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RELEASE INFORMATION, DX10 TIFORM,
RELEASE 3.3.0 -990

TEXAS INSTRUMENTS INCORPORATED DATA SYSTEMS GROUP	drawing number 2268526-9901
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SECTION 1

PURPOSE AND SCOPE

This document contains information about the operation of DX10 TIFORM 990, Release 3.3. This package should only be installed and run on the 3.6 or later release of the DX10 operating system. The hardcopy terminals supported by this release are the OMNI 820 and Silent 700 KSR's. TIFORM also supports output to the OMNI 810 printer and sequential files. TIFORM supports the following video display terminals (VDT):

- * 911 VDT
- * 915 Remote Video Terminal
- * 940 EVDT
- * Business Systems Terminal
- * 931 VDT
- * Texas Instruments Professional Computer using the 931 Emulator

TIFORM treats VDTs as generic terminals with an 80 column 24 line format. Though some of these terminals support larger formats and other graphics characters, TIFORM utilizes only the functions available to a 911 VDT. Therefore, any application that executes on a 911 VDT will execute on all supported VDTs without any changes. Because of keyboard differences, the operation of a TIFORM application varies from terminal to terminal. For instance, to leave or enter the field mask mode in the Interactive Screen Generator/Editor (ISGE) Utility, you enter F10. The 931 keyboard has an F10 key, but on a 911 terminal you must enter the (Control)2 key combination. The TIFORM documentation and screen displays use generic key names. The TIFORM Reference Manual presents the ISGE tutorial from a 931 keyboard. Previous releases of TIFORM demonstrate the tutorial from a 911 keyboard. If you do not have a 931, 940, or Business System terminal and you are not familiar with ISGE, refer to Appendix A of this document. Appendix A demonstrates the ISGE tutorial from a 911 keyboard.

Purpose and Scope

CAUTION

TIFORM 1.0, 2.1, 3.1, and TIFORM 3.3 FDL object are still downward compatible. The TIFORM 3.3 Executor is able to execute TIFORM 1.0, 2.1, and 3.1 FDL object.

However, TIFORM 3.3 FDL object is different from TIFORM 3.1 FDL object. It is different to the extent that, once a segment has been compiled by the TIFORM 3.3 compiler that form file may not be executed by a TIFORM 3.1 Executor.

Neither 3.3 nor 3.1 TIFORM object can be decompiled using the decompile option in ISGE. However, the 3.3 decompiler can decompile 2.1 or 1.0 TIFORM object.

FDL source is upward compatible: you can recompile your FDL source and execute your application under TIFORM 3.3 without recompiling or relinking an existing application. While the TIFORM 3.3 Executor can execute form segments generated by previous releases of TIFORM (DX10 or DNOS), it is recommended to recompile TIFORM segments before using them with the multitask 3.3 Executor.

If your application uses the Linkable Executor, installing TIFORM 3.3 does not affect its execution and you should not recompile the application's form segments. If you modify your application object and relink with the 3.3 Linkable Executor, you should then also recompile your form segments.

SECTION 2
INTRODUCTION

TIFORM 990 addresses the problems of application program control of a VDT. Many of these problems, such as the programming being terminal dependent, repetitive, and time consuming, are solved by TIFORM 990. The components of TIFORM allow the application programmer to separate the application's procedural code from the characteristics of the terminal used. The man-machine interface is specified and controlled by components of TIFORM, freeing the procedural program for data processing, the job it does best.

In TIFORM 990, control of the VDT screen is vested in the form. A form consists of one or more segments, where a segment is a screen or a piece of a screen. Access to the variables, groups, and segments of a form is through the names of these entities. The form designer has control over which entities' names are accessible by the application.

Using the TIFORM approach, the terminal characteristics, input edit criteria, and output display attributes are handled independently of the application's procedural code. The form can be redesigned or installed on a different terminal without affecting the application. The application is also relieved of handling simple edit errors in the input data. Generally, detailed interactions with the terminal have been shifted from the application's procedural code to TIFORM, leaving the application free to perform more serious processing.

SECTION 3

GENERAL COMPONENTS OF TIFORM

The TIFORM 990 System consists of five major components. Several DX10 utilities and language processors are used by the TIFORM 990 System, but these are not discussed here. The unique TIFORM components are the FDL Compiler, the Interactive Screen Generator/Editor, the TIFORM Executor, the High Level Language Run-time Interface package, and the Utility Package.

3.1 THE FDL COMPILER

FDL, the form Description Language, is a block-structured language designed for specifying VDT screen layouts, or forms. The form designer must state his form design in FDL. This FDL description must then be entered into a DX10 source file, using the DX10 text editor, and compiled by the FDL Compiler to be usable by the TIFORM System.

3.2 THE INTERACTIVE SCREEN GENERATOR AND EDITOR

For relatively simple forms, FDL is unnecessarily cumbersome. The Interactive Screen Generator and Editor (ISGE) provides a more convenient tool for specifying such forms. It allows the form designer to draw the layout of each segment on a blank screen, then interactively specify the attributes of the fields so drawn.

The ISGE collects the screen image and field attributes specified by the form designer in an intermediate (IMS) file. You can terminate an incomplete edit session and save the results in the IMS file at any time. When you complete a form description and compile the FDL that ISGE creates, ISGE also saves the IMS file. If you decide to change the form, you can do so in two ways. One way is to use ISGE to modify the IMS file and then recompile. If you do this, the ISGE updates the IMS file. The second way is to edit the FDL source file. However, if you edit the FDL source file directly, the IMS file is not updated. For complicated forms, it is easier to edit the FDL source directly. However, if you do, your ISGE IMS file will not contain any changes that you make. Since you cannot decompile your forms into IMS, this means that once you begin to edit your FDL directly, you will have to

Components of TIFORM

continue to use the direct method for future changes. If you tried to use ISGE to make additional changes, you would find that none of the changes you made directly to the FDL are included in your IMS file.

Many people prefer to use ISGE because it presents FDL options in a simple menu-driven fashion. ISGE also serves to acquaint new users to TIFORM capabilities without having to worry about syntax. However, once you are familiar with TIFORM and FDL, it is much easier and faster to directly edit FDL source than to use ISGE. It is important to remember that once you stop using ISGE to modify your forms, the IMS file maintained by ISGE no longer contains any changes that you make.

3.3 THE HIGH LEVEL LANGUAGE RUN-TIME INTERFACE PACKAGE

To access the terminal, the application program issues commands to the TIFORM form Executor. The application calls the Run-time Interface Package, which communicates with the Executor through the Intertask Communication (ITC) facility of DX10. Release 3.3 of TIFORM 990 provides Run-time Interface Packages for COBOL, FORTRAN, and Pascal.

There are files on the S\$TIFORM directory to aid the application designer in using TIFORM 3.3. The C\$STATUS file is a COBOL 3.1 or higher copy module that contains a template for the TIFORM Status Block. The directory PASCAL on the TIFORM object installation disk contains the Pascal files necessary to use LUNOBJ and MINOBJ with TIFORM. (If you received the object on three DSDD diskettes, .PASCAL resides on the third diskette.) Also, the .S\$TIFORM.PASCAL.PX\$START file is a Pascal 1.5 or higher procedural definition module which may be used to ensure getting the correct procedural definitions for the PX\$ High Level Language Interface.

3.4 THE FORM EXECUTOR

The run-time package that actually executes the commands issued by the application is the form Executor. The form Executor is a separate DX10 task, that communicates with the application task through the DX10 ITC facility. The descriptive statements of FDL are interpreted by the form Executor as directed by the application, causing the form Executor to interact with the terminal user. It reads and writes fields, edits input data, handles edit errors, and passes data to and from the application.

3.5 THE UTILITY PACKAGE

One utility, named FORMTSTR, is provided to support the development of user applications.

The FORMTSTR is a program that allows the user to test any form without having to write a program to drive it. The form tester prompts the user to select any of the High Level Language commands and provide data as appropriate. These commands permit the user to interact with the form in order to evaluate its appearance and correctness. As an example of TIFORM usage, the source of the FORMTSTR task is included on the TIFORM release disk under TIFRMINS.FORMTSTR. Section 7 of the TIFORM Reference Manual describes the operation of the form tester utility.

3.6 THE DEMONSTRATION PACKAGE

The directory TIFRMINS.DEMOINS on the release disk contains an application implemented in COBOL 3.3 and TIFORM 3.3. This application, using a simplified version of the United States income tax form 1040a, serves as an example of both TIFORM's features in action as well as demonstrating techniques for implementing an application using TIFORM.

To run this application, the SCI procedure TAX in TIFRMINS.DEMOINS.TAXPROC must be installed in .S\$PROC. TAX assumes that its program file resides under the pathname @TIFRMINS.DEMOINS.PROG, where TIFRMINS is a synonym for the volume name of the object installation disk. Thus, if the TIFRMINS disk is installed (and TIFORM 3.3 has been installed) all that need be done to run this application is (1) install the TAX procedure by executing an Execute Batch command,

```
XB INPUT=TIFRMINS.DEMOINS.TAXPROC, LIST=DUMY
```

and (2) execute the SCI command TAX. If you copy TAX's program file to a more permanent directory, then the TAX procedure must be edited to reflect the program file's new pathname.

In addition to the TAX program file and procedure, TIFRMINS.DEMOINS.SRC contains the source of TAX's COBOL driver and all its TIFORM screen descriptions. These source modules provide an example of implementation techniques for a TIFORM application. Also, TIFRMINS.DEMOINS.LINK.TAX is the link control file used to link the TAX demonstration Cobol object with the TIFORM Cobol 3.2 interface.

SECTION 4

MEMORY AND DISK SIZES

4.1 DISK CONSUMPTION

The total disk consumption of TIFORM is approximately 707 864-byte ADUs. The installation of TIFORM creates a single directory; S\$TIFORM, on the system disk. Three procedures are placed into .S\$PROC by the installation of TIFORM. They occupy 4 ADUs.

4.2 MEMORY CONSUMPTION

TIFORM's memory consumption is a function of the number of users, the sizes of their forms, and the sizes of their application programs. TIFORM uses three shared procedures to minimize memory consumption. Exclusive of form sizes and application programs, the amount of memory occupied by TIFORM can be determined

17060 bytes	<if any users>
+11800 bytes	<for first 911 user>
+ 8392 bytes	<for each additional 911 user>
+12008 bytes	<for first 820 user>
+8600 bytes	<for each additional 820 user>

4.3 ITC SYSTEM GENERATION SIZE

TIFORM uses the Intertask Communication (ITC) facility to move commands and text between application tasks and the Form Executor. Although any size larger than 100 bytes will work for the ITC system generation parameter, performance degrades rapidly if TIFORM must wait to move a message through ITC. A rough estimate of this parameter would be 1 to 4 times the length of the longest message the application might send or receive. On a development system running ISGE extensively, a size of 2,000 bytes is recommended. Also, if other packages that use ITC are installed on the system, adjust the ITC area accordingly. For

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instance, if your system also includes 3270 ICS, add the 100 bytes that TIFORM requires to the number of bytes required by 3270 ICS.

SECTION 5

KNOWN PROBLEMS AND USEFUL INFORMATION

5.1 INTRODUCTION

The following is a list of known problems in this release of TIFORM together with some useful information not included in the TIFORM Reference Manual.

5.2 UTILITY PROBLEMS

The FORMTSTR does not execute well on a KSR. The FORMTSTR is a Cobol application which uses positional ACCEPT and DISPLAY. So the FORMTSTR itself runs as TIFORM does when addressing the KSR in unformatted mode.

5.3 ISGE AND FDL BUILDER INFORMATION AND PROBLEMS

1. The logical record size of the ISGE's IMS file changed between release 2.0 and 3.0. Therefore, IMS files created under TIFORM 1.0 cannot be accessed by the TIFORM 3.3 ISGE. IMS files created under TIFORM 3.1 can be accessed by the TIFORM 3.3 ISGE.
2. The ISGE cannot be executed on a KSR. KSR's do not support cursor position, so the TIFORM Executor reports incorrect intrafield cursor position on a KSR. The ISGE depends heavily on intrafield cursor position.
3. The speed of field mask manipulation under the ISGE depends strongly on the number of disjoint pieces of text in the field mask. Manipulating a field mask consisting of a single line of text goes quite quickly. Manipulating a field mask consisting of several lines or several pieces of text on the same line goes much more slowly.
4. Synonym overflow can prevent the ISGE from terminating properly. File names are communicated from the ISGE to the FDL Builder and FDL Compiler through synonyms. If the synonym space is full, these synonyms do not get

Known Problems

set, preventing the building and/or compilation of the FDL. The IMS file is recoverable using the RI option. Be careful not to overfill the synonym space prior to an XISGE.

5. The ISGE uses line 24 of the VDT during Screen Drawing mode to accept parameters for the functions. However, the TIFORM executor always uses line 24 to display error messages. And, it does not reset the data and fields which were on line 24 before the message. Thus, the mask elements of the Screen Drawing prompts will be lost if invalid data is entered in one of those fields.
6. In ISGE Field Mask Mode, the user is prompted for BRIGHT and BLINKING (BR,BL). The BLINKING prompt is invalid because Field Masks do not blink. This problem is corrected by Patch #3424.
7. In ISGE, function key F6 (Move Field) does not allow you to enter coordinates unless the cursor was positioned in an actual field at the time F6 was pressed.

5.4 FDL COMPILER INFORMATION AND PROBLEMS

1. There is no check made on a function key list statement to make sure that only one field has been associated with each function key.
2. If TAB, REQ, or AUTOSKIP is specified for a field and then NOTAB, NOTREQ, or NOAUTO is specified, the conflict is not detected, and the FDL Compiler ignores the negative attribute.
3. A segment mask cannot be compiled separately from the segment referencing it.

5.5 FORM EXECUTOR INFORMATION AND PROBLEMS

1. The Operating System does not support cursor positioning on KSR device. Consequently, TIFORM's intrafield cursor position feature does not work when executing a form to a KSR.
2. The range test does not distinguish between numeric and

non-numeric ASCII values which fall within the defined range. So in order to get a true numeric value range test on a field, a character test should be included in the field which restricts the valid characters to a numeric set; or the numeric attribute can be defined in combination with the range test.

3. If ",DEC=0" is specified on a justify statement, the Executor acts as if the user omitted the ",DEC=n" part of the statement altogether.

4. Form root, segment, and mask and overlay sizes can be estimated as follows:

form root length = 34 + 22*(# of segments in the form)

segment mask length = 6 + 4*(# of M statements in the mask)
+ (# of bytes of mask text)

segment length = 32 + 8*(# of externalized names)
+ 8*(total # of names in symbol table)
+ 4*(# of variables)
+ 1*(# of bytes of variable text)
+ 4*(# of groups)
+ 2*(# of group members)
+ 4*(# of output fields)
+ 7*(# of input fields)
+ ~2*(# of field attributes, all fields)
+ 1*(# of bytes of input field lengths)
+ 1*(sum of field masks, see seg masks)
+ ~3*(number of list elements)

5. If more than 50 Executor/Application pairs are added to the Run ID Table, the following message will appear: "CHECKER CANNOT MONITOR TASKS: nn,mm RIT FULL.". Where "nn" and "mm" are the application and TIFORM executor run-ids which will not be monitored.

Known Problems

5.6 Current Software Trouble Reports

The following is a list of Software Trouble Reports known to exist for this release.

- STR #06281 ISGE does not have the "TERMINATE READ IMMEDIATELY" syntax implemented.
- STR #06284 Using ISGE, the Initial Value of a field cannot be set to a string of blanks (probably true for Default as well). Note that the application can very easily provide this value or that blanks can be used as the fill character.
- STR #08594 In input fields which permit signed values, the condition of multiple signs is not treated as an error. The last sign entered is used. In Signed Numeric fields, IJUST\$ does not flag the second or subsequent signs as errors, it ignores preceeding signs. Perhaps IJUST\$ could flag that as an error condition and put out a message, such as "ONLY ONE SIGN ALLOWED"
- STR #10607 In the Field Attribute Specification, for FILL character, when a blank () is specified, it produces an underscore in the FDL. The FDL must be edited to insert the line, FILLER = .
- STR #12752 During Field Mask Mode in ISGE, the NON DISPLAY (ND) Attribute statement is built into the FDL with numbers replacing the Y or N. This does not always occur.
- STR #09546 As released, JUSTIFY L will truncate any leading instances of the specified fill character of the Justify statement. Patch number 2092 is an optional patch to avoid that.
- STR #09547 The French key board uses an ASCII comma for a decimal point. Optional patch #2091 TIFORM to recognize this difference. Another problem exists when field validation is attempted for a numeric field containing a comma.
- STR #12747 Changing a Display Attribute from YES to NO in an Edit Set will not work.
- STR #12755 CONTROL MODE 8 does not do reverse processing on SCALING and SUBSTITUTION. It does work on

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JUSTIFY.

STR #12841 In ISGE, a note that comes up for the EC command refers to TIFORM 3.0.0. This should be changed to TIFORM 3.3.0. Patch #3424 fixes this.

5.7 DOCUMENTATION INFORMATION AND PROBLEMS

The ISGE tutorial presented in section 4 of the TIFORM Reference Manual does not apply for 911 users. Appendix A of this document contains a 911 version.

APPENDIX A

Interactive Screen Generator/Editor Tutorial for the 911 VDT

A.1 INTRODUCTION

This appendix demonstrates how to perform the tutorial exercise contained in Section 3 of the TIFORM Reference Guide from a 911 VDT. The tutorial in the reference guide demonstrates ISGE usage from a 931 or 940 terminal. The 911 keyboard is substantially different. You can use this appendix in conjunction with the illustrations in the reference guide to perform the ISGE tutorial from a 911 VDT. The appendix references figures contained in the reference guide.

There is no difference in the tutorial for the initial phases. You can follow the description in the reference manual up to Figure 4-11, a Sample Segment. At this point, refer to the following instructions and the illustrations in section 4 of the reference guide.

A.2 DESIGNING THE SEGMENT MASK

The first step in designing the segment mask is to make the border that outlines the segment. To make the upper left-hand corner of the border, the cursor must be in a specific row and column:

Press F1.

A screen prompt giving the current position of the cursor appears on the bottom of your screen. This position should be row 01, column 01. The upper left-hand corner of the border should be in row 03, column 05. You can move the cursor to this position by entering the correct coordinates:

Enter 003 for Row.
Press RETURN.
Enter 005 for Column.
Press RETURN.

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The cursor should now be in row 3, column 5. Draw the upper left-hand corner of the border by entering the following graphic character:

Press CONTROL/J.

Move the cursor to the upper right-hand corner of the screen as follows:

Press F1.
Enter 003 for Row.
Press RETURN.
Enter 075 for Column.
Press RETURN.

The cursor should now be in row 3, column 75. Make the upper right-hand corner of the border as follows:

Press CONTROL/Z.

Move the cursor to the lower left-hand corner of the screen as follows:

Press F1.
Enter 020 for Row.
Press RETURN.
Enter 005 for Column.
Press RETURN.

Now, make the lower left-hand corner of the border as follows:

Press CONTROL/M.

Move the cursor to the lower right-hand corner of the screen as follows:

Press F1.
Enter 020 for Row.
Press RETURN.

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Enter 075 for Column.
Press RETURN.

Make the lower right-hand corner of the border as follows:

Press CONTROL/+.

You are now ready to draw the left side of the border:

Press F4. (This allows you to draw vertically.)

A series of prompts appears on the bottom of your screen. Answer them as follows:

Enter CONTROL/I after the words Draw a vertical line using.
Press SHIFT/FIELD to proceed to the next field. (The
RETURN key will not work here.)
Enter 016 for rows.

Press RETURN.
Enter 004 for Row. (The left side of the border begins
on row 4.)
Press RETURN.
Enter 005 for Column. (The left side of the border fills
column 5.)
Press RETURN.

Now, draw the right side of the border as follows:

Press F4.
Press CONTROL/I after the words Draw a vertical line using.
Press SHIFT/FIELD. (The RETURN key will not work here.)
Enter 016 for rows.
Press RETURN.
Enter 004 for Row. (The right side begins on row 4.)
Press RETURN.
Enter 075 for Column. (The right side fills column 75.)
Press RETURN.

Use the up, down, left, and right arrow keys and the REPEAT key to position the cursor in the space immediately to the right of

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the left-hand corner of the border. (You cannot use the RETURN key to position the cursor at this time since it produces a graphics character during segment mask design.) You are now ready to connect the top corners of the border with a horizontal line:

Press REPEAT/CONTROL/V and hold until the corners are joined.

Use the up, down, left, and right arrow keys and the REPEAT key to position the cursor in the space immediately to the right of the lower left-hand corner of the border. Connect the corners with a horizontal line as follows:

Press REPEAT/CONTROL/V and hold until the corners are joined.

The border is now complete. Fill in the background text information as follows:

Press F1.
Enter 005 for Row.
Press RETURN.
Enter 009 for Column.
Press RETURN.
Enter FRED'S RACQUET SHOP.

Press F1.
Enter 005 for Row.
Press RETURN.
Enter 058 for Column.
Press RETURN.
Enter INVOICE #.

Press F1.
Enter 007 for Row.
Press RETURN.
Enter 009 for Column.
Press RETURN.
Enter PART #.

Press F1.
Enter 007 for Row.
Press RETURN.
Enter 022 for Column.
Press RETURN.
Enter DESCRIPTION.

Press F1.

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Enter 007 for Row.
Press RETURN.
Enter 037 for Column.
Press RETURN.
Enter QTY.

Press F1.
Enter 007 for Row.
Press RETURN.
Enter 048 for Column.
Press RETURN.
Enter PRICE.

Press F1.
Enter 007 for Row.
Press RETURN.
Enter 058 for Column.
Press RETURN.
Enter TOTAL.

Press F1.
Enter 018 for Row.
Press RETURN.
Enter 009 for Column.
Press RETURN.
Enter EMPLOYEE NAME.

Your next step is to define the length and position of each field you want to create. Insert a field four spaces long next to the word INVOICE # as follows:

Press F8. (This inserts a field.)
Enter 005 for the Row.
Press RETURN.
Enter 067 for the Column.
Press RETURN.
Enter 004 for the Length.
Press RETURN.

Insert a field six spaces long beneath the PART # as follows:

Press F8.
Enter 008 for the Row.
Press RETURN.
Enter 009 for the Column.
Press RETURN.
Enter 006 for the Length.
Press RETURN.

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Insert a field 11 spaces long beneath DESCRIPTION as follows:

Press F8.
Enter 008 for the Row.
Press RETURN.
Enter 022 for the Column.
Press RETURN.
Enter 011 for the Length.
Press RETURN.

Insert a field three spaces long beneath QTY as follows:

Press F8.
Enter 008 for the Row.
Press RETURN.
Enter 037 for the Column.
Press RETURN.
Enter 003 for the Length.
Press RETURN.

Insert a field six spaces long beneath PRICE as follows:

Press F8.
Enter 008 for the Row.
Press RETURN.
Enter 048 for the Column.
Press RETURN.
Enter 006 for the Length.
Press RETURN.

Insert a field seven spaces long beneath TOTAL as follows:

Press F8.
Enter 008 for the Row.
Press RETURN.
Enter 058 for the Column.
Press RETURN.
Enter 007 for the Length.
Press RETURN.

Insert a field 20 spaces long next to EMPLOYEE NAME as follows:

Press F8.
Enter 018 for the Row.

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Press RETURN.
Enter 023 for the Column.
Press RETURN.
Enter 020 for the Length.
Press RETURN.

You have now completed the segment mask. Your screen should look like Figure 4-11.

A.3 FIELD MASK DESIGN

On the 911 VDT, you can use the graphics characters (Figure E-1).

During field mask design, you create text that will appear at specified points in the application program. Typically, a field mask provides the information you need to correctly fill in a particular field or delivers a message commenting on your response. When you complete a given field, the field mask usually disappears.

Field masks associated with a specific field are displayed either upon entry into that field or when specified conditions are satisfied. The first field mask you create in this tutorial is to be associated with the field positioned below DESCRIPTION. To make this association, place the cursor on the dotted line directly beneath the D and proceed as follows:

Press CONTROL/2.

Field mask prompts appear on the bottom of your screen:

Enter DSCRIP for name.
Press RETURN.

Field masks can be displayed in bright or normal intensity. Normal is the default attribute. For bright display, enter Y in response to the BR prompt.

For this tutorial, proceed as follows:

Enter Y for BR.

Your screen should look like Figure 4-12. To create the field

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mask for the field labeled DESCRIPTION, complete the following steps:

Press F1.
Enter 009 for Row.
Press RETURN.
Enter 012 for Column.
Press RETURN.
Enter DESCRIPTION ITEMS ARE:.
Place cursor on next line beneath the D.
Enter HAT, RACKET, CLOTHING, BALLS, SHOES.
Press CONTROL/2. (This displays prompts that allow you to specify what to do with the mask.)

The screen is now blank except for the Field Mask Completion prompts on the bottom line. You now decide whether to keep the mask, delete it, or abort this activity entirely. For this tutorial, proceed as follows:

Enter 1 for Option. (This option saves the field mask.)
Press RETURN.

The segment mask shown in Figure 4-11 should appear.

Sometimes a field mask appears only if the data entered into a field satisfies a particular set of conditions. These conditions are specified as an attribute of that field during field attribute specification and are associated with an edit set. When the conditions are satisfied, the attributes listed in the edit set appear on the screen. When an edit set controls the display of a field mask, the field mask must not be directly associated with a field. Therefore, the cursor must not be in a field when the mask is created.

You will now create two field masks that are controlled by edit sets. Specify the name of the first of these masks as follows:

Press F1.
Enter 010 for Row.
Press RETURN.
Enter 045 for Column.
Press RETURN.
Press CONTROL/2.
Enter COMISS for Name. (This names the field mask.)
Press RETURN.
Enter Y for BR.

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Your screen should look like the screen in Figure 4-12. Now, create the field mask as follows:

Position the cursor on a line below PRICE.
Enter CONGRATULATIONS! YOU WILL.
Position the cursor on the next line beneath
the letter C.
Enter RECEIVE A 10% COMMISSION.
Press CONTROL/2. (This displays prompts that allow you
to specify what to do with the mask.)
Enter 1 for Option.
Press RETURN.

The segment mask shown in Figure 4-11 should appear on your screen.

You have completed the design of the field mask COMISS. Later in this tutorial (during field attribute specification) you will associate the field mask COMISS with the edit set DOTTHIS.

Create the second field mask controlled by an edit set, as follows:

Press F1. (This positions the cursor.)
Enter 014 for Row.
Press RETURN.
Enter 033 for Column.
Press RETURN.
Press CONTROL/2. (This displays the field mask prompts.)
Enter TOOBAD for Name. (This names the field mask.)
Press RETURN.
Enter Y for BR. (This displays the screen shown in
Figure 4-11.)
Enter BETTER LUCK NEXT TIME.
Press CONTROL/2. (This displays the prompts that allow
you to specify what to do with the mask.)
Enter 1 for Option. (This indicates that the mask is
finished.)
Press RETURN.

The segment mask shown in Figure 4-11 should appear on your screen.

You have completed the design of the field mask TOOBAD. Later in this tutorial (during field attribute specification) you will associate the field mask TOOBAD with the edit set DOTTHAT.

You are now ready to leave the mask design mode and select a new activity:

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Press CMD.

A.4 SELECTION MENU

The Selection menu shown in Figure 4-13 should now appear on your screen.

As indicated in Figure 4-14, this menu is the central control point in an ISGE session.

During the design phase of ISGE, you can move back and forth between mask design mode and field attribute specification mode by selecting design segment/field mask (DM) or specify field attributes (SF) from this menu. You can also choose to abort this session (AB), to edit segment information (ES), or to terminate this session by selecting one of the following:

- * Save the Intermediate File (SI)
- * Create an FDL File (CF)
- * Compile the Segment (CS)

Select attributes for the fields you created during segment mask design as follows:

Enter SF.
Press RETURN.

Your screen displays the segment mask shown in Figure 4-11.

A.5 FIELD ATTRIBUTE SPECIFICATION MODE

You are now in the field attribute specification mode (Figure 4-15).

In the field attribute specification mode, you can select attributes for all of the fields in this segment. You can select those attributes from either the Field Attribute Specification (FAS) menu or the Edit Set Specification menu (ESS). Although the segment mask appears on your screen, you cannot change it or the field masks associated with it while you are in field attribute specification mode.

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On the 911 VDT you can use the regular keyboard characters and special function keys described and illustrated in Table 4-1 for this activity.

To select attributes for a particular field, you must place the cursor in that field. Begin selecting attributes for the fields in this segment by placing the cursor in the field labeled INVOICE. Now you can select either the FAS menu or the ESS menu. For this tutorial, select the FAS menu as follows:

Press F1.

A.6 FIELD ATTRIBUTE SPECIFICATION MENU

The FAS menu (Figure 4-16) appears on your screen.

For a complete list of the attributes listed on both the FAS menu and the ESS menu and a description of their functions, see Appendix G of the reference manual. For your convenience, this tutorial defines each attribute as it is introduced.

Note that the first three attributes (row, column, and length) have been filled in with the corresponding coordinates for the field you were in when you pressed F1. They should be 005 for the row, 067 for the column, and 004 for the length.

Several attributes in this paragraph have default values. To accept these default values, press the RETURN key. Directions are given for the attributes you are to select. Press the SHIFT/FIELD key to move through attributes for which no directions are specified. Note that you cannot press RETURN to accept the default for the FILL attribute. Instead you must press SKIP [SKIP]. For all other attributes not specified for the following edit set, tab through the attribute by pressing RETURN. Select attributes for this field as follows:

Enter NVOICE for Name. (This names the field.)
Enter Y for Required. (This specifies that you must enter data for this field.)
Enter Y for Numeric. (This specifies that values entered in this field must be numbers.)
Enter _ for Numeric Fill.
Enter Y for Field Complete. (This signifies that you have completed field attribute specification for this field.)
Press RETURN.

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Your screen looks like the screen in Figure 4-11.

You have completed the field attribute specification for INVOICE. You are now ready to select attributes for PARTN. The cursor should be in the field beneath PART #. To select attributes for this field, proceed as follows:

Press F1.

The FAS menu (Figure 4-16) appears on your screen. Coordinates for the row, column, and length of the field located beneath PART # appear as follows: row 008; column 009; and length 006. Complete the attribute specification for the first part of this menu as follows:

Enter PARTN for Name. (This names the field.)
Enter N for Accept Display Defaults. (This allows you to specify display attributes.)
Enter Y for Blink. (On a 911 VDT, specifying this attribute causes the cursor to blink when it enters this field.)
Enter Y for Autoskip. (This causes the cursor to automatically leave this field after you enter data.)
Press ENTER. (This moves the cursor to the lower left-hand section of the FAS menu.)

The cursor should now be next to the attribute labeled Complete. Use the down arrow key to move the cursor to the attribute labeled Characters. This attribute allows you to specify what characters are valid for this field. To select this attribute, proceed as follows:

Press F1.

The screen in Figure 4-17 appears.

The section on the right side of your screen should now contain a series of prompts. This section is called the attribute prompt area. The prompts that appear in this area differ according to which attribute you select. For this attribute, you must complete six prompts. Figure 4-18 labels these prompts, and the text that follows describes them.

To respond to these prompts, complete the following steps:

Enter DIGIT for Name. (This names the attribute.)

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Press RETURN.
Enter 0.9,BLANK on the dotted line.
Press RETURN three times.
Enter Y for Complete.
Press RETURN.

The text in the attribute prompt area should disappear. The cursor is on the line labeled Characters. Move the cursor to the attribute labeled Fixed Lengths. This attribute allows you to specify valid lengths for data entered in this field. To select this attribute, proceed as follows:

Press F1.

Respond to the prompts in the attribute prompt area as follows:

Enter PNLN for Name. (This names the attribute.)
Press RETURN.
Enter 4 on the dotted line.
Press RETURN three times.
Enter Y for Complete.
Press RETURN.

The cursor is now on the line labeled Fixed Lengths. Move the cursor to the line labeled Other Page. This attribute allows you to gain access to another page of attributes. Respond as follows:

Press F1.

Note that new attributes appear in the list below Other Page. The cursor is next to Complete. Use the down arrow key to move the cursor next to User Error Message. Select this attribute to create your own error messages:

Press F1.

A series of prompts appear in the attribute prompt area. During a typical ISGE session, you select the type of user-defined error message you want. For this tutorial, use the down arrow key to move the cursor next to Length List. Then proceed as follows:

Press F1.

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Respond to the prompts that appear as follows:

Enter ERRPN for Name. (This is the name of the list.)
Press RETURN.
Enter PART NUMBER MUST BE 4 DIGITS on the dotted line.
Press RETURN two times.
Enter Y for Complete.
Press RETURN. (The attribute prompt display disappears and the field attribute specification display appears.)
Move the cursor to Complete.
Press F1. (This returns the cursor to the Field Complete prompt.)
Enter Y for Field Complete.
Press RETURN.

Your screen now looks like the one in Figure 4-11. The cursor is in the field located beneath DESCRIPTION. To select attributes for this field, proceed as follows:

Press F1.

The FAS menu appears on your screen. Coordinates for the row, column, and length of the field appear as follows: row, 008; column, 022; and length, 011. Note that the Field Mask attribute contains the name DSCRIP, which is the field mask associated with this field during mask design mode. To complete the field attribute specification for this field, proceed as follows:

Enter DESCRP for Name. (This names the field.)
Accept the default, Y, for Postclear. (This clears the mask from the screen after the cursor leaves the field.)
Press ENTER (This moves the cursor to the second section of the FAS menu.)
Move the cursor to Tables of Values.

The Tables of Values attribute allows you to specify a list of values that are valid or invalid for this field. The specified table can be inclusive (IN), which means that any value entered in this field must match a value in the table, or exclusive (EX), which means that any value entered must not be in the listed table. Complete the prompts for this attribute as follows:

Press F1.
Enter THINGS for Name. (This names the attribute.)
Press RETURN.
Enter IN, 'HAT', 'RACKET', 'CLOTHING', 'BALLS', 'SHOES' on the

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dotted line.
Press RETURN three times.
Enter Y for Complete.
Press RETURN.
Move the cursor to Complete.
Press F1. (This moves the cursor to Field Complete.)
Enter Y for Field Complete.
Press RETURN.

The segment mask shown in Figure 4-11 appears on your screen. The cursor is in the field located beneath QTY. To display the FAS menu for this field, proceed as follows:

Press F1.

The row, column, and length values for this field should appear as follows: row, 008; column, 037; and length, 003. Complete the following steps:

Enter QNTITY for Name. (This names the field.)
Enter N for Accept Display Defaults.
Enter Y for Bright. (This highlights the value.)
Press ENTER. (This moves the cursor to Complete.)
Move the cursor to Ranges of Values.

The Ranges of Values attribute allows you to specify a list of ranges that are valid or invalid for this field. The ranges specified can be inclusive (IN), which means that any data entered into this field must be within the ranges listed, or exclusive (EX), which means that any data entered into this field must not be within the ranges listed. Complete the field attribute specification for this field as follows:

Press F1.
Enter RGEQTY for Name. (This names the attribute.)
Press RETURN.
Enter IN,1/99999 on the dotted line.
Press RETURN three times.
Enter Y for Complete.
Press RETURN.
Move the cursor to Complete.
Press F1.
Enter Y for Field Complete.
Press RETURN.

The segment mask shown in Figure 4-11 appears on your screen.

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The cursor should be in the field located beneath PRICE.

Press F1.

The FAS menu appears on your screen. The values for row, column, and length appear as follows: row, 008; column, 048; and length, 006. Complete the following steps:

Enter PRICE for Name. (This names the field.)
Enter N for Accept Display Defaults.
Enter Y for Bright.
Enter Y for Numeric. (This specifies that you can enter only numbers in this field.)
Enter Y for Signed. (This allows you to enter signed numbers in this field and to pass them to the application.)
Enter 0 for Numeric Fill. (This fills the field with zeros.)
Enter 002 for Decimal Places. (This specifies that the values entered in this field must have two decimal places.)
Press ENTER.
Move the cursor to Copy-to-Entry.

The Copy-to-Entry attribute copies the field's value into another field or variable. Make the following entries:

Press F1.
Enter TOTAL for copy to field/variable. (This names the field that will receive the values entered in PRICE.)
Press RETURN.
Enter Y for Complete.
Press RETURN.
Move the cursor to Characters.

Press F1.
Enter MONEY for Name. (This names the character list.)
Press RETURN.
Enter 0..9, '.', '+', BLANK on the dotted lines.
Press RETURN three times.
Enter Y for Complete.
Press RETURN.
Move the cursor to Complete.

Press F1.
Enter Y for Field Complete.
Press RETURN.

The segment mask shown in Figure 4-11 reappears on your screen.

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The cursor is now in the field located beneath TOTAL. Proceed as follows:

Press F1.

The FAS menu appears on your screen. The values for row, column, and length appear as follows: row, 008; column, 058; and length, 007. Begin the field attribute specification for this field as follows:

Enter TOTAL for Name.

Enter N for Accept Display Default.

Enter Y for Bright.

Enter Y for External. (This allows the application program to refer to the field in Read, Write, and Reset commands.

Section 5 describes these commands.)

Press ENTER.

Move the cursor to Other Page.

Press F1.

Move the cursor to Cond. Attribute. (This allows you to specify the conditions that determine which edit set is used with this field.)

Press F1.

The attribute prompts for this attribute appear on your screen. Proceed as follows:

Enter BONUSS for Condition. (This names the condition.)

Press RETURN.

Enter PRICE for Field/Variable.

Press RETURN.

Enter DOTHIS for then edit set is. (The edit set DOTHIS will be used if the condition is true.)

Press RETURN.

Enter DOTTHAT for else edit set is. (The edit set DOTTHAT will be used if the condition is false.)

Press RETURN three times to go to Ranges of Values Name.

Enter RANGE\$ for Ranges of Values Name. (This gives the range of values for the condition BONUSS.)

Press RETURN five times to go to Complete.

Enter Y for Complete.

Press RETURN.

Move cursor to Other Page.

Press F1.

Move cursor to Ranges of Values.

Press F1.

Enter RANGE\$ for Name. (This names the range list for RANGE\$.)

Press RETURN.

Enter IN,50/99999 on dotted line. (This specifies that if data entered in the field TOTAL is between 50 and

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99999 then DOTHIS applies; otherwise, DOTTHAT applies.)
Press RETURN three times.
Enter Y for Complete.
Press RETURN.
Move cursor to Complete.

Press Fl.
Enter Y for Field Complete.
Press RETURN.

The segment mask shown in Figure 4-11 appears on your screen. The cursor should be in the field located next to EMPLOYEE NAME. Begin attribute specification for this field as follows:

Press Fl.

The row, column, and length values for this field appear as follows: row, 018; column, 023; and length, 020. Complete the attribute specification for this field as follows:

Enter YRNAME for Name. (This names the field.)
Enter Y for Required.
Press ENTER.
Move the cursor to Characters.

Press Fl.
Enter YOUWHO for Name. (This names the character list.)
Press RETURN.
Enter A..Z, BLANK on the dotted line.
Press RETURN three times to go to Complete.
Enter Y for Complete.
Press RETURN.
Go to Complete.
Press Fl.
Enter Y for Field Complete.
Press RETURN.

A.7 EDIT SET SPECIFICATION MENU

You are now ready to create an edit set for this field. The cursor can be anywhere on the screen for this activity. An edit set contains one or more attributes that are applied to a field when the data entered in that field meets conditions specified in a conditional attribute statement. You use the Edit Set Specification menu (ESS) to specify attributes for an edit set.

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To display this menu, proceed as follows:

Press F2.

Note that the cursor need not be in a field when you specify an edit set for that field.

The ESS menu (Figure 4-19) appears on your screen.

The ESS menu contains many of the same attributes listed in the FAS menu. It does not contain the Position or Display attributes. Although the Array attribute is listed on the ESS menu, you cannot specify it for an edit set.

Note that you cannot press RETURN to accept the default for the FILL attribute. Instead you must press SKIP [SKIP]. For all other attributes not specified for the following edit set, tab through the attribute by pressing RETURN.

Create the edit set DOTHIS and associate it with the field mask COMISS as follows:

Enter DOTHIS for Edit Set Name.
Enter COMISS for Field Mask.
Enter Y for Postclear.
Enter Y for Edit Set Specification Complete.

The segment mask shown in Figure 4-11 appears on your screen. Create the edit set DOTTHAT and associate it with the field mask TOOBAD as follows:

Press F2.
Enter DOTTHAT for Edit Set Name.
Enter TOOBAD for Field Mask.
Enter Y for Postclear.
Enter Y for Edit Set Specification Complete.

The segment mask shown in Figure 4-11 appears on your screen. You have now completed the design phase of this ISGE session. Enter the termination phase as follows:

Press CMD.

The Selection menu shown in Figure 4-13 appears on your screen.

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A.8 TERMINATION PHASE

Refer to section 4 of the reference manual (paragraph 4.3.4) to complete the tutorial. The remainder of the tutorial is terminal independent.