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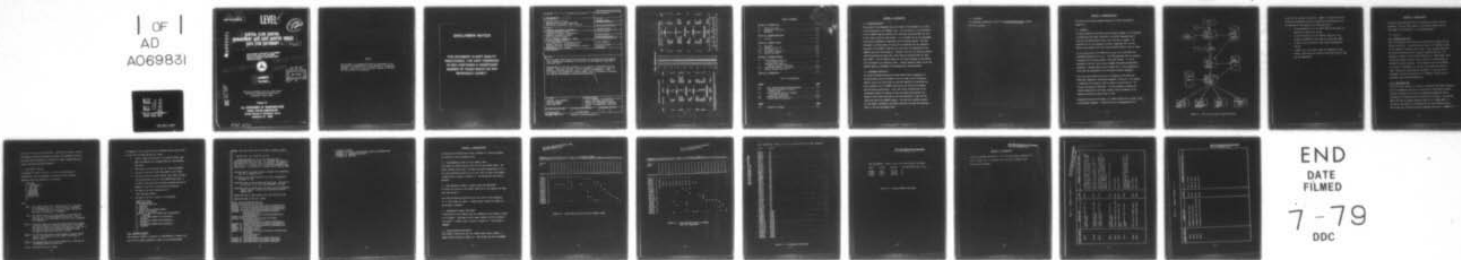
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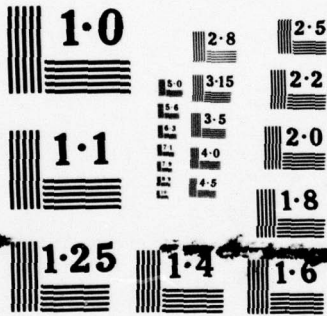
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**CENTRAL FLOW CONTROL  
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DATA ITEM DICTIONARY, User's Manual.**

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**U.S. DEPARTMENT OF TRANSPORTATION  
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16. Abstract <p>This document describes the functions of the Data-Item Dictionary (DID) generation programs and details the procedures required to exercise them.</p> <p>The purpose of the DID programs is to build a dictionary of all COMPOOL items and provide a cross-reference listing of items and modules, showing item-set and/or item-use information. The dictionary is printed on a table basis, and is primarily intended for use by maintenance programming personnel.</p>					
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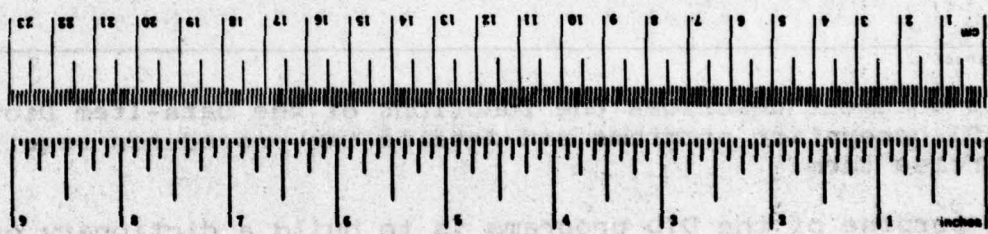
### METRIC CONVERSION FACTORS

#### Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
<b>LENGTH</b>				
in	inches	2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
<b>AREA</b>				
sq in	square inches	6.5	square centimeters	cm <sup>2</sup>
sq ft	square feet	0.09	square meters	m <sup>2</sup>
sq yd	square yards	0.8	square meters	m <sup>2</sup>
sq mi	square miles	2.6	square kilometers	km <sup>2</sup>
acres	acres	0.4	hectares	ha
<b>MASS (weight)</b>				
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
<b>VOLUME</b>				
imp gal	imperial gallons	4	liters	l
U.S. gal	U.S. gallons	3.8	liters	l
qt	quarts	0.95	liters	l
pint	pints	0.47	liters	l
cup	cups	0.24	liters	l
fl oz	fluid ounces	0.03	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
cu ft	cubic feet	0.03	cubic meters	m <sup>3</sup>
cu yd	cubic yards	0.76	cubic meters	m <sup>3</sup>
<b>TEMPERATURE (exact)</b>				
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

#### Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
<b>LENGTH</b>				
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
km	kilometers	1.1	yards	yd
		0.6	miles	mi
<b>AREA</b>				
cm <sup>2</sup>	square centimeters	0.16	square inches	in <sup>2</sup>
m <sup>2</sup>	square meters	1.2	square yards	yd <sup>2</sup>
km <sup>2</sup>	square kilometers	0.4	square miles	mi <sup>2</sup>
ha	hectares (10,000 m <sup>2</sup> )	2.5	acres	ac
<b>MASS (weight)</b>				
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	st
<b>VOLUME</b>				
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
m <sup>3</sup>	cubic meters	1.36	quarts	qt
km <sup>3</sup>	cubic kilometers	0.36	gallons	gal
m <sup>3</sup>	cubic meters	36	cubic feet	ft <sup>3</sup>
km <sup>3</sup>	cubic kilometers	1.3	cubic yards	yd <sup>3</sup>
<b>TEMPERATURE (exact)</b>				
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F



\*1 in = 2.54 exactly. For other exact conversions and many other tables, see NBS Misc. Publ. 226, Units of Weight and Measure, Price \$1.25, SO Catalog No. C13.10-226.

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## SECTION 1 - INTRODUCTION

### 1.1 PURPOSE AND SCOPE

The purpose of the Management Aids Code Auditor (MA) Component is to build a data dictionary of all COMPOOL items. The dictionary is a cross-reference list of COMPOOL items and modules with indicators showing whether the item is set, used, or both by each module. It is intended for use by programmers as an aid to modifying or maintaining the CFC Software System. The data dictionary is printed table by table and is formatted with the assumption that most of the COMPOOL items have the same first two characters as the COMPOOL table that they belong to. However, if any of the items are defined without following the above rule, these items are printed under the table name 'NONE'. All the COMPOOL items that are locally defined in any modules will be printed in an exception report. Another exception report of all the COMPOOL items not referenced in any modules will also be printed.

### 1.2 BACKGROUND INFORMATION

The Jovial Automated Verification System (JAVS) has the capability to build and print a data dictionary of all the items in all the modules. However, since this system does not have the capability of printing the cross reference list of COMPOOL items alone, the need for the present data dictionary system arose. Since JAVS output contains most of the information needed for running the data dictionary build system, the design of the MA data dictionary build was formulated to read the JAVS output and select the COMPOOL symbols. The user must therefore execute the JAVS BASIC, STRUCTURAL, and ASSIST functions to create the necessary input to the data dictionary build.

### 1.3 REFERENCES

For additional information, refer to the JAVS Reference Manual, Volume CR-1-722, Section 5.

## SECTION 2 - PROGRAM OPERATION

The data item dictionary program operation is briefly described in Figure 2-1.

### 2.1 OVERVIEW

In order to execute the MA data item dictionary component, it is essential to execute the JAVS BASIC, STRUCTURAL, and ASSIST components and to input all the source modules whose cross reference is needed. The execution of the JAVS components creates a sequential file of item/module cross reference file (this may be created either on disk or tape).

All the source modules are submitted as input to the JAVS BASIC and STRUCTURAL components one by one. The JAVS components add the necessary information in the source modules to the JAVS library. It is not necessary to run the COMPOOL source through JAVS BASIC and STRUCTURAL components. Running COMPOOL source through JAVS is time consuming and slows down the processing of the data item dictionary component.

After the source modules have been run through the JAVS BASIC and STRUCTURAL components, JAVS ASSIST component is executed. This creates a sequential file (either on disk or tape) of record size 133. The file may be blocked or unblocked. The file consists of records containing information on the items, modules, and line numbers in the modules in which the items are set or used.

Along with the above JAVS output, the COMPOOL source file is input to the MA dictionary component. This file must be a sequential file of

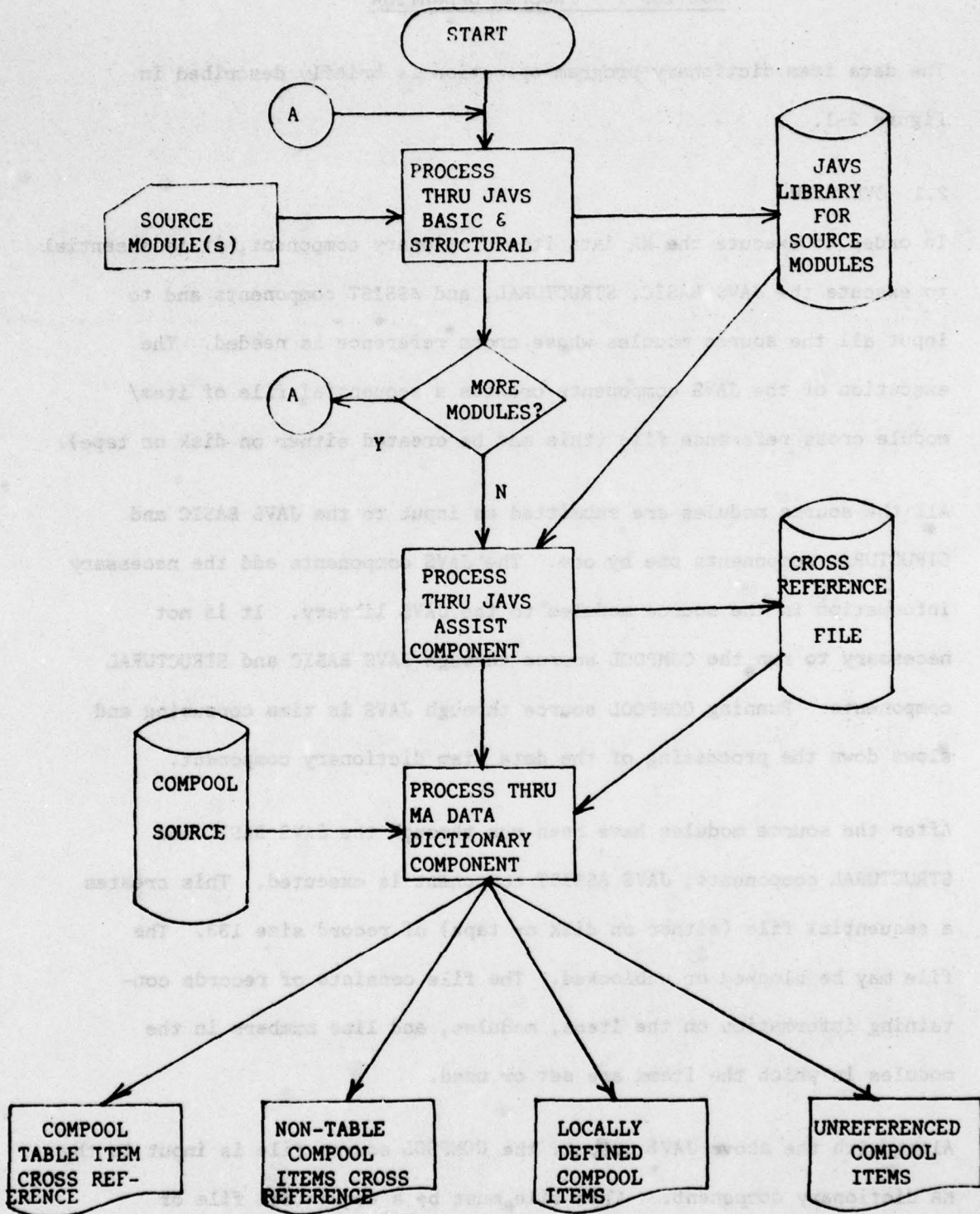


Figure 2-1. Data Item Dictionary Program Operation

record size 80, blocked or unblocked. Members of a partitioned data set may be concatenated and may be submitted as one sequential file.

The execution of this produces the following reports:

1. A cross reference of all the valid COMPOOL items under the table name to which they belong.
2. A cross reference of all the COMPOOL items that do not belong to any specific table under the table name 'NONE'.
3. A report on all the COMPOOL items locally (duplicately) defined.
4. A report on all the COMPOOL items not referenced in any modules (table names are omitted in this report even if they are not referenced).

## SECTION 3 - PROGRAM INPUTS

The MA data dictionary build does not require any control cards for operation. The only input required is the COMPOOL source file and JAVS output file discussed in the following sections.

### 3.1 DATA SETS

#### 3.1.1 COMPOOL Source File

This is a sequential file containing records fixed in length, with an 80-byte record size. The records may be blocked. No checking is done for the validity of COMPOOL source format. Only item and table names are picked and formatted into a separate temporary data set. The presence or absence of valid COMPOOL symbols (e.g., START, TERM, BEGIN, and END) and comment cards will have no impact on the processing of the data dictionary component. The DD name for this file is COMPOOL. If the file is catalogued, the user need only specify the name by a 'CMPL=' keyword while executing the procedure. If the file is not catalogued, the user must override the '//COMPOOL' DD card with the appropriate UNIT and VOLUME parameters.

#### 3.1.2 JAVS Output File

This is the file created as a result of running the JAVS ASSIST component. This is a sequential file with a record size of 133, and may be blocked. The file is assumed to be valid with appropriate header and trailer information and item/module cross reference in the middle. The important header the data dictionary component looks for is 'SYMBOL MODULE...' printed by JAVS ASSIST at the beginning of the cross reference report. The trailer that the data dictionary component looks for is 'COMMAND IS....'

printed at the end of cross reference. JAVS output, however, contains some header information preceding the header this component looks for and some trailer information succeeding the trailer information processed by the Data Dictionary component.

### 3.2 JOB CONTROL LANGUAGE

A procedure as listed in Section 3.2.1 below is catalogued in SYS2.PROCLIB. The JCL necessary to execute the Data Dictionary component using this procedure is as follows:

```
//JOB CARD
// EXEC MACABLD,
// CMPL='XXX',
// JAVS='XXX',
// JAVSIZ=NNN,
// CMPSIZ=NNN,
// ERRFIL='XXX',
// SRTLIB='XXX'
/*
//
```

where

CMPL = The complete name of the COMPOOL source file. This must be a catalogued data set. If this is not a catalogued set or if more than one file is to be input, the DD card that must be overridden is '//COMPOOL'.

JAVS = The complete name of the file created in JAVS ASSIST run. This must be a catalogued sequential data set. The DD card that has to be overridden if this set is not catalogued is '//JAVSFILE'.

JAVSIZ = A decimal number indicating the number of tracks of scratch disk space required to process the JAVS file. This number has to be at least 1/8 of size of the JAVS file. That is, if the JAVS file created in the ASSIST component contains 64 tracks of data, JAVSIZ must be 8 or more.

CMPSIZ = The scratch disk space in tracks needed to process COMPOOL source. This number must be at least 1/4 the size of COMPOOL source.

ERRFIL = The complete name of the error message file. This must be a catalogued partitioned data set.

SRTLIB = The name of the sort library.

An example of JCL to execute the MA dictionary build is given below in which the following options are chosen:

- COMPOOL source is contained in the members APSTAB, DBAF, DBAJ, and DBAO of the catalogued data set 'OPCX.COMPOOL.SRC.T1016'
- JAVS file is the catalogued data set 'MACA.JAVS.APXREF'
- The size of JAVS file 'MACA.JAVS.APXREF' is 80 Tracks.
- The size of the four members APSTAB, DBAF, DBAJ, and DBAO of the partitioned data set 'OPCX.COMPOOL.SRC.T1016' is 40 tracks. (The user need not bother counting the size of members of the PDS not used during the execution.)
- The name of the error message file is 'SPCX.LIB.ERROR.CURRENT'
- The name of the sort library is 'SYS1.SORTLIB'

```
//MATEST JOB CARD
//TEST EXEC MACABLD.
// JAVS='MACA.JAVS.XREF',
// JAVSIZ=10,
// CMPSIZ=10,
// ERRFIL='SPCX.LIB.ERROR.CURRENT',
// SRTLIB='SYS1.SORTLIB'
//COMPOOL DD DSN='OPCX.COMPOOL.SRC.T1016(APSTAB)',
// DISP=SHR
// DD DSN='OPCX.COMPOOL.SRC.T1016(DBAF)',
// DISP=SHR
// DD DSN='OPCX.COMPOOL.SRC.T1016(DBAJ)',
// DISP=SHR
// DD DSN='OPCX.COMPOOL.SRC.T1016(DBAO)',
// DISP=SHR
/*
//
```

### 3.2.1 MACABLD Procedure

The procedure 'MACABLD' catalogued in 'SYS2.PROCLIB' to execute the data item dictionary component is shown on the following page.

```

//MACABLD PROC CMPL=,JAVS=,JAVSIZ=100,CMPSIZ=50,ERRFIL=,SRTLIB=
//*
//*
//*      MACABLD PROC  LAST UPDATE ON 10/4/78
//*
//*      MACABLD PROCEDURE MAY BE USED IN CONNECTION WITH
//* DATA DICTIONARY BUILD JOB STEP.  IT IS ASSUMED THAT PRIOR TO
//* THE EXECUTION OF THIS STEP THAT TWO SEQUENTIAL (OR MEMBERS OF
//* PDS) FILES, I.E., COMPOOL SOURCE & JAVS CROSS REFERENCE FILE
//* WERE CREATED.  THE FOLLOWING IS A DESCRIPTION OF THE KEY WORDS
//*
//*
//* CMPL=THE NAME OF THE COMPOOL SOURCE FILE(MUST BE A SEQUENTIAL
//* DATA SET OR MEMBER OF PDS)
//*
//* JAVS=NAME OF JAVS CROSS REFERENCE FILE (MUST BE SEQUENTIAL
//* OR MEMBER OF PDS)
//*
//* JAVSIZ=THE SIZE IN TRACKS NEEDED FOR WORK FILES.  THIS MAY BE
//* AS LITTLE AS 1/8 OF JAVS CROSS REFERENCE FILE SIZE
//*
//* CMPSIZ=THE SIZE IN TRACKS NEEDED FOR WORK FILES FOR PROCESSING
//* COMPOOL SOURCE.  THIS MAY BE AS LITTLE AS 1/4TH OF
//* COMPOOL SIZE
//*
//* ERRFIL=THE NAME OF ERROR MESSAGE FILE (THIS MUST BE A PDS)
//*
//* SRTLIB=THE NAME OF THE SORT LIBRARY.
//*
//DATBLD EXEC PGM=MADDB,REGION=200K
//STEPLIB DD DSN=MA.LOAD.VOL,DISP=SHR
//MATRIXGD DD SYSOUT=A,DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330)
//MATRIXEX DD SYSOUT=A,DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330)
//SYSPRIN1 DD SYSOUT=A,DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330)
//JAVSFORM DD DSN=&&JAVFRM,DISP=(NEW,PASS),UNIT=SYSDA,
//          SPACE=(TRK,&JAVSIZ),
//          DCB=(RECFM=FB,LRECL=16,DSORG=PS,BLKSIZE=3520)
//COMPOOL DD DSN=&CMPL,DISP=SHR
//POOLOUT DD DSN=&&CMPLSR,DISP=(NEW,PASS),UNIT=SYSDA,
//          SPACE=(TRK,&CMPSIZ),
//          DCB=(RECFM=FB,LRECL=20,DSORG=PS,BLKSIZE=3520)
//DUPREPRT DD SYSOUT=A,DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330)
//ERROUT DD SYSOUT=A,DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330)
//ERRMSGG DD DSN=&ERRFIL,DISP=SHR
//JAVSFILE DD DSN=&JAVS,DISP=SHR
//POOLIN DD DSN=&&CMPLUN,DCB=(RECFM=FB,LRECL=20,BLKSIZE=3520)
//          UNIT=SYSDA,
//          SPACE=(TRK,&CMPSIZ),
//          DISP=(NEW,PASS)
//POOLWK01 DD UNIT=SYSDA,SPACE=(TRK,&CMPSIZ),DSN=&&TST1
//POOLWK02 DD UNIT=SYSDA,SPACE=(TRK,&CMPSIZ),DSN=&&TST2
//POOLWK03 DD UNIT=SYSDA,SPACE=(TRK,&CMPSIZ),DSN=&&TST3

```

```
//SYSOUT DD SYSOUT=A
//UNFREPRT DD SYSOUT=A,DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330)
//SORTLIB DD DSN=&SRTLIB,DISP=SHR
//SYSUDUMP DD SYSOUT=A
```

## SECTION 4 - PROGRAM OUTPUTS

The data item dictionary build output consists of a series of reports as outlined in the following sections.

### 4.1 CROSS REFERENCE REPORT OF VALID COMPOOL ITEMS

This report is printed table by table for all the COMPOOL items. The report contains table name, item names, and module names with S, U, B, or a blank indicating that an item is set, used, or both in the module. A sample output is given in Figure 4-1. The DD name for this file is MATRIXGD.

### 4.2 CROSS REFERENCE REPORT OF COMPOOL ITEMS WITH EXCEPTIONS

The first two letters of the COMPOOL items are not the same as the table name they belong to.

The items and modules are printed with set, used, or both indicators (S, U, or B) under the table. A sample output is shown in Figure 4-2. The DD name is MATRIXEX.

### 4.3 UNREFERENCED COMPOOL ITEM REPORT

A listing of all the COMPOOL items not referenced in any modules is given in this report. Unreferenced table names, however, are not included in this report. A sample output is given in Figure 4-3. The DD name is UNFREPRT.

### 4.4 LOCALLY DEFINED ITEM REPORT

This report is printed for all the COMPOOL items locally defined. A sample output is given in Figure 4-4. The DD name for this is DUPREPRT.

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**COMPOOL ITEM-TABLE: /MODULE CROSS REFERENCE REPORT:**

\*\*\*\*\*

TABLE=	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A		
FI	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
	P	C	C	C	D	F	F	P	P	P	A	A	A	E	T	C	P	O	O	I	Z	
	L	P	L	Z	D	P	R	A	A	A	C	C	F	O	Y	T	T	J	F	R	N	O
	C	N	I	I	L	I	M	C	I	N	A	I	F	U	P	U	4	P	P	L	P	N
	T	I	D	D	F	D	T	D	D	P	L	D	L	P	E	P	S	R	R	D	T	E

\*\*\*\*\*

FIATD *	U	U	U	U	U	U	U	U	U													
FIARL *										U	U	U										
FIAVX *						U																
FICLS *							U						U	U								
FICTR *		U	U	U			U			U												
FICTU *																U						
FIFIX *						U	U															
FIMSG *																	U					
FINDN *											U											
FIOOV *																	U					
FIOFM *																				U		
FIOPC *											U	U										U
FIPRM *																						U
BITYP *							U					U	U									U
FIZLN *																						U

Figure 4-1. Cross Reference Matrix of Valid COMPOOL Items

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COMPOOL ITEM-TABLE=ZMODULE CROSS REFERENCE REPORT:

TABLE= NONE	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
	R	L	T	B	R	T	N	F	N	U	D	H	P	X	F	D	Q	F	N	L
	S	D	J	L	M	A	P	R	R	P	A	D	I	B	F	L	U	P	I	D
	M	T	P	D	T	S	T	P	P	D	T	R	D	D	L	E	P	R	M	F
YPCRT *	S	S	S	S	S	S	S	S	S	S	B									
YPELD *	U																			
YPERL *	S	S	S	S	S	S	S	S	S	S										
YDEPP *	B	B	S	B	B	S	B	S	S	S	B	B								
YPERT *	S	S	S	S	S	S	S	S	S	S										
YPFLO *	U																			
YPIND *								U		U										
YPMASK *									U											
YPTTY *					U															
ZMELS *										U										
ZPFIX *												U	U							
ZPFYBD *													U	U						
ZPFXFR *													U							
ZPM4L *				U											U	U	U	U		U
ZPM4L *						U				U										
ZPM4L *																				U
ZPM4L *																				U
ZPPE1 *										U										
ZPPE2 *											U									
ZPTXL *				U							U	U								U

Figure 4-2. Cross Reference Matrix of COMPOOL Items With Exceptions

THE FOLLOWING COMPOOL ITEMS ARE UNREFERENCED IN ANY MODULES:

ITEM TABLE

SMNDE	SM
SMNER	SM
SMQRE	SM
SMQSV	SM
SMSTP	SM
SMSV	SM
SMTVC	SM
SMZSF	SM
SMZSK	SM
SJACT	SO
SOANT	SO
SOAID	SO
SOBAT	SO
SOBR T	SO
SODAP	SO
SODEP	SO
SODI	SO
SJETA	SO
SOETO	SO
SOETE	SO
SOLNT	SO
SODCI	SO
SOPAT	SO
SOPOT	SO
SOSBT	SO
SOTCI	SO
S3ACT	S3
S3ADD	S3
S3HP	S3
S3IAC	S3
S3TAD	S3
S4DAP	S4
S4DLY	S4
YPDL1	NONE
YPDL2	NONE
ZMENP	NONE
ZMMHC	NONE
ZMQLS	NONE
ZPCDLT	NONE
ZPMFX3	NONE
ZPMFX4	NONE
ZPMFX5	NONE
ZPMFX6	NONE
ZPMFX7	NONE
ZPMXFX	NONE
ZPMXF2	NONE
ZPNTL	NONE
ZPTADJ	NONE

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Figure 4-3. Unreferenced Item Report

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THE FOLLOWING COMPOUND ITEMS ARE DUPLICATEDLY DEFINED:

ITEM	TABLE	MODULE	SET/USED/BOTH-S,U, OR B
YPMBA	NONE	APGTMS	S
YPMBA	ACNE	APSNI4	U
YPMJA	ACNE	APSARP	U

Figure 4-4. Locally Defined Item Report



Table 5-1. Diagnostic Messages (1 of 2)

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MESSAGE NUMBER	MESSAGE TEXT	TYPE	PROBABLE CAUSE AND USER ACTION
MAL01	COMPOOL source read error in MAFDTA module	Fatal	Probably the user misspelled the DD name for COMPOOL source or the source is not a sequential file. Verify the DD name and the COMPOOL file structure
MAL02	COMPOOL item file close error in MAFDTA module	Fatal	Misspelling of DD name. Verify the spelling and resubmit the job
MAL03	COMPOOL item file sort error in MAFDTA module	Fatal	Misspelling or omission of DD names required by sort. Most probably the user did not specify the correct data set name in 'SRTLIB=' parameter in EXEC MACABLD procedure
MAL04	COMPOOL item write error in MAFDTA module	Fatal	Misspelled or omitted DD name
MAL05	Sorted COMPOOL file open error	Fatal	Same as MAL04
MAL06	Sorted COMPOOL source read error	Fatal	Same as MAL04
MAL07	Unformatted JAVS file read error	Fatal	Misspelled DD name or the JAVS file is not a sequential file the way it is supposed to be. Verify the DD name and attributes
MAL08	Write error in MARPG module	Fatal	Same as MAL04
MAL09	Write error in MADPRP module	Fatal	Same as MAL04

Table 5-1. Diagnostic Messages (2 of 2)

MESSAGE NUMBER	MESSAGE TEXT	TYPE	PROBABLE CAUSE AND USER ACTION
MAL10	XXXXXXXX file open error	Fatal	Same as MAL04
MAL11	XXXXXXXX file cose error	Fatal	Same as MAL04
MAL12	Formatted JAVS file write error	Fatal	Same as MAL04
MAL13	Formatted JAVS file read error	Fatal	Same as MAL04