IBM InfoSphere Optim for z/OS
Version 11 Release 3

Compare User Manual

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Note
Before using this information and the product it supports, read the information in "Notices" on page 119.

Version 11 Release 3

This edition applies to version 11, release 3 of IBM InfoSphere® Optim for z/OS and to all subsequent releases and modifications until otherwise indicated in new editions.

Contents

About this publication

This document explains how to use Compare to compare relational sets of data. Compare is the relational comparison facility that lets you compare sets of related data from two database structures. The information in this document pertains to Compare processing for DB2 table data only. For details on using Compare for Legacy table data, refer to *Compare for IMS, VSAM and Sequential File Data*.

Chapter 1. Introduction

IBM® InfoSphere Optim for z/OS® manages enterprise data throughout every stage of the information life cycle.

The Optim solution enables you to assess, classify, subset, archive, store, and access enterprise application data. The solution uses the relationships defined in the DB2® Catalog, where available, and supplements these relationships with those defined in the Optim Directory. The Optim solution runs as a TSO/ISPF application and incorporates familiar ISPF commands. The solution handles any number of tables and any number of relationships, regardless of the complexity.

The Optim solution helps you achieve these benefits with the following components: Access, Archive, Move, and Compare. You can use these Optim components for test data management, data privacy, data retention, application retirement, and data growth management. This manual describes how to use Compare in test data management.

Test Data Management

The test data management capabilities of the Optim solution provide an efficient alternative to database cloning, allowing you to create development and testing environments that are sized appropriately.

For information about the test data management functions of the Optim solution, see the *Move User Manual*, the *Access User Manual*, and this user manual.

Compare is a relational comparison facility used to compare the data from one set of source tables with another. This facility is unique in providing the ability to analyze multiple tables to identify not only changes to a pair of tables, but more importantly changes to related tables. By analyzing an entire set of data across multiple tables, users can pinpoint exactly where the changes occurred. Using the powerful Compare browse facility, users can start with one table and display only the rows that are different between the sources. Additionally, the rows for which related data has changed are identified with this starting table. Users can display the data from the related tables directly from the starting table to view the related changes.

The source of the data can be a set of rows that currently resides in DB2 and spans multiple tables or a set of rows extracted previously from the database and stored.

A previously extracted set of data provides a consistent “snap shot” of the data. Using this snap shot, programmers can evaluate application execution by comparing the results of the execution, the “after” copy, with the snap shot, the “before” copy, of the data.

Compare is indispensable for

- Analyzing the data used to test an application by comparing the versions of the data before and after the application is executed.
- Reviewing the contents of the database to locate problems such as referential integrity errors.
- Comparing archived data with current data to evaluate changes.
- Identifying similarities and differences in separate databases.
- Auditing changes to a database.

Programmers and database administrators no longer have to struggle through single table utilities to accomplish these tasks. Instead, Compare provides an interactive utility to prompt for the necessary

information and perform the comparison. A comprehensive report and the complete row-by-row results are available for a set of related data residing in multiple tables.

Since Compare runs as a TSO/ISPF application, the Help and Tutorial facility in ISPF is also supported. Menu-driven prompt screens or panels are used to specify which data to obtain and which process to perform. Intelligent screen handling technology provides simultaneous display of multiple tables, pop-up windows, context-sensitive online help, and tutorials.

Data Privacy

Data privacy is a licensed function of test data management.

For information about the general test data management functions of the Optim solution, see the *Move User Manual*, the *Access User Manual*, and this user manual. Data transformations for privacy are accomplished through the use of Optim column maps. For information needed to transform data using a column map, see the *Common Elements Manual*, section on Column Maps.

Data Retention, Application Retirement, and Data Growth Management

You can use the archiving features in the Optim solution to do the following:

- Isolate historical data from current activity and safely remove it to a secure archive.
- Access archived data easily, using familiar tools and interfaces.
- Restore archived data to its original business context when it requires additional processing.

For information about the archive functions of the Optim solution, see the *Archive User Manual*.

Processing Flow

To compare a set of related data, you specify the sources of the data to be compared. Compare then accesses the data, performs the comparison, and presents the results in a formatted, row-by-row manner either as a screen display, a printed report, or both, per your specification.

You can compare individual tables or a set of related data residing in multiple tables. When the data resides in multiple tables, the changes are characterized as *Direct* changes (occurring in that table) and *Related* changes (occurring in a related subordinate table).

In general, Compare performs the following steps for each request:

- Identify the two sets of data to be compared.
- Compare the data in each pair of tables from the two sources and mark the changes.
- If the comparison involves data from multiple tables, chain rows from related tables and indicate related changes.
- Store the results of the comparison.

Identify the Data

To perform a Compare Process, you must identify the source of the data. You can extract one or both sets of data directly from DB2 or read from a file containing previously extracted data. (Previously extracted data can be in an Extract or an Archive File.)

Compare Definition

The information specified for a Compare Process is called a Compare Definition. You can direct Compare to save the definition so it can be reused as needed, or you can use the definition for a single Compare Process and discard it.

Specify Data to be Compared

To specify the data to be compared, the following is required:

- The names of the tables from which data is to be selected. If a single DB2 table is the source, you need specify only the name of the table and any selection criteria for that table.
- The relationships between the named tables that are to be used for the data selection.
- For each table, you can qualify which rows are to be selected by specifying selection criteria for any of the tables.

If a single table is the source, you need specify only the name of the table and any selection criteria for that table.

The specifications for the set of data can be used for a single Compare Process or stored in an Access Definition. The Access Definition can be used with all Optim components.

Access Definitions are described in detail in the *Common Elements Manual*.

Map Tables and Columns

After specifying the two sets of data, you can map these sets of source tables. This is useful when the names of the tables are different. You can also map the columns from any pair of tables to map unlike column names or eliminate one or more columns from the comparison.

Compare Process Options

In addition to specifying the data to be compared, there are several processing options. Before execution, you are prompted for these Compare Process options.

The options include whether the process is to be executed online or in batch, is to be limited to a specific number of rows, or is to create a report. If you specify that a report is to be created, you are prompted to specify the format of the report and the information to include. For example, you can request that all rows or only changed rows are included. In addition, if you perform the Compare Process online, the browse facilities can be invoked automatically to review the results when the process completes.

General Information

This section discusses general information about Compare, including a description of elements common to the Optim components, terminology used to describe Compare, and the sample database.

Note: For general information about naming conventions and screen format and handling, see the *Common Elements Manual*.

Common Elements

The components of the Optim solution provide varied functions.

Access is the relational facility that lets you browse and edit related data residing in multiple DB2 tables. Archive enhances database performance by facilitating the removal of infrequently referenced data. Compare is the relational comparison facility that lets you compare sets of related data from two database structures. To compare Legacy table data, refer to *Compare for IMS, VSAM and Sequential File Data*. Move is the relational copy facility that lets you extract sets of related data from DB2 or Legacy tables, and insert that data into destination databases and files. Features common to the Optim components are discussed in the *Common Elements Manual*.

To carry out their functions, the Optim components rely upon user-defined objects that supplement objects defined to the database (for example, tables, primary keys, relationships, stored procedures). These user-defined objects (collectively, Optim objects) are stored in the Optim Directory.

Optim objects that are common to the Optim components include:

- Access Definitions
- Column Maps
- Primary Keys
- Table Maps
- Relationships

The following processes and facilities are common to the Optim components:

- Export/Import
- Retry/Restart
- Convert
- Browse

The *Common Elements Manual* section about Options describes the various options that allow you to manage the Optim solution.

Terminology

This section describes some common terms that are used in this manual.

These and additional terms are described in the *Common Elements Manual*, Glossary section.

Access Definitions

The set of specifications for a set of related data to be extracted when the data to be compared resides in multiple tables is an **Access Definition**. All Optim components can use the same Access Definitions. The Access Definition contains a variety of information, including

- Set of tables from which to extract data.
- Relationships used in the Extract Process and direction of traversal.
- Optionally, the order in which data is displayed or selection criteria for data in the listed tables.

The first table from which the data is extracted is the Start Table. All other listed tables are visited in logical sequence based on relationships and specifications in the Access Definition.

You can save an Access Definition for repeated future use. The saved definition can be modified and re-saved under the same or a new name. Once saved, the same Access Definition can be used by Access to browse and edit data, by Archive to archive data, and by Move to extract data.

The name of an Access Definition consists of three parts:

group.user.name

The *group* and *user* portions are useful for organizing projects. For example, you can assign a unique group name to each project and, within each project, a unique user value for each person (user) in the group.

Archive Files

An Archive File is a sequential file that contains the archived data and information about the data characteristics. An Archive File provides safe, unmodified, storage of archived data. You can use an Archive File as a source file for Compare. See the *Archive User Manual* for more information.

Column Maps

A **Column Map** is a set of specifications used by Compare to determine which columns are to be included or omitted from the comparison and the correspondence of unlike-named columns. For example, a timestamp may be different in different executions of the application. If included in the Compare Process, every compared row would be identified as having changed.

The Column Map name consists of two parts:

mapid.mapname

The *mapid* is frequently used to group the maps by user or project.

Column Maps can be stored in the Directory. Column Maps can also be used and created by Move. They can be used interchangeably, if the definition fits the application. (Different rules are used to define Column Maps for Move than for Compare. Column Maps created with Move may not be available for Compare.)

Compare Definitions

A **Compare Definition** contains information you specify to perform a Compare Process. This definition can be specified for a single Compare Process, or stored in the Optim Directory and reused. A Compare Definition includes:

- Specifications for the data sources. You can compare one table to another, or you can compare two sets of tables. Specify the data sources as:
  - An Extract or Archive File containing the data.
  - A set of data defined by an Access Definition.
  - All rows from the tables specified for Source 1 (available only for Source 2).
- Specifications (that is, a Table Map and, optionally, Column Maps) to map the two sets of data.
- A Match Key.

The name of a Compare Definition consists of three parts:

group.user.name

The *group* and *user* portions are useful for organizing projects. For example, you can assign a unique group name to each project and, within each project, a unique user value for each person (user) in the group.

Compare Files

A **Compare File** is a sequential file created by Compare to store the results of the comparison. The contents of a Compare File can be browsed online or printed.

Note: The Compare File contains the actual data only when Compare must extract the data from DB2 to perform the comparison. When an Extract or Archive File is used as a source, the data has already been extracted and is used directly from the file. Therefore, the Extract or Archive File should remain available and unchanged for as long as the Compare File is used.

Direct Change

In a Compare Process, a **direct change** indicates that rows from Source 1 and Source 2 have the same match key value, but different values in one or more other columns. Direct changes are noted in the comparison results by a "D" marking the changed rows. The columns containing the changes are highlighted. A variety of commands are available to locate and scroll to the changed rows.

Extract Files

An **Extract File** contains the extracted data and information that defines the characteristics of the data. If an Extract File is used to define a source, the name of the Extract File is stored with the results of the comparison instead of the extracted data.

Once created, Extract Files can be reused, providing a constant set of data with which to compare modified data. Extract Files are available to all users. All Extract Files on disk can be used by either Move or Compare.

Note: An extract file on tape cannot be used with compare.

Match Keys

A **match key** is used by the Compare Process to "match" rows from one source with rows from the other source. When available, Compare uses a primary key from one of the source tables for the Compare Process. However, when a primary key is not defined in either the DB2 Catalog or the Optim Directory for either table, you are prompted to create a match key. You can also define a match key for the current Compare Process or a Compare Definition.

Match keys are similar to primary keys, except that the column name in the key must exist in both source tables either directly, having the same base name, or indirectly, using a Column Map to match unlike names. Also, unlike the DB2 primary keys, match keys do not have to be based on a unique index and, unlike Optim primary keys, match keys are not available to be used by any other user or process. Match keys are stored in the current Compare Definition only and not in the Optim Directory.

Primary Keys

A **primary key** is the column or set of columns that uniquely identifies each row in a table. For example, the CUSTOMERS table has a column, CUST_ID, that contains a unique value for each row in the table. CUST_ID is an acceptable primary key for the CUSTOMERS table.

Optim™ Directory

The Optim Directory contains information needed to access DB2 data. This information includes user-specified:

- Access Definitions
- Relationships
- Compare Definitions
- Column Maps
- Primary Keys
- Table Maps

Access Definitions, Compare Definitions, Column Maps, and Table Maps are unique to the Optim solution. DB2 primary key definitions and relationships are available in the DB2 Catalog. Compare uses DB2 Catalog information whenever possible. However, when the information is not available in the DB2 Catalog, you can use Compare facilities to specify the information and store it in the Optim Directory.

Referential Integrity Rules

Compare uses referential integrity information and table and column information from the DB2 Catalog. When the DB2 Catalog does not provide the needed relationship information, user-specified objects, stored in the Optim Directory, supplement the Catalog.

Related Change

In a Compare Process, a **related change** indicates that dependent rows in a related table have direct changes or unmatched rows. Related changes are noted in the comparison results by an "R" marking the row in the parent table related to the changed rows in the dependent table. The "R" indicator is propagated through the levels such that the related row in the parent, grandparent, great-grandparent, and so on, also displays the indicator. The actual changed rows in the dependent table are identified as direct changes by a "D" indicator.

Relationships

A **relationship** determines how two tables are related. A relationship can be defined in the DB2 Catalog or the Optim Directory. Whenever a list of relationships is presented, the source is indicated. You can create or modify an Optim relationship using Compare, or you can browse DB2 relationships. You can also use DB2 relationships as a "model" for new Optim relationships.

In the DB2 Catalog, a relationship is defined by a primary key/foreign key pairing. The foreign key is the set of columns in a child table that describes the correspondence with the primary key columns in the parent table.

However, Optim relationships do not require primary key/foreign key pairing. You can define Optim relationships that pair any compatible columns between two tables, and specify substring and concatenation functions for columns, and literal and constant values. Optim relationships are defined by and available to all components of these products interchangeably. You cannot define a relationship for a Materialized Query Table.

Source 1 and Source 2

In a Compare File, **Source 1** and **Source 2** can be:

- An Extract or Archive File containing the data to be compared.
- An Access Definition that defines the data to be extracted for the comparison.
- An additional choice is available for Source 2 to specify that all rows from the tables defined for Source 1 are to be extracted.

Note: For the Compare Process, it is irrelevant which data is identified as Source 1 and Source 2. However, when browsing the data online and in reports, Source 1 is used to determine table names and column headings, by default.

Table Maps

A **Table Map** is a set of specifications used by Compare to match the sets of source tables when comparing data from multiple tables.

The Table Map name consists of two parts:

mapid.mapname

The *mapid* is frequently used to group the maps by user or project.

Table Maps can be stored in the Optim Directory. Table Maps can also be used and created by Move. They can be used interchangeably, if the definition fits the application. (Different rules are used to define Table Maps for Compare than for Move.)

Tables

Throughout this document, **tables** refers to tables, views, aliases, and synonyms, which are operated on in a similar manner. The differences in handling are noted where pertinent.

Data from Materialized Query Tables (MQTs) can be browsed. You can edit data in a User-Maintained MQT. System-maintained MQTs are protected from modification.

Sample Database

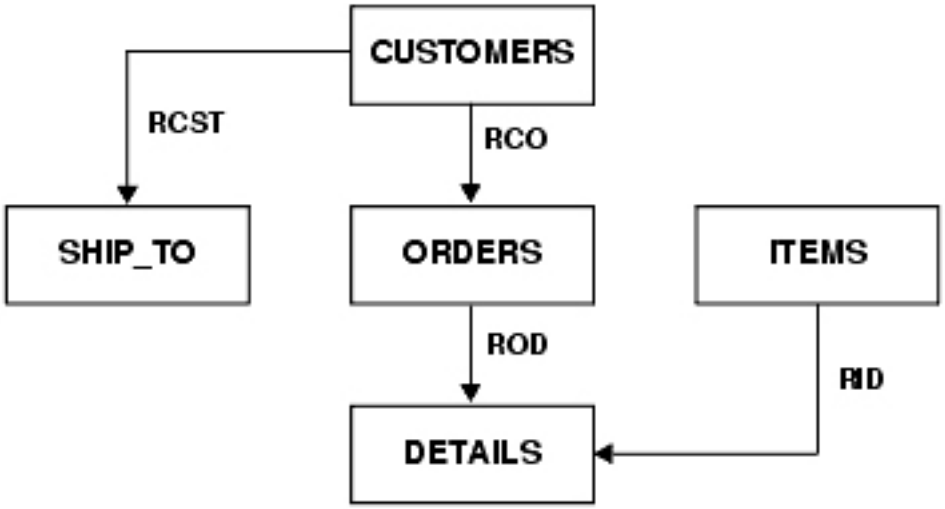
A sample database is distributed with the Optim solution.

The sample database is created as part of the installation and is described fully in the *Common Elements Manual*. The sample database provides data for training and allows you to experiment with the solution without fear of disrupting your production database.

The sample database is used in the sample session in Chapter 2, "Session Overview," on page 11 and in other examples in this manual. This database includes the following DB2 tables (names are prefixed with the Creator ID FOPDEMO):

- OPTIM_CUSTOMERS
- OPTIM_ORDERS
- OPTIM_DETAILS
- OPTIM_SALES
- OPTIM_ITEMS
- OPTIM_SHIP_TO
- OPTIM_SHIP_INSTR
- OPTIM_FEMALE_RATES
- OPTIM_MALE_RATES
- OPTIM_STATE_LOOKUP

The tables in the following chart are used in this manual. The chart shows these tables and the relationships among them. The arrows indicate the flow from parent to child. (In the chart, the OPTIM_ prefixes for table names are not shown.)



If you use the Session Overview as a tutorial, note that relationships may have been added to the sample database at your facility during training or other activities. The table names in the sample scenario are shown without the OPTIM_ prefix. To use the scenarios, prefix the table names with OPTIM_

Chapter 2. Session Overview

The following overview highlights the key facilities provided with Compare by presenting a brief sample session.

For this sample session, assume you want to compare two sets of related data–the version before and the version after executing an application in development. This task comprises three basic steps:

- Specify the two sets of source data to be compared.
- Execute the Compare Process.
- Review the results.

This sample session begins with the **Main Menu** and demonstrates how to perform these steps with Compare.

Main Menu

When Compare is invoked, the **Main Menu** is displayed.

The **Main Menu** display at your site may vary depending upon the Optim components installed. Options 1 through 4 are available only when Access is installed; Option 7 (MIGRATION) is available only when Move or Compare is installed; and Option 9 (Archive) is available only when Archive is installed. If an option is not available, it is shown as an asterisk.

```
--------------------------- IBM's InfoSphere Optim ----------------------------
OPTION  ===>

0  OPTIONS         - Site and User Options      SQLID  ===> FOPDEMO
1  BROWSE TABLE    - Browse a DB2 Table         SUBSYS ===> TDB2
2  EDIT TABLE      - Edit a DB2 Table           LOCATION ===>
3  BROWSE USING AD - Browse DB2 Tables Using Access Definition
4  EDIT USING AD   - Edit DB2 Tables Using Access Definition
5  ADS             - Create or Modify Access Definitions
6  DEFINITIONS     - Maintain InfoSphere Optim Definitions (Keys, Maps, ...)
7  MIGRATION       - Data Migration - Extract, Insert, Update, ...
8  COMPARE         - Compare Two Sets of Data
9  ARCHIVE         - Archive and Restore Data

T  TUTORIAL        - Information About IBM's InfoSphere Optim
C  CHANGES         - Changes from Prior Release(s)
X  EXIT            - Terminate Product Use
P  LICENSING       - Product Licensing Modification
```

Figure 1. Main Menu

Panel Options

To select the desired option, type the one-character identifier corresponding to the function you want to invoke.

0 OPTIONS

Specify product options, including user options, editor and display options, job card and print options, Compare options, Archive options, and Legacy options. For details, see the *Common Elements Manual*.

1 BROWSE TABLE
Browse data from a DB2 table. This facility is documented in the *Access User Manual*.

2 EDIT TABLE
Edit data from a DB2 table. This facility is documented in the *Access User Manual*.

3 BROWSE USING AD
Browse data from DB2 using an Access Definition. This facility is documented in the *Access User Manual*.

4 EDIT USING AD
Edit data from DB2 using an Access Definition. This facility is documented in the *Access User Manual*.

5 ADS
Create and maintain Access Definitions. For details, see the *Common Elements Manual*.

6 DEFINITIONS
Define and maintain Optim primary keys, relationships, Access Definitions, Column Maps, Table Maps, Legacy Tables, IBM IMS™™ Environment Definitions, and IMS Retrieval Definitions, and Archive Collections, or invoke utilities to export and import these objects. For details, see the *Common Elements Manual*.

7 MIGRATION
Perform the Move processes of Extract, Insert, LOAD, Create, Convert. These processes are documented in the *Move User Manual*. The Extract Process and the Browse Process are available with Compare and are documented in this manual.

8 COMPARE
Compare one set of tables with another and browse the results.

9 ARCHIVE
Perform the Archive processes for archiving data, browsing, and searching the archives and selectively restoring the archived data. These facilities are documented in the *Archive User Manual*.

T TUTORIAL
Display the online Tutorial.

C CHANGES
Display a list of enhancements for the current release.

X EXIT
Terminate the session.

P LICENSING
Display a list of the Optim components and their releases. The status for each component is identified as `In Evaluation: n Days Left` or `Not Installed`. Administrator privileges are required to enable or disable a component. This facility is documented in the *Customization Guide*.

Panel

The following three values are profiled.

SQLID
The current SQLID. Modify this value to connect using a different SQLID.

SUBSYS
The current DB2 subsystem. Modify this value to connect to a different DB2 subsystem.

When connecting to a remote subsystem, this value should be the local subsystem where the remote location is defined.

LOCATION
The remote location. This prompt is displayed if remote access is available. Specify a value to

connect to a remote DB2 subsystem. You can use a percent sign (%) to obtain a selection list of available locations. If the connection fails, the session is restarted and the Main Menu is redisplayed. If you leave this prompt blank, the local subsystem is assumed.

Specify the Data to Compare

To begin the Compare Process, select option 8 on the **Main Menu**, to display the COMPARE Process Menu.

```
----------------------------- COMPARE Process --------------------------------
OPTION  ===>
                                                SQLID  ===>
1  SINGLE   - Compare One Table to Another      SUBSYS ===>
2  MULTIPLE - Compare Two Sets of Tables        LOCATION ===>
3  PERFORM  - Specify COMPARE Parameters and Perform COMPARE

B  BROWSE   - Browse Results of Previous COMPARE
R  REPORT   - Generate Report from Previous COMPARE

Type of Compare Definition to Use for COMPARE ===> T  (P-Perm, T-Temp)

If Permanent, Specify New or Existing Compare Definition Name:
  GROUP  ===>
  USER   ===>
  NAME   ===>

Use '_' for DB2 LIKE Characters ===> N  (Y-Yes, N-No)
```

Figure 2. COMPARE Process Menu

First, you must choose an option to compare versions of a single table or versions of a set of tables:

- **If you are comparing two versions of one DB2 table,** the single table option provides a quick path. All you need to provide are the names of the two tables for the comparison and a Compare File in which to store the results of the comparison.
- **When comparing data in multiple DB2 tables** there are several considerations. If the data is to be extracted, you must provide the names of the tables and may need to select relationships and traversal paths to determine the set of data.

Once the data is defined and, if necessary, extracted, Compare identifies all changes and indicates direct and related changes. (Changes to a row are direct; changes to a row or rows in a dependent table are related.) When two versions of a single table are compared, there are no related changes.

Since this is a sample session, a temporary Compare Definition is used. Type a "T" for the **Type of Compare Definition to Use for COMPARE**.

In this sample session, Option 2 is specified to compare sets of tables. The following panel is displayed.

```
-- Specify COMPARE Source Types: TEMPORARY CD --------------------------------
Command ===>

COMPARE can process data saved in an Extract File or in DB2, IMS, VSAM, and
Sequential Tables. Specify source types as follows:


   Source 1 ===> 1    1 - Extract File
                      2 - Set of Data Defined by an Access Definition

   Source 2 ===> 3    1 - Extract File
                      2 - Set of Data Defined by an Access Definition
                      3 - All Rows from Multiple Tables
```

Figure 3. Specify COMPARE Source Types

The Specify COMPARE Source Types panel is used to specify the types of sources to be used.

- If you are comparing **DB2 table data**, for both Source 1 and Source 2, you can use data previously extracted and stored in an Extract File on disk or you can define the data to be extracted for the comparison using an Access Definition.

  Note: An extract file on tape cannot be used in a compare process.

  An additional choice for Source 2, All Rows from Multiple Tables, is available to specify that all rows from the tables defined for Source 1 are to be extracted. This is useful when comparing before and after images of your test database. You can retain the Extract File used to create the test database, execute your application, and then compare the Extract File with the entire test database. This comparison will identify all inserted, deleted, and changed rows, and all orphan rows.

Sample Premise

For this example, assume you are working on enhancements to an application. To test that application, you extract a set of related data from the production database and create a test database with the data. This data is extracted using Compare and is stored in an Extract File. (For more information, see "Extract Data" on page 25. Move can be used to create the test database and/or insert the test data using the same Extract File.) After you execute the application, you need to compare the original extracted data, the before version, with the data in the test database, the after version.

The options on the Specify COMPARE Source Types panel are specified as **1 Extract File** for Source 1, and **3 All Rows from Multiple Tables** for Source 2. When you press ENTER, Compare prompts for additional information about each source based on your response on this panel. (For details on the various prompts, see "Specify the Source Types" on page 67.)

For this sample session, the following panel is displayed.

```
-- Specify COMPARE Sources: TEMPORARY CD --------------------------------------
Command ===>                                                SCROLL ===> PAGE

Source 1: Extract File
  DSN ===> 'DEMO.EXTRACT'

Source 2: All Rows from Multiple Tables
  COMPARE will initially use matching Table Names from the above
  Extract File for the Table Map
```

Figure 4. Specify COMPARE Sources - Session Overview

Source 1 An Extract File

An Extract File is used for Source 1. Specify the dataset name of the Extract File. For this sample session, assume the Extract File named *qual1.qual2*.DEMO.EXTRACT has been created. (This Extract File is distributed with the system.) This is an Extract File defined using Compare.

Source 2 All Rows

After the information needed for Source 1 has been supplied, specify Source 2. Since the data for Source 2 has been specified as **All Rows from Multiple Tables**, you are not prompted for additional specifications. In this case, Compare assumes that the same tables specified in Source 1 are to be used as Source 2.

Table Map

After you have specified Source 1 and Source 2, Compare prompts for the Table Map. This provides an opportunity to specify tables that do not have exact name matches or omit tables from the comparison. The following panel is displayed.

```
---------------------- COMPARE Process Table Map -----------------------------
Command ===>                                                 Scroll ===> PAGE

Available Commands: APPLY,SAVE,LIST,MAP,POPULATE,ACM,CLEAR,MKEY, END when Done
Source 2 May be any Tables or Views
 Src 1 CID: FOPDEMO                                    Column
 Src 2 CID: FOPDEMO                                 >>  Map ID ===>

 Source 1 Table Name      Source 2 Table Name      Type   Column Map or "LOCAL"
-------------------- -------------------------->> ------- ---------------------
*********************************** TOP ************************************
CUSTOMERS             CUSTOMERS                  TABLE
ORDERS                ORDERS                     TABLE
DETAILS               DETAILS                    TABLE
ITEMS                 ITEMS                      TABLE
SHIP_TO               SHIP_TO                    TABLE
********************************* BOTTOM ***********************************
```

Figure 5. COMPARE Process Table Map

Source 1

Different rules are used for populating the CID (default Creator ID) and Table Name values based on the source types. For Source 1, CID is populated with the Default Creator ID from the Extract File or Access Definition. In addition, all table names from the Extract File or Access Definition are filled in as the Source 1 tables. These values are protected.

Source 2

For Source 2, if the source type is an Extract File or Access Definition, CID is populated appropriately from the named source. The Table Name values are populated with only the table names from Source 2 that match table names in Source 1. The remaining values are blank.

If the source type is **All Rows in Multiple Tables** (as in this example), the Src 2 CID and Table Name values are populated with the same values as their Source 1 counterparts.

Specifying CID

If Source 2 is **All Rows**, you can overtype the CID as desired. For this sample session, assume the default Creator ID is FOPDEMO.

Specifying Table Names

You can edit the table names directly or request a selection list of available tables not currently mapped as Source 2. When editing names, you can use the CLEAR command to remove all Source 2 names before typing names on the panel. You can also prefix or suffix the Source 2 names with a string of your choice.

Use the LIST TABLES command to display a selection list of tables and automatically insert your selection as the Source 2 table name. The APPLY command overlays all or part of the displayed Table Map with the specifications from a stored Table Map. (For details about defining and storing Table Maps, see the *Common Elements Manual*).

You can also replace the initial table names with an existing Table Map. In addition to Table Maps, you can specify Column Maps to map the columns for a pair of tables that do not have matching names provided they have compatible data types. You can also eliminate columns from the comparison. You can define a Column Map for the current Compare Definition only (referred to as LOCAL) or a Column Map that is stored in the Optim Directory and reusable. (For details about defining and storing Column Maps, see the *Common Elements Manual*).

For this sample session, the tables and column names are the same and all tables and columns are to be compared. Column Maps are not needed.

When the Table Map specifications are complete, use END to proceed.

Relationships

When comparing two sets of data from multiple tables, the relationships used to determine the related changes are important. Only one relationship may be selected between any two tables in a given direction (i.e., for a specific parent and child), regardless of the relationships used to extract the data. In this example, only one relationship is defined between these tables; therefore, Compare will automatically use the appropriate relationships.

Execute the Compare Process

After the sets of data to be compared are specified and the relationships to be used for the comparison are selected, the Specify Compare Parameters and Execute panel is displayed. (This panel is also displayed when Option 3 is selected on the Compare Process menu to re-execute an existing Compare Definition.)

```
------------------- Specify COMPARE Parameters and Execute --------------------
Command ===>                                                 SCROLL ===> PAGE

Compare File DSN ===> 'FOPDEMO.SAMPLE.COMPARE'

Source 2 Extract Options:
  Limit Number of Extract Rows   ===>           (1-4294967295, Blank/SL)
  Extract Data using             ===> D         (D-DB2,I-IBM High Perf Unload)

Compare Options:
  Generate Report After Process  ===> N         (Y-Yes, N-No)
  Run Process in Batch or Online ===> O         (B-Batch, O-Online)
    If Online, Invoke Browse     ===> Y         (Y-Yes, N-No)
    If Batch, Review or Save JCL ===> R         (N-No, R,Review, S-Save)
```

Figure 6. Specify COMPARE Parameters and Execute

Compare File DSN

Specify the name of a sequential file that is to contain the results of the comparison. This is the Compare File. If the file you name does not exist, Compare will prompt for allocation information and automatically allocate the file for you. The Compare File for this sample session is named FOPDEMO.SAMPLE.COMPARE.

Compare Options

Several Compare Process options are provided. These include the ability to limit the number of rows of data to be extracted if one or both sources are DB2 tables, to specify whether or not a report is generated, and to specify whether the process is executed online or in batch. If online, you can specify whether the results of the comparison are automatically displayed in a browse session when the Compare Process is completed.

If the Compare Process must extract the data from one or both sources (in this example, Source 2 must be extracted), you are prompted to specify a maximum number of rows to be extracted for the source. You can specify any value from 1 through the site limit that is displayed on the panel or leave blank to automatically default to the site limit. (Additional prompts are displayed only when pertinent. For example, if an unload program is available, you can specify whether it is to be used. For details on all the prompts, see "Perform Process" on page 78.)

Generate Reports

When you specify Yes to **Generate Reports**, the following panel is displayed to prompt for information required to generate the report before the Compare Process executes.

```
---------------------- Specify COMPARE Report Parameters -----------------------
Command ===>                                                 SCROLL ===> PAGE

Compare File DSN ===> FOPDEMO.SAMPLE.COMPARE
Report File DSN  ===> 'FOPDEMO.SAMPLE.REPORT'

  Report Type    ===> D               (S-Summary, D-Details)
  Lines Per Page ===>                 (0-No Titles, 1-99, Blank=57)
  Specify Table Name to Limit Report (Blank for ALL Tables in Compare)
    Table Name   ===>

  If Detail Report Specify Format and Select Desired Row Types:
    Report Format          ===> C     (C-Columnar, S-Sidelabels, E-External)
      If S, Which Columns? ===> A     (A-All, D-Different and Key Columns Only)
    All Rows               ===> Y     (Y-Yes, N-No)
    Or, if NO, Select One or More of the following Row Types:
      Direct Changes       ===> N     (Y-Yes, N-No)
      Related Changes      ===> N     (Y-Yes, N-No)
      Unmatched Rows       ===> N     (Y-Yes, N-No)
      Orphan Rows          ===> N     (Y-Yes, N-No)
      Duplicate Match Keys ===> N     (Y-Yes, N-No)
    Wide Lines             ===> C     (C-Change File, W-Wrap Data)
  Display Unused Columns      : Y     (Y-Yes, N-No)
```

Figure 7. Specify Compare Report Parameters

The name of the Compare File is supplied. You should specify a sequential file to receive the output. If you specify a sequential file, you can use standard ISPF facilities to browse, edit, and print the file.

When multiple tables have been compared, you can request a report on only one of the tables by typing a table name at the prompt, **Provide Table Name to Report**.

The remaining prompts determine the contents of the report. **Report Type** prompts you to specify whether the report is to include the summary information, or both the detail and summary information. The summary information includes the names of the tables from each source, the total number of rows for every type of detail that can be reported on and the total number of rows in the comparison from each table. (See "Generate Reports" on page 107 for a sample of the summary information report. The summary information displayed in Figure 8 on page 19 is the same information displayed in the report.)

The details are the rows that have been compared. You can select which details are to be included based on their status. (The status is printed along with each row.) The available statuses are listed on the panel.

You can select all rows by specifying Y for **All Rows** or specify one or more of the following:

Direct Changes
All rows from Source 1 and Source 2 that have the same match key value but different values in one or more other columns.

Related Changes
All rows that have dependent rows with direct changes or unmatched rows.

Unmatched Rows
All rows from Source 1 and Source 2 that do not have a match key value that matches a row from the other source.

Orphan Rows
All rows from Source 1 and Source 2 that do not have a parent.

Duplicate Match Keys
All rows from Source 1 and Source 2 that have duplicate match key values. Since the match key values are the same in multiple rows, Compare does not attempt to match the rows arbitrarily. Instead, the rows are unmatched and marked with a special flag.

Display Unused Columns
This column is non-modifiable. Indicates whether unused columns are displayed in the Compare Process Report. Use the Compare Options panel to specify a value for this field.

(A sample of the detail information as displayed online is shown in Figure 9 on page 20. A sample report including the details is contained in "Generate Reports" on page 107.) The report specifications have no effect on the Compare Process and the contents of the Compare File. They only define the data that is written to the report.

Perform the Process

When you have finished indicating the report options, press ENTER. The Compare Process is performed. The steps in the Compare Process are:

1. Get data for Source 1. If Source 1 is an Access Definition, the data is extracted. If Source 1 is an Extract File, the data has already been extracted and is available.
2. Get data for Source 2. If Source 2 is an Access Definition or All Tables, the data is extracted. If Source 2 is an Extract File, the data has already been extracted and is available.
3. Compare the data in each pair of tables to determine the equal rows, direct changes and unmatched rows.
4. Process the relationships to determine the related changes and orphan rows.

Status information is displayed as the process executes. This information notes which step is currently being performed and is updated as each table is extracted, as each pair of tables is compared, and as the selected relationships are traversed to chain the related rows that have been changed. (For more information about the status display, see "Perform Process" on page 78.)

Review the Results

The Compare Process creates the Compare File containing the results and, if requested, a report that can be stored in a sequential file.

In Figure 6 on page 16, the specifications for this sample session establish that the process is executed online and a browse session is invoked when the process terminates. This browse session enables you to display the results of the comparison online and to scroll and view the changes as they relate to the other compared data. The source of each row is clearly identified and all changes are highlighted.

To begin the browse session, a panel providing summary information and a selection list of the pairs of tables involved in the Compare Process is displayed.

```
---------------------- Compare Summary Selection List -------------------------
Command ===>                                                 Scroll ===> PAGE

Use 'S' to Select Browse Start Table, 'I' for Extended Table Information

Source 1: XF - Z13600MP.FOPDEMO.EXTRACT, SUBSYS: TDB2
Source 2: DB2 Tables, SUBSYS: TDB2
                                                                 Rows    Non-
                                                Changes          with   Unique
                          Total  UnMatched  Equal (D)irect   Missing Match
Sel   Source:Table Name   Rows     Rows     Rows  (R)elated  Parents  Keys
--- --------------------->> -------- -------- -------- --------- -------- -------
*** ********************************* TOP ************************************
S__ 1 FOPDEMO.CUSTOMERS         703        1      690 D:      12      N/A       0
    2 FOPDEMO.CUSTOMERS         704        2          R:      25      N/A       0

___ 1 FOPDEMO.ORDERS           1712       10     1697 D:       5        0       0
    2 FOPDEMO.ORDERS           1709        7          R:       4        0       0

___ 1 FOPDEMO.SHIP_TO           503        9      490 D:       4        0       8
    2 FOPDEMO.SHIP_TO           526       32          R:     N/A        6      25

___ 1 FOPDEMO.DETAILS          3591       11     3574 D:       6        0       0
    2 FOPDEMO.DETAILS          3596       16          R:     N/A        0       0

___ 1 FOPDEMO.ITEMS             102        0      102 D:       0      N/A       0
    2 FOPDEMO.ITEMS             102        0          R:       0      N/A       0
*** ******************************** BOTTOM ***********************************
```

Figure 8. Compare Summary Selection List

The summary information provides an overview of the comparison results. Each source is identified. Note that Source 1 is the Extract File Z13600MP.FOPDEMO.EXTRACT, and Source 2 is a set of DB2 tables. The source of both is the subsystem TDB2.

Statistics are included for the following items:

Total Rows
The total number of rows from each table.

UnMatched Rows
The number of rows from each table that contain a match key value that does not match a row in the table with which it was compared. This occurs when rows have been added to or deleted from one of the sources.

Equal Rows
The number of rows in a pair of compared tables that are the same. That is, every column included in the comparison in the row from Source 1 exactly matches the corresponding columns in Source 2.

Changes
The number of rows in each table where the match key value matched a row in the other source, but a value in another compared column did not match. Changes are identified as:

D - Direct
Number of rows that are different between the two named tables.

R - Related
Number of rows that have dependent rows with direct changes or unmatched rows.

Rows with Missing Parents
The number of rows in each dependent table that do not have a parent row in a source table. This can occur when the parent row was deleted from one source, but the children were not.

Non-Unique Match Keys
The number of rows that have duplicate match key values in each source table. (Although DB2 requires that primary keys are based on unique indexes, the Optim Directory does not. Therefore, if a Directory primary key or an explicit match key is used for the Compare Process, non-unique match key values can be encountered.)

(For details on the meaning of each of these see "Compare Summary Selection List" on page 88.)

To display the comparison results, select any pair of tables as the starting point for the session by typing an S in **Sel** to select that table pair. In Figure 8 on page 19 the pair of CUSTOMERS tables is selected. The following panel is displayed.

```
-------------------- Optim: Browse (Source 1 Names Shown) ---------------------
Command ===>                                                 Scroll ===> PAGE

Cmd Chg Src == Table: CUSTOMERS(T1) ======================== 1 OF 717 === MORE>>
            CUST_ID       CUSTNAME             ADDRESS              CITY
            ------- -------------------- ==================== ---------------
*** ************************************ TOP ********************************
___ DR   1   00001  Audio-Video World    593 West 37th Street Brass Castle
___ DR    2  00001  Audio Video World    593 West 37th Street Black Castle
___       12  00002  Select-A-Vision      5720 MacArthur Drive Evening Shade
___  R   12  00003  Showplace            1 Ocean Parkway      Alto
___ DR   1   00004  Audio-Video World    593 West 37th Street West Palm Beach
___ DR    2  00004  Audio-Video World    593 West 37th Street Panacea
___       12  00005  Take Home Movies     Box 357              Fence Lake
___       12  00006  Main Street Video    Gateway Shopping Cen Pumpkin Center
___  R   12  00007  Cinemagic            Pass-a-Grille Beach  Pass-a-Grille
___        2  00008  Director's Chair     347 Miners Row       Spuds
___  R   12  00009  Prime Time Video     64 Newberg Avenue    Loving
___  R   12  00010  Reely Great Videos   590 Frontage Rd      Christmas Valley
___       12  00011  Director's Chair     347 Miners Row       Kiester
___        2  00012  Main Street Video    Gateway Shopping Cen Howey in Hills
___       12  00013  Front Row Video      U.S. Highway 130     Christmas
___       12  00014  Reely Great Videos   590 Frontage Rd      Economy
___       12  00015  Director's Chair     347 Miners Row       Happy Camp
___       12  00016  Movies-R-Us          1772 Bridge St       Bonanza
```

Figure 9. Compare Results Display

The data from both sources is displayed. The differences in the data are highlighted. The columns in the Match Key are listed first. On the display, the column heading and underline is highlighted to identify the Match Key column. In this example, CUST_ID is the only Match Key column.

In addition to the data, the display includes an information line that provides headings (Cmd, Chg, and Src), the table name, the number of rows and the relative position of the first displayed row, and a horizontal scroll indicator.

In this example, the table names from each source are the same, but that may not always be the case. By default, the Source 1 table name is displayed. The Creator ID, the portion of the name most likely to differ, is not displayed. (Similarly, the Source 1 column headings are displayed by default. If you prefer, you can display the Source 2 table names and column headings. Use the FLIP command to toggle the names.)

Compare assigns an identifier to the table name. This identifier provides shorthand notation for specifying the table as an operand on the many available primary commands. In the figure, T1 (Table 1), is assigned. (Details about the available commands are provided in "Browse Compare File" on page 87.)

Src

The rows from both sources are displayed. The source is identified in the **Src** column. You can readily identify rows that have changed by the value in **Src**.

Equal Rows
: When the row in Source 1 exactly matches the row in Source 2, the row is displayed once and **Src** contains the number 12 to indicate both Source 1 and Source 2. (The customers with CUST_ID 00002 and 00003 are the same in both sources.)

Changed Rows
: When the rows differ, the row from each source is displayed and **Src** contains either 1 or 2 to indicate the source. (The rows for the customers with CUST_ID 00001 and 00004 have changed.) These rows are marked as having a Direct change. Data in the columns that do not match is highlighted.

One Source Only
: When a row exists in only one source (it was added or deleted by the application), **Src** contains 1 or 2, as appropriate. (The customer Director's Chair, CUST_ID 00008, and Main Street Video, CUST_ID 00012, exist only in Source 2.) The **Src** value for these rows is highlighted.

Chg

In addition to identifying the source of each row, the type of change, if any, is also indicated in the **Chg** column. **Chg** contains a **D** for Direct changes, and related rows with changes are identified with an **R** or Related changes. (In the figure, customers with CUST_ID 00001 and 00003, for example, have related changes.)

Rows with no parent are identified by a **U** for Unusual row. The CUSTOMERS table is the parent, so this is not applicable for this table. The rows that have duplicate match keys are displayed and identified by brackets. None are displayed in this sample.

Display Related Changes

Initially, data from one pair of tables is displayed. To get a more complete view of what has changed, you must use the Join facility to display the related rows from other tables.

In this sample session, the CUSTOMERS table is directly related to the ORDERS table, which was included in the comparison. **Chg** indicates related changes for CUST_ID 00007, Cinemagic. Use the J line command or the JOIN primary command to display the related data. In this example, type J in the line command entry area to display the following panel.

```
-------------------- Optim: Browse (Source 1 Names Shown) ---------------------
Command ===>                                                 Scroll ===> PAGE

Cmd Chg Src == Table: CUSTOMERS(T1) ======================= 5  OF 503 === MORE>>
            CUST_ID       CUSTNAME             ADDRESS             CITY
            ------- -------------------- ==================== ---------------
___  R   12  00007  Cinemagic            Pass-a-Grille Beach  Pass-a-Grille

Cmd Chg Src == Table: ORDERS(T2) ============================ 1 OF 3 === MORE>>
            ORDER_ID CUST_ID ORDER_DATE ORDER_TIME FREIGHT_CHARGES
            -------- ------- ---------- ---------- ---------------
*** ********************************* TOP ***********************************
___  R   12   77784   00007  1998-01-29  11.30.11       52.00
___       2   77785   00007  1998-01-29  11.35.11       57.00
___      12   77786   00007  1998-01-29  14.25.41       15.25
*** ******************************** BOTTOM *********************************
```

Figure 10. Browse Related Data

An information line displays headings for the joined table. As with the first table, the table name is taken from Source 1 and an identifier assigned by Compare.

Here, T2 (table 2) is assigned to the ORDERS table. The source and nature of changes is highlighted. In this example, a row in Source 2 does not exist in Source 1; ORDER_ID 77785 has been added to Source 2. The DETAILS table, a dependent table related to ORDERS, is included in the Compare Process. Changes to related data in the DETAILS table are indicated by the R in the **Chg** column for ORDER_ID 77784 in the ORDERS table.

You can join to the other tables in the comparison and scroll the data. Many other commands, discussed in “Browse Compare File” on page 87, are available to browse the results of the comparison.

Iterative Testing

Compare supports iterative testing. You can copy your test database to an Extract File. (Use Move to create the test database from this file.)

After executing your application, use Compare to analyze before and after versions of the data. If you need to revise your application, use Move to refresh the test database, using the original Extract File. After re-executing your application, use Compare again to verify the changes. You need not recreate the test data or re-specify the data to be compared to be sure of executing against the same test data.

Additional Information

This topic shows where you can obtain additional information about the Compare Process.

For additional information about the Compare Process, see “Browse Compare File” on page 87. The other sections of this manual provide additional information about the other facilities available with Compare. You can read these sections in any order.

Chapter 3. Data Migration

In addition to extracting sets of related data as part of the Compare Process when needed to obtain the source data, Compare enables you to extract the data as a separate, explicit process and store that data in an Extract File. When you extract the data as a separate process, you can compare data from different subsystems.

Further, when Move is also installed, the extracted data can also be used to create and populate tables in the same or another DB2 subsystem. A single Extract File can be used to serve both purposes. Also, if the Optim solution is installed on a client server system, the extracted data can be migrated to databases on other platforms.

Specify Source

To specify the source you use an existing Access Definition or create a new Access Definition. The created Access Definition can be temporary, for a single use, or permanent, saved for repeated use. The Access Definition is used as input to the Extract Process. (See the *Common Elements Manual*, for a detailed discussion of creating and modifying Access Definitions.)

The Extract Process copies the specified data to an Extract File. The Extract File is saved and can be reused as needed.

Migration Menu

To migrate data, select Option 7 MIGRATION on the **Main Menu**. (If Move is not installed, this option is SNAPSHOT.)

The following panel is displayed when Move and Archive are also installed. When only Compare is installed, the options to EXTRACT and BROWSE are available.

```
------------------------------ Data Migration --------------------------------
OPTION ===>
                                              SQLID  ===> FOPDEMO
                                              SUBSYS ===> TDB2
1  EXTRACT  - Extract Data from Source Tables   LOCATION ===>
2  INSERT   - Insert Data into Destination Tables
3  LOAD     - Create Load Files and Perform Load
4  DELETE   - Delete Data from Tables
5  CREATE   - Create Tables and Related Object Definitions
6  CONVERT  - Convert Extract File using Table and Column Maps
7  LIST     - List Extract Files in Directory
8  IMPORT   - Import Extract File and Populate Directory

R  RETRY/RESTART   - Retry/Restart an Insert Process
B  BROWSE          - Browse Content of Extract File or Control File
```

Figure 11. Data Migration Menu

Panel Options

The available options are:

1 - EXTRACT
Specify the set of data to be extracted. After the set of source data is specified, this option extracts

the data and stores it in an Extract File. (If Move is installed, the extracted data can include the rows from the tables and the object definitions for those tables. If Move is not installed, only the data is extracted.)

The specifications for the extracted data can be defined in an Access Definition and stored for repeated use or defined as temporary for one-time use.

Note: You may choose to create the extract file on tape. Be aware that an extract file on tape cannot be used in a compare process and can only be browsed, inserted, or deleted in batch.

When Move is installed, the Extract File is used as the input for the other options listed on this panel. Also, if the Extract File is on disk, it can be specified as the input for the Compare Process. The Extract Process generates the Extract File. The other processes do not modify it.

If an unload program is available, it can be used to extract the data from Image Copy files or directly from the DB2 VSAM files.

2 - INSERT
Specify the destination for the source data in an Extract File. This option inserts the source data into the destination. It is only available when Move is installed. See the *Move User Manual*.

3 - LOAD
Create load files from the Extract File. This option is only available when Move is installed. See the *Move User Manual*.

4 - DELETE
Delete data from tables. This option is only available when Archive is installed. See the *Archive User Manual*.

5 - CREATE
Create tables and related objects for which the definitions are contained in the Extract or Archive File. This option is only available when Move or Archive is installed. See the *Move User Manual*, or the *Archive User Manual*.

6 - CONVERT
Convert the source data defined in the Extract or Archive File. The original source data is converted by applying the Table Map and Column Map specifications to obtain a new or revised Extract File. This option is only available when Move or Archive is installed. For details, see the *Common Elements Manual*.

7 - LIST
Display a list of Extract files that match selection criteria you specify. The List process allows you to manage extract files registered in the Optim Directory. With List you can display, delete, browse, generate a report or see extended information for an extract file. You can also select a file to use in an Insert process. This option is only available when Move is installed. Refer to the *Move User Manual*.

8 - IMPORT
Create entries to register extract files in the current Optim directory. An extract file stored on tape must be registered in the Optim Directory before it can be used in a Convert, Create, Insert, or Report process. This option is only available when Move is installed. Refer to the *Move User Manual*.

R - RETRY/RESTART
Complete an Insert, Delete or Restore process that has not successfully processed the entire Extract or Archive File as specified. This option is only available when Move or Archive is installed. For details, see the *Common Elements Manual*.

B - BROWSE
Display an Extract File or Archive File to view the contents of that file or a Control File to examine extracted data or identify rows in error.

Panel Prompts

The following prompts are available:

SQLID
The current SQLID. Modify this value to connect using a different SQLID.

SUBSYS
The current DB2 subsystem. Modify this value to connect to a different DB2 subsystem.

When connecting to a remote subsystem, this value should be the local subsystem where the remote location is defined.

LOCATION
The remote location. This prompt is displayed if remote access is available. Specify a value to connect to a remote DB2 subsystem. You can use a percent sign (%) to obtain a selection list of available locations. If the connection fails, the session is restarted and the Main Menu is redisplayed. If you leave this prompt blank, the local subsystem is assumed.

The remainder of this section discusses the options available with Compare.

Extract Data

The Extract Process is used to create an Extract File. An Extract File contains the selected set of related rows from one or more tables. An Extract File on disk can be used as one or both sources for a Compare Process.

If Move is installed, the definitions of the tables and related objects may also be extracted. However, any Extract File may be used by both products regardless of which was used to create it. Compare ignores the object definitions and uses only the data for the Compare Process.

The Extract File can be used repeatedly and simultaneously by many users.

Note: An extract file on tape cannot be used for a compare process.

Extract File

An Extract File is created by traversing a set of tables and extracting specific data from those tables. The tables and the relationships to use to traverse those tables are specified in an Access Definition. You can use specifications from an existing Access Definition, create a new Access Definition, or specify temporary definitions.

The Access Definition also includes other specifications, such as:

- Manual selection of specific rows in the Start Table. This selection process is referred to as Point-and-Shoot.
- Selection criteria for one or more tables.
- A maximum number of rows to extract for one or more tables.
- A numeric value used to determine random selection. For example, select every twentieth row.

Extract Process Menu

When you select Option 1 EXTRACT on the **Data Migration** menu to perform the Extract Process, the following menu is displayed.

```
------------------------------- EXTRACT Process ------------------------------
OPTION ===>                                                 SCROLL ===> PAGE

  1  TABLES               - Specify Set of Tables and Selection Criteria
  2  PATHS                - Specify Traversal Paths via Relationship List
  3  OBJECTS              - Specify Object Definitions to Extract
  4  PERFORM              - Specify EXTRACT Parameters and Perform EXTRACT

Type of Access Definition to Use for EXTRACT ===> T  (P-Perm, T-Temp)

If Permanent, Specify New or Existing Access Definition Name
  Group ===>
  User  ===>
  Name  ===>

  Use '_' for DB2 LIKE Character ===>  N  (Y-Yes, N-No)
```

Figure 12. EXTRACT Process Menu

Menu Options

Select an option:

1 TABLES
Define or modify the set of tables to be used for the Extract Process. The Select Tables/Views for AD panel is used to specify the names of the tables to be included in the extract. This is called the Table List.

This panel also displays the type of selection criteria, if any, that has been defined for each table. You can specify a random factor and row limits for each table on this panel. You can use commands to display additional panels for defining selection criteria, an SQL WHERE clause, and substitution variables. From the Table List, you can also invoke the Point-and-Shoot facility to select rows from the Start Table.

For detailed information on the Select Tables/Views for AD panel, see **Access Definitions** in the *Common Elements Manual*.

2 PATHS
Display and modify the relationship list. The Specify Relationship Usage panel is used to select the relationships to be traversed when extracting the data. For detailed information on how to specify the relationships and accompanying parameters, see the *Common Elements Manual*.

3 OBJECTS
Display the Specify Object Definitions to EXTRACT panel from which the objects to be extracted are selected. (This option is only available when Move is installed.)

4 PERFORM
Display the Specify EXTRACT Parameters and Execute panel to specify the parameters and invoke the Extract Process.

Temporary or Permanent

Indicates whether the specifications defined for the extract are temporary, discarded after the extract, or permanent, saved in the Access Definition. For temporary, specify T for TEMP at the prompt, **Type of Access Definition to Use for EXTRACT**. For permanent, specify P. You must specify the name of an Access Definition for permanent specifications.

Access Definition Name

If you decide that the specifications are permanent, specify the name of the Access Definition to be used for the process. The prompts on the panel correspond to the three parts of the Access Definition name:

```
GROUP
USER
NAME
```

Create a New Access Definition

If the name of the Access Definition you specify does not exist, Compare automatically prompts you to create a new Access Definition. The Select Tables/Views for AD panel is displayed. See the *Common Elements Manual*, for details on how to define an Access Definition.

Selection List

You can leave the prompts blank or use DB2 LIKE syntax to display a selection list of available Access Definitions. Use the Select line command, S, to select an Access Definition from the list, and then use ENTER to redisplay the **EXTRACT Process** menu with the name of the selected Access Definition displayed in **Access Definition Name**.

Specify Options

You can define or modify the Access Definition specifications, whether temporary or permanent, by selecting Options 1 or 2 again. As noted earlier, these options display panels discussed in other sections of this manual.

Once the source data has been specified, use the PERFORM Option to perform the extract.

Available Commands

The following primary commands are available when the **EXTRACT Process** menu is displayed:

- CANCEL
- END
- OPTIONS

Perform the Extract Process

When you select Option 4 PERFORM from the **EXTRACT Process** menu to perform the extract, the Specify EXTRACT Parameters and Execute panel is displayed.

Note: Prior to displaying this panel, the Default Value panel may be displayed if you used a substitution variable in the Access Definition, but did not specify a default value for the variable. See the *Common Elements Manual*, section on Access Definitions. for further information.

Here is an example of the Specify EXTRACT Parameters and Execute panel.

```
---------------------- Specify EXTRACT Parameters and Execute ------------------
Command ===>

Current AD Name     : FOPDEMO.EXTRACT.SAMPLE
Extract File DSN ===>
Extract          ===> B                        (D-Data
                                                O-Object Definitions
                                                B-Both)
If Extracting Data:
  Limit Number of Extract Rows  ===>           (1-4294967295, Blank/SL)
  Extract Data using            ===> D         (D-DB2, B-BMC UnloadPlus)
  Extract Data to Tape          ===>           (Y-Yes, N-No)

Perform Convert with Extract    ===> N         (Y-Yes, N-No)

Extract with Uncommitted Reads  ===>           (Y-Yes, N-No)

Run Process in Batch or Online  ===> O         (B-Batch, O-Online)
  If Batch, Review or Save JCL  ===> S         (N-No, R-Review, S-Save)

Process Report Type             ===> S         (D-Detailed, S-Summary)
```

Figure 13. Specify EXTRACT Parameters and Execute

Panel

The prompts on this panel include the following:

Current AD Name
Name of the currently active Access Definition. This read-only value is provided by the system.

Extract File DSN
Name of the Extract File that is to contain the extracted data. This file must be a sequential data set. The Extract File name can be specified explicitly by enclosing it in quotes; otherwise, the default prefix as specified on the User Options panel is automatically prepended to the name. When the Extract Process begins, Compare searches for the named data set.

- If the data set exists, Compare checks to see if it is suitable for an Extract File. If it is, the current Extract Process overlays the data. If it is not an Extract File, Compare does not perform the extract and prompts you for a new data set name.
- If the data set does not exist, Compare prompts for the necessary information to allocate the file. See the *Common Elements Manual*, section on Allocating External Files for a description of the allocation prompts.

  You can obtain a selection list of data sets using either of the wild card characters, % or *, in the last position of the name. Use the Select line command, S, on the selection list to select the file.

Extract
Extract is to include data, object definitions, or both. (Object definitions are pertinent only when Move is installed; therefore, this prompt is only displayed when Move is also installed.)

Limit Number of Extract File Rows
Maximum number of rows of data that can be extracted. The Extract is terminated if the number of extracted rows exceeds this limit. Specify:

Value 1 – 4,294,967,295

blank Site-defined limit

The site-defined limit is set on the Site Options panel.

Extract Data using
If you select a special unload utility in the Site Options panel, this prompt is displayed, offering two options for extracting the data: DB2 and the utility specified in the Site Options panel. Specify:

D Use DB2.

B Use BMC UNLOAD PLUS to access the data in batch.

Extract Data to Tape
An extract file on tape cannot be used in a compare process.

Perform Convert with Extract
Specifies whether the Convert Process is performed before the data is written to the Extract File. The process can mask sensitive data or alter data values.

Y Convert Process is performed. (After ENTER is pressed, the **Specify Convert Parameters** panel is displayed.)

N Convert Process is not performed.

This option is only available when Move is installed. See the *Move User Manual*, section on Perform Convert with Extract.

Extract With Uncommitted Reads
Specify whether to extract uncommitted data from the database during the Extract Process.

Y Extract uncommitted data from the database.

Note: Note: If you choose to extract uncommitted data, the relational integrity of the data in the Extract File may be compromised.

N Do not extract uncommitted data from the database.

Run Process in Batch or Online
Indicates whether the Extract Process is executed in batch or online. Specify:

B Batch

O Online

If site management has established a maximum number of rows for online processing and this request exceeds that limit, this option is forced to Batch and cannot be changed. Consult site management for guidelines.

If Batch, Review or Save JCL
For batch execution, indicate whether the JCL and Batch Utility control statements should be submitted, reviewed prior to job submission or saved for submission at a later time. Since the JCL and control statements are displayed in the ISPF editor, you can modify them for the current request and save them to submit later. Specify:

N Submit job, do not display or save the JCL and control statements.

R Display the JCL and control statements for review prior to job submission.

S Save the JCL and control statements. Prompts are provided for you to specify the name of a file in which to store the JCL and control statements.

Process Report Type
Indicator to include additional information in the Extract Process Report. If selected, detailed information about selection criteria, as well as Column Map usage if converting the Extract File during processing, is displayed.

D Display detailed information in the Extract Process Report.

S Display summarized information in the Extract Process Report.

Available Commands

The following commands are available on this panel:

- CANCEL
- END
- OPTIONS

Extract File Selection List

The following figure shows the selection list that is displayed when you request a list of Extract File data set names.

```
+------------------Select Extract Data Set--------------------+
| Cmd                 Data Set Name                  1 OF 5   |
| --- ---------------------------------------------            |
|     ******************* TOP ********************           |
| ___ FOPDEMO.COHEND.XFILE                                     |
| ___ FOPDEMO.CUST.XCUST                                       |
| ___ FOPDEMO.NAD.XFILE                                        |
| ___ FOPDEMO.SHIP_TO.TEST                                     |
| ___ Z13600MP.FOPDEMO.EXTRACT                                 |
|     ******************* BOTTOM ******************           |
+--------------------------------------------------------------+
```

Figure 14. Select Extract Data Set

Use the Select line command to select a data set. Use END to return to the Specify EXTRACT Parameters and Execute panel.

Unload Program Parameters

If an unload program is installed and site management has made it available to Compare, users can indicate whether the data is extracted directly from DB2 or from the unload program.

If an unload program is used, the prompts shown in the following figure are displayed.

```
---------------------- Specify EXTRACT Parameters and Execute ------------------
Command ===>

 +---------------------Specify Unload Program Parameters--------------------+
 |                                                                          |
 | Source for Extract Data ===> I       (I-IMAGE COPY, D-DB FILES)          |
 |                                                                          |
 | If using an Image Copy, specify which Image Copy datasets should be used |
 |   Image Copy Criteria   ===> L       (A-First On or After Date/Time,     |
 |                                       B-First On or Before Date/Time,    |
 |                                       L-Latest Image Copy,               |
 |                                       S-Specific Image Copy DSN)         |
 |                                                                          |
 |   If selecting an Image Copy by Date and Time:                           |
 |     Date (YYYY-MM-DD)    ===>                                            |
 |     Time (HH.MM.SS)      ===>                                            |
 |                                                                          |
 |   If selecting an Image Copy by data set name:                           |
 |     Image Copy DSN ===>                                                  |
 |                                                                          |
 | If Start Table is partitioned, you may use a subset of the partitions    |
 |   Use Subset           ===> N        (Y-Yes, N-No)                       |
 +--------------------------------------------------------------------------+
```

Figure 15. Specify Unload Program Parameters

Panel

This panel prompts for the following:

File Type
Specify which files are to be used as the data source. Specify:

I Image Copy files are the source.

D Database VSAM files are the source.

Image Copy DSNs
Specify which Image Copy datasets are to be used. You indicate whether the most recent Image Copy is used or an Image Copy is selected by date and time.

A First Image Copy files on or after the date and time specified on the panel.

B First Image Copy Files on or before the date and time specified on the panel.

L Latest Image Copy files. The dates and times specified on the panel are ignored.

Date Specify the date in the format defined for your site.

Time Specify the time in the format defined for your site.

Use Subset
Specify whether the Extract Process extracts from all partitions or a specific set of partitions when the Start Table is in a partitioned tablespace. Specify:

Y A selection list of partitions is displayed from which you can select specific partitions to be included in the process.

N All partitions are used.

Image Copy data sets on the same tape volume

To extract or compare data from DB2 image copy data sets in multiple partitions of the same tablespace stored on the same tape volume, you must manually edit the JCL to allocate the data sets. Multiple image copy data sets cataloged on the same tape volume can not be allocated using dynamic allocation. This is

a z/OS limitation. If you attempt to use dynamic allocation, the extract or compare process fails with a dynamic allocation error. Refer to the *Common Elements Manual*, section on Allocating External Files, for details.

Selecting a Subset

If you specify **Y** for **Use Subset**, Compare displays list of partitions, as shown in the following example.

```
---------------------- Specify EXTRACT Parameters and Execute ------------------
Command ===>

 +------------------------- Specify Partitions to Use ----------------------+
 |                                                                          |
 | Select the partitions to be used by placing an 'S' in the field provided |
 | below for each partition.  Enter 'U' to de-select selected partitions.   |
 | Enter END to proceed with UNLOAD.                                        |
 |                                                                          |
 | Partition                 Partition Values                     1 of 10   |
 | --------- ------------------------------------------------------------   |
 | ******************************** TOP ***********************************  |
 | ___ 1   S '01000'                                                        |
 | ___ 2   S '10000'                                                        |
 | ___ 3   S '20000'                                                        |
 | S__ 4     '30000'                                                        |
 | ___ 5     '40000'                                                        |
 | ___ 6     '50000'                                                        |
 | ___ 7     '60000'                                                        |
 | ___ 8     '70000'                                                        |
 | ___ 9     '80000'                                                        |
 | ___ 10    '99999'                                                        |
 +--------------------------------------------------------------------------+
```

Figure 16. Specify EXTRACT Parameters and Execute

Panel

This panel includes:

Partition
An area for line commands and a sequential number are shown for each partition. Line commands are:

S Select a partition. An S prior to a sequential number identifies a selected partition.

U De-select the partition.

You can select any number of partitions, however, if you do not select at least one, the **Use Subset** option on the Specify Unload Program Parameters panel is automatically changed to N and all partitions are used.

Partition Values
Up to 55 characters showing the maximum index value for the partition, as defined to DB2. (Although DB2 limits the usable portion of the index value to the first 40 characters, when the value is converted to external value, it may be longer.)

Perform the Extract

After you have completed the Specify EXTRACT Parameters and Execute panel, press ENTER. Compare evaluates the Access Definition to be used and your entries on the Specify EXTRACT Parameters and Execute panel. The Extract proceeds as follows.

Online Processing

- The Access Definition is evaluated. If the Access Definition contains an invalid entry, an appropriate error or warning is displayed. (Details are discussed later in this section.)
- The Extract File is located and the contents evaluated to ensure that the named file is an Extract File. If it is not an Extract File, an error message is displayed and you are re-prompted to specify the file name. If the Extract File does not exist, you are prompted for allocation information and Compare creates the file.
- The Extract Process is executed online. A status report is displayed and updated periodically during the processing.
- An Extract Process Report is generated and displayed for browsing.

Batch Processing

- The Access Definition is evaluated. If the Access Definition contains an invalid entry, an appropriate error or warning is displayed. (Details are discussed later in this section.)
- The Extract File is located and its attributes are evaluated to ensure that the named file is suitable as an Extract File. If it is not suitable, the job terminates and an error message is written to the job output file.
- The JCL and Batch Utility control statements are built.
- The Extract Process is executed as a batch job. Note the Extract File must be located again when the process is executed.
- An Extract Process Report is generated and stored in the default output file specified in the JCL.

Access Definition Evaluated

There are a few conditions that can be detected in the Access Definition that prevent the Extract Process from proceeding and some conditions that present warning messages.

Error Conditions

Error conditions can result when an existing Access Definition is used without review. Changes may have been made to the database that are only detected when the Access Definition is edited or used. The following error conditions also prevent you from saving an Access Definition that you are editing. The error conditions include:

- Duplicate entries are encountered for a single table. A table can be included on the list only once. You can not specify a table and one or more views, synonyms, or aliases of that table, or specify more than one view, synonym, or alias of a table. To perform the extract, delete the duplicate entries. (If the Access Definition was created for Access, then the duplicate entries are valid for editing.)
- No valid table is specified. The list of tables in the Access Definition does not contain any valid tables. This can occur if the tables have been dropped from the database. Also, any tables not fully qualified when named are affected when the default Creator ID is changed. To perform the extract, re-specify the tables in the Access Definition.
- A WHERE clause is invalid. Selection criteria for one or more tables, regardless of how it is specified, is invalid. This can occur if changes have been made to the tables since the Access Definition was created. (For example, a column used in an SQL WHERE Clause has been dropped.) This condition can also occur if the default value you specify for a substitution variable is the incorrect data type or size for the column, or does not conform to SQL syntax. To perform the extract, re-specify the selection criteria or correct the default value for the substitution variable.
- The Start Table is invalid. This can occur if the table is dropped from the database or the default Creator ID was changed and the Start Table name was not fully qualified. The table is then marked as UNKNOWN and can not be used as a Start Table.
- The primary key is missing in a child table that has multiple parents. A primary key is required to ensure that multiple copies of the same row are not extracted when the child table is related to multiple parents.

- The user requesting the extract does not have authorization to select data from a table that is to be included.

Warnings

A warning message is issued for every condition that may require your attention, but these conditions do not prevent the extract from proceeding. When warning messages are issued, you are given the option of proceeding or aborting the Extract Process. Warning messages are issued for the following conditions:

- A relationship is in NEW status. This indicates that a relationship has been added to the list and you have not explicitly selected or de-selected it. You can use the Specify Relationship Usage panel to view the relationship list and specifically select or deselect individual relationships. You can use the prompt **Use NEW Relationships** on the Access Definition Parameters panel to specify whether NEW relationships are selected or unselected as the desired default behavior. In general, you will probably want to review these relationships before using them.
- A relationship is in the UNKNOWN status. This occurs when the **Default Creator ID** of the Access Definition has been changed, and a relationship, defined for tables named with the original Creator ID, does not have a comparable relationship when named with the new Creator ID.
- A table is in UNKNOWN status. This occurs when the **Default Creator ID** has changed causing the name of the table to change and a table does not exist with this changed name. UNKNOWN also occurs when the table has been dropped from the database.
- A table specified in the Access Definition is not traversed for the Extract Process. This indicates that a relationship is not selected to provide a path from the Start Table to this table.
- A relationship specified in the Access Definition is not traversed for the Extract Process. This indicates that a relationship is not used during the extract.
- A table specified in the Access Definition has not had RUNSTATS run against it. If the table is large, this could have performance consequences when the extract is performed.
- A view, synonym, or alias is to be extracted, but object definitions for objects other than primary keys and relationships have been requested. These other object definitions will not be extracted for views, synonyms or aliases.

Error and Warning Reporting

If one or more errors or warnings are encountered, the EXTRACT Errors & Warnings panel is displayed. Any error prevents the Extract Process from proceeding. The Extract Process can continue despite warnings.

You may use the SHOW STEPS command to display additional information about how the Extract Process will proceed.

In the following figure, the EXTRACT Errors & Warnings panel is displayed with three warnings documented.

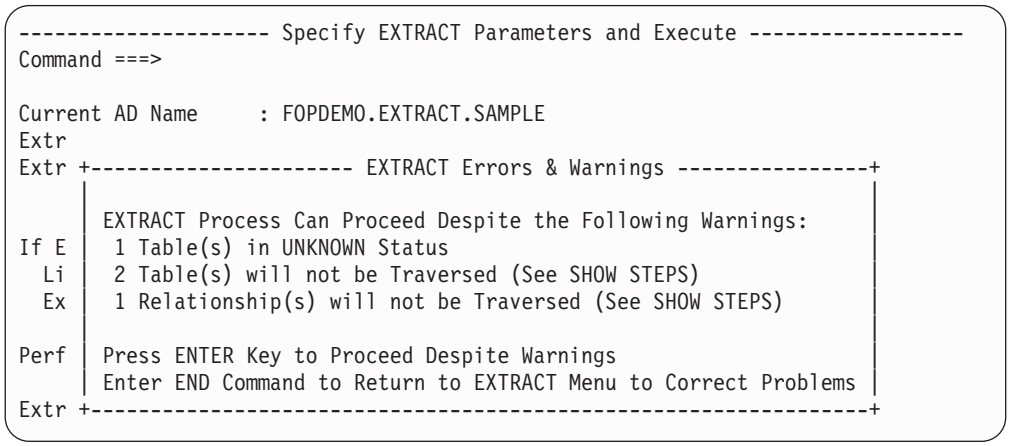


Figure 17. Extract Process Warnings

Point-and-Shoot Validation

If specified, the data set containing the primary key values for the selected rows using Point-and-Shoot is checked as part of the validation of the Access Definition.

A problem is encountered when:

- The Point-and-Shoot file cannot be found.
- The contents of the file specify primary key values for rows that cannot be found.

If any of these problems are encountered, you are prompted to specify how to proceed. You can continue processing without using the Point-and-Shoot values or re-specify the Point-and-Shoot file name.

Unload Program

If an unload program is used, the job can only be executed in batch. However, disregard the error messages and return codes in the report for the unload program. You should review Compare's Extract Process Report to determine whether the job executed successfully.

For example, the Extract Process uses the unload program only to read the data; the data is not written to DDNAME SYSREC. (The Extract Process uses its own facilities to write the data to the Extract File.) For example, UNLOAD PLUS sets a return code of 4 to indicate no records were written to SYSREC although the Extract Process has performed successfully. As another example, UNLOAD PLUS sets a return code of 12 when the Extract Process was successful but terminated prematurely, because of a user limit for the number of rows from an individual table or for the number of rows extracted for the entire process.

The Extract Process Report always contains appropriate messages. Usually these messages are sufficient. However, the following message may be generated when termination is due to processing the unload program.

Error detected during execution of the Unload Program.
See z/OS Job Log for the error message.

Before invoking an unload program, Compare checks for errors to ensure that the selection criteria adhere to the unload program restrictions. If an error is encountered, Compare displays a message. These restrictions are:

1. Expressions before an operator are limited to a single column name.
2. Subselection is not allowed after an operator.
3. Expressions after an operator are limited to a constant or one of the following terms: NULL, CURRENT DATE, or CURRENT TIMESTAMP.

4. The EXISTS predicate is not allowed.

Batch Execution:
For batch execution, Compare builds the necessary JCL and Batch Utility control statements. The JOB card information is taken from the JCL specified on the Job Card and Print Options panel.

If you specified YES to the prompt, **Prompt for Changes Before Job Submission** on the Job Card and Print Options panel, the default job card, as specified on that panel, is displayed prior to job submission. You may edit the job card and specify whether changes are to apply to the current job only or are to be applied permanently. (See Job Card and Print Options in the *Common Elements Manual* for further information.)

The information on the Job Card and Print Options panel is used, along with the extract parameters, to build the JCL and control statements required to perform the Extract Process. If you specify Review to the prompt **If Batch, Review or Save JCL** on the Specify EXTRACT Parameters and Execute panel, the complete jobstream is displayed in the ISPF editor. It can be edited and saved.

When you have completed reviewing the JCL and control statements, you can submit the job. If you have set the option so that jobs are automatically submitted when END is used, the job is submitted. Otherwise, you will have to explicitly SUBMIT the job from the ISPF editor. (See User Options in the *Common Elements Manual*, for information about establishing whether jobs are automatically submitted when END is used.)

If you do not want to submit the job, use CANCEL to return to the Specify EXTRACT Parameters and Execute panel. You can modify the specifications or cancel the extract request from this panel.

If an error is encountered in the job card, a message is displayed. You can review the job card and correct the error or terminate the Extract Process.

Save JCL

You can save the JCL and Batch Utility control statements, modify them, and execute the process without re-invoking COMPARE. Specify S to the prompt, If Batch, Review or Save JCL. The following prompts for the information to save the JCL and control statements.

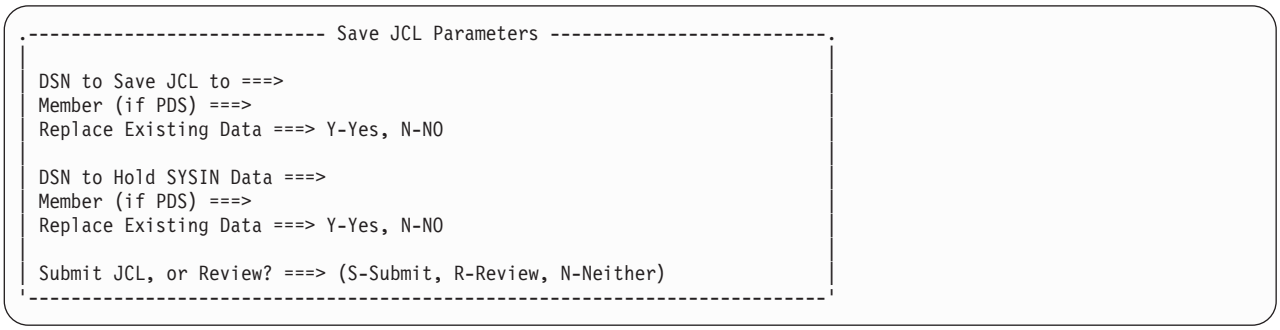


Figure 18. Save JCL Parameters

The following prompts are displayed:

DSN to Save JCL to
Name of the sequential file or partitioned data set to receive the JCL and control statements. If you specify a partitioned data set, specify the member name at the Member prompt.

Member (if PDS)
Name of the member in the partitioned data set specified for the DSN prompt. If a sequential file is specified and you specify a member name, an error message displays.

Replace Existing Data?
Specify whether the generated JCL and control statements replace existing data in the specified file.

DSN to Hold SYSIN Data
Name of the sequential file or partitioned data set to hold SYSIN data. If you specify a partitioned data set, specify the member name at the Member prompt.

Member (if PDS)
Name of the member in the partitioned data set specified for the DSN prompt. If a sequential file is specified and you specify a member name, an error message displays.

Replace Existing Data?
Specify whether the generated JCL and control statements replace existing data in the specified file.

Submit JCL or Review?
Specify whether the JCL and control statements are saved and submitted, displayed for review, or both. If you select Submit, the JCL and control statements are saved and the job is submitted. If you select Review, use ISPF facilities to save or submit the JCL and control statements. If you select Neither, the JCL and control statements are saved, but not submitted or displayed for review.

Unload Program

If an unload program is used, the job can only be executed in batch. However, disregard the error messages and return codes in the report for the unload program. You should review COMPARE's Extract Process Report to determine whether the job executed successfully.

For example, the Extract Process uses the unload program only to read the data; the data is not written to DDNAME SYSREC. (The Extract Process uses its own facilities to write the data to the Extract File.) For example, UNLOAD PLUS sets a return code of 4 to indicate no records were written to SYSREC although the Extract Process has performed successfully. As another example, UNLOAD PLUS sets a return code of 12 when the Extract Process was successful but terminated prematurely, because of a user limit for the number of rows from an individual table or for the number of rows extracted for the entire process.

The Extract Process Report always contains appropriate messages. Usually these messages are sufficient. However, the following message may be generated when termination is due to processing the unload program.

```
Error detected during execution of the Unload Program.
See z/OS Job Log for the error message.
```

Before invoking an unload program, Compare checks for errors to ensure that the selection criteria adhere to the unload program restrictions. If an error is encountered, Compare displays a message. These restrictions are:

1. Expressions before an operator are limited to a single column name.
2. Subselection is not allowed after an operator.
3. Expressions after an operator are limited to a constant or one of the following terms: NULL, CURRENT DATE, or CURRENT TIMESTAMP.
4. The EXISTS predicate is not allowed.

Online Execution Status

When an Extract Process is performed online, Compare provides a status notification pop-up window, as shown in the following example.

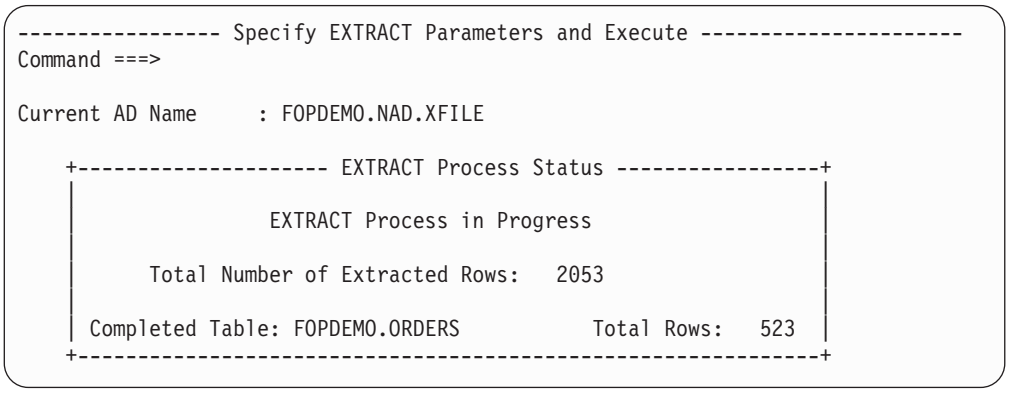


Figure 19. Extract Process Status

The total number of rows that have been extracted is displayed. Also, the name of the currently processing table and total rows that have been extracted from that table are displayed. This is revised:

- After every 1000 rows are extracted for each table to display the current total number of processed rows.
- When the extract for one table is complete and the extract for the next table begins.

Extract Process Report

An EXTRACT Process Report is generated as part of the process. This report contains general information and statistics about the process.

Display the Report

The contents of the EXTRACT Process Report can be browsed. When the process is executed online, the EXTRACT Process Report is automatically displayed. You can scroll the report using the ISPF scrolling facilities or use the FIND command to locate a specific table.

In batch, the report is placed in the default output file as specified in the JCL. You can then display the report as you would the output from any job.

Report Contents

The EXTRACT Process Report documents what has been extracted.

```
------------------ EXTRACT Process Report -------------------------------------
 Command ===>                                                SCROLL ===> PAGE

********************** Top of Data ****************************************

                            EXTRACT Process Report

Extract File          : FOPDEMO.TESTJUL
Access Definition     : TEMPORARY ACCESS DEFINITION
Created by            : Job PSTUSR, using SQLID PSTUSR on DB2 Subsystem DDAF
Time Started          : 2014-08-07 11.01.31
Time Finished         : 2014-03-07 11.01.39

File Compression Impact  :
Extract File
  Compression is not available on BASIC or LARGE format datasets.

Process Options:
  Process Mode        : Online
  Retrieve Data using : DB2
  Limit Extract Rows  : 3000000

Total Number of Extract Tables              : 5
Total Number of Extracted Rows              : 34888
Total Number of First Pass Start Table Rows : 3520
Extract file data byte count  :  2,603,172 Bytes (0.002 GB)

     Extracted Object Types  Number
     ----------------------  ------
1    Table-List Tables            5
2    Related Primary Keys         5
3    Relationships                4
4    Related Indexes              5
5    Related Views                1
6    Materialized Query Tables    0

                                 Extracted   Reference
     Extract Tables                 Rows       Table          Data Byte Count
     --------------              ---------   -----------      ------------------
1    PSTSUPP.CUSTOMERS             3520                        1722290
2    PSTSUPP.ORDERS                9321         N               419445
3    PSTSUPP.SALES                  110         N                11206
4    PSTSUPP.DETAILS              21427         N               428540
5    PSTSUPP.ITEMS                  510         N                21691


                    Relationship Usage Report
                                                 Access Type  Key Limit
                                      Relation  ------------ ------------
   Parent Table    Child Table         Name      Parent Child Parent Child
----------------  -----------------  --------  ------ ----- ------ -----
PSTSUPP.CUSTOMERS  PSTSUPP.ORDERS      RCO       **     SCAN

PSTSUPP.ORDERS     PSTSUPP.DETAILS     ROD       **     SCAN

PSTSUPP.SALES      PSTSUPP.CUSTOMERS   RSC       KEY    **

PSTSUPP.ITEMS      PSTSUPP.DETAILS     RID       SCAN   **

** This path was not traversed during this run.

                      ****** End of Report ******
```

Figure 20. Extract Process Report Format

Report Format

The report format includes headings to identify the information. General information is provided. This includes the Extract File name, the Access Definition, the user requesting the extract and the date and time the process was executed. This is followed by the statistics for the extracted data.

Data Information

The report includes the total number of tables in the extract and the combined total number of rows extracted from these tables.

The **Total Number of First Pass Start Table Rows** displays the number of rows extracted from the Start Table in the initial pass. This value does not include the number of additional rows that may have been extracted in subsequent passes. Subsequent passes of the Start Table may be performed as a result of **Q1** and **Q2** on the Specify Relationship Usage panel or RI cycles.

The names of the tables from which data was extracted are listed in the order in which these tables were listed in the Access Definition. The number of rows extracted from each table is also provided.

Relationship Usage Report

The Relationship Usage Report lists each relationship traversed during the Extract Process, displaying the parent and child table in the relationship as well as the name of the relationship. Additionally, the report displays the actual access method used to access rows for processing, table scan or key lookup, and if key lookup is used, the key lookup limit is also displayed.

Note: The Relationship Usage Report displays the actual Access Method used to access rows. The report lists the following if the access method you specified is overridden.

Detailed Extract Report

If you request a detailed process report from the Specify EXTRACT Parameters and Execute panel, the report includes the following:

Any Column Maps specified for Convert after Extract. If the Column Map is Local, no Column Map information, Column Map Name, Security Status, or other information are displayed.

```
Column Maps in Use:

Map Name        : FOPDEMO.CM2
Source File     : 'FOPDEMO.PERF.APR14'
Modfied By      : FOPDEMO
Last Modified   : 2004-04-28
Security Status : PUBLIC

Source Table: FOPDEMO.CUSTOMERS   Destination Table: FOPDEMO2.CUSTOMERS

Source Column      Data Type      Destination Column   Data Type       Status
---------------- -------------- -------------------- --------------- -------
CUST_ID          CHAR(5)        CUST_ID              CHAR(5)         EQUAL
CUSTNAME         CHAR(20)       CUSTNAME             CHAR(20)        EQUAL
ADDRESS          VARCHAR(50)    ADDRESS              VARCHAR(50)     EQUAL
CITY             VARCHAR(15)    CITY                 VARCHAR(15)     EQUAL
'PA'             LITERAL        STATE                CHAR(2)         LITERAL
ZIP              CHAR(5)        ZIP                  CHAR(5)         EQUAL
                 UNUSED         YTD_SALES            DECIMAL(7,2)    UNUSED
SALESMAN_ID      CHAR(6)        SALESMAN_ID          CHAR(6)         EQUAL
PHONE_NUMBER     CHAR(10)       PHONE_NUMBER         CHAR(10)        EQUAL
```

Any selection criteria specified in the Access Definition. The report displays each table where selection criteria was specified.

```
           Table        Opr      Column                    Criteria
---------------------- --- --------------- ---------------------------------
FOPDEMO.CUSTOMERS      AND STATE           = 'CA'
                       SQL                 cust_ID < '00070'
                                           and ytd_sales > 2000

FOPDEMO.ORDERS         OR  ORDER_ID        = 88603
                           ORDER_SALESMAN  = 'WE012'
```

Print Report

While browsing the EXTRACT Process Report online, you can use the OUTPUT command to direct the contents of the report to an output file or the printer. A panel prompts for the necessary information for the specified output destination. (See the command in the *Command Reference Manual* for further information.)

Browse Extract File

The BROWSE option on the **Data Migration** menu allows you to display the contents of an Extract File to ensure that the desired data is selected for the comparison. Also, when there are several Extract Files, you can display the contents to determine which to use. The browse facility works in four modes:

- Table Mode provides a dynamically formatted display of related data from an Extract File. You display data in Table Mode by selecting rows from the Start Table, or another designated table, and joining to related rows in other tables in the Extract File. Once you have located the desired set of related data, you can print it or save it to a data set.
- In Report Mode, you can generate, browse, write to disk, and print a report on the contents of an Extract File or Control File. This read-only report includes all data in the file or all data in a selected table.
- Summary Mode provides a summarized listing of the tables in the Extract File and the row counts for each (i.e., data rows are omitted).
- In Access Definition Mode, you can browse the Access Definition used to create an Extract File.

When you select Option B BROWSE on the **Data Migration** menu, the following panel is displayed.

```
------------- Extract, Archive or Control File Browse Parameters --------------
Command ===>                                                 SCROLL ===> PAGE

Provide Extract, Archive or Control File Data Set Name:
  DSN              ===>

Browse Mode        ===> T                          (T-Table, R-Report,
                                                    S-Summary, A-Access Def)
If Table Mode, specify
  Table Name       ===>                         >> (Blank for Start Table)
  Begin with       ===> D                          (D-Data, S-Sel Crit, Q-SQL)
  If begin with S or Q
    Case Sensitive ===> Y                          (Y-Yes, N-No  If NO, any
                                                    dense indexes are skipped)
If Other than Table Mode, specify
  Table Name       ===>                         >> (Blank for all tables)
  If output to Disk, specify                       (Blank for temp dataset)
    Output DSN     ===>

For Control File Only:
  Show Row Status  ===> Y                          (Y-Yes, N-No, X-Explain)
  Filter Data      ===> A                          (E-Error Rows Only, A-All)

If Display Length Exceeds File Width ===> C        (C-Change File, W-Wrap Data)
```

Figure 21. Extract Browse Parameters

Note: The title of both the Browse Parameters panel and the **Data Set Name** prompt may vary depending on which tools are installed at your site.

Panel

This panel includes:

DSN Data set name of the Extract File to use for constructing the browse output. (Note that you can also browse Control Files when Move is installed, and Archive Files when Archive is installed.)

You can obtain a selection list of Extract Files using * or % as a wild card character in the last position of the name. (A sample of the selection list displayed for Extract File data set names is provided in Figure 14 on page 30.)

Browse Mode

Type of browse. Specify:

T Browse contents of Extract File dynamically, by selecting and displaying related data.

R Browse contents of Extract or Control File in static report format.

S Browse a summarized listing showing only the names of tables in the Extract File and the row counts for each (that is, data rows are omitted).

A Browse the Access Definition used to create the Extract File.

Note: When you supply a Control File DSN, Browse Mode is ignored and the browse is processed automatically in Report Mode (that is, all data rows are included).

If Table Mode, specify

Table Name

Name of the first table in the Extract File to be browsed. You must include the Creator ID with the table name if different from the default Creator ID. Leave **Table Name** blank to begin browsing with the Start Table. Use SQL LIKE syntax or the LIST TABLES command to obtain a selection list of tables in the Extract File. A value in **Table Name** is ignored if **Browse Mode** is R, S, or A.

Begin with

Indicates the use of criteria in the initial data display. This value is ignored if **Browse Mode** is R, S, or A.

D Display all data in the table referenced in **Table Name**. Do not use criteria to select data for initial browsing. D is the default setting.

S (For Archive Files only.) Display a panel to specify criteria for browsed data.

Q (For Archive Files only.) Display a panel to specify an SQL WHERE Clause for browsed data.

If begin with S or Q

Case Sensitive

If you specified S or Q for **Begin with**, indicate whether the specified selection criteria or SQL is case sensitive by entering a **Y** or **N** here. Specify:

Y Select data, matching the case of criteria exactly as specified. You must use a case-sensitive search to search a dense index.

N Select data without regard to the case of criteria.

If Other than Table Mode, specify

Table Name

Name of a table in the Extract File to browse. You must include the Creator ID with the table name if different from the default Creator ID. Leave **Table Name** blank to browse data from all tables in the Extract File.

This value is ignored if **Browse Mode** is T, S, or A. If **Browse Mode** is R, the report displays results only for the table name specified.

If output to Disk, specify

Output DSN

The data set name for the report. Specify only if the data is to be saved. Leave **Output DSN** blank to use a temporary data set. This value is ignored if **Browse Mode** is T, S, or A.

If the specified data set does not exist, COMPARE prompts for allocation information and allocates the file. (See the *Common Elements Manual*, for further information on file allocation.)

For Control File Only:

Show Row Status

Indicates if the row status defined in the Control File is displayed with the data. This setting is ignored if you do not provide a Control File DSN. (This prompt is only available when Move is installed.)

Filter Data

Indicator for including all rows in the Extract File or only rows that have been discarded. This setting is ignored if you do not provide a Control File DSN. (This prompt is only available when Move is installed.)

If Display Length Exceeds File Width

The action taken if the display length of the data exceeds the width of the file. This setting is used only if the Report result is output to a file and printed. Specify:

C Change file characteristics to accommodate the data.

W Do not change the file characteristics. The data will be wrapped onto multiple lines.

LIST TABLES Command

The LIST TABLES command is used to list the tables in the Extract File. There are no parameters for this command. When the selection list is displayed, use the Select line command, S, to select the tables.

Available Commands

The following commands are available on the Extract, Archive or Control File Browse Parameters panel:

- CANCEL
- END
- LIST TABLES
- OPTIONS

Browse Example

Assume you have selected an Extract File named Z13600MP.FOPDEMO.EXTRACT for browsing in Report Mode. The following figure shows the formatted contents of the Extract File.

```
BROWSE    SYS94031.T141746.RA000.COHEND.R0000049    Line 00000000 Col 001 080
Command ===> _____________________________________________ SCROLL ===> PAGE

******************************** Top of Data ********************************

                Optim - Extract File Print Report

Extract File     : Z13600MP.FOPDEMO.EXTRACT
File Created By  : Job COHEND using SQLID FOPDEMO
File Created On  : January 14, 1998 at 01:04 PM
Report Printed On: January 14, 1998 at 01:15 PM

Number of Tables in the Extract File: 5
Number of Tables Processed in Report: 5

Table: FOPDEMO.CUSTOMERS

CUST_ID        CUSTNAME             ADDRESS
------- -------------------------- ------------------------------------------
00001   Audio-Video World          593 West 37th Street
00002   Select-A-Vision            5720 MacArthur
00003   Movie Classics             75 North Webster
00004   Audio-Video World          593 West 37th Street
```

Figure 22. Browse Extract File – Report Mode

General information including the name of the Extract File, the creator and the number of tables is displayed first. This is followed by the name of each table, total number of rows and the extracted data for each table. To view the rows from each table, scroll the display.

The contents of the Extract File can be printed. (See the command in the *Command Reference Manual* for further information.)

For information on browsing an Extract File in Table Mode, see the *Common Elements Manual*. For details about browsing an Extract or Control File, see the *Move User Manual*.

Available Primary Commands

Several primary commands are available to manipulate the display: The available primary commands are:

- BOTTOM
- CANCEL
- DOWN
- END
- FIND
- LEFT
- LOCATE
- RIGHT
- RFIND
- UP
- TOP

Chapter 4. Compare Process

Compare provides a powerful facility for comparing two sets of related data, as described in this topic.

The following steps are used to perform the Compare Process:

- Define sources. That is, specify the two sets of data to be compared.
- Match tables using Table Maps and, if desired, Column Maps.
- Specify Match Keys. These are the sets of columns used to match rows in the corresponding tables and are usually determined automatically by Compare.
- Select relationships. These are the relationships used to mark related changes and find orphan rows. These are usually determined automatically by Compare.
- Perform Compare Process.
- Browse results using the relational facilities available for a Browse session or review the generated report.

Define the Sources

Many options are provided for defining the sources of the data. You can use a new or existing Access Definition and Compare will extract the data as part of the process. Alternatively, you can use the data previously extracted and stored in an Extract File on disk. Data to be compared can reside in a single table or in multiple related tables.

Store and Browse the Results

The results of the comparison are stored in a Compare File. You can browse the results online using Compare, or generate a report and print or store the report in a sequential file. A variety of report options enable you to control the contents.

About this Section

The remainder of this section discusses the processing flow and describes how to perform the Compare Process for a single pair of tables or for two sets of related data residing in multiple tables. It also includes information on browsing the results and generating reports.

Processing Flow

The Compare Process performs a series of steps based on your specifications. The following documents the steps that are performed when multiple tables are compared. A single table comparison only performs the first two steps: retrieving the data and comparing a pair of tables.

Retrieve the Data

Based on your specifications, Compare will obtain the data for each source either from an Extract File or the DB2 tables.

DB2 Tables - Compare Each Pair of Tables using the Match Key

The rows in each pair of tables are compared independently. Compare uses the “match key” to determine the row from Source 1 that is compared to a row from Source 2.

The match key consists of one or more corresponding columns from each source. These match key columns are used to determine if two rows are the same or different. That is, when the values in the match key columns are the same, the remaining columns in the pair of rows are compared.

Compare attempts to use the primary key defined for a source table as the match key, evaluating the primary keys for each pair of tables as follows:

- If both tables have the same primary key, the primary key is used.
- If both tables have a primary key and one primary key consists of columns common to both, the common primary key is used.
- If both tables have a primary key and either is valid as the match key, you are prompted to select one.
- If neither table has a primary key or if a Column Map does not include a primary key column, you are prompted to define the match key, which is stored in the Compare Definition. The steps used to define a match key are the same as those used to define a primary key.

You can also define a match key that you can use with the current Compare Process or save in the Compare Definition. For a single table comparison, use the Specify COMPARE Sources panel to indicate a user-defined match key will be used. For a multiple table comparison, use the MKEY command in the **COMPARE Process Table Map** to indicate the tables that will use a user-defined match key. After completing each panel, you will be prompted to define the match key.

The columns in a match key can correspond directly by name and compatible attributes (e.g., CUST_ID in both tables) or the correspondence can be established using a Column Map. (When a Column Map is used, the names may be different but the attributes must be compatible.)

To demonstrate the Compare processing, assume the match key for the pair of CUSTOMERS tables contains only the CUST_ID column as the match key column, and the following data is contained in that column in each source:

```
Source 1          Source 2

00001             00001
00002             00002
00003             00004
00004             00005
00006             00006
00006             ...
...
```

When reviewing the compared data, Compare provides two areas to indicate the results. **Chg** defines the type of change and **Src** identifies the source of the displayed row. The following examples discuss the possible values for **Chg** and **Src** and the comparison results that generate them.

- The rows containing 00001, 00002, and 00004 in both sources of the CUSTOMERS table contain the same value. These rows are identified as “matched” rows and the remaining columns are compared. When all of the remaining columns match, the rows are “equal”. These equal rows are indicated in **Src** as “12,” but there is no value for **Chg**.

Example - Matched equal rows

```
      Chg                 Src                 CUST_ID

                          1 2                  00001
                          1 2                  00002
                          ...                  00004
                          1 2
```

- When one or more of the remaining columns do not match, the row is marked as having a “direct” change and the row from each source is displayed. For these rows the source is indicated in **Src** as “1” or “2” and a “D,” for direct change, is inserted in **Chg**.

Example - Matched rows with a Direct change

Chg	Src	CUST_ID
D	1	00002
D	2	00002

- When one or more of the column values in the match key are not the same, the row is identified as “unmatched.” The rows containing 00003 in Source 1 and 00005 in Source 2 do not match a row in the other source. These rows are “unmatched” and identified as such by the value in **Src**; the remaining columns are not compared.

Example - Unmatched rows

Chg	Src	CUST_ID
	1	00003
	...	00005
	2	

- There are two rows with a CUST_ID of 00006 in Source 1. These are identified as duplicate match key rows. Although Source 2 may have one or more corresponding rows with identical match key column values, these rows are not compared because it is impossible to determine which rows are to be paired. Duplicate rows are identified by brackets.

Example - Duplicate Match Key values

Chg	Src	CUST_ID
/	1	00006
|	1	00006
\	2	00006

Comparing Data that is Uniquely Keyed

Compare processes uniquely keyed tables and reports the results of the comparison as one of these values: equal, changed, unmatched or non-unique match key. These values are described as follows:

- If rows exist in source 1 and source 2, with keys that match and identical contents, they are reported as “Equal”.
- If rows exist in source 1 and source 2, with keys that match but different contents, they are reported as "Changed".
- If rows exist only in source 1 or source 2, with keys that do not match, they are reported as "Unmatched".
- If multiple rows exist in either source 1 or source 2, with the same key they are reported as “non-unique Match Keys” and no comparison is made.

Comparing Data that is Not Uniquely Keyed - Soft Match

When comparing data that is not uniquely keyed or non-keyed, you have the option to use soft match for the comparison. Soft match means you decide the criteria to determine whether rows match. The Optim solution will attempt to match rows that have the same key or are non-keyed and do not have identical values. Soft match cannot be used for uniquely-keyed data.

For rows to be considered matched, you can determine the minimum columns required. That is, you can specify the percentage of column values that must be equal (in each source) for the rows to be considered a match. The Optim solution calculates the percentage from the number of columns that are not keyed. A row is matched to the row that has the highest matching percentage.

You can limit the soft match processing in two ways:

- Specify a minimum percentage of columns that can be considered a match.

- Set a maximum number of comparisons that can be performed. When this value is reached, the rows compared will be matched and those not compared will be considered unmatched.

See “Match Options Panel” on page 61.

DB2 Tables - Joining Tables in Each Source

After the rows in each pair of tables are compared, Compare determines the parent and child relationships for all tables and, using these relationships, joins the tables within each source. (For example, rows in Source 1 are only joined to other rows in Source 1.)

Here is an example. Assume that CUSTOMERS and ORDERS are specified for a Compare Process, and the match key column is CUST_ID for CUSTOMERS and ORDER_ID for ORDERS. The child relationship column or foreign key in ORDERS is named CUST_ID.

```
Source 1                          Source 2
                CUSTOMERS

CUST_ID                           CUST_ID

00001                             00001
00002                             00002
00003                             00004
00004                             00005
00006                             00006
00006                               ...
...

Source 1                          Source 2
                 ORDERS

ORDER_ID     CUST_ID              ORDER_ID     CUST_ID

20           00001                20           00001
25           00001                25           00001
229          00003                32           00001
...          ...                  229          00004
```

- There are two orders related to customer 00001 in Source 1 and three orders for that customer in Source 2. Based on the match key columns for ORDERS, ORDER_ID, the two listed orders for Source 1 (20 and 25) are compared with the first two orders in Source 2. The third order for customer 00001 in Source 2 is not compared.
- There is one order for customer 00003 in Source 1 and one for customer 00004 in Source 2. These rows are compared because the match key value (the value in the ORDER_ID column) is the same. However, these ORDERS rows actually have different parents. This is noted in the Compare Process output.

  Unlike DB2 primary keys, the columns used in the match key need not be the same columns used for the relationships. This sometimes results in interesting situations such as “matched” parent rows related to different children as well as matched children related to different parents.

DB2 Tables - Identifying Related Changes

After the data is joined, Compare identifies which dependent rows contain changes and marks the appropriate parent rows with the related change indicator.

A related change is identified when:

- a dependent row contains a direct change.
- a dependent row is an unmatched row.
- a dependent row is marked as having a related change.

Example

For example, the match key and relationship data used for the previous CUSTOMERS and ORDERS tables examples are extended, as follows:

```
          Source 1                          Source 2
                        CUSTOMERS

          CUST_ID                           CUST_ID

          00001                             00001
          00002                             00002
          00003                             00004
          00006                             00005
          00006                             00006
          ...                               ...

                          ORDERS

       ORDER_ID      CUST_ID   SALESREP      ORDER_ID      CUST_ID     SALESREP

        20            00001     RP0013        20            00001       RP0013
        25            00001     RP0013        25            00001       SL0033
       229            00003     RP0013        32            00001       SL0033
       352            00005     RP0013       229            00004       RP0013
                                              352            00005       RP0013
```

The first ORDERS row is the same in both sources. When browsing the results of the comparison, this row is displayed once and a source identifier is included, as follows:

```
   Chg            Src               ORDER_ID         CUST_ID          SALESREP

                  1 2               20               00001            RP0013
```

For the second ORDERS row, the SALESREP is not the same in Source 1 and Source 2. This row is marked as a direct change and the related CUSTOMERS row in both the sources is marked as having a related change. (Note since the related CUSTOMERS row from both sources is identical, it is displayed once with the related change identifier. If the rows had not matched, both the row from Source 1 and the row from Source 2 would display the R in **Chg**.)

```
                              Chg          Src          CUST_ID

CUSTOMERS Related change       R           1 2          00001



                              Chg          Src      ORDER_ID   CUST_ID    SALESREP

ORDERS Direct Change          D            1         20        00001      RP0013

                              D            2         20        00001      SL0033
```

The third ORDERS row in Source 2 does not have a match row in Source 1. However, since the row (based on the value of CUST_ID) is related to CUSTOMERS row 00001 in both sources, the CUSTOMERS row is marked as a related change. (The related change marker is not applied when an unmatched row in one source does not have a corresponding parent in the same source. For example, if the CUSTOMERS row only existed in Source 2, a related change marker is not applied.)

```
                            Chg        Src        CUST_ID

CUSTOMERS Related change    R          1 2        00001

                            Chg        Src        ORDER_ID   CUST_ID   SALESREP

ORDERS row in Source
2 only                                 2           32        00001     SL0033
```

The ORDERS rows from both sources for ORDER_ID 229 are compared because they have the same match key value. However, another column, CUST_ID has been changed so both rows are displayed. Further, since the value in the CUST_ID column is different, the row in each source is joined to a different CUSTOMERS row. (The CUST_ID column is used to relate CUSTOMERS to ORDERS.) This unusual circumstance is identified with a U in **Chg** on the ORDERS from each source and the related change indicator is applied to both CUSTOMERS 00003 and 00004.

```
                          Chg        Src        CUST_ID

CUSTOMERS Related Change  R          1          00003

                          R          2          00004

                          Chg        Src        ORDER_ID   CUST_ID   SALESREP

ORDERS Direct Change      D U        1          229        00003     RP0013

                          D U        2          229        00004     RP0013
```

The last ORDERS row in Source 1 does not have a parent in Source 1. There is a comparable row in Source 2. These rows are also considered an unusual circumstance so the row that is an orphan is marked.

```
                          Chg         Src        CUST_ID

CUSTOMERS Related Change  R           2          00005

                          Chg         Src        ORDER_ID   CUST_ID   SALESREP

ORDERS Unusual            D U         1          352        00005     RP0015

                           D          2          352        00005     RP0013
```

The related change indicator is propagated from dependent table to parent up through the chain. For example, assume CUSTOMERS is parent to ORDERS and ORDERS is parent to DETAILS. A change to a DETAILS row is marked as a direct change. The related ORDERS row and the CUSTOMERS row related to that ORDERS row are marked as having a related change.

DB2 Tables - About Cycles

If cycles are involved, the related change indicator that is propagated may not reflect a directly related table. For example, if CUSTOMERS was a self-referencing table, an R marked in a CUSTOMERS row could correspond to a change in ORDERS for a related descendant CUSTOMERS row.

Browsing the Results

After the Compare Process completes, you can browse the results online. Since the results are stored in the Compare File, you can use the Browse option on the **COMPARE Process** menu to browse the results later.

Details about browsing the results are provided in “Browse Compare File” on page 87. Details about specifying the Compare Process are provided in “Compare Process Menu” through “Perform Process” on page 78. An overview of the contents of the Compare File is provided in “Terminology” on page 4.

Compare Process Menu

When Option 8 COMPARE is selected, the following panel is displayed to begin the prompting for the information necessary to perform the Compare Process.

```
----------------------------- COMPARE Process ---------------------------------
OPTION  ===>
                                              SQLID  ===>
1  SINGLE   - Compare One Table to Another     SUBSYS ===>
2  MULTIPLE - Compare Two Sets of Tables       LOCATION ===>
3  PERFORM  - Specify COMPARE Parameters and Perform COMPARE

B  BROWSE   - Browse Results of Previous COMPARE
R  REPORT   - Generate Report from Previous COMPARE

Type of Compare Definition to Use for COMPARE ===> T  (P-Perm, T-Temp)

If Permanent, Specify New or Existing Compare Definition Name:
  GROUP  ===>
  USER   ===>
  NAME   ===>

Use '_' for DB2 LIKE Characters ===> N  (Y-Yes, N-No)
```

Figure 23. COMPARE Process Menu

Panel Options

The following options are available:

1 - SINGLE
Compare one pair of tables. The source for each table can be an Extract File or a DB2 table.

2 - MULTIPLE
Compare a set of related data that resides in multiple tables. The source for each set of data can be an Extract File or the DB2 tables. The data from the DB2 tables can be defined by an Access Definition or, for Source 2, based on the specifications from Source 1.

3 - PERFORM
Perform the Compare Process using an existing Compare Definition.

B -BROWSE
Browse an existing Compare File. Special facilities are available when browsing to highlight the differences, to scroll, and to join to related data in other tables.

R - REPORT
Generate and print a report based on the contents of the Compare File. This report can include summary information, details, or both. Summary information includes statistics about the Compare Process. The detail report includes the data rows from each table from each source and the status of those rows.

In addition to these options, this panel prompts for the following:

SQLID
The current SQLID. Modify this value to connect using a different SQLID.

SUBSYS
The current DB2 subsystem. Modify this value to connect to a different DB2 subsystem.

When connecting to a remote subsystem, this value should be the local subsystem where the remote location is defined.

LOCATION
The remote location. This prompt is displayed if remote access is available. Specify a value to connect to a remote DB2 subsystem. You can use a percent sign (%) to obtain a selection list of available locations. If the connection fails, the session is restarted and the Main Menu is redisplayed. If you leave this prompt blank, the local subsystem is assumed.

Type of Compare Definition to Use
Specify whether the Compare Definition is to be used for the current Compare Process only or is to be stored in the Directory. If stored, it is available for reuse and to other users. Specify:

P PERManent. Compare Definition is to be stored in the Directory.

T TEMPorary. Compare Definition is not saved.

If Permanent, Specify New or Existing Compare Definition Name
Specify the name of the Compare Definition to be used. The name is composed of three parts:

GROUP
The 1- to 8-character group identifier. The default is the previously entered value or the TSO ID of the current user if a GROUP has never been specified.

USER The 1- to 8-character user name. The default is the previously entered value or the user's DB2 SQLID if a USER has never been specified.

NAME
The 1- to 12-character name of the Compare Definition. You can use DB2 LIKE syntax or leave one or more parts blank to obtain a selection list.

Use '_' for DB2 LIKE Character
Specifies whether or not the underscore (`'_'`) is to be used as a DB2 LIKE character or used literally as part of the name.

For example, A_B could be assumed to be a three-character name containing the characters `'A_B'` as entered or a three-character name that begins with A, ends with B, and has any valid character in the middle. The default is NO which means that the underscore is not handled as a DB2 LIKE character.

Use Existing Compare Definition

To use an existing Compare Definition, specify P for permanent in **Type of Compare Definition to Use for COMPARE** and the name of the Compare Definition. For example, during the iterative testing process you need to compare the same sets of data each time you execute your revised application. Rather than redefine the two sources, just specify the same Compare Definition each time you execute the Compare Process.

Subsequent Use

The **GROUP**, **USER**, and **NAME** information specified on this panel is stored in your profile. The next time you display this panel, those values are automatically provided. You may change any of these values. If you press ENTER without supplying a fully qualified name, a selection list of all Compare Definitions for the named **GROUP**, **USER**, and **NAME** are displayed. If there are no Compare Definitions to satisfy these values, a message is displayed prompting you to re-specify. (See "Compare Definition Selection List" on page 55 for information about this selection list.)

Primary Commands

The END command can be used to return to the **Main Menu**. Any values specified on this panel are retained in your profile. The CANCEL command returns to the previous menu but your profile is not updated. The OPTIONS command can be used to display the User Options panel or, if authorized, the Site Options panel.

When all specifications are complete, press ENTER to continue.

Compare Definition Selection List

If requested, a selection list of Compare Definitions is displayed based on the specifications in **GROUP**, **USER**, and **NAME** on the COMPARE Process panel.

For example, a selection list of all Compare Definitions, regardless of the GROUP or USER, can be obtained by leaving all three prompts blank or specifying % for any or all prompts.

A selection list of all Compare Definitions in any GROUP beginning with A and for the USER identified as JAA, can be obtained by specifying A% for GROUP, JAA for USER, and % or blank for NAME.

If a selection list is requested and there are no Compare Definitions that match the selection criteria, the message NO MATCHING DEFINITIONS is displayed. You are prompted for the information again.

Select a Compare Definition

Assuming Compare Definitions have been defined and **GROUP**, **USER**, and **NAME** all contain blanks or DB2 LIKE syntax, a selection list formatted like the one in the following example is displayed. The names are presented in alphabetical order sorted by **GROUP**, **USER**, and **NAME**.

Use the Select (S) line command to select the desired Compare Definition. In the following figure, for example, the last definition on the selection list, FOPDEMO.SAMPLE.COMPARE, is selected.

```
------------------------ Select a Compare Definition --------------------------
Command ===>                                                  Scroll ===> PAGE

    Line Cmds: S-Select, D-Delete, C-Copy, R-Rename, AT-Attr, I-Info 1 OF 8

    ---- Compare Definition ------ ------ Last Modified -------
Cmd  Group     User       Name        By           Date
--- -------- -------- ------------ -------- -------------------
    ****************************** TOP ***********************************
___ DVLMT01  FOPDEMO  CUSTTEST     KEBLERD  1999-06-06 16.37.59
___ DVLMT02  FOPDEMO  CUSTTEST     KEBLERD  1999-03-13 14.52.49
___ FOP      COHEND   EMPL01       ALLEGRA  1999-07-21 16.36.59
___ FOP      DETL     PAYROLL      LISAC    1999-06-22 09.51.12
___ FOPDEMO  COHEND   SAMPLTST     DCOHEN   1999 07-23 19.12.23
___ FOPDEMO  COHEND   TEST04       DCOHEN   1999-05-13 14.52.49
___ FOPDEMO  FEIN     CMPSAMP      FEINP    1999-06-02 13.23.14
S__ FOPDEMO  SAMPLE   COMPARE      ALLEGRA  1999-07-26 12.14.39
    ***************************** BOTTOM *********************************
```

Figure 24. Select a Compare Definition

Panel

This panel includes:

Cmd Line command entry area. The available line commands are:

- **S** Select a Compare Definition.
- **D** Delete a Compare Definition. After deleting, *DELETED is displayed in the selection list.
- **C** Copy a Compare Definition. The copy command allows you to create a new Compare Definition by copying an existing Compare Definition. The **Copy Compare Definition** panel prompts for the name of the Compare Definition. After copying, *COPIED is displayed in the selection list.
- **R** Rename a Compare Definition. The Rename command allows you to change the name of

an existing Compare Definition. The Rename Compare Definition panel prompts for the new name of the selected Compare Definition. After renaming, *RENAMED is displayed in the selection list.

AT Modify attributes of a Compare Definition. The Object Attributes panel allows you to edit the description and security status of the Compare Definition.

I Display information about a Compare Definition.

Compare Definition

Group The group name supplied when the Compare Definition was created.

User The user name supplied when the Compare Definition was created.

Name The base name of the Compare Definition.

Last Modified

By TSO User ID of the user that created or last updated the Compare Definition.

Date Date and time of last update displayed in the format of a DB2 TIMESTAMP.

Description

A user option controls whether or not the description of each Compare Definition is displayed on this panel. (See the *Common Elements Manual* for more information about the **Selection List Format** option.)

Copy Compare Definition

To copy a Compare Definition, type C in **Cmd** next to the name of the Compare Definition to be copied. The following figure shows the Copy Compare Definition panel.

```
+--------Copy Compare Definition--------+
|                                        |
| Existing Name: FOPDEMO.SAMPLE.COMPARE  |
|                                        |
| New Name:                              |
|                                        |
|    Group ===> FOPDEMO                  |
|    User  ===> SAMPLE                   |
|    Name  ===> COMPARE                  |
+----------------------------------------+
```

Figure 25. Copy Compare Definition

The Copy Compare Definition panel displays the name of the source Compare Definition and prompts for a new three-part name for the copy operation.

Rename Compare Definition

To rename a Compare Definition, type R in **Cmd** next to the name of the Compare Definition to be renamed. The following figure shows the Rename Compare Definition panel.

```
+-------Rename Compare Definition-------+
|                                       |
| Existing Name: FOPDEMO.SAMPLE.COMPARE |
|                                       |
| New Name:                             |
|                                       |
|    Group ===> FOPDEMO                 |
|    User ===>  SAMPLE                  |
|    Name ===>  COMPARE                 |
+---------------------------------------+
```

Figure 26. Rename Compare Definition

The Rename Compare Definition panel displays the current name of the Compare Definition and prompts for a new three-part name.

Object Attributes

To modify the description and security status attributes of a Compare Definition, type AT in **Cmd** next to the name of the Compare Definition. The description and security status are specified on the Object Attributes panel.

```
+------------------------Object Attributes-----------------------+
|                                                                |
| Object Name: FOPDEMO.SAMPLE.COMPARE                            |
|                                                                |
| Modify the attributes below as needed.                         |
|                                                                |
| Description ===>                                               |
|                                                                |
| Security Status ===> PUBLIC (PUBLIC, PRIVATE, READONLY)        |
|                                                                |
| Use END command to accept any changes and return.              |
| Use CANCEL command to ignore any changes and return.           |
|                                                                |
+----------------------------------------------------------------+
```

Figure 27. Object Attributes

The Object Attributes panel provides a 40-character area to display and edit the description. An 8-character area is available to specify one of the following security statuses:

- **Public** which means anyone can edit and use.
- **Private** which means only the owner can edit and use.
- **Readonly** which means anyone can use, but only the owner can edit.

A site option can prevent users from specifying a security status on this panel, in which case Security Status will not be displayed. For additional information about the Object Attributes panel, see the *Common Elements Manual*.

Compare Definition Attributes

To aid in selecting a Compare Definition, use the I line command to display information about a Compare Definition. Assume the I line command is entered for a Compare Definition named FOPDEMO.SAMPLE.COMPARE. The following panel is displayed.

```
----------------------- Compare Definition Attributes -------------------------
Command ===>                                                 SCROLL ===> PAGE

Group              : FOPDEMO
User               : SAMPLE
Name               : COMPARE

Description        : Sample Compare Definition
Security Status    : PUBLIC
Last Modified By   : ALLEGRA
Modified On        : 1998-07-26 14.32.45
Compare File       : FOPDEMO.NADELSS.COMPARE

Source 1 Table     : FOPDEMO.SALES
Source 2 Type      : FOPBP.SALES
```

Figure 28. Compare Definition Attributes

This is a read-only display. The COMPARE generates and maintains the information on this panel according to your specifications for the Compare Definition. The information on the panel includes general information about the Compare Definition such as the user, date and time last modified, and the name of the Compare File. The sources of the compared data are identified as an Extract File, an Access Definition, or the DB2 tables. If an Extract File or Access Definition, the name is displayed appropriately. If using DB2 tables, the name of a Compare Definition is displayed only if a permanent Compare Definition was specified.

Available Commands

You can use standard ISPF scrolling facilities to scroll a selection list. The following primary commands are available when the Select a Compare Definition panel is displayed:

BOTTOM, CANCEL, DOWN, END, FIND, LOCATE, OPTIONS, RESET, RFIND, SELECT, SHOW, SORT, TOP, and UP.

- FIND locates a character string anywhere in the list.
- LOCATE locates and scrolls to an object name that matches or is greater than the search value.
- SELECT can be used to select a Compare Definition. Note that the named Compare Definition does not have to be included in the selection list.
- SHOW limits the selection list to objects for which a specific value is displayed.
- SORT arranges the list by values under a column heading (for example, SORT DATE).

Terminate List

Use the END command or the CANCEL command to return to the **COMPARE Process** menu. Use ENTER, after entering an S line command to select a Compare Definition. If ENTER is used, the name of the selected Compare Definition is inserted on the **Compare Process** menu.

One Pair of Tables

At times, you might need to compare the “before” and “after” versions of a single table or the contents of one pair of tables. Option 1 on the **COMPARE Process** menu allows you want to compare one pair of tables or two versions of a single table.

For example, after a reference table is updated, you can confirm the revisions by comparing the original version with the updated version. Although important to the data in other tables, the reference table is frequently maintained independently.

Select Option 1 on the **COMPARE Process** menu when you want to compare one pair of tables or two versions of a single table. The Specify COMPARE Sources panel is displayed. If an existing Compare Definition is to be used, the panel is populated with information from that definition. If not, the profiled values are displayed. The first time this panel is displayed, there are no profiled values. Only **Modify Sel. Criteria** and **Status** contain default values, as shown in the following example.

```
-- Specify COMPARE Sources: FOPUSER.TEST.COMPDEF ------------------------------
Command ===>                                                 SCROLL ===> PAGE

Table 1 (Use LIKE Syntax for Lists):
  Creator ID             ===>                 >>
  Table Name             ===>                                      >>
  If Data from Extract File:
    Extract File DSN     ===>
  If Data from DB2 Table:
    Modify Sel. Criteria ===> N  (S-SEL, Q-SQL, N-NO, A-ALL)   Status: NONE

Table 2 (Use LIKE Syntax for Lists):
  Creator ID             ===>                 >>
  Table Name             ===>                                      >>
  If Data from Extract File:
    Extract File DSN     ===>
  If Data from DB2 Table:
    Modify Sel. Criteria ===> N (S-SEL, Q-SQL, N-NO, A-ALL)  Status: NONE

Column Map (Optional) -   Use MAP command to edit existing Column Map:
  MapID.MapName ===>                       (Use LOCAL for Internal/Unnamed Map)
Define New Match Key               ===> N (Y-Yes, N-No)
Display Current Key                ===> N (Y-Yes, N-No)
Define Compare Match Options       ===> N (Y-Yes, N-No)
```

Figure 29. Specify COMPARE Sources - Single Tables

Panel

The prompts on the panel for Table 1 and Table 2 are the same and include the following items for each table:

Creator ID
An up to 128-character creator ID. Use DB2 LIKE syntax to display a selection list of tables.

Table Name
For DB2 tables only, name of the table containing the data to be compared. Use DB2 LIKE syntax to display a selection list of tables.

Extract File DSN
If the data has been previously extracted and stored in an Extract File on disk, specify the data set name of the Extract File containing the data for the named table. For Legacy data, the sources to be compared must exist in Extract Files. (Use the Extract Process under Main Menu Option 7 MIGRATION to create an Extract File in a separate step. See Chapter 3, “Data Migration,” on page 23.) If an Extract File data set name is not specified, Compare assumes the data is to be extracted from the database as part of the current Compare Process.

Use an * as the last character in the data set name to display a selection list of Extract Files.

Note: An extract file on tape cannot be used in a compare process.

Modify Sel. Criteria
For DB2 data, if the data is to be extracted, specify whether you want to define or modify selection criteria for the data. Specify:

S SEL. Display the Specify Selection Criteria panel.

Q SQL. Display the SQL WHERE Clause panel.

N NO. The criteria is not to be modified.

A ALL. Delete any selection criteria and extract all rows.

Selection criteria cannot be specified when the source is an Extract File.

Status Indicates whether selection criteria has been specified when the data is to be extracted for the Compare Process. **Status** cannot be modified. Valid values are:

NONE
Criteria has not been specified.

SEL Selection criteria has been specified.

SQL An SQL WHERE clause has been specified.

SEL/SQL
Both selection criteria and an SQL WHERE clause have been specified and will be logically ANDed.

MapID.MapName
Specify the name of a Column Map if one is to be used. Specify:

blank A Column Map is not used.

name Name of the Column Map to use.

LOCAL
Keyword identifying the Column Map as specific to the current Compare Process and not available for any other process.

Use DB2 LIKE syntax or the LIST MAPS command to display a selection list of Column Maps. (More information about specifying a Column Map name is provided later in this section. See the *Common Elements Manual* for details about defining Column Maps.)

Define New Match Key
For DB2 data only: Indicate if a user-defined match key will be used for the Compare Process. Specify:

Y A user-defined match key will be used. After completing the panel, you will be prompted to define a match key.

The steps used to define a match key are the same as those used to define a primary key. See the *Common Elements Manual* for details about creating a primary key.

N Do not use a user-defined match key.

Display Current Key
For DB2 data only: This prompt is displayed if the Compare Definition has been saved and contains a match key. Indicate to display the current match key. Specify:

Y Display the match key.

N Do not display the match key.

Define Compare Match Options
Indicate whether or not you want to modify the compare match options. Specify:

Y Change the current options. The current options are displayed on the panel. Any changes you make will be in effect for this comparison and will be saved with the Compare Definition.

N Use the current options.

All values specified on this panel are profiled, except **Define New Match Key** and **Display Current Key**.

Match Options Panel

The Compare Match Options panel allows you to specify match options that control the method used to compare rows, the accuracy with which non-uniquely keyed tables are matched, and limits on the processing to be performed.

If you specify Y for Define Compare Match Options on the Specify Compare Sources panel, the Compare Match Options panel is displayed.

If you specify Y for Define Compare Match Options on the Specify Compare Sources panel, the Compare Match Options panel is displayed.

```
--Compare Match Options-------------------------------------------------------
Command ===>

Commands: MKEY, CANCEL    END when Done

Source 1: RDLC.FILE10B
Source 2: RDLC.FILE10B

Match Key Property   ===> Non-Unique  (Non-Keyed, Non-Unique, Unique, Unknown)

Match Method         ===> ANY

Soft Match Parameters (if not unique)
  Enabled            ===> Y      (Y-Yes, N-No)
  Percent Required   ===> 50     Percentage of columns that must match
  Percent Acceptable ===> 100    Processing stops at this percentage match
  Maximum Attempts   ===> 0      Limits number of comparisons per row
```

The Compare Match Options panel includes the following fields:

Source 1
Source 2
These are the two sources that are to be compared. These values are not modifiable.

Match Key Property
Describes the match key used for the sources to be compared. The value in this field is automatically populated, based upon the known attributes of the data. If you change this value to Non-keyed any match key previously defined for these sources is deleted. If this value is Unique, the remaining fields on this panel are non-modifiable. Allowable values are:

Non-Keyed
Data has no match key defined. All rows will be matched using the specified **Match Method**.

Non-Unique
A non-unique match key has been defined between source 1 and source 2. Unique rows will be matched using only the match key. Non-unique rows will be matched using the specified **Match Method**.

Unique
A unique match key has been defined between source 1 and source 2. Rows will be matched using only the match key. If duplicate keys are found, they will be reported as duplicates and not compared.

Note: If you select Unique and the data is not uniquely keyed, the results of the comparison may not be as expected. That is, the comparison may produce a large number of unmatched rows.

Unknown
The match key property is not known and will be determined by the compare process. Unknown is the default value when either of the sources is not an extract file. If you

specify Match Method and Soft Match parameters, they will be used only if it is determined that the match key property is not **Unique**.

Match Method

Controls the processing for non-uniquely keyed and non-keyed sources. This field is not modifiable and displays the value ANY. Data that is non-keyed or non-uniquely keyed is compared using this method: all of the rows in Source 1 with the same key are compared with the rows in Source 2 with the same key. Equal rows are matched without any consideration for their relative sequence. Unequal rows are either considered unmatched or are matched according to the **Soft Match Parameters**.

Soft Match Parameters (if not unique)

The following are the soft match parameters.

Enabled

Controls whether soft matching is performed. Specify:

Y Enables soft matching. Unequal rows are compared and the best matches are paired and considered changed.

N Disables soft matching. All unequal rows are considered changed. Unequal rows are considered to be source 1 or source 2 only. If you specify N, the other Soft Match parameters are ignored.

If the match key property is **Unique**, soft matching cannot be used.

Percent Required

Specifies the percentage of similarity required to consider two unequal rows matched. This value applies only to the columns that are not defined as part of the match key. Allowable values range from 1 through 100. The default is 50 percent.

For example, if there are 10 columns that are not part of the match key and you specify a value of 80 for **Percent Required**, 8 columns or more must be equal for the rows to be paired. For this reason, if there are columns that must match, ensure that you define them as part of the match key.

Percent Acceptable

This parameter limits processing by reducing the precision of the comparison. Normally, all of the rows in source 1 are compared to all of the rows in source 2 and the best matches that meet the **Percent Required** are selected. If you specify a value less than 100 for **Percent Acceptable**, match processing for a row will stop when a row comparison meets or exceeds this percentage. The default is 100 percent.

Maximum Attempts

Limits the number of compares performed for any set of unequal rows. The value 0 disables this limit. Specify a value in the range 1 to 999,999. The default is 0.

Display Current Key

This prompt is displayed if the Compare Definition has been saved and contains a match key. Indicate to display the current match key. Specify:

Y Display the match key.

N Do not display the match key.

Match Option Examples

This topic contains several examples of different matching options used for the segment SHIPI, which is non-uniquely keyed. The Match Key used for all examples includes FOP_SURKEY(1:15) and SHIPI_KEY.

Here is the Source 1 example:

```
FOP_SURKEY(1:15)          SHIPI_KEY CLASS TYPE    DATE_UPDATED OWNER
++++++++++++++++++++++++ +++++++++ ----- ------- ------------ -----
SALES1CUST10001SHIPI30000 SHIPI3    1st   LETTER  12.04.27     BOB
SALES1CUST10001SHIPI40000 SHIPI4    2nd   PACKAGE 12.03.02     JOHN
SALES1CUST10001SHIPI40001 SHIPI4    1st   PACKAGE 09.04.27     PHIL
SALES1CUST10001SHIPI40002 SHIPI4    1st   PACKAGE 08.04.27     MIKE
```

Here is the Source 2 example.

```
FOP_SURKEY(1:15)          SHIPI_KEY CLASS TYPE    DATE_UPDATED OWNER
++++++++++++++++++++++++ +++++++++ ----- ------- ------------ -----
SALES1CUST10001SHIPI30000 SHIPI3    1st   PACKAGE 12.04.27     PETER
SALES1CUST10001SHIPI40000 SHIPI4    1st   PACKAGE 08.04.27     FRANK
SALES1CUST10001SHIPI40001 SHIPI4    2nd   PACKAGE 12.03.02     JOHN
SALES1CUST10001SHIPI40002 SHIPI4    1st   LETTER  11.04.29     BOB
```

Example 1

In this example, the Match Options are specified as shown:

```
Match Key Property    ===> Non-Unique  (Non-Keyed, Non-Unique, Unique, Unknown)

Match Method          ===> ANY

Soft Match Parameters (if Non-Keyed or Non-Unique)
  Enabled             ===> N       (Y-Yes, N-No)
  Percent Required    ===>         Percentage of columns that must match
  Percent Acceptable  ===>         Processing stops at this percentage match
  Maximum Attempts    ===>         Limits number of comparisons
```

The following example shows the comparison results:

```
Cmd Chg Src == Table: SALEHDAM SHIPI (T1) ==================================

                FOP_SURKEY      SHIPI_KEY   CLASS     TYPE    DATE_UPDATED   OWNER
*** ********************************************************************************
___  D   1  SALES1CUST100010000  SHIPI3      1st     LETTER     12.04.27     BOB
___  D    2 SALES1CUST100010000  SHIPI3      1st     PACKAGE    12.04.27     PETER
___       1  SALES1CUST100010001  SHIPI4      1st     PACKAGE    09.04.27     PHIL
          1  SALES1CUST100010002  SHIPI4      1st     PACKAGE    08.04.27     MIKE
___      12  SALES1CUST100010000  SHIPI4      2nd     PACKAGE    12.03.02     JOHN
___       2  SALES1CUST100010000  SHIPI4      1st     PACKAGE    08.04.27     FRANK
          2  SALES1CUST100010002  SHIPI4      1st     LETTER     11.04.29     BOB
*** ********************************************************************************
```

Example 2

In this example, the Optim solution attempts to match all rows with non-unique keys. Only non-unique rows with identical contents will be reported as matched (Src 12). All other rows will be reported as existing only in source 1 or source 2.

If the Match Options are specified as shown in the following example:

```
Match Key Property    ===> Non-Unique  (Non-Keyed, Non-Unique, Unique, Unknown)

Match Method          ===> ANY

Soft Match Parameters (if Non-Keyed or Non-Unique)
  Enabled             ===> Y       (Y-Yes, N-No)
  Percent Required    ===> 75      Percentage of columns that must match
  Percent Acceptable  ===> 100     Processing stops at this percentage match
  Maximum Attempts    ===> 0       Limits number of comparisons
```

The comparison results would be as shown in this example:

```
Cmd Chg Src == Table: SALEHDAM SHIPI (T1) ================================

              FOP SURKEY      SHIPI KEY   CLASS     TYPE    DATE UPDATED   OWNER
*** ************************************************************************
___       1  SALES1CUST100010000  SHIPI3      1st     LETTER     12.04.27     BOB
___       2  SALES1CUST100010000  SHIPI3      1st     PACKAGE    12.04.27     PETER
___      12  SALES1CUST100010000  SHIPI4      2nd     PACKAGE    12.03.02     JOHN
    D     1  SALES1CUST100010002  SHIPI4      1st     PACKAGE    08.04.27     MIKE
___ D     2  SALES1CUST100010000  SHIPI4      1st     PACKAGE    08.04.27     FRANK
___       1  SALES1CUST100010001  SHIPI4      1st     PACKAGE    09.04.27     PHIL
___       2  SALES1CUST100010002  SHIPI4      1st     LETTER     11.04.29     BOB
*** ************************************************************************
```

In this example, Soft Match is enabled and Percent Required is 75. The Optim solution attempts to match all rows with identical keys, unique or non-unique, that have at least 75% of identical column data. Two matches were found: one has identical contents, and one has different OWNER contents. All other rows are reported as existing only in source 1 or source 2.

Selection List of DB2 Tables

You can obtain a selection list of DB2 tables by specifying DB2 LIKE syntax for the Creator ID, table name, or both. If the name of an Extract File is specified, a list of the DB2 tables in that Extract File can be displayed.

If an Extract File is not specified, a value must be entered for the Creator ID or the name of the table because the list of tables is obtained from the DB2 Catalog. This requirement ensures that you do not inadvertently request a selection list of all tables in the DB2 Catalog. Such a list can be time-consuming to produce and cumbersome to scroll. However, you can specifically request a selection list of all the tables in the DB2 Catalog by specifying only % for the Creator ID, the table name, or both.

The following is a sample selection list with Creator ID set to FOPDEMO.

```
-- Specify COMPARE Sources: FOPUSER.TEST.COMPDEF ------------------------------
Command ===>                                                SCROLL ===> PAGE

Table 1 (Use LIKE Syntax for Lists):
  Creator ID             ===> FOPDEMO         >>
  Table Name             ===> %                                  >>
  If Data from Extract File:
    Extract F
  If Data fro +--------------------Select One Table--------------------+
    Modify Se | Cmd            CreatorID.TableName             1 OF 10 | NE
              | --- ----------------------------------------            |
Table 2 (Use  | ******************* TOP ********************            |
  Creator ID  | ___ FOPDEMO.CUSTOMERS                                   |
  Table Name  | ___ FOPDEMO.DETAILS                                     |
  If Data fro |  __ FOPDEMO.FEMALE_RATES                                |
    Extract F | S__ FOPDEMO.ITEMS                                       |
  If Data fro | ___ FOPDEMO.MALE_RATES                                  |
    Modify Se | ___ FOPDEMO.ORDERS                                      |
              | ___ FOPDEMO.SALES                                       |
Column Map (O | ___ FOPDEMO.SHIP_INSTR                                  |
  MapID.MapNa | ___ FOPDEMO.SHIP_TO                                     | d Map)
Define New Ma +---------------------------------------------------------+
Display Current Key                  ===>
Define Compare Match Options         ===>
```

Figure 30. Tables Selection List - Single Tables

Use the S line command to select the table to use in the comparison. You can scroll the list. Use END or ENTER to terminate the list and return to the Specify COMPARE Sources panel after selecting a table. Use CANCEL to abandon table selection. (In the previous example, the FOPDEMO.ITEMS table is selected.)

DB2 Tables - Column Maps

Column Maps are used to map unlike named columns from one source table to another or to eliminate one or more columns from the comparison. You can define a Column Map for a specific Compare Process or define one to be stored in the Optim Directory and available for all processes and to all users. These types of Column Maps are identified by a unique name or the keyword LOCAL.

LOCAL
The specifications for a Column Map identified by the keyword LOCAL are stored in the Compare Definition and, therefore, are only available to a Compare Process using this Compare Definition. It cannot be used for any other process.

name A Column Map stored in the Optim Directory under a unique name can be used by any process and any user. The format for naming this type of Column Map is MapID.MapName, where MapID equals a valid 1-to-8-character user ID, followed by the name of the column map.

LOCAL Column Maps

If you specify LOCAL, Compare assumes that you are going to create a Column Map; therefore, the Column Map editor panel is automatically displayed and populated with the names of the columns that match in name and data type from each source table. (For details about Column Maps, see the *Common Elements Manual*.)

Explicit Name

If you specify the name of a Column Map that does not exist, a confirmation prompt is displayed to ensure that a new map is to be created and the name was not mistyped. The prompt is displayed, as follows:

```
+------------- Create Column Map Confirmation -------------+
|                                                          |
|          Column Map FOPDEMO.NEWMAP Does Not Exist        |
|                                                          |
| Press ENTER to Proceed with Column Map Create            |
| Enter END Command to Return to 'Specify COMPARE Sources' |
+----------------------------------------------------------+
```

Note: This prompt is only displayed if you specify a valid user ID as part of the new column map name. In the previous example, for instance, the user ID is FOPDEMO. If the user omitted that user ID or specified an invalid ID, an error message would have been displayed, instead of the prompt.

Use ENTER to continue to create a new Column Map or use END to redisplay the Specify COMPARE Sources panel. If ENTER, the Column Map editor panel is displayed and populated with the names of the columns that match in name and data type from each source table.

Compare assumes that if you specify the name of a Column Map that does exist, you intend to use that map without editing it. Compare does not check table names or validate column mapping at this point. The validation is performed as part of the Compare Process. You can use the MAP command to display and edit the Column Map.

You can display a selection list of Column Maps by specifying DB2 LIKE syntax in **MapID.MapName**. A list can also be generated with the LIST MAPS command. (Information about Column Map selection lists is provided in the *Common Elements Manual*.)

When the selection list is displayed, use the S line command to select a Column Map. Use END or ENTER to return to the Specify COMPARE Sources panel. The Column Map you selected is automatically inserted in **MapID.MapName**.

MAP Command

Use the MAP command to edit an existing Column Map whether it is permanent or LOCAL. The Column Map editor panel is displayed and populated with the names of the columns in the map. If the corresponding columns do not conform to the Compare rules, appropriate messages are displayed.

If the names of the tables in the existing map conflict with the names of the tables on the Specify COMPARE Sources panel, you are prompted to specify whether to abandon editing the Column Map or change the table names in the Column Map to the current table names.

```
+-----------------Edit Column Map Confirmation-------------+
|                                                          |
|  Column Map FOPDEMO.COMPMAP is defined with              |
|  tables that do not match Specified pair of tables.      |
|  CHANGE TABLES command will be automatically performed.  |
|                                                          |
| Press ENTER Key to Proceed with Column Map Edit          |
| Enter END Command to Return to 'Specify COMPARE Sources' |
+----------------------------------------------------------+
```

Column Map Editor Panel

When the editor panel is displayed, you can overtype, rearrange and delete the column names from the first source, Table 1. (For details on editing Column Maps, see the *Common Elements Manual*.)

The attributes of the columns that are mapped must be compatible. For details, see the *Common Elements Manual*.

Save Column Map

When you have completed editing the Column Map, regardless of whether it is LOCAL, existing or new, you can save the map under a new name using the SAVE command. Use the keyword LOCAL as the name to designate that the Column Map is not stored in the Directory but is to be used only with the current Compare Definition. When editing an existing map, the original version is unchanged if you explicitly save it under another name. (This is a handy way to model a new or a LOCAL Column Map after an existing Column Map.)

If you have edited the Column Map but do not use the SAVE command, the map is automatically saved when you use END. Use CANCEL to abandon your editing.

Both END and CANCEL terminate Column Map editing and redisplay the Specify COMPARE Sources panel. When you return to the Specify COMPARE Sources panel, **MapID.MapName** is automatically updated as appropriate to display the name under which the map was saved.

Specifications Complete

When you press ENTER, Compare evaluates your entries.

If you are comparing DB2 tables and there is no primary key specified for either of the tables, you are prompted to create a match key to be used and stored in the Compare Definition. (For more information on match keys, see "Processing Flow" on page 47. See the *Common Elements Manual* for details on creating a primary key.)

The Specify COMPARE Parameters and Execute panel is displayed. Since this is the same panel that is displayed when Option 3 PERFORM is selected on the **COMPARE Process** menu, see "Perform Process" on page 78 for information about this panel.

Two Sets of Data

Frequently, you need to compare the "before" and "after" versions of related data that resides in multiple tables.

For example, after an application in development is executed, you can verify that it has processed correctly by comparing the "before" and "after" images of the data manipulated by the application. Since most applications address a set of related data that spans multiple tables, you need to evaluate not only the data from each table independently, but also the impact of the changes with respect to the set of related data. This option allows you to compare two sets of related data and identifies the changes in the rows in each table and propagates the change status to parent tables.

Specify the Source Types

Select Option 2 on the **COMPARE Process** menu when you want to compare one set of related data with another. You are prompted to specify the type of source for each set of data. The Specify COMPARE Source Types panel is displayed.

```
-- Specify COMPARE Source Types: TEMPORARY CD ---------------------------------
Command ===>

COMPARE can process data saved in an Extract File or in DB2, IMS, VSAM, and
Sequential Tables. Specify source types as follows:


   Source 1 ===> 1    1 - Extract File
                      2 - Set of Data Defined by an Access Definition

   Source 2 ===> 3    1 - Extract File
                      2 - Set of Data Defined by an Access Definition
                      3 - All Rows from Multiple Tables
```

Figure 31. Specify COMPARE Source Types

Source Types

As indicated on the panel, the possible types of sources are:

1 - Extract File
The source data has been previously extracted and stored in an Extract File on disk. This provides a constant, unchanging "snap shot" of one version of the data.

Note: An extract file on tape cannot be used in a compare process.

2 - Set of Data Defined by an Access Definition
The source data, as defined by an Access Definition, is to be selected as part of the Compare Process. Each time the Compare Process is executed using this Compare Definition, the data is extracted and, therefore, reflects the current state of the database.

3 - All Rows from Multiple Tables
This option is only available for Source 2. The source data is to be extracted for the Compare Process and consists of all the data from all the tables specified for Source 1. As with Option 2, the data is extracted each time a Compare Process is performed and, therefore, reflects the current state of the database.

This option is useful when:

1. Source 1 uses a temporary Access Definition, an Extract File, or resides on a different subsystem. You do not need to respecify the set of data using this option. Typically, when using a test database you will want to include all rows.
2. When the Source 2 tables do not have DB2 relationships, orphan rows can exist. Using this option, all rows are extracted for Source 2; therefore, when compared to the relational extract provided by Source 1, these orphans are identified.

Your selections are profiled. These profiled values are displayed whenever you are specifying a temporary Compare Definition. When you use an existing permanent Compare Definition, the values contained in that definition are displayed.

The panel that is displayed to prompt for more information about each source is determined by your selections. The following describes the prompts for each option.

Extract File

If the source is an Extract File, the following prompt is displayed on the Specify COMPARE Source Types panel.

```
Source n: Extract File
   DSN ===>
```

The *n* in this panel segment will be 1 or 2 to indicate the source. For **DSN**, specify the data set name of the Extract File. You can display a selection list by typing * as the last character in the name.

Access Definition

If an Access Definition is selected, the following prompts are displayed on the Specify COMPARE Source Types panel.

```
Source n: Relational Extract from DB2 Tables in Access Definition

  Type of Access Definition to Use ===> P  (P-PERM, L-LOCAL)

  If Permanent, Specify Access Definition Name:
    GROUP ===>
    USER  ===>
    NAME  ===>
  Modify Access Definition         ===> N  (Y-YES, N-NO)
```

The *n* in this panel segment will be 1 or 2 to indicate the source. Specify the following for the displayed prompts:

Type of Access Definition to Use
Whether the Access Definition is stored in the Directory or is to be defined only for the current Compare Definition. Specify:

P Access Definition is stored permanently.

L Access Definition is LOCAL. It is stored in and used by the current Compare Definition only.

If Permanent, Specify Access Definition Name

The name of the Access Definition to be used. The name is composed of three parts:

GROUP

The 1- to 8-character group ID. The default is the previously entered value.

USER The 1- to 8-character user name. The default is the previously entered value.

NAME

The 1- to 12-character name of the Access Definition.

You can use DB2 LIKE syntax in any of the prompts or leave one or more prompts blank to obtain a selection list.

Modify Access Definition

Used to indicate whether you want to edit the existing Access Definition. Specify:

Y Display Select Tables/Views for AD panel to edit the selected Access Definition.

N Access Definition is not to be edited.

Editing an Access Definition

When you specify that the Access Definition is LOCAL, you must define the Access Definition. Therefore, Compare automatically displays the Select Tables/Views for AD panel for you to specify the set of data. If the Access Definition is PERMANENT and you specify the name of a new Access Definition, Compare also displays the Select Tables/Views for AD panel. (See the *Common Elements Manual* for details about defining and editing an Access Definition.)

After the initial editing of a LOCAL or new permanent Access Definition, you must specify Y to **Modify Access Definition** on the Specify COMPARE Sources panel if you want to re-edit the definition. Also, you must specify Y to edit an existing Access Definition.

Compare analyzes the steps involved to extract the data specified by the named Access Definition. Any error or warning conditions that may be encountered are displayed at this time.

When these errors and warnings are displayed, you can use the SHOW STEPS command to display information about how the extract would proceed. Operands on the command enable you to specify for which source you want the information. For example, to display the SHOW STEPS information for Source 2 enter:

SHOW STEPS 2

You can return to the Specify COMPARE Sources panel and specify Y to **Modify Access Definition** to correct the errors, warnings, or both; or you can specify a different source.

The possible error and warning conditions that may be encountered are listed in “Extract Data” on page 25 along with details on the SHOW STEPS command.

All Rows

If All Rows is selected for Source 2 and Source 1 is an Extract File, the following is displayed:

```
Source 2:  All Rows from Multiple Tables
  COMPARE will initially use matching Table Names from the (selected)
  Extract File for the Table Map
```

If All Rows is selected for Source 2 and Source 1 is an Access Definition, the following is displayed:

```
Source 2:  All Rows from Multiple Tables
  COMPARE will initially use matching Table Names from the (selected)
  Access Definition for the Table Map
```

As the text for this option states, you can modify the names of the tables and add and delete tables for Source 2 on the COMPARE Process Table Map panel.

Note: When comparing Legacy data, the option for All Rows is not allowed.

Example

To demonstrate these prompts, the following figure displays the panel that prompts for Source 1 as an Extract File and Source 2 as All Rows from Multiple Tables. These are the default values.

```
Source 1: Extract File
  DSN ===>

Source 2: All Rows from Multiple Tables
  COMPARE will initially use matching Table Names from the (selected)
  Extract File for the Table Map
```

Specifications Complete

After you specify the sources for the comparison, use ENTER to proceed. The COMPARE Process Table Map panel is displayed. Use CANCEL to return to the Specify COMPARE Sources panel.

Compare Process Table Map

The COMPARE Process Table Map panel enables you to match unlike named tables and to eliminate one or more tables from the comparison.

The tables from each source are listed under the appropriate Source 1 or Source 2 heading. Each table in Source 1 is compared to the corresponding table in Source 2 displayed on the same line. You may also specify the names of any Column Maps that are to be used. (Column Maps enable you to map unlike named columns and eliminate individual columns from the Compare Process.)

Initial Display

When this panel is initially displayed:

- Source 1 contains the Creator ID and table names defined in the Extract File or Access Definition that is used. The order in which the tables are listed is the same as in the Extract File or Access Definition. These values are protected.
- Source 2 contains the Creator ID and matching table names defined in the Extract File or Access Definition, if one is used. However, if All Rows is specified, these values are populated with the information from Source 1.

All Rows versus Extract File or Access Definition

When Source 2 is specified as an Extract File or an Access Definition, you can use only the tables included in the Extract File or Access Definition. However, if Source 2 is All Rows, you can use any DB2 table, view, alias, or synonym.

Assuming an Extract File is named for Source 1 and All Rows is specified for Source 2, the following panel is displayed.

```
---------------------- COMPARE Process Table Map -----------------------------
Command ===>                                                 Scroll ===> PAGE

Available Commands: APPLY,SAVE,LIST,MAP,POPULATE,ACM,CLEAR,MKEY, END when Done
Source 2 May be any Table or View
 Src 1 CID: FOPDEMO                                      Column
 Src 2 CID: FOPDEMO                                   >>  Map ID ===>

 Source 1 Table Name      Source 2 Table Name      Type   Column Map or "LOCAL"
-------------------- ------------------------>> ------- --------------------
*********************************** TOP ************************************
CUSTOMERS             CUSTOMERS                 TABLE
ORDERS                ORDERS                    TABLE
DETAILS               DETAILS                   TABLE
ITEMS                 ITEMS                     TABLE
SHIP_TO               SHIP_TO                   TABLE
********************************** BOTTOM **********************************
```

Figure 32. COMPARE Process Table Map

The Creator ID FOPDEMO inserted for both sources. The tables in the Extract File are listed under **Source 1 Table Name** and **Source 2 Table Name**.

Panel

This panel includes:

Src 1 CID
The default Creator ID for the Source 1 tables, as defined in the Access Definition or Extract File being used.

Src 2 CID
The default Creator ID for the Source 2 tables. The initial display is based on the source type.

If Source 2 is an Extract File or an Access Definition, the default Creator ID is displayed and cannot be modified.

If Source 2 is All Rows (Option 3 on the Specify COMPARE Source Types panel), **Src 2 CID** is unprotected. If Source 1 is an Extract File, the default Creator ID from that Extract File is displayed in **Src 2 CID**. If Source 1 is an Access Definition, **Src 2 CID** is blank.

Column Map ID
The default qualifier for Column Maps.

Source 1 Table Name
The list of tables to be compared from Source 1. The names of the tables are taken from the Access Definition or Extract File specified for the source.

Source 2 Table Name
The list of tables to be compared from Source 2. If an Access Definition or Extract File is specified as the source, Compare attempts to match same name tables. Non-matching names are not displayed. If All Rows is the source, the Source 1 table names are repeated. To edit the list:

- Replace a name by typing over it or selecting a new table from a list. You can request a selection list using the LIST TABLES primary command.
- Clear all names using the CLEAR primary command.
- Prefix all names with a string using the PREFIX primary command.

Append a string to all names using the SUFFIX primary command.

Type The type of the object named in **Source 2 Table Name**. Compare supplies this value and it is not modifiable. Possible values include:

TABLE
Table

S-MQT
System-maintained Materialized Query Table

U-MQT
User-maintained Materialized Query Table

VIEW View

UNKNOWN
Non-existent table or no value in Dest CID

EXISTS
Exists

TEMPTBL
Temporary table

A-TABLE
Alias of a table

S-TABLE
Synonym of a table

A-VIEW
Alias of a view

S-VIEW
Synonym of a view

UNUSED
Unused. When a Source 2 table is not mapped to a Source 1 table, the type is UNUSED. When a Source 2 table does not exist, the type is UNKNOWN. (This must be resolved before saving or using the Compare Definition.) When Source 2 is an Extract File, the original source type may be unavailable; therefore, the type is EXISTS.

When a Source 2 table is not mapped to a Source 1 table, the type is UNUSED. When a Source 2 table does not exist, the type is UNKNOWN. (This must be resolved before saving or using the Compare Definition.)

When Source 2 is a table and the type value is EXISTS, one of the following values may also be displayed:

- An asterisk indicates a user-defined match key will be applied to the tables.
- A dash (-) indicates user-specified match options will be used.
- A plus sign (+) indicates both user-defined match key and user-specified match options.

When Source 2 is an Extract File, the original source type may be unavailable; therefore, the type is EXISTS.

Column Map
The name of the Column Map used to compare the two tables.

Modify Source 2 Table Names

You can modify the Source 2 Creator ID when All Rows is the source. You can modify any of the table names specified for Source 2. However, if the source is specified as an Access Definition or an Extract File, you can only specify table names included in the specified source. If the source is **All Rows**, you can specify any DB2 table, view, alias, or synonym.

When Source 2 is **All Rows**, you can display a selection list of tables for Source 2, using the LIST TABLES command to replace or insert a table name. This command presents a list of the available tables and

assigns a number to the tables listed for Source 1. This number is used to select a table from the list of Source 2 tables. The following is a sample of the LIST TABLES display. In the following figure, LIST TABLES FOPDEMO.% has been entered. Note there are a few DB2 tables not used in the Extract File for Source 1, but included on the list for Source 2 tables because they are in the database.

```
---------------------- COMPARE Process Table Map -----------------------------
Command ===>                                                 Scroll ===> PAGE

Available Commands: APPLY,SAVE,LIST,MAP,POPULATE,ACM,CLEAR,MKEY, END when Done
Source 2 May be any Table or View
 Src 1 CID: FOPDEMO                                      Column
 Src 2 CID: FOPDEMO                                        ==>
                           +-------------Tables--------------+
Num  Source 1 Tables   Type |                                | ap or "LOCAL"
--- ----------------- ------- Select Items by Matching 'Num'  | ------------
*** ************************ |                                | *************
  1 CUSTOMERS         TABLE  Num CreatorID.TableName  1 OF 9 |
  2 ORDERS            TABLE  --- --------------------        |
  3 DETAILS           TABLE  ********* TOP **********        |
  4 ITEMS             TABLE  1__ FOPDEMO.CUSTOMERS           |
  5 SHIP_TO           TABLE  2__ FOPDEMO.ORDERS              |
***************************** 3__ FOPDEMO.DETAILS             | *************
                             |  __ FOPDEMO.FEMALE_RATES       |
                             | 4__ FOPDEMO.ITEMS              |
                             |  __ FOPDEMO.MALE_RATES         |
                             | 5__ FOPDEMO.SHIP_TO            |
                             | ___ FOPDEMO.SHIP_INSTR         |
                             | ___ FOPDEMO.STATE_LOOKUP       |
                             | ******** BOTTOM ********       |
                             +--------------------------------+
```

Figure 33. Matching Tables on Compare Process Table Map

Use **Num** on the **Tables** pop-up window to specify the number of the Source 1 table to match to the selected Source 2 table. In this example, five tables are mapped to the five Source 1 tables. The selected table names are automatically inserted under **Source 2 Table Name**. The LIST command can be used to display a selection list of tables, views, aliases, and synonyms.

When Source 2 is an Extract File or an Access Definition, the LIST TABLES command lists all of the objects currently not matched to Source 1 tables. Use LIST ALL to list all available objects in the Extract File or Access Definition. (See the *Common Elements Manual* for details on using LIST to map source tables.)

Use Existing Map

You can use the APPLY command to populate the Table Map with the specifications from a previously defined Table Map. If the Source 1 tables in the Compare Process match the Source 1 tables in the Table Map, Compare will populate the Source 2 tables from the existing Table Map, provided they exist.

User-Defined Match Key

You can use the **MKEY** command to create a match key. To specify the table pair to which you want to apply the match key, type one of the table names with the command (for example, MKEY *creatorid.tablename*), or type the command and place the cursor on the row with the tables. After pressing ENTER, an asterisk is displayed next to the Type for the tables. After completing the Table Map, you will be prompted to define a match key, which is saved with the Compare Definition.

The steps used to define a match key are the same as those used to define a primary key. See the *Common Elements Manual* for details about creating a primary key.

Display Match Key

After a Compare Definition is saved, you can display a match key for a table pair using the **MKEY DISPLAY** command. To display a match key, type the command, place the cursor on the row with the table pair, and press ENTER.

MOPT Command (Match Options)

For a multiple compare, match options can be defined for each pair of tables by typing MOPT (Match Options) on the command line, placing the cursor on the source 2 table name, and then pressing Enter. The Optim solution displays the Compare Match Options panel.

ACM Command

If necessary, you can use the ACM command to open the **Choose Access Method** pop-up dialog, allowing you to override the default method (scan or key lookup) for accessing the parent or child table for each relationship. A scan reads all rows in a table at one time; whereas a key lookup locates rows using a WHERE clause to search for primary or foreign key values.

Saving the Map

You can use the SAVE command to save this Table Map in the Optim Directory. Then, the Table Map is available to other users and can be used for other Compare Definitions when specified as the operand of the APPLY command.

If you do not explicitly save the Table Map, it is stored only in the current Compare Definition and is not available to other users or processes.

Available Commands

The following commands are available on this panel:

ACM, APPLY, ATTRIBUTES, BOTTOM, CANCEL, CLEAR, DOWN, END, LIST ALL, LIST MAPS, LIST object, LIST UNUSED, MAP, MKEY, OPTIONS, POPULATE, PREFIX, SAVE, SUFFIX, TOP, and UP.

See the *Common Elements Manual* for details on these commands.

Column Maps

By default, columns whose names match and attributes are compatible are compared. When this default is inadequate, you can specify Column Maps for any pair of compared tables. These maps are used to match unlike named columns and eliminate columns from the comparison. However, the following restrictions apply.

- Mapped columns must be defined with compatible data types.
- You cannot eliminate a column that is part of the match key.
- If you eliminate a column that is part of a relationship, that relationship cannot be used to mark related changes or find orphans.

Specify the Column Map Name

You can type the Column Map name in the provided area, request a selection list of Column Maps using the **LIST MAPS** command, or use the **POPULATE** command to automatically insert the Column Map names. You can create a new Column Map by specifying a new name. (Compare will display a confirmation prompt and, if the name is correct, invoke the Column Map editor.) You can edit an existing Column Map using the **MAP** command.

You can define a Column Map to be used by the current Compare Definition by specifying the Column Map name as LOCAL. Compare assumes that you are going to create the Column Map; therefore, the Column Map editor panel is automatically displayed and populated with the names of the columns that match in name and have compatible data types from each source table. You can edit appropriately.

POPULATE command

You can use the **POPULATE** command to automatically insert the names of Column Maps stored in the Directory for each pair of tables to be compared.

If the columns in the Column Map are not present in the paired tables, a diagnostic is displayed.

More Information

Details about defining Table Maps and Column Maps are provided in the *Common Elements Manual*.

Specifications Complete

When you have completed specifying the Table Map information, use **END** to proceed. Compare analyzes the available relationships on the two sources. Typically all relationships can be used automatically and the Specify COMPARE Parameters and Execute panel is displayed. Since this is the same panel that is displayed when Option 3 PERFORM is selected on the **COMPARE Process** menu, see "Perform Process" on page 78for information about this panel.

Select Relationships - for DB2 Tables only

After the Table Map is completed, Compare checks the relationships between the tables in each source. Regardless of how many relationships are traversed between tables to extract the data, only one relationship can be used for each pair of tables in each direction (parent to child and child to parent) to propagate related changes.

Compare prompts when more than one relationship is available. That is, if the relationships from each source are not the same and/or more than one relationship exists in either or both sources, Compare displays a list of the available relationships from which you must select one for each pair of tables.

The list of relationships is obtained from the sources–DB2 Catalog and Optim Directory if DB2 tables are the source and the Extract File when that is the source. The relationships from the Extract File are those that were available when the Extract File was created. (The list of relationships is displayed on the Specify Relationship Usage panel when defining the data to be extracted.)

The list of relationships on the Select Relationship to Use panel are grouped by parent and child table names.

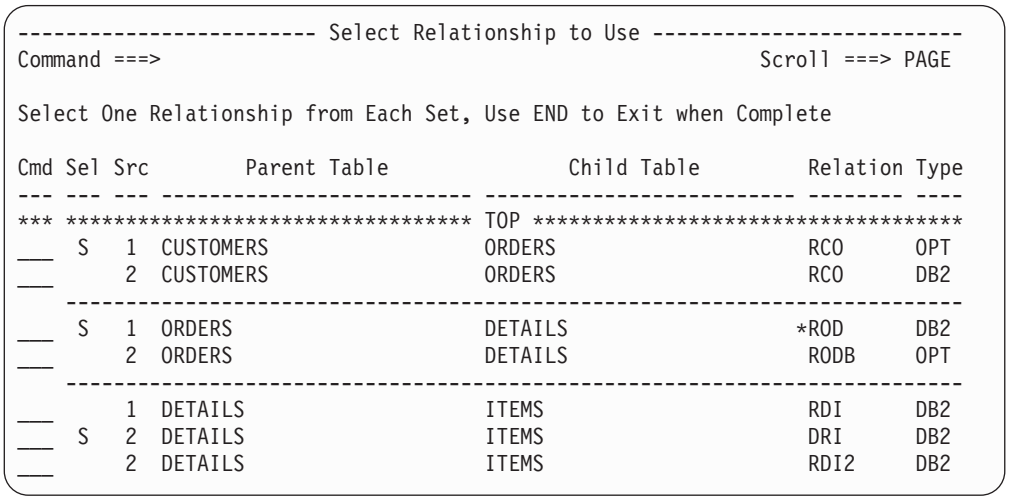


Figure 34. Select Relationship to Use

Panel

This panel includes the following items:

Cmd The line command entry area. Specify:

S Select relationship.

I Display information about a relationship.

U Unselect relationship.

Only one relationship can be selected for each pair of tables.

Sel Indicates whether the relationship has been selected. If selected, **Sel** contains an S, otherwise it is blank.

Src Indicates the source of the relationship as either 1 for Source 1 or 2 for Source 2.

Parent Table
Name of the parent table in the relationship.

Child Table
Name of the child table in the relationship.

Relation
Name of the relationship.

Type Indicates the type of the relationship as either defined in the DB2 Catalog (DB2) or the Optim Directory (OPT).

Duplicate Relationships

Sometimes relationships are encountered that, although named differently, are actually identical. That is, the names of the parent and child tables are the same and the columns are the same, but the relationship name is different. (A relationship is not identical if the assignment of parent/child table names is reversed such as the parent and child in one relationship are the child and parent in another.)

Rather than list these duplicate relationships individually, one of the relationships is listed preceded by an asterisk. The asterisk indicates that there are one or more other relationships identical to the listed relationship but these other relationships have different names. (On the panel in the figure, an asterisk precedes the relationship ROD for ORDERS and DETAILS indicating that at least one more identical relationship exists.)

Selecting Relationships

Use the Select line command to select the relationship. In this example, one relationship is selected for each pair of related tables. Use the Unselect line command to remove a relationship from the select status. Also, if you select a relationship, any previously selected relationship for that pair of tables is automatically unselected because only one relationship can be selected for each pair of tables.

If you do not select a relationship for each pair of tables, the Compare Process does not identify the related changes between these tables. When you do not select a relationship for one or more pairs of tables, Compare displays a confirmation prompt when you attempt to leave the panel. You can proceed with the Compare Process by pressing ENTER or redisplay the Select Relationship to Use panel by using END.

Display Information

The Info line command is available to aid in selecting a relationship. This line command displays the details of the relationship for the relationship selected by the command. Assume the I line command is entered for the relationship RCO between the CUSTOMERS and ORDERS tables. The following information is displayed.

```
------------------------- Select Relationship to Use --------------------------
Command ===>                                                Scroll ===> PAGE

Select One Relationship from Each Set, Use END to Exit when Complete

C +-------------------------- Browse Relationship ------------------------+ ype
- |                                                                       | ---
* |             Browse only Display of DB2 Relationship RCO               | ***
- |                                                                       | ST
I | Parent: FOPDEMO.CUSTOMERS          Child: FOPDEMO.ORDERS              | B2
* |                                                              1 OF 1   | --
  |      Column Name       Data Type        Column Name       Date Type   | B2
  | -------------------->> ----------  -------------------->> ----------  | ST
  | ******************************** TOP ********************************  | --
  | CUST_ID                 CH(5)      CUST_ID                   CH(5)    | B2
  | ******************************** BOTTOM *****************************  | B2
  +-----------------------------------------------------------------------+ B2
```

Figure 35. Browse Relationship Information

The columns participating in the relationship are displayed along with their data type and length. If the list of columns does not fit in its entirety on the screen, you can scroll the display. When you have completed reviewing the relationship information, use END to return to the Select Relationship to Use panel.

Additional Information

The relationships included on this selection list are retrieved from the Extract File, DB2 Catalog, and Optim Directory. Only relationships where the table names and the column names in the relationship match or have been mapped are included.

If a relationship is encountered that does not meet these requirements, but a comparable relationship exists, the unsuitable relationship is not used. However, if a comparable relationship does not exist, a message is displayed. You can continue with the Compare Process; however, the related changes are not propagated for the tables that do not have a suitable relationship.

Perform Process

After the sets of data to be compared are specified and, for DB2 data, the relationships to be used for the comparison are selected, the Specify COMPARE Parameters and Execute panel is displayed.

The Specify COMPARE Parameters and Execute panel is also displayed when Option 3 is selected on the **Compare Process** menu to perform a compare using an existing Compare Definition. The prompts are determined by the sources.

- When data is to be extracted from the database (Source 1 is an Access Definition and when Source 2 is an Access Definition or All Rows), prompts for **Extract Options** for the appropriate sources are displayed.
- When the data is from an Extract File, prompts for **Extract Options** for the appropriate sources are not displayed.
- The prompts for the **Compare File DSN** and **Compare Options** are always included.

In the following figure, both Source 1 and Source 2 request data to be extracted from DB2 tables. Prompts for Extract Options are displayed for both sources.

```
------------------- Specify COMPARE Parameters and Execute --------------------
Command ===>                                                 SCROLL ===> PAGE

Compare File DSN ===> 'FOPDEMO.SAMPLE.COMPARE'

Source 1 Extract Options:
  Selection Criteria and Row List Specified for Start Table:
    Select Start Table Rows by   ===> R         (R-Row List Only, B-Both)
  Limit Number of Extract Rows   ===>           (1-4294967295, Blank/SL)
  Extract DB2 Data using         ===> D         (D-DB2, B-BMC Unload Program)

Source 2 Extract Options:
  Limit Number of Extract Rows   ===>           (1-4294967295, Blank/SL)
  Extract DB2 Data using         ===> D         (D-DB2, B-BMC Unload Program)

Compare Options:
  Generate Report After Process  ===> Y         (Y-Yes, N-No)
  Run Process in Batch or Online ===> O         (B-Batch, O-Online)
    If Online, Invoke Browse     ===> Y         (Y-Yes, N-No)
    If Batch, Review or Save JCL ===> R         (N-No, R,Review, S-Save)
```

Figure 36. Specify COMPARE Parameters and Execute

Specify COMPARE Parameters and Execute Panel

The Specify COMPARE Parameters and Execute panel includes the following information.

Compare File DSN

Name of the Compare File that is to contain the results of the comparison. This file must be a sequential data set. The file name can be specified explicitly by enclosing it in quotes; otherwise, the default prefix as specified on the User Options panel is automatically prefixed to the name.

When the Compare Process begins, Compare searches for the named data set.

- If the data set exists, Compare checks to see if it is suitable for a Compare File.

  If it is, the current Compare Process overlays the data.

  If it is not, Compare prompts you to respecify the name.
- If the data set does not exist, Compare prompts for the necessary information to allocate the file. See the *Common Elements Manual* for a description of the allocation prompts.

You can obtain a selection list of data sets using the asterisk wild card character (*) in the last position of the name. Use the S Select line command to select the file name on the selection list.

Extract Options

The following prompts for Extract Options are displayed for Source 1 or Source 2 or both only when the data for the source(s) must be extracted from the DB2 tables for the Compare Process.

Select Start Table Rows by

This prompt is only displayed when both a row list and selection criteria have been specified.

Specify whether a row list or selection criteria is to be used for the Start Table when extracting the data. Specify:

R Only the row list values are used.

B Both the row list and selection criteria are used.

Limit Number of Extract Rows

Maximum number of rows of data that can be extracted for the source. The extract is terminated if the number of extracted rows exceeds this limit. (If the extract is terminated, the Compare Process is not performed.) Specify:

value 0-4,294,967,295

blank Site-defined limit

The figure shows the distributed default maximum. The site-defined limit is set on the Site Options panel.

Extract DB2 Data using

This option is available only if DB2 data is being compared. Method for extracting the data. You will have two options: DB2 and a utility specified in the Site Options panel. Specify:

D DB2 is used.

I High Performance Unload is used.

Compare Options

Generate Report After Process

Specify whether a report is to be generated after the Compare Process completes. The report can contain a statistical summary, details, or both. You can store the report in a file and print it. Specify:

Y Display the prompts for report options and generate a report.

N Do not generate a report. Default.

Whether or not a report is generated, you can browse the results of the Compare Process stored in the Compare File. Details about the prompts and the format of the report are discussed in "Generate Reports" on page 107.

Run Process in Batch or Online

Specify whether execution of the Compare Process is batch or online. Specify:

B Batch.

O Online.

When using an unload utility, or if this request exceeds the site limit for the maximum number of rows for online processing, this option is set to Batch and cannot be modified.

If Online, Invoke Browse

Indicate whether the Compare Browse facility should be invoked automatically when the Compare Process completes. Specify:

Y Invoke Browse.

N Do not invoke Browse. The Compare Process Report is displayed.

This is specified for online execution only. For Details about browsing the results, see “Browse Compare File” on page 87.

If Batch, Review or Save JCL

For batch execution, indicate whether the JCL and control statements should be submitted, reviewed prior to job submission or saved for submission at a later time. Since the JCL and control statements are displayed in the ISPF editor, you can modify them for the current request and save them to submit later. Specify:

N Submit job, do not display or save the JCL and control statements.

R Display the JCL and control statements for review prior to job submission.

S Save the JCL and control statements. Prompts are provided for you to specify the name of a file in which to store the JCL and control statements.

Unload Programs

If an unload program is available and the response to **Extract Data using** is an unload program for Source 1, Source 2, or both, you are prompted to define unload program parameters for each source. In the next figure, a sample prompt is displayed for Source 1.

```
------------------- Specify COMPARE Parameters and Execute --------------------
Command ===>

+--------------Specify Unload Program Parameters for Source 1--------------+
|                                                                           |
| Source 1 File Type      ===> I       (I-IMAGE COPY, D-DB FILES)           |
|                                                                           |
| If using an Image Copy, specify which Image Copy datasets should be used  |
|   Image Copy Criteria   ===> L       (A-First On or After Date/Time,      |
|                                       B-First On or Before Date/Time,     |
|                                       L-Latest Image Copy,                |
|                                       S-Specific Image Copy DSN)          |
|                                                                           |
|   If selecting an Image Copy by Date and Time:                            |
|     Date (YYYY-MM-DD)    ===>                                             |
|     Time (HH.MM.SS)      ===>                                             |
|                                                                           |
|   If selecting an Image Copy by data set name:                            |
|     Image Copy DSN ===>                                                   |
|                                                                           |
| If Start Table is partitioned, you may use a subset of the partitions     |
|   Use Subset           ===> N        (Y-Yes, N-No)                       |
+---------------------------------------------------------------------------+
```

Figure 37. Specify Unload Program Parameters

If you use an unload program for both sources, the prompts appear consecutively.

You are prompted to specify the **Source File Type** as either the Image Copy or the database VSAM files. If you specify an Image Copy, you can specify the date and time of the file.

Image Copy data sets on the same tape volume

To extract or compare data from DB2 image copy data sets in multiple partitions of the same tablespace stored on the same tape volume, you must manually edit the JCL to allocate the data sets. Multiple image copy data sets cataloged on the same tape volume can not be allocated using dynamic allocation. This is a z/OS limitation. If you attempt to use dynamic allocation, the extract or compare process fails with a dynamic allocation error. Refer to the *Common Elements Manual*, section on Allocating External Files, for details.

Generate Report

If you have specified Yes to **Generate Report**, a panel prompting for information to generate the report is displayed prior to performing the Compare Process. This is the same panel that is displayed when option R is selected from the **COMPARE Process** menu and is discussed in "Generate Reports" on page 107.

Batch Execution

If you specify batch execution, Compare builds the necessary JCL and Batch Utility control statements.

The JOB card information is taken from the JCL specified on the Job Card and Print Options panel.

If you enter YES at the **Prompt for Changes Before Job Submission** prompt on the Job Card and Print Options panel, the default Job card, as indicated on that panel, is displayed prior to job submission. You can edit the Job card and print options and specify whether your changes apply to the current job only or are applied permanently. (See the *Common Elements Manual*.)

The information on the Job Card and Print Options panel is used, together with the Compare Process parameters, to build the JCL and control statements required to perform the process. If you enter Review to **If Batch, Review or Save JCL** on the Specify COMPARE Parameters and Execute panel, the entire JCL and control statements are displayed in the ISPF editor. The JCL and control statements can be edited and saved. (See the *Batch Utilities Guide* for the Compare statement parameters and values.)

Use END to return from the ISPF editor to Compare. However, your response to the **Submit Jobs with END** prompt on the User Options panel determines whether the job is automatically submitted. If you enter NO at the prompt, you must explicitly submit the job from the ISPF editor, using the SUBMIT command.

If you enter YES, the job is automatically submitted. Use the CANCEL command to return to the Specify COMPARE Parameters and Execute panel without submitting the job. You can modify the specifications or cancel the request from this panel.

(See the *Common Elements Manual* for more information on establishing whether jobs are automatically submitted when END is used.)

If you submit the job and an error is encountered in the Job card, a message is displayed. You can review the Job card and correct the error or terminate the Compare Process.

Batch Overrides

If you save the generated batch job to a data set, you can submit the job directly from the ISPF editor rather than from within an online session. Submitting the job directly is especially convenient when you want to compare different Extract or Archive Files to a set of tables or to another file, using common Compare Process JCL. When you submit the batch job directly, you can specify overrides to the Source 1, Source 2, or both data set names. Also, if an unload program is used to extract data for Source 1, Source 2, or both, you can override the Image Copy data set name, date, and time parameters for each source.

Note: With Release 5.5 and later, a generated batch job executes the Batch Utility to perform the specified function. The batch job includes a series of control statements defining the function to be performed. You can edit these control statements directly as an alternative to providing batch overrides. If batch overrides are not available, you must edit the control statements directly. The *Batch Utilities Guide* describes the Batch Utility control statements. (All batch overrides that were valid prior to Release 5.5 will continue to be valid.)

Use the PSDFOVRD DD statement in the JCL to provide the desired overrides.

COMPARE_DSN_SRC1

To specify a new data set name for the Source 1 file, specify:

```
COMPARE_DSN_SRC1   data.set.name
```

This override allows you to use one set of saved JCL to compare files regardless of the names.

COMPARE_DSN_SRC2

To specify a new data set name for the Source 2 file, specify:

```
COMPARE_DSN_SRC2data.set.name
```

This override allows you to use one set of saved JCL to compare files regardless of the names.

SOURCE_CID_OVERRIDE_{ 1 | 2 }

To override the default Creator ID for Source 1 or Source 2 of the Compare Definition, specify:

```
SOURCE_CID_OVERRIDE_{ 1 | 2 } cid
```

This override allows you to use one set of saved JCL to compare files regardless of the default Creator ID. To override the Source 1 specification, use SOURCE_CID_OVERRIDE_1. Use SOURCE_CID_OVERRIDE_2 to override the Source 2 specification.

cid Creator ID to override the default Creator ID for the source.

If the source is an Extract File, you can use the wildcard (%) to use the default Creator ID defined in the Extract File.

This Creator ID applies to all tables that were defined with the initial default Creator ID in the Compare Definition. Tables in the Compare Definition not defined with the initial default Creator ID will not be altered by the specified Creator ID override. This override also changes the names of the tables in the relationships processed by Compare to use the override default Creator ID. If a relationship is not found for the updated table name, an error occurs when the compare is performed. If the source is an extract file, and a table initially defined in the Compare definition with default Creator ID is not in the extract file, the table will be skipped, a warning message will be produced, but the Compare job will continue.

UNL_IMAGECOPY _DSN

To override the Image Copy DSN parameter for an unload program used to extract data for Source 1, specify:

```
UNL_IMAGECOPY_DSN image.file.dsn
```

UNL_IMAGECOPY _DATE

To override the Image Copy Date parameter for an unload program used to extract data for Source 1, specify:

```
UNL_IMAGECOPY_DATE yyyy-mm-dd
```

UNL_IMAGECOPY _TIME

To override the Image Copy Time parameter for an unload program used to extract data for Source 1, specify:

```
UNL_IMAGECOPY_TIME hh.mm.ss
```

UNL_IMAGECOPY _SELECT

To override the Image Copy Criteria parameter for an unload program used to extract data for Source 1, specify:

```
UNL_IMAGECOPY_SELECT { A | B | L | S }
```

A First Image Copy file created on or after the specified Date and Time.

B First Image Copy File created on or before the specified Date and Time.

L Latest Image Copy file. Any Date and Time values are ignored.

S Image Copy file. The name is provided as the Image Copy DSN parameter.

UNL_IMAGECOPY _DSN2

To override the Image Copy DSN parameter for an unload program used to extract data for Source 2, specify:

UNL_IMAGECOPY_DSN2 *image.file.dsn*

UNL_IMAGECOPY _DATE2
To override the Image Copy Date parameter for an unload program used to extract data for Source 2, specify:

UNL_IMAGECOPY_DATE2 *yyyy-mm-dd*

UNL_IMAGECOPY _TIME2
To override the Image Copy Time parameter for an unload program used to extract data for Source 2, specify:

UNL_IMAGECOPY_TIME2 *hh.mm.ss*

UNL_IMAGECOPY _SELECT2
To override the Image Copy Criteria parameter for an unload program used to extract data for Source 2, specify:

UNL_IMAGECOPY_SELECT2 { A | B | L | S }

A First Image Copy file created on or after the specified Date and Time.

B First Image Copy File created on or before the specified Date and Time.

L Latest Image Copy file. Any Date and Time values are ignored.

S Image Copy file. The name is provided as the Image Copy DSN parameter.

Save JCL

You can save the JCL and Batch Utility control statements, modify them and execute the process without re-invoking Compare. Specify S for the **If Batch, Review or Save JCL** prompt. The following window prompts for the information to save the JCL and control statements.

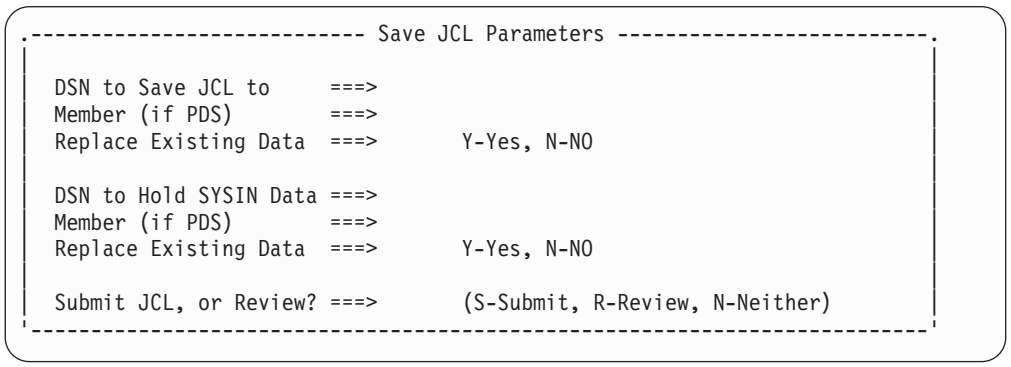


Figure 38. Save JCL Parameters

Save JCL Parameters Panel

The displayed prompts are:

DSN to Save JCL to
Name of the sequential file or partitioned data set to receive the JCL and control statements.

If you specify a partitioned data set, specify the member name at the **Member** prompt.

Member (if PDS)
Name of the member in the partitioned data set specified for the DSN prompt. If a sequential file is specified and you specify a member name, an error message displays.

Replace Existing Data?
Specify whether the generated JCL and control statements replace existing data in the specified file.

DSN to Hold SYSIN Data
Name of the sequential file or partitioned data set to hold SYSIN data. If you specify a partitioned data set, specify the member name at the **Member** prompt.

Member (if PDS)
Name of the member in the partitioned data set specified for the DSN prompt. If a sequential file is specified and you specify a member name, an error message displays.

Replace Existing Data?
Specify whether the generated JCL and control statements replace existing data in the specified file.

Submit JCL or Review?
Specify whether the JCL and control statements are saved and submitted, displayed for review, or both. If you select Submit, the JCL and control statements are saved and the job is submitted. If you select Review, use ISPF facilities to save or submit the JCL and control statements. If you select Neither, the JCL and control statements are saved, but not submitted or displayed for review.

Online Execution

When the Compare Process is executed online, a panel is displayed noting the progress of the process.

If one or both of the sources must be extracted, the progress of the extract is shown. The next step, comparing the tables is then noted followed by the step in which related change indicators are propagated to related tables. The following is a sample of this display.

```
+--------------------COMPARE Process Status--------------------+
|                                                              |
|                   COMPARE Process in Progress                |
|                                                              |
| Extracting Source 1 : COMPLETE                               |
|      Total Extracted: 703                                    |
|                                                              |
| Extracting Source 2 : COMPLETE                               |
|      Total Extracted: 704                                    |
|                                                              |
| Comparing Tables    : IN PROGRESS     Table Pair: 1 of 5     |
| Source 1: FOPDEMO.CUSTOMERS                                  |
| Source 2: FOPDEMO.CUSTOMERS                                  |
|                                                              |
| Joining Related Data:  Pending                               |
|                                                              |
+--------------------------------------------------------------+
```

Figure 39. Compare Process Online Status

As shown on the panel:

- The data is extracted, if necessary. Any errors and warnings were evaluated when the Access Definition was specified on the Specify COMPARE Sources panel. If the process is being performed for an existing Compare Definition through option 3 (PERFORM) directly, the source is evaluated before the Compare Process is performed.
- The tables are compared to identify direct changes and duplicate match key rows.
- The table relationships are evaluated to identify related changes and unusual rows.

Error Conditions

Several warnings and error conditions can occur during each step of the Compare Process. If an error is encountered when the job is executed in batch, the job terminates and an error message is written to the output file. If the job is executed online, the job is terminated and a message is displayed on the screen.

When Extracting Data

If an error is encountered when the data is extracted for either source and an unload program is used, the process is terminated.

When Comparing Data

When a previously defined Compare Definition is used, changes may have occurred that affect whether the process can be performed. The conditions arising from these changes are all validated when creating or editing a Compare Definition and, therefore, only occur if the Compare Definition is used at a later time.

The following is a list of the changes that can cause error conditions when an existing Compare Definition is used directly from the **Compare Process** menu through Option 3 PERFORM. The conditions are grouped by object:

Compare Definition
Modified other than through the Compare Process option and is now invalid.

Access Definition
Modified or deleted. Also, when another user is editing the Access Definition, it is unavailable.

Extract File
Modified or deleted. Also, when another user is writing to the Extract File, it is unavailable.

Column Map
Modified or deleted. Also, when another user is editing the Column Map, if not a LOCAL map, it is unavailable.

Source table
Modified or dropped since the Compare Definition was created or last edited. If the source table was modified, the match key, a compare relationship (relationship used to chain the changes to related tables), or the Column Map may be invalid. A variety of conditions are related to modifications to a source table such as:

- Column attributes for mapped columns are no longer compatible and Compare requires that attributes be compatible for columns to be compared.
- A column does not exist. Only mapped or key columns are a concern. If a column is deleted and that column is not part of a match key, part of a compare relationship, or explicitly mapped; the Compare Process can still proceed. This is not flagged and the corresponding column in the other source, if one exists, is handled as if it does not correspond and is not included in the comparison.

However, if the column is part of the match key, part of a relationship, or explicitly mapped, the Compare Process cannot proceed.

A match key does not exist because one or more of the underlying columns was deleted or the primary key used as the match key was deleted.

When modifying a source table, many changes do not affect whether a Compare Process is performed. For example, if a column that is not part of a match key, relationship or Column Map is deleted, it has no effect on the process. Also, if a new column is added to a table that participates in the Compare Process, Compare attempts to compare the contents of the column with a like-named column in the other source provided that the attributes are the same. If the column cannot be compared, it is handled as a unique column.

If a primary key is created that can serve as a match key such that the primary key from both sources can now be used as the match key and these primary keys are different, you are prompted to specify which to use as the match key. The Compare Process can then proceed.

Compare Process Report

If you do not invoke the browse when the online Compare Process completes, Compare displays the Compare Process Report.

```
------------------------- COMPARE Process Report -----------------------
COMMAND ===>                                           SCROLL ===> PAGE
                                                       ROW 0    OF 39
********************************* Top of Data ********************************

                             COMPARE Process Report

Compare File      : FOPDEMO.COMP.FILE
Report File       : FOPDEMO.COMP.RPT
User ID           : FOPDEMO
Time Started      : 2001-06-21 15.37.03
Time Finished     : 2001-06-21 15.37.10

Source 1 - Extract File      : FOPDEMO.EXTRACT
  Total Number of Tables     : 6
  Total Number of Rows       : 0

Source 2 - Table, Subsystem  : DSNC
  Total Number of Tables     : 6
  Total Number of Rows       : 6608

                                                                Rows     Non-
COMPARE Results                                     Changes     with    Unique
                           Total  UnMatched  Equal  (D)irect   Missing   Match
   Source:Table Name       Rows     Rows     Rows   (R)elated  Parents   Keys
  ---------------------- -------- -------- -------- ---------- -------- ------
1 FOPDEMO.CUSTOMERS            0        0        0 D:        0        0      0
2 FOPDEMO.CUSTOMERS          705      705          R:        0        1      0

1 FOPDEMO.FEMALE_RATES         0        0        0 D:        0        0      0
2 FOPDEMO.FEMALE_RATES        63       63          R:      N/A       56      0

1 FOPDEMO.ORDERS               0        0        0 D:        0        0      0
2 FOPDEMO.ORDERS            1709     1709          R:        0        0      0

1 FOPDEMO.DETAILS              0        0        0 D:        0        0      0
2 FOPDEMO.DETAILS           3596     3596          R:      N/A        0      0

1 FOPDEMO.SALES                0        0        0 D:        0      N/A      0
2 FOPDEMO.SALES               22       22          R:        0      N/A      0

1 FOPDEMO.SHIP_TO              0        0        0 D:        0        0      0
2 FOPDEMO.SHIP_TO            513      513          R:      N/A        3      0

******************************** Bottom of Data *******************************
```

Figure 40. COMPARE Process Report

The report's header information includes the name of the Compare File, the user that generated the report, the time, and the number of tables and rows processed. The sources are listed, along with any pertinent information about each source. The Compare Results section contains the names of the tables from each source, the total number of rows for every type of detail that can be reported on, and the total number of rows in the comparison from each table.

Browse Compare File

The Compare File contains the results of the Compare Process. Using Compare browse, you can examine the results of the Compare Process as a set of related data and focus on the changes. The status information in the Compare File combined with the powerful capacity to display related data from multiple tables on a single screen, allow you to:

- Exclude rows from the display based on their change status or source.
- Join to other tables to locate related changes.
- Simultaneously scroll from any level of a displayed table.

You can browse the Compare results online by specifying **Y** at the **If Online, Invoke Browse** prompt on the Specify COMPARE Parameters and Execute panel. You can also browse the contents by selecting **Option B BROWSE** on the **COMPARE Process** menu.

From Menu Option

When you select Option B from the **COMPARE Process** menu, the Specify COMPARE Browse Parameters panel is displayed.

```
----------------------- Specify COMPARE Browse Parameters ---------------------
Command ===>                                                 SCROLL ===> PAGE

Compare File DSN ===>

Browse Options:
  Start Browse with ===> S (S-Start Table, L-Table Selection List)
```

Figure 41. Specify COMPARE Browse Parameters

Panel

The prompts on the panel are:

Compare File DSN
The data set name of the Compare File containing the data to be browsed. **Compare File DSN** initially contains the name of the current or profiled Compare File. If there is no current or profiled Compare File, it is blank.

You can overtype the value as desired. To obtain a selection list of Compare Files, specify * as the last character in the string used as the search value for the data set name.

Start Browse with
The table used to begin the browse session. Specify:

S Begin with Start Table.

L Begin with Compare Summary Selection List panel, listing pairs of tables from which you can select the table to browse.

The value you specify is profiled.

When you have completed your responses, use ENTER to continue. If you specify S for **Start Browse with**, the Compare browse session is invoked. If you specify L, select the desired pair of starting tables from the Compare Summary Selection List panel.

Use END or CANCEL to terminate the Browse request and return to the **COMPARE Process** menu.

Compare Summary Selection List

When you select L for **Start Browse with** on the Specify COMPARE Browse Parameters panel, the Compare Summary Selection List panel is displayed.

You can select a pair of tables to start the browse session. The Compare Summary Select List panel also displays when a browse session is invoked automatically after online execution of the Compare Process.

The following panel is displayed.

```
---------------------- Compare Summary Selection List ------------------------
Command ===>                                                 Scroll ===> PAGE

Use 'S' to Select Browse Start Table, 'I' for Extended Table Information

Source 1: XF - Z13600MP.FOPDEMO.EXTRACT, SUBSYS: TDB2
Source 2: Table, SUBSYS: TDB2
                                                                Rows    Non-
                                                    Changes     with   Unique
                             Total  UnMatched  Equal  (D)irect  Missing Match
Sel   Source:Table Name      Rows     Rows     Rows   (R)elated  Parents  Keys
--- -------------------->> -------- -------- -------- --------- -------- -------
*** ********************************** TOP ***********************************
S__ 1 FOPDEMO.CUSTOMERS         703        1      690 D:     12      N/A       0
    2 FOPDEMO.CUSTOMERS         704        2          R:     25      N/A       0

___ 1 FOPDEMO.ORDERS           1712       10     1697 D:      5        0       0
    2 FOPDEMO.ORDERS           1709        7          R:      4        0       0

___ 1 FOPDEMO.SHIP_TO           503        9      490 D:      4        0       8
    2 FOPDEMO.SHIP_TO           526       32          R:    N/A        6      25

___ 1 FOPDEMO.DETAILS          3591       11     3574 D:      6        0       0
    2 FOPDEMO.DETAILS          3596       16          R:    N/A        0       0

___ 1 FOPDEMO.ITEMS             102        0      102 D:      0      N/A       0
    2 FOPDEMO.ITEMS             102        0          R:      0      N/A       0
*** ******************************** BOTTOM **********************************
```

Figure 42. Compare Summary Selection List

Panel

This panel includes:

Source 1
Identifies the first source of data as either an Extract File or an Access Definition and displays the name of the source. The DB2 subsystem from which the data was extracted is also displayed. **Source 1** is an Extract File named Z13600MP.FOPDEMO.EXTRACT in the DB2 subsystem TDB2 in the figure.

Source 2
Identifies the second source of data as an Extract File, an Access Definition, or DB2 tables. If **Source 2** is an Extract File or an Access Definition, the name is displayed. The subsystem from which the data was extracted is also displayed. In the figure, **Source 2** is a set of tables in the subsystem, TDB2.

Sel Line command entry area. Specify:

S Select the pair of tables with which to start the browse session. In Figure 42, the first pair of tables is selected.

I Display information about a pair of tables. See "Display Information" for details about the information displayed.

Source:Table Name
Source identifier followed by the name of the table. For example, the first table in Source 1 is identified as: 1:FOPDEMO.CUSTOMERS

Total Rows
Number of rows in each table included in the Compare Process.

UnMatched Rows
Number of rows in each table for which the match key value of that row does not have a corresponding value in a row from the other source table with which it was compared.

Equal Rows
Number of rows in each pair of tables for which the match key values and all other column values included in the Compare Process match exactly.

Changes
Number of rows that generated flags for **D** or Direct changes, or **R** or Related changes.

Direct changes are the number of rows in which the match key values match, but one or more of the other column values do not match.

Related changes are the number of rows in dependent related tables that contain changes. (This values does not apply to a comparison of a single pair of tables, any table that does not have dependent tables in the Compare Process, or reference tables.)

Rows with Missing Parents
Number of rows that are orphans. (This value does not apply to a comparison of a single pair of tables or any table that does not have parent tables in the Compare Process.)

Non-Unique Match Keys
Number of rows in each table that contain non-unique values in the match key columns and, therefore, are not compared.

(See "Browsing the Results" on page 91 for additional information about the change and source flags.)

Display Information

You can display information about any pair of compared tables using the Information line command. Type I in **Sel** for the desired pair. The following is displayed when the CUSTOMERS tables are selected.

```
---------------------- Compare Summary Selection List ------------------------
Command ===>                                                Scroll ===> PAGE

Use 'S' to Select Browse Start Table, 'I' for Extended Table Information

Source 1: XF - Z13600MP.FOPDEMO.EXTRACT, SUBSYS: TDB2
Source 2: Table, SUBSYS: TDB2

+--------------------Extended Compare Table Information---------------------+
|                                                                           |
| ------------------------------------------------------------------------- |
| ********************************* TOP ********************************** |
|         Source 1 Table Name                  Source 2 Table Name          |
| ----------------------------------  ---------------------------------- |
| FOPDEMO.CUSTOMERS                     FOPDEMO.CUSTOMERS                   |
|                                                                           |
|      Source 1 Column Name           Source 2 Column Name      Status  Attr |
| ----------------------------- ------------------------------ ------- ---- |
| CUST_ID                       CUST_ID                        MATCH   SAME |
| CUSTNAME                      CUSTNAME                       COMPARE SAME |
| ADDRESS                       ADDRESS                        COMPARE SAME |
| CITY                          CITY                           COMPARE SAME |
| STATE                         STATE                          COMPARE SAME |
| ZIP                           ZIP                            COMPARE SAME |
| YTD_SALES                     YTD_SALES                      COMPARE SAME |
| SALESMAN_ID                   SALESMAN_ID                    COMPARE SAME |
| PHONE_NUMBER                  PHONE_NUMBER                   COMPARE SAME |
| ******************************** BOTTOM ******************************** |
+---------------------------------------------------------------------------+
```

Figure 43. Extended Compare Table Information

The information displayed on this panel includes the names of the tables, the columns in each table, the status of the columns, and the names of the related tables included in the Compare Process. You can also display this information using the INFO primary command when browsing the Compare File.

Column Information

The Extended Compare Table Information panel displays the names of the source tables and the columns from each table. The status of each pair of columns is indicated under **Status**:

MATCH
The columns were included in the match key.

COMPARE
The columns were compared when the values in the paired match key columns were the same.

NOTUSED
The column was excluded from the Compare Process because it was found in one table only or was specifically excluded.

Attr indicates whether the attributes for each pair of compared columns are the SAME or different (DIFF). Columns with different attributes can be compared when the attributes are compatible. (See the *Common Elements Manual*, section on Compatibility Rules for information.)

Related Tables

The Extended Compare Table Information panel also lists tables directly related to the pair of tables for which column information is provided with the following information:

Type Indicates whether the related table is the parent or child table in the relationship. In Figure 43, both tables are children of CUSTOMERS.

Name The name of the relationship.

From The source of the relationship definition as either DB2 (DB2 Catalog) or OPT (Optim Directory). In Figure 43 on page 90, the first relationship is from the Optim Directory and the second from the DB2 Catalog.

Status Indicates whether the relationship is selected or unselected. In Figure 43 on page 90, both relationships are SELECTED.

Rel Src
The source of the relationship as either 1 (Source 1) or 2 (Source 2). In Figure 43 on page 90, both relationships are from Source 1.

When the number of lines required for the information exceeds the size of the screen, you can scroll the display. A count is provided to indicate the total number of rows and the relative position in that total of the first displayed row.

Uses

The information provided by the Extended Compare Table Information panel is useful for determining the table to select when initiating a browse session or when several Compare Files are distinguished only by the columns that are included in the match key, the columns that are compared, or the relationships that are used. Use END to return to the **Compare Summary Selection List**.

Browsing the Results

After you have selected a pair of tables with which to start, the browse session is invoked. The data in the selected pair of tables is displayed in ascending order by match key.

By default, the match key columns are listed first, in the order in which they were specified for the match key. To identify match key columns, the headings are highlighted. The remaining columns are then displayed. A source identifier for each row is displayed. Change identifiers for the compared rows are displayed, as appropriate. All differences between the compared rows as well as the source identifier for all unmatched rows are highlighted.

The table name and column headings from Source 1 are used. If desired, use the FLIP command to switch the names to those from Source 2. You can use FLIP again to switch the name and headings to those from Source 1.

The default display shows all columns in the tables, including those excluded from the Compare Process by a Column Map. As these columns were not compared, however, any changes are not identified.

To omit excluded columns from the display, use the **Display Unused Cols** Compare option. To control the number of rows displayed from a table at one time, use the **Maximum Fetch Rows** Compare option. To display the Compare options, use the **OPTIONS COMPARE** command.

Assume two versions of five related tables have been compared and the CUSTOMERS table is selected to start the browse session. CUST_ID is the match key column. It is listed first and the data is sorted in ascending order by the match key. The following is displayed.

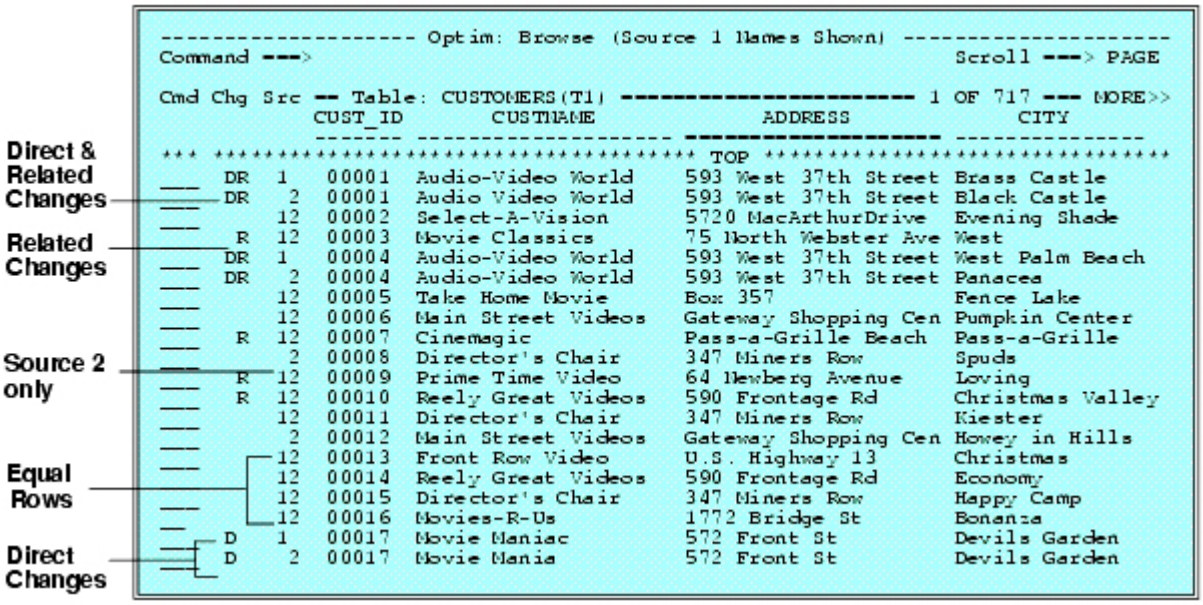


Figure 44. Browse Compare Results

Panel

This panel includes:

Cmd Line command entry area.

Chg The type of change, as one of the following:

Blank No changes.

D Direct changes. Values in one or more columns, excluding the match key columns, are different.

R Related changes. One or more related rows have a direct change or are unmatched.

U Unusual rows. Orphan rows and pairs of compared rows that result in a different set of related data are flagged as unusual. Compare identifies orphan rows when the child relationship column has no corresponding parent row. When the values in the parent relationship columns in a pair of matched rows are not the same, different sets of child rows are related.

Since these conditions are determined by relationships, they are detected only when sets of related data are compared.

/
|
\ Identifies rows with duplicate match key values encountered in a single source table. The brackets group the rows together. These rows are not compared. (For an example, see "Duplicate Rows-Example" on page 106.)

If only two rows contain duplicate values, they are displayed as:

```
/ 01001  Video Magic
\ 01001 Video Mania
```

If three or more rows contain duplicate values, they are displayed as:

```
/  01001  Video Magic
|  01001  Video Mania
\  01001 Video Maniac
```

Note: The characters (brackets) shown here are the distributed defaults. You can specify these characters in the site or user options.

See "Processing Flow" on page 47 for additional information about Chg flags.

Src The source of a row, as one of the following:

1 Source 1.

2 Source 2.

12 Both Source 1 and Source 2. The rows are identical and only one copy of the row is recorded.

In sidelabels format, identical Source 1 and Source 2 columns are displayed once and different and unmatched columns are displayed separately. **Src** indicates these unmatched rows as "1/2."

See "Processing Flow" on page 47 for additional information about **Src** flags.

Table Name
The name of the table from Source 1 is displayed. The Creator ID is not included.

Short Name
A short name or identifier for each table (T*n*), where *n* uniquely identifies the table. For example, in a multi-table display, T1 identifies the first table, T2 the second table, and so on. The T*n* value can be used in place of the table name, as a command operand.

Row Count
The current position within the total set of rows. This value is displayed in the form ***x* OF *y*** with *x* as the relative position of the first row and *y* the total number of rows. In sidelabels or expanded display or when rows from Source 1 and Source 2 do not match and the tables are joined, both rows are displayed. To indicate two rows are displayed, a plus sign is added to the relative position value as in *x*+ OF *y*.

Horizontal Scroll Indicator
Displayed in columnar format only, <<MORE indicates that more data is displayed in prior columns, and MORE>> indicates more data is displayed in subsequent columns. Use the LEFT and RIGHT commands, usually assigned to PF10 and PF11, to scroll the display horizontally. (For more information, see the *Common Elements Manual*, section on Basic Screen Format and Handling.)

Column Headings
By default, DB2 column names for Source 1 are displayed as the column headings. The compared columns are listed first, followed by the Source 1 and the Source 2 columns that were not included in the Compare Process, because of the Column Map specification or because the column in one source does not match a column in the other. For more information, see "Column Display" on page 94.

Truncated Column Indicator
In columnar format, the maximum display width of columns can be in the range of 2 to 70 characters. In sidelabels format, the maximum display width can be in the range of 50 to 32,767. These values are controlled by editor options and apply to all displayed columns. When the length of data in a column exceeds this value, the display is truncated. In columnar format, this is indicated by using equal signs (=) to separate the data from the column heading. In sidelabels format, an equal sign is displayed following the column heading. The complete data in these columns can be displayed using the EXPAND command (see the *Common Elements Manual*, section on EXPAND for details).

Column Count
Displayed in sidelabels format only. Indicates the current position within the total set of columns.

Column Display

By default, the match key columns are listed first, in the order in which they were specified for the match key. To identify match key columns, the headings are highlighted. These columns are followed, in order, by common columns that are not compared, columns unique to Source 1, and columns unique to Source 2. To ensure a unique column heading and provide easy identification of single source columns for unmatched rows, the headings for columns unique to Source 1 or Source 2 are prefixed with 1: or 2: appropriately (e.g., 1:CUST for a column named CUST that is unique to Source 1). The data from the existing source column is displayed and "N/A" is displayed for the other source column.

Sidelabels

When data is displayed in sidelabels format, all common and equal columns are displayed once, combining Source 1 and Source 2. Both versions are displayed for the columns that have different values. In the following figure, only the values in the column CITY differ. The source of each version is identified by a 1 or 2 prior to the heading and text delimiter.

```
-------------------- Optim: Browse (Source 1 Names Shown) ---------------------
Command ===>                                                 Scroll ===> PAGE

== Table: CUSTOMERS(T1) ======================================ROW   1+ OF 171 ==
== LineCmd ==> ___     Source: 1/2     Changes: DR     COLUMN  1 OF 9

CUST_ID       : 00001
CUSTNAME      : Audio-Video World
ADDRESS       : 593 West 37th Street
CITY         1: Brass Castle
             2: Black Castle
STATE         : NJ
ZIP           : 10017
YTD_SALES     :  10049.00
SALESMAN_ID   : RP0013
PHONE_NUMBER  : 201-8748393
********************************** BOTTOM ***********************************
```

Figure 45. Browse Compare Results - Sidelabels Display

The format of the sidelabels display is discussed in the *Common Elements Manual*, section on Sidelabels Format. During a Compare browse session, **Source** and **Changes** replace the status flag of a Point-and-Shoot session, as described in the *Common Elements Manual*, section on Display Basics. The possible values for **Source** are the same as those documented for **Src** in columnar format. The possible values for **Changes** are the same as the values for **Chg** in columnar format.

Available Commands

The available primary commands include the following:

ANCHOR, ATTRIBUTES, BOTTOM, CANCEL, COLUMNS, DOWN, END, EXCLUDE, EXPAND, FIND, FLIP, HEX, INDENT, INFO, JOIN, LEFT, LOCK, ONLY, OPTIONS, RESET, RESTART, RFIND, RIGHT, SHOW, SIDELABELS, SORT, START, SWITCH, TOP, UNJOIN, UNLOCK, UP, and ZOOM.

For details on any of the commands discussed in this section, see the *Command Reference Manual.*

Available Facilities

For the most part, the browsing facilities available during a Point-and-Shoot session are available when browsing the Compare Process results. This section documents the facilities unique to browsing Compare File data, as well as the unique features of the common facilities.

Details about the common facilities are provided in the *Common Elements Manual*.

Displaying Table Information

During a Compare File browse, you can display general information about a specific pair of tables using the INFO command. The **Extended Compare Table Information** display is the same as the one invoked using the I line command on the COMPARE Summary Selection List panel. (See Figure 43 on page 90.)

When you use the INFO command, you can use a specific table name as an operand (INFO CUSTOMERS), use the short form (INFO T1), or identify the table with the cursor position.

Assume information is requested for the CUSTOMERS table, the following is displayed.

```
-------------------- Optim: Browse (Source 1 Names Shown) ---------------------
Command ===>                                                 Scroll ===> PAGE

Cmd Chg Src == Table: CUSTOMERS(T1) ======================== 1 OF 717 === MORE>>
            CUST_ID       CUSTNAME             ADDRESS              CITY
            ------- -------------------- ==================== ---------------
*** ************************************ TOP ********************************
___  DR  1   00001  Audio-Video World    593 West 37th Street Brass Castle

+-------------------- Extended Compare Table Information --------------------+
|                                                                            |
| ---------------------------------------------------------------------------|
| ********************************* TOP ********************************** |
|         Source 1 Table Name                  Source 2 Table Name           |
| ---------------------------------  ---------------------------------------|
| FOPDEMO.CUSTOMERS                    FOPDEMO.CUSTOMERS                     |
|                                                                            |
|      Source 1 Column Name           Source 2 Column Name      Status  Attr  |
| ----------------------------- ------------------------------ ------- ----  |
| CUST_ID                       CUST_ID                        MATCH   SAME  |
| CUSTNAME                      CUSTNAME                       COMPARE SAME  |
| ADDRESS                       ADDRESS                        COMPARE SAME  |
| CITY                          CITY                           COMPARE SAME  |
| STATE                         STATE                          COMPARE SAME  |
| ZIP                           ZIP                            COMPARE SAME  |
| YTD_SALES                     YTD_SALES                      COMPARE SAME  |
| SALESMAN_ID                   SALESMAN_ID                    COMPARE SAME  |
| PHONE_NUMBER                  PHONE_NUMBER                   COMPARE SAME  |
|                                                                       Rel  |
|       Related Tables                Type     Name    From   Status   Src  |
| ----------------------------------  ------  -------- ---- ---------- ---  |
| SHIP_TO                             CHILD   CSHIP    OPT  SELECTED    1   |
| ORDERS                              CHILD   RCO      DB2  SELECTED    1   |
| ******************************** BOTTOM ******************************** |
+----------------------------------------------------------------------------+
```

Figure 46. Table Information when Browsing

Details about this display are provided in "Display Information" on page 89.

Manipulating the Display

Several commands are provided to manipulate the Browse display. (Refer to the *Common Elements Manual*, section on Manage the Display for more information about the display management facilities available for both Browse and Point-and-Shoot.)

For example, the standard ISPF commands for scrolling horizontally and vertically are available. In addition, the LOCK, UNLOCK and ANCHOR commands are helpful adjuncts when scrolling. The functionality of these commands is detailed in the *Common Elements Manual*, section on Lock Columns.

Handling Column Display

You can use the Describe Columns for Table panel to rearrange the columns or to remove one or more columns from the display. Use the COLUMNS command to display this panel.

For example, assume the COLUMNS command is entered to specify the columns to be displayed for the CUSTOMERS table. The following prompts are displayed.

```
--Describe Columns for Table: ------------------------------------------------
Command ===>                                              Scroll ===> PAGE

Table Name: CUSTOMERS                                  Col 1 of 9

                         Display  --Sort---  -Heading-
Cmd     Column Name        Y/N    Level A/D    L/R/C     Data Type    Null
---  ------------------  -------  ---------  --------- -------------- ----
***  ****************************** TOP ********************************
___  CUST_ID                Y       __   _       C     CHAR(5)        YES
___  CUSTNAME               Y       __   _       C     CHAR(20)       YES
___  ADDRESS                Y       __   _       C     VARCHR(50)     YES
___  CITY                   Y       __   _       C     VARCHR(15)     YES
___  STATE                  Y       __   _       C     CHAR(2)        YES
___  ZIP                    Y       __   _       C     CHAR(5)        YES
___  YTD_SALES              Y       __   _       C     DECIMAL(7,2)   YES
___  SALESMAN_ID            Y       __   _       C     CHAR(6)        YES
___  PHONE_NUMBER           Y       __   _       C     CHAR(10)       YES
*** ***************************** BOTTOM *********************************
```

Figure 47. Describe Columns during Browse

You can use the Describe Columns panel to reposition columns or remove columns from the display that are not involved in the Compare Process.

To remove a column from the display, specify N for **Display** for that column. Use **Sort** to specify criteria to arrange rows according to values in any column. Use **Heading** to specify the position of the column heading. (The column headings defined for the Source 1 table are used by default for common columns.) You can also rearrange the columns using the Move line command (M) in conjunction with the destination line commands, that is, A or B. **Data Type** and **Null** values are displayed for information only.

Note: This panel is similar to the Describe Columns panel displayed when defining an Access Definition or during a Point-and-Shoot session. However, only the facilities described in this section are available when browsing the results of the Compare Process.

Displaying Specific Rows

Additional commands are available to handle the data display: EXCLUDE, FIND, ONLY, and SHOW. The basic use of these commands is described in the *Common Elements Manual* in the Manage Data Display section. This section focuses on using the unique features of the EXCLUDE, FIND, and ONLY commands to handle the Compare Browse display.

EXCLUDE Command

Compare FilesYou can use the EXCLUDE command to remove specific sets of data from the display based on the **Src** and **Chg** flags. For example, when large quantities of data have been compared, you may want to focus on the changes. You can use EXCLUDE COMMON ALL, or the short form X COM ALL, to remove all rows that have been compared and do not contain any changes, direct or related. These rows are identified by "12" for **Src** and no entry for **Chg**.

Assume the EXCLUDE COMMON ALL command is entered when the data is displayed as shown in Figure 44 on page 92. The following panel is displayed.

```
-------------------- Optim: Browse (Source 1 Names Shown) ---------------------
Command ===>                                                 Scroll ===> PAGE

Cmd Chg Src == Table: CUSTOMERS(T1) =============== ZOOMED = 1 OF 74 === MORE>>
            CUST_ID       CUSTNAME             ADDRESS             CITY
            ------- -------------------- ==================== ---------------
*** ********************************** TOP ************************************
___ DR   1   00001  Audio-Video World    593 West 37th Street Brass Castle
___ DR    2  00001  Audio Video World    593 West 37th Street Black Castle
___   ------------------------------------------------------ 1 LINE(S) EXCLUDED
___  R   12  00003  Showplace            1 Ocean Parkway      Alto
___ DR   1   00004  Audio-Video World    593 West 37th Street West Palm Beach
___ DR    2  00004  Audio-Video World    593 West 37th Street Panacea
___   ------------------------------------------------------ 2 LINE(S) EXCLUDED
___  R   12  00007  Cinemagic            Pass-a-Grille Beach  Pass-a-Grille
___       2  00008  Director's Chair     347 Miners Row       Spuds
___  R   12  00009  Prime Time Video     64 Newberg Avenue    Loving
___  R   12  00010  Reely Great Videos   590 Frontage Rd      Christmas Valley
___   ------------------------------------------------------ 1 LINE(S) EXCLUDED
___       2  00012  Main Street Video    Gateway Shopping Cen Howey in Hills
___   ------------------------------------------------------ 4 LINE(S) EXCLUDED
___ D    1   00017  Movie Maniac         572 Front St         Devils Garden
___ D     2  00017  Movie Mania          572 Front St         Devils Garden
___  R   12  00019  It's In The Can      2005 Rt 22           Three Brothers
___   ------------------------------------------------------ 4 LINE(S) EXCLUDED
```

Figure 48. Exclude Common Rows

The excluded rows are replaced with an EXCLUDED LINES message and the total row count on the information line is revised. Note that although the customer with CUST_ID 00003 is a common row (**Src** is "12"), it is retained in the display because related data has changed.

You can exclude rows based on data or **Chg** or **Src** status. Various operands on the EXCLUDE command provide a variety of criteria to select the rows to be excluded:

Dir Rows with direct changes only.

Rel Rows with related changes only.

DR Rows with direct or related changes.

DUP Rows with duplicate match key values.

ORPhans
Orphan rows only.

RKD Rows that have a change in the columns that comprise the basis for a relationship to other tables.

UNUsual
Orphan rows or rows that have changes in the columns that comprise the basis for a relationship to other tables.

S1 Rows from Source 1 exclusively.

S2 Rows from Source 2 exclusively.

S1* Rows from Source 1 and common rows.

S2* Rows from Source 2 and common rows.

S12 Common rows regardless of other flags.

S1U Unmatched Source 1 rows exclusively.

S2U Unmatched Source 2 rows exclusively.

UNMatched
Unmatched rows exclusively.

COMmon
Common rows that have no other flags set.
Alternate form: NCHG.

CHG Any changed or any uncommon row.
Alternate form: NCOM.

FIND Command

Compare FilesThe FIND command is as versatile as the EXCLUDE command and uses the same set of operands. You can use FIND to locate and scroll to an occurrence of a specific type of change or source. For example, to scroll to the first related change, specify `FIND R` or `FIND REL`.

To scroll to the first customer from Florida with a direct, related, or direct and related change:

FIND DR IN STATE FL

The operand IN STATE is used to limit the search to the STATE column. Otherwise, the command FIND DR FL searches all columns for the string FL, and the result includes changed rows containing the string FL in any column. For example, any customers with “FLICK” in their name are included.

You can combine the use of FIND with the EXCLUDE command to display all customers in the state of Florida with direct, related, or direct and related changes:

```
EXCLUDE ALL
```

FIND ALL DR IN STATE FL

ONLY Command

The ONLY command provides, in one command, the results obtained from executing the EXCLUDE command followed by the FIND command. The same set of operands provided with EXCLUDE and FIND are available with ONLY.

For example, to display only the rows containing changes for all of the customers in the state of Florida, enter:

ONLY DR IN STATE FL

As with FIND, the operand IN STATE is included to limit the search to the STATE column. The following panel is displayed.

```
-------------------- Optim: Browse (Source 1 Names Shown) ---------------------
Command ===>                                                 Scroll ===> PAGE

Cmd Chg Src == Table: CUSTOMERS(T1) ================ ZOOMED = 1 OF 16 === MORE>>
            CUST_ID       CUSTNAME             ADDRESS             CITY
            ------- -------------------- ==================== ---------------
*** ********************************** TOP ************************************
___ DR   1   00004  Audio-Video World    593 West 37th Street West Palm Beach
___ DR    2  00004  Audio-Video World    593 West 37th Street Panacea
___   ------------------------------------------------------ 2 LINE(S) EXCLUDED
___  R   12  00007  Cinemagic            Pass-a-Grille Beach  Pass-a-Grille
___   ------------------------------------------------------ 9 LINE(S) EXCLUDED
___ D    1   00017  Movie Maniac         572 Front St         Devils Garden
___ D     2  00017  Movie Mania          572 Front St         Devils Garden
___   ------------------------------------------------------ 13 LINE(S) EXCLUDED
___  R   12  00031  Prime Tyme           982 Upper State Rd   Frostproof
___   ------------------------------------------------------ 3 LINE(S) EXCLUDED
___ DR   1   00035  Select-A-Movie       593 Astoria Boul     Cotton Plant
___ DR    2  00035  Select-A-Movie       593 Astoria Boul     Cotton Plant
___   ------------------------------------------------------ 8 LINE(S) EXCLUDED
___  R   12  00044  Showcase             1150 Indian Terrace  Paisley
___   ------------------------------------------------------ 669 LINE(S) EXCLUDED
___
```

Figure 49. Only Changed Rows Where STATE is FL

With these three commands, you have the flexibility to obtain exactly the data you want to display.

Redisplaying Excluded Rows

Use the SHOW primary command to redisplay excluded rows. SHOW ALL or SHOW EXCLUDES redisplays all excluded rows.

You can use the Show line commands to redisplay one or more excluded rows at the location of a specific excluded rows message. The available Show line commands include:

S Show one excluded row.

S*n* Show *n* excluded rows.

F Show the first excluded row.

F*n* Show the first *n* excluded rows.

L Show the last excluded row.

L*n* Show the last *n* excluded rows.

Enter the line command in **Cmd** of the EXCLUDED LINES message to display specific rows.

Joining Related Data

One of the most useful features of the Compare Browse facility is the ability to display the related data and review the related changes. Compare provides several commands to support accessing and viewing related data.

Using the Join Facility

You can display related changes using the Join facility. This facility is invoked using the JOIN primary command or the J line command on the Browse display, or by using the Auto Join feature while viewing Extended Row Information (see "Information about Related Changes" on page 102). During a Compare browse session, you can join to tables included in the Compare Process as long as there is a relationship between the tables. (For details about the Join facility, see the *Common Elements Manual*, section on Join Tables.)

Note: If you want to view a table that cannot be joined, return to the Compare Summary Selection List panel. For example, in Figure 42 on page 88, the SHIP_TO table is not related to the ORDERS table. If you select SHIP_TO as the Start Table, you can only join to the CUSTOMERS table, the only table for which a relationship is available.

Related change flags are generated only for tables for which a relationship was used to extract the data; therefore, related change flags are not generated for reference tables. However, you can join to reference tables included in the Compare Process when a relationship between the tables exists, but since a relationship is not used to extract the data, the related change flags are not generated.

For example, assume two versions of four related tables have been compared, and the CUSTOMERS table is selected to start the browse session. The J line command is entered on the first displayed CUSTOMERS row, as shown in the following panel.

```
-------------------- Optim: Browse (Source 1 Names Shown) ---------------------
Command ===>                                                 Scroll ===> PAGE

Cmd Chg Src == Table: CUSTOMERS(T1) ======================== 1 OF 717 === MORE>>
            CUST_ID       CUSTNAME             ADDRESS             CITY
            ------- -------------------- ==================== ---------------
*** ********************************** TOP ************************************
J__ DR   1   00001  Audio-Video World    593 West 37th Street Brass Castle
___ DR    2  00
___       12  00 +-------- Select One or More Related Tables----------+ hade
___  R   12  00 | Cmd Table Name (Source 1 Name)  From  Type  1 OF 2 |
___ DR   1   00 | --- ---------------------------------------         |  Beach
___ DR    2  00 | ****************** TOP ******************          |
___       12  00 | S__ FOPDEMO.ORDERS              OPT  CHILD         |
___       12  00 | ___ FOPDEMO.SHIP_TO             OPT  CHILD         | enter
___  R   12  00 | ***************** BOTTOM ******************        | ille
___       2  00 +-----------------------------------------------------+
```

Figure 50. J Line Command

If CUSTOMERS were related to only one table participating in the Compare Process, the related data would be joined and displayed automatically. In this example, CUSTOMERS is related to two tables. The **Select One or More Related Tables** pop-up window prompts you to select one or more of the related tables—ORDERS and SHIP_TO.

```
-------------------- Optim: Browse (Source 1 Names Shown) ---------------------
Command ===>                                                 Scroll ===> PAGE

Cmd Chg Src == Table: CUSTOMERS(T1) ======================== 1 OF 717 === MORE>>
            CUST_ID       CUSTNAME             ADDRESS             CITY
            ------- -------------------- ==================== ---------------
*** ********************************** TOP ************************************
J__ DR   1   00001  Audio-Video World    593 West 37th Street Brass Castle
___ DR    2  00
___       12  00 +-------- Select One or More Related Tables----------+ hade
___  R   12  00 | Cmd Table Name (Source 1 Name)  From  Type  1 OF 2 |
___ DR   1   00 | --- ---------------------------------------         |  Beach
___ DR    2  00 | ****************** TOP ******************          |
___       12  00 | S__ FOPDEMO.ORDERS              OPT  CHILD         |
___       12  00 | ___ FOPDEMO.SHIP_TO             OPT  CHILD         | enter
___  R   12  00 | ***************** BOTTOM ******************        | ille
___       2  00 +-----------------------------------------------------+
```

Figure 51. Select One or More Related Tables

Use the S line command to select the table to join. The ORDERS table is selected in Figure 51.

Related rows from the ORDERS table are displayed as shown in the following example. To indicate that the currently displayed data contains a row from each source occupying two lines, the value in the row count is suffixed with a plus sign.

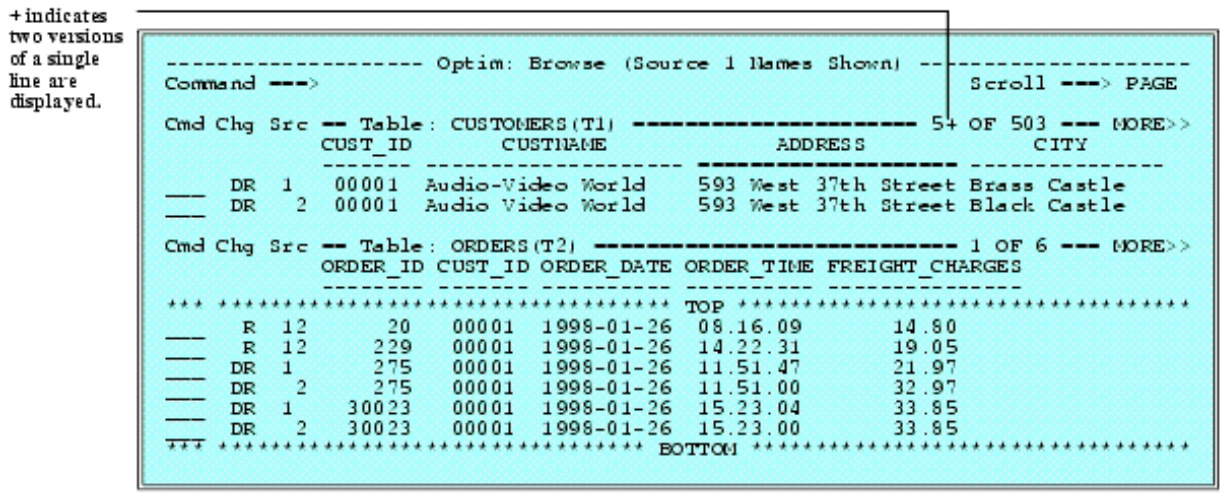


Figure 52. Browse Related Data

For this example, assume that in addition to the ORDERS rows related to the first customer, the related DETAILS for ORDERS are also joined. Use the J line command on the third ORDERS row to join DETAILS to ORDERS. The related rows from the three tables are displayed.

```
-------------------- Optim: Browse (Source 1 Names Shown) ---------------------
Command ===>                                                 Scroll ===> PAGE

Cmd Chg Src == Table: CUSTOMERS(T1) ====================== 1+ OF 717 === MORE>>
            CUST_ID       CUSTNAME             ADDRESS             CITY
            ------- -------------------- ==================== ---------------
___  DR  1   00001  Audio-Video World    593 West 37th Street Brass Castle
___  DR   2  00001  Audio Video World    593 West 37th Street Black Castle

Cmd Chg Src == Table: ORDERS(T2) ========================== 3+ OF 6 === MORE>>
            ORDER_ID CUST_ID ORDER_DATE ORDER_TIME FREIGHT_CHARGES
            -------- ------- ---------- ---------- ---------------
___  DR  1      275   00001  1999-02-02  11.51.47       21.97
___  DR   2     275   00001  1999-02-02  11.51.47       32.97

Cmd Chg Src == Table: DETAILS(T3) ========================== 1 OF 4 === MORE>>
            ITEM_ID ORDER_ID ITEM_QUANTITY DETAIL_UNIT_PRICE
            ------- -------- ------------- ----------------
*** ********************************** TOP ***********************************
___  D   1   DR012      275          5            19.00
___  D    2  DR012      275          3            19.00
___       12  DR029      275         12            22.00
___       12  DR038      275          6            20.00
*** ******************************** BOTTOM ********************************
```

Figure 53. Three Joined Tables

Direct and Related changes are indicated on the rows displayed from the CUSTOMERS and ORDERS tables. There are Direct changes on the first pair of rows in the DETAILS table.

Information about Related Changes

During a Compare browse session, you can also display information about related changes and join related data automatically. As noted previously, an "R" in **Chg** identifies a change in a related row. This indicates that one or more related rows in one or more dependent tables has direct changes or is unmatched. You can obtain information about the tables that contain these rows by using the I line command.

Note: You can also obtain information about rows with unusual changes, identified by a "U" in **Chg**.

For example, assume two versions of three related tables have been compared and the SALES table is selected to start the browse session. Enter the I line command, as shown in the following panel.

```
-------------------- Optim: Browse (Source 1 Names Shown) ---------------------
Command ===>                                                Scroll ===> PAGE

Cmd Chg Src == Table: SALES(T1) ============================ 1 OF 22 === MORE>>
            SALESMAN_ID    SALESMAN_NAME         AGE     SEX   TERRITORY
            ----------- -------------------- ----------- --- --------------
*** ********************************** TOP ************************************
___
___    +----------Extended Row Information (Select(S) one to Join)----------+
___    | Cmd Extended Information Type   TableName                  1 OF 1 |
I__    | --- ------------------------------------------------------        |
___    | ************************** TOP ***************************        |
___    | ___ RELATED CHANGES             FOPDEMO.ORDERS                     |
___    | ************************ BOTTOM ***************************        |
___    +-------------------------------------------------------------------+
```

Figure 54. I Line Command

The following information is displayed.

```
-------------------- Optim: Browse (Source 1 Names Shown) ---------------------
Command ===>                                                Scroll ===> PAGE

Cmd Chg Src == Table: SALES(T1) ============================ 1 OF 22 === MORE>>
            SALESMAN_ID    SALESMAN_NAME         AGE     SEX   TERRITORY
            ----------- -------------------- ----------- --- --------------
*** ********************************** TOP ************************************
___
___    +----------Extended Row Information (Select(S) one to Join)----------+
___    | Cmd Extended Information Type   TableName                  1 OF 1 |
I__    | --- ------------------------------------------------------        |
___    | ************************** TOP ***************************        |
___    | ___ RELATED CHANGES             FOPDEMO.ORDERS                     |
___    | ************************ BOTTOM ***************************        |
___    +-------------------------------------------------------------------+
```

Figure 55. Extended Row Information

The **Extended Row Information** pop-up lists each related change, showing each type of change that applies in the **Extended Information Type** column, with the names of associated tables displayed in the **Table Name** column. In Figure 55, one table from Source 1 is listed.

Note: The **Cmd** area is displayed only if related changes are noted on the row identified by the I line command. The **Cmd** area allows you to select and join to a table to display the related changes. See "Auto Join" on page 103.

Possible values for **Extended Information Type** include:

RELATED CHANGES
The tables listed after this entry are dependent tables and contain changed rows related to the row identified by the I line command. (RELATED CHANGES are identified in Figure 55 on page 102.)

ORPHAN-MISSING PARENT
The row identified by the I line command does not have a related parent row in the listed table.

DIFFERENT PARENT ROWS
The compared rows identified by the I line command are related to different rows in the listed parent table.

This situation can occur because the relationship used to join the tables need not include the match key columns used to compare the rows. For example, DIFFERENT PARENT ROWS results when a pair of rows in the child tables is compared because the match key is the same, but one or more columns used to relate these child rows to parents are different.

DIFFERENT CHILD ROWS
The compared rows identified by the I line command are related to different rows in the listed child table.

DIFFERENT CHILD ROWS may result when a direct change in a parent row involves a column used to relate to a child table. This situation is possible only when Optim extended relationships are used (that is, not when standard DB2 relationships are used).

Auto Join

If the row identified by the I line command has related changes, the Extended Row Information panel provides a **Cmd** area for line commands, as shown in Figure 55 on page 102. To view the related changes, enter the S line command in **Cmd** to select a dependent table that contains the row for which the "R" is displayed in **Chg**.

Note: You can only select a table with RELATED CHANGES as the **Extended Information Type**.

Compare analyzes the traversal path to the selected table on the basis of relationships between tables in the comparison, and joins to the selected table to display the related changes.

```
-------------------- Optim: Browse (Source 1 Names Shown) ---------------------
Command ===>                                                 Scroll ===> PAGE

Cmd Chg Src == Table: SALES(T1) ============================ 1 OF 22 === MORE>>
            SALESMAN_ID    SALESMAN_NAME         AGE     SEX   TERRITORY
            ----------- -------------------- ----------- --- --------------
*** ********************************** TOP ***********************************
___
___    +----------Extended Row Information (Select(S) one to Join)----------+
___    ¦ Cmd Extended Information Type   TableName                 1 OF 1 ¦
I__    ¦ --- ------------------------------------------------------        ¦
___    ¦ ************************** TOP ***************************        ¦
___    ¦ S__ RELATED CHANGES             FOPDEMO.ORDERS                    ¦
___    ¦ ************************ BOTTOM ************************        ¦
___    +-------------------------------------------------------------------+
```

Figure 56. Extended Row Information - Select to Join

If there is only one traversal path to the selected table, Compare automatically joins to display the selected table. If there is more than one traversal path to the selected table, the **Auto Join Table Display** prompts you to select a path. The Auto Join Table Display panel lists tables in each traversal path as a hierarchy, showing the levels between the Start Table and the selected table. Each succeeding level in a hierarchy is indented, and the selected table is listed at the end of each hierarchy.

In the following example, SALES is the Start Table. Two traversal paths to the ORDERS table are listed. The level of each table is indicated in the **Lvl** column.

```
------------------------- Auto Join Table Display ----------------------------
Command ===>                                                 Scroll ===> PAGE

Default Creator ID: FOPDEMO                                        1 OF 4

Cmd Lvl                      Table Name
--- --- -------------------------------------------------------
*** ************************* TOP ****************************
___  1  FOPDEMO.SALES
___  2   FOPDEMO.CUSTOMERS
___  3    FOPDEMO.ORDERS
___  2   FOPDEMO.ORDERS
*** ********************** BOTTOM ***************************

Line Commands: (S)elect - Join to Specified Table list
```

Figure 57. Auto Join Table Display

This panel includes:

Default Creator ID
The Creator ID specified for Source 1 in the Compare Definition.

x OF y
Relative position of the first displayed table (*x*) and the total number of listed tables (*y*).

Cmd Area for line command. Use the S line command to specify a path to the selected table.

For example, Figure 57 displays two paths to the ORDERS table. If you select ORDERS at level 3, Compare joins CUSTOMERS to SALES and ORDERS to CUSTOMERS. If you select ORDERS at level 2, ORDERS is joined directly to SALES.

Note: If you select a path and Compare cannot join to the selected table, the "NO TARGET RELATION" message is displayed. This occurs when one of the tables in the selected path does not have a valid related row to join to the selected table. You can use the **Auto Join Table Display** to select a different path.

Lvl Display level for the table.

Table Name
Fully qualified name of the table.

The Start Table is listed first, and tables in each path to the selected table are listed as a hierarchy. Indentations are used to denote each level in the table hierarchy.

Use the S line command on the **Auto Join Table Display** to specify the path for joining to the selected table. For example, in Figure 57, enter S in **Cmd** for FOPDEMO.ORDERS at level 3 to display the following panel.

```
-------------------- Optim: Browse (Source 1 Names Shown) ---------------------
Command ===>                                                 Scroll ===> PAGE

Cmd Chg Src == Table: SALES(T1) ============================ 5 OF 22 === MORE>>
            SALESMAN_ID    SALESMAN_NAME         AGE     SEX   TERRITORY
            ----------- -------------------- ----------- --- --------------
___    R  12   NE005     Mister Ed                    80  M  NorthEast
Cmd Chg Src == Table: CUSTOMERS(T2) ======================== 1 OF 24 === MORE>>
            CUST_ID       CUSTNAME             ADDRESS             CITY
            ------- -------------------- ================== ---------------
___   RU 12  00001  Audio-Video World    593 West 37th Street Black Castle

Cmd Chg Src == Table: ORDERS(T3) ============================ 1 OF 5 === MORE>>
            ORDER_ID CUST_ID ORDER_DATE ORDER_TIME FREIGHT_CHARGES
            -------- ------- ---------- ---------- ---------------
*** ********************************** TOP ***********************************
___       12      20   00001  1998-01-26  08.16.09       14.80
___       12     229   00001  1998-01-26  14.22.31       19.05
___  D    1      275   00001  1998-01-26  11.51.47       32.97
___  D    2      275   00001  1998-01-26  11.51.47       21.97
___       12   30023   00001  1998-01-26  15.23.04       33.85
```

Figure 58. Tables Joined Automatically

Note the **Chg** flags in the display. Related (and Unusual) changes are indicated for the rows from the SALES and CUSTOMERS tables. There are Direct changes on the third pair of rows from the ORDERS table.

Scroll Example

You can scroll any of the displayed tables and all related data is scrolled automatically. (For more information on scrolling when multiple tables are displayed, see the *Common Elements Manual*, section for Scroll.) For example, assume the CUSTOMERS table, as shown in Figure 53 on page 101, is scrolled forward to the customer with CUST_ID 00003. The results of the scroll are shown in Figure 59 on page 106. There are no direct changes to the row from the CUSTOMERS table. Only one row is displayed. There are related changes in both the ORDERS table and the DETAILS table.

```
-------------------- Optim: Browse (Source 1 Names Shown) ---------------------
Command ===>                                                 Scroll ===> PAGE

Cmd Chg Src == Table: CUSTOMERS(T1) ======================== 3 OF 717 === MORE>>
            CUST_ID       CUSTNAME             ADDRESS             CITY
            ------- -------------------- ==================== ---------------
___   R  12  00003  Showplace            1 Ocean Parkway      Alto

Cmd Chg Src == Table: ORDERS(T2) ============================ 1+ OF 4 === MORE>>
            ORDER_ID CUST_ID ORDER_DATE ORDER_TIME FREIGHT_CHARGES
            -------- ------- ---------- ---------- ---------------
___  DRU 1       25   00003  1998-01-29  08.16.09       14.80
___  DRU  2      25   00004  1998-01-29  08.16.09       14.80

Cmd Chg Src == Table: DETAILS(T3) ============================ 1 OF 7 === MORE>>
            ITEM_ID ORDER_ID ITEM_QUANTITY DETAIL_UNIT_PRICE
            ------- -------- ------------- ----------------
*** ********************************** TOP ***********************************
___  D   1   CM015       25          4            19.00
___  D    2  CM015       25          5            19.00
___  D   1   DR041       25          4            20.00
___  D    2  DR041       25          5            20.00
___  D   1   MU005       25          8            25.00
___  D    2  MU005       25         10            25.00
___       12  SF017       25          5            32.00
*** ********************************* BOTTOM *********************************
```

Figure 59. Scrolled Display

Note the **Chg** flags for the pair of ORDERS rows, both of which are DRU. The D or Direct change is in the CUST_ID column. The R or Related changes are marked in the DETAILS table. The U or Unusual change is generated by the different values in the CUST_ID column because this column is used to related the ORDERS rows to the CUSTOMERS rows. Due to the different values, these compared rows relate to different parents in the CUSTOMERS table. (The rows are compared because only ORDER_ID is used as the match key, and that value is the same in both rows.) These ORDERS rows are also displayed if you scroll to the CUSTOMER with the CUST_ID 00004.

Scroll by Pair

When scrolling joined tables, scrolling any table other than the lowest-level table always results in displaying a complete pair. This has no apparent impact when the rows are an exact match or unique to one source. Then, the row is displayed once and occupies one panel line. However, when the rows are not an exact match, the row from each source is displayed and occupies two panel lines. If you request a one-line scroll (e.g., DOWN 1) when a pair of rows is displayed, the next row or pair of compared rows is displayed. (Scrolling is performed by pairs of rows.)

When scrolling the only or lowest level displayed table, as many lines as fit are displayed. Therefore, the compared rows from the two sources may not be displayed on the same screen.

UNJOIN

Use the UNJOIN primary command or the UNJ line command to remove one or more subordinate level tables from the display. Assume the UNJ line command is entered in **Cmd** for the CUSTOMERS table in Figure 59. Both ORDERS and DETAILS are removed from the display. (For more information about the Unjoin commands, see the *Common Elements Manual*, section on Unjoin Tables.)

Duplicate Rows-Example

The J line command is entered on the first displayed CUSTOMERS row. The **Select One or More Related Tables** prompt is redisplayed, since both ORDERS and SHIP_TO are related to CUSTOMERS. This time,

SHIP_TO is selected, as shown in the following example.

```
-------------------- Optim: Browse (Source 1 Names Shown) ---------------------
Command ===>                                                  Scroll ===> PAGE

Cmd Chg Src == Table: CUSTOMERS(T1) ====================== 1+ OF 717 === MORE>>
            CUST_ID       CUSTNAME             ADDRESS             CITY
            ------- -------------------- ==================== ---------------
*** ********************************** TOP ***********************************
___ DR   1   00001  Audio-Video World    593 West 37th Street Brass Castle
___ DR    2  00001  Audio Video World    593 West 37th Street Black Castle
Cmd Chg Src == Table: SHIP_TO(T2) ========================== 1 OF 5 === MORE>>
            SHIP_ID CUST_ID       ADDRESS             CITY       STATE
            ------- ------- ==================== --------------- -----
*** ********************************** TOP ***********************************
___ /    1     803   00001  1000 Cactus Higway   Sweet Water      NJ
___ |     2    803   00001  1000 Cactus Higway   Sweet Water      NJ
___ |     2    803   00001  9023 Main Street     Flemington       NJ
___ |     2    803   00001  76 Washington Ave    Clinton          NJ
___ \     2    803   00001  1000 Cactus Higway   Sweet Water      NJ
*** ******************************** BOTTOM ***********************************
```

Figure 60. Duplicate Rows Displayed

The SHIP_TO table generated the related change indicator because it contains unmatched rows. These unmatched rows are duplicate rows. That is, the match key column, SHIP_ID, contains the same value for all of the displayed rows. Compare was unable to determine which row from Source 2 to compare with Source 1. Even though the row from Source 1 and the row from Source 2 directly under it appear to be same, they have not been compared to determine if they are identical. They are displayed as separate rows.

Browse Complete

You can continue to join and unjoin, display information about related or unusual changes, scroll, and use the many available browse commands to evaluate the results of the Compare Process. (See the *Common Elements Manual*, section on Browse Related Data, for more information on browsing a Compare File.)

Use END to terminate the browse session. These results are retained in the Compare File. If you use the same file for another Compare Process, the results are overwritten with the new results.

Generate Reports

When you select Option R from the **COMPARE Process** menu or specify Yes to **Generate Reports** on the Specify COMPARE Parameters and Execute panel, you are prompted for the information required to generate the report.

You can specify that the contents of the report should include a statistical summary, detail information or both.

Summary

The summary information includes the names of the tables from each source, the total number of rows for every type of detail that can be reported, and the total number of rows in the comparison from each table.

Details

The details are the rows that have been compared. You can select which details are to be included based on their status. (The status is printed along with each row.)

Specify Report Parameters

When you request a report, the Specify COMPARE Report Parameters panel is displayed.

```
---------------------- Specify COMPARE Report Parameters -----------------------
Command ===>                                                 SCROLL ===> PAGE

Compare File DSN ===> COMPARE
Report File DSN  ===> 'FOPDEMO.ABC'

  Report Type    ===> D               (S-Summary, D-Details)
  Lines Per Page ===>                 (0-No Titles, 1-99, Blank=57)
  Specify Table Name to Limit Report (Blank for ALL Tables in Compare)
    Table Name   ===>

  If Detail Report Specify Format and Select Desired Row Types:
    Report Format          ===> C     (C-Columnar, S-Sidelabels, E-External)
      If S, Which Columns? ===> A     (A-All, D-Different and Key Columns Only)
    All Rows               ===> Y     (Y-Yes, N-No)
    Or, if NO, Select One or More of the following Row Types:
      Direct Changes       ===> Y     (Y-Yes, N-No)
      Related Changes      ===> Y     (Y-Yes, N-No)
      Unmatched Rows       ===> Y     (Y-Yes, N-No)
      Orphan Rows          ===> Y     (Y-Yes, N-No)
      Duplicate Match Keys ===> Y     (Y-Yes, N-No)
    Wide Lines             ===> C     (C-Change File, W-Wrap Data)
  Display Unused Columns       : Y     (Y-Yes, N-No)
```

Figure 61. Specify COMPARE Report Parameters

Panel

The prompts on this panel include:

Compare File DSN
Name of the Compare File from which the report is to be generated. This value cannot be modified when this panel is displayed from Options 1, 2 or 3 on the **Compare Process** menu. This value can be modified when Option R is selected.

Report File DSN
Name of a sequential file to receive the report. You can use the standard ISPF facilities to browse and print the file.

Report Type
Specify whether the report is to include only the summary information, or both the detail and summary information:

S Summary information only.

D Detail and Summary information.

Lines Per Page
Specify the number of lines per page as:

0 Suppress titles.

1-99 Absolute number of lines per page.

blank Use the default, 57 lines per page.

Table Name
Specify the name of a table for which the report is to be generated when multiple tables have been compared. Leave blank to include all tables.

If you specify Details or Both, you can specify the report format and select which rows are to be included based on the status of the row.

Specify Format

Report Format
Specify whether the report is to be printed in columnar, sidelabels, or external format. An example of each is provided later in this section. Specify:

C Print in columnar format.

S Print in sidelabels format.

E Print external report. If you select this option, the External Format Specification panel displays, as follows.

```
---------------------- External Format Specification -------------------------
Command ===>                                                Scroll ===> PAGE

                                                                1 of 7
Report File DSN          ===> 'KEVGSKI.TEST.REPORT'
Output  Format              : Delimited
Generate Header          ===> N    (Y-Yes, N-No)
  Beginning Label        ===>
  Ending Label           ===>
  Header Delimiter       ===> ,
  Use Column Labels      ===> N    (Y-Yes, N-No)
  Match Key Label        ===>
  Relationship Key Label ===>
Field Delimiter          ===> ,
String Delimiter         ===>
Delimiter Escape Char  ===>
Use Data Labels          ===> Y    (Y-Yes, N-No)
  Changed Data Label     ===>
  Equal Data Label       ===>
Default Destination DSN  ===> 'KEVGSKI.TEST.EXTERNAL'

Table/View                   Destination DataSet
--------------------------  ------------------------------------------
******************************** TOP ***********************************
KEVGSKI.SHIP_TO
KEVGSKI.CUSTOMERS
KEVGSKI.ORDERS
KEVGSKI.DETAILS
KEVGSKI.ITEMS
KEVGSKI.SALES
KEVGSKI.MALE_RATES
******************************** BOTTOM ********************************
```

Figure 62. External Format Specification

If S, Which Columns?
If sidelabels has been selected, specify which columns are to be included:

A D All columns are included.

Only columns containing changes and the Match Key columns are included.

Select Row Types

All Rows
You can select all rows by specifying Y for All Rows, or select one or more of the following:

Direct Changes
All rows from Source 1 and Source 2 that have the same match key value, but different values in one or more other columns.

Related Changes
All rows from Source 1 and Source 2 that are marked as having related changes. This only applies to multiple table comparisons and is not shown for single table comparisons.

Unmatched Rows
All rows from Source 1 and Source 2 that do not have a match key value that matches a row from the other source.

Orphan Rows
All rows from Source 1 and Source 2 that do not have a parent. This only applies to multiple table comparisons and is not shown for single table comparisons.

Duplicate Match Keys
All rows from Source 1 and Source 2 that have duplicate Match Key values.

Wide Lines
Specify whether the data is to wrap or the file attributes are to be changed when the length of a row exceeds the current file width. Specify:

C Change the file width to fit the longest record in the report file.

W Wrap the report data.

Display Unused Columns
Indicates if unused columns are displayed in the report. This option is specified on the Compare Options panel. (For more information about this panel, see the *Common Elements Manual*.) Specify:

Y Unused columns are displayed.

N Unused columns are not displayed.

The report specifications have no impact on the Compare Process and the contents of the Compare File. They only define the data written to the report.

You can use the ISPF facilities to browse and print the reports.

Sample Reports

Sample reports are provided to facilitate describing the contents of the reports.

A sample columnar report and a sample sidelabels report are provided in this section. Both reports include summary and detail information for a Compare Process that involved five tables, and both are formatted as they would be output to the report file.

Sample Report - Columnar Format

The following is a sample of a Compare File report in columnar format. For this sample, the data has been truncated.

```
8/11/2014                    Optim - COMPARE File Report

Compare File     : FOPDEMO.SAMPLE.COMPARE
Created by       : Job PSTCBR using SQLID PSTCBR on 11 Aug 2014 at 02:38 PM
Number of Tables : 1

Source 1         : Extract File - PSTCBR.TESTJUL
  Created by     : Job PSTCBR using SQLID PSTCBR
  Created on     : 03 Aug 2014 at 09:40 AM on DB2 Subsystem TDB2

Source 2         : Extract File - PSTCBR.ALL829
  Created by     : Job PSTCBR using SQLID PSTCBR
  Created on     : 11 Aug 2014 at 02:38 PM on DB2 Subsystem TDB2

Table Statistics: 1:PSTSUPP.OPTIM_CUSTOMERS  2:PSTSUPP.OPTIM_CUSTOMERS
   Total Number of Merged Rows                :    3520
   Total Number of Rows from Source 1         :    3520
   Total Number of Rows from Source 2         :      18
   Number of Unmatched Rows from Source 1     :    3502
   Number of Unmatched Rows from Source 2     :       0
   Total Number of Equal Rows                 :      18
   Total Number of Rows with Direct Changes   :       0
   Total Number of Rows with Related Changes  :     N/A
   Total Number of Orphan Rows on Source 1    :     N/A
   Total Number of Orphan Rows on Source 2    :     N/A
   Sets of Rows with Non-Unique Keys          :      0
   Total Number of S1 Rows with Non-Unique Keys:      0
   Total Number of S2 Rows with Non-Unique Keys:      0

Compare Match Options:

 Match Key Property  : Unique
```

Figure 63. Sample Compare File Report - Columnar Format

The report's header information includes the name of the Compare File, the user that generated the report and, the time, and the number of tables involved in the process. The sources are listed, along with any pertinent information about each source.

This is followed by the requested report information for each table. In this example, the information is provided for the CUSTOMERS table, the first table listed in the Compare Process. Both summary and detail information has been requested.

Summary Information

The summary information is the same as that provided on the Compare Summary Selection List panel. If you request only summary information, the information for each table is provided one after the other in the order in which the tables were specified for Source 1. That is the order of the tables in the Access Definition or Extract File, whichever was used for Source 1.

Only the pertinent summary information is included. This report documents a Compare Process that included multiple tables; however, if only one pair of tables or a reference table is involved, statistics about related rows and orphan rows are not included. (For an explanation of this information, see “Compare Summary Selection List” on page 88.)

Details

The details, rows from the compared tables, are included after the summary information. This portion of the report is divided into the following:

Chg Identifies rows containing changes, rows for which related rows contain changes, orphan rows, and duplicate match key rows, as follows:

D Indicates that one or more columns are different, other than the match key columns.

R Indicates that one or more columns in a related row are different, other than the match key columns.

U Identifies rows that are orphans and the pairs of compared rows that result in a different set of related data.

Orphan rows in a table can only be determined when data from multiple tables is compared and the parent table is included.

Different sets of related data can result when matched rows contain data in a relationship column that results in joining to a different child.

**/ | **
Identifies rows with duplicate match keys. If only two rows contain duplicate values:

```
/  00001  Video Magic
\  00001  Video Mania
```

If three or more rows contain duplicate values:

```
/  00001  Video Magic
|  00001  Video Mania
\  00001  Video Maniac
```

Src Identifies the source of each row as:

1 Source 1

2 Source 2

12 Source 1 and Source 2. The row is identical; therefore, included once.

The data is shown before this information. The match key columns are presented first, and are identified by plus signs following the heading. The compared columns are listed next, followed by the columns that are unique to Source 1 and Source 2. The column headings defined for Source 1 are used for the compared columns. The column headings for columns unique to a source are prefixed with the source identifier 1: or 2:, as appropriate. (For example, the heading for a column named CUST unique to Source 1 is displayed as 1:CUST.)

Unchanged rows (rows in which all compared column values match) are included once. Both the Source 1 and Source 2 versions of changed rows are included. Any rows unique to one source are included and the source is identified. (For a more complete explanation and examples of how the change and source flags are generated, see “Processing Flow” on page 47.)

Within each pair of changed rows, the changed columns are identified by the symbol >. For example, in the following pair of compared rows, the second and third columns are different.

```
Chg       Src          CUST_ID      CUSTNAME        ADDRESS
------   -----------   ++++++++     -------------   --------------
 D        1            00100        >CinemaMagic    >726 West State Street
 D          2          00100        >CineMagic      >123 East State Street
```

This format simplifies interpreting the results of the comparison.

Sample Report - Sidelabels Format

The sidelabels Compare File print report in the following figure is based on the same Compare Process used for the columnar example. However, sidelabels format is especially useful for focusing directly on the changes. Therefore, the report parameters limit this sidelabels report to include only unmatched rows and rows with direct and related changes. For unmatched rows, all columns are included. For those rows with direct and related changes, only the columns containing differences are included. The Match Key

columns are always included for every row in the report.

```
                     Optim - COMPARE File Report

Compare File     : PSTCBR.AUGELV
Created by       : Job PSTCBR using SQLID PSTCBR on 11 Aug 2014 at 02:38 PM
Number of Tables : 5

Source 1         : Extract File - PSTCBR.TESTJUL
  Created by     : Job PSTCBR using SQLID OPTIM
  Created on     : 03 Aug 2014 at 10:55 AM on DB2 Subsystem TDB2

Source 2         : Extract File - PSTCBR.ALL829
  Created by     : Job PSTCBR using SQLID OPTIM
  Created on     : 03 Aug 2014 at 11:52 AM on DB2 Subsystem TDB2

Table Statistics: 1:PSTSUPP.OPTIM_CUSTOMERS  2:PSTSUPP.OPTIM_CUSTOMERS
   Total Number of Merged Rows                :    3520
   Total Number of Rows from Source 1         :    3520
   Total Number of Rows from Source 2         :      18
   Number of Unmatched Rows from Source 1     :    3502
   Number of Unmatched Rows from Source 2     :       0
   Total Number of Equal Rows                 :      18
   Total Number of Rows with Direct Changes   :       0
   Total Number of Rows with Related Changes  :     N/A
   Total Number of Orphan Rows on Source 1    :     N/A
   Total Number of Orphan Rows on Source 2    :     N/A
   Sets of Rows with Non-Unique Keys          :      0
   Total Number of S1 Rows with Non-Unique Keys:      0
   Total Number of S2 Rows with Non-Unique Keys:      0

Compare Match Options:

  Match Key Property    : Unique
```

Figure 64. Sample Compare File Report - Sidelabels

Only the detail information is affected by the columnar and sidelabel format. Therefore, for details about the report headers and summary information refer to the discussion provided for the columnar format sample.

Details

Details are presented after the summary information. The following headings are provided for the column information: **Column Name**, **Src**, and **Data**.

Column Name
The column name is displayed only once, regardless of whether the data is unique, common, or different between sources.

Src Indicates the source of the column data. Possible values are:

- **1** Source 1 only.
- **2** Source 2 only.
- **12** Common to Source 1 and Source 2.
- **KEY** Match Key column.

Data The data is presented in 50-byte segments. That is, if the data exceeds 50 characters, the next 50 characters are placed on the next line. As many lines as are needed to include all of the data in the column are used.

When all columns are included, the data in the common columns are displayed once and **Src** contains 12.

The Match Key columns are listed first and are identified by KEY in **Src**.

A separator line is shown following these headings and after each set of columns from a single row. The following row information is provided:

Source

Indicates the row source. Possible values are:

1 Row is from Source 1. There is no matching row in Source 2.

2 Row is from Source 2. There is no matching row in Source 1.

12 Row is a common row. All compared columns in Source 1 and Source 2 match.

1/2 Compared rows have differences in columns other than Match Key columns.

Use the information in **Src** to determine the source of any unmatched column values.

Changes

Indicates the type of change. Possible values are:

blank Row is unique to one source.

D One or more columns are different, other than the match key columns.

R One or more columns in a related row are different, other than the match key columns.

U Identifies rows that are orphans and the pairs of compared rows that result in a different set of related data.

Orphan rows in a table can only be determined when data from multiple tables is compared and the parent table is included.

**/ | **

Identifies rows with duplicate Match Keys. See "Details" on page 111 for additional information.

Relational View

If you want to review the compared data in a relational format, use the Browse option on the **COMPARE Process** menu. The same information is provided, but you can display the related data from other tables to identify the related changes and review the possible different sets of related data for each source. (See "Browse Compare File" on page 87 for information about browsing the compared data online.)

Appendix. Printing Files

This appendix describes how to print the contents of a Compare File.

You can browse Compare Files online using Option B BROWSE on the **COMPARE Process** menu; however, to print these files you must submit a batch job. To print a Compare File, execute FOPCFPMN.

Note: Support for the FOPCFPMN batch report program is available for compatibility purposes. IBM recommends use of the REPORT Compare utility available through the ISPF interface and parameters in a Compare batch job to print the contents of a Compare file in various formats. For information, see the *Batch Utilities Guide*.

Sample JCL

The following sample JCL can be used to print the contents of a Compare File using FOPCFPMN.

You must supply the appropriate values for all italicized text:

```
//jobname JOB jobcard info
//*-----------------------------------------*
//PRINT  EXEC PGM=FOPCFPMN,PARM='parms'
//*-----------------------------------------*
//STEPLIB   DD DSN=loadlib,DISP=SHR
//PSDFCOMP  DD DSN=compare file,DISP=SHR
//PSDFEXTR  DD DSN=source1 extract file,DISP=SHR
//PSDF2EXT  DD DSN=source1 extract file,DISP=SHR
//PSDFCRPT  DD SYSOUT=*,DCB=LRECL=136
//SYSPRINT  DD SYSOUT=*
```

The DD names are supplied to specify:

STEPLIB
Name of the Optim load library.

PSDFCOMP
Name of the Compare File to be printed.

PSDFEXTR
Name of the Source 1 Extract File to be printed. This can only be included when Source 1 is an Extract File.

PSDF2EXT
Name of the Source 2 Extract File to be printed. This can only be included when Source 2 is an Extract File.

PSDFCRPT
Destination for the print request. This can be SYSOUT or a disk data set. This file has variable length record format with carriage control. (A parameter on the EXEC statement can be used to modify this.)

SYSPRINT
Destination of error messages.

There are several parameters that can be specified in the parameter field on the EXEC JCL statement. These are all optional:

Report Format

-NTL Suppress report title lines.

-LNnn Print the number of lines per page. Specify *nn* as a value in the range of 1-99 designating the number of lines to be printed before a page break is forced. You can also specify 00 to suppress generating report title lines. Any other value is ignored. The default for *nn* is 57.

If report titles are suppressed by either -NTL or -LN, there will be no page breaks.

By default the report is in columnar format. That is, each row of data is presented on a single line similar to columnar display during a browse session. You can override this default and request sidelabels format using the -SID parameter. The -OCH parameter is only available for sidelabels reports, otherwise it is ignored.

Sidelabels

-SID Format the output in sidelabels mode. For this mode, the columns are listed one per line. For each column, the name, source and contents are included. One copy of common columns is included. Each version of unmatched columns is included. If not specified, the report is output in columnar format

-OCH Include only the columns that contain changes and the match key columns. (All columns in an unmatched row are always printed.)

The remaining parameters apply to columnar and sidelabels format.

Details

-D Include details. Default.

-ND Do not include details.

Summaries

-S Include summaries for each table. Default.

-NS Do not include summaries for each table.

If none of the following parameters are specified, all rows are included in the report.

Direct Changes

-DC Show direct changes.

Related Changes

-RC Show related changes.

Unmatched Rows

-UM Show unmatched rows.

Orphan Rows

-OR Show orphan rows.

Duplicate Rows

-DP Show duplicate match keys.

The following parameters are used to override the default characters used to designate changed, orphan, and duplicate rows. For each operand the default character is specified as the decimal equivalent for the character. For example, to define an asterisk as the delimiter, specify -VCDC92 where 92 is the decimal representation of the asterisk. (This is represented as *nnn* in the syntax.)

Match Key Designators

-FDCnnn
Indicate the value of the character to be used as the duplicate match key character for the first row in the set.

The default is '/'.

-MDCnnn
Indicate the value of the character to be used as the duplicate match key character for rows that are not the first or last row in the set.

The default is '|'.

-LDCnnn
Indicate the value of the character to be used as the duplicate match key character for the last row in the set.

The default is '\'.

VARCHAR Delimiter

-VCDCnnn
Indicate the value of the character to be used as the varchar delimiter.

The default varchar delimiter is the semicolon, ';'.

Null Field Indicator Character

-NFCnnn
Indicate the value of the character to be used as the null field indicator.

The default null field indicator character is the question mark, '?'.

Table Name

cid.table
Indicate one or more tables in the file that are to be printed. If you do not specify a value, all tables are printed. If you specify:

cid All tables with the specified Creator ID are printed.

table All tables with the specified base name, regardless of Creator ID, are printed.

cid.table
The named table is printed.

The specified name is matched against both sources.

Example

The following is an example of an EXEC statement using parameters to specify that all rows including row status are to be printed for the CUSTOMERS table in a COMPARE File.

```
EXEC PGM=FOPCFPMN,PARM='CUSTOMERS'
```

When several parameters are specified, they must be separated by spaces.

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