Avaya Call Management System

Custom Reports

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Contents

Chapter 1: Introduction

Purpose

The document describes how to design and create custom reports in Avaya Call Management System (CMS).

Intended audience

This document is intended for system administrators who can gain access to all parts of CMS and for other administrators, such as split or skill supervisors, who have limited access to CMS.

Related resources

Documentation

See the following documents.

Table 1: Related documents

Title	Use this document to:	Audience
Implementing		
Avaya Call Management System Software Installation, Maintenance, and Troubleshooting for Linux	Install, maintain, and troubleshoot CMS on the Linux operating system.	Implementation engineers and system administrators

Table 1: Related documents

Title	Use this document to:	Audience
Avaya Call Management System Software Installation, Maintenance, and Troubleshooting for Solaris	Install, maintain, and troubleshoot CMS on the Solaris operating system.	Implementation engineers and system administrators
Avaya Call Management System Base Load Upgrade	Upgrade to a new hardware platform and to migrate data.	Implmentation engineers and system administrators
Avaya Call Management System Upgrade Express Customer Requirements	Upgrade from an earlier version without change in platform hardware.	Implementation engineers and system administrators
Using		
Avaya Call Management System Administration	Administer CMS.	Implementation engineers and system adminsitrators
Avaya Call Management System Database Items and Calculations	Learn about database items, data calculations, and tracking and storing of data that is available in CMS reports.	All CMS users

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Chapter 2: Custom reports

Custom reports

A custom report is a report that you create and design using the Custom Reports subsystem. Like standard CMS reports, a custom report displays information about Automatic Call Distribution (ACD) activity in your call center. For a custom report, you can determine what ACD information is displayed and how it is displayed.

Like standard reports, custom reports fall into two categories: real-time and historical. A single custom report can contain real-time data or historical data, but not both.

You can use the Custom Reports subsystem, not the Reports subsystem, to run custom reports.

Screen Painter

You design custom reports with a tool called Screen Painter. When creating historical and real-time custom reports, use Screen Painter to:

- Arrange report fields and bars.
- Copy existing report designs, including standard report designs.
- Define ACD data for bar graphs if you have the CMS Graphics feature.
- Define ACD data for report fields.
- Define stationary, that is, no-scroll areas.
- Edit reports using block moves, copies, and deletions.
- Emphasize text and fields with highlighting options.
- Enter text for field labels, column headers, row headers, or special instructions.

For Historical custom reports, use Screen Painter to:

- Merge data in a report field to include data from different ACD entities, for example, to define a field that represents the percentage of calls that an agent answered compared to all calls handled by the split or skill of the agent.
- Merge data in a report field to include data with different time frame. For example, to define a field that represents the percentage of calls answered in an intrahour interval compared to all calls answered in the day.

- Include data from custom data tables that you create and populate within the CMS database. To create custom data tables, see Advanced report design on page 131.

  WARNING:
  If you create custom data table, ensure that you have disk space to store data. CMS does not automatically check the available space. If you fill the disk with custom data, you will lose or damage stored custom and ACD data.

For more information about disk storage, see *Avaya Call Management System Administration*.

Large reports could degrade the performance of your system. Ensure that you test the new custom report before you use the reports.

WARNING:
Do not tamper with standard ACD data in the CMS database. If you do, you will lose the stored data.

Important:
You cannot merge real-time data with historical data.

Creating custom reports

You must complete 14 tasks to create a custom report. If you perform all the tasks for each report that you create, your reports will run properly and you will be able to create reports efficiently.

The 14 tasks are as follows:

1. Defining report name, access, type, and option on page 29.

   Define a name that you use to run the report and to gain access to the report design if you want to change the design. Define access to whether other users can run the report and copy the report design to create their own custom reports. Define the type as real-time or historical.

2. Navigating Screen Painter on page 37.

   Gain access to Screen Painter to design reports.

3. (Optional) Copying an existing report design on page 41.

   Copy an existing report design to begin with existing report headings, data fields, bars, and other report features. While this step is optional, you save a lot of time. You can copy standard and custom reports.

4. Editing a report with blocks on page 45.

   Use block moves, copies, and deletions to quickly rearrange and delete sections of report design.

5. Entering report text on page 49.

   Type headings for the data fields in the report so that the text:

   - Provides a layout to position data fields.
   - Defines the data type for each data field.

     If you copy a report design, the text of the report is included. Use the Custom Report subsystem to modify the text.

6. Defining fields for the Report Input window on page 51.

   Define fields for the Report Input window so that users can use parameters to run the report. You can define fields, such as split, agent, time, and date.

   If you copy a report design, CMS includes the definition of the Report Input window. You can modify the definition.

7. Defining report fields on page 62.

   Define the location of fields and bars, field length, bar length and height, and the data to be displayed in the fields and bars. Data includes database items that supply data to the fields and bars.

   If you copy a report design, CMS includes the definition of those data fields and bars. You can modify the definitions.

   Also complete the steps in Defining bars in a report on page 78.

8. Defining the rows of data for a report on page 86.

   Define the rows of data that supply information for the fields and bars that you defined in Task 7.

   If you copy a report design, CMS includes the definition of the rows of data. You can modify the selection of rows.

9. Defining fields to show run time/date and user inputs on page 105.

   Define fields on the report to show when the report was run and what items the report covers, as defined in the Report Input window.

   If you copy a report design, CMS includes the fields. You can modify these fields.

10. Highlighting fields on page 111.

    Change the level of brightness or color if you have a color terminal. You can use underlines and reverse video to emphasize or de-emphasize individual fields and text in the report.

    If you copy a report design, CMS includes the highlighting and other video attributes. You can modify these attributes.

11. Defining stationary (no-scroll) areas on page 113.

    Define parts of the report that stay in the same place in the window even when you scroll up, down, right, or left. You can define no-scroll areas for column headers, column totals, and row identifiers.

    If you copy a report design, CMS includes the no scroll-areas. You can modify the no-scroll areas.

12. Saving the report design on page 115.

    Save the design of the report.

13. Testing the report design on page 116.

    Test the custom report after you save the report to ensure that the design has no errors.

14. Running custom reports on page 129.

    Run the report.

Standard reports

You cannot customize the following reports:

- Historical
  - Split/Skill: Status
  - System: Multi-ACD by Split/Skill (daily, weekly, monthly)
  - System: Multi-ACD Call Flow by VDN
  - Trunk Group: Busy Hour
  - Vector Directory Number (VDN): Busy Hour
  - VDN: Status
- Real-time
  - Multi-ACD
  - Multi-ACD Top Agent

Database items not in custom reports

Standard CMS reports contain many database items. For more information, see *Avaya Call Management System Database Items and Calculation*.

Storing and retrieving data

The most important and most difficult part of designing a custom report is defining the data for a report. To define custom report data, you must first understand how CMS stores and retrieves data.

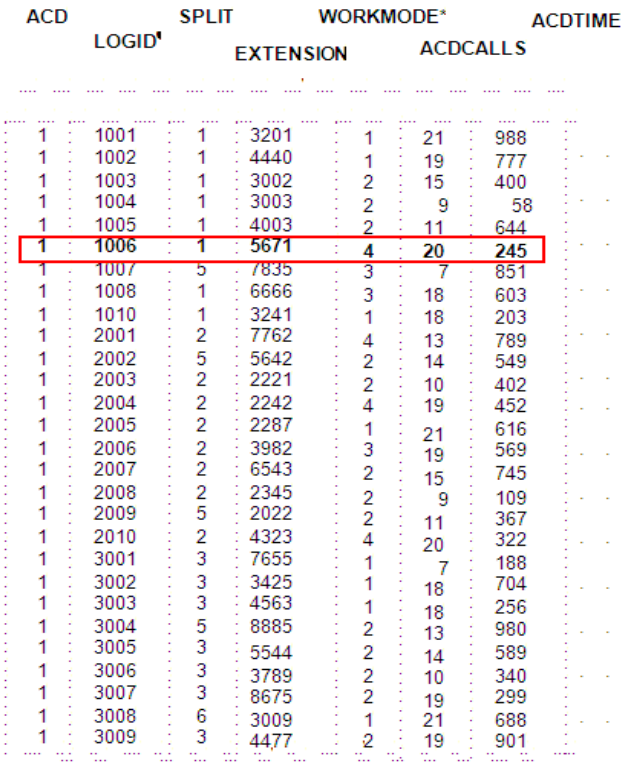
Storing data

CMS stores data in the CMS database. The database has 54 different tables that you can use in custom reports.

A table is an array of columns and rows that stores data for an ACD element for a specific period. ACD elements can include split or skill, agent, trunk, trunk group, VDN, vector, call work code, forecasting, agent trace, call record, or exceptions. Period can be the current intrahour interval, past intrahour intervals, or past day that is summarized by day.

The following figure shows how a small piece of the Current Interval Agent table might look in the database. The figure shows data for the current intrahour interval for agents 1001 to 3009. As data in this table is in real time, data changes every second. The example represents a snapshot of the most recent update of the table.

Figure 1: Sample of the Current Interval Agent table



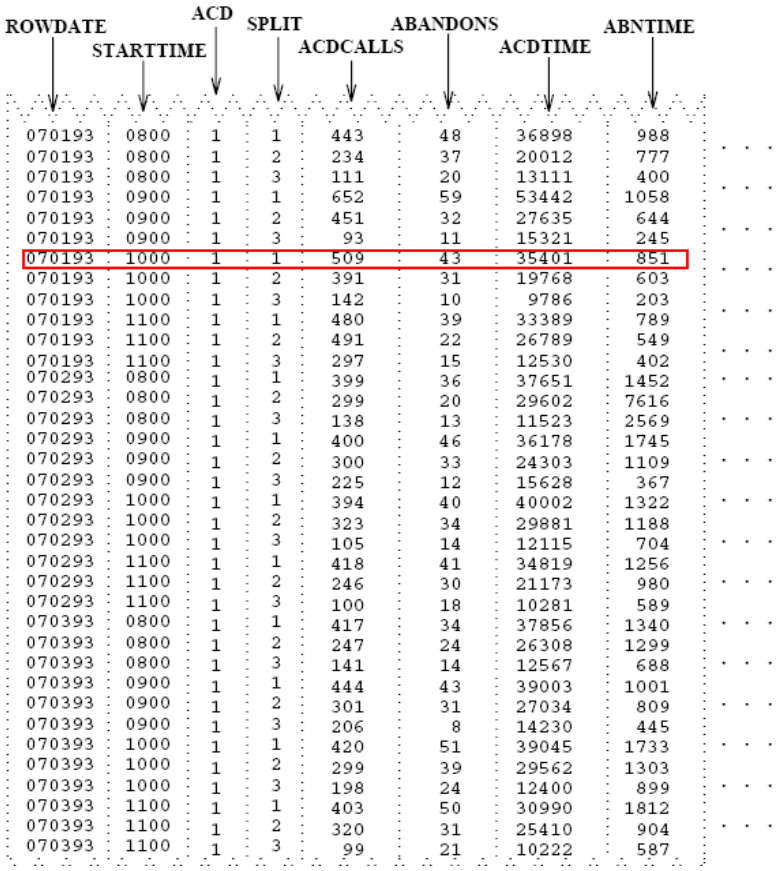
ACD	LOGID	SPLIT	EXTENSION	WORKMODE*	ACDCALLS	ACDTIME
1	1001	1	3201	1	21	988
1	1002	1	4440	1	19	777
1	1003	1	3002	2	15	400
1	1004	1	3003	2	9	58
1	1005	1	4003	2	11	644
1	**1006**	**1**	**5671**	**4**	**20**	**245**
1	1007	5	7835	3	7	851
1	1008	1	6666	3	18	603
1	1010	1	3241	1	18	203
1	2001	2	7762	4	13	789
1	2002	5	5642	2	14	549
1	2003	2	2221	2	10	402
1	2004	2	2242	4	19	452
1	2005	2	2287	1	21	616
1	2006	2	3982	3	19	569
1	2007	2	6543	2	15	745
1	2008	2	2345	2	9	109
1	2009	5	2022	2	11	367
1	2010	2	4323	4	20	322
1	3001	3	7655	1	7	188
1	3002	3	3425	1	18	704
1	3003	3	4563	1	18	256
1	3004	5	8885	2	13	980
1	3005	3	5544	2	14	589
1	3006	3	3789	2	10	340
1	3007	3	8675	2	19	299
1	3008	6	3009	1	21	688
1	3009	3	4477	2	19	901

Figure notes:

1. The numeric values for WORKMODE represent agent work state in the reports. For example, 1=AVAIL, 2=ACD, 3=ACW, and 4=AUX.

The following figure shows how a small piece of the Historical Intrahour Interval Split table looks in the report. See the highlighted data as an example. The figure shows data from July 1 to July 3, 1993, and simulates data for an ACD that has three splits, intrahour intervals of 60 minutes, and daily activity from 8:00 a.m. to 11:00 a.m.

Figure 2: Sample of the Historical Intrahour Interval Split table



ROWDATE	STARTTIME	ACD	SPLIT	ACDCALLS	ABANDONS	ACDTIME	ABNTIME
070193	0800	1	1	443	48	36898	988
070193	0800	1	2	234	37	20012	777
070193	0800	1	3	111	20	13111	400
070193	0900	1	1	652	59	53442	1058
070193	0900	1	2	451	32	27635	644
070193	0900	1	3	93	11	15321	245
070193	1000	1	1	509	43	35401	851
070193	1000	1	2	391	31	19768	603
070193	1000	1	3	142	10	9786	203
070193	1100	1	1	480	39	33389	789
070193	1100	1	2	491	22	26789	549
070193	1100	1	3	297	15	12530	402
070293	0800	1	1	399	36	37651	1452
070293	0800	1	2	299	20	29602	7616
070293	0800	1	3	138	13	11523	2569
070293	0900	1	1	400	46	36178	1745
070293	0900	1	2	300	33	24303	1109
070293	0900	1	3	225	12	15628	367
070293	1000	1	1	394	40	40002	1322
070293	1000	1	2	323	34	29881	1188
070293	1000	1	3	105	14	12115	704
070293	1100	1	1	418	41	34819	1256
070293	1100	1	2	246	30	21173	980
070293	1100	1	3	100	18	10281	589
070393	0800	1	1	417	34	37856	1340
070393	0800	1	2	247	24	26308	1299
070393	0800	1	3	141	14	12567	688
070393	0900	1	1	444	43	39003	1001
070393	0900	1	2	301	31	27034	809
070393	0900	1	3	206	8	14230	445
070393	1000	1	1	420	51	39045	1733
070393	1000	1	2	299	39	29562	1303
070393	1000	1	3	198	24	12400	899
070393	1100	1	1	403	50	30990	1812
070393	1100	1	2	320	31	25410	904
070393	1100	1	3	99	21	10222	587

The CMS database uses names to refer to columns of data in a table. These names are called Database Items in CMS. The Current Interval Agent table and the Historical Intrahour Interval Split table contain many more columns and, therefore, many more database items than are shown in the figures. For a complete list of database items, see *Avaya Call Management System Database Items and Calculations*.

Each row in a table contains data that is related by the values of more than one column. In the Current Interval Agent table, each row in the table contains data related by agent login ID. If you look at the highlighted row in Figure 1: Sample of the Current Interval Agent table on page 20, you see that the agent is logged into Split 1 on extension 5671 and is currently in the Auxiliary (AUX) work mode. In addition, up to this point in the current interval, the agent received 20 ACD calls (ACDCALLS) and 245 seconds of ACD talk time (ACDTIME).

A column or a set of columns that causes the values in a row to be related is called an index. An index stores data sequentially and adds structure for the storage of data in the other columns. For each value in an index column, the remaining values in the corresponding row are related to that value. Therefore, in Figure 1: Sample of the Current Interval Agent table on page 20, the LOGID database item is an index.

Each row in the Historical Intrahour Interval Split table contains data related by date, interval, and split. If you look at the highlighted row in Figure 2: Sample of the Historical Intrahour Interval Split table on page 21, you see that Split 1 had:

- 509 ACD calls (ACDCALLS)
- 43 abandoned calls (ABANDONS)
- 35401 cumulative seconds of ACD talk time for all ACD calls (ACDTIME)
- 851 cumulative seconds of wait time for all calls that callers abandoned before agents answered the calls (ABNTIME)

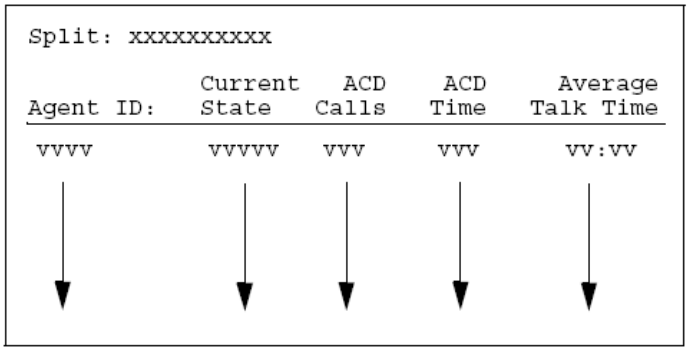
Retrieving data

CMS retrieves data from the database based on the following information that you supply when you design a custom report:

- Table title
- Database items in the table
- Rows of data in the table

For example, if you want a custom real-time agent report that lists the agents in a split, CMS displays the report design as shown in the following figure.

Figure 3: Custom report design

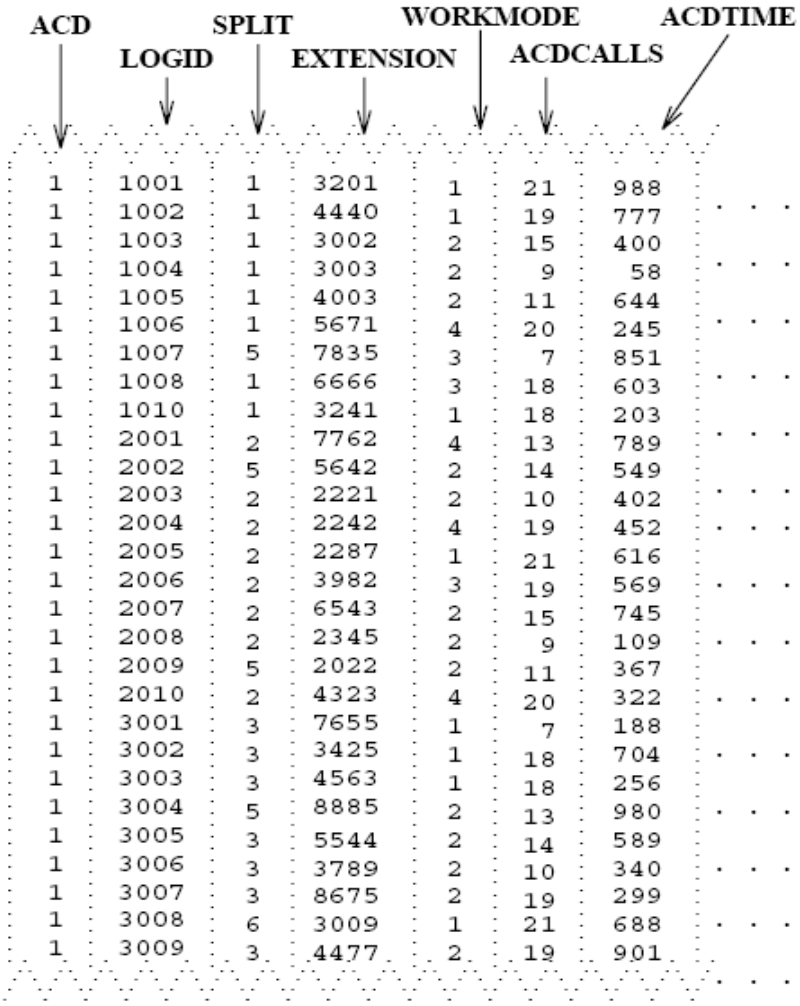


Note:
Each series of v's in the figure represents a report field for which CMS finds multiple values. In this case, the system displays values for more than one agent. CMS displays the values vertically in a column. The x's by the Split label represent the fact that only one value (in this case, a single split name or number) is expected for the field.

You can assign the ACDTIME/ACDCALLS calculation for the **Average Talk Time** field in the report.

To retrieve data, you must tell CMS to gain access to the cagent, that is, Current Interval Agent, table. Then, for each report field, you assign the appropriate database items. When you run the report, CMS finds and displays columns of data associated with the database items as shown in the following figure.

Figure 4: Sample 1 of database item selection



ACD	LOGID	SPLIT	EXTENSION	WORKMODE	ACDCALLS	ACDTIME
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1	3005	3	5544	2	14	589
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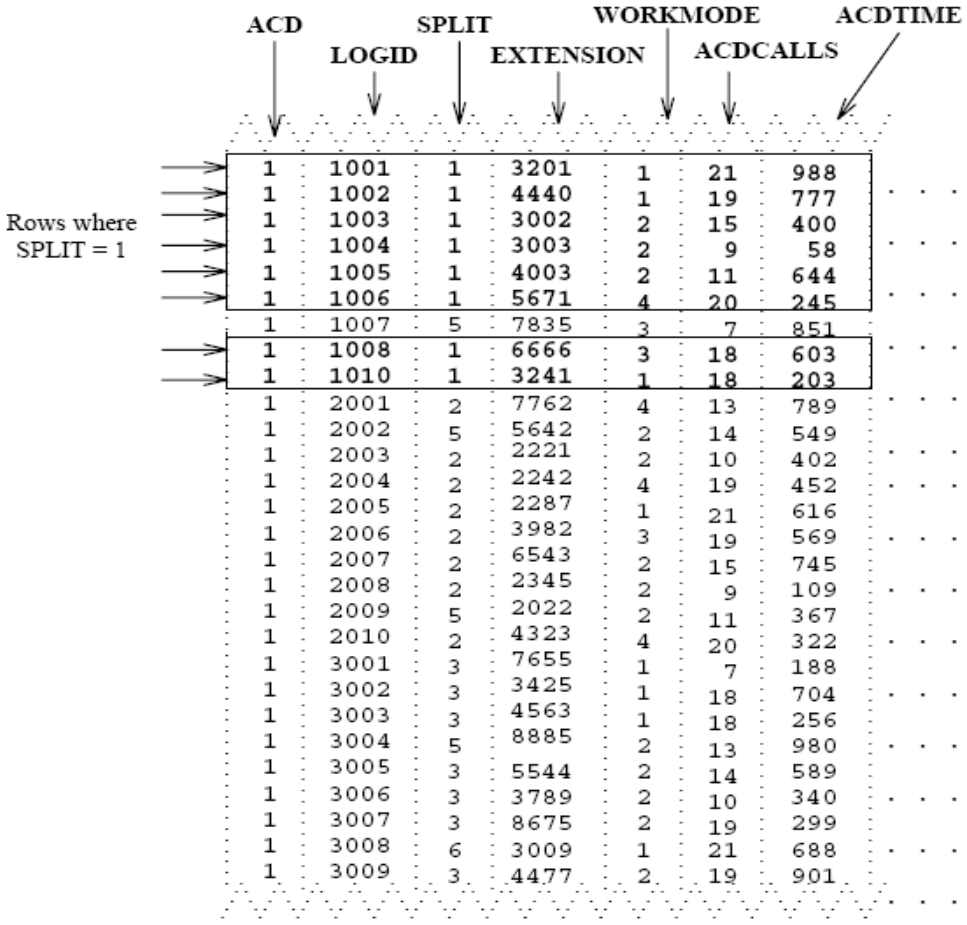
1	3007	3	8675	2	19	299
1	3008	6	3009	1	21	688
1	3009	3	4477	2	19	901

Next, you identify the appropriate rows that supply data. If you want agents in Split 1, you must tell CMS to find rows that have the value 1 for the SPLIT database item. When you run the report, CMS finds the appropriate rows of data in the cagent table. See the rows with arrows in the following figure.

Figure 5: Sample 1 of table row selection



ACD	LOGID	SPLIT	EXTENSION	WORKMODE	ACDCALLS	ACDTIME
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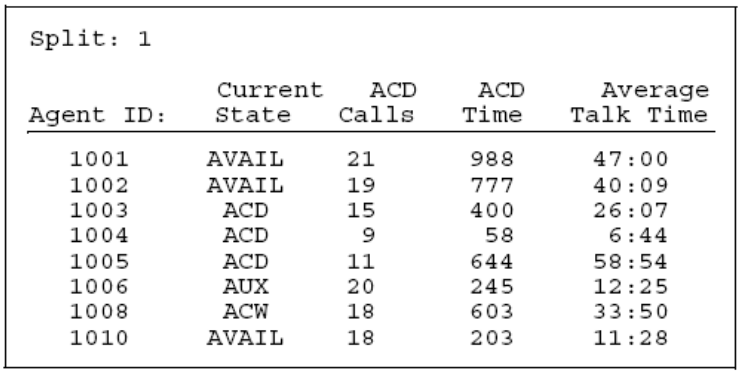
1	1003	1	3002	2	15	400
1	1004	1	3003	2	9	58
1	1005	1	4003	2	11	644
1	1006	1	5671	4	20	245
1	1007	5	7835	3	7	851
1	1008	1	6666	3	18	603
1	1010	1	3241	1	18	203
1	2001	2	7762	4	13	789
1	2002	5	5642	2	14	549
1	2003	2	2221	2	10	402
1	2004	2	2242	4	19	452
1	2005	2	2287	1	21	616
1	2006	2	3982	3	19	569
1	2007	2	6543	2	15	745
1	2008	2	2345	2	9	109
1	2009	5	2022	2	11	367
1	2010	2	4323	4	20	322
1	3001	3	7655	1	7	188
1	3002	3	3425	1	18	704
1	3003	3	4563	1	18	256
1	3004	5	8885	2	13	980
1	3005	3	5544	2	14	589
1	3006	3	3789	2	10	340
1	3007	3	8675	2	19	299
1	3008	6	3009	1	21	688
1	3009	3	4477	2	19	901

The data that CMS displays for the report is the data found in the intersection of the selected database items and rows. Therefore, the report contains data as shown in the following figure.

Figure 6: Sample 1 of custom report



Split: 1

Agent ID:	Current State	ACD Calls	ACD Time	Average Talk Time
1001	AVAIL	21	988	47:00
1002	AVAIL	19	777	40:09
1003	ACD	15	400	26:07
1004	ACD	9	58	6:44
1005	ACD	11	644	58:54
1006	AUX	20	245	12:25
1008	ACW	18	603	33:50
1010	AVAIL	18	203	11:28

Note:

When you design a custom report, you can set up row selection so that a user running the report can choose the rows in the Report Input window. For example, to run a report, you can set up the row selection so the user can fill out a Report Input window that prompts the user for a split number. For more information, see Defining fields for the Report Input window on page 51.

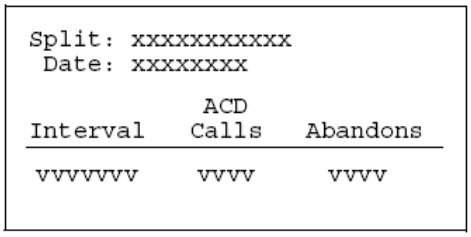
CMS uses indexes to create a structure for storing data and to search for data. With indexes, CMS can find data much faster than if data were stored randomly. Therefore, when you design a custom report, you must define the rows of data for the report on the basis of index values.

For more information, see Defining fields for the Report Input window on page 51.

The indexes for each standard table are fixed. Therefore, you cannot change, delete, or add an index. However, if you use INFORMIX SQL to define a custom table in the CMS database, you can define any indexes for the new table.

Another example of how CMS retrieves report data is shown in Figure 7: Sample 2 of custom report on page 25, which is an example of a report design for a custom intrahour interval split report that lists, by intrahour interval, data for a split in a single day.

Figure 7: Sample 2 of custom report

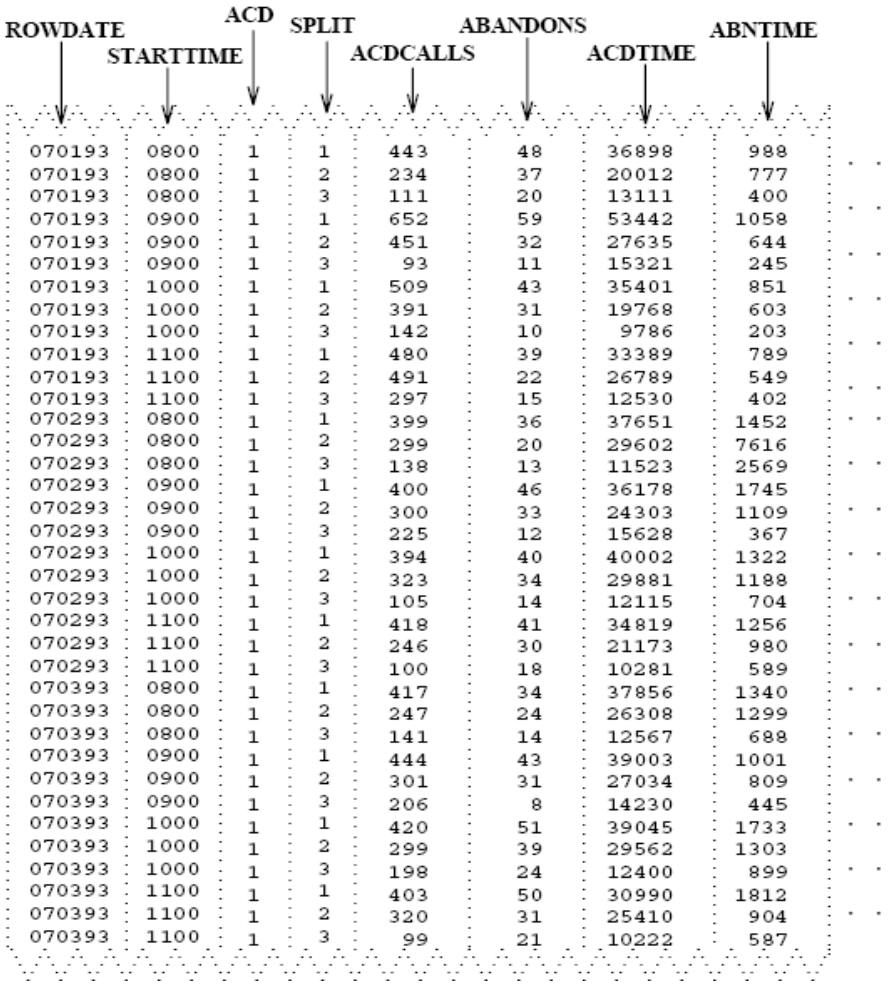


Split: xxxxxxxxxxx
Date: xxxxxxxx

Interval	ACD Calls	Abandons
vvvvvvv	vvvv	vvvv

To retrieve data, you must tell CMS to gain access to the hsplit, that is, Historical Intrahour Interval Split, table. You must then assign the appropriate database items to the fields. When you run the report, CMS finds and displays the columns of data associated with the database items in the hsplit table as shown in Figure 7: Sample 2 of custom report on page 25.

Figure 8: Sample 2 of database item selection



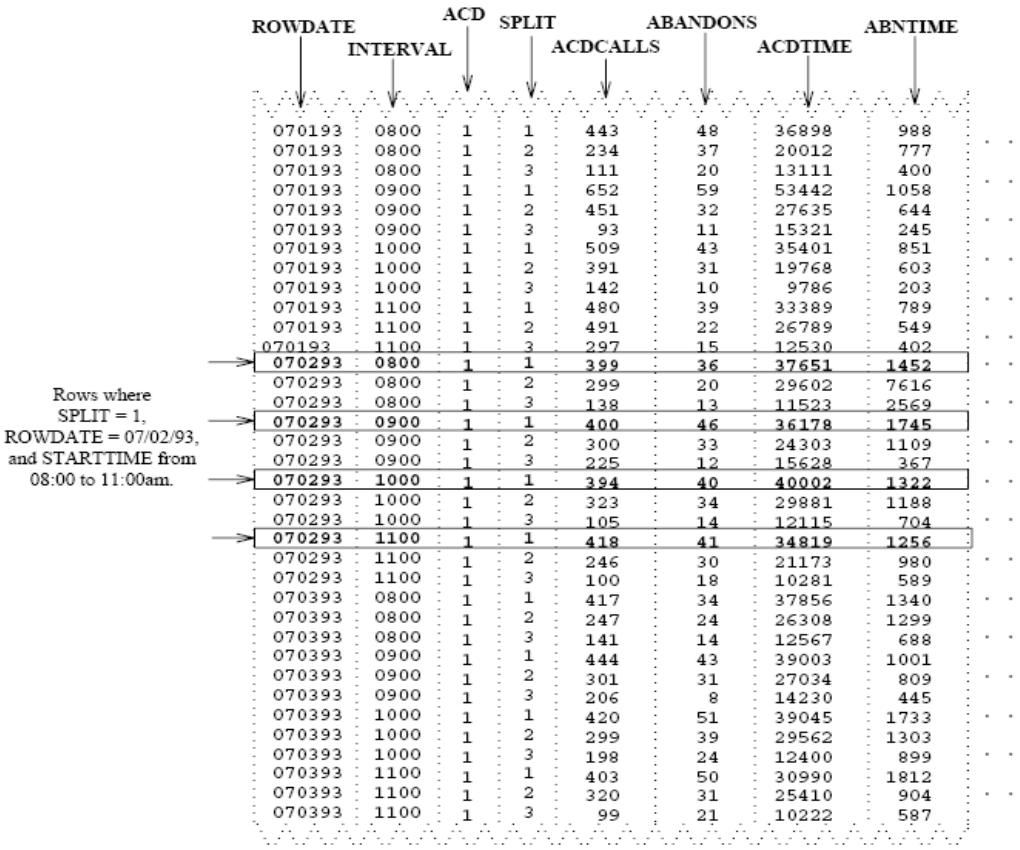
ROWDATE	STARTTIME	ACD	SPLIT	ACDCALLS	ABANDONS	ACDTIME	ABNTIME
070193	0800	1	1	443	48	36898	988
070193	0800	1	2	234	37	20012	777
070193	0800	1	3	111	20	13111	400
070193	0900	1	1	652	59	53442	1058
070193	0900	1	2	451	32	27635	644
070193	0900	1	3	93	11	15321	245
070193	1000	1	1	509	43	35401	851
070193	1000	1	2	391	31	19768	603
070193	1000	1	3	142	10	9786	203
070193	1100	1	1	480	39	33389	789
070193	1100	1	2	491	22	26789	549
070193	1100	1	3	297	15	12530	402
070293	0800	1	1	399	36	37651	1452
070293	0800	1	2	299	20	29602	7616
070293	0800	1	3	138	13	11523	2569
070293	0900	1	1	400	46	36178	1745
070293	0900	1	2	300	33	24303	1109
070293	0900	1	3	225	12	15628	367
070293	1000	1	1	394	40	40002	1322
070293	1000	1	2	323	34	29881	1188
070293	1000	1	3	105	14	12115	704
070293	1100	1	1	418	41	34819	1256
070293	1100	1	2	246	30	21173	980
070293	1100	1	3	100	18	10281	589
070393	0800	1	1	417	34	37856	1340
070393	0800	1	2	247	24	26308	1299
070393	0800	1	3	141	14	12567	688
070393	0900	1	1	444	43	39003	1001
070393	0900	1	2	301	31	27034	809
070393	0900	1	3	206	8	14230	445
070393	1000	1	1	420	51	39045	1733
070393	1000	1	2	299	39	29562	1303
070393	1000	1	3	198	24	12400	899
070393	1100	1	1	403	50	30990	1812
070393	1100	1	2	320	31	25410	904
070393	1100	1	3	99	21	10222	587

Next, you must identify the appropriate rows that supply data. You might want data for the following:

- Split 1, which means that you must identify rows with value 1 for the SPLIT database item.
- The date 07/02/93, which means that you must identify rows with the value 070293 for the ROWDATE database item.
- The intrahour interval 8:00 a.m. to 11:00 a.m., which means that you must identify rows with values from 0800 through 1100 for the STARTTIME database item.

CMS finds and displays the relevant rows of data as shown in the following figure.

Figure 9: Sample 2 of table row selection



ROWDATE	INTERVAL	ACD	SPLIT	ACDCALLS	ABANDONS	ACDTIME	ABNTIME
070193	0800	1	1	443	48	36898	988
070193	0800	1	2	234	37	20012	777
070193	0800	1	3	111	20	13111	400
070193	0900	1	1	652	59	53442	1058
070193	0900	1	2	451	32	27635	644
070193	0900	1	3	93	11	15321	245
070193	1000	1	1	509	43	35401	851
070193	1000	1	2	391	31	19768	603
070193	1000	1	3	142	10	9786	203
070193	1100	1	1	480	39	33389	789
070193	1100	1	2	491	22	26789	549
070193	1100	1	3	297	15	12530	402
070293	**0800**	**1**	**1**	**399**	**36**	**37651**	**1452**
070293	0800	1	2	299	20	29602	7616
070293	0800	1	3	138	13	11523	2569
070293	**0900**	**1**	**1**	**400**	**46**	**36178**	**1745**
070293	0900	1	2	300	33	24303	1109
070293	0900	1	3	225	12	15628	367
070293	**1000**	**1**	**1**	**394**	**40**	**40002**	**1322**
070293	1000	1	2	323	34	29881	1188
070293	1000	1	3	105	14	12115	704
070293	**1100**	**1**	**1**	**418**	**41**	**34819**	**1256**
070293	1100	1	2	246	30	21173	980
070293	1100	1	3	100	18	10281	589
070393	0800	1	1	417	34	37856	1340
070393	0800	1	2	247	24	26308	1299
070393	0800	1	3	141	14	12567	688
070393	0900	1	1	444	43	39003	1001
070393	0900	1	2	301	31	27034	809
070393	0900	1	3	206	8	14230	445
070393	1000	1	1	420	51	39045	1733
070393	1000	1	2	299	39	29562	1303
070393	1000	1	3	198	24	12400	899
070393	1100	1	1	403	50	30990	1812
070393	1100	1	2	320	31	25410	904
070393	1100	1	3	99	21	10222	587

The data that CMS displays for the report is the data found in the intersection of the selected database items and columns. Therefore, the report contains data as shown in the following figure.

Figure 10: Sample 3 of custom report

Split: 1
Date: 07/02/93

Interval	ACD Calls	Abandons
8:00am	399	36
9:00am	400	46
10:00am	394	40
11:00am	418	41

Defining data is the main task of creating and designing a custom report, but you must also perform other tasks. For more information, see Getting started on page 29.

Chapter 3: Getting started

This chapter describes how to perform the following tasks in CMS:

- Defining report name, access, type, and option on page 29
- Changing report access, description, or option on page 35
- Deleting a custom report on page 36

You can use the Edit Report: Report Select window to perform these tasks.

Important:
You must have read and write permission for the Custom Reports subsystem to create, change, or delete a custom report.

Defining report name, access, type, and option

Note:
You cannot define a custom report with a timetable. If you are a CMS administrator, you can specify the owner of the report that you are defining. For more information, see Defining the user ID on page 33. If you are not a CMS administrator, you can define a report with only you as the owner.

To design a custom report, perform the following tasks:

1. Gaining access to the Report Select window on page 30
2. Assigning a name to the report on page 31
3. Entering a report description on page 32
4. Defining the user ID on page 33
5. Defining access to the report on page 33
6. Defining the report as historical or real-time on page 34
7. Defining the report option on page 34
8. Saving the report name on page 34

Gaining access to the Report Select window

To gain access to the Report Select window:

1. On the main menu, select **Custom Reports** and press **Enter**.

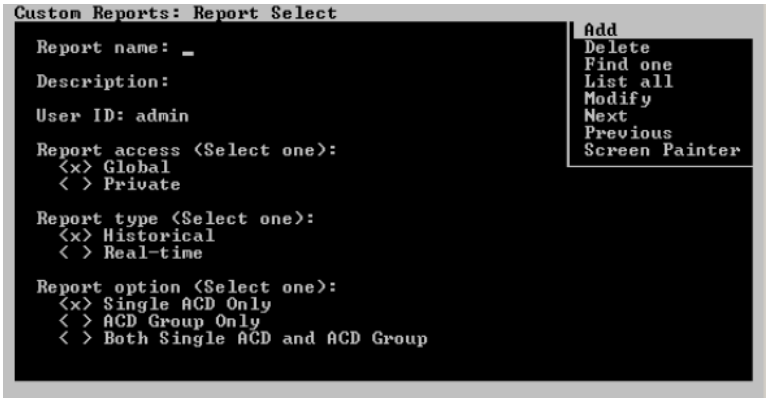
   The system displays the **Custom Reports** submenu as shown in the following figure:

Figure 11: Custom Reports submenu

2. Select **Edit Report**.

   The system displays the Report Select window as shown in the following figure:

Figure 12: Report Select window



Note:

The Report Select window does not display the **Report option** menu if you do not authorize the Global Dictionary/ACD Groups feature.

Assigning a name to the report

Type a name in the **Report name** field. The name can have up to 20 characters, including spaces. As the name that you enter must be unique, you can view the existing custom report names before you type a name.

Perform the following steps to the view the existing report names:

1. Clear the fields.
2. In the **Report access** field, select **Global** or **Private**.
3. In the **Report type** field, select **Historical** or **Real-time**.
4. In the **Report option** field, select **Single ACD Only**, **ACD Group Only**, or **Both Single ACD and ACD Group**.

   For more information about report options, see Report option definitions on page 31
5. Press **Enter**.

   The system displays the List all window with all global and private custom report names for the specified report type.
6. Check the list to ensure that the name that you want to assign is not already in use.

   If you are creating a global report, the name that you assign must be different from all the names in the list.

   If you are creating a private report, the name that you assign must be different from all the existing global reports and the private reports that you created. The name that you assign can match the name of a private report of another user.
7. Press **Exit**.

   The system closes the List all window, and the cursor returns to the Report Select window.
8. Type a name for the report.

Report option definitions

Single ACD Only

When you select this report option, you define a report that relates only to information about a single ACD. If the single ACD is a member of an ACD group, CMS displays no information about the ACD group in which the single ACD is a member.

For example, if an Agent Split/Skill report for Agent 5001 for ACD 1 is designed using the Screen Painter and ACD 1 is defined in the ACD group named Sales, CMS displays information only for Agent 5001 for ACD1.

When you run the report, you must set your Current ACD as a single ACD or you will not see your report in the **Custom Reports > Historical** or **Real-Time** submenus.

ACD Group Only

When you select this report option, you define a report that contains summarized information about ACDs that are members of an ACD Group. Queries for ACDs defined for this report contain aggregate data of all the member ACDs within the ACD Group.

For example, if an Agent report for Agent 5001 for an ACD group named Sales is required, and Sales is an ACD Group that contains ACD members ACD 1 and ACD2, CMS displays an aggregate of Agent 5001's split or skill information from both ACD 1and ACD 2.

When you run the report, you must set your current ACD as a Group ACD or you will not see your report in the **Custom Reports > Historical** or **Real-time** submenus.

Both Single ACD and ACD Group

When you select this report option, you define a report that contains information at the Single ACD or ACD Group level.

When you run the report, your current ACD can be a single ACD or a group ACD. Your report will be available in the **Custom Reports > Historical** or **Real-time** submenus regardless of the current ACD setting.

Entering a report description

You can enter a description of the report in the **Description** field. The description can have up to 50 characters, including spaces. Your description must be detailed enough to describe the contents of the report accurately. Do not use the following characters:

- Asterisk (*)
- Back slash (\)
- Double quotes (")
- Grave accent (`)
- Pipe (|)
- Question mark (?)
- Semicolon (;)
- Tilde (~)

Defining the user ID

Type the user ID of the owner of the report in the **User ID** field. The default is your user ID. If you are a CMS administrator, you can type the ID of another user to create a custom report for that user. Do this if you want only that user to run the report.

Note:
To view a custom report of another user, you can type that the ID of the user and click **List all**. You do not have to be an administrator to view the custom reports of other users.

Defining access to the report

Select **Global** or **Private** in the **Report access** field.

Note:
Keep your reports as private reports until you have debugged and run the reports successfully. This action prevents other users from running reports that you have saved but not yet tested.

Global access to the report gives other users the following capabilities:

- Other users can run the report.
- Other users can copy the design of the report when other users create custom reports. For more information, see Copying an existing report design on page 41.

If you select **Global**, the name of your report must be different from the name of any other custom report whether global or private.

Private access to the report means that only you and the CMS administrators can run the report. No other users, except for CMS administrators, can copy or run the report design for use in their custom reports.

If you select **Private**, the name of your report must be different from the names of the following:

- Other private reports that you create.
- Global reports of the same type.

Note:
No other CMS user, other than a CMS administrator, can modify a report design that you create regardless of whether the report is global or private. A CMS administrator can modify your report design, even if you save the report as a private report.

Defining the report as historical or real-time

Select **Historical** or **Real-time** in the **Report type** field.

When you design the report on Screen Painter, you can gain access to data only for the category that you select. For example, if you select **Real-time**, you cannnot specify historical data in the report design.

When you run the report, CMS lists the report under the related submenu, that is, Real-time or Historical.

You must select **Historical** to include the following data in the report:

- Agent trace
- Call record
- Call Work Code (CWC)
- Exceptions
- Forecast

Defining the report option

With Global Dictionary/ACD Groups, call center supervisors can view agents regardless of the system that the agents log in to. Multi-ACD reporting consolidates split reporting that aggregates data from multiple ACDs.

When defining the report option, the **Single ACD Only** option runs only when the current ACD is set to a single ACD.

Select one of the following options in the **Report option** field:

- **Single ACD Only**
- **ACD Group Only**
- **Both Single ACD and ACD Group**

Note:
The Report Select window does not display the **Report option** menu if you do not authorize the Global Dictionary/ACD Groups feature.

Saving the report name

To save the report name:

1. Press **Enter**.

2. Select **Add**.
3. Press **Enter**.

   The system displays Successful on the status line.

   If CMS does not add the report name because the name is not unique, click **List all** to view report names that already exist, and repeat the procedure from Assigning a name to the report on page 31.

After you add the report name, you can gain access to Screen Painter to design the report.

Changing report access, description, or option

Note:
You cannot change a report name, report type, report option, or report owner after you add the report. Instead, you must create a new report with the name, type, option, or owner and then copy the design of the old report to the new report.

To change report access, description, or option:

1. On the Report Select window, complete the fields that you want to search. **Report type** is a required field on CMS.
2. Press **Enter**, click **List all**, and press **Enter** again.

   The system displays the List all window with the list of custom reports for the specified type and user ID.

   Note:
   You can change the **User ID** field to view the custom reports of another user. You cannot change the user ID of a report that already exists in the system.
3. Find the report that you want to change, and press **Exit**.
4. In the **Report name** field on the Report Select window, type the name of the report for which you want to change the description and access.
5. (Optional) Change the default selection in the **Report type** field. Press **Enter**, click **Find one**, and press **Enter** again.

   CMS fills in all the fields with the characteristics of the report.
6. Change the description and access of the report.
7. Press **Enter**, click **Modify**, and press **Enter** again.

   The system displays Successful on the status line.

   Note:
   You cannot use **Modify** to change the name of a report or a user ID. To change a report name or user ID, you must:

1. Add a new report name with the desired user ID.
2. Gain access to Screen Painter.
3. Copy the design of the old report to the new report.
4. Delete the old report name.

Deleting a custom report

Note:
You must be a CMS administrator to delete the custom reports of another user.

To delete custom reports:

1. On the Report Select window, complete the fields that you want to search, and click **List all**. **Report type** is a required field on CMS.

   The system displays the List all window with the list of all global and private custom reports for the specified type and user ID.

   Note:
   You can change the **User ID** field to view the custom reports of another user. However, you can delete the reports of another user only if you are a CMS administrator.

2. In the List all window, find the report that you want to delete, and press **Exit**.
3. In the **Report name** field on the Report Select window, type the name of the report that you want to delete from the system.
4. Press **Enter**, click **Find one**, and press **Enter** again.

   CMS fills in all the fields with the characteristics of the report.

   Note:
   If more than one report has the same name, click **Next** to find the report that you want to delete from the system.

5. Press **Enter**, click **Delete**, and press **Enter** again.

   The system displays Successful on the status line.

Chapter 4: Using Screen Painter editing tools

Navigating Screen Painter

With Screen Painter, you can enter report text, data fields, and data bars in a layout that closely resembles the layout of the actual report. You must define the report name and characteristics in the Edit Report: Report Select window before you can gain access to Screen Painter for that report.

Note:
You can gain access to Screen Painter for a report that someone else designed only if you are a CMS administrator. However, if another user's report has global access, you can add your own report name. You can then copy that user's report design on Screen Painter. For more information, see Copying an existing report design on page 41.

On Screen Painter, cursor movement, scrolling, and data entry all differ from those operations in normal CMS windows.

Gaining access to Screen Painter

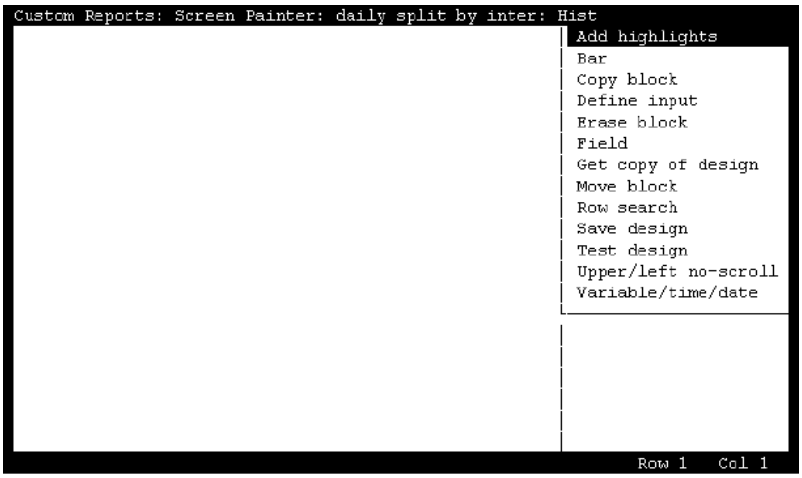
To gain access to Screen Painter:

1. In the **Report name** field on the Report Select window, type the name of the report.
2. Click **Find one**.

   The system displays the characteristics of the report.
3. Select the **Screen Painter** action list option.

   The system displays the Screen Painter window as shown in the following figure.

Figure 13: Screen Painter window



Moving the cursor on Screen Painter

As Screen Painter has no predefined fields, you can move the cursor around the interior of Screen Painter with the following keys.

Table 2: Terminal keys

Terminal key	Action
Arrow keys	Moves the cursor one space in the direction that the arrow points.
Tab	Moves the cursor eight spaces to the right. You can use Tab when you define blocks. For more information, see Editing a report with blocks on page 45

Table 2: Terminal keys

Terminal key	Action
Shift+Tab	Press and hold Shift and then press Tab. This key combination moves the cursor eight spaces to the left. You can use Shift+Tab when you define blocks. For more information, see Editing a report with blocks on page 45 The Shift+Tab combination might be unavailable on some terminals. Throughout this document when any set of two keys are shown side by side, press and hold the first key and then press the second key.
Back Space	Moves the cursor one space to the left.
Ctrl+f	Forward. Moves the cursor to the far right edge, that is, column number 132, of Screen Painter.
Ctrl+b	Back. Moves the cursor to the left edge, that is, the first column, of Screen Painter.
Ctrl+d	Down. Moves the cursor to the bottom, that is, line 25, of Screen Painter.
Ctrl+u	Up. Moves the cursor to the first line of Screen Painter.

Screen Painter report size

With Screen Painter, you can create a report design with the following maximum dimensions:

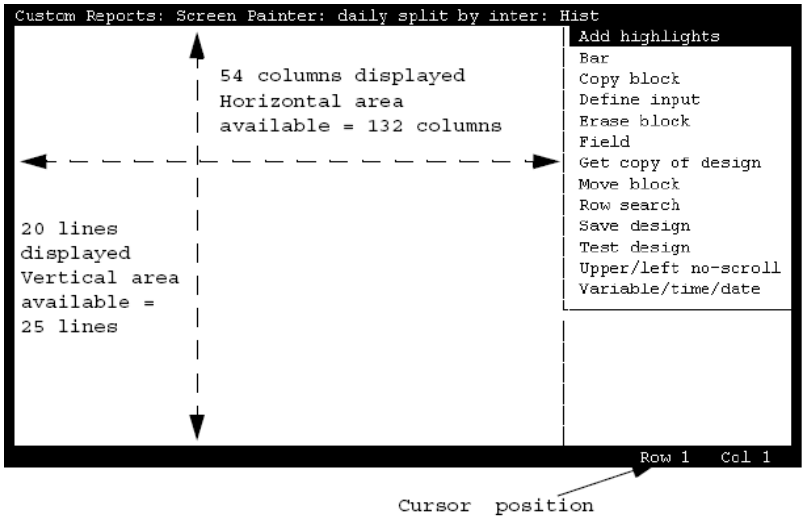
- A horizontal size of 132 columns (character spaces)
- A vertical size of 25 lines

For most terminals, CMS displays, in the lower right border of Screen Painter, the position of the cursor with the 25 column by 132 column grid. However, because the interior of the Screen Painter window is 54 columns wide and 20 lines high, you have to scroll Screen Painter horizontally or vertically to view the area that does not fit within the window.

The widest custom report that you can view on the terminal without scrolling is 78 columns wide. The terminal displays 80 columns, but the side borders of the report window hide two columns.

The following figure illustrates the description.

Figure 14: Screen Painter window dimensions



Scrolling Screen Painter

Screen Painter scrolls automatically when the cursor touches the left, right, top, or bottom border. Screen Painter scrolls one column or one line at a time when you use the arrow keys, but scrolls eight columns at a time when you use the **Tab** key for horizontal scrolling. Right scrolling beeps when the system diplays the 132nd column. Left scrolling beeps when the system displays the first column. Down scrolling stops when the system displays the 25th line. Up scrolling stops when the system displays the top line again.

Properties of secondary windows

For most tasks on Screen Painter, you must complete a secondary window. The secondary windows pop up after you select an action list option. Some secondary windows automatically close when you type data and select an action list option. However, for some secondary windows, you must press the **Exit** screen-labeled key to close the window and return to Screen Painter.

If you use the **Current** screen-labeled key to leave a secondary window and return to Screen Painter, the secondary window remains open. However, until you close the secondary window, Screen Painter is locked and you cannot type text or select any other action list options.

Editing keys in secodary windows

In the secondary windows, you can use the following standard field editing keys.

Table 3: Field editing keys

Terminal key	Action
Ctrl+e	Turns the Insert mode on or off. With the Insert mode on, you can insert characters at the cursor's position in the field.
Ctrl+x	Erases characters in a field from the current postion to the end of the field.
Ctrl+y	Erases all characters in the field.
Ctrl+z	Erases inputs in all fields in a window.

Copying an existing report design

In a majority of cases, you must begin your design of a custom report by copying an existing report design and then make changes. Copying and then modifying an existing report design is the quickest and easiest method for designing a custom report.

You can copy standard report designs or custom report designs. You can also copy more than one report design into a single custom report. However, if your report is a historical report, you cannot copy a real-time report onto Screen Painter. Similarly, if your report is a real-time report, you cannot copy a historical report onto Screen Painter.

Note:
Run test design on a report copy before modifying the report to ensure that the report copy functions as designed.

Items in the report that you copy might overlap text, fields, or bars that you previously entered on Screen Painter. If items in the copied report overlap existing items, CMS copies to Screen Painter only those parts of the report that do not overlap.

Important:
To prevent overlapping, clear the area in the upper left portion of Screen Painter before you copy a report design. You can clear the area by moving or deleting all data as a block. Ensure that the cleared space is large enough to contain the report design you are copying. For more information, see Editing a report with blocks on page 45

You cannot copy the following standard reports:

- Historical
  - Split/Skill: Status
  - System: Multi-ACD by Split/Skill (daily, weekly, monthly)
  - System: Multi-ACD Call Flow by VDN
  - Trunk Group: Busy Hour
  - Vector Directory Number (VDN): Busy Hour
  - VDN: Status
- Real-time
  - Multi-ACD
  - Multi-ACD Top Agent

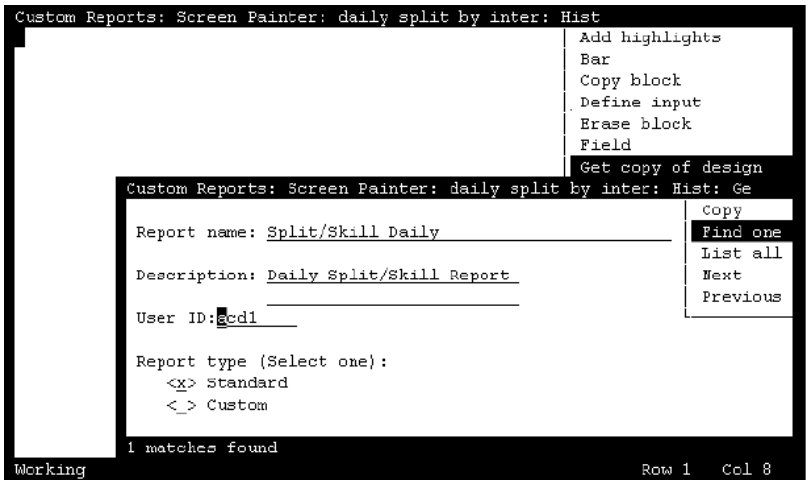
Perform the following tasks to copy an existing report design:

1. Gaining access to the Get Copy window on page 42
2. Entering a report name on page 43
3. Entering a user ID on page 43
4. Selecting a report type on page 44
5. Verifying the report on page 44
6. Copying the report on page 44

Gaining access to the Get Copy window

On Screen Painter, select **Get copy of design** to view the Get Copy window.

Figure 15: Snapshot of the Get Copy window



Entering a report name

In the **Report name** field, type the name of the report that you want to copy.

You can copy standard report designs, global report designs, and private report designs. However, you can copy a private report design of another user only if you are a CMS administrator.

If you do not know the report name, click **List all**. For List all, you can leave the **Report name** field blank, but you must select **Standard** or **Custom** in the **Report type** field. After you click **List all**, you can go back and type the report name.

Note:

Because of the need to shorten names of standard reports for this window, the name you must type in this window does not always match the exact name of a standard report.

Entering a user ID

In the **User ID** field, type a user ID if one of the following is true:

- You are a CMS administrator and you want to copy a private report of another user.
- You want to view the custom reports of a user.

Selecting a report type

In the **Report type** field, select **Standard** or **Custom** for the type of report that you want to copy. If you select an incorrect option, CMS does not find or copy the report that you want to copy.

Verifying the report

Click **Find one** to verify that the report is the one you want to copy.

The system displays the user ID in the **User ID** field and, if a report exists, the system displays the report description in the **Description** field.

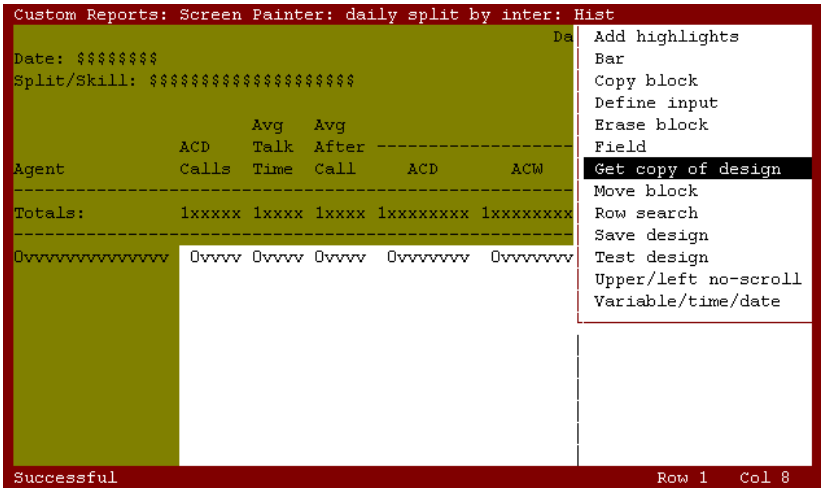
Copying the report

Click **Copy** to copy the design to Screen Painter.

CMS displays the Get Copy window and the report design on Screen Painter, starting in the upper left corner.

To copy another report design, clear the upper-left area by deleting or moving any existing block of text and fields. For more information, see Editing a report with blocks on page 45. Repeat the procedure.

Figure 16: Copy of a report design using Get Copy



Note:
If part of the report that you copy overlaps existing text or fields on Screen Painter, CMS does not copy that part of the report to Screen Painter.

Editing a report with blocks

A block is a rectangular area on Screen Painter that you define and use to rearrange fields and text. You can erase blocks, copy blocks, or move blocks.

You define a block with the cursor by marking two opposite corners of a rectangle. When you define a block, CMS highlights the defined area. A block can contain a single character of text, a single field or bar, several words of text, several fields or bars, a combination of fields or bars and text, or a whole report design.

Note:
If a block includes any part of a field or bar, CMS automatically includes the entire field in the block. You must, therefore, use care when deleting blocks to avoid unintentionally deleting a field or bar.

You can edit a report in blocks using the steps described in the following pages.

Erasing a block

Note:
Prior to completing a block erase, you can press **Ctrl + C** to cancel the erasure.

To erase a block:

1. On Screen Painter, place the cursor over one corner of the block and click **Erase block**.

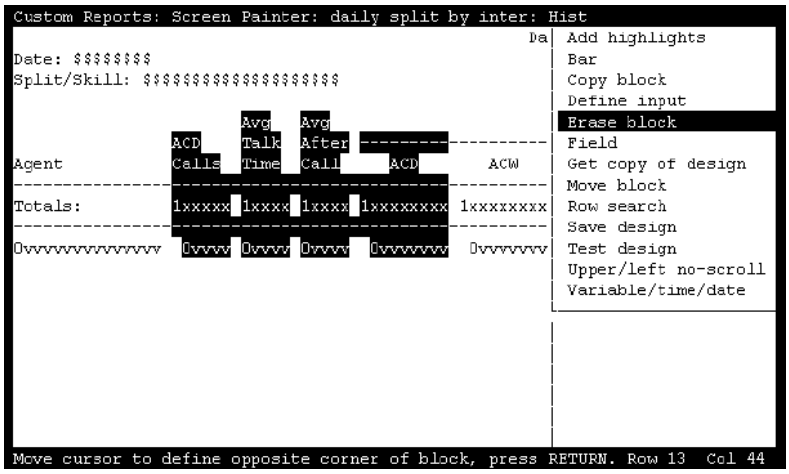
   The cursor returns to the original postion, and the system displays the following message on the status line:

   `Move cursor to define opposite corner of the block, press Return.`

2. Move the cursor to the opposite corner of the block. The block should include all fields and text that you want to erase.

   The following figure shows how the system hightlights the block as you move the cursor.

Figure 17: Selecting a block to erase



We want to erase the middle section of the copied report design. To accomplish that we have scrolled horizontally to the middle section and defined the block we want to erase.

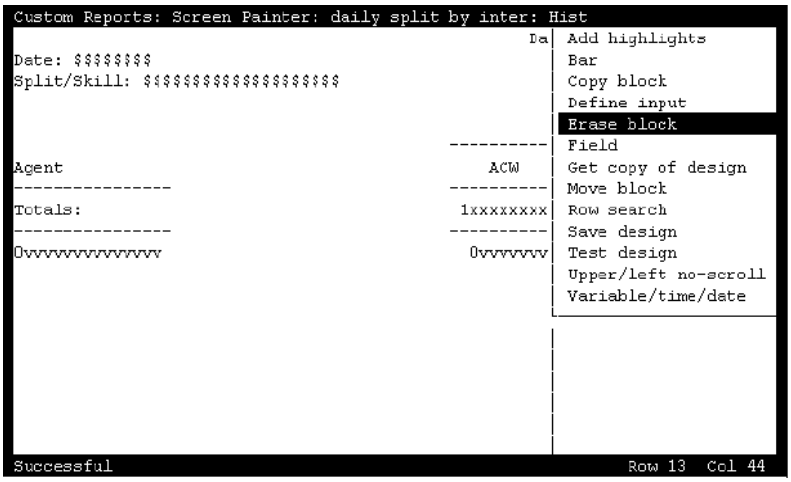
3. Press **Enter**.

   The system displays an acknowledgment window.

4. Type **y**, and press **Enter**.

   The system removes all fields and text within the block as indicated in the following figure.

Figure 18: Erased block



Moving a block

Note:
Prior to completing a block move, you can press **Ctrl + C** to cancel the move.

To move a block:

1. On Screen Painter, place the cursor over on the corner of the block, and click **Move block**.

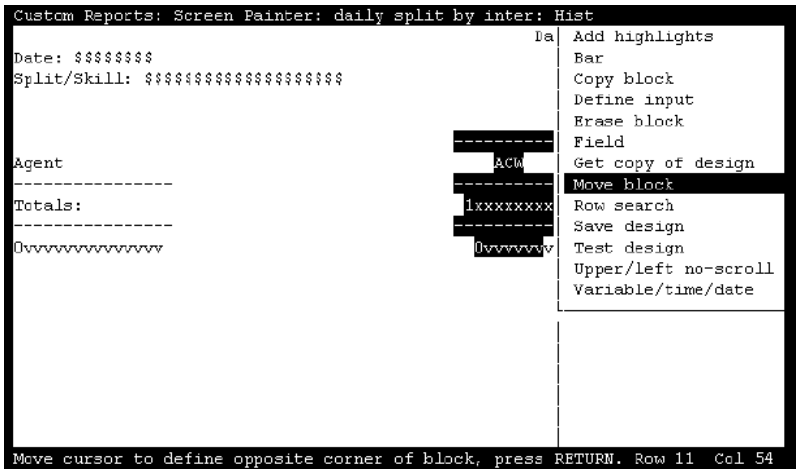
   The cursor returns to the original position, and the system displays the following message on the status line:

   `Move cursor to define opposite corner of block, press RETURN.`

2. Move the cursor to the opposite corner of the block. The block should include all fields and text that you want to move.

   The following figure shows how the system hightlights the block as you move the cursor.

Figure 19: Selecting a block to move



We want to keep the After Call Work (ACW) time column, but we want to move the column to the left next to the other report items that we want to retain.

3. Press **Enter**.

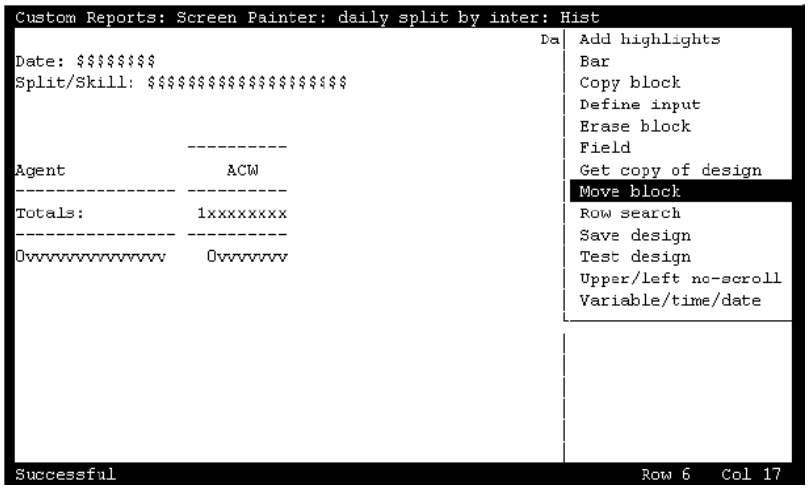
   The system displays the following message on the status line:

   `Move cursor to locate upper left corner of move, press RETURN.`

4. Move the cursor to to a new position for the upper left corner of the block, and press **Enter**.

   The system moves all fields and text within the block to the new location as indicated in the following figure.

Figure 20: Completing a block move



When the block moves to a new location, the text or fields cannot overlap any other text or fields. If you try to move a block to a location where the text or fields will overlap the existing text or fields, the system displays an error message on the status line.

Copying a block

Note:
Prior to completing a block copy, you can press **Ctrl + C** to cancel the copy.

To copy a block:

1. On Screen Painter, place the cursor over one corner of the block, and click **Copy block**.

   The cursor returns to the original postion, and the system displays the following message on the status line:

   `Move cursor to define opposite corner of block, press RETURN.`

2. Move the cursor to the position where you want the opposite corner of the block to be. The block should include all fields and text that you want to copy.

   The system hightlights the block as you move the cursor.

3. Press **Enter**.

   The system displays the following message on the status line:

   `Move cursor to locate upper left corner of copy, press Return.`

4. Move the cursor to the new position for the upper left corner of the block, and press **Enter**.

   The system copies all fields and text within the block to the new location.

When you copy a block, the text or fields cannot overlap any other text or fields. If you try to copy a block to a location where the text or fields overlap the existing text or fields, the system displays an error message on the status line.

Entering report text

You can enter text on Screen Painter to label your fields, type a report title, or include special instructions for the report. You should type text to label each data field so that when you run the report you will know what data the field is showing.

You should type text before defining the data fields for the following reasons:

- The text provides a layout for positioning of data fields.
- The text describes each data field.

To type text, position the cursor where you want the text and type the characters. You can use the space bar to create spaces and to delete text. You can also overwrite existing text with new text.

Note:
You cannot overwrite a data field.

To delete large portions of text, use the **Erase block** action list option. For more information, see Erasing a block on page 45.

Saving your work

To save your work, select **Save design**, and press **Enter**.

If you press **Exit** before you save your work, the system displays the following message:

```
There have been changes made in Screen Painter since the last
SAVE. Do you still want to Exit?
Enter y or Y for yes, n or N for no:_
```

If you enter **n**, the system returns to Screen Painter without saving any changes. If you enter **y**, the system returns to the Report Select window.

Chapter 5: Defining data for custom reports

You have to perform the following tasks to define data for a custom report:

- Defining fields for the Report Input window on page 51.
- Defining report fields on page 62.
- Defining bars in a report on page 78.
- Defining the rows of data for a report on page 86.
- Defining fields to show run time/date and user inputs on page 105.
- Saving the design on page 109.

Defining fields for the Report Input window

Perform the following tasks to define fields for the Report Input window:

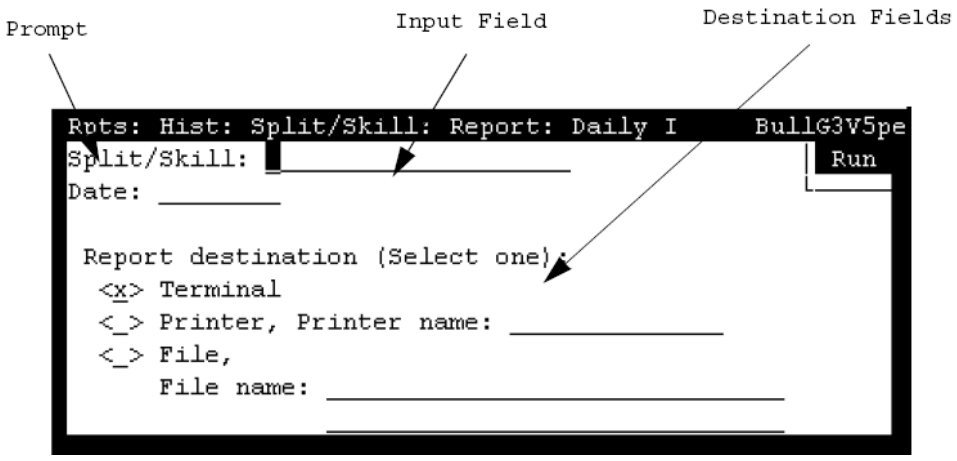
1. Gaining access to the Report Input window on page 52.
2. Gaining access to the Define Input window on page 52.
3. Defining a variable name on page 53.
4. Entering a field prompt on page 54.
5. Defining the number of field columns and rows on page 55.
6. Defining the field as single value or range/list on page 55.
7. Entering a default value for the field on page 55.
8. Selecting a field type on page 56.
9. Associating an ACD with the variable field on page 60.
10. Saving a variable input field on page 60.

Gaining access to the Report Input window

To run a standard CMS report, you must gain access to the Report Input window. You can use the window to determine what data to include in the report. For example, you can include data about splits or skills, trunk, dates, and intrahour intervals.

The following figure shows a sample Report Input window.

Figure 21: Sample of the Report Input window



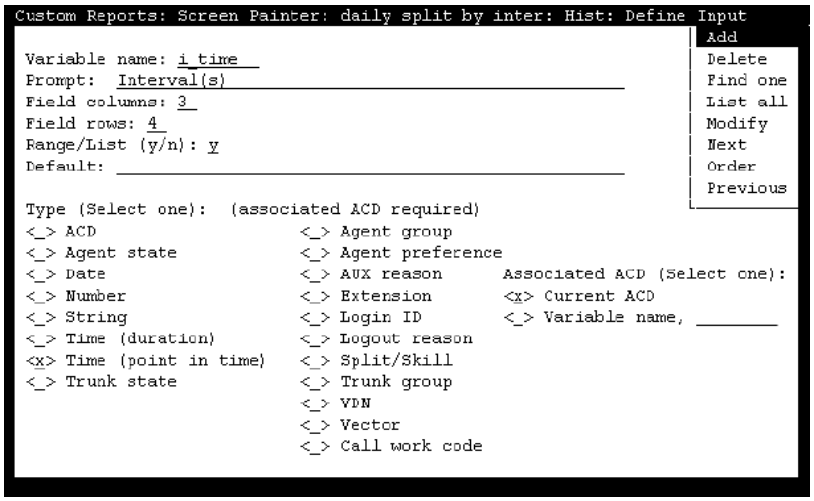
Gaining access to the Define Input window

You must use the Define Input window to define report input fields. Click **Define input** on Screen Painter to gain access to the Define Input window.

You must complete a Define Input window for each input field. On finishing, you create a Report Input window. When you or another user prepares to run your custom report, the system displays the Define Input window with the field prompts and the input fields that you defined.

The following figure shows a sample Define Input window.

Figure 22: Sample of the Define Input window



Defining a variable name

Type a name of up to eight alphanumeric characters in the **Variable name** field on the Define Input window. You must use this exact variable name again in the Row Search window when you define the row search conditions.

For more information, see Defining the rows of data for a report on page 86.

The variable name links the fields in the Report Input window to the row search conditions. With this link, CMS uses the values a user enters when running the report to search the database for report data.

If you copy a report using **Get Copy**, the input fields and row search conditions are also copied. Before entering any variable names, you can click **List all** to view the report input fields that are already defined and the variable names. If you then add, delete, or change a variable name for a report input field, you must also add, delete, or change that variable name in the row search conditions.

You cannot click **List all** or **Find one** in the Define Input window by searching multiple fields. For a **Find one** search, CMS uses only the entry in the **Variable name** field. CMS ignores the other fields. For a **List all** search, CMS ignores all fields.

The following figure shows an example of how the report input fields are linked to the search conditions.

Figure 23: Linking input fields and row search

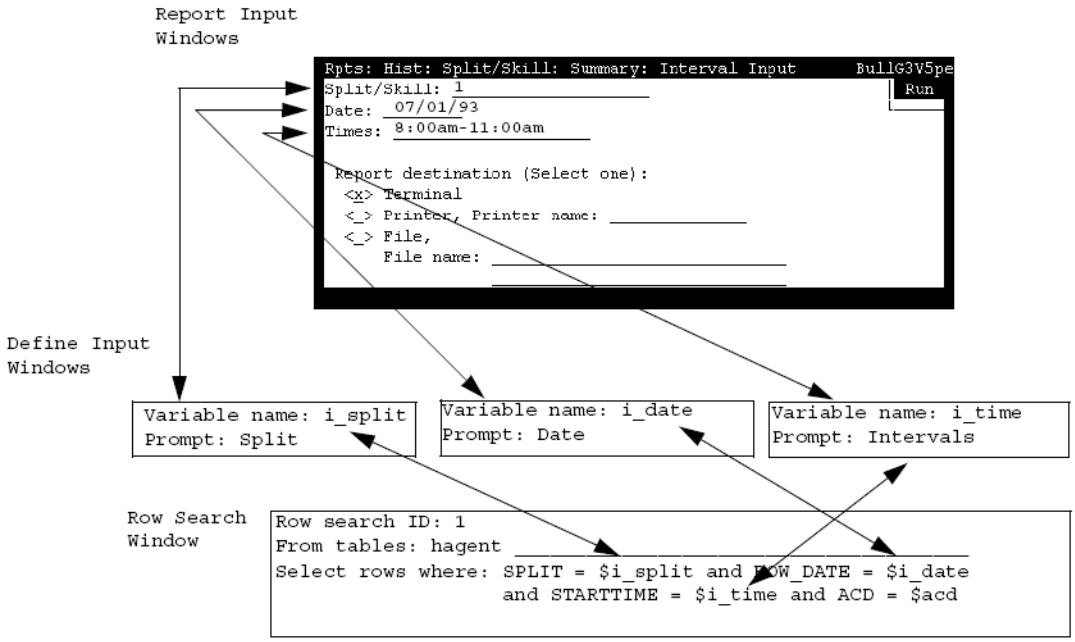


Figure notes:

1. The user enters a split/skill number of 1, a date of 07/01/93, and intrahour intervals from 8:00 a.m. to 11:00 a.m.
2. CMS identifies the split/skill number 1 as the value for the variable *name i_split*, 07/01/93 as the value for the variable name *i_date*, and 8:00 a.m. to 11:00 a.m. as the values for the variable name *i_time*.
3. CMS searches the specified database items, that is, SPLIT, ROW_DATE, and STARTTIME, in the Intrahour Agent, that is, the hagent table for rows that have the values.
4. CMS extracts data from the rows and displays the data in the fields of the report.

Entering a field prompt

In the **Prompt** field on the Define Input window, type a name of up to 50 characters to be displayed next to the input field on the Report Input window. For fields on the Define Input window, see Figure 22: Sample of the Define Input window on page 53.

As you can use blanks, your prompt can be more than one word.

The name in the **Prompt** field should describe the data such as split or skill, date, time, and email that a user must enter in the field when ordering the report. For example, if you want the user to enter a date, *Date* would be an appropriate prompt. However, if the user can enter more than one date in the field, *Dates* would be an appropriate prompt.

Defining the number of field columns and rows

The product of the numbers that you enter in the **Field columns** and **Field rows** fields on the Define Input window determine the size of the input field. For fields on the Define Input window, see Figure 22: Sample of the Define Input window on page 53.

The maximum product of the two numbers that you enter cannot exceed 50. If a user orders the report with names, for example, split names, instead of numbers, ensure that the field is large enough for the user to enter the complete name (up to 20 characters). If the user can enter a range of values, ensure that the field is large enough for any range that the user might possibly enter.

Defining the field as single value or range/list

In the **Range/List** field of the Define Input window, type **y** to allow the user to enter a range or list of values in the input field. For fields on the Define Input window, see Figure 22: Sample of the Define Input window on page 53.

If you type **n**, the user can enter only one value in the input field when ordering the report. For example, to define a *Date* input field so that the report displays data for only one day, type **n**. To define a *Times* or *Intervals* input field so that the report displays data for multiple intrahour intervals in a day, type **y**.

Note:
If you specify a range/list for a variable name in the Define Input window, then in the Row Search window you must use the equals (=) sign in the “where” clause for that variable name. For more information, see Defining the rows of data for a report on page 86.

Entering a default value for the field

Assign a value of up to 50 characters in the **Default** field on the Define Input window. For fields on the Define Input window, see Figure 22: Sample of the Define Input window on page 53.

The system displays the default value in the input field when the user gains access to the Report Input window. The user can then choose to overwrite the default value with another value or order the report with this value.

You can leave the **Default** field blank so that the input field is blank when the user gains access to the Report Input window.

Selecting a field type

To select an item in the **Type** field on the Define Input window, type **x**. For fields on the Define Input window, see Figure 22: Sample of the Define Input window on page 53.

The field type tells CMS what kind of values the user enters in the field.

The following table lists the field types.

Table 4: Types of input fields

Field type	User action
ACD	The user enters an ACD number or name as defined in the Dictionary subsystem.
Agent group	The user enters an agent group name as defined in the Dictionary subsystem.
Agent state	The user enters the name of an agent work state. The name can be standard or new based on the definition in the Dictionary susbsystem. Standard names include work modes, such as ACD, Auxiliary (AUX), and After Call Work (ACW).
Agent preference	The user enters the number or name of the call handling preference.
AUX reason	The user enters a number or name of an AUX reason code as defined in the Dictionary subsystem.
Call Work Code (CWC)	The user enters a number or name of a CWC. Up to six work codes might exist. For more information, see *Avaya Call Management System Database Items and Calculations*.
Date	The user enters a date in mm/dd/yy format or as a relative number. For example, -7 for 7 days ago.

Table 4: Types of input fields

Field type	User action
Extension	The user enters an extension number of one to five digits as administered for System 75/ Generic 1/Generic 3 or three to five digits as administered for System 85/Generic 2.
Login ID	The user enters a login ID of one to nine digits as administered for System 75/Generic 1/Generic 3 or four digits as administered for System 85/Generic 2.
Logout reason	The user enters a number or name as administered in the Dictionary subsystem for a logout reason code.
Number	The user enters a number, which might include digits to the right of the decimal point. This field type is applicable if the variable field requires a value for ACD performance. For example, the number of ACD calls or the percent of calls within the administered service level.
Split/Skill	The user enters a number or name for a split or skill.
String	The user enters a character string. You can select this field type if one of the following is true: • The variable field is linked to a custom database item that you identify in INFORMIX as a CHAR column. • The variable field is linked to a standard database item that is a CHAR column, and you want to allow the user to perform pattern searching when the users runs a report. For more information, see Input fields that allow pattern searching on page 59.

Table 4: Types of input fields

Field type	User action
Time (duration)	The user enters the number of seconds, including decimals. This field type is applicable if the variable field requires values for ACD performance. For example, time in AUX work, Average Speed of Answer (ASA), or Average Handling Time (AHT).
Time (point in time)	The user enters the time of day in hh:mm format in a 24-hour format or with am or pm appended.
Trunk group	The user enters the number or name of a trunk group.
Trunk state	The user enters the name of the trunk state, that is, the standard name or new name as administered in the Dictionary subsystem. Standard names data such as IDLE, SEIZED, or QUEUED.
Vector Directory Number (VDN)	The user enters a VDN of one to five digits as administered on System 75/Generic 1/Generic 3 or three to five digits as administered on System 85/Generic 2.
Vector	The user enters the number or name of a vector.

Note:

With the **Number** field type, users can type any number. With the **String** field type, users can type any number, letter of the alphabet, or keyboard symbol in any format.

The field type does not determine what database items the variable represents.The database items linked to the variable are specified in the Row Search window.

If you specify a String or Number field type, CMS does not accept any names for VDNs, splits or skills, or login IDs that are defined in the Dictionary subsystem. CMS does not check permissions or system limits.

Input fields that allow pattern searching

CMS can search values in certain database items according to wildcard search patterns. As a result, you can create a custom report that allows report inputs based on character strings, plus either an asterisk (*) sign that matches zero (0) or more occurrences of any character or a question mark (?) that matches any character. CMS then includes data for all items that match the character strings that the user entered.

The standard database items that allow pattern searching are as follows:

- CWC, that is, the value is a Call Work Code.
- EQLOC, that is, the value is the location number of a 9-digit trunk.
- EXTENSION, that is, the value is an extension number.
- LOGID, that is, the value is a login ID.
- ROW_DATE, that is, the value is a date.
- VDN, that is, the value is a Vector Directory Number.

In addition, any custom database items that you define as CHAR columns in INFORMIX also allow pattern searching.

An example of matching with an asterisk (*) sign: If an input field is a String field type and is associated with the LOGID database item, the user can enter 1*. CMS includes data for all agents with login IDs that start with 1, for example, 1, 10, 1238, or 190, based on the login length that you administer on the switch.

An example of matching with a question mark (?): If an input field is a String field type and is associated with the VDN database item, the user can enter 21?0. CMS includes data for all VDNs that start with 21, end with 0, and have any single character displayed between 21 and 0. For example, 2100, 2110, 2120, or 2130.

Note:

If you select String for an input field, CMS does not check the user input in that field for appropriate read permissions or valid switch parameters. If you want CMS to check permissions for a VDN input field, you must select the VDN field type. If you want CMS to check the switch parameters for a VDN, login ID, extension, or Call Work Code (CWC) input field, you must select that field type, not the String field type. If you select String for a field, the user cannot enter Dictionary names. Therefore, to allow the user to enter VDN, login ID, or CWC names to run a report, you must select that specific field type, not the String field type.

Associating an ACD with the variable field

In the **Associated ACD** field on the Define Input window, type **x** to associate the variable field with the current ACD or a user-selected ACD. For fields on the Define Input window, see Figure 22: Sample of the Define Input window on page 53.

You must select an associated ACD if the input field you define is a type listed under the heading (associated ACD required). These field types require an associated ACD because they are administered for each ACD. For field types that are not administered for each ACD, CMS ignores any selection of an associated ACD.

Select **Current ACD** if one of the following conditions is true:

- You have only one ACD.
- You want the report to always display data for the current ACD.

Select **Variable name** so that the user can select the ACD. If you select **Variable name**, you must type a name of up to eight characters in the field next to the **Variable name** field on the Define Input window.

Using a variable name for the associated ACD is most useful when you are creating a multi-ACD report.

Note:
Select **Variable name** only if the users who run the report have read permission for more than one ACD. You can create such a report without knowing if the user has read permission for more than one ACD. If you do, and the user does not have read permission, the user cannot view the report.

Before you can select **Variable name** for an input field's associated ACD, you must define a separate report input field for the ACD number or name. This field must have:

- An assigned field type of **ACD**.
- The same variable name that you assign to the associated ACD.

Saving a variable input field

Click **Add** to save the definition of the variable input field.

Note:
Add saves newly defined input fields. If you have previously saved an input field definition and you are changing the definition, you must click **Modify**.

To define more input fields, press **CTRL + z** to clear the Define Input window, and repeat the procedure from Gaining access to the Define Input window on page 52.

If you define a real-time report, do not define the **Refresh Rate in Seconds** input field. CMS automatically puts this field in the Report Input window.

If you define a historical report, do not define the **Report Destination** input field. CMS automatically puts this field in the Report Input window.

Defining the order of display of input fields

CMS displays the input fields on the Report Input window in the order in which you define the fields. You can change the order of display.

Perform the following tasks to change the order in which CMS displays the input fields:

1. Click **Order** after you define and save the input fields.

   The system displays the Define Input: Order window. The following figure shows the prompts for each input field.

Figure 24: Sample of the Define Input: Order window

2. Type **1** next to the prompt that you want CMS to display as the first prompt on the Report Input window. Assign the order of display for the other prompts.
3. Click **Modify** to save the display order.

   The system closes the Define Input: Order window and returns the cursor to the previous position on the Define Input window.

Changing report input fields

To change the report input field:

1. On Screen Painter, click **Define input** to view the Define Input window.
2. Type a name in the **Variable name** field and click **Find one** to view the characteristics of the variable name.

Before entering any variable names, you can click **List all** to view the report input fields that you have already defined. If you copied an existing report design, report input fields defined for that report are also copied and available in the Define Input window.

Note:
You cannot click **List all** or perform a **Find one** search on multiple fields in the Define Input window. For a **Find one** search, you can type only in the **Variable name** field as the system ignores the other fields. For a **List all** search, the system ignores all the fields.

3. Change data in any field other than the **Variable name** field, and click **Modify**.

   The system displays successful on the status line.

Note:
To change a variable name, you must delete the variable and add a new variable.

Defining report fields

A report consists of data fields. Defining each field is the central task of creating a custom report.

To define a field, specify the data, position, length, and size of data.

Screen Painter window legend

If you copy the design of an existing report, the fields on Screen Painter are displayed filled with x's, v's, or h's.

x’s indicates that the field is discrete, that is, the field is displayed as a single field in the report because, based on the row search conditions assigned to the field, CMS finds only one value.

v’s indicate that the field is repeated vertically in the report, that is, the field is displayed as a column of fields because, based on the row search conditions assigned to the field, CMS finds multiple values.

h’s indicate that the field is repeated horizontally in the report, that is, the field is displayed as a row of fields because, based on the row search conditions assigned to the field, CMS finds multiple values.

For more information, see Assigning a row search ID to report fields and bars on page 100.

Perform the following tasks to define report fields:

1. Defining the position and length of a field on page 63.
2. Defining data expressions of a field on page 63.
3. Defining tables for calculation names on page 71.

4. Aligning data in a field on page 71.
5. Defining the format of a field on page 71.
6. Saving the definition of a field on page 77.

Defining the position and length of a field

To define the position and length of a field:

1. On Screen Painter, position the cursor where you want a field to begin, and select **Field**.

   The cursor returns to the original position, and the system displays the following message:

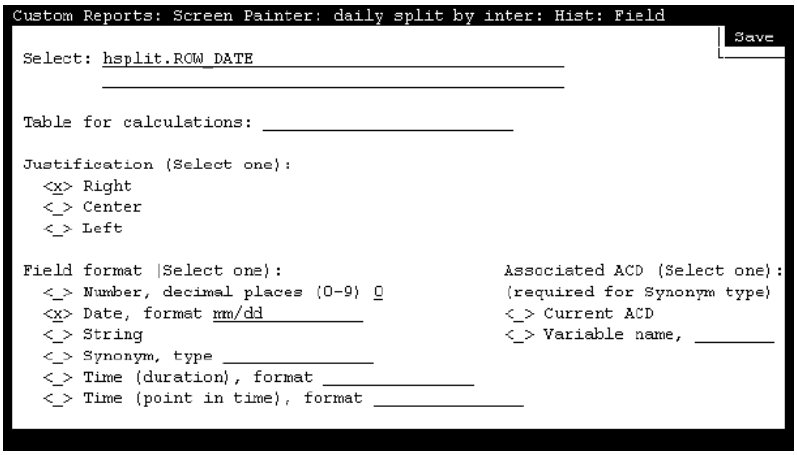
   `Move cursor to define opposite corner of field and press RETURN.`

2. Move the cursor using the arrow keys to define a field length, and press **Enter**. Ensure that the field is long enough to contain data. If the field is too short for a value, the report shows an asterisk (*) sign in the field or, if the data is a word, the report cuts the letters off.

   The system displays the field as a question mark (?) followed by x's. The question mark indicates that you have not yet assigned a Row Search ID to the field.

   The following figure shows the **Field** window.

Figure 25: Sample of the Field window



Defining data expressions of a field

In the **Select** field on the Field window, enter a data expression that enables CMS to:

- Associate data in a table column with the field.

- Customize data.

CMS selects values from a table with row and column identifiers. CMS identifies rows of data based on user input and the row search conditions that you define. For more information, see Defining the rows of data for a report on page 86. CMS identifies table columns based on the data expression that you define for a field.

You can enter the following types of data expressions:

- Aggregate functions on page 64
- Calculations on page 66
- Calculation names on page 67
- Count on page 69
- Data from more than one table on page 69
- Database items on page 70

Aggregate functions

An aggregate function is a prefix attached to a database item, a calculation, parts of a calculation, or a calculation name.

When you define an aggregate function, you must place the database item or calculation in parentheses. For example:

```
max(dsplit.ACDTIME/dsplit.ACDCALLS)
```

Note:
In real-time reports, fields with aggregate functions cannot share a set of row search conditions with non-aggregate fields. For historical reports, special considerations exist when you assign the same row search conditions to aggregate functions and other types of data expressions. For more information, see Repeating aggregate function values on page 159.

An aggregate function can be one of four types. Each type retrieves a different value from the data.

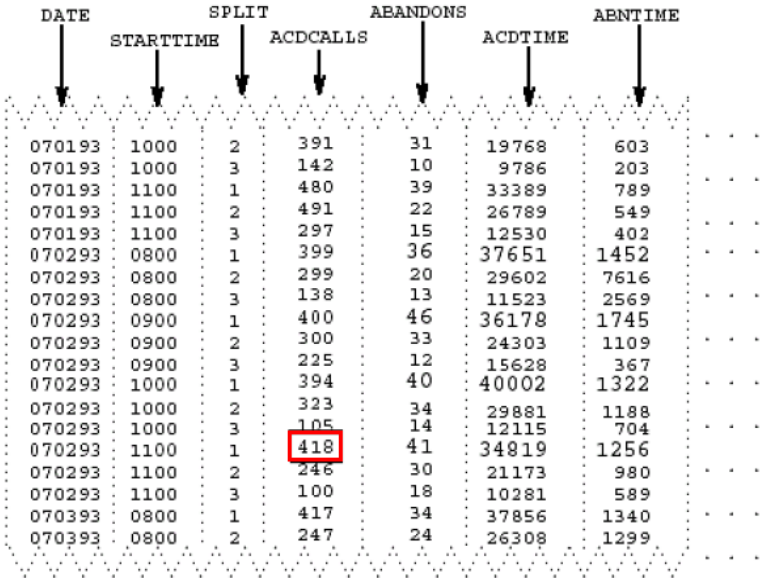
max

The max aggregate function retrieves the highest value for a calculation or database item over the time frame of the report.

For example, if the Intrahour Split table contains data as shown in the following figure, and you enter max(hsplit.ACDCALLS) for a field in a report and run the report for Split 1 for all intervals on 07/02/93, CMS finds all rows as shown in the figure.

However, CMS displays only the value 418 as highlighted in the box, which is the maximum ACD calls in any single interval on 07/02/93. Similarly, if you enter max(ACDTIME/ACDCALLS) for the field, CMS displays the value 101.53, which is the highest average talk time in any single interval on 07/02/93.

Figure 26: Max aggregate function sample



min

The min aggregate function retrieves the lowest value for a calculation or database item over the time frame of the report.

Following the example for max aggregate function, if you enter min(hsplit.ACDCALLS) instead of max(hsplit.ACDCALLS) and run the report for Split 1 for all intervals on 07/02/93, CMS displays only the value 394, which is the smallest number of ACD calls in any single interval on 07/02/93.

sum

The sum aggregate function retrieves the sum of all values for a calculation or database item over the time frame of the report.

For example, if the Intrahour Split table contains data as shown in Figure 26: Max aggregate function sample on page 65, and you enter sum(hsplit.ACDCALLS) for a field in a report, then for Split 1 and all intervals on 07/02/93, CMS takes the values for hsplit.ACDCALLS and adds the values to display only the value 1611. Similarly, if you enter sum(hsplit.ABANDONED+hsplit.ACDCALLS) for the field, CMS displays only the value 1774, which is the total of all ACD calls and abandons for Split 1 on 07/02/93.

avg

The avg aggregate function retrieves the average of all values found over the time frame of the report.

Following the example in Figure 26: Max aggregate function sample on page 65, if you enter avg(ACDCALLS) for a field and run the report for Split 1 for all intervals on 07/02/95, CMS displays the value 402.75, which is the average of 399, 400, 394, and 418.

Calculations

A calculation is a combination of database items and arithmetic operators. You can also include constants in a calculation.

You can use the following arithmetic operators:

Table 5: Arithmetic operators

Symbol	Operation
+	Addition
-	Subtraction
*	Multiplication
/	Division
()	Parentheses. Perform these operations first.

Some examples of calculations are as follows:

```
dsplit.ACDCALLS/dsplit.ACDTIME

hagent.AUXOUTTIME+hagent.ACWOUTTIME

100*((cagent.I_ACDTIME+cagent.I_ACWTIME)/cagent.I_STAFFTIME)
```

Arithmetic operations are generally performed in order from left to right. However, multiplication and division operations are performed before addition and subtraction operations, unless the addition or subtraction operations are enclosed in parentheses.

Operations in parentheses are always performed first. If more than one set of parentheses is used, the operation in the set farthest to the left is performed first. If one set of parentheses is inside of another set, the operation of the inner set is performed first.

Calculation names

A calculation name is a name that can substitute for the actual calculation. The calculation name can be a standard name that is used in standard reports or a name that you define. You cannot append a table name to a calculation name. You must specify a table name in the **Table for calculations** field on the Field window.

Note:
CMS differentiates between uppercase and lowercase letters in calculation names. Therefore, ensure that you enter the calculation name exactly as the name is in the Dictionary subsystem.

A calculation name reflects the purpose of the calculation. As a result, typing a name is an easier and more meaningful way to define data for a report field. More importantly, if you use a calculation name in many custom reports and later decide to change the calculation, you can make your changes once in the Dictionary subsystem. CMS applies the changes to every report that uses the calculation name.

For example, if you use the standard calculation name <PERCENT_ACD_TIME>, which represents the calculation 100*((I_ACDTIME+I_ACWTIME)/I_STAFFTIME), but do not want to include the ACWTIME in the calculation, you can change the calculation in the Dictionary subsystem so that <PERCENT_ACD_TIME> represents 100*(I_ACDTIME/I_STAFFTIME). Then, any report that uses the calculation name PERCENT_ACD_TIME reflects the new calculation.

Important:
Changing the calculation for a standard calculation name affects standard and custom reports that use the calculation name.

At times, using calculation names helps save space in the **Select** field so you can create more complex calculations. For example, if you wanted to know the average time agents spent on all extension calls (both incoming and outgoing), you might have to add the following calculation:

```
(csplit.ACWINTIME + csplit.AUXINTIME + csplit. ACWOUTTIME +
  csplit.AUXOUTTIME) / (csplit.ACWINCALLS + csplit.AUXINCALLS +
  csplit.ACWOUTCALLS + csplit.AUXOUTCALLS)
```

Unfortunately, the **Select** field is not long enough to enter the complete calculation. However, you could define in the Dictionary subsystem two separate calculation names for each half of the calculation.

For:

```
(csplit.ACWINTIME + csplit.AUXINTIME + csplit.ACWOUTTIME +
  csplit.AUXOUTTIME),
```

you can enter the following calculation name in the Dictionary subsystem:

```
TIME_ON_NON-ACD_SUM with the assigned calculation (ACWINTIME +
  AUXINTIME + ACWOUTTIME + AUXOUTTIME).
```

Similarly, for:

```
csplit.ACWINCALLS + csplit.AUXINCALLS + csplit.ACWOUTCALLS +
  csplit.AUXOUTCALLS),
```

you could enter the calculation name:

```
NON-ACD_CALLS_SUM with the assigned calculation (ACWINCALLS +
  AUXINCALLS + ACWOUTCALLS + AUXOUTCALLS).
```

As a result, you can enter the following calculation in the **Select** field:

```
TIME_ON_NON-ACD_SUM/NON-ACD_CALLS_SUM
```

Then, you can enter the table name csplit in the **Table for calculation** field.

Important:
You should not add table names to your custom calculations in the Dictionary subsystem. Doing so makes the assigned calculation name less flexible for use in custom reports. Also, if you append table names to the Dictionary calculation and then also assign a table name to the calculation name in the Field window, the report fails.

Constants

A constant is the name of a fixed numerical value, that is, whole number or decimal, that you define in the Dictionary subsystem. Constant names can be up to 20 characters long.

A constant can represent a per-minute usage rate for trunks, a daily or hourly wage rate, or a service objective, such as number of abandons, number of ACD calls, or percent within service level.

A constant can also represent an average for the estimated dollar loss of an abandoned call, which can be used to calculate daily loss of revenue because of abandoned calls. No standard constants exist in CMS when CMS is installed. Therefore, you must define every constant that you want to use.

Using constants makes sense only if you have a fixed value that you want to use under one or both of the following conditions:

- The constant is a value that you use in a number of different custom reports. For example, an average wage rate.
- You cannot remember the numerical value, but remember a name assigned to the value. For example, for the $9.00 hourly wage rate for an agent called Smith, you have a constant called Smithwage.

Note:
The CMS real-time database allows only whole numbers in queries. If you need a value to be a decimal, for example, 9.5, use whole numbers and division to arrive at the correct number. To have 9.5 in a query, you can use 19/2 as the query entry.

Count

The count (*) expression tells CMS to count the number of rows in a table that match certain row search conditions as defined in the Row Search window.

For example, if you want the number of agents in a split that had more than five extension-out calls, the Row Search window would have a row search statement as follows:

```
Select rows where: SPLIT = 1 and (ACWOUTCALLS+AUXOUTCALLS) > 5
```

The statement means that CMS must find rows of data where the SPLIT value is 1 and the total extensionout calls for After Call Work (ACW) and Auxiliary (AUX) work mode are greater than 5.

If you enter count (*) in the **Select** field, the report field counts the number of matching rows and displays that number in the report.

Do not append a table name to the beginning of count(*).

The count (*) expression is always the number of matching rows and is used to track specific measures of performance by ACD elements, for example:

- The number of agents currently logged in to a split.
- The number of trunks that were occupied for more than 80% of the time.
- The number of VDNs that had over 30 abandoned calls in an intrahour interval.

With count (*), you can create fields that act as exception counts.

Data from more than one table

A calculation can merge data from more than one table in a report field.

For example, you might want the percentage of ACD calls that an agent handled for a split in a day. Thus, you can enter a calculation that merges data from the Daily Agent and Daily Split tables, as in the following example.

```
dagent.ACDCALLS/dsplit.ACDCALLS
```

When you merge data from two tables, you must define your row search conditions in a special way. For more information, see Selecting rows from more than one table on page 152.

Note:
You cannot use calculation names for a field in which you merge data from two tables, and you cannot merge data in real-time reports.

Database items

A database item is the name of a column of data in a table, either standard or custom.

When you enter a database item, you must always add the name of a table and a period (.) as a prefix. The format is as follows:

```
<table name>.<database item>
```

For example:

```
dsplit.ACDCALLS

hagent.STARTTIME

ctkgrp.NUMINUSE
```

Standard database items

Standard database items are listed in the Dictionary subsystem as having all upper-case letters as indicated in the examples.

A standard database item can store:

- Identifiers such as SPLIT, VDN, or LOGID
- Timed data such as ACDTIME, ABNTIME, or AUXOUTIME
- Event counts such as ACDCALLS, INTERFLOWCALLS, or ABNCALLS
- Current state data such as WORKMODE, DURATION, or NUMINUSE for real-time and agent trace reports

For a description of database tables and items including the exceptions, forecast, and login/logout tables, see *Avaya Call Management System Database Items and Calculations*.

For information about custom reports that include exceptions and forecase data, see Advanced report design on page 131.

Standard database items are often shared by more than one table. For example, ABNCALLS can identify a column in the Current Interval Split, Daily Split, or Intrahour Agent tables or many other tables.

Note:
CMS can determine the exact database item only when the item is identified with a table.

Custom database items

You must enter a custom database item with the custom table name as a prefix, exactly as you defined it in the Dictionary subsystem. The data identified by a custom database item depends entirely on the data you enter for the item in the custom table.

For more information, see Advanced report design on page 131.

Defining tables for calculation names

Enter a table name in the **Table for calculations** field on the Field window if you entered a calculation name in the **Select** field. The table name tells CMS in what table to look for the database items in the calculation.

Note:
The **Table for calculations** field is necessary because you cannot append a table name to a calculation name in the **Select** field.

For example, look at the following entries:

```
Select: AVG_POS_STAFF

Table for calculation: hsplit
```

These entries mean that CMS must take the calculation defined in the Dictionary subsystem for <AVG_POS_STAFF>, which is I_STAFFTIME/(INTERVAL*60), and apply the hsplit table name to the database items. In effect, the two fields make the calculation

```
hsplit.I_STAFFTIME/(hsplit.INTERVAL*60)
```

Aligning data in a field

Select, from the **Justification** list on the Field window, how you want CMS to line up data when CMS displays data in the field. For fields on the Field window, see Figure 25: Sample of the Field window on page 63.

Normally, numerical data is right-justified so that the right hand side lines up in a column. Names are left-justified so that the first character of each name is lined up. However, you can choose any of the three options for any type of data.

Defining the format of a field

In the **Field format** list on the Field window, type **x** to select an item. You must also complete the field associated with the list item.

For fields on the Field window, see Figure 25: Sample of the Field window on page 63.

The format type and the format that you specify in the associated field tells CMS how to display the values that CMS finds for the field. However, the format that you select depends on the type of data that CMS displays.

The format options are as follows:

- Date on page 72
- Number on page 72

- String on page 73
- Synonym on page 73
- Time (duration) on page 74
- Time (point in time) on page 76

Date

Select **Date, format mm/dd** on the Field window if the field expression is ROW_DATE. For fields on the Field window, see Figure 25: Sample of the Field window on page 63.

You must also specify a date format with appropriate punctuation. You can select a single format or a combination of formats.

The available formats are as follows:

- mm = Numerical month, for example, 12 for December
- MMM = Month represented by three letters, for example, APR for April
- yy = Year as two digits, for example, 94
- YYYY = Year as four digits, for example, 1994
- dd = Numerical day of the month, for example, 31
- jjj = Day of the year in the Julian calendar, for example, 151 for May 31
- www = Day of the week as three letters, for example, THU

Number

Select **Number, decimal places (0-9)** on the Field window if the field will display a number of events, an average, or a percentage. For fields on the Field window, see Figure 25: Sample of the Field window on page 63.

You must also specify a number of decimal places for the field. Type **0** if you do not need decimal places to be displayed. If the field expression is ACDCALLS, select **Number, decimal places (0-9)** and type **0** in the field. However, if the field expression generates an average, such as the average staffed positions per interval,

```
I_STAFFTIME/(INTERVAL*60),
```

you can include decimal places.

When you run the report, the decimal point and the decimal places use spaces in the field. For example, if the field contains six spaces and you specify three decimal places for the field, then data is displayed with two characters to the left and three characters to the right of the decimal point (for example, 12.344).

String

Select **String** on the Field window for those database items whose data CMS identifies as character strings, not numbers. For fields on the Field window, see Figure 25: Sample of the Field window on page 63.

Each item is identified as being a CHAR column type in INFORMIX terminology. Although these items store numbers, CMS searches for values as if the items stored nonnumeric symbols and alphabetic words, as well as numbers.

Database items for which you might select **String** are as follows:

- Custom database items with the CHAR column type
- CWC, that is, the value is a Call Work Code
- EQLOC, that is, the value is a 9-digit trunk location number
- EXTENSION, that is, the value is an extension number
- LOGID, that is, the value is an agent login ID
- VDN, that is, the value is a Vector Directory Number

String, as used here, does not have the same meaning as string-value database item, as defined for the Dictionary subsystem. For the purposes of custom report design, Dictionary names for string-value database items are referred to as Synonyms, and include names for agents, splits, VDNs, trunk groups, and vectors. In fact, for the VDN and LOGID database items, you may want to select Synonym, not String, since you may have assigned names to VDNs and login IDs in the Dictionary subsystem.

Synonym

Select **Synonym, type** on the Field window to display a name defined in the Dictionary subsystem, instead of the value stored in the database tables. For fields on the Field window, see Figure 25: Sample of the Field window on page 63.

You must also enter the Dictionary name type. For more information, see *Avaya Call Management System Administration*.

The type must correspond to the database item that you enter in the **Select** field. The types you enter are as follows.

Table 6: Synonym type and corresponding database item

Report field	Synonym type	Database item
ACD entities	acd agname tkgrp split vdn vector aux_rsn logout_rsn cwc	ACD LOGID TKGRP SPLIT VDN VECTOR AUXREASON LOGOUTREASON CWC
Agent states	workmode ag_orig ag_dir ag_dest ag_pref	WORKMODE ORGIN DIRECTION DESTINATION PREFERENCE
Trunk states	tkstate tk_pri tk_qtype tk_vpri tk_dir all_busy	TKSTATE PRIORITY QUETYPE PRIORITY DIRECTION ALLINUSE
Split states	slvl_chg per_chg	SVCLEVELCHG PERIODCHG

Time (duration)

Select **Time (duration), format** on the Field window if the field expression will display a length of time. Assign a time format with the appropriate punctuation. For fields on the Field window, see Figure 25: Sample of the Field window on page 63.

Durations, for example, ACDTIME, is stored as the number of seconds. However, you can choose to display time as minutes and seconds, or even hours, minutes, and seconds.

The time formats available are as follows.

Table 7: Time (duration) format

Format	Description
ss	Displays time as the number of seconds. Type as many **s**'s as needed to display the seconds. If the number of seconds can reach six digits, type **ssssss**.
mm	Displays time as the number of minutes. Type as many **m**'s as needed to display the minutes. If the number of minutes can reach six digits, type **mmmmmm**.
hh	Displays time as the number of hours. Type as many **h**'s as there are digits needed to display the hours. If the number of hours can reach three digits, type **hhh**.
mm:ss	Displays time as minutes and seconds. The minutes count is increased by one and the seconds count is reset to 00 when the seconds count reaches 60. Specify more than two digits for minutes if the minutes will exceed 99. For example, if you type **mmmm:ss**, 2822:35 (2822 minutes and 35 seconds) might display in the report.

Table 7: Time (duration) format

Format	Description
hh:mm	Displays time as hours and minutes. The hours count is increased by one and the minutes count is reset to 00 when the count reaches 60. Specify more than two digits for hours if hours will exceed 99. For example, if you type **hhh:mm**, up to 999:59 can display in the report.
hh:mm:ss	Displays time as hours, minutes, and seconds. The minutes count is increased by one when the seconds count reaches 60. The hours count increases by one when the minutes count reaches 60. With this format, you can increase the digits for hours if necessary, but **not** the minutes digits.

Time (point in time)

Select **Time (point in time), format** on the Field window if the field expression will display a point in time, for example, 10:34 a.m. Assign a time format with the appropriate punctuation.

For fields on the Field window, see Figure 25: Sample of the Field window on page 63.

You can use one of the following formats.

Table 8: Time (point in time) format

Format	Description
HH	The hour only, in military time (24-hour clock). For example, 15 equals 3:00 p.m.
hh	The hour only, according to a 12-hour clock. For example, 3 could mean 3:00 a.m. or 3:00 p.m. For this reason, if you use hh, you should add am (hham).
mm	The number of minutes after the hour only.
ss	The number of seconds in the minute.
HH:mm:ss or HH:mm	24-hour clock time up to the second or to the minute.
hh:mm:ssam or hh:mmam	12-hour clock time, with AM or PM attached, up to the second or the minute.

Saving the definition of a field

Click **Save** on the Field window. For fields on the Field window, see Figure 25: Sample of the Field window on page 63.

The Field window closes, and the system displays Successful on the status line of Screen Painter to indicate that the field definition has been added.

To define additional fields, repeat the procedure from Defining the position and length of a field on page 63.

Note:

You must assign a Row search ID to the field before completing the field definition. When you do, the question mark (?) changes to the Row search ID number. For more information, see Defining the rows of data for a report on page 86.

Changing the definition of a field

To change a field definition:

1. On Screen Painter, place the cursor on the field that you want to change, and select **Field**.

   The cursor returns to the field and rests on the last space of the field. The system displays the following message on the status line:

   `Move cursor to define opposite corner of field, press RETURN.`

2. If needed, move the cursor using the arrow keys to make the field longer or shorter, and press **Enter** to view the Field window.
3. Overwrite any data in the fields that you want to change, and click **Save**.

   The system closes the Field window, displays Successful on the status line, and returns the cursor to the field that you changed.

Defining bars in a report

Note:
You can define bars in a custom report only if you have purchased the CMS Graphics feature. If you have not purchased the Graphics feature, the **Bar** list option is not available.

You might want a report to display data as bar graphs instead of numbers. Defining a bar or bars in a report is similar to defining fields, except in the way that you define the format.

To define a bar format, you must specify the following items:

- The postion and length of the bar.
- The direction of the bar, that is, horizontal or vertical.
- The thresholds that cause the bar to change color.
- The scale of the bar.

The legend of the bar

If you copy the design of an existing bar graph, the bars filled with Xs, Vs, or Hs are displayed.

- **X** indicats that the bar is discrete. The bar is displayed as a single bar in the report because, based on the row search conditions assigned to the bar, CMS finds only one value.

- **V** indicates that the bar is repeated vertically in the report. The bar is displayed as a series of bars, one over the other, because, based on the row search conditions assigned to the bar, CMS finds multiple values.
- **H** indicates that the bar is repeated horizontally in the report. The bar is displayed as a series of bars, side by side, because, based on the row search conditions assigned to the bar, CMS finds multiple values.

For illustrations of repeated and discrete bars, see Assigning a row search ID to report fields and bars on page 100.

Perform the following tasks to define bars in a report:

1. Defining the position and length of a bar on page 79.
2. Defining the data expression for a bar on page 80.
3. Defining the tables for calculation names on page 80.
4. Defining the bar direction on page 81.
5. Defining the bar scale on page 81.
6. Defining the maximum graph value on page 82.
7. Defining the first threshold on page 83.
8. Defining the second threshold on page 84.
9. Selecting normal or reversed thresholds on page 84.
10. Saving the bar definition on page 85.

Defining the position and length of a bar

To define the position and length of a bar:

1. On Screen Painter, position the cursor where you want a bar to begin, and select the bar action list option.

   The cursor returns to the original position, and the system displays the following message:

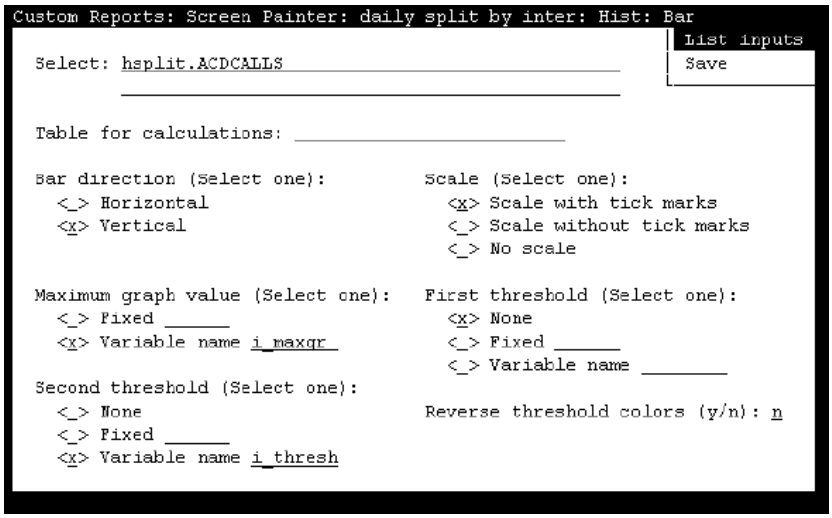
   ```
   Move cursor to define opposite corner of bar and press RETURN.
   ```

2. Move the cursor using the arrow keys to define the length and width of the bar, and press **Enter**.

   The system displays a question mark (?) in the upper left corner of the bar. The question mark indicates that you have not yet assigned a Row search ID to the bar.

   The system displays the Bar window as shown in the following figure.

Figure 27: Sample of the Bar window



Defining the data expression for a bar

In the **Select** field on the Bar window, enter a data expression to tell CMS the following:

- What table columns should supply data to the bar.
- How to manipulate data.

The rules for the **Select** field on the Bar window are identical to those of the **Select** field on the Field window. However, the following types of database items do not make sense for bars:

- Identifiers such as SPLIT, VDN, LOGID
- Current state data such as WORKMODE or DURATION
- Constants unless these are part of the calculation

If an expression is a database item that stores a number of seconds, the bar normally shows time as seconds. You can make the bar represent minutes by dividing the database item by 60.

To complete the definition of bar data, you must, as for field data, define row search conditions for the bars. This includes whether a bar you define will be repeated to display multiple bars for multiple values. For more information, see Defining the rows of data for a report on page 86.

Defining the tables for calculation names

In the **Table for calculations** field on the Bar window, type a table name if you entered a calculation name in the **Select** field. For fields on the Bar window, see Figure 27: Sample of the Bar window on page 80.

The table name tells CMS which table to search for database items in the calculation.

Note:
The **Table for calculations** field on the Bar window is necessary when using calculation names because you cannot append a table name to a calculation name in the **Select** field.

Defining the bar direction

In the **Bar direction** list on the Bar window, type **x** to select **Horizontal** or **Vertical**. For fields on the Bar window, see Figure 27: Sample of the Bar window on page 80.

Vertical means that the bar length is oriented up and down. Horizontal means that the bar length is oriented left and right.

Defining the bar scale

In the **Scale** list on the Bar window, type **x** to select one of the following options:

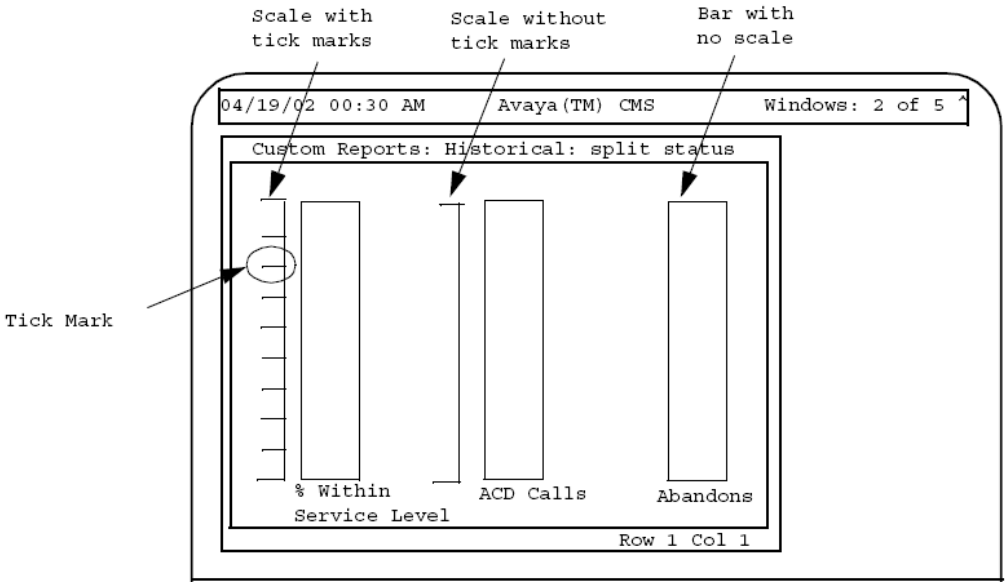
- Scale with tick marks: The scale is displayed as a line, segmented by evenly spaced marks as shown in Figure 28: Bars with or without scales on page 82. For a vertical scale, a tick mark is displayed for each vertical character space. For a horizontal scale, a tick mark is displayed at every fifth horizontal character space.
- Scale without tick marks: The scale is displayed automatically in the report as a line parallel to the bar as shown in Figure 28: Bars with or without scales on page 82. The line is of a fixed length equal to the maximum length of the bar. The end of the scale always represents the maximum graph value that you define.
- No scale: The bar does not have a scale. You might want this option if the scale defined for another bar applies to the bar you are currently defining. For example, in Figure 28: Bars with or without scales on page 82, the scale for the **ACD Calls** bar can apply to the **Abandons** bar.

  A scale defined for one bar is displayed in correct relation to other bars if the following are true:

  - All bars are parallel, have the same maximum length, and have the same starting points.
  - All bars have the same maximum graph value.
  - All bars display the same units such as number of calls, averages, percentages, or number of seconds.

Note:
Do not enter any text or fields in the column immediately to the left of a vertical bar. Do not enter any text or fields in the row immediately above a horizontal bar.

Figure 28: Bars with or without scales



Defining the maximum graph value

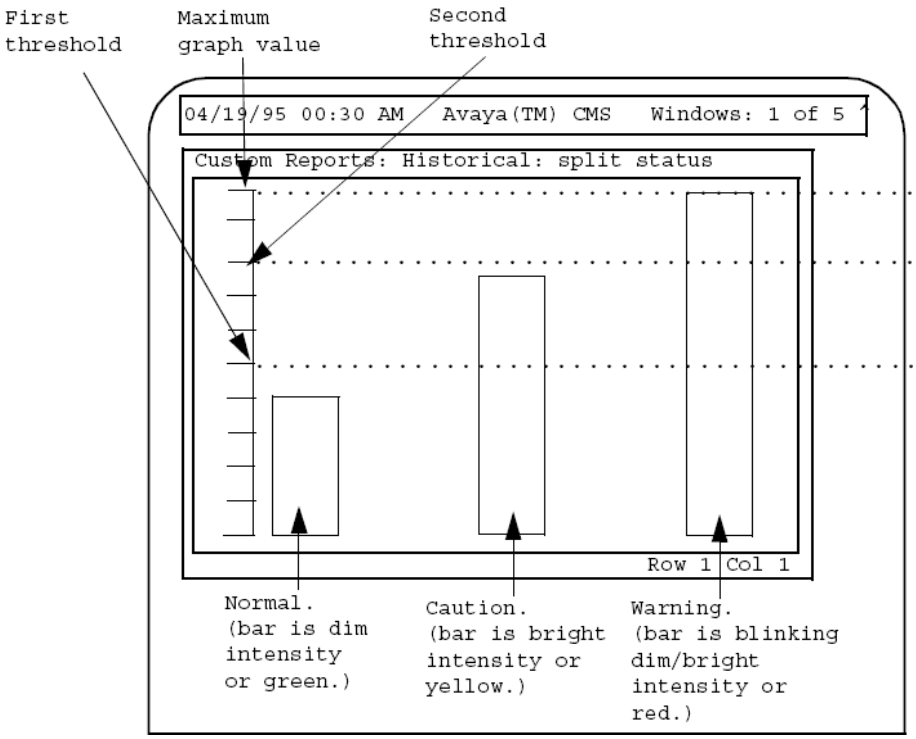
In the **Maximum graph value** list on the Bar window, type **x** to select **Fixed** or **Variable name**. For fields on the Bar window, see Figure 27: Sample of the Bar window on page 80.

The maximum graph value is the value that the bar represents when the bar is at the maximum length or height as shown. The value must always be a whole number or decimal.

If you select **Fixed**, you must also type, in the accompanying field, the value that the bar must represent when the bar is at the maximum length or height.

If you select **Variable name**, you must also type, in the accompanying field, a variable name that references a report input field. With the **Variable name** option, users can enter a maximum graph value for the bar when ordering the report. The variable name that you type must be identical to a variable name that you define in the Define Input window.

Figure 29: Thresholds bar graph



Defining the first threshold

In the **First threshold** list on the Bar window, type **x** to select **None**, **Fixed**, or **Variable name**. For fields on the Bar window, see Figure 27: Sample of the Bar window on page 80.

The first threshold identifies the point at or above which the bar changes color to indicate a caution condition. The first threshold must have the lower value of the two thresholds. The value must always be a whole number or decimal.

If you select **None**, the bar does not have a first threshold at which the bar changes color. If you select **Fixed**, you must also type, in the accompanying field, the value at or above which the bar changes color. If you select **Variable name**, you must also type, in the accompanying field, a variable name.

With the **Variable name** option, which references a report input field, users can enter the first threshold value for the bar when ordering the report. The variable name that you type must be identical to the variable name that you assign to a report input field. For more information, see Defining fields for the Report Input window on page 51.

Defining the second threshold

In the **Second threshold** list on the Bar window, type **x** to select **None**, **Fixed**, or **Variable name**. For fields on the Bar window, see Figure 27: Sample of the Bar window on page 80.

The second threshold identifies the point at or above which the bar changes color to indicate a warning condition. The second threshold must have the higher value of the two thresholds. The value must always be a whole number or decimal.

If you select **None**, the bar does not have a second threshold at which the bar changes color. If you select **Fixed**, you must also type, in the accompanying field, the value at or above which the bar changes color.

If you select **Variable name**, you must also type a variable name in the accompanying field. With the **Variable name** option, which references a report input field, users can enter a maximum graph value for the bar when ordering the report. The variable name that you type must be identical to the variable name that you assign to a report input field. For more information, see Defining fields for the Report Input window on page 51.

Selecting normal or reversed thresholds

In the **Reverse threshold colors** list on the Bar window, type **y** to select reversed threshold colors or **n** to select normal threshold colors. For fields on the Bar window, see Figure 27: Sample of the Bar window on page 80.

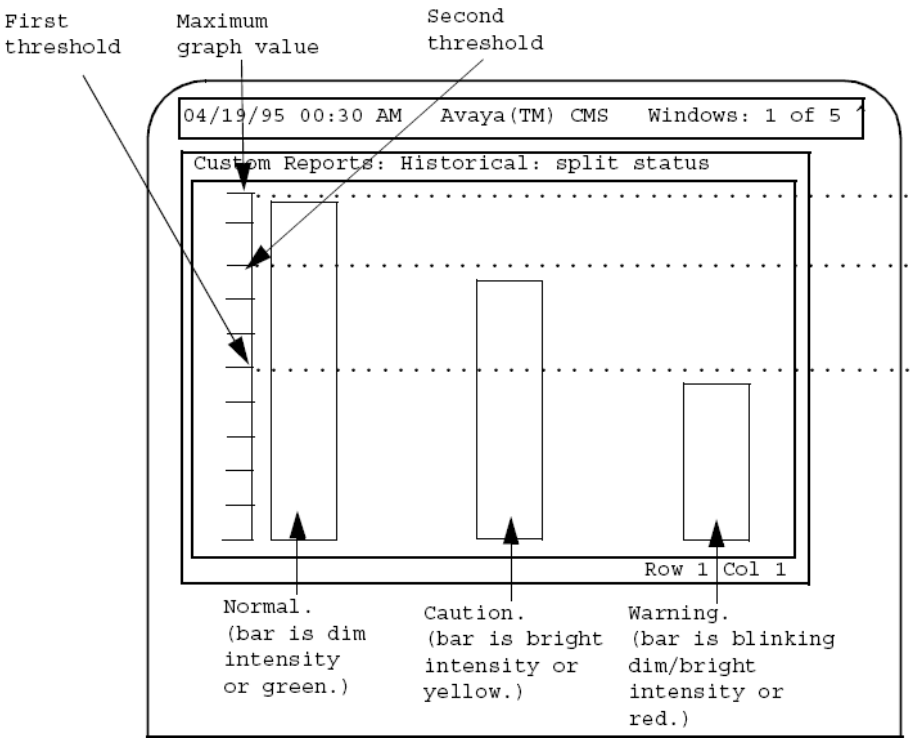
If you select **n**, the bar changes to a caution color at the first threshold and changes to a warning color at the second threshold. Select **y** to reverse the meanings of the thresholds.

With meanings reversed, the bar is a normal color when the bar is above the second threshold. The bar changes to a caution color when the bar is at or below the second threshold but is above the first threshold. The bar changes to a warning color when the bar is at or below the first threshold.

Reversed colors are appropriate for a bar that represents the percentage of calls answered within service level. In this case, the bar is a normal color when the percentage is high, a caution color when the percentage goes down, and a warning color when the percentage is very low.

The following figure shows the reversed bar graph.

Figure 30: Thresholds reversed bar graph



Saving the bar definition

Click **Save** on the Bar window to close the window. The system displays Successful on the status line to indicate that the bar definition is added.

To define additional bars, repeat the procedure from Defining the position and length of a bar on page 79.

Note:

You must assign a row search ID to the bar before the field definition is complete. When you do, the question mark (?) changes to the row search ID number. For more informatin, see Defining the rows of data for a report on page 86.

If a bar will be a repeated bar as defined with the Row Search window, you cannot define any other bars in the direction that the bar will repeat. That is, if the bar will be repeated vertically, no other bars, text, or fields can be displayed directly below the bar. If the bar will be repeated horizontally, no other bars, text, or fields can be displayed directly to the right of the bar.

Changing the definition of a bar

To change a bar definition:

1. On Screen Painter, place the cursor on the bar that you want to change, and select **Bar**.

   The cursor returns to the bar and rests on the lower right corner of the bar. The system displays the following message on the status line:

   ```
   Move cursor to define opposite corner of bar and press RETURN.
   ```

2. If needed, move the cursor using the arrow keys to make the bar bigger or smaller, and press **Enter** to view the Bar window.
3. Overwrite data in the fields that you want to change, and click **Save**.

   The system closes the Bar window, displays Successful on the status line, returns the cursor to the bar that you just changed.

Defining the rows of data for a report

To complete the definition of a report's fields or bars, you must define the rows of the tables that supply data to the fields or bars. To do this:

- Using the Row Search window, define the criteria needed to find the appropriate rows of data. Each set of criteria is stored by row search ID.
- Assign the row search IDs to the appropriate fields or bars.

Row search criteria are values for database items or calculations. In most cases, your criteria will specify variable names rather than specific values for the database items or calculations. These variable names allow CMS to use the values entered in the Report Input window in the row search criteria. From the rows CMS finds, report data is retrieved for the report fields.

For more information, see Storing and retrieving data on page 19.

Note:
If you copy the design of an existing report, the row search criteria and input fields, as defined in the Define Input window, are copied. If you then delete or change a variable name in the Row Search window, you must delete or change that variable name in the Define Input window.

Perform the following tasks to define the rows of data for a report:

1. Gaining access to the Row Search window on page 87.
2. Viewing the report input variables on page 87.
3. Selecting a Row Search ID on page 88.
4. Selecting tables on page 88.

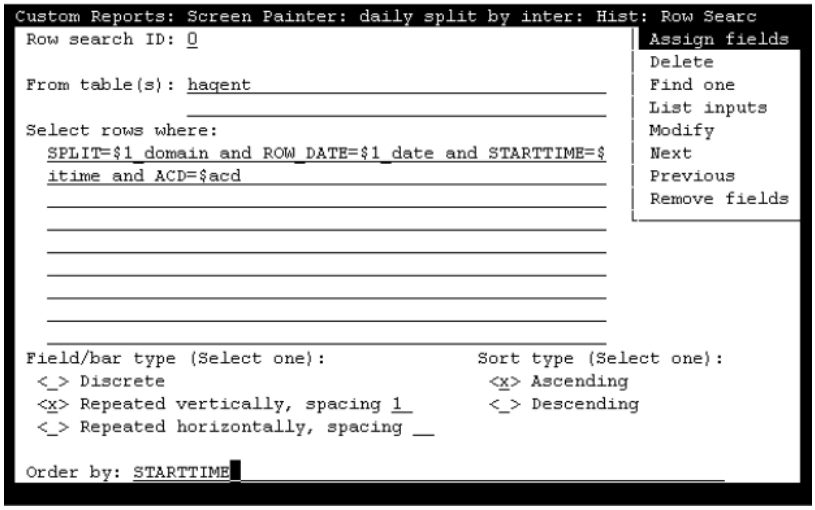
5. Selecting rows in the tables on page 92.
6. Selecting a field or bar type on page 95.
7. Selecting a Sort type on page 97.
8. Selecting a sorting order for data on page 98.
9. Saving the row search conditions on page 100.

Gaining access to the Row Search window

On Screen Painter, click **Row Search** to view the Row Search window.

The following figure shows a sample of the Row Search window.

Figure 31: Sample of the Row Search window



Viewing the report input variables

1. Click **List inputs** on the Row Search window to view the variable names defined in the Define Input window.

   The system displays the List Inputs window.
2. Use the **Commands** screen-labeled key and the **Print window** option to print the contents of the window.
3. Press **Enter** to close the List Inputs window and to return to the Row Search window.

Note:
If you defined report input fields in the Define Input window or you copied a report design that has report input fields, your row search criteria use the variable names for those input fields. Conversely, to use a variable name in your row search criteria, you must first define an input field with that variable name.

Selecting a Row Search ID

In the **Row search ID** field on the Row Search window, type a number from **0** to **9**. For fields on the Row Search window, see Figure 31: Sample of the Row Search window on page 87.

The ID identifies the set or one of the set of row search conditions that you are using in the report. For a single report, you can use ten different sets of conditions to select rows of data.

You can create a new set of conditions or click **Find one** on the Row Search window with the **Next/Previous** actions to view or change an existing set of conditions. If you have already assigned row search conditions to a field or bar on Screen Painter, the row search ID is displayed as the first character in that field or bar.

If you are going to use multiple tables, at least one *join* clause must be displayed in the **Row search ID** assigned to the field.

A *join* clause makes the values that CMS searches on the same in both tables. Therefore, the data extracted from the rows in both tables is related.

A *join* clause has the following format:

```
tablename1.item1 = tablename2.item1
```

Where item1 is a database item that the tables have in common.

For more information on the join clause, see Advanced report design on page 131 and the INFORMIX documentation.

Selecting tables

In the **From table(s)** field on the Row Search window, type the names of the tables the rows of which supply data. Use a comma to separate multiple table names.

For fields on the Row Search window, see Figure 31: Sample of the Row Search window on page 87

For example: **From table(s)**: hagent,dagent_____

If you are going to assign this row search ID to a particular report field or bar, the names in the **From table(s)** field must include the table names that you assigned to the report field.

Note:
If a report field merges data from two tables, you must include both table names in this field. For more information, see Selecting rows from more than one table on page 152.

The following tables list the CMS database table names. For a description of the tables and database items that each table contains, see *Avaya Call Management System Database Items and Calculations*.

Table 9: Real-time table names

Table name	Data stored
csplit	Split or skill data for the current interval
psplit	Split or skill data for the previous interval
cagent	Agent data for the current interval
pagent	Agent data for the previous interval
ctkgrp	Trunk group data for the current interval
ptkgrp	Trunk group data for the previous interval
ctrunk	Trunk data for the current interval
ptrunk	Trunk data for the previous interval
cvector	Vector data for the current interval
pvector	Vector data for the previous interval
cvdn	Vector Directory Number (VDN) data for the current interval
pvdn	VDN data for the previous interval
ccwc	Call Work Code (CWC) data for the current interval
pcwc	CWC data for the previous interval

Table 10: Historical table names

Table name	Data stored
hsplit	Split or skill data for each intrahour interval
dsplit	Split or skill data summarized by day
wplit	Split or skill data summarized by week
msplit	Split or skill data summarized by month
hagent	Agent data for each intrahour interval
dagent	Agent data summarized by day
wagent	Agent data summarized by week
magent	Agent data summarized by month
ag_actv	Agent trace
haglog	Agent login or logout
htkgrp	Trunk group data for each intrahour interval
dtkgrp	Trunk group data summarized by day
wtkgrp	Trunk group data summarized by week
mtkgrp	Trunk group data summarized by month
htrunk	Trunk data for each intrahour interval
dtrunk	Trunk data summarized by day
wtrunk	Trunk data summarized by week
mtrunk	Trunk data summarized by month
hvector	Vector data for each intrahour interval
dvector	Vector data summarized by day

Table 10: Historical table names

Table name	Data stored
wvector	Vector data summarized by week
mvector	Vector data summarized by month
hvdn	Vector Directory Number (VDN) data for each intrahour interval
dvdn	VDN data summarized by day
wvdn	VDN data summarized by week
mvdn	VDN data summarized by month
hcwc	Call Work Code (CWC) data for each intrahour interval
dcwc	CWC data summarized by day
wcwc	CWC data summarized by week
mcwc	CWC data summarized by month
call_rec	Call record data
agex	Agent exceptions
spex	Split exceptions
tgex	Trunk group exceptions
vecex	Vector exceptions
vdncex	VDN exceptions
inkex	Link down exceptions
mctex	Malicious Call Trace (MCT) exceptions
f_cday	Forecast current day configuration data by split or skill
f_cdayrep	Current day forecast data by split or skill

Selecting rows in the tables

In the **Select rows where** field on the Row Search window, type a selection criteria statement to tell CMS how to select data from the table. For fields on the Row Search window, see Figure 31: Sample of the Row Search window on page 87.

The statement specifies values for more than one database item or calculation.

Note:

To ensure a reasonable run time for your report, the database items that you specify in the **Select rows where** field on the Row Search window must include index items. For a historical report, you must include a *where* clause with the ROW_DATE database item. If your row search is based on items that are not indexes, your report can take a long time to run. For more information, see *Avaya Call Management System Database Items and Calculations*.

Your row search criteria must always include the selection of an ACD. For more information, see Where clause for selecting rows from an ACD on page 95.

Basic *Where* clause

A basic clause has the following format:

```
Expression Relational Operator Value
```

The Expression can be a database item or calculation. The Value is a whole number.

Relational operators available for a *where* clause are as follows.

Table 11: Relational operators for a *Where* clause

Operator	Meaning
=	equal to
<> or !=	not equal to
>	greater than
<	less than
>=	greater than or equal to
<=	less than or equal to

Do not enter calculation names as the names do not work in the **Select rows where** field.

Note:
Standard database items consists of only upper-case letters.

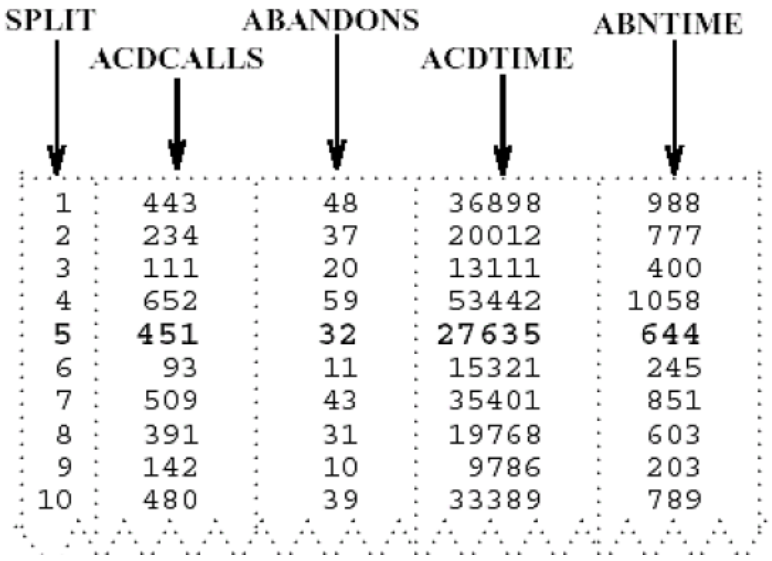
As an example of a basic *where* clause, if you create a real-time report using data from the Current Interval Split table and you define the following report fields for the report:

```
Split: (the SPLIT database item)

ACD Calls: (the ACDCALLS database item)

Average Talk Time: (the calculation ACDTIME/ACDCALLS)
```

The basic *where* clause might be as follows: **Select rows where:** SPLIT = 5

The following figure shows how CMS finds the row in the table for Split 5 and fills in the report fields with data from that row.

Figure 32: Sample Current Interval Split table



The report fields show the following data:

- Split: 5
- ACD Calls: 451
- Average Talk Time: 61 (the result of 27635/451)

Note:
This example of row search criteria would also include the selection of an ACD. For more information, see Where clause for selecting rows from an ACD on page 95.

Where clause with variable

The previous examples create hardcoded row search conditions, that is, when you run the report, CMS always searches for the values that you entered in the *where* clause. However, instead of a hardcoded value, you can enter a variable name in a clause.

A variable name tells CMS to search for the values that you or another user chooses when you run the report.

Note:
You must define a variable on the Define Input window before using the variable in a *where* clause.

The variable name then links a report input field to the *where* clause that uses the values that you or another user entered.

To see the variable names that you previously defined on the Define Input window, click **List inputs** on the Row Search window. For more information, see Viewing the report input variables on page 87.

In a clause with a variable name, you must always enter a dollar ($) sign before of the variable. The format is as follows:

```
Expression Relational Operator $variable
```

As with a basic *where* clause, the Expression can be a database item or calculation. The relational operators available are the same as those available for a basic *where* clause.

Look at the following *where* clause:

```
Select rows where: SPLIT = $splitvar
```

This *where* clause tells CMS to search for rows with the Split value that the user enters when ordering the report. The example clause presupposes that the variable name, splitvar, is already defined on the Define Input window.

Multiple *Where* clauses

Use the logical operators **AND** to put more than two clauses in a statement or to define more than two clauses where CMS finds only rows that meet all conditions. For example, the following statement searches for rows where splits had an Average Speed of Answer (ASA) greater than 30 seconds and abandons greater than 100.

```
Select rows where: ANSTIME/ACDCALLS > 30 and ABANDONS > 100
```

Use the logical operator **OR** to define two conditions where CMS finds rows that meet either condition, but not necessarily both the conditions. For example, the following statement searches for rows where splits had too many abandoned calls or too many extension-out calls.

```
Select rows where: ABANDONS>15 or AUXOUTCALLS+ACWOUTCALLS>7
```

Where clause with Range/List variable

If a variable name, as defined in the Define Input window, has been assigned the Range/List option, the *where* clause must use the equals (=) sign with the variable name.

Where clause for selecting rows from an ACD

In the *where* statement, you must always include a clause to select the ACD. If you always want a report to find data for the user's current ACD, append and ACD = $acd to the *where* statement, as shown in the following example:

```
Select rows where: SPLIT = $splitvar and ROW_DATE = $datevar and
  ACD = $acd
```

If you define a variable name as acd, you do not have to define the variable in the Define Input window. CMS always identifies this variable name as the current ACD. You can also define a different variable name for the ACD database item so that a user can specify the ACDs when the user orders a report. You can also hardcode the ACD in a *where* clause, as indicated in the following example:

```
Select rows where: ACD = 1
```

Where clause for excluding rows of data

You can use a *where* clause as follows to exclude a split from the report, but to include all other splits:

```
Select rows where: SPLIT != 5 or Select rows where: SPLIT <> 5
```

Selecting a field or bar type

In the **Field/bar type** field on the Row Search window, select one of the following options:

- **Discrete**
- **Repeated vertically**
- **Repeated horizontally**

For fields on the Row Search window, see Figure 31: Sample of the Row Search window on page 87.

Discrete

If you select **Discrete**, CMS finds only one value for each report field or bar to which you assign this row search ID. CMS finds only one value if the field or bar is an aggregate function, such as SUM, AVG, MIN, or MAX, or if both of the following conditions are true:

- You type a *where* statement that is so specific that CMS finds only one row.

- On the Define Input window, you select **n** for Range/List for all variables used in the *where* statement. For example, if you select the Daily Split, that is, dsplit, table and type the following *where* statement:

  ```
  Select rows where: ROW_DATE = $datevar and SPLIT = $splitvar and
    ACD = $acd
  ```

  and you select **n** for Range/List for both the splitvar and datevar variables, CMS finds a single row containing the date and split that a user types when the user orders the report.

Note:
If you are assign the row search ID only to fields and bars that contain aggregate functions, such as sum, max, min, or avg, select **Discrete**. For more information, see Repeating aggregate function values on page 159.

Repeated vertically

Select **Repeated vertically** to display a column of multiple field values or a vertical series of bars, one for each value.

If you select **Repeated vertically**, you must also type a number in the **Spacing** field. This number tells CMS how many lines to go down to display each value. If you type **1** in the **Spacing** field, CMS displays a value on every line. If you type 2, CMS displays a value on every alternate line.

Note:
If you select **Repeated vertically**, you cannot define any fields directly under a repeated field.

Repeated horizontally

Select **Repeated horizontally** to display multiple field values in row format or a horizontal series of bars, one for each value.

If you select **Repeated horizontally**, you must also type a number in the **Spacing** field. This number tells CMS how many characters to move horizontally from the beginning of one value to the beginning of the next. The spacing that you type must include the blank spaces between fields or bars and the width of a field or bar.

For example, if a field or bar is four characters wide and you type **8** in the **Spacing** field, CMS displays each value with four blank characters in between.

Repeated values, whether repeated horizontally or vertically, are applicable if CMS finds multiple values for the report fields. CMS finds multiple values if one of the following conditions exists:

- You define a *where* statement that specifies more than one range of values.
- For at least one variable, you enter **y** in the **Range/List** option on the Define Input window.

- You define a *where* statement that is general enough to select multiple rows. For example, you type the following *where* statement for the dsplit table:

  ```
  Select rows where: ROW_DATE = $datevar and ACD = $acd
  ```

  As no split values are specified, CMS displays, for a user-specified date, a value for every split in the ACD.

If, based on your *where* statement and Define Input window entries, CMS finds multiple values, but you select **Discrete**, the report displays only the first value that CMS finds for each report field.

Note:
If you select **Repeated horizontally**, you cannot define any fields directly to the right of a repeated field.

Selecting a Sort type

In the **Sort type** field on the Row Search window, select **Ascending** or **Descending**.

For fields on the Row Search window, see Figure 31: Sample of the Row Search window on page 87.

Ascending order means that CMS must display data from the lowest to the highest values. Descending order means that CMS must display data from the highest to the lowest values.

If the database item in the **Order by** field on the Row Search window is ROW_DATE, and you select **Descending**, CMS lists data as shown in the the following table. For dates and times, lowest values are those dates/times farthest in the past.

Table 12: Sample CMS report based on sorting criteria

DATE	SPLIT	ACDCALLS
10/12/99	1	7
10/12/99	2	6
10/12/99	3	5
10/11/99	1	25
10/11/99	2	50
10/11/99	3	41
10/10/99	1	40
10/10/99	2	36
10/10/99	3	30

Selecting a sorting order for data

In the **Order by** field on the Row Search window, type a database item with the table name to specify how CMS must arrange multirow data in the report.

For fields on the Row Search window, see Figure 31: Sample of the Row Search window on page 87.

CMS orders the rows of data by the values for the database item. For example, if you type dsplit.ROW_DATE in the **Order by** field, CMS displays data by date, as shown in Table 13: Sample report based on the ROW_DATE database item on page 98.

Table 13: Sample report based on the ROW_DATE database item

DATE	SPLIT	ACDCALLS
10/10/99	1	40
10/10/99	2	36
10/10/99	3	30
10/11/99	1	25
10/11/99	2	50
10/11/99	3	41
10/12/99	1	7
10/12/99	2	6
10/12/99	3	5

If you type dsplit.SPLIT in the **Order by** field, CMS displays data by split, as shown in Table 14: Sample report based on SPLIT database item on page 98.

Table 14: Sample report based on SPLIT database item

DATE	SPLIT	ACDCALLS
10/10/99	1	40
10/11/99	1	25
10/12/99	1	7
10/10/99	2	36

Table 14: Sample report based on SPLIT database item

DATE	SPLIT	ACDCALLS
10/11/99	2	50
10/12/99	2	6
10/10/99	3	30
10/11/99	3	41
10/12/99	3	5

If you leave the **Order by** field blank, CMS displays data in the report using the same sequence that CMS uses to store the data in the table.

For historical reports, you can type more than one database item in the **Order by** field. Separate the database items by commas. The effect of more than one sorting database item is that data is ordered first by values found for the first sorting database item, then sorted by values for the second sorting database item, and so on.

For the following assignment:

```
Order by: dsplit.SPLIT,dsplit.ACDCALLS
```

CMS displays the report as shown in Table 15: Sample report based on two database items on page 99.

Table 15: Sample report based on two database items

DATE	SPLIT	ACDCALLS
10/12/99	1	7
10/11/99	1	25
10/10/99	1	40
10/12/99	2	6
10/11/99	2	36
10/10/99	2	50
10/12/99	3	5
10/11/99	3	30
10/10/99	3	41

Notice that the data is first sorted by split number, then by the number of ACD calls. As a result, the dates are displayed totally out of sequence.

Saving the row search conditions

Click **Modify** on the Row Search window to add the row search conditions.

After you save the row search conditions, you can assign a row search ID to report fields or bars.

Assigning a row search ID to report fields and bars

To complete the definition of data for a field or bar, you must assign a row search ID to the field or bar.

Perform the following tasks to assign a row search ID:

Note:
If a field already has an assigned row search ID, for example, a field that is part of a design you have copied, you must first remove the existing row search ID assignment. For more information, see Changing the row search field assignment on page 104.

1. On Screen Painter, place the cursor on the field to which you want to assign a row search ID. To assign a row search ID to several fields at one time, place the cursor in a position from which you can define an appropriate block.
2. Click **Row search** on Screen Painter to view the Row Search window.
3. Assign a row search ID, and select **Find one** on Row Search window.

   The system displays the row search conditions and IDs.
4. Click **Assign fields** on the Row Search window.

   The system closes the Row Search window, returns the cursor to the original position, and displays the following message on the status line:

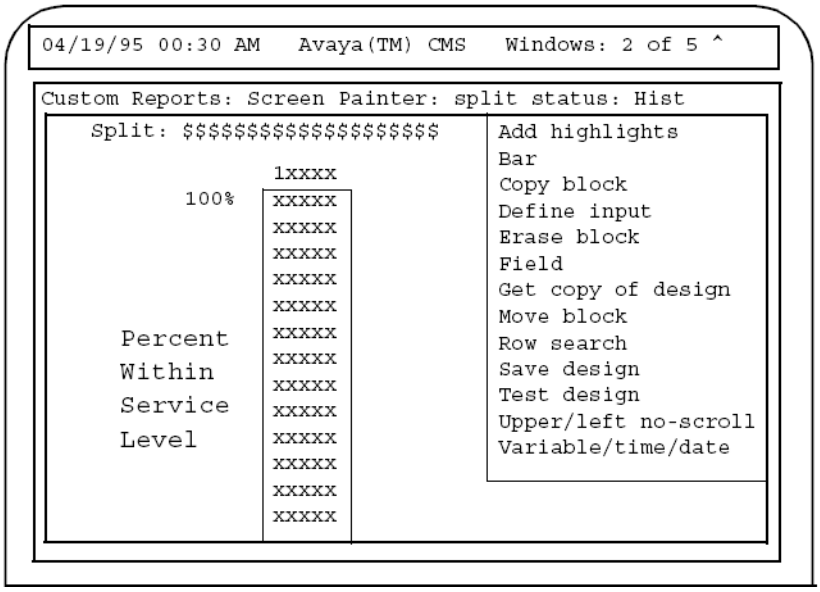
   ```
   Move cursor to define a block and press RETURN
   ```
5. Move the cursor using the Tab, Shift Tab, or arrow keys. If the block that you define contains more than one character of a field or bar, CMS assigns the row search ID to that field or bar.

   The cursor defines a block on your terminal in inverse video or color.
6. Press **Enter**.

   The question mark (?) in each field or bar changes to the row search ID to indicate that the row search conditions have been assigned. Additional characters fill the field or bar as shown in the following figures.

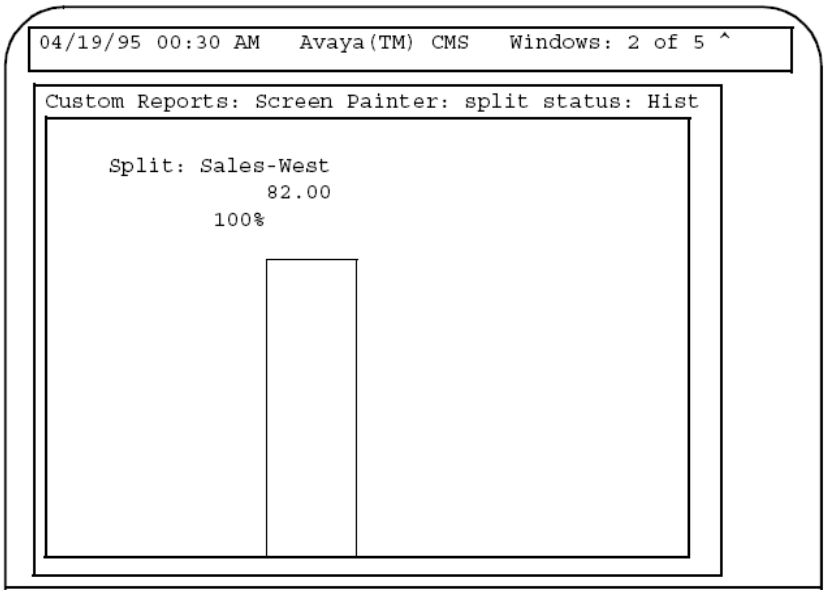
If your row search conditions specify discrete fields or bars, assigned fields are displayed with lowercase x's and assigned bars are displayed with uppercase X's as in the following figure.

Figure 33: Sample of discrete field and bar design



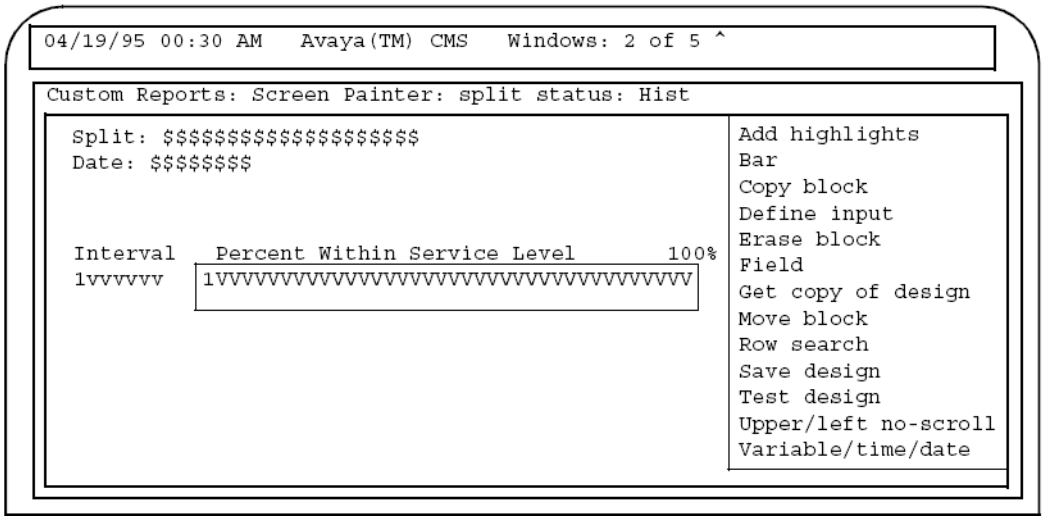
A report with this design is shown in the following figure.

Figure 34: Sample report with discrete field and bar



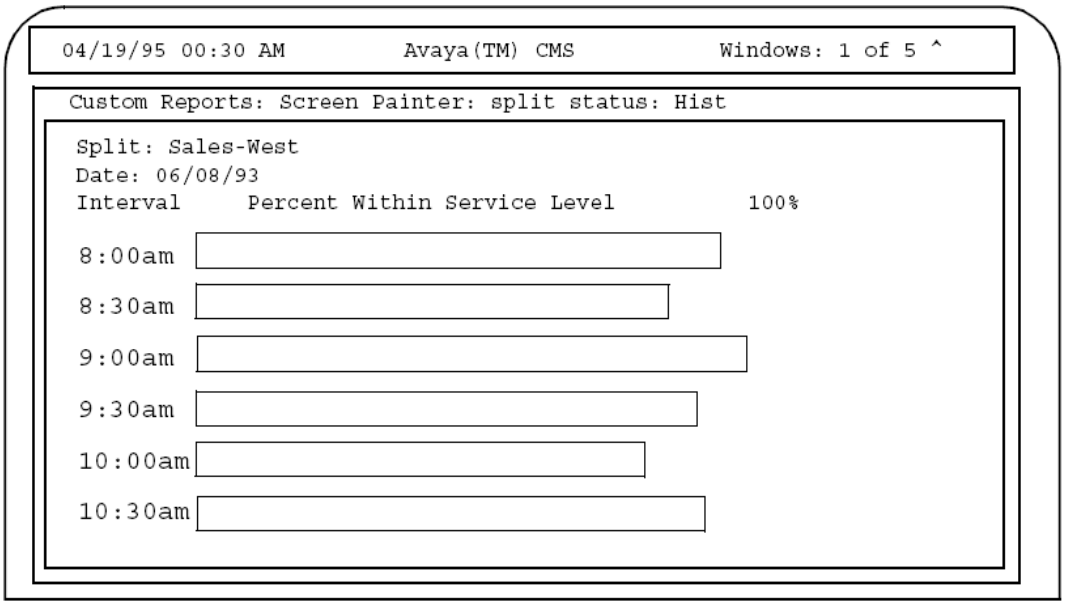
If your row search conditions specify vertically repeated fields or bars, CMS displays assigned fields with lowercase v's and assigned bars with uppercase V's as shown in the following figure.

Figure 35: Sample of vertically-repeated field and bar design



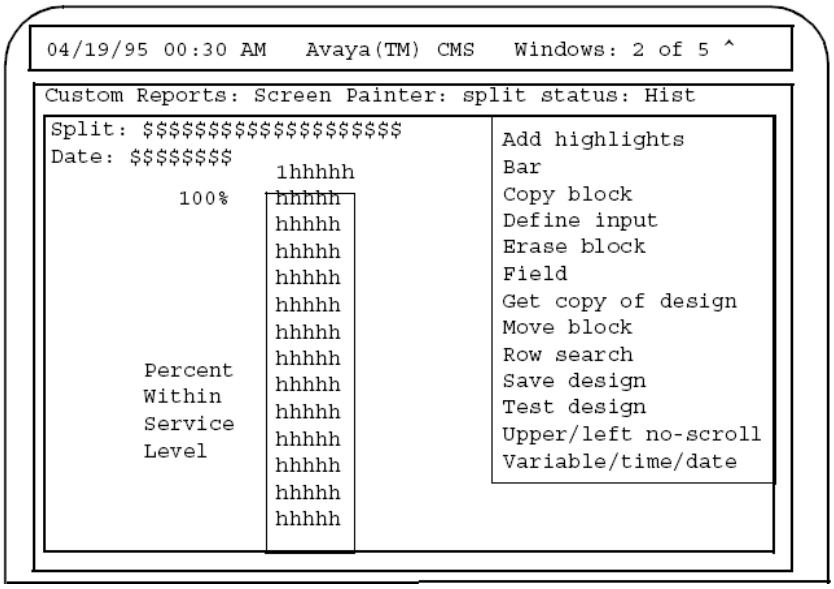
A report with this design is shown in the following figure.

Figure 36: Sample report with vertically-repeated field and bar



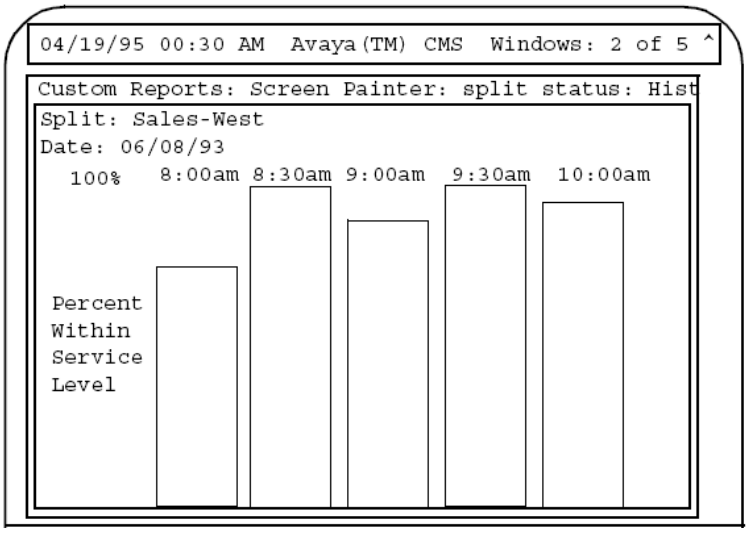
If your row search conditions specify horizontally repeated fields or bars, CMS displays the assigned fields with lowercase h's and assigned bars with uppercase H's as shown in the following figure.

Figure 37: Sample of horizontally-repeated field and bar design



A report with this design is shown in the following figure.

Figure 38: Sample report with horizontally-repeated field and bar



Changing row search conditions

Perform the following tasks to change the row search conditions:

1. On Screen Painter, click **Row search** to view the Row Search window.
2. In the **Row search ID** field on the Row Search window, type a number from **0** to **9**, and click **Find one**.

   The system displays the row search conditions for the row search ID.

   Note:
   For a **Find one** search, CMS takes only your entry in the **Row search ID** field and ignores the other fields.
3. Change data, and click **Modify** on the Row Search window.

   The system displays Successful on the status line to indicate that the row search conditions have been changed.

The changes apply all the fields to which you had previously assigned the row search ID.

Changing the row search field assignment

To change the row search ID assigned to a particular field, you must first disassociate the field from the row search ID. Use the **Remove fields** action list option on the Row Search window to disassociate the field.

Perform the following tasks to change the row search field assignment:

1. On Screen Painter, place the cursor on the field or bar from which you want to disassociate the row search ID. To disassociate a row search ID from several fields or bars at once, place the cursor in a position from which you can define a block that includes the fields or bars.
2. Click **Row search** to view the Row Search window.
3. Type the row search condition, and click **Find one**.

   The system clicks the row search conditions for the row search ID.
4. Click **Remove fields** on the Row Search window.

   The system closes the Row Search window, moves the cursor to the original position on Screen Painter, and displays the following message on the status line:

   `Move cursor to define a block and press RETURN`
5. Move the cursor using the Tab, Shift Tab, or arrow keys. The block that you define should contain all characters of each field or bar from which you disconnect the row search ID.

   The cursor defines a block on your terminal in inverse video or color.

6. Press **Enter**.

   The system replaces the row search ID in each field or bar by a question mark (?) to indicate that the row search conditions have been disconnected.

7. Assign a new row search ID to the fields or bars.

Defining fields to show run time/date and user inputs

The time or date when a report is run is not stored in any database table. Instead, CMS recognizes when CMS completes processing the report, and if requested, displays this information on the report. Similarly, CMS knows what your current ACD is when you order the report and can display the current ACD name or number on the report.

To display the report's run-time, run-date, or the current ACD when you ordered the report, you must define a field using the Var/Time/Date window. With this window, you can define fields that mirror your entries in the Report Input window. That is, CMS takes the values that you enter for an input variable, as defined in the Define Input window, and displays the values on the report.

Perform the following tasks to define the report display type and format:

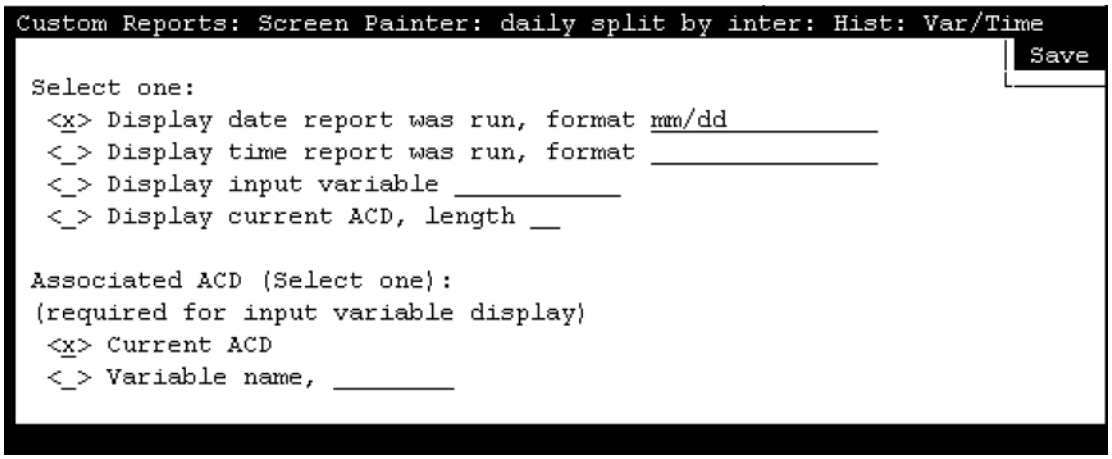
1. Gaining access to the Var/Time/Date window on page 105.
2. Defining display type and format on page 106.
3. Saving the Var/Time/Date fields on page 108.

Gaining access to the Var/Time/Date window

On Screen Painter, place the cursor where you want the left end of the field to be displayed, and select **Variable/time/date**.

The system displays the Var/Time/Date window as shown in the following figure.

Figure 39: Sample of the Var/Time/Date window



Defining display type and format

Note:
You can define the appearance of the date and time fields. However, only text matching the defined formats is converted into equivalents. Any other text is displayed as entered.

You must select a display type and complete the associated field. The display options are as follows:

- **Display date report was run**
- **Display time report was run**
- **Display input variable**
- **Display current ACD**

Select **Display date report was run** to display the date when you ran the report. You must also specify a date format with appropriate punctuation in the associated field.

You can enter any of the following date formats or a combination of date formats.

Table 16: Date formats

Symbol	Meaning
mm	Month in numerals. For example, 12 for December.
MMM	Month in letters. For example, DEC for December.
yy	Year in two digits. For example, 96.
YYYY	Year in four digits. For example, 1996.
dd	Day of the month in numerals. For example, 03 for the third day of a month.
jjj	Day of the year in the Julian calendar. For example, 365 for December 31 in a regular year and 366 for December 31 in a leap year.
www	Day of the week in three letters. For example, MON for Monday.

Note:
An example of combined formats is the standard date format, that is, mm/dd/yy. You can type the day and month in the mm/dd format.

Select **Display time report was run** to display the time when you ran the report. You must also enter a time format with the appropriate punctuation.

You can use any of the following time formats.

Table 17: Time formats

Symbol	Meaning
HH	Hour in the 24-hour format. For example, 18 for 6 p.m.
hh	Hour in the 12-hour format with a.m. or p.m.
mm	Number of minutes after the hour.
ss	Number of seconds.
HH:mm:ss or HH:mm	24-hour fomat, to the second or the minute. For example, 23:40:15 or 23:40.
hh:mm:ss am or hh:mm am	12-hour format, to the second or the minute. For example, 11:40:15 a.m., 11:40 a.m., 11:40:15 p.m., or 11:40 p.m.

Verify that the format of the date and time entries are accepted by the system by gaining access to the help screen for the date and time fields.

Select **Display input variable** to display data as it is entered in one of the fields on the Report Input window. You must also enter, in the associated field, the variable name assigned to the report input field on the Define Input window.

Select **Display current ACD** to display the number or name of the ACD that was current when you ordered the report. You must type, in the associated **length** field, the number of characters from **1** to **20** for the current ACD. If you have defined names in the Dictionary subsystem for your ACDs, you can type 20 as 20 is the maximum length for Dictionary names.

Saving the Var/Time/Date fields

Click **Save** to close the Var/Time/Date window. CMS marks the field in one of the following ways:

- For **date**, CMS displays the format that you define, for example, mm/dd/yy.

- For **time**, CMS displays the format that you define, for example, hh:mmam.
- For **input variable**, CMS displays a string of dollar ($$$) signs with the number of dollar signs equal to the field length that you assign to the variable's input field on the Define Input window.
- For **current ACD**, CMS displays a string of dollar ($$$) signs with the number of dollar signs equal to the length that you assign in the Var/Date/Time window.

Saving the design

On Screen Painter, click **Save design**. If you have defined something incorrectly, CMS displays an error message. You must go back and correct any errors before saving the report design.

Chapter 6: Completing custom reports

Highlighting fields

For each CMS custom report, you can determine how the screen displays the colors and brightness levels of the text, data, and background. You can also administer color, brightness, reverse video, and underlining to emphasize individual fields and text in the report.

Note:
You cannot use the following procedure to change the way the screen displays bars. However, you can use the **Commands** screen-labeled key and the **Options: Color** submenu selection to change the threshold colors of the bars.

Perform the following tasks to change the way the screen displays fields and text in your report:

1. On Screen Painter, place the cursor in a position where you want one corner of a block to be, and select **Add highlights**.

   The system returns the cursor to the original position, and displays the following message on the status line:

   `Move cursor to define opposite corner of block, RETURN.`

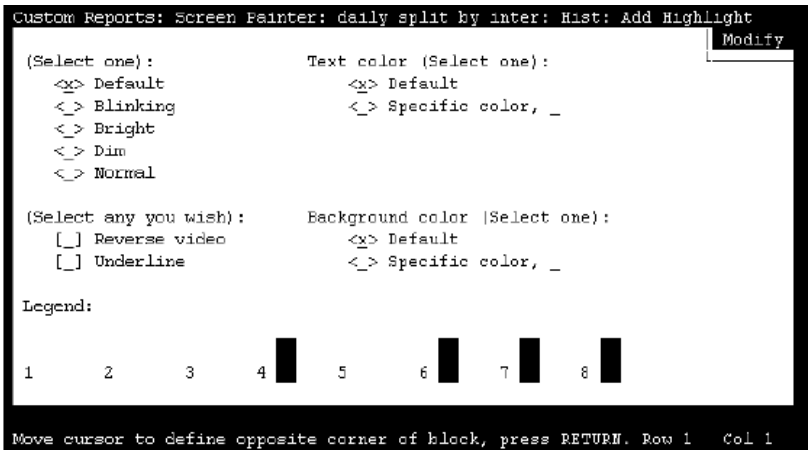
2. Move the cursor to a position where you want the opposite corner of the block to be. The block must include all the field text that you want to highlight.

   The system highlights the block that you are defining.

3. Press **Enter**.

   The system displays the Add Highlights window as shown in the following figure.

Figure 40: Sample of the Add Highlights window



4. Select from the following options.

Table 18: Options to highlight field text

Field option	Action
Default	Reflects the text and background settings administered for this terminal.
Blinking	Causes the text or data in the defined area to blink (continuous alternation between dim and normal brightness or foreground/ background colors).
Bright	Makes the text or data in the defined area bright. If your terminal does not have a bright capability, this field option equals the **Normal** field option. For some color terminals, dim or bright settings may affect the colors selected.
Dim	Makes the text or data in the defined area dim. If your terminal does not have a dim capability, this field option equals the **Normal** field option. For some color terminals, dim or bright settings may affect the colors selected.

Table 18: Options to highlight field text

Field option	Action
Normal	Makes the text or data in the defined area appear with a brightness level between dim and bright.
Reverse video	Reverses the brightness or color settings for text and background. The brightness and blinking options also affect the display of reverse video.
Underline	Draws a line under any text or data in the defined area. If you select **Reverse video**, the underline color or brightness is reversed.

5. Click **Modify** to close the Add Highlights window.

Defining stationary (no-scroll) areas

Many standard reports are bigger than the available space on your terminal. As a result, when you view the report, you must scroll the window to see data. You will notice that some report text or data fields do not move when you scroll the window. These stationary, that is, no-scroll parts of the report are usually column headers, column totals, and row identifiers.

The following figure shows the no-scroll parts in shaded areas.

Figure 41: No-scroll areas in a report

No-scroll areas apply only to reports that you are viewing on your terminal. If you view the report on your terminal, almost half of the right side of the report is hidden from view and you have to scroll to the right and data on the left is removed off the left side of the window. But while you scroll the data, the agent on the left remain in place so you always know which agent the data is for.

If you have more than 20 agents listed in the report, some rows of data at the bottom will be hidden. Thus, you have to scroll down to see the rows of data past 20 agents. Meanwhile, data at the top scrolls off the top of the window. However, the report title, the column headers, and the **Totals** row stay in place.

You can assign areas as no-scroll areas in custom reports. You can assign one no-scroll area on the left side of the report and one no-scroll area at the top of the report.

Perform the following tasks to define no-scroll areas in custom reports:

1. On Screen Painter, click **Upper/left no-scroll**.

   The system returns the cursor to the upper left corner of the report and displays the following message on the status line:

   `Move the cursor down and right. Press RETURN when finished`

2. To define a no-scroll area at the top, move the cursor down. To define a no-scroll area on the left, move the cursor to the right.

   The system highlights the no-scroll area as you move the cursor.

3. Press **Enter** to save the no-scroll area.

Changing a no-scroll area

Perform the following tasks to change a no-scroll area:

1. On Screen Painter, click **Upper/left no-scroll**.

   The system returns the cursor to a position at the edge of the top or left no-scroll areas and displays the following message on the status line:

   `Move the cursor down and right. Press RETURN when finished`

2. To change a no-scroll area at the top, move the cursor up or down the desired number of lines. To change a no-scroll area on the left, move the cursor to the right or left.

   The system highlights the no-scroll area that you add or removes the highlight for the no-scroll area that you delete.

3. Press **Enter** to save your changes.

Saving the report design

Before you exit Screen Painter, you must save your report design. If you do not save the design, all the work you did since accessing Screen Painter will be lost, including any work you did with secondary windows. You must save the design, even if you successfully test it with the **Test design** list option.

You cannot save a design that does not test successfully because there are errors. Do not run a report design until you have corrected any errors and the report test is successful.

Perform the following tasks to save your report design:

1. On Screen Painter, click **Save design**.

   The system displays Successful if there are no errors. If you did not define all the necessary elements of the design, the system displays the Save Design window with a list of errors.

   When there are errors in the design, the system might delete certain items from the design and the next time the design is read into Screen Painter, the system does not display these elements.

2. Do the following if the system displays errors:
   - Note the errors.
   - Press the **Exit** screen-labeled key.
   - Fix the errors on Screen Painter.

Note:
If you exit Screen Painter without first fixing the errors that you viewed in the Save Design window, CMS deletes the report items associated with the errors from Screen Painter.

After you save your design, you can continue to work on the design, test the design, or exit Screen Painter to work on the design at a later time.

Testing the report design

Instead of running a report and having the report fail because you had errors in your design, you can test the design directly from Screen Painter. Testing your report design regularly can save you time.

Perform the following tasks to test the report design:

1. On Screen Painter, click **Test design**.

   If your design has Phase 1 errors, the system displays a window listing the errors. For more information, see Test design error messages on page 118. If your design has no Phase 1 errors, the system displays the Test Design window with a copy of the Report Input window.

   The following figure shows a sample Test Design window with Phase 1 errors.

Figure 42: Sample of the Test Design window with Phase 1 errors

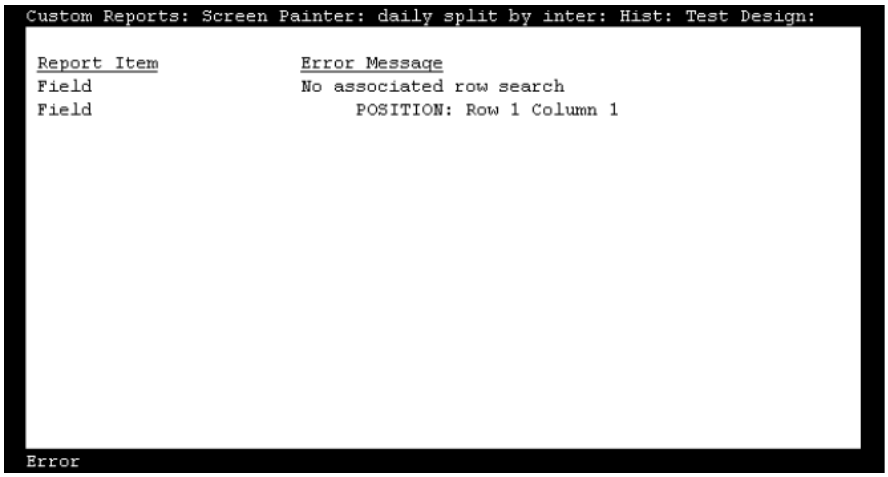
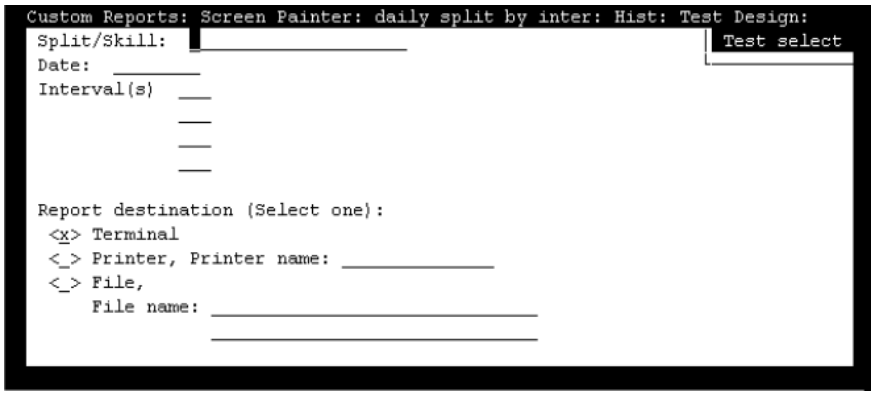


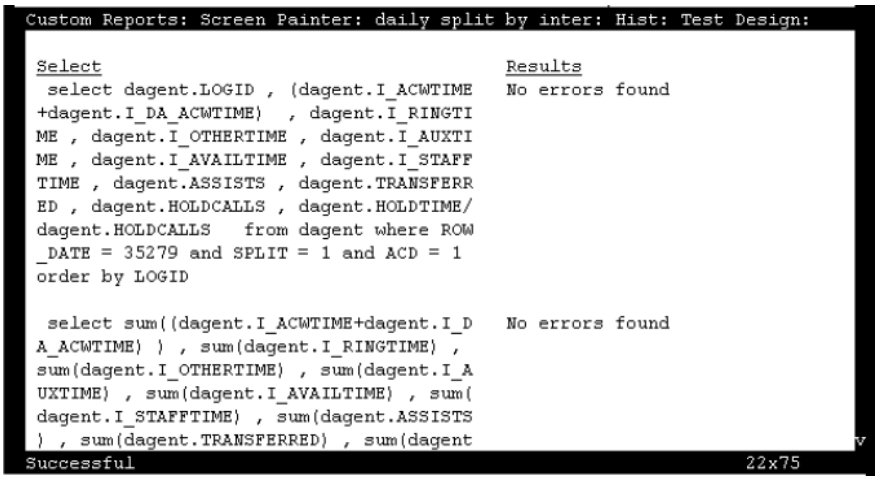
Figure 43: Sample of the Test Design input window



2. Complete the fields on the Report Input window, and click **Test select**.

   The system displays a list of the row search conditions as shown in the following figure, with a list of any Phase 2 errors. For more information, see Test design error messages on page 118. If you see Phase 1 errors, fix the errors and repeat the first step of this procedure. If you have no errors, the system displays a **No errors found** message in the window as shown in the following figure.

Figure 44: Sample of the Test Design window with no errors



3. Do the following if you have errors:
   - Note the errors.
   - Press the **Exit** screen-labeled key.
   - Fix the errors.
   - Click **Test design**.

- Repeat steps 1 and 2 in this procedure.

Note:
For real-time reports, the link to the switch must be up for the current ACD, and there must be data, for example Split 5, for the item that you are selecting.

If you have no errors, press the **Exit** screen-labeled key and continue with your design, or save the design and exit Screen Painter.

Test design error messages

Test design error messages are divided into the following categories:

- Phase 1 Error Messages that the system detects before displaying the sample input screen.
- Phase 2 Historical Error Messages that require user input before occurring.
- Phase 2 Real-Time Error Messages that require user input before occurring.

Phase 1 error messages

The following table lists the Phase 1 error messages alphabetically and includes a cause and a recommended solution for each message.

Table 19: Phase I error messages, causes, and solutions

Message	Cause	Solution
$<variable name> not defined	The *where* clause contains a variable that is not defined.	Use the **Define input** action to define the variable and remove the variable from the row search criteria.
Cannot mix aggregates and nonaggregates in the select	You specified aggregate columns and nonaggregate columns in the same select for real-time reports.	Create two identical row search conditions. Apply one condition to aggregate columns and the other to the nonaggregate columns.
Cannot use the SYN function for order by	You tried to use a synonym to sort the output.	Delete the SYN aggregate from the **Order by** field.

Table 19: Phase I error messages, causes, and solutions

Message	Cause	Solution
CMS system error-check the error log	A CMS system error occured while the select executed. The error should be recorded in the error log.	Check the error in the error log to initiate corrective action. **CAUTION:** If you run a report that merges data from two tables, especially table with large amount of data, into a single field and the **Select rows where** statement is not specific, you might see this error message. A cause can be that the number of rows that you selected is very large and CMS does not have space to create temporary files. if this is the case, add more *where* clauses to the row search conditions.
CMS system error-data collection off	CMS cannot test the row search criteria while the data collection is off.	Turn data collection on and rerun the test of the report design.
CMS system error-Too much data retrieved-try a more restrictive search	Too much data was retrieved with the given criteria.	Add more conditions to the row search criteria.

Table 19: Phase I error messages, causes, and solutions

Message	Cause	Solution
CMS system error-updating translations	CMS cannot test the row search criteria as CMS is receiving the set of configuration data from the switch.	Wait till the switch completes sending the configuration data and then rerun the test of the report design.
keyword AVG invalid in *where* clause	You used the AVG keyword in the row search criteria.	Delete the AVG keyword from the row search criteria.
keyword BETWEEN invalid for real-time	You used the BETWEEN keyword in the row search criteria for a real-time report.	Delete the BETWEEN keyword from the row search criteria.
keyword COUNT invalid in where clause	You used the COUNT keyword in the row search criteria.	Delete the COUNT keyword from the row search criteria.
keyword MAX invalid in where clause	You used the MAX keyword in the row search criteria.	Delete the MAX keyword from the row search criteria.
keyword MIN invalid in where clause	You used the MIN keyword in the row search criteria.	Delete the MIN keyword from the row search criteria.
keyword SUM invalid in where clause.	You used the SUM keyword in the row search criteria.	Delete the SUM keyword from the row search criteria.
keyword SYN invalid in where clause	You used the SYN keyword in the row search criteria.	Delete the SYN keyword from the row search criteria.

Phase 2 historical error codes

Phase 2 historical error codes contain the INFORMIX error codes to be displayed for CMS historical reports. Each code includes a description of the error and a corrective action.

These errors are reported in the following format:

```
INFORMIX error: <error number>
```

In addition, a circumflex (^) can be displayed in the listed Select statements to mark the location of an error.

Note:
If the system displays an error code that is not listed in this document, see *INFORMIX SQL Relational Database Management System Reference Guide*.

The following table lists the Phase 2 historical error codes.

Table 20: Phase 2 historical error codes

Error code	Description	Solution
—201	A syntax error has occured.	Check if an RDSQL statement is incorrect, key words are out of sequence, an INFORMIX-SQL reserved word is in the query.
—202	An illegal character is found in the statement.	Delete the illegal character, which is usually a nonprintable control character, and resubmit the statement.

Table 20: Phase 2 historical error codes

Error code	Description	Solution
—203	An illegal integer is found in the statement.	Integers must be whole numbers from -2,147,483,647 to +2,14,483,647. Check if you have included a number with a fractional portion or a number outside the acceptable range. Check if you have typed a letter instead of a number. For example, check for inputs such as 125p3 instead of 12503.
—204	An illegal floating-point number is found in the statement.	Check if you have typed a letter instead of a number. For example, check for inputs such as 125p3 instead of 125.03.
—206	The specified table name is not in the database.	Check the spelling of the table name.
—217	Column *column-name* not found in any table in the query.	Check the spelling of the database item and ensure that the item is in the database table. Verify the presence of required commas and quotes.
—219	Wildcard matching is not to be used with noncharacter types.	Check the data type of the column. Wildcards such as an asterisk (*) sign or a question mark (?) and characters enclosed in brackets [] can be used only the CHAR data types.

Table 20: Phase 2 historical error codes

Error code	Description	Solution
—220	There is no FROM clause in the query.	You must include a FROM clause in the query. Check if the line before the FROM keyword has an illegal character ($, #, &, email, or a CONTROL character).
—223	Duplicate table name *table-name* in the FROM clause.	Remove the redundant table name from the statement and use an alias to rename one of the tables.
—228	Cannot have negative characters.	Check if you have included a negative CHAR data type, for example, -a or -p.
—278	Too many ORDER BY columns. The maximum is eight ORDER BY columns.	Reduce the number of columns in the clause.
—280	Total size of ORDER BY column exceeds 120 bytes.	Reduce the number of characters in the clause. You can delete a CHAR column of more than 30 characters.
—282	Found a quote for which there is no matching quote.	Check if all quoted strings are terminated with a quote.
—284	A subquery has not returned exactly one value.	Check data for the subquery. Restructure the subquery by adding more components in the WHERE clause to get only one value.

Table 20: Phase 2 historical error codes

Error code	Description	Solution
—297	The SELECT list cannot contain a subquery.	Delete the subquery from the SELECT list.
—300	Too many GROUP BY columns. The maximum is eight GROUP BY columns.	Reduce the number of nonaggregate database items that are assigned the same row search ID that is also assigned to an aggregate function.
—301	The total size of the GROUP BY column exceeds 120 characters.	Reduce the number of nonaggregate database items that are assigned the same row search ID that is also assigned to an aggregate function. The total number of characters in all columns listed in the GROUP BY list must not exceed 120 characters.
—303	Expression mixes columns with aggregates.	Restructure your query such that columns and aggregates are not in the same expression.
—309	ORDER BY database item must be included in a report field to which the row search ID is assigned.	Check if the database items included in the ORDER BY clause are displayed in the report and are assigned to a row search ID.

Table 20: Phase 2 historical error codes

Error code	Description	Solution
—324	Ambiguous database item.	A database item in your row search criteria is in more than one table also cited in your row search criteria. Prepend each database item with the correct table name.
—352	Database item not found.	Check the spelling of the database item.
—367	Sums and averages cannot be computed for character columns.	In the aggrgate function, delete any database item of a string type, that is, VDN, LOGID, or email.
—522	A database item in a field or bar does not exist in the table specified in the row search ID of the field.	Check the SELECT statement that has an error. The database item that is not in the table is marked with a circumflex (^). Change or delete the database item or change the table in the row search ID of the field.
—809	RDSQL syntax error has occured.	Check if an RDSQL statement is incorrect, key words are out of sequence, an INFORMIX-SQL reserved word is in the query.

Table 20: Phase 2 historical error codes

Error code	Description	Solution
—1202	An attempt to divide by zero.	Ensure that you do not divide a numerical column type by a character column type. For example, 16/Jones. Also, check if the value of the divisor is equal to zero.
—1203	Values used in MATCH must be of type CHARACTER.	Verify that the values included in the MATCH conditions are of type CHAR. Use another comparison condition for nonCHAR types.
—1204	Invalid year in date.	Acceptable years are from 0001 to 9999. If you use two digits, RDSQL uses the year as 19xx. Check the value in the date field.
—1205	Invalid month in date.	Valid month entries are from 1 to 12. Check the value in the date field.
—1206	Invalid day in date.	Valid entries are from 1 to 31. Check the value in the date field.
—1226	Decimal or money value exceeds maximum precision.	Increase the precision of the DECIMAL or the MONEY field.

Phase 2 real-time error codes

Phase 2 real-time error codes contain the real-time Database Manager error codes. Each code includes a description of the error and a solution.

These errors are reported in the following format:

```
CMS Database Manager error: <error number>
```

The system displays a circumflex (^) in the listed Select statements to mark the location of an error.

The following table lists the Phase 2 real-time error codes.

Table 21: Phase 2 real-time error codes

Error codes	Description	Solution
—1	A syntax error has occured.	Verify that keywords are not incorrect or out of sequence.
—2	An illegal character is found in the SELECT statement.	Delete the illegal character, which is usually a nonprintable control character.
—3	The specified table name is invalid.	Verify that the table name is correct and also check for required commas in the **From tables** field.
—4	The specified column is invalid.	Verify that the column name is correct.
—5	Selection of a mixture of aggregates and nonaggregates is not allowed in real-time reports. This error code also indicates a comparison with mismatched types.	Create two identical row search conditions, and apply one search condition to aggregate columns and the other condition to nonaggregate columns.
—6	Bad column in ORDER BY clause.	Verify that the column name in the ORDER BY clause is correct and that the column is selected by one of the fields included in the row search.

Table 21: Phase 2 real-time error codes

Error codes	Description	Solution
—7	Bad index in ORDER BY clause.	The ORDER BY clause must have a column in the SELECT clause or a number that indicates a position of the column in the SELECT clause.
—8	Bad argument given to an aggregate function. For example, you cannot take a SUM or AVG of a character column.	Verify that the data type in the argument is correct.
—9	Wrong data type in SELECT of one of the fields associated with the row search. For example, you cannot use arithmetic with characters.	Verify that the data type and the action on the data type match.
—10	Error with subquery.	Verify that the subquery in the WHERE clause is supported by CMS. You will see this error code when you embed a SELECT clause within another SELECT clause. This error can occur with Agent Group report.
—11	CMS system error.	Check the error logs.
—12	Memory allocation error.	Check the error logs.
—13	Query cannot select more than one table.	Check the error logs.

Running custom reports

You can run custom reports using steps similar to steps that you use to run standard reports. However, you run custom reports from the Custom Reports Main Menu option. Also, the Report Input window shows input fields that you defined on the Define Input window for the report.

For real-time reports, the Report Input window also automatically shows a **Refresh rate in seconds** field. For historical reports, the Report Input window automatically shows report destination fields.

Perform the following tasks to run custom reports if Global Dictionary/ACD Groups is unauthorized or when the current ACD is set to nongroup ACD:

1. Select the Custom Reports Main Menu option.

   The system displays the **Custom Reports** submenu.

2. Select the **Real-time** or **Historical** submenu option.

   The system displays a submenu of custom reports, that is, real-time or historical. The list includes all existing global reports and your private reports.

3. Select a report to view the Report Input window for the report.

   Note:
   If more than 20 custom reports are available, scroll the submenu to find the report that you want to view. Scroll down with the down arrow key. Scroll up with the up arrow key.

4. Complete the fields of the Report Input window, and click **Run**.

   The system displays Working on the status line of the Report Input window. If the destination is the terminal, the system displays the report. If the destination is a printer or file, the system displays Successful.

Perform the following tasks to run Custom Reports if Global Dictionary/ACD Groups is authorized:

1. Select the Custom Reports Main Menu option.

   The system displays the Custom Reports submenu.

2. Select the **Real-time** or **Historical** submenu option.

   The system displays a submenu of custom reports, that is, real-time or historical. Each list, real-time or historical, includes a submenu that lists the reports. The lists display reports that meet the following conditions:

   - If you define a report as **ACD Single Only**, the system:
     - Displays the ACD report when the current ACD is administered as **single ACD**.
     - Does not display the ACD report when the current ACD is administered as **group ACD**.

- If you define a report as **ACD Group Only**, the system:
  - Does not display the ACD report when the current ACD is administered as **single ACD**.
  - Displays the ACD report when the current ACD is administered as **group ACD**.
- If you define a report as **Both Single ACD and Group ACD**, the system displays the ACD report regardless of the current ACD administration.

3. Select a report to view the Report Input window.

Note:
If more than 20 custom reports are available, scroll the submenu to find the report that you want to view. Scroll down with the down arrow key. Scroll up with the up arrow key.

4. Complete the fields of the Report Input window, and click **Run**.

   The system displays Working on the status line of the Report Input window. If the destination is the terminal, the system displays the report. If the destination is a printer or file, the system displays Successful.

Note:
If your custom report is not listed, try changing your current ACD. For example, if you cannot find a custom report that you previously defined as a ACD Group Only, change the current ACD to a group ACD, and your report will be listed.

Chapter 7: Advanced report design

Creating a custom data table

The section of the CMS database that stores historical ACD data uses the INFORMIX SQL (ISQL) Relational Database Management System (RDBMS). All historical ACD data available for use in custom reports is stored in tables in the CMS database.

You can gain access to INFORMIX and the CMS database to build your own data tables that contain information such as financial information and product or service-related information. You can then design historical custom reports to display the data, with or without ACD data.

You must choose the appropriate procedure based on your CMS version. If the CMS version that you have is:

- R3V8 or earlier, follow the steps in Gaining access to the CMS database in INFORMIX SE on page 132.
- R3V9 or later, contact Avaya Professional Services.

Note:

Instructions on the use of INFORMIX SQL are included in this document for convenience. These instructions are not intended as a substitute for the INFORMIX documentation. Except where noted, the standard rules of INFORMIX SQL apply, as documented in *INFORMIX-SQL Relational Database Management System User Guide* for INFORMIX SQL. If you purchased ISQL with CMS, the INFORMIX document is available with your CMS software and documents.

CAUTION:
CMS does not automatically check the database for disk space used by data in the custom tables. Therefore, you can use up all your disk space with custom data. When this happens, you can lose or damage custom data and ACD data. Therefore, if you create custom data tables, regularly check the disk space. For more information, see *Avaya Call Management System Admnistration*.

CAUTION:
If you back up data using the Maintenance-Backup Data window, data stored in custom INFORMIX tables is saved. The custom table definitions, that is, table names, column names, or data types, are not saved. As a result, if you lose the custom table definitions because of a disk failure, power hit, or some other reason, you cannot restore these table definitions using the Backup Data window. Because the custom table definitions will be lost, you cannot restore custom data that was saved using the Backup Data window.

For this reason, we recommended that you make backups of the custom table definitions using the UNIX system/Solaris system. If you lose INFORMIX table definitions or custom data, you can restore the table definitions using UNIX, then restore the custom data. For more information, see *Avaya Call Management System Administration*.

Perform the following tasks to define custom data tables:

1. Gaining access to the CMS database in INFORMIX SE on page 132.
2. Building the table on page 133.
3. Adding data to the table on page 140.

Gaining access to the CMS database in INFORMIX SE

Perform the following tasks to gain access to the CMS database in INFORMIX:

1. Press the **Commands** screen-labeled key.

   The system displays the **Commands** submenu.
2. Select **UNIX**.

   The system closes all menus and windows, and displays the UNIX prompt.
3. At the $ prompt, type the following command:

   ```
   DBPATH=/cms/db/inf
   ```
4. Press **Enter**.
5. Type the following:

   ```
   export DBPATH
   ```

6. Press **Enter**.

   The system displays the UNIX prompt.

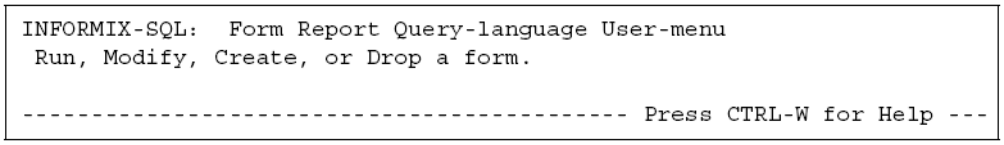
7. At the $ prompt, type the following pathname:

   /usr/informix/bin/isql

8. Press **Enter**.

   The system displays the INFORMIX logo and the INFORMIX main menu as shown in the following figure.

Figure 45: INFORMIX main menu



Building the table

In INFORMIX, you can select menu items in the following ways:

- Use arrow keys to move the cursor to the menu option, and press **Enter**.
- Type the first character of the menu option.

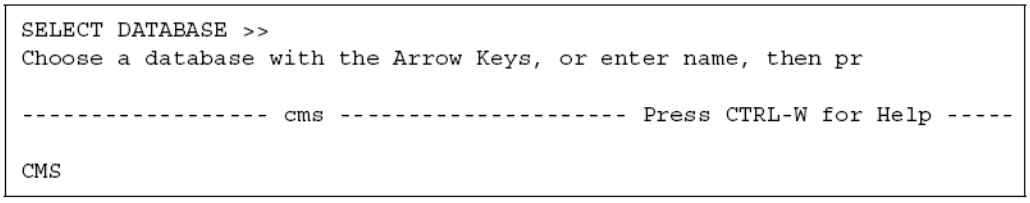
Note:
To escape from a step and go back to the previous step, press **Del or Delete**, depending on your keyboard.

Perform the following steps to build a table:

1. On the INFORMIX main menu, select **Table**.

   The system displays the Select Database screen as shown in the following figure.

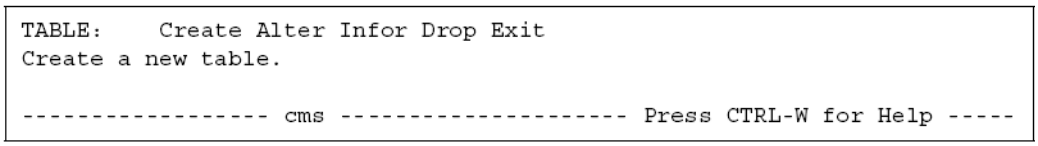
Figure 46: INFORMIX Select Database screen



2. Type **cms**, and press **Enter**.

   The system displays the **Table** menu as shown in the following figure.

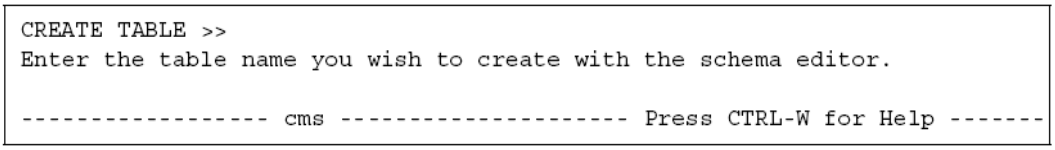
Figure 47: INFORMIX Table menu



3. Select **Create**.

   The system displays the Create Table screen as shown in the following figure.

Figure 48: INFORMIX Create Table screen



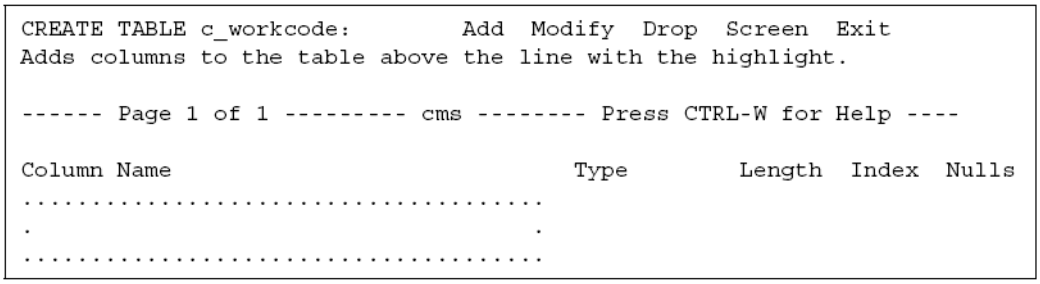
4. Type a table name of up to 18 characters. The table name must begin with the letter c in the lowercase followed by an underscore, that is, c_. For example, type tha following:

   c_workcode.

5. Press **Enter**.

   The system displays the **Create Table** menu with a highlighted box under the column with title **Column Name** as shown in the following figure.

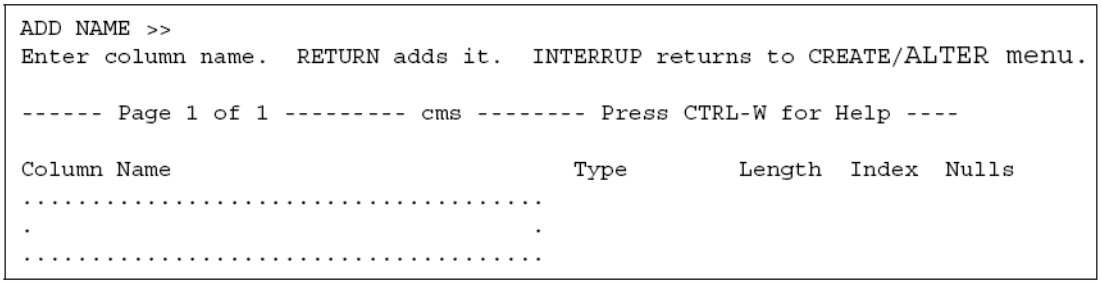
Figure 49: INFORMIX Create Table menu



6. Select **Add**.

   The system displays the Add Name screen as shown in the following figure.

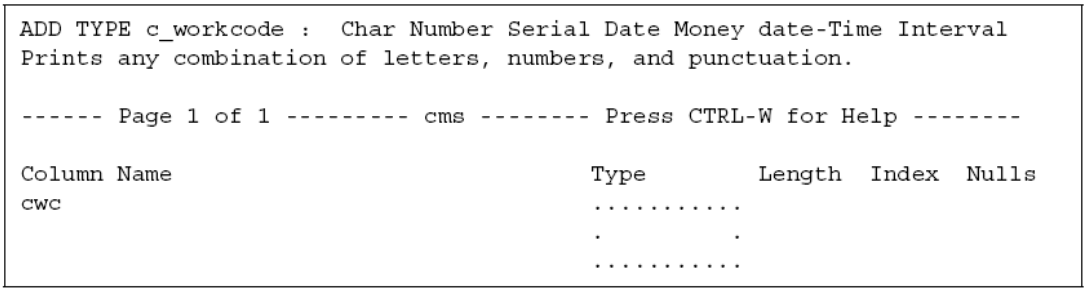
Figure 50: INFORMIX Add Name screen



7. Type a column name of up to 18 characters. You can use names of the standard CMS database items, but only if you type the name in lowercase letters in the Dictionary subsystem. The Dictionary: Custom Items window accepts only lowercase letters for custom item names that are the same as standard database items.
8. Press Enter.

   The system displays the Add Type screen as shown in the following figure.

Figure 51: INFORMIX Add Type screen



9. Select the following data type for the field.

Table 22: Data types

Data type	Description
Char	This data type stores any combination of letters, numbers, and symbols.
Number	This data type stores only numbers of the following types: • Decimal: Contains a decimal point. • Smallint: Contains integers from -32,767 to +32,767. • Integer: Contains integers from -2,147,483,647 to +2,147,483,647. • Smallfloat: Contains floating point numbers with up to seven significant digits. • Float: Contains floating point numbers with up to 14 significant digits.
Serial	This data type stores a unique sequence number in each row of the table.
Date	This data type stores calendar dates with the format mm/dd/yy.
date-Time	This data type is not supported by CMS Custom Reports, but is supported by INFORMIX. You must type **T** to select this data type. You can type a database qualifier for year, month, day, hour, or minute.

Table 22: Data types

Data type	Description
Interval	This data type is not supported by CMS Custom Reports, but is supported by INFORMIX. You can type a database qualifier for year, month, day, hour, or minute.
Money	This data type is not supported by CMS Custom Reports, but is supported by INFORMIX. If your data is in dollars and cents, you must use Decimal.

Note:
The additional prompts that the system displays vary based on the data type that you select.

10. Respond to the prompts that the system displays to complete the definition of the column. The prompts and the sequence depends on the data type that you select. The following table lists the prompts.

    After you respond to all of the prompts for the column, the system displays a new highlighted line in the table and the **Add Name** field at the top of the screen.

Table 23: Prompts for data types

Prompts	Action
PRECISION	Select **Smallfloat** or **Float**. The system displays PRECISION for the Float data type.
INDEX	Type y to make the column an index. The system displays INDEX for all data types except Serial because the column with the Serial data type automatically becomes an index. Make a column an index only if the column is to be used for row searches and the table contains more than 200 rows of data.

Table 23: Prompts for data types

Prompts	Action
DUPLICATES	The system displays the DUPLICATES prompt if you answer yes to an INDEX prompt. Enter **y** to allow the column to contain the same value in different rows. For example, if a column contains the last name of people, you can allow multiple entries of people with the same last name, but with a different first name. If you create a column containing social security numbers, enter **n** to prevent multiple entries. The system displays DUPLICATES for all data types, except Serial.
NULLS	Enter **y** to allow the column to have rows with no value. For example, if you create a table for customer data and you add a column for the customer's employer, you can allow null values for customers who are unemployed or self-employed. Enter **n** to require a value in each row. The system displays NULLS for all data types, except Serial.
ADD STARTING NUMBER	Assign a number that INFORMIX must use as the starting point for numbering rows. INFORMIX identifies the first row in the table with the number that you assign. As you add new rows to the table, INFORMIX assigns the next number in the sequence. The system displays ADD STARTING NUMBER only for the Serial data type.
NUMERIC	Type the first letter of the numeric that you want: Integer, Smallint, Decimal, or Float.

Table 23: Prompts for data types

Prompts	Action
LENGTH	Enter the number of digits that the column must store for a single piece of data. The system displays LENGTH for the Char and Decimal data types.
SCALE	Enter the number of digits that you want the system to display to the right of the decimal point. The decimal digits, and not the decimal point, occupy part of the field length that you specify LENGTH. For the Decimal data type, the system displays SCALE after LENGTH.

11. To add more columns, repeat the procedure from step 6.
12. After you add the columns, press **Enter** till the system displays the **Create Table** menu with your values as shown in the following figure.

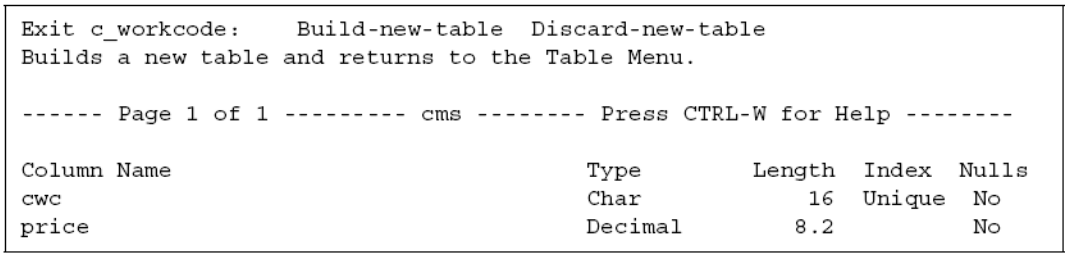
Figure 52: INFORMIX Create Table menu with values

```
ALTER TABLE c_workcode :    Add  Modify  Drop  Screen  Exit
Adds columns to the table above the line with the highlight.

------ Page 1 of 1 --------- cms -------- Press CTRL-W for Help --------

Column Name                              Type        Length  Index  Nulls
cwc                                      Char            16  Unique  No
price                                    Decimal        8.2          No
.....................................
.                                    .
.....................................
```

13. Select **Exit**.

    The system displays the **Build-new-table** menu as shown in the following figure.

Figure 53: INFORMIX Build-new-table menu



14. Select **Build-new-table**.

    The system displays the **Table** menu. The system adds the table if the system finds no errors. If the system finds errors, you must go back to the Alter Table screen and correct the errors. You must then repeat steps 11 and 12 until the system displays the **Table** menu.

15. Select Exit.

    The system displays the INFORMIX main menu.

Adding data to the table

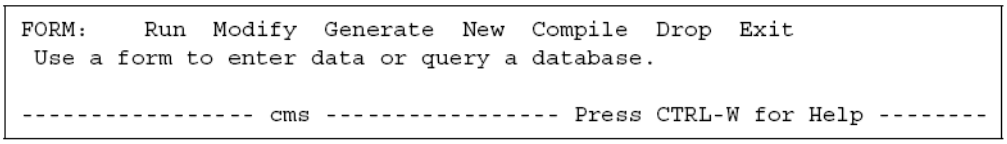
To add data to the table, you must first create a data entry form for your table. For more information about forms, see *INFORMIX-SQL Relational Database Management System User Guide*.

Perform the following tasks to add data to the table:

1. On the INFORMIX main menu, select **FORM**.

   The system displays the **FORM** menu as shown in the following figure.

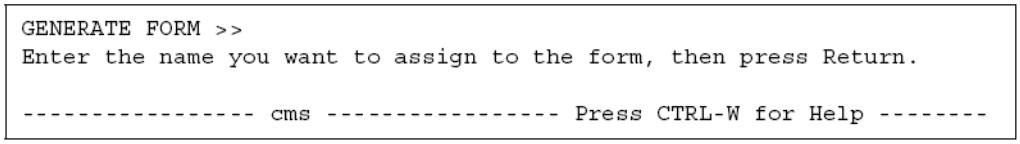
Figure 54: INFORMIX FORM menu



2. Select **Generate**.

   The system displays the GENERATE FORM screen as shown in the following figure.

Figure 55: INFORMIX GENERATE FORM screen

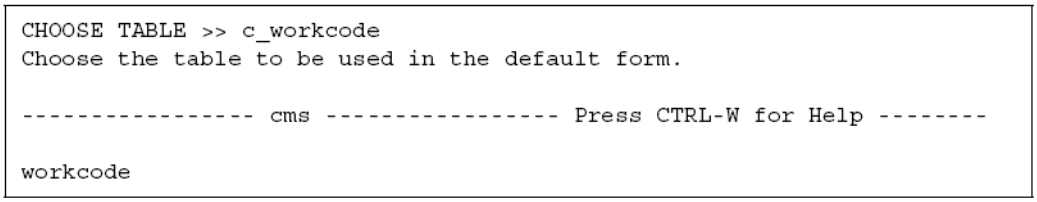


3. Type a name of up to 10 characters for the form, and press **Enter**.

Note:
You can use the table name as the form name.

The system displays the CHOOSE TABLE screen as shown in the following figure.

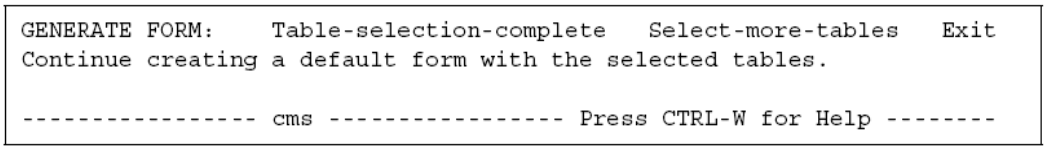
Figure 56: INFORMIX CHOOSE TABLE screen



4. Type the name of the table for which you want to enter data, and press **Enter**.

   The system displays the **Table-selection-complete** menu as shown in the following figure.

Figure 57: INFORMIX Table-selection-complete menu



5. Select **Table-selection-complete** menu.

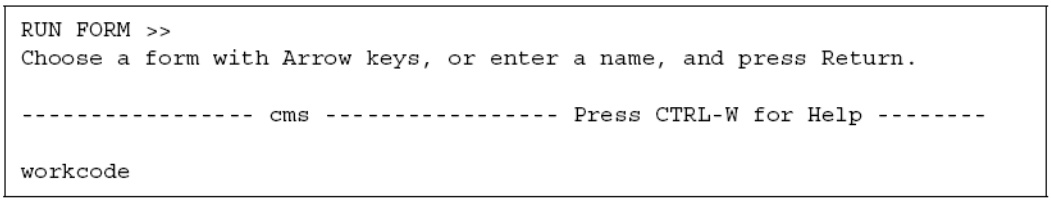
   The system displays the following message after processing the form, and then displays the **FORM** menu:

   The screen form specification was successfully compiled.

6. Select **Run**.

   The system displays the RUN FORM window and the table that you selected as shown in the following figure.

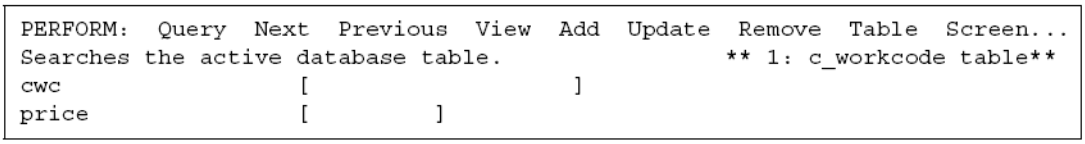
Figure 58: INFORMIX RUN FORM window



7. Press **Enter**.

   The system displays the **PERFORM** menu as shown in the following screen.

Figure 59: INFORMIX PERFORM menu



8. Select **Add**.

   The system moves the cursor to the first column in the table.

9. Type data for the first column of the table, and press **Enter**.

   The system moves the cursor to the next column. If you view an error message, you might have typed data in an incorrect format.

10. Repeat step 9 for each column.

11. Press **Esc** to save the row of data.

    The system displays the following message indicating that the row is added to the table and saved.

    Row added

12. Repeat from step 8 for each row of data that you want to add to the table.

13. Type **e** three times to exit INFORMIX, where e means Exit.

    The system displays the UNIX prompt.

14. Press **Ctrl + b**.

    The system displays the CMS windows that were displayed before you gained access to UNIX.

Note:
To design a custom report that uses data from the table, you must also type the column names (database items) in the Dictionary: Database Item: Custom Items window.

CAUTION:
CMS does not automatically check the database for disk space used by data in custom tables. As a result, you can inadvertently fill up your disk with custom data. When this happens, you can lose or damage custom data and ACD data. Therefore, if you create custom data tables, regularly check the amount of disk space available. For more information, see *Avaya Call Management System Administration*.

Modifying a table

Perform the following tasks to add, change, or delete columns in an existing table:

1. On the INFORMIX main menu, select **Table**.

   The system displays the Select Database screen.
2. Press **Enter** to view the **Table** menu.
3. Select **Alter**.

   The system displays the ALTER TABLE screen and a list of existing tables.
4. Type the name of the table that you want to change, and press **Enter**.

   The system displays the **ALTER TABLE** menu.

Adding a column

Perform the following tasks to add a column:

1. Select **Add** to add a new column.

   The system displays the ADD NAME screen.
2. Complete the fields for the new column.
3. Press **Del** after you complete adding the columns, and go to Deleting a column on page 144.

   The system displays the **ALTER TABLE** menu.

Changing a column

Perform the following tasks to change a column:

1. Select **Modify**.

   The system displays the MODIFY NAME screen.
2. Use the arrow keys to select a field to change.

3. Press **Del** after you complete changing the columns, and go to Deleting a column on page 144.

   The system displays the **ALTER TABLE** menu.

Deleting a column

Perform the following tasks to change a column:

1. Use the arrow keys to move the cursor to the column, and select **Drop**.

   The system displays the REMOVE screen.

2. Select **YES** to remove the column.

   The system removes the column and displays the **ALTER TABLE** menu.

3. At the **ALTER TABLE** menu, select **Exit** after you complete changing the table.

   The system displays the **Build-new-table** menu.

4. Select **Build-new-table** to save your changes. Select **Discard-new-table** to ignore the changes.

Note:
If you change columns in a table, rebuild the form that you assigned to the table.

Changing data in a table

Perform the following tasks to add, change, or delete data in an existing table:

1. On the INFORMIX main menu, select **FORM**.

   The system displays the **FORM** menu.

2. Select **Run**.

   The system displays the RUN FORM screen and a list of forms.

3. Type the name of the form, and press **Enter**.

   The system displays the **PERFORM** menu.

Adding rows of data to a table

Perform the following tasks to add rows of data to a table:

1. Select **Add**.

   The system displays the column fields of the table with the cursor in the first field.

2. Enter data in the fields. Press **Tab** to move between fields.

3. Press **Esc** after you add a row of data.

   The system displays the **PERFORM** menu and the following message:

   ```
   Row added
   ```

Changing rows of data in a table

Perform the following tasks to change rows of data in a table:

1. Select **Query**.

   The system displays the column fields of the table with the cursor in the first field.

2. Enter data in the column that you want to search on, and press **Esc**.

   The system fills data in the column fields for the row.

3. Select **Update**, and press **Enter**.

   The system displays the Update screen.

4. Use the arrow keys to move the cursor to the data that you want to change. Overwrite the data, and press **Esc**.

   The system displays the **PERFORM** menu and the following message:

   ```
   This row has been changed.
   ```

Deleting rows of data from a table

Perform the following tasks to delete rows of data from a table:

1. Select **Query**.

   The system displays the table's column fields with the cursor in the first field.

2. Enter data in the column that you want to search on, and press **Esc.**

3. Press **Esc**.

   The system displays the **PERFORM** menu.

4. Select **Remove**.

   The system displays the REMOVE ROW screen.

5. Select **YES** to delete the row.

   The system deletes the row of data and displays the following message:

   ```
   Row deleted
   ```

Including forecast data in custom reports

Forecasting is a separately purchased feature of CMS. If you have not purchased Forecasting, you cannot run forecasts and, therefore, cannot include forecast data in a custom report.

Important:
For historical custom reports only, you can design reports that include current day forecast data. Only current day forecast data is available for custom reports because current day is the only forecast data saved in the CMS database.

The steps for creating a custom report with forecast data are almost identical to the steps for creating any other custom report. As with any other type of data, you must specify the database items, tables, row search conditions, and report input fields.

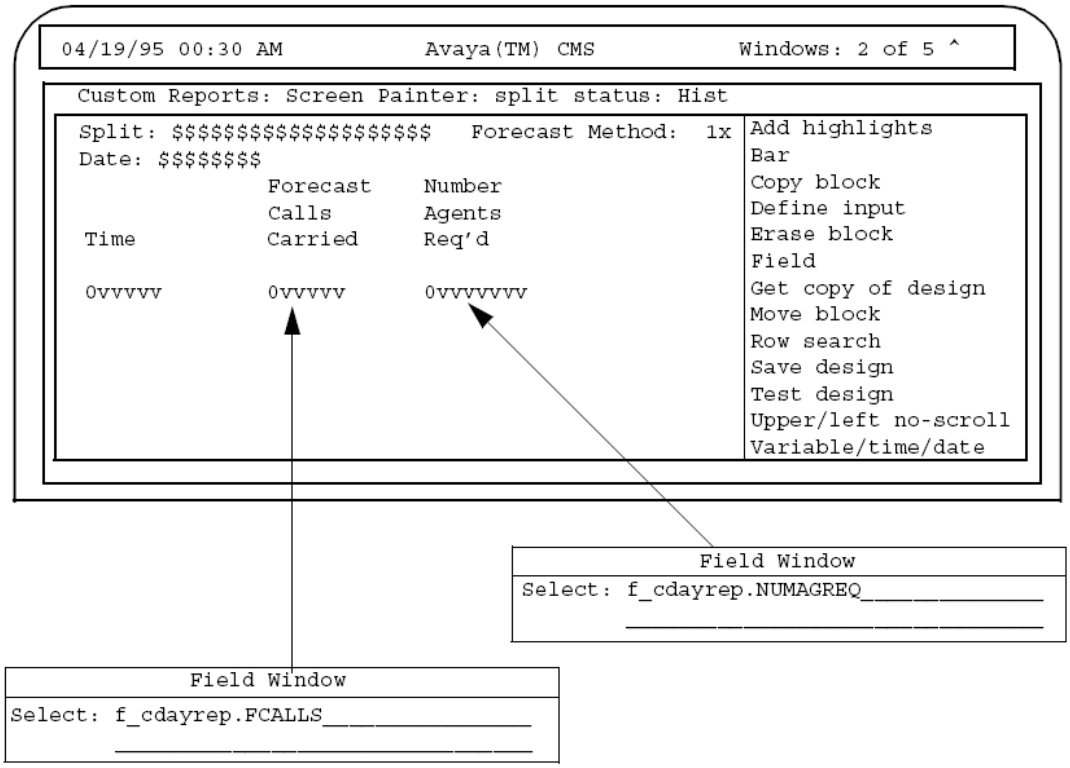
However, there are two differences:

- You cannot copy a standard current day forecast report on Screen Painter. The system does not display the Current Day forecast data if you click **List all** in the Get Copy window.
- CMS stores current day forecast data in two separate tables:
  - **f_cday** table that contains forecast administrative data entered in the Current Day Configuration window.
  - **f_cdayrep** table that contains the agent positions required and forecast calls carried data, as well as objectives entered in the Call Handling Profiles window.

For a list of all the database items that the tables contain, see *Avaya Call Management System Database Items and Calculations*.

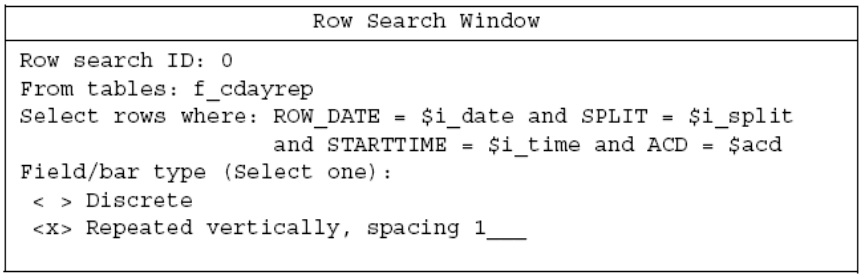
If you design a very abbreviated version of the current day forecast report, the design is similar to the following figure:

Figure 60: Sample of a Forecast report design



As shown in this figure, Row search ID 0 is assigned to the **Time**, **Forecast Calls Carried**, and **Number Agent Req'd** fields. The conditions for Row search ID 0 can be as shown in the following figure.

Figure 61: Row search conditions for Forecast data

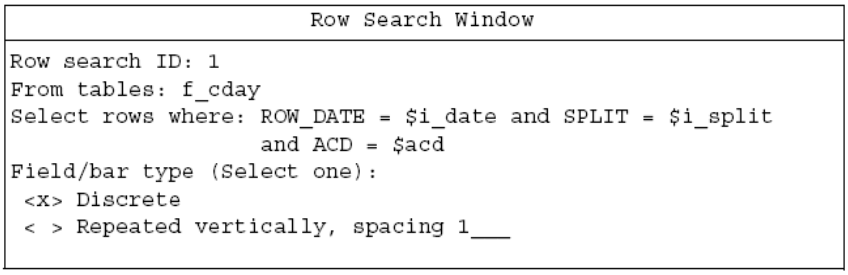


As in historical interval reports for splits, the statement in Row search ID 0 searches for rows based on values for STARTTIME, ROW_DATE, and SPLIT.

As shown in Figure 60: Sample of a Forecast report design on page 147, Row search ID 1 is assigned to the **Forecast Method** field. The database item for this field is FMETHOD. The **f_cday** table stores FMETHOD, but the **f_cdayrep** table does not store FMETHOD. This is an example of how current day forecast data is divided between the two tables.

However, in the following figure, the Row search ID 1 has row search conditions that are almost identical to the row search conditions in Figure 61: Row search conditions for Forecast data on page 147.

Figure 62: Similar row search conditions for Forecast data



The only differences between Row search ID 0 and Row search ID 1 are the table selections and the field types.

In the standard Current Day Forecast, FMETHOD normally displays a character string, either Seasonal trending, Current trending, or No trending. However, the CMS database actually stores a number to represent each method. Therefore, if you include the FMETHOD database item in a report, CMS displays a number, not a character string, in the report.

For more information, see *Avaya Call Management System Database Items and Calculations*.

You can retrieve data from the Current Day Configuration Forecast (**f_cday**) table if you specify an appropriate call handling profile for the dates. For retrieval of data from the Current Day Forecast Report (**f_cdayrep**) table, Forecast Manager must run for the particular date for which the report is run.

Including exceptions data in custom reports

Important:
For historical custom reports only.

You can design reports that include exceptions data. For more information about exceptions tables, see *Avaya Call Management System Database Items and Calculations.*

The steps for creating a custom report with exceptions data are almost identical to the steps for creating other custom reports. As with any other type of data, you must specify the database items, the tables, the row search conditions, and the report input fields.

However, you cannot copy any standard exceptions report on Screen Painter. The system does not display the exceptions reports if you click **List all** in the Get Copy window.

In each exceptions table, the database item EXTYPE stores the types of exceptions that occurred. However, exception types are stored as numbers, not as character strings. If you want your report to list the types of exceptions that occurred, the types must be listed as numbers. For a description of these numbers, see *Avaya Call Management System Database Items and Calculations*.

The following figure shows an example of a VDN exceptions report.

Figure 63: VDN Exceptions report

VDN Exceptions

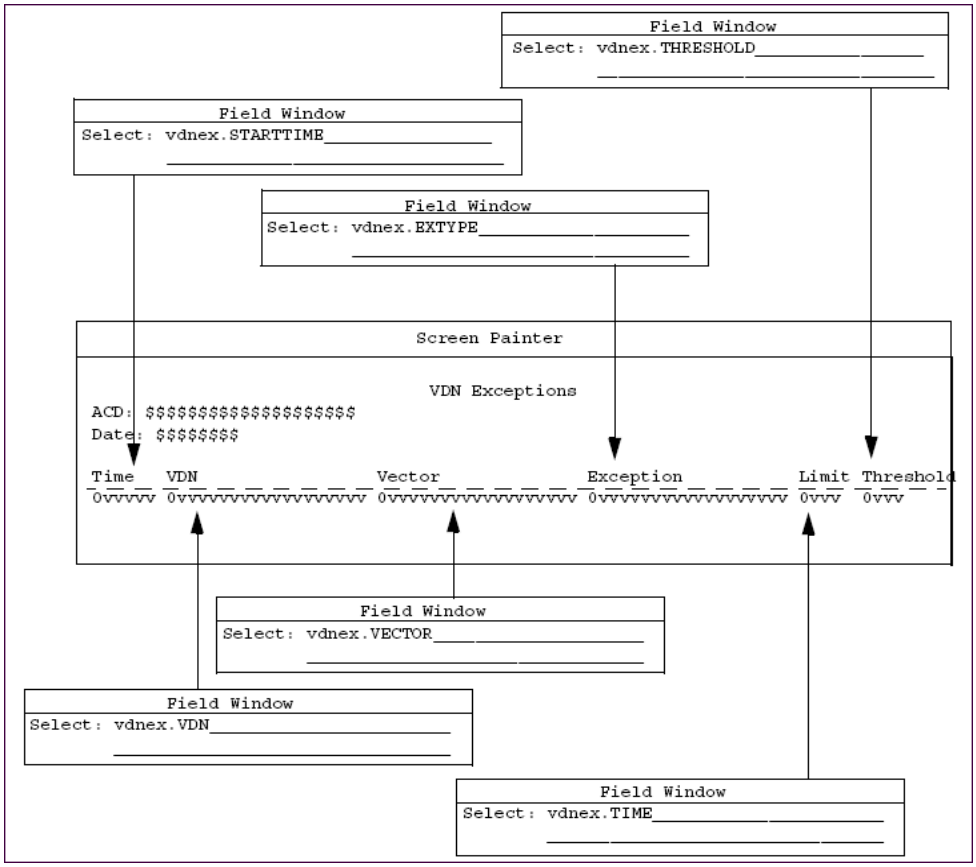
ACD: burbank Printed 04/10/93 04:35 PM

Date: 04/09/93

Time	VDN	Vector	Exception	Time Limit	Threshold
09:16AM	Catalog Sales	Weekday Sales	Number calls abandoned in vector		20
09:24AM	Catalog Sales	Weekday Sales	Calls in ACD split queue		10
10:02PM	Catalog Sales	Weekday Sales	Calls disconnected		50

If you design a custom exception report to replicate the standard VDN exceptions report, the design looks similar to the following figure.

Figure 64: Custom Exceptions report



This figure is an example of the report that results from the design shown in the following figure.

Figure 65: VDN Exceptions report design

VDN Exceptions

ACD: burbank Printed 04/10/93 04:35 PM

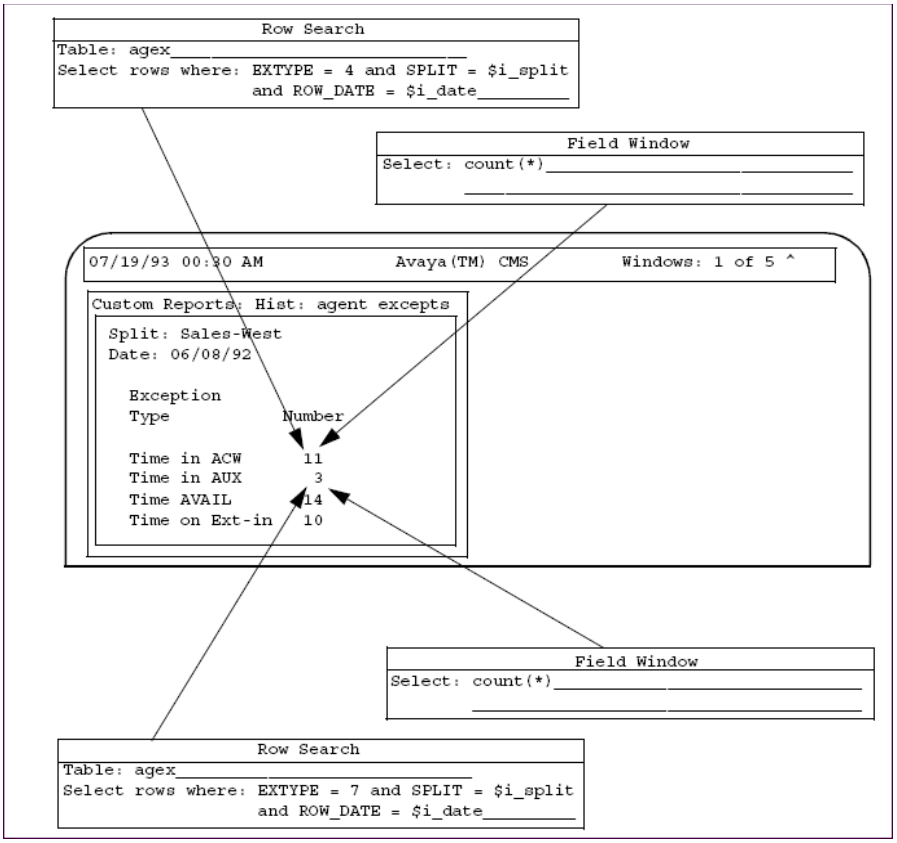
Date: 04/09/93

Time	VDN	Vector	Exception	Time Limit	Threshold
09:16AM	Catalog Sales	Weekday Sales	37	32	20
09:24AM	Catalog Sales	Weekday Sales	37	30	10
10:02PM	Catalog Sales	Off-hour Sales	76	73	50

The report is displayed this way because CMS exceptions tables store the exception types as numbers.

However, another way of designing an exceptions report would be to use count(*) for the exception field. You could then include a specific exception type as part of the row search as shown in the following figure. CMS would then count the rows that had that exception type and display the total in the report.

Figure 66: Custom Exceptions report using count (*)



The row search statement for the first field searches for exception type #4 (Time in ACW) for a particular date and split. Because the field is count(*), the field displays the total number of rows that had exception type #4 for the date and split.

Similarly, the row search statement for the second field searches for exception type #7 (Time in AUX) for a particular date and split. Again, because the field is count(*), the field displays the total number of rows that had exception type #7 for the date and split.

Note:

For retrieval of data from an exceptions table, you can only retrieve data for those exceptions that have been turned on for the particular split or agent that have actually occurred and have not been deleted from the database because they exceeded the storage parameters for exceptions.

Selecting rows from more than one table

Important:
For historical reports only.

You can merge data from two tables into a single report field. You can, for example, take the number of ACD calls a single agent handled (where data is taken from the dagent table) and divide by the total ACD calls handled by the agent's split (where data is taken from the dsplit table). You can also take the ACD calls a split handled in an intrahour interval (where data is taken from the hsplit table) and divide by the total ACD calls the split handled for the day (where data is taken from the dsplit table).

To merge data from two tables into a single report field:

- The two tables must have at least one database item in common. Typically, the database items in common are indexes.
- You must enter both table names in the Table field of the Row Search ID assigned to the field.
- For custom historical reports, you can use data from more than one table and use the same row search ID for multiple tables.
- At least one *join* clause must be included in the Row search ID assigned to the field. A *join* clause searches for the same value for the same item in both tables. In this way, the data extracted from the rows in both tables is related.

  A *join* clause has the following format:

  ```
  tablename1.item1 = tablename2.item1
  ```

  Where item1 is a database item that the tables have in common.
- You must prepend the table name to each database item included in the Select rows where: statement. This rule applies to all database items, including the database items that are not in a *join* clause.
- A *join* clause must use a database item that is also included with a regular *where* clause (one that directly assigns a value or variable name to the database item).

Note:
The syntax of a *join* clause is similar to the standard INFORMIX SQL syntax. For more information, see *INFORMIX-SQL Relational Database Management System User Guide*.

CAUTION:
If you run a report that merges data from two tables (particularly tables with large amounts of data) into a single field and your Select rows where statement is not specific, you can receive an error message when you test the design. The cause might be that the number of selected rows is very large and CMS does not have space to create temporary files. If this is the case, you must add additional *where* clauses to the row search criteria.

You might need several *join* clauses in a row search criteria statement. For example, you must first specify row search values for the hagent or hsplit table if you define a report field that contains the following data expression:

```
hagent.ACDCALLS/hsplit.ACDCALLS
```

You can also type the following *where* clause:

```
hsplit.SPLIT = $i_split and hsplit.ROW_DATE = $i_date and
  hsplit.STARTTIME = $i_time and hsplit.ACD = $acd
```

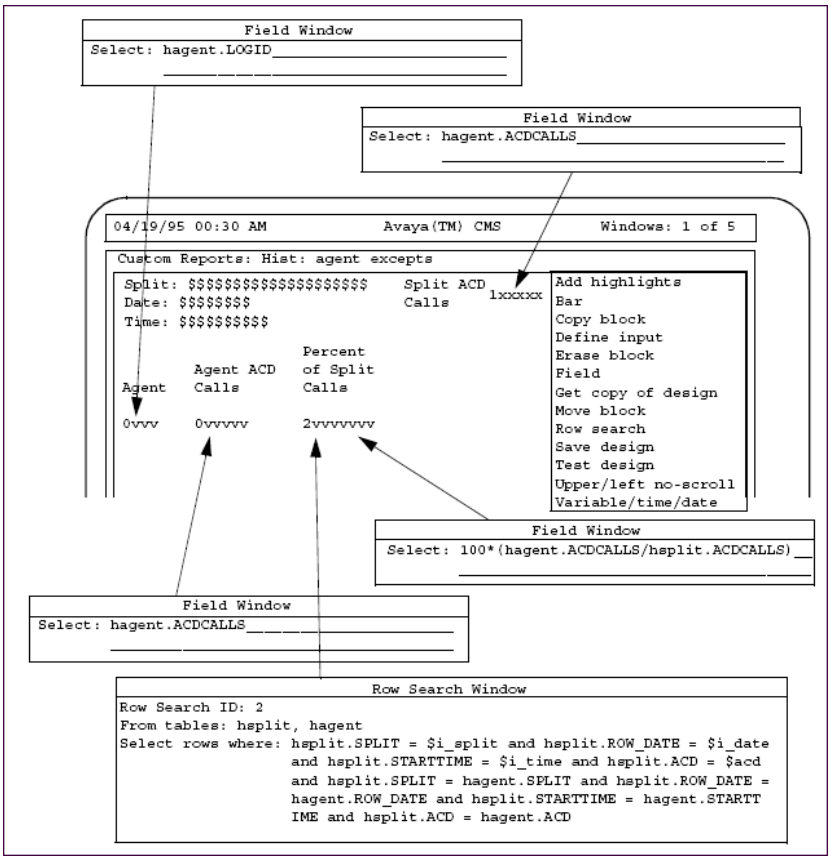
Note:
Table names are prepended to each database item.

You must then specify *join* clauses so that the rows found in one table are related to the values found in the other table. In the following example, you add *join* clauses, shown in bold, for every regular *where* clause:

```
hsplit.SPLIT = $i_split and hsplit.ROW_DATE = $i_date and

hsplit.STARTTIME = $i_time and hsplit.ACD = $acd and

hsplit.SPLIT = hagent.SPLIT and hsplit.ROW_DATE = hagent.ROW_DATE
  and hsplit.STARTTIME = hagent.STARTTIME and

hsplit.ACD = hagent.ACD
```

The following figure shows how the row search selection affects data in a report.

Figure 67: Report design with data from two tables merged in a field



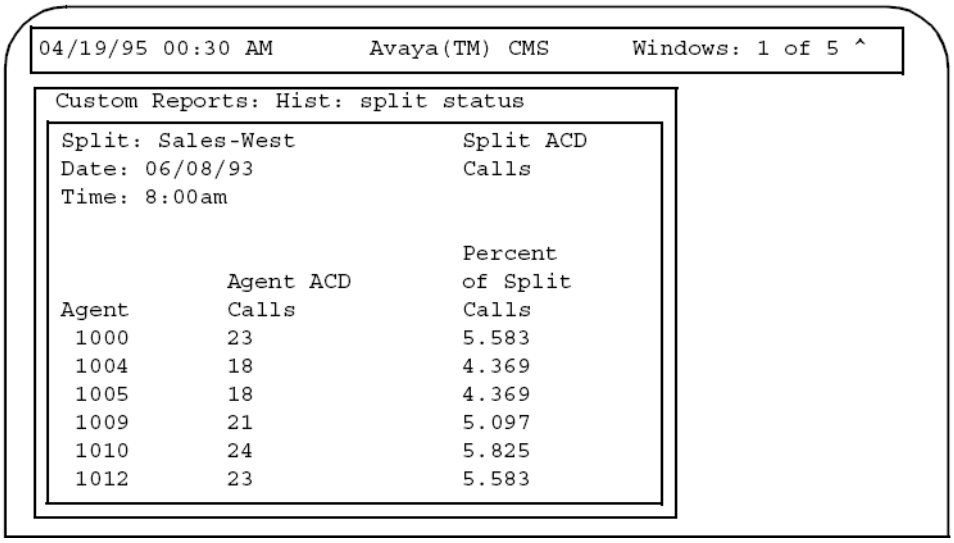
Notice that the **Percent of Split Calls** field merges data. Also notice that Row search ID 2, which is assigned to the **Percent of Split Calls** field, contains the row search statement.

To illustrate the effect of *join* clauses, the report design in this figure includes the **Agent ACD Calls** and **Split ACD Calls** fields. Notice that each field uses a database item that is also included in the **Percent of Split Calls** field.

When the report is run, the **Percent of Split Calls** field, for each agent in the selected split, divides that agent's ACD calls by the total ACD calls for the split, then multiplies by 100 to give a percentage. Thus, as in the following figure, if agent 1000 had 23 ACD calls, and the split Sales-West had 412 ACD calls, the Percent of Split Calls for agent 1000 would be as follows:

5.583 (100 * [23/412]).

Figure 68: Sample report with merged data



```
04/19/95 00:30 AM        Avaya(TM) CMS      Windows: 1 of 5 ^

Custom Reports: Hist: split status

Split: Sales-West                    Split ACD
Date: 06/08/93                       Calls
Time: 8:00am

                                     Percent
                  Agent ACD          of Split
Agent             Calls              Calls
 1000             23                 5.583
 1004             18                 4.369
 1005             18                 4.369
 1009             21                 5.097
 1010             24                 5.825
 1012             23                 5.583
```

Alternative row search conditions

For row search conditions, you can use the *where* clauses. For more information, see Defining data for custom reports on page 51. However, several *where* clause formats are available. Alternative row search conditions describes the formats.

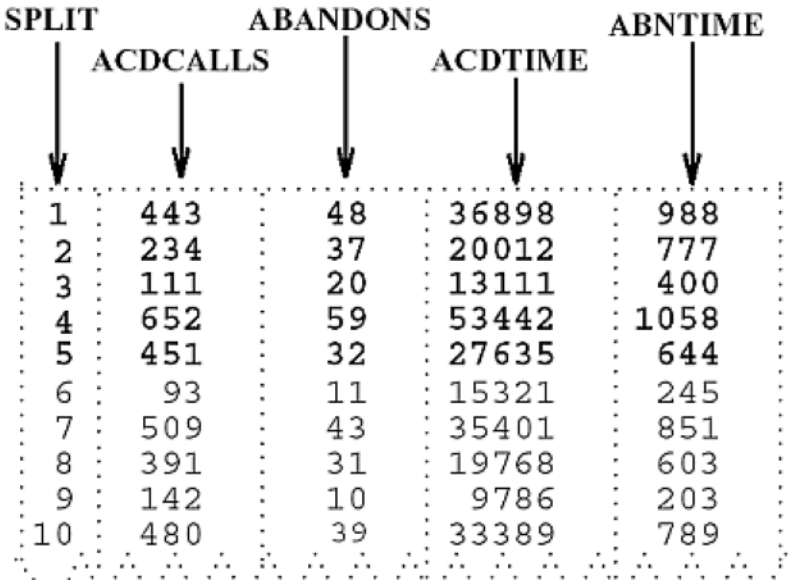
Selecting rows based on a range of values

To include a range of splits in the report, you can use two *where* clauses as follows:

```
Select rows where: SPLIT >= 1 and SPLIT <= 5
```

When you run the report, CMS finds rows for Splits 1 through 5 as shown in the following figure:

Figure 69: Use of ranges in *where* clauses



To specify a range, you can define a report input field that accepts a range.

Using apostrophes for some database item values

Some database items require that, if you hardcode values in a *where* clause, you enclose the values in apostrophes ('), as follows:

```
Select rows where: ROW_DATE > '07/01/93'
```

Values of standard database items that you must enclose in apostrophes are as follows:

- CWC: The value is a Call Work Code (CWC) of 1 to 16 digits.
- EQLOC: The value of a 9-digit trunk location number.
- EXTENSION: The value of an extension number.
- LOGID: The value of an agent login ID.
- ROW_DATE: The value of date in the mm/dd/yy format.
- VDN: The value of a Vector Directory Number (VDN).

You must also enclose, in apostrophes, hardcoded values for any custom database items that you define as CHAR or DATE columns in INFORMIX.

For historical reports only, the following is an alternative format for these database items:

```
Expression matches 'value'
```

In this type of a clause, matches is the same as an equals to (=) sign. However, with this type of a clause, you can use wildcard searches, that is, within the apostrophes, you can use an asterisk (*) sign or a question mark (?).

The asterisk (*) sign matches any and all characters, including blanks and no characters. See the following examples:

Select rows where: EQLOC matches '01*'

The clause finds all rows where the EQLOC value begins with 01, which means that all trunks for module 01. Therefore, 010012020, 010211110, and 011023100 are values that can match.

Select rows where: ROW_DATE matches '*/01*'

The clause finds all rows where the ROW_DATE value has 01 as dd, that is, the day of the month. The clause searches for the first day of each month. Therefore, 01/01/93, 04/01/93, and 10/01/92 are values that can match.

Note:
The ROW_DATE value, that is, */01*, can also find all dates, if the dates had passed, in the year 2001. For example, 01/22/01, 08/03/01, and 11/31/01.

The question mark (?) matches any single character. See the following examples:

Select rows where: EXTENSION matches '444?'

The clause finds all rows where the EXTENSION value is four digits and has 444 as the first three characters. Therefore, 4441, 4440, and 4449 can match, but 444 does not match.

Select rows where: LOGID matches '?000'

The clause finds all rows where the LOGID value is four digits, begins with any number, and ends with 000. Therefore, 4000, 5000, and 9000 can match, but 000 does not match.

To exclude rows, use not in a *matches* clause. For example, you can exclude a range of login IDs from your report with a clause such as the following:

Select rows where: LOGID not matches '2*'

The clause finds all login IDs except the IDs that begin with 2. If you have a 4-digit login ID, login IDs from 2000 to 2999 are excluded.

Using string-value database items

String-value database items contain numerical data that the Dictionary subsystem translates to display current states or state changes. For example, a report field using the string-value database item WORKMODE displays AVAIL, ACD, and ACW based on the current work state of an agent.

However, tables store work state as numbers, not as strings. When you run a report, CMS substitutes the character strings for the numerical values. This process is identical to the substitution of names for split numbers, trunk group numbers, and vectors.

To use string-value database items in a *where* clause, specify numerical values, not string values. For example, if you want a current real-time agent report that lists data only for agents on extension-in or extension-out calls, select the Current Interval Agent table and type a statement such as following:

```
Select rows where: SPLIT = $splitvar and WORKMODE > 10 and
WORKMODE < 60
```

The statement finds rows for a user-specified split where the agent state is one of the following work state:

- ACWIN (numerical value of 20)
- ACWOUT (numerical value of 30)
- AUXIN (numerical value of 40)
- AUXOUT (numerical value of 50)

For a list of row search values for the string-value database items, see *Avaya Call Management System Database Items and Calculations*.

Other available formats for *Where* clauses

For historical reports only, you can specify a list of hardcoded values using the following format:

```
Expression in (list of values)
```

As with a basic *where* clause, the Expression can be a database item or calculation. Separate the values that you list in the parentheses by commas. You must also use apostrophes for values that require apostrophes. For example, the following *where* clause specifies three dates for the report:

```
Select rows where: ROW_DATE in ('07/01/93','07/08/93','07/15/93')
```

The following *where* clause specifies three splits for the report:

```
Select rows where: SPLIT in (1,7,22)
```

For historical reports only, you can exclude rows using a list of values by adding *not* to the clause. Using *not* can be extremely useful to exclude, for example, lunch time intrahour intervals from intrahour historical reports, as shown in the following example:

```
Select rows where: STARTTIME not in (1130, 1200, 1230)
```

Repeating aggregate function values

A field or bar that contains an aggregate function, such as sum, max, min, or avg, displays one value, which is true regardless of the Select rows where criteria. Therefore, select **Discrete** as the field type or bar type in the Row search ID that is assigned to aggregate functions.

In historical reports only, CMS can display multiple values for an aggregate function if the aggregate function shares a Row search ID with more than one field that does not have an aggregate function.

The following figure shows a report with the maximum ACD calls in an interval for each of a variety of splits.

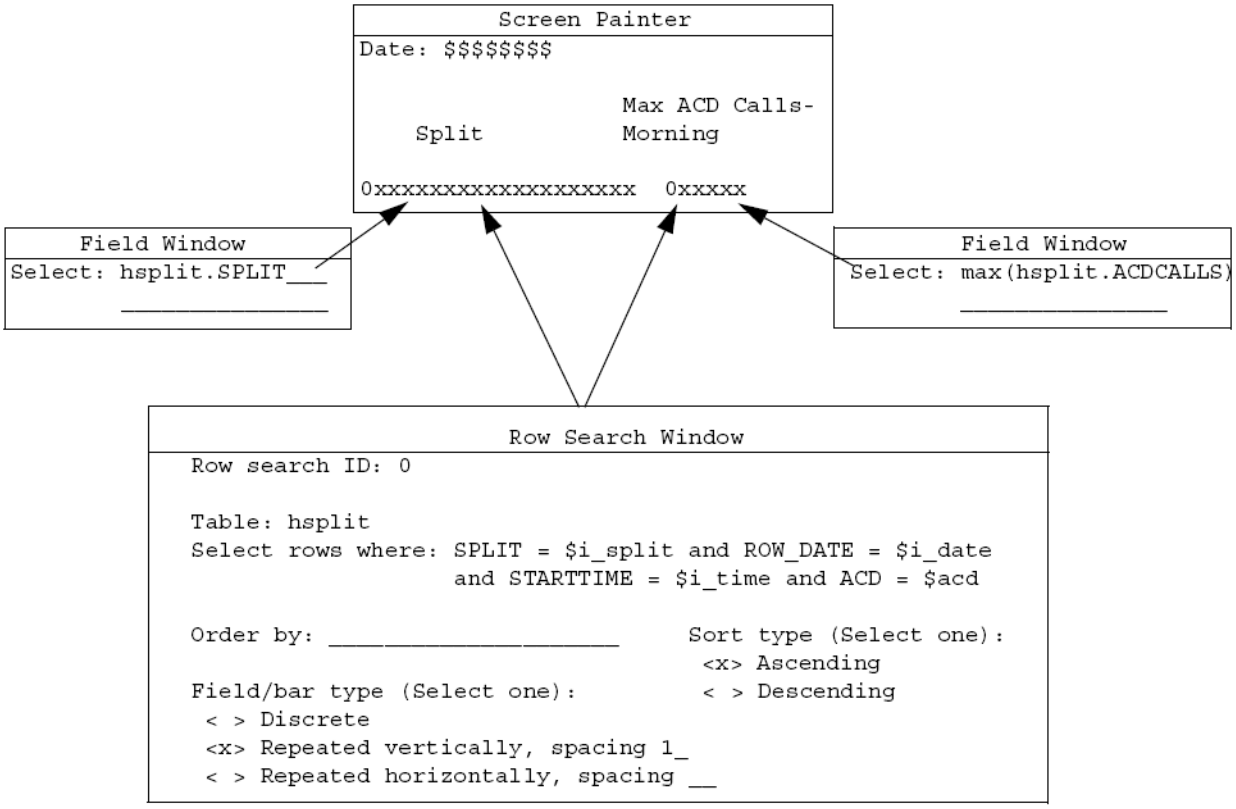
Repeated aggregate function report

For the date 07/01/93, the maximum ACD calls are shown in the following table. See the report design in Figure 70: Sample report design for repeated aggregate functions on page 160 for the following report.

Table 24: Repeated aggregate function report

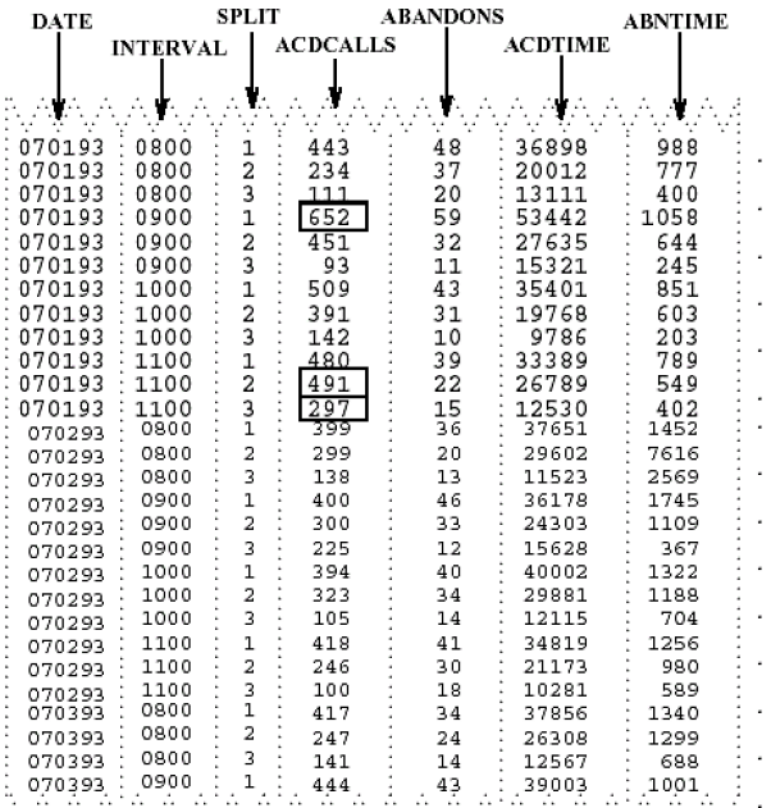
Split	Morning
1	652
2	491
3	297

Figure 70: Sample report design for repeated aggregate functions



According to the design, CMS searches the Intrahour Split table for the splits that the user ordered when running the report (Splits 1, 2, and 3 in our example). CMS also searches for the date (07/01/93 in our example) and the maximum ACD calls in the selected range of intrahour intervals for each of the selected splits.

Figure 71: Sample row search of grouped aggregate functions



CMS would then display the values found in the report. However, notice in this figure that CMS found four rows with the SPLIT value of 1, four rows with SPLIT value 2, and four rows with SPLIT value 3, but displayed each value only once in the report.

CMS displays each value only once because the aggregate function max(hsplit.ACDCALLS) field shares the same row search ID with the hsplit.SPLIT field.

If the hsplit.SPLIT field and the max(hsplit.ACDCALLS) fields have different row search IDs (with each ID having identical criteria), CMS displays data as shown in the following table.

Date: 07/01/93

Table 25: Group values

Split	Maximum ACD Calls Morning
1	652
1	—

Table 25: Group values

Split	Maximum ACD Calls Morning
1	—
1	—
2	—
2	—
2	—
2	—
3	—
3	—
3	—
3	—

The display of a value only once to represent multiple occurrences of the same value is called grouping and can be done only when sum, max, min, or avg values are listed based on the unique values found for other fields. The rules for grouping data are as follows:

- If you assign a row search ID to more than one aggregate function field, you can assign the same row search ID to a maximum of eight nonaggregate fields.
- Assigning the same row search ID to aggregate functions and nonaggregate fields is useful only if the nonaggregate fields contain identifier data, such as split numbers, login IDs, dates, interval start times, and vector numbers.
- If you assign the same row search ID to both aggregate functions and a nonaggregate field, the report displays a single value for each unique value found for the nonaggregate field (that also matches the row search criteria). If multiple rows contain the same value, CMS still lists the value only once. Therefore, only identifier fields must have the same row search ID as aggregate functions.
- If you assign the same row search ID to aggregate functions and more than one nonaggregate field, the report displays a single row of data for each unique combination of values for the nonaggregate fields.

Database items and calculations

For complete descriptions of the database items and calculations, see *Avaya Call Management System Database Items and Calculations*.

Glossary

ACD Group An administratively-defined set of ACDs that serves as the scope of multi-ACD administration and reporting.

ACD Group Only When you select this report option, you define a report that contains summarized information about ACDs that are members of an ACD Group. Queries for ACDs defined for this report contain aggregate data of all the member ACDs within the ACD Group.

access permissions Permissions assigned to a CMS user so that the user can gain access to different subsystems in CMS or administer specific elements (splits/skills, trunks, vectors, email) of the ACD. Access permissions are specified as read or write permission. Read permission means that the user can gain access to data and view data. Write permission means that the user can add, modify, or delete data and execute processes.

aggregate function A prefix (avg, max, min, or sum) attached to a database item, calculation, parts of a calculation, or a calculation name. An aggregate function normally displays a single value that is determined from a group of selected values.

ascending Listed with the lowest values first and the highest values last. With time and dates, the oldest values are listed first.

associated ACD The ACD associated with or assigned to an input field, as defined in the **Define Input** window. When an input field is associated with an ACD, the values that the user enters in the field are applicable only to that ACD. For example, if an input field requiring a split number also has associated ACD #1, the selected split number is a split in ACD #1.

bar A representation of data in the form of a bar that gets longer or shorter as values go up or down. A horizontal bar grows and shrinks horizontally. A vertical bar grows and shrinks vertically.

block A rectangular area on Screen Painter that you define and use to rearrange report fields, bars, and text.

block editing Defining and using a block to copy, move, or delete fields, bars, and text in a report design.

Both Single ACD and Group ACD When you select this report option, you define a report that contains data for reporting at the single ACD level or the group ACD level. When you run the report, your current ACD can be a single ACD or a Group ACD. Your report is available in the **Custom Reports > Historical or Real-time** submenus regardless of your current ACD setting.

calculation A calculation is a formula consisting of database items, numbers, and arithmetic operators (+, -, /, *, and ( )). A calculation can also include constants.

calculation name A standard CMS calculation name or a name that you define in the Dictionary subsystem. A calculation name is useful when you want to use the same calculation for field or bar definitions in multiple custom reports. If you need to change the calculation, you can change the calculations once in the Dictionary, and all custom reports that use the calculation name reflect the change.

call-based items The category of database items in CMS that are committed to the database after the call completes. If a call starts and ends in different intrahour intervals, all the call-based data is recorded in the interval in which the call completed. Most database items are call-based.

CMSQL A tool with which you can query the historical database. CMSQL is an interactive interface that is used to view the INFORMIX database. For CMS, use CMSQL instead of INFORMIX SQL.

column A column is a part of a table that stores data types such as the number of events of a certain type, the length of time spent on a certain type of event, the time that an event occured, the numerical identifier of an ACD entity, or the current status of an ACD entity. Database items are the names of columns. Examples include ACDCALLS, ACDTIME, SPLIT, STARTTIME, and WORKMODE.

constant A name that you assign in Dictionary to a fixed numerical value. A constant is useful when you want to use the same numerical value for field or bar definitions in multiple custom reports. If you want to change the value, you can change the constant once in Dictionary, and all custom reports that use the constant reflect the change.

count (*) An expression that you can type in the **Select** field in the Field window or Bar window. count(*) tells CMS to count the number of rows in a table that match certain row search conditions as defined for the assigned Row search ID and to display the total in the field or bar.

custom database item A database item (column name) that you include in a custom INFORMIX table and identify to CMS in Dictionary.

current interval Represents the current intrahour interval which can be 15, 30, or 60 minutes. The current interval is part of the real-time database.

custom report A report that you create and design using the Custom Reports subsystem.

daily data Interval data that CMS converted to a 1-day summary.

data expression An expression that you type in the **Select** field of the Field window or Bar window to define data and manipulation of data for display in a field or bar.

database A group of files that stores ACD data based on a time frame. For example, current and previous intrahour real-time data and intrahour, daily, weekly, and monthly historical data.

database items The names for data types that are stored in one of the CMS databases. A database item can store ACD identifiers, for example, split numbers or split names, login IDs, VDNs, and email. A database item can also store statistical data on ACD performance, for example, the number of ACD calls, wait time for calls in a queue, current work state of individual agents, and email.

database tables CMS uses database tables to collect, store, and retrieve ACD data. Standard database items are names of columns in the CMS database tables.

descending Listed with the highest values first and the lowest values last. With time and dates, the most recent values.

design The physical layout of a custom report and the definition of the report fields, bars, input window, and row search criteria.

direction (bar) The direction, horizontally or vertically, in which a bar grows and shrinks.

discrete field or bar A field or bar for which CMS finds and displays a single value.

Dictionary A CMS subsystem that you can use to assign names to call center entities such as login IDs, splits or skills, trunk groups, VDNs, and vectors. You can use Dictionary to customize calculations for use in reports.

entity A generic term that refers to one of the following: Agent, Split or Skill, Trunk, Trunk Group, VDN, or Vector.

exception reports Reports that display occurences of unusual call-handling events.

field A space designated in a custom report to display a specifically-defined piece of ACD data. CMS displays data in a field as characters in specific format, that is, as time with a.m. or p.m., as decimal, or as date.

global access The ability for other CMS users to run a custom report and to copy the design on Screen Painter.

historical database A database that contains intrahour records for up to 62 days in the past, daily records for up to 5 years in the past, and weekly or monthly records for up to 10 years in the past for each CMS-measured agent, split or skill, trunk, trunk group, vector, and VDN.

historical reports Reports that display past ACD data for agent, split or skill, trunk, trunk group, vector, or VDN activities.

INFORMIX A relational database management system that is used to organize CMS historical data.

INFORMIX SQL A query language tool that is used to extract data from an INFORMIX database. For the CMS historical database, CMSQL is used in place of INFORMIX SQL.

index A column (database item) that you use to relate the values in a row. For example, in the Current Interval Split table, SPLIT is an index. An index adds structure to the data in a table.

input field An area on a user window in which a CMS user enters more than one valid field values. For example, the valid values for the input field Split are integers from 1 through 255 (Generic 3r Version 2 to Version 4) and split names that are assigned in the Dictionary subsystem.

input window The window that CMS displays when you run a report so that you can specify what data, that is, split or skill, agent, time, or date, the report displays.

interval-based items A category of database items that represents the amount of time during a collection interval spent doing a particular activity. Interval-based items are updated throughout the collection interval and timing is restarted at the end of the interval. Do not use interval-based items to calculate averages such as average hold time.

intrahour interval A 15-minute, 30-minute, or 60-minute segment of time starting on the hour. An intrahour interval is the basic unit of CMS report time.

justification The alignment of data for a field such that, in the report, the data is always centered, lined up on the left, or lined up on the right.

maximum graph value The value that a bar represents when the bar is at the maximum length or height.

measured A term that means that an ACD element, such as agent, split or skill, trunk, trunk group, vector, or VDN, is administered as measurable on the switch. The switch sends messages to CMS only for ACD elements that are measured. If the ACD element is not measured, CMS collects no data.

monthly data Daily data that CMS converted to a monthly summary.

multi-user mode An administered CMS user can log in to CMS. Data continues to be collected if data collection is On.

name (synonym) field Fields in which you can enter a name (synonym) that you entered in the Dictionary subsystem. For example, names of agents, splits or skills, agent groups, trunk groups, vectors, or VDNs.

normal user A user who can gain access to a limited number of subsystems within CMS. A normal user cannot gain access to a custom report design created by another user and cannot run or copy the private reports of another user.

owner The CMS user who creates the design of a custom report.

pattern matching Searching the database for data that partly or completely matches a set of characters, that is, letters, numbers, and symbols, entered by a user. For example, the user can enter *01*, and CMS might find the following types of matching data: 0001, split01, 22010, or 01444.

previous interval One intrahour interval. At the end of each intrahour interval, CMS copies the contents of the current intrahour interval to the previous intrahour interval portion of the real-time database.

private access A restriction that only the owner of a custom report can run the report. Normal users cannot copy the design of the report. Private access does not restrict CMS administrators from running a private report or gaining access to the report design.

private report A custom report that only the creator of the report can gain access to.

read permission The CMS user with read permission can gain access to data and view data, for example, run reports or view the Dictionary subsystem. Read permission is granted from the User Permissions subsystem.

real-time database A database that consists of the current and previous intrahour data on each CMS-measured agent, split or skill, trunk, trunk group, vector, and VDN.

real-time report Report that displays current ACD call activity on agents, splits or skills, trunks, trunk groups, vectors, and VDNs for the current or previous intrahour interval. Current intrahour interval real-time reports are periodically updated as data changes during the interval. Previous intrahour interval real-time reports show data totals for activity that occurred in the previous intrahour interval.

report type The specification of a custom report as a real-time report or a historical report.

reversed thresholds The reversal of thresholds so that the bar has the color of normal conditions when the bar is at the longest. With reversed thresholds, the bar changes color from normal to caution to warning as the bar shrinks in length.

row A horizontal line of data in a table. The data is related by the values of more than one column. For example, each row of current real-time agent data contains data for an agent login ID.

Row search ID The identification number of a set of row search conditions defined in the **Row Search** window. The ID is assigned to fields or bars that use the associated set of row search conditions.

Row Search window The secondary window on Screen Painter that you use to define row search criteria and assign row search criteria to fields or bars.

scale A line, with or without tick marks, that CMS displays in a custom report to provide a reference point for the approximate value of a bar as the bar changes in length.

Screen Painter The window that you use to design custom reports. Screen Painter has special properties that makes this window function differently from other windows.

second threshold A graph term for the upper limit that you enter for a particular condition in a graph report. When the limit is met, the bars change color or intensity, indicating that a possible Warning condition exists.

secondary window A user window that is generated from a primary window. You can move, resize, or scroll secondary windows. CMS does not include secondary windows in the user window count.

Select field The name of the first field in the Field window and Bar window. You can type the data expression that you want for a report field or bar in the **Select** field.

Select rows where statement	The row search criteria that CMS uses to retrieve data from the database. Select rows where statements consists of several *where* clauses.
single-user mode	Only one person can log in to CMS. Data continues to be collected if data collection is On. You need this mode to change some CMS administration.
Single ACD Only	When you select this report option, you define a report that relates only to information about a single ACD. If the single ACD is a member of an ACD Group, no information about the ACD Group in which it is a member is provided in this report. To view your report in the Custom Reports > Historical or Real-Time submenus, set Current ACD as single when you run the report.
subsystem	Each CMS Main Menu selection, for example, Reports, Dictionary, System Setup, Exceptions, along with Timetable and Shortcut, are referred to as subsystems.
sort order	The order in which you want data to be displayed in a custom report. The sort order is always based on the values of more than one database item. With real-time reports, you can use one database item for sorting.
sort type	The order, ascending or descending, in which CMS must display data.
Standard database item	A database item (column name) for a column in a standard CMS table. Standard database items are listed in the Dictionary subsystem.
String (data format)	A report field that displays data from a CHAR column. CHAR columns, which store data as characters, include LOGID, VDN, and CWC.
String (input field)	An input field type using which users can type character strings and pattern searches when running the report. Any input field that has the **String** field type must be associated in the Row Search window with a database item or table column that is a CHAR column.
table	An array of columns and rows that stores data for a type of ACD element, for example, split or skill, agent, or trunk, for a specific time frame, such as current intrahour interval, past intrahour intervals, or past days.
text	The words, numbers, and other characters that you type directly in Screen Painter to provide report titles, column headers, row identifiers, and other labels.
threshold	A value at or above which CMS indicates a change in condition, that is, to a caution (first threshold) or a warning (second threshold) condition. Thresholds apply to bars in a report.
tick marks	The marks on a scale defined for a bar in a report. Tick marks break a scale into segments to indicate increments of the bar's length relative to the maximum graph value.
type (input field)	The specification of how CMS is to validate user input values and format when ordering the report. You can determine whether CMS checks for numbers, character strings (names), times, dates, specific ACD configuration values (split numbers, or login IDs), and emails.

type (report) The specification of whether a report is a real-time or historical report. You specify the type on the Report Select window.

time format The standard format for entering times on CMS reports. Acceptable formats are as follows:

A 12-hour time format with AM/PM, for example, 7:30AM, 5:00PM.

A 24-hour time format, for example, 7:30, 17:00.

A "-" offset based on the current interval date, for example, -1 for the previous hour or -0:30 for the previous half hour interval.

user ID The login ID for a CMS user. CMS links custom report designs to a user ID, that is, the owner of a report design is the user, identified by a user ID, who created the design.

user permissions A CMS subsystem using which CMS administrators can define user access permissions.

variable name The name assigned to a report input field that allows users to type values and use the values to find data for the report. The variable name links the row search criteria to the report input fields so that user input values become the basis of the search for data.

weekly data Daily data that CMS converts to a weekly summary.

where clause An expression in the **Select rows where** field that specifies values for a single database item or calculation. A *where* clause has the following format:

```
Expression Relational operator Value
```

A row search criteria statement can consist of multiple *where* clauses.

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