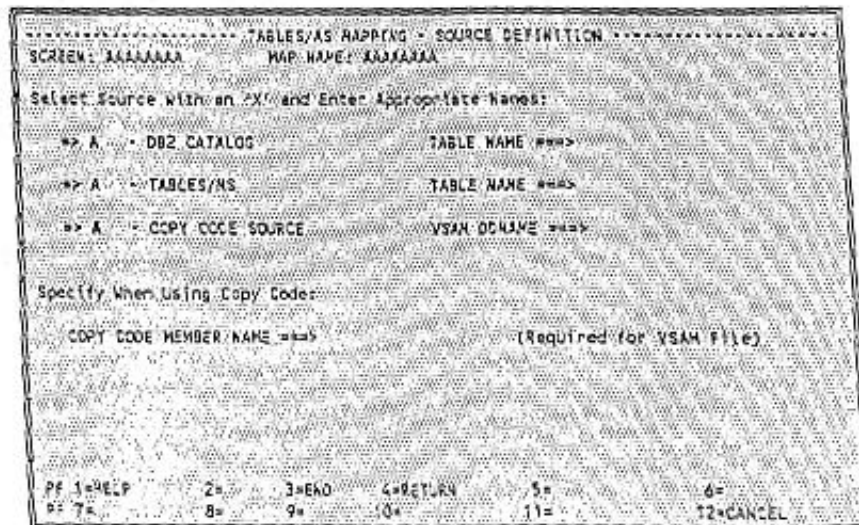


Figure 2-49

Figure 2-50 shows the IMS version.

```

----- TABLES/AS MAPPING - SOURCE DEFINITION -----
SCREEN:                                     MAP NAME:
Select Source with an 'X' and Enter Appropriate Names:
=> X - DB2 CATALOG                         TABLE NAME =>
=> A - TABLES/MS DEFINITION              TABLE NAME =>
=> A - COPY CODE SOURCE INPUT             SEGMENT NAME =>
                                           IMS DSD NAME =>

Specify When Using Copy Code:
COPY CODE MEMBER NAME ==>>>              (required for IMS Segment)

PF 1=HELP      2=      3=END      4=RETURN      5=      6=
PF 7=          8=      9=         10=         11=     12=CANCEL
  
```

Figure 2-50

ENTER X NEXT TO SOURCE WHICH DEFINES MAPPING FOR THIS SCREEN

Indicate the source which defines mapping for the screen by placing an X to the left of one of the following:

DB2 CATALOG:

- Enter the DB2 table name fully qualified
- May enter a name next to Copy Code Member Name if there is a need to break down any group fields using copy code

TABLES/MS

- Enter the TABLES/MS table name
- May enter a name next to Copy Code Member Name if there is a need to break down any group fields using copy code.

COPY CODE SOURCE INPUT

In CICS

- Place an X to the left of COPY CODE SOURCE INPUT
- Enter VSAM FILE NAME ==>>
- Enter COPY CODE MEMBER NAME ==>>
- Press ENTER

In IMS

- Place an X to the left of COPY CODE SOURCE INPUT
- Enter IMS SEGMENT NAME ==>
- Enter DBD NAME ==>
- Enter COPY CODE MEMBER NAME ==>
- Press ENTER

EXAMPLE - ADD A NEW TABLE MAP

Continuing the example of the order databased tables developed earlier in this section, the order header table is mapped to the line item table. The entries on the Define Mapping Source screen are as follows in a CICS system:

```
X - COPY CODE SOURCE INPUT
  VSAM FILE NAME      ==> ORDEDR
  COPY CODE MEMBER NAME ==> ORDHEAD
```

The table format extract batch utility, JCL40IMC, and/or SSA extract utility, JCL40IMG, must be previously run for this copy code name.

Pressing ENTER displays the screen that is being mapped to and from so fields may be selected to be mapped. See Figure 2-51.

ORDER ENTRY

ENTRY DATE: X
 CUSTOMER NUMBER: X OR CUSTOMER SHORT NAME: X
 SHIP-TO LOCATION: X
 REQUESTED SHIP DATE: X

ITEM NO.	QUANTITY	TAX	PROMISED	ITEM NO.	QUANTITY	TAX	PROMISED
-----	-----	----	----	-----	-----	----	----
X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X

Figure 2-51

Fields marked X are selected as fields that may be mapped for this table. Enter an M in place of the X for those fields being mapped. Fields marked with # may not be mapped.

Enter an M for each of the fields at the top of the screen to map the fields from the screen to the order header.

ENTER DATE: M
 CUSTOMER NUMBER: M OR CUSTOMER SHORT NAME: M
 SHIP-TO LOCATION: M
 REQUESTED SHIP DATE: M

Mapping for the ITEM NO, QUANTITY, TAX CODE, and PROMISED DATE is done later.

Press ENTER. Figure 2-52 shows the results of mapping the upper portion of the ORDERENT screen to a copy code member named ORDHEAD.

SCREEN		TABLES/AS		MAPPING		FIELD DEFINITION		RECORD	OPERATOR
FIELD NAME	DATE	FIELD SEQ	MAP	DATE	FIELD NAME TO MAP TO AND FROM	SEQ	FIELD NAME	NO	FIELD NAME
ENTRYDT	1	001	999		WKORDS-CRDEY				
CUSTNO		002	999	3	WKORDS-SHIP TO				
SHORTNAM		003	999	5	WKORDS-RSHIPGAT				
SHIPDT		004	999		WKORDS-ENTERDATE				
RECSHPDT		005	999		WKORDS-CUSTOMERS				
			999		WKORDS-SHORTNAME				
			999		WKORDS-ORDERVCHG				
			999		WKORDS-PRICE LIST CODE				
			999		WKORDS-PRIORITY				
			999		WKORDS-HANDLING CHARGE				

PF 1=HELP	2=	3=END	4=RETURN	5=	6=
PF 7=UP-SCRN	8=DOWN-SCRN	9=	10=UP-REC	11=DOWN-REC	12=CANCEL

Figure 2-52

This screen shows the results of mapping the upper portion of the ORDERENT screen to a copy code member named ORDHEAD. The field names on the right side of the screen came from the copy code member. The field names on the left side, are the field names used in the example screen. Only the field names for those fields which were selected for mapping by placing an M on the previous screen are shown. All others are ignored.

SCREEN DATE FORMAT

The code under the Screen Date Format is automatically placed there based on the date format defined for the screen.

FIELD SEQ #

An automatically assigned sequence number beginning with 001 and incremented by 1 for each field listed. This is the primary field used to map the fields together.

MAP SEQ #

An automatically assigned sequence number always equal to 999 at the beginning of the mapping process. Replace this value with the FIELD SEQ # value for the corresponding field. When mapping is completed, each set of fields with the same FIELD SEQ # and MAP SEQ # is mapped together.

TABLE DATE FORMAT

When first displayed, this field contains a value of L for DB2 date field, a value of I for TABLES/MS date field, and a value of space for all others. If the field being mapped to is a date field, enter one of the valid date codes to automatically convert from one date format to the other.

1 MMDDYY	F YY/DDD	
2 MMDDYYYY	G YYYY/DDD	
3 DDMMYY	H DD-MMM-YY	('01-JAN-90',L=9)
4 DDMMYYYY	I DD-MMM-YYYY	('01-JAN-1990',L=11)
5 YYMMDD	J MON DD,YYYY	('JUNE 1, 1990',L=18)
6 YYYYMMDD	K MMM DD,YYYY	('OCT 1, 1990',L=12)
7 MM/DD/YY	L YYYY-MM-DD	(DB2 FORMAT, ISO, JAPANESE)
8 MM/DD/YYYY	M DD.MM.YYYY	(EUROPEAN STD)
9 DD/MM/YY	S TIME STAMP	
A DD/MM/YYYY	T HHMMSS	
B YY/MM/DD	U HH:MM:SS	
C YYYY/MM/DD	V HHMM.SS	
D YYDD	W HH.MM AM/PM	
E YYYYDD		

TABLE FIELD NAME TO MAP TO AND FROM

This is the name of a field obtained from the source defined for mapping. If copy code was used in addition to another source, the names from the primary source followed by the names of the sub-defined fields for any groups are presented.

SORT NO

Sort sequence number for DB2 row selection. Multiple fields may be selected for sorting. The sort sequence (order by) is stored in SCRORD table. This table may be viewed by using TABLES/MS processing menu.

SORT S

Sort sequence

- A = Ascending
- D = Descending

OPERATOR FIELD NAME

Operator Field Name is the name of a field on the screen which may be used to enter a search operator.

Search operators specify a condition to be met when retrieving records. If a search operator is not defined, then a default of (=) Equal To the value of the search field is applied. The following are the valid search operators:

- < Less than
- > Greater than
- = Equal to
- L Less than or equal to
- G Greater than or equal to
- ~ Not equal to

When maps are created for table validation, embedded search operators may be specified instead of operator field names. The embedded search operators must be entered with quotes on both sides. For example, search operator greater than (>) is entered as '>'.

PF KEYS

PF3	Save results of mapping and return to the Table Mapping Option menu
PF4	Save results of mapping and return to the TABLES/AS Primary Option menu
PF7	Scroll the screen names up
PF8	Scroll the screen names down
PF10	Scroll the table field names up
PF11	Scroll the table field names down
PF12	Return to the table Mapping Option menu without saving the mapping
ENTER	Resequence the table field names into the sequence of the map sequence numbers assigned so far

OPTION ===> C - CHANGE A MAP

When you wish to change an existing map, enter MAP NUMBER ===> on the TABLES/AS Table Mapping menu.

The system displays the TABLES/AS Mapping Field Definition screen. See Figure 2-53.

```

..... TABLES/AS MAPPING - FIELD DEFINITION .....
SCREEN:
===== RECORD =====
FIELD DATE FIELD MAP DATE FIELD NAME TO MAP SORT FIELD
NAME FORMAT SEGN SEGN FORMAT TO AND FROM NO S NAME
-----
ENTRDT 1 001 999 WKORDS-ORDKEY
CUSTNO 002 004 5 WKORDS-SHIPTO
SHORTNAM 003 001 3 WKORDS-RSHIPDT
SHIPTO 1 004 002 WKORDS-ENTERDATE
KERSHPDT 005 003
          999 WKORDS-CUSTNUMB
          999 WKORDS-SHORTNAME
          999 WKORDS-ORDERNUMB
          999 WKORDS-PRICE/LIST-CCCB
          999 WKORDS-PRIORITY
          999 WKORDS-HANDLING-CHARGE

PF F1=HELP      2=      3=END      4=RETURN      5=      6=
PF F2=LP=SCRN  8=DOWN=SCRN  9=      10=UP=REC     11=DOWN=REC  12=CANCEL
    
```

Figure 2-53

This screen shows the mapping definition in effect. You may change it as described in Add a New Map, earlier in this section.

OPTION ===> D - DELETE A MAP

When you wish to delete an existing map, enter MAP NUMBER ===> on the TABLES/AS Table Mapping menu, press ENTER and the map is deleted.

Remaining map numbers are automatically re-sequenced.

OPTION ===> V - VIEW A MAP

When you wish to view an existing map, enter MAP NUMBER ===> on the TABLES/AS Table Mapping menu.

The system displays the TABLES/AS Mapping Field Definition screen. See Figure 2-54.

The screenshot shows a terminal window with the title 'TABLES/AS-MAPPING' and 'FIELD DEFINITION'. The main content is a table with columns: FIELD, DATE, FIELD, PA, DATE, FIELD, NAME, JO, HA, SO, and OPERATOR. The table lists several mappings for fields like ENTRYDT, CUSTNO, SHORTNAM, SHIPTO, and REGSHIPOT. At the bottom, there are function key definitions: PF 1=HELP, PF 7=CF=SCRN, 8=DOWN SCRN, 9=, 10=UP=, 11=CF=, and 12=CANCEL.

FIELD	DATE	FIELD	PA	DATE	FIELD	NAME	JO	HA	SO	OPERATOR
ENTRYDT		001	999		W	WORDS-CRKEY				
CUSTNO		002	004	5	W	WORDS-SHPTO				
SHORTNAM		003	001	5	W	WORDS-SHPTDAT				
SHIPTO		004	002		W	WORDS-ENTERDATE				
REGSHIPOT		005	003		W	WORDS-CUSTNUM				
			999		W	WORDS-SHORTNAME				
			999		W	WORDS-ORDERNUM				
			999		W	WORDS-PRICELIST-CD				
			999		W	WORDS-PRICELIST				
			999		W	WORDS-HANDLING-CHARGE				

PF 1=HELP 2= 3= 4= 5= 6= 7= 8= 9= 10= 11= 12=

PF 7=CF=SCRN 8=DOWN SCRN 9= 10=UP= 11=CF= 12=CANCEL

Figure 2-54

This screen shows the mapping definition in effect.

All fields are protected and you can not change any of them.

PRIMARY OPTION MENU

OPTION ==> 4 - PROCESSING OPTIONS

Selecting processing options allows you to:

- **SPECIFY FUNCTIONS TO BE ALLOWED**
Select processing functions (A, C, D). Required in order to utilize TABLES/AS Screen Processor.

This is required only for maps that are to be processed using Add, Change, Delete or Inquire function. Maps that are set up for switching data and table validations must not be specified under allow functions.
- **SPECIFY TABLE LEVEL VALIDATION**
Used to indicate if additional validation is desired in TABLES/MS table, DB2 table, VSAM file, or IMS/DB segment.
Used to verify that a field is either present or absent on a TABLES/MS table, DB2 table, VSAM file, or IMS/DB segment.
- **SPECIFY VSAM FILE ACCESS DATA, OR IMS SSA DATA**
Used to define the file being accessed.

When you select Option 4 on the TABLES/AS Primary Option menu and enter the screen name, the system displays the TABLES/AS Process Options menu. See Figure 2-55.

```

.....TABLES/AS PROCESS OPTIONS MENU.....
SELECT OPTION ==>
1 ALLOW FUNCTIONS          * ALLOW ADD, CHANGE AND/OR DELETE
2 REFERENTIAL INTEGRITY   * DEFINE REFERENTIAL PROCESSING
3 DATABASE ACCESS         * SPECIFY VSAM FILE OR IMS SSA INFORMATION

ENTER/VERIFY THE FOLLOWING:

MAP NUMBER ==>          (SELECT FROM BELOW)
SCREEN NAME ==>

-----
MAP---MAP NAME-----MAPPED FROM-----TABLE NAME-----
-----
PF-1=HELP      2=      3=END      4=RETURN      5=      6=
PF-7=         8=      9=     10=         11=     12=CANCEL
  
```

Figure 2-55

The options are:

- 1 - ALLOW FUNCTIONS
- 2 - REFERENTIAL INTEGRITY
- 3 - DATABASE ACCESS

The lower half of the screen displays up to 5 maps for the screen. The MAP column contains the identifying map number. The TABLE column identifies the specific TABLE the map processes against. The MAPPED FROM column identifies the source table.

You enter the option number and map number. Press ENTER and the system displays the appropriate screen.

PF KEYS

- PF3 Return to the TABLES/AS Primary Option menu
- PF4 Return to the TABLES/AS Primary Option menu
- PF12 Return to the TABLES/AS Primary Option menu

SELECT OPTION ==>> 1 - ALLOW FUNCTIONS

When you select Option 1 on the TABLES/AS Process Options menu, the system displays the TABLES/AS Process Options - Function screen. See Figure 2-56.

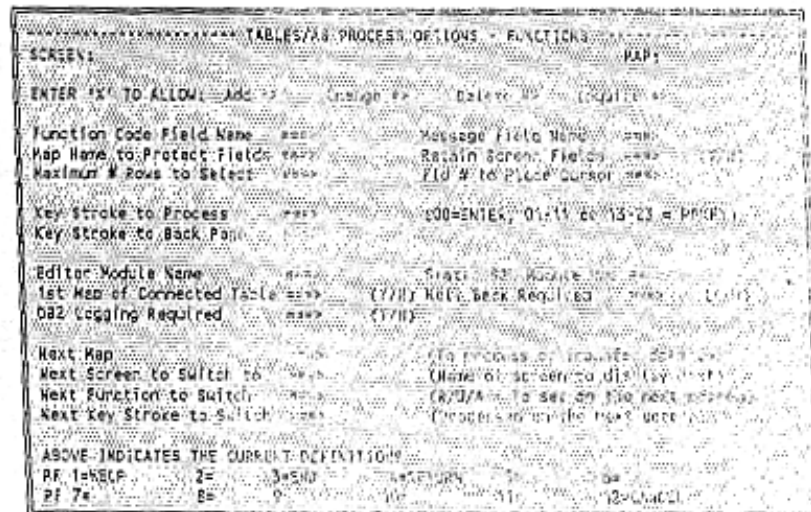


Figure 2-56

MARK ALLOWED FUNCTIONS WITH X

Enter an X next to each potential use of the map.

- Add a record to a table.
- Change values in a table.
- Delete records in a table.
- Inquire about one or more tables.

FUNCTION CODE FIELD NAME

The field name defined on your screen that is used at entry to identify the function being performed for that table on your screen.

If the allow function is either Add or Inquiry only, then the function code field is not required, and it is not used during screen processing.

A single function code field can be used for multiple tables (repeating groups) on the screen or a function code can be established as part of the repeating group so a single screen could perform multiple functions with the various repeating groups, independent of each other.

MESSAGE FIELD NAME

The name of the field on the screen where error messages are shown.

MAP NAME TO PROTECT FIELDS

One or more fields on the screen may be protected by creating a map containing those fields. Specify the name of the map created to protect the fields.

RETAIN SCREEN FIELDS

If fields for this table are to be retained on the screen in add mode.

MAXIMUM # ROWS TO SELECT

Specify the limits used to satisfy a single search within the TABLES/AS Screen Processor environment.

For DB2, the limit determines how many FETCH calls are to be issued to DB2. For TABLES/MS, IMS and VSAM, the limit determines how many records are to be searched to satisfy a retrieval.

FLD # TO PLACE CURSOR

Relative field number on the screen to be used for initial cursor positioning when there is no function code field specified for the given screen. Used only when there is no function code field name given or it is an inquiry only map on the given screen.

KEY STROKE TO PROCESS

The PF key number that is entered to indicate that screen processing should take place for this table. 00 indicates the ENTER key. The other choices are 01, 11, and 13-23. PF12 is reserved.

KEY STROKE TO BACK-PAGE

The PF key number that is entered to indicate that back-paging (scrolling up) is to occur for this table. This is permitted for inquiry only.

EDITOR PROGRAM NAME

The name of a user-written program that is used to perform editing beyond the scope of TABLES/MS. This field is not required. See the TABLES/MS and TABLES/AS Technical Guides.

STATIC SQL MODULE NAME

Name of a program which will be used to execute static SQL calls. In CICS, this must be a name defined in PPT with language = COBOL. The static SQL module is created in batch using a JCL procedure supplied with the product. (See Appendix H Technical Guide, JCLSQL01.)

1ST MAP OF CONNECTED TABLE

Enter a 'Y' or 'N' to indicate whether the given processing option applies to the 1st map in a chain of connected maps to be processed together.

A code of 'Y' provides capability to update multiple tables in one key stroke. The following should be considered:

- Requires same function code field, key stroke, and allow functions
- Connection is established using the next table name
- Rollback option may be selected to back out partial changes
- A maximum of 14 tables may be connected

ROLL BACK REQUIRED

Enter a 'Y' or 'N' to indicate whether a roll back is required whenever a database error occurs. A code of 'Y' indicates that all database updates are to be backed out when a failure occurs under the following conditions:

- A multi-row screen contains a single table and a failure occurs after updating the 1st row successfully.
- A single or multi-row screen contains more than one table and a failure occurs after updating the first table successfully.

DB2 LOGGING REQUIRED (For DB2 only)

If this option is selected, changes made to the table are logged and an audit trail can be printed in batch.

NEXT MAP

If Next Screen Name to Transfer has been specified, enter the table name to be mapped on the next screen. To transfer data from one screen to another, both screens must have been mapped to the same table using the same map name.

To process a second table, VSAM file, or IMS segment with a single key stroke. Enter the name of the table, file or segment being processed. Both tables are then processed using a single key. Specify the functions being allowed for the second table. Identify a key stroke for processing the second table which is different than the key stroke specified on this screen. The second table is then processed by itself by using the second key stroke.

NEXT SCREEN TO SWITCH TO

If it is desired that another screen be displayed after this screen, enter the name of the next screen to be displayed. This field is not required.

NEXT FUNCTION TO SWITCH

A function to be performed internally before the next screen is displayed. For example, function R specifies that the next table is to be accessed and the data from it is to be displayed on the next screen.

NEXT KEY STROKE TO SWITCH

A key stroke to be used internally for processing the internal function (TRANSFER TO FUNCTION) before displaying the next screen. This field is optional, but if specified, it must be the key stroke defined on the next screen for processing the given function on the given table.

PF KEYS

- PF3 Process functions entered and return to the TABLES/AS Process Options menu
- PF4 Process functions entered and return to the TABLES/AS Primary Option menu
- PF12 Cancel functions entered and return to the TABLES/AS Process Options menu

SELECT OPTION ==>> 2 - REFERENTIAL INTEGRITY

This option is used to define the inter-table validation that is to take place when updating a specific table. The validation is specified on the TABLES/AS Process Options - Referential Integrity screen. See Figure 2-57.

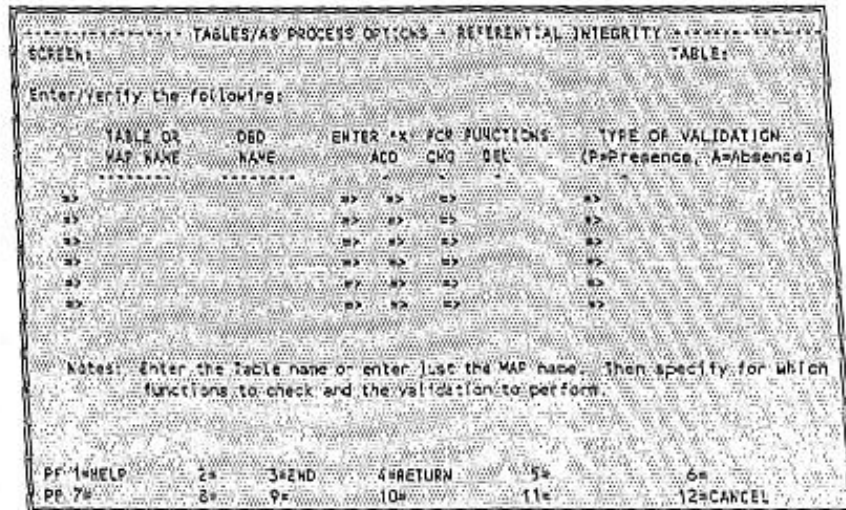


Figure 2-57

The SCREEN: and TABLE: areas display the names of the screen and table, respectively, you are defining.

If the table is a VSAM file, TABLE: is the VSAM DDNAME.
If the table is a DB2 table, TABLE: is the map name.

TABLES TO BE VALIDATED

TABLE NAME

Enter the name of the table, map name, file or IMS segment which is being validated against. This must be an existing mapped table. For DB2 tables, it must be the map name.

FUNCTIONS

Indicate which function(s) requires the validation process by placing an X below Add, Change, and/or Delete.

TYPE OF VALIDATION

P for presence, causes the system to validate that the mapped table is present before updating can be completed. For example, we want to perform a presence check on the department table whenever an attempt is made to add or change an employee record, assuring that the department number does exist in the DEPTFILE table.

A for absence, causes the system to validate that the mapped table is absent before updating can be complete.

Sometimes a presence check is necessary for one function and an absence check for another function. For example, a salesperson's number needs to be present on the salesperson's file when adding or changing the commission record. And a salesperson's number needs to be absent on the commissions file when deleting a salesperson's record.

The screen shown in Figure 2-58 demonstrates how this is entered.

TABLES/AS PROCESS OPTIONS				REFERENTIAL INTEGRITY		TABLE:
SCREEN:						
Enter/Verify the following:						
TABLE OR MAP NAME	ENTER 'X' FOR FUNCTIONS			TYPE OF VALIDATION (P=Presence, A=Absence)		
	ADD	CHG	DEL			
>> SLSPEN	>> X	>> Y	>>	>> P		
>> SLSPSH	>>	>>	>> X	>> A		
>>	>>	>>	>>	>>		
>>	>>	>>	>>	>>		
>>	>>	>>	>>	>>		

Notes: Enter the table name or enter just the MAP name. Then specify for which functions to check and the validation to perform.

PF 1=HELP 2= 3=END 4=RETURN 5= 6=

PF 7= 8= 9= 10= 11= 12=CANCEL

Figure 2-58

EFFECTIVITY VALIDATION FOR DB2 TABLES

During Add, Change, Delete from a DB2 table, effectivity validation on other tables is performed based on referential processing options. The following must be considered:

1. Columns to be validated on must be mapped including the Break-in date. Mapping of a Break-out date is optional.
2. The tables to be validated on must be under effectivity control; table to be processed need not be under effectivity control.
3. If dates for the effectivity range are not supplied through the table being processed, the current date is used for the required Break-in effective date and the effectivity checking on the Break-out date, if defined, is ignored.
4. The validation is performed for the presence or absence

PF KEYS

PF3	Save changes and return to the TABLES/AS Processing Options menu
PF4	Save changes and return to the TABLES/AS Primary Option menu
PF12	Cancel changes and return to the TABLES/AS Process Options menu
ENTER	Accept changes and return to the previous screen

SELECT OPTION ==> 3 - DATABASE ACCESS

When you select Option 3 on the TABLES/AS Process Options menu, the system displays either the TABLES/AS Process Options - VSAM File Access screen, or the TABLES/AS Process Options - Database Access screen. The VSAM File Access screen is shown in Figure 2-59.

```

..... TABLES/AS PROCESS OPTIONS - DATABASE ACCESS .....
SCREEN:
Enter/Verify the VSAM File Information:

RECORD LENGTH  ****
KEY FIELD START ****
KEY FIELD LENGTH ****

PF 1=HELP      2=      3=END      4=RETURN    5=
PF 7=          8=      9=          10=         11=
PF 12=CANCEL
  
```

Figure 2-59

SCREEN

The screen name is automatically provided from the name entered on the Define Options for Screen Processor menu.

VSAM DDNAME

The file name is automatically provided for the name entered on the Define Options Screen Processor menu.

RECORD LENGTH

Enter the length of the VSAM file record in a four-digit format. The maximum acceptable value is 4000.

Record length fields must be mapped and established in one of the following methods:

Variable length files are treated as fixed length files with the record size equal to the maximum record size. An editor program can be used to set the length value based on the data entered on the screen.

A field length can be defined on the screen for the operator to enter the record length.

If the record really is not variable but only defined that way, a non-display field can be established on the screen. By using the initial values function, the value can be set to the actual length always written.

KEY FIELD START

The starting position of the key or sequence field in a table is a four-digit format. The field start position must be greater than zero.

KEY FIELD LENGTH

The length of the key or sequence field in bytes in a table is in a three-digit format.

NOTE: Once a VSAM field is defined to TABLES/AS, it is not defined again for use on other screens. TABLES/AS stores the information and returns if that file is used for mapping on some other screen.

PF KEYS

- PF3 Save changes and return to the TABLES/AS Process Options menu
- PF4 Save changes and return to the TABLES/AS Primary Option menu
- PF12 Cancel changes and return to the TABLES/AS Process Options menu

The Database Access screen for IMS access is shown in Figure 2-60. This screen is used to specify information necessary for TABLES/AS to create the segment search arguments to access the segment to which the map pertains.

```

..... TABLES/AS PROCESS OPTIONS ..... DATABASE ACCESS .....
SCREEN:                                     SEGMENT NAME:
Enter/Verify IMS SEGMENT SEARCH ARGUMENT Information:
                                           DBD NAME:

SEGMENT LENGTH      >>>>          KEY FIELD NAME >>>>
KEY FIELD START     >>>>          KEY FIELD LENGTH >>>>
DBD OCCURRENCE NUMBER IN THE PSS >>>>
SECONDARY INDEX ACCESS (Y OR N) >>>>  SHARED INDEX >>>>  (Y OR N)

Enter/Verify NEXT HIGHER LEVEL SSA'S:
LEVEL  SEGMENT NAME  LENGTH  KEY NAME  KEY START  KEY LENGTH
-1
-2
-3
-4
-5
-6
-7
-8

PF 1=HELP      2=      3=END      4=RETURN      5=      6=
PF 7=          8=      9=          10=          11=      12=CANCEL

```

Figure 2-60

Each level in the database from the root to the target segment must have been mapped to identify the screen field which corresponds to the key/sequence field of that segment.

The segment information on the upper portion of this screen corresponds to the segment to which this map pertains. The lower portion of the screen pertains to those segments at higher levels (parents) within the data access path.

Most of the information necessary for this screen is obtained by executing JCL40IMG (Extract Segment Information from DBD Source). Refer to the TABLES/MS and TABLES/AS Technical Guide. If this is done, only the DBD Occurrence Number, Secondary Index, and Shared Index need to be specified.

SCREEN

The screen name is automatically provided from the name entered on the Define Options for Screen Processor menu.

SEGMENT NAME

The name is automatically provided from the name entered on the Define Options for Screen Processor menu.

DBD NAME

The name is automatically provided based on the prior mapping definition.

SEGMENT LENGTH

- Enter the length of the segment as defined in the DBD in a four-digit format. The maximum acceptable value is 4000.
- Segment length fields must be mapped and established in one of the following methods:
 - Variable length segments are treated as fixed length segments with the segment size equal to the maximum record size. An editor program can be used to set the length value based on the data entered on the screen.
 - A field can be defined on the screen for the operator to enter the record length. (Not practical.)
 - If the segment really is not variable but only defined that way, a non-display field can be established on the screen. By using the initial values function, the value can be set to the actual length always written.

KEY FIELD NAME

The name of the key or sequence field as defined in the DBD. This is either the primary key or XDFLD (secondary index) name.

KEY FIELD START

The starting position of the key or sequence field in the table is a four-digit format.

KEY FIELD LENGTH

The length of the key or sequence field in bytes in the table is in a three-digit format.

DBD OCCURRENCE # IN THE PSB

The PCB within the PSB which is established to access this DBD in the desired manner. If there are four PCBs for this DBD in the PSB, specify which one to use.

For example, if the second occurrence of this DBD name in the PSB is the proper PCB for accessing this database in the manner desired, enter a value of 002.

Note, this is the occurrence number relative only to this DBD name. It is not the occurrence number within all of the PCBs in the PSB.

SECONDARY INDEX ACCESS (Y/N)

If the accessing of this database with this PCB is by a secondary index, enter Y. If it is not, enter an N.

IS IT A SHARED INDEX?

Enter a Y if the secondary index contains more than one field type.

NEXT HIGHER LEVEL SSAs**SEGMENT-NAME**

The name of the next higher level segment in the hierarchy (the parent of the segment just defined).

LENGTH

The length of the segment as defined in the DBD. It must be in a four-digit format. The maximum value allowed is 4000.

KEY-NAME

The name of the key or sequence field as defined in the DBD.

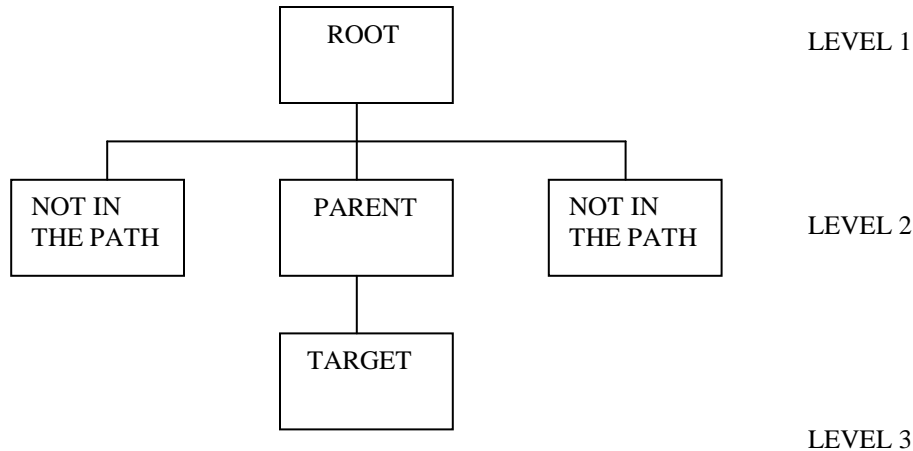
KEY-START

The starting position of the key or sequence field in this segment as defined in the DBD. It must be in a four-digit format.

KEY-LENGTH

The length in bytes of the key or sequence field as defined in the DBD. It must be in a three-digit format.

If the map pertain to a root (top level) segment, no data is entered in the lower portion. If the map pertains to a segment three levels into the database, enter the data for the target segment in the upper portion. Then enter the data for the level just above the target segment in the line numbered – 1. Finally, enter the data for the root segment in the line numbered – 2.



Three maps must have been created to be able to specify the SSA requirements for this example.

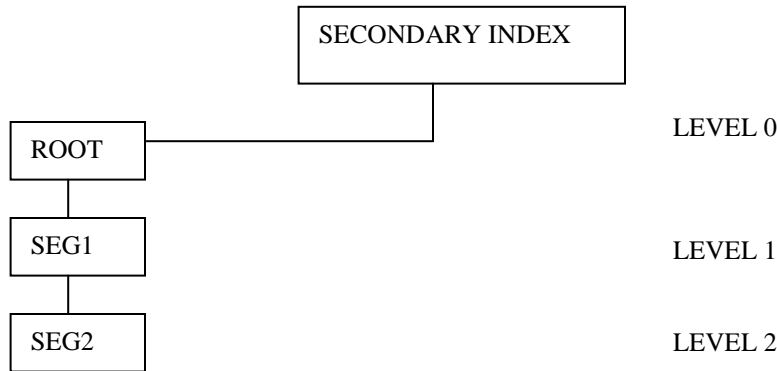
- . A map for the root to relate to the key field.
- . A map for the parent to relate to the sequence field.
- . A map for the target to relate all of the fields relative to this segment.

Note: Once an SSA is defined to TABLES/AS, it does not have to be defined again for use on other screens. TABLES/AS stores this information and returns it if that segment is used for mapping on some other screen.

PF KEYS

- PF 3 Save changes and return to the TABLES/AS Process Options menu
- PF 4 Save changes and return to the TABLES/AS Primary Option menu
- PF 12 Cancel changes and return to the TABLES/AS Process Options menu

EXAMPLES OF SSA CODING



1. Access the root segment
2. Access a segment in Level 1. (SEG 1)
3. Access a segment in Level 2. (SEG 2)

1. To access the root segment

A. Via the primary key

- . Map the root
- . The map must contain the key field
- . Define record processing for the root

SSA DEFINITION

- . Segment length = root length
- . Key field name = primary key for root
- . Key field name = starting position of key field in root
- . Key field length = length of key field
- . Secondary index access = N
- . Next higher level SSAs = None

B. Via a Secondary Index (XDFLD)

- . Map the XDFLD
- . See the section How To Map An XDFLD
- . Map the root
- . Define record processing for the root

SSA DEFINITION

- . Segment length = root length
- . Key field name = XDFLD name
- . Key field start = starting position of XDFLD in copy code
- . Key field length = length of XDFLD
- . Secondary index access = Y

2. To access a segment in Level 1 (SEG1)

A. Via the primary key

- Map the root
- The map must contain the key field
- Map SEG1
- Define record processing for SEG1 map.

SSA DEFINITION

- Segment length = SEG1 length
- Key field name = either the sequence field name for SEG1 or any field name defined in the DBD for SEG1. (If there is no field name defined in the DBD, then the segment cannot be accessed.)
- Key field start = starting position of the field specified above
- Secondary index access = N

Define next higher level SSAs.

<u>Level</u>	<u>Segment Name</u>	<u>Length</u>	<u>Key Name</u>	<u>Key Start</u>	<u>Key Length</u>
-1	Root name	Root length	Primary Key field	Primary Key starting position	Primary Key length

B. Via a Secondary Index (XDFLD)

- Map the XDFLD
- See the section How To Map An XDFLD
- Map SEG1
- Define record processing for SEG1 map

SSA DEFINITION

- Segment length = SEG1 length
- Key field name = either the sequence field name for SEG1 or any field name defined in the DBD for SEG1. (If there is no field name defined in the DBD, then the segment cannot be accessed.)
- Key field start = starting position of the field specified above
- Secondary index access = Y

Define next higher level SSAs.

<u>Level</u>	<u>Segment Name</u>	<u>Length</u>	<u>Key Name</u>	<u>Key Start</u>	<u>Key Length</u>
-1	Root name	Root length	XDFLD name of XDFLD	Start position	Length of XDFLD

3. To access a segment in Level 2 (SEG2)

A. Via the primary key

- Map the root
- The map must contain the key field
- Map SEG1
- This map must contain the key field that is defined on Level 1
- Map SEG2
- This map must contain the key field that is defined on Level 2
- Define record processing for SEG2 map

. Next higher level SSAs = none

SSA DEFINITION

- Segment length = SEG1 length
- Key field name = either the sequence field name for SEG2 or any field name defined in the DBD for SEG2. (If there is no field name defined in the DBD, then the segment cannot be accessed.)
- Key field start = starting position of the field specified above
- Secondary index access = N

Define next higher level SSAs

<u>Level</u>	<u>Segment Name</u>	<u>Length</u>	<u>Key Name</u>	<u>Key Start</u>	<u>Key Length</u>
-1	SEG1 name	SEG1 length	Seg Fld name	Starting position of Seg Fld	Length of Seg Fld
-2	Root name	Root length	XDFLD name	Starting position of Primary Key	Length of Primary Key

B. Via a secondary index (XDFLD)

- Map the XDFLD
- See the section How To Map An XDFLD
- Map SEG1
 - This map must contain the key field that is defined on level 1
- Map SEG2
 - This map must contain the key field that is defined on level 2
- Define record processing for SEG2 map

SSA DEFINITION

- Segment length = SEG2 length
- Key field name = either the sequence field name for SEG2 or any field name defined in the DBD for SEG2. (If there is no field name defined in the DBD, then the segment cannot be accessed.)
- Key field start = starting position of the field specified above
- Secondary index access = Y

Define next higher level SSAs

<u>Level</u>	<u>Segment Name</u>	<u>Length</u>	<u>Key Name</u>	<u>Key Start</u>	<u>Key Length</u>
-1	SEG1 name	SEG1 length	Seg Fld name	Starting position of Seg Fld	Length of Seg Fld
-2	Root name	Root length	XDFLD name	Starting position of XDFLD	Length of XDFLD