

intercomm[®]

AUTOGEN FACILITY

SDA

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Autogen Facility

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This is a proprietary and confidential document.

PREFACE

Intercomm is a state-of-the-art teleprocessing monitor system of SDA, operating under the control of IBM 360/370 Operating Systems (MFT, MVT, VS). Intercomm monitors the transmission of messages from terminals, concurrent message processing, centralized access to I/O files, and the routine utility operations of editing input messages and formatting output messages, as required.

The Autogen Facility Special Feature is an extension to the Message Mapping Utilities (MMU). Autogen allows screen layouts to be specified at the terminal. The terminal user enters field-oriented data according to prompting screens supplied by Autogen. MMU map definitions are generated as a result of the terminal session.

This document provides an overview of Autogen operation for the terminal user and details installation procedures for the systems programmer. Specifics for use of Autogen at the terminal are provided by the Autogen prompting screens.

The following prerequisite publications support the material contained herein:

- Concepts and Facilities
- Message Mapping Utilities Users Guide
- Introduction to Programming the IBM 3270 (an IBM publication)

Other technical publications related to Intercomm use are described on the previous page.

A User Review Form is included at the back of this manual. We welcome recommendations, suggestions and reactions to this or any Intercomm publication.

INTERCOMM PUBLICATIONS

GENERAL INFORMATION MANUALS

Concepts and Facilities

Planning Guide

APPLICATION PROGRAMMERS MANUALS

Assembler Language Programmers Guide

COBOL Programmers Guide

PL/1 Programmers Guide

SYSTEM PROGRAMMERS MANUALS

Basic System Macros

BTAM Terminal Support Guide

Installation Guide

Messages and Codes

Operating Reference Manual

System Control Commands

CUSTOMER INFORMATION MANUALS

Customer Education Course Catalog

Technical Information Bulletins

User Contributed Program Description

FEATURE IMPLEMENTATION MANUALS

Amigos Users Guide

Autogen Facility

ASMF Users Guide

DBMS Users Guide

Data Entry Installation Guide

Data Entry Terminal Operators Guide

Dynamic Data Queuing Facility

Dynamic File Allocation

Extended Security System

Generalized Front End Facility

Message Mapping Utilities

Model System Generator

Multiregion Support Facility

File Recovery Users Guide

OS Remote Job Entry

Page Facility

Store/Fetch Facility

SNA Terminal Support Guide

TCAM Support Users Guide

Utilities Users Guide

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Section 1

INTRODUCTION

1.1 MAP DEFINITIONS WITH MMU

Intercomm Message Mapping Utilities (MMU) are provided to isolate terminal-oriented specifications from on-line application programs and to reduce the complexities of screen format considerations within the application program.

Using MMU, the application programmer prepares screen format specifications by coding Assembler Language macros. These macros specify such information as constant values, field positioning information, field attribute information and other such items required to delineate CRT screen use.

The collection of macros describing a screen layout is called a Map Definition. Following assembly, Map Definitions are used in the on-line environment to provide message formatting services in conjunction with application program processing.

1.2 MAP DEFINITIONS WITH AUTOGEN

The Autogen Special Feature provides a direct method of creating Map Definitions, speeding implementation of on-line applications by specification of terminal screen layout through the terminal itself. Autogen operates as an Intercomm application program (subsystem).

Using Autogen, the application programmer enters a "model" of the screen layout desired, then submits this "model" to the Autogen facility. Autogen, through a series of prompting screens, requests additional information to complete the screen specifications and produces the Assembler Language macros required for MMU.

After the general screen layout is defined, that layout is displayed to the user for detailed specification of names of variable fields and field attributes. This process completes the definition of one screen. The user may then continue to define additional screens, or terminate the session.

A correction facility exists within Autogen which enables the user to return to a previous point within the prompting sequence for a map definition in order to change previously specified items. This correction facility is referred to as Revise Mode.

1.3 AUTOGEN CAPABILITIES

Autogen has been designed to provide automatic specification for a subset of MMU capabilities; that subset has been chosen to represent the majority of anticipated MMU usages. Autogen is designed for simplicity and ease of use.

MMU provides an extensive array of features that offer a diversity of complex formatting options, many of which produce an output format whose characteristics vary dynamically according to data content. In such formatting situations, direct assembler macro specification may still be required.

Some of the advantages of the Autogen Special Feature are:

- Proposed screen layouts can be analyzed and critiqued at the terminal to quickly correct design flaws such as clutter or awkward field positioning.
- Proposed screen layouts can be created by analysts or programmers in conjunction with prospective system users to obtain immediate user reaction and feedback.
- Programmer requirement to understand MMU macro coding and other training requirements are decreased.
- Programmer productivity is increased; programmer error rates can be decreased.

Autogen uses existing system facilities and requires negligible system overhead. Depending on installation requirements, it can be defined as a high-priority resident subsystem or a lower priority dynamically loaded (or overlay region) subsystem.

Autogen supports the IBM 3270 Model 2 terminal (1920-character screen) devices which are hardware compatible with the 3270, and the Teletype (Dataspeed) Model 40/1 and 2 terminals.

Chapter 2

AUTOGEN OPERATIONS

This chapter assumes knowledge of MMU facilities and macros as described in Message Mapping Utilities.

2.1 AUTOGEN PROMPTING SCREENS

Execution of Autogen is initiated by entry of a user-assigned Intercomm verb (e.g., AGEN) at the terminal. The Autogen subsystem then prompts the terminal operator with a series of screens requesting specific data for generating map definitions. The sequence of requests (Normal Mode) is:

- Specify map group name and mode,
- Specify map name,
- Describe screen layout,
- Assign field names,
- Assign numeric field types,
- Assign field attributes,
- Make additional map definition(s) for the map group,
or
- Define additional map groups or terminate session.

The correction facility (Revise Mode) may be used after describing the screen layout to correct any previously entered specification for a particular map prior to starting definition of a subsequent map or map group.

There are no restart procedures associated with Autogen. In the event of system failure and subsequent system restart, the Autogen prompting sequence must be reinitiated with entry of the Autogen verb.

Figure 2-1 summarizes Autogen screens and terminal operator action for Normal Mode of operation. Cross-references to figures in this section that illustrate use of the screens are provided.

Screen Title	Operator Reply	Figure
MAPGP-N	Enter map group name and map group mode	2-3
MAP-N	Enter map name	2-4
LAYOUT	Enter screen layout	2-5, 2-6
TNAMES-N*	Enter field names for fields entered on the LAYOUT screen	2-7, 2-8
PNAMES-N*	Enter changes to field names specified on T-NAMES	2-9
CHGERR-N*	Enter corrections to syntax errors from PNAMES entries	2-18
NUMTYPE-N*	Enter numeric field types	2-10, 2-11
ATTRIB-N*	Enter field attributes	2-12, 2-13, 2-14, 2-15
MOREMAPS*	Begin definition of a new map within the current map group or terminate definition of this map group	2-16
MOREGPS	Begin definition of a new map group or terminate this AUTOGEN session	2-17
* - Revise Mode can be entered from these screens.		

Figure 2-1. Autogen Screens and Replies, Normal Mode

2.2 AUTOGEN MAP DEFINITIONS

When the Autogen user specifies completion of a map group definition, Autogen produces a set of MMU Map Definition macros in symbolic form. The Map Definitions consist of:

- MAPGROUP macro with map group name and mode as specified from the terminal. All maps are created with DEVICE=ALL (default)
- MAP macro(s) with map name as specified from the terminal. Each map represents a full screen (24 rows, 80 columns), and specifies START=(1,1)

- FIELD macro(s) for each data field specified on the screen layout (map). Field names and characteristics are derived from terminal input (or assume macro defaults, if not specified). All fields have ATTRIB=UAN by default, others may be specified. RELPOS generated for each field is relative positional and is that of the data area, not the attribute byte. RELPOS=VERB/AID/CURSOR, if desired, must be added to the map off-line. RELPOS=POS, keyword or fixed definitions are not applicable. Structured segments and occurring fields/segments are not applicable.

If the terminal session defines more than one map group, a separator card (with * in column 1) is produced between each set of output map definitions.

A user exit is provided within the Autogen output routine which allows the user to intercept and process each "card" output by Autogen. (See Appendix A.)

2.3 GENERATING A MAP DEFINITION

Use of Autogen is best illustrated by an example. Figure 2-2 illustrates a typical screen layout for which Autogen is used to generate a Map Definition. The user (analyst or programmer) sketches such a layout, proceeds to the terminal, and enters the Autogen verb to initiate the Autogen session.

In the discussion following, Normal Mode of operation is described; error procedures and use of Revise Mode are described in Sections 2.4 and 2.5.

NOTE: All names specified during the Autogen session (map group, map, and field names) must begin with an alphabetic character. The remaining characters may be alphabetic or numeric only (no special characters, @, #, \$, no blanks). Where Autogen requests entry of data into fields of a prompting screen, all data must be entered as left-justified values with no embedded blanks.

2.3.1 Specifying Map Group Name and Mode

Figure 2-3 illustrates the MAPGP-N prompting screen with operator reply specifying the name of the map group to be defined. The name may be up to seven characters long and must be left-justified. The mode can be specified as 'I' for input, 'O' for output, or a blank, indicating the default of I/O may be used (see the MMU manual for a discussion of map group modes).

If Input mode is specified, the FIELD macros subsequently generated for this map group will include the JUSTIFY= and COND=ENTERED parameters. If Output mode is specified, the macros generated include the JUSTIFY=, ATTRIB=, and INITIAL= parameters. If the default of I/O is chosen, all of the above parameters are included.

```
@PANS@EMPLOYEE NO:@          @NAME:@          @
@DIVISION:@  @LOCATION:@  @POSITION:@          @
@PAN DATE:@      @STATUS:@ @EXEMPT?@  @CLASS:@ @
@INCREASE:@  @NEW SALARY:@  @EFFECTIVE DATE:@  @INCREASE CODE:@ @
@BONUS AMOUNT:@  @BONUS DATE:@  @
@SECURITY LEVEL:@ @SECURITY DATE:@  @SECURITY OFFICE:@ @
@LOA START DATE:@  @LOA RETURN DATE:@  @
@TERMINATION DATE:@  @TERMINATION CODE:@ @
          @REASON:@          @
@COMMENTS@          @
```

Figure 2-2. A Typical Screen for Autogen Definition

<p>INTERCOMM SCREEN GENERATION NORMAL MODE - SCREEN MAPGP-N</p> <p>ENTER MAPGROUP NAME <u>PERSNEL</u></p> <p>THE MAPGROUP MODE WILL BE I/O (INPUT/OUTPUT) UNLESS YOU SPECIFY EITHER I FOR INPUT OR O FOR OUTPUT HERE: _</p>
<p><u>NOTE:</u> Enter maximum 7-character name, left-justified, no embedded blanks (PERSNEL). This map group will be I/O.</p>

Figure 2-3. MAPGP-N Screen Reply

2.3.2 Specifying Map Name

Figure 2-4 illustrates the MAP-N prompting screen with operator reply specifying the map name to be defined. The name may be up to eight characters in length.

<p>INTERCOMM SCREEN GENERATION NORMAL MODE - SCREEN MAP-N ENTER MAP (SCREEN) NAME <u>PANSCRN</u></p>
<p><u>NOTE:</u> Enter maximum 8-character name, left-justified, no embedded blanks. (PANSCRN)</p>

Figure 2-4. MAP-N Screen Reply

2.3.3 Describing the Screen Layout

Figure 2-5 shows the LAYOUT prompting screen with operator reply. Note that an "at-sign", @, has been chosen as the character to indicate attribute byte positions on the screen. Following reply to the LAYOUT, Autogen clears the screen, and the user enters the desired screen layout, as illustrated by Figure 2-6. The layout entered on this blank screen becomes the basis for all subsequent specifications, and is referred to as the "layout screen" in this section.

```
INTERCOMM SCREEN GENERATION
NORMAL MODE - SCREEN LAYOUT

ENTER SCREEN LAYOUT.

ENTER CONSTANT OR INITIAL-VALUED FIELDS AS THEIR VALUES.
ENTER CHARACTER FIELDS AS 'X'.
ENTER NUMERIC FIELDS USING 'S', '9' AND '.'.
ENTER YES/NO FIELDS AS 'YYY'.
SELECTOR PEN SELECTION FIELDS MUST BEGIN WITH '?'.
SELECTOR PEN ATTENTION FIELDS MUST BEGIN WITH '='.

ENTER FIELD ATTRIBUTE BYTES AS '_' (UNDERSCORE). IF YOU WISH TO USE A CHARACTER
OTHER THAN UNDERSCORE, PLEASE INDICATE IT HERE: @
```

NOTE: "@" is the designated indicator of attribute byte position.

Figure 2-5. LAYOUT Screen Reply

```

@PANS@EMPLOYEE NO:@999999@NAME:@XXXXXXXXXXXXXXXXXXXXXXXXX@
@DIVISION:@XXX@LOCATION:@XXX@POSITION:@XXXXXXXXXXXXXXXXXXXX@
@PAN DATE:@999999@STATUS:@X@EXEMPT?@YYY@CLASS:@X@
@INCREASE:@99.99@NEW SALARY:@999.99@EFFECTIVE DATE:@999999@INCREASE CODE:@X@
@BONUS AMOUNT:@999999@BONUS DATE:@999999@
@SECURITY LEVEL:@X@SECURITY DATE:@999999@SECURITY OFFICE:@X@
@LOA START DATE:@999999@LOA RETURN DATE:@999999@
@TERMINATION DATE:@999999@TERMINATION CODE:@X@
          @REASON:@XXXXXXXXXXXX
@COMMENTS@XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                                                    XXXXXXXXXXXXXXXXXXXX
                                                    XXXXXXXXXXXXXXXXXXXX
    
```

NOTE: The entire field need not be filled with "x" or "9", as illustrated by the last 5 lines of this screen.

Figure 2-6. User Screen Layout Definition

2.3.4 Assigning Field Names

Assigning field names is accomplished by first entering field names directly into the layout screen, keying over the previously entered fields. Field names at this point in the operation are restricted to seven characters or the length of the field itself, whichever is smallest. Field names may then be changed (lengthened) on the subsequent prompting screen to the maximum seven characters. Field names may consist of alphabetic characters and numeric digits; no special characters.

Figure 2-7 illustrates the prompting screen T NAMES. The user at the terminal replies to T NAMES by pressing the ENTER key. Autogen then displays the previously entered screen layout and the user enters field names in the screen positions where field names are desired (Figure 2-8).

After receiving the layout with screen names, Autogen presents the user with the P NAMES prompting screen. Figure 2-9 shows the P NAMES screen with the desired field name changes entered by the user.

Field names assigned by replies to the T NAMES and P NAMES prompting sequence become Map Definition FIELD macro labels and thus are the symbolic field names referenced by application programs using the defined map.

INTERCOMM SCREEN GENERATION
NORMAL MODE - SCREEN T NAMES-N

ENTER FIELD NAMES FOR VARIABLE FIELDS WITHIN THE FIELDS THEMSELVES ON THE FOLLOWING SCREEN. NOTE THAT TEMPORARILY THE FIELD NAME MAY BE ONLY AS LONG AS THE FIELD. THE NEXT SET OF SCREEN-GENERATION INSTRUCTIONS WILL ALLOW YOU TO LENGTHEN ANY FIELD NAME TO UP TO SEVEN CHARACTERS.

IF YOU WISH TO ENTER REVISE MODE, ENTER A NON-BLANK CHARACTER, HERE: _

Figure 2-7. T NAMES-N Screen Reply

```

@PVR@EMPLOYEE NO:@EMPNUM@NAME:GXXXXXX@EMPNAMEXXXXXXXXXX@
@DIVISION:@DIVE@LOCATION:@LOC@POSITION:@XXX@POSTITLXXXXXXXXXXXX@
@PAN DATE:@PDATE@STATUS:@AGEXEMPT:@BDB@CLASS:@CB
@INCREASE:@IAMP@NEW SALARY:@NEWSAL@EFFECTIVE DATE:@EDATE@INCREASE CODE:@ID
@BONUS AMOUNT:@BONAMT@BONUS DATE:@BONDATE
@SECURITY LEVEL:@ER@SECURITY DATE:@SECDAT@SECURITY OFFICE:@FB
@LOA START DATE:@LOASTR@LOA RETURN DATE:@LOARET@
@TERMINATION DATE:@TDATE@TERMINATION CODE:@CA
@REASON:@XXX@REASON@XXX
@COMMENTS@XXXX@COMMS@XXXXXX
XXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXX

```

NAME: The field name (maximum seven characters) may be entered anywhere within the designated field position on the screen layout. See "EMPNAME", Line 1.

The field name assigned must consist of characters other than those entered for each field on the layout screen. For example, if "xxxxxx" was used to define a field on the layout screen, the character "x" must not be used within a temporary field name. Similarly, if an initial-valued field was entered on the layout screen as "NAME:", and the desired field name is "NAME", enter "NAME" beginning in the second position of the 5-position initial-value field (the screen will show "NNAME").

Figure 2-8. Temporary Field Name Assignment

INTERCOMM SCREEN GENERATION
NORMAL MODE - SCREEN P NAMES-N

IF YOU WISH TO LENGTHEN OR OTHERWISE CHANGE ANY FIELD NAME GIVEN ON THE PREVIOUS SCREEN, ENTER HERE PAIRS OF THE FORM (OLDNAME,NEWNAME) WITH THE NAMES ENCLOSED IN PARENTHESES AND SEPARATED BY A COMMA.

(A,STATUS)(BBB,EXEMPT)(C,CLASS)(IAMT,INCRAMT)
(EDATE,EFFDATE)(D,SPECIAL)(E,SECLEV)
(F,SECOFC)(LOASTR,LOASTRT)
(TDATE,TRMDATE)(G,TRMCODE)

IF YOU HAVE NO NEED OF THIS OPTION, ENTER A NON-BLANK CHARACTER HERE: _
IF YOU WISH TO ENTER REVISE MODE, ENTER A NON-BLANK CHARACTER HERE: _

NOTE: The field names entered here replace the field names of the T NAMES screen, as shown.

Figure 2-9. P NAMES-N Screen Reply

2.3.5 Assigning Numeric Field Types

Following assignment of field names, the user is presented with the prompting screen NUMTYPE (Figure 2-10) to specify characteristics of numeric fields. The reply to this screen depends upon the type of numeric fields you wish to define. The fields specified as numeric at the layout screen may be defined as all of the same numeric type (one of those shown on the NUMTYPE display), or as a mixture of these types.

If you want all numeric fields to be of the same type, enter the code for that type in the first indicated position and enter a non-blank character in the second indicated position. This causes the entered numeric-type code to apply to all numeric fields in the screen layout, and the next screen to appear is the attribute assignment screen.

If numeric fields in the same screen layout are to be of different numeric types, enter the type code in the indicated default position and nothing in the second indicated position (Figure 2-10). The example shown indicates that most fields in the layout are to be zoned decimal. Entering nothing in the second indicated position causes the layout screen to be returned, rather than causing the ATTRIB-N screen to appear.

```
INTERCOMM SCREEN GENERATION
NORMAL MODE - SCREEN NUMTYPE-N

                NUMERIC FIELD TYPE CODES
      B - 1-BYTE BINARY      H - (UNALIGNED) HALFWORD      Z - ZONED DECIMAL
      J - 3-BYTE BINARY      F - (UNALIGNED) FULLWORD      P - PACKED DECIMAL

THE DEFAULT NUMERIC DATA TYPE WILL BE PACKED DECIMAL UNLESS YOU ENTER ANOTHER
TYPE CODE HERE:  Z

IF YOU WOULD LIKE ANY VARIABLE NUMERIC FIELD TO BE OF DATA TYPE OTHER THAN THE
DEFAULT, ENTER THE TYPE CODE IN THE FIELD ON THE FOLLOWING SCREEN.

IF ALL NUMERIC DATA ARE TO BE OF THE DEFAULT TYPE, ENTER A NON-BLANK CHARACTER
HERE:  _

IF YOU WISH TO ENTER REVISE MODE, ENTER A NON-BLANK CHARACTER HERE:  _
```

Figure 2-10. NUMTYPE-N Screen Reply

Figure 2-11 illustrates operator reply to the returned layout screen, entering desired numeric-type codes (other than the default type) anywhere within the numeric fields.

```

@PANS@EMPLOYEE NO:9999999@NAME:XXXXXXXXXXXXXXXXXXXXXXXXX@
@DIVISION:XXX@LOCATION:XXX@POSITION:XXXXXXXXXXXXXXXXXXXXX@
@PAN DATE:9999999@STATUS:XX@EXEMPT?@YYY@CLASS:XX@
@INCREASE:99.99@NEW SALARY:99.99@EFFECTIVE DATE:9999999@INCREASE CODE:XX@
@BONUS AMOUNT:9999@BONUS DATE:9999999@
@SECURITY LEVEL:XX@SECURITY DATE:9999999@SECURITY OFFICE:XX@
@LOA START DATE:9999999@LOA RETURN DATE:9999999@
@TERMINATION DATE:9999999@TERMINATION CODE:XX@
          @REASON:XXXXXXXXXXXXX
@COMMENTSXXXXXXXXXXXXXXXXX          XXXXXXXXXXXXXXXXXXXX@
                                     XXXXXXXXXXXXXXXXXXXX@

```

NOTE: The field numeric-type code can be entered anywhere within the field area on the layout screen. See "Salary", line 4.

Figure 2-11. Numeric Field Type Assignment

2.3.6 Assigning Field Attributes

The final step in defining fields is to specify field attributes. The ATTRIB prompting screen allows the user to specify one attribute to be assigned. Autogen then displays the layout screen, and the user enters any non-blank character within the field to assume that attribute. Autogen then returns the ATTRIB screen for the user to make a second (or subsequent) attribute assignment.

If the user reply to the ATTRIB screen is null (no attribute code entered), Autogen considers attribute assignment complete. Figures 2-12 and 2-13 illustrate assignment of one attribute, Figures 2-14 and 2-15 show assignment of a second attribute. One field may be assigned more than one attribute.

```

                                INTERCOMM SCREEN GENERATION
                                NORMAL MODE - SCREEN ATTRIB-N

IF YOU WISH TO ASSIGN ANY FIELD ATTRIBUTE, ENTER THE STANCARD ATTRIBUTE CODE
HERE: MDION__ THEN ASSIGN THE ATTRIBUTE FOR A FIELD BY ENTERING ANY NON-BLANK
CHARACTER IN THE FIELD ON THE FOLLOWING SCREEN.

IF YOU WISH TO ENTER NO FURTHER SUCH ATTRIBUTES, MAKE NO ENTRIES IN THE ABOVE.

IF YCU WISH TO ENTER REVISE MODE, ENTER A NON-BLANK CHARACTER HERE:  _

PERMISSIBLE ATTRIBUTE CODES ARE AS FOLLOWS:
    RTJUST  BLNKFILL  MDTON   HIGHINT
    LFJUST  ZEROFILL  AUTOSKIP  NONDISP
```

Figure 2-12. ATTRIB-N Screen Reply 1

```

*NS EMPLOYEE NO:09999999NAME:0XXXXXXXXXXXXXXXXXXXXXXXXX0
0DIVISION:0XXX0LOCATION:0XXX0POSITION:0XXXXXXXXXXXXXXXXXXXX0
0PAN DATE:09999990STATUS:0X0EXEMPT?0YYY0CLASS:0X0
0INCREASE:099.990NEW SALARY:0999.990EFFECTIVE DATE:09999990INCREASE CODE:0X0
0BONUS AMOUNT:09999990BONUS DATE:0999999
0SECURITY LEVEL:0X0SECURITY DATE:09999990SECURITY OFFICE:0X0
0LOA START DATE:09999990LOA RETURN DATE:09999990
0TERMINATION DATE:09999990TERMINATION CODE:0X0
      0REASON:0XXXXXXXXXXXX
0COMMENTS0XXXXXXXXXXXXXXXXXXXXX
                                XXXXXXXXXXXXXXXXXXXX0
                                XXXXXXXXXXXXXXXXXXXX0

```

NOTE: Enter the attribute selection character (* in this example) anywhere within the field area on the layout screen.

Figure 2-13. Attribute Assignment Screen 1

INTERCOMM SCREEN GENERATION
NORMAL MODE - SCREEN ATTRIB-N

IF YOU WISH TO ASSIGN ANY FIELD ATTRIBUTE, ENTER THE STANDARD ATTRIBUTE CODE
HERE: AUTOSKIP THEN ASSIGN THE ATTRIBUTE FOR A FIELD BY ENTERING ANY NON-BLANK
CHARACTER IN THE FIELD ON THE FOLLOWING SCREEN.

IF YOU WISH TO ENTER NO FURTHER SUCH ATTRIBUTES, MAKE NO ENTRIES IN THE ABOVE.

IF YOU WISH TO ENTER REVISE MODE, ENTER A NON-BLANK CHARACTER HERE: _

PERMISSIBLE ATTRIBUTE CODES ARE AS FOLLOWS:
RTJUST BLNKFILL MDTON HIGHINT
LFJUST ZEROFILL AUTOSKIP NONDISP

Figure 2-14. ATTRIB-N Screen Reply 2

```

*ANS*EMP*DYEE NO:2999999*ANAM*CA*XXXXXXXX*XXXXXXXXXXXXXXXXXXXX*
*DIV*SION:XXXX*LOCA*ION:XXXX*POSITION:XXXXXXXXXXXXXXXXXXXXXXXX*
*H*IN DATE:2999999*ATUS:AX*E*HPT?2YYY*CLA*=:AX*
*INC*EASE:299.99*NE* SALARY:9999.99*EFF*CTIVE DATE:2999999*INCREASE CODE:AX*
*BO*US AMOUNT:2999999*NONU* DATE:2999999
*SE*URITY LEVEL:AX*SE*URITY DATE:2999999*SE*URITY OFFICE:AX*
*BL* START DATE:2999999*LOA RE*URN DATE:2999999
*TER*MINATION DATE:2999999*TERMINATI*ION CODE:AX*
*RE*ASON:XXXXXXXXXXXX
*COMMENTSXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXX

```

NOTE: Enter the attribute selection character (* in this example) anywhere within the field area on the screen.

Figure 2-15. Attribute Assignment Screen 2

2.3.7 Terminating Map Group Definition

The MOREMAPS prompting screen is displayed following attribute assignment. The reply to this screen is either YES or NO, depending upon whether or not there are further maps to be defined for this map group. A response of YES returns you to the MAP-N screen for definition of the next map in this group. A response of NO terminates definition of this map group, and the associated MMU macros are generated. (See Figure 2-16.)

```
INTERCOMM SCREEN GENERATION
NORMAL MODE - SCREEN MOREMAPS

ARE THERE TO BE ANY FURTHER MAPS (SCREENS) IN THIS GROUP?
ENTER *YES* OR *NO*: NO_

THIS IS YOUR FINAL OPPORTUNITY TO REVISE THIS MAP. IF YOU WISH TO ENTER REVISE
MODE, ENTER A NON-BLANK CHARACTER HERE: _
```

Figure 2-16. MOREMAPS Screen Reply

2.3.8 Terminating the Autogen Session

If the reply to the MOREMAPS screen is NO, Autogen presents the user with the MOREGPS screen. (See Figure 2-17.)

The reply to this screen is either YES or NO, depending on whether or not you wish to continue this Autogen session. A response of YES returns you to the MAPGP-N screen to begin definition of a new map group. A response of NO terminates this Autogen session and the message

'AUTOGEN SESSION COMPLETED'

is returned. The screen is unprotected; you may now choose another Intercomm function.

```

                INTERCOMM SCREEN GENERATION
                NORMAL MODE - SCREEN MOREGPS

ARE THERE TO BE ANY FURTHER MAPGROUPS?
ENTER 'YES' OR 'NO': NO

```

Figure 2-17. MOREGPS Screen Reply

2.5.1 Selecting Revision Type

The REVSEL screen is displayed as a result of a request to enter Revise Mode. The reply to this screen specifies the type of revision you wish to make. (See Figure 2-19.)

```

                                INTERCOMM SCREEN GENERATION
                                REVISE MODE - SCREEN REVSEL

                                SELECT THE SCREEN YOU WISH TO USE BY ENTERING ITS NUMBER HERE:

                                1) MAPGROUP NAME AND MODE      4) LIMITED LENGTH FIELD NAMES
                                2) MAP (SCREEN) NAME           5) CHANGE FIELD NAMES
                                3) SCREEN LAYOUT*              6) NUMERIC DATA TYPES
                                7) ASSIGN/DELETE FIELD ATTRIBUTES

* NOTE THAT STRICTLY THERE IS NO 'REVISE MODE' FOR SCREEN LAYOUT. SINCE A
REVISION OF THE SCREEN LAYOUT REQUIRES RESPECIFICATION OF ALL FIELD NAMES,
NUMERIC DATA TYPES AND FIELD ATTRIBUTES, YOUR SELECTION OF THIS OPTION WILL
RETURN YOU TO NORMAL MODE.

```

Figure 2-19. REVSEL Screen

2.5.2 Revise Mode Prompting Screens

The prompting screen associated with the revision type selected is then displayed. Revise Mode prompting screens are identical to Normal Mode prompting screens (with the exception of ATTRIB, which allows revision and/or deletion of previously specified attributes) but do not include the option to enter Revise Mode. Revise Mode screen names are suffixed with "-R" to distinguish them from Normal Mode screen names (suffixed with "-N"). If option 3 (LAYOUT screen is chosen, a blank screen is returned; the entire layout must be recreated.

When using the NUMTYPE-R Option (6), all numeric codes must be respecified (except the indicated default in this screen).

When choosing TNAMES-R option (4), do not press the ENTER key. After this screen is displayed, enter RLSE command to receive the LAYOUT screen. When using the P NAMES-R option (5), only short names entered in the previous TNAMES-R processing may be changed/expanded. Those entered in Normal mode may not be changed.

2.5.3 Continuing from Revise Mode

Following completion of the input associated with the revision type selected, the user is presented with the REVCON screen to specify continuation options as shown in Figure 2-20. It provides the user with the option to remain in Revise Mode, return to Normal Mode, or terminate the current map definition.

```
INTERCOMM SCREEN GENERATION
REVISE MODE - SCREEN REVCON

SELECT THE WAY IN WHICH YOU WISH TO CONTINUE BY ENTERING THE APPROPRIATE OPTION
NUMBER HERE: _

1) RETLRN TO NORMAL MODE FROM THE POINT WHERE REVISE MODE WAS ENTERED.
2) REMAIN IN REVISE MODE, SELECTING THE NEXT SCREEN TO USE.
3) CONTINUE FROM THE SCREEN JUST USED IN NORMAL MODE, LOSING CONNECTION WITH
  THE POINT WHERE REVISE MODE WAS ENTERED.
4) ALL SPECIFICATION FOR THIS MAP COMPLETE.
```

Figure 2-20. REVCON Screen

Chapter 3

INSTALLATION PROCEDURES

This chapter assumes knowledge of Intercomm installation procedures as described in the Operating Reference Manual, Message Mapping Utilities, and Store/Fetch Facility.

3.1 AUTOGEN REQUIREMENTS

The Autogen Special Feature is available for installation with Intercomm Release 8.0. Installation of Autogen requires:

- Installation of Message Mapping Utilities and Store/Fetch
- SPALIST parameter specifications
- Autogen subsystem definition in Front End Verb Table and Subsystem Control Table
- Autogen subsystem linkedit
- Autogen map load to MMU Store/Fetch Map Data Set
- Store/Fetch data set initialization (if an existing Store/Fetch data set is not to be used by Autogen)
- Intercomm linkedit (if Autogen subsystem is not to be dynamically loaded)
- Autogen JCL additions to Intercomm execution JCL.

3.2 MMU AND STORE/FETCH INSTALLATION

Installation procedures for the Message Mapping Utilities (MMU) are described in Message Mapping Utilities. There are no special MMU installation requirements for use of Autogen. MMU utilizes two Store/Fetch data sets, specified by the MMU Vector Table (MMUVTBL).

Installation procedures for the Store/Fetch Facility are described in the Store/Fetch Facility. There are no special Store/Fetch installation requirements for use of Autogen, except possible initialization of a Store/Fetch data set (see Section 3.7).

3.3 SPALIST PARAMETER SPECIFICATION

SPALIST macro parameters for Autogen are described below. Both the System Parameter Area (SPA CSECT) and Extension (SPAEXT CSECT) should be assembled and linkedited. The SPALIST macro is described in the Basic System Macros manual; procedures for coding, assembling and linkediting the System Parameter Area and Extension are described in the Operating Reference Manual.

The SPALIST macro parameters associated with Autogen are:

(symbol)	SPALIST	
	, AUTOSFD = { <u>store/fetch-ddname</u> } , <u>INTSTOR0</u>
		AUTOPCH = { <u>ddname-of-autogen-punch-file</u> } , <u>AUTOGPCH</u>
		AUTOMXF = { <u>nn</u> } <u>100</u>

AUTOSFD=

is the ddname defining the Store/Fetch data set to be used by Autogen as a work file. It must be in the form INTSTORx, x=0, 1, ..., 9. The default is INTSTOR0. Do not specify the same Store/Fetch data set used as the MMU Map Data Set (i.e., that specified by MMUVT macro MAPDDNM parameter).

AUTOPCH=

is the ddname defining the file that receives the generated map definition macros. The default value is AUTOGPCH.

AUTOMXF=

is the maximum number of fields that will be defined for one map generated by Autogen. Code as a decimal number in the range $1 \leq nn \leq 256$. The default value is 100.

3.4 AUTOGEN SUBSYSTEM DEFINITION

The Autogen subsystem must be defined by a Front End Verb Table entry (BTVERB macro) and Subsystem Control Table entry (SYCTTBL macro). The Autogen verb and subsystem code are user-assigned. The values used in the example below are suggested values only.

3.4.1 Front End Verb Table Entry

Code a BTVVERB macro for the Autogen Facility as illustrated in Figure 3-1.

[symbol]	BTVVERB	VERB=agen, SSCH=a, SSC=g, EDIT=NO[, CONV=3000]
----------	---------	--

Figure 3-1. BTVVERB Macro Coding

Do not code any parameters not shown above; "agen, "a" and "g" are user-assigned values. It is recommended that Autogen be a conversational subsystem, and that terminals using Autogen be defined as conversational (CONV=YES in BTERM).

3.4.2 Subsystem Control Table Entry

Code a SYCTTBL macro for the Autogen facility, as illustrated in Figure 3-2.

[symbol]	SYCTTBL	SUBH=a, SUBC=g, SPAC=5000, SBSP=ISGEN(, LOADNAM=AUTOGEN), LANG=RBAL, MNCL=n, OVLY=n, NUMCL=n, DFLN=ddname, PCEN=n, RESTART=NO, CNVREST=NO, RVFILE=NO,.... (additional SYCTTBL parameters are user options)
<p>NOTE: SUBH and SUBC must match the SSCH and SSC parameters in the BTVVERB macro. OVLY and LOADNAM coding depend on residency. The subsystem may be resident, overlay, or dynamically loaded. Lowercase parameter values are user-supplied.</p>		

Figure 3-2. SYCTTBL Macro Coding

3.5 AUTOGEN SUBSYSTEM LINKEDIT

Figure 3-3 lists the Autogen members and CSECTs which reside on the Intercomm source and load module libraries PMI.SYMREL and PMI.MODREL (or SYMLIB and MODLIB if modified). Additionally, source statement members ISGDATA and ISGFIT define DSECTs COPYed by Autogen programs.

JCL for linkedit of the Autogen subsystem is shown in Figure 3-4. Total storage required is approximately 10K.

Member and CSECT Name	Program Function
ISGEN	Main program (subsystem entry point)
ISGATTN	Process attributes--Normal Mode
ISGATTR	Process attributes--Revise Mode
ISGLONGS	General scan routine
ISGLYOUT	Screen layout routine--finds start/end of each field
ISGLNAMS	Process limited-length field names
ISGCNAMS	Change field names--limited-length to actual length
ISGNUMTY	Process numeric field types
ISGOUT	Generates Map Definition output

Figure 3-3. Autogen Members and Functions

<pre>//AGENLINK EXEC LKEDP,Q=LIB,LMOD=AUTOGEN //LKED.SYSIN DD * INCLUDE SYSLIB(ISGEN,ISGOUT,ISGLONGS) INCLUDE SYSLIB(ISGATTN,ISGATTR,ISGLYOUT) INCLUDE SYSLIB(ISGLNAMS,ISGCNAMS,ISGNUMTY) ENTRY ISGEN NAME AUTOGEN(R)</pre>	
NOTE:	LMOD and NAME must correspond to the SYCTTBL LOADNAM operand if AUTOGEN is a dynamically loaded subsystem.

Figure 3-4. Autogen Subsystem Linkedit

After Autogen subsystem linkedit, the load module (LMOD=AUTOGEN or user name) may then be:

- Included as a resident subsystem in the Intercomm load module
- Included and inserted as an overlay subsystem in the Intercomm load module
- Subject to dynamic linkedit (with proper execution time JCL) as an Intercomm dynamically loaded subsystem

The ICOMLINK macro may be used to generate INCLUDE and INSERT cards to linkedit the Autogen release library members as an Overlay A subsystem. (See Section 3.8.)

3.6 AUTOGEN MAP LOAD

Autogen uses a set of MMU map definitions in its processing. The release library (PMI.SYMREL) member containing Autogen Map Definition macros for Autogen maps is ISGMAPS.

The Autogen Map Definition macros must be assembled and linkedited to the users map definition load module library (usually PMI.MODMDF). See Figure 3-5.

```
//MAPS EXEC ASMPCL,Q=MDF,NAME=ISGMAPS,LMOD=ISGMAPS
```

Figure 3-5. Autogen Map Assemble and Linkedit

Subsequent execution of the LOADMAP utility will load the Autogen maps (along with other user maps) to the MMU Store/Fetch Map Data Set. Refer to the MMU Users Guide for LOADMAP utility JCL.

Autogen map definitions use map group name ISG; the map names and associated screen types are listed in Figure 3-6.

Map Name		Screen Type
<u>Normal Mode</u>	<u>Revise Mode</u>	
MAPGPN	MAPGPR	Obtain map group name
MAPN	MAPR	Obtain map name
LAYOUT	---	Enter screen layout
NUMTYPEN	NUMTYPER	Set numeric field types
ATTRIBN	ATTRIBR	Set field attributes
TNAMESN	TNAMESR	Assign temporary field names
PNAMESN	PNAMESR	Assign permanent field names
CHGERRN	CHGERRR	Correct syntax errors in permanent field name processing
MOREMAPS	---	Ask if more maps for group
MOREGPS	---	Ask if more map groups
---	REVSEL	Select Revise Mode function
---	REVCON	Continuation from Revise Mode function

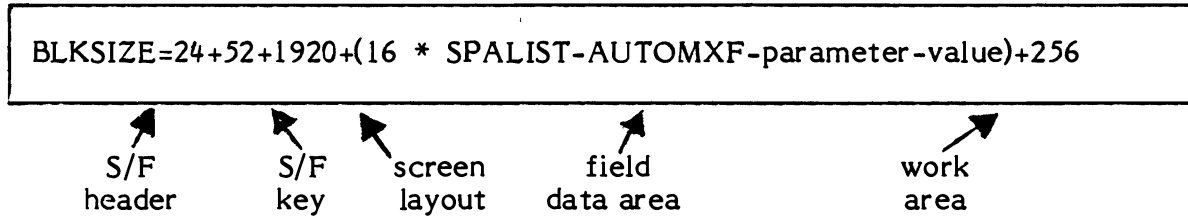
Figure 3-6. Map Names Within ISG Map Group

3.7 AUTOGEN STORE/FETCH DATA SET

The Store/Fetch data set used by Autogen as a work file has the following characteristics:

- May be any Store/Fetch data set except the MMU Map Definition data set.
- May be shared with other applications using Store/Fetch data sets.
- May be the default Store/Fetch data set INTSTOR0.

Performance is optimized by utilizing a Store/Fetch data set with blocksize calculated as follows:



If a Store/Fetch data set is to be created for Autogen, it must be preformatted by the off-line utility KEYCREAT. Refer to the Store/Fetch Facility Users Guide for execution procedures.

3.8 INTERCOMM LINKEDIT

The required Intercomm linkedit control cards for the Autogen subsystem (plus Store/Fetch and MMU) are generated by coding the ICOMLINK macro parameter AUTOGEN=YES. INCLUDE and INSERT cards are generated which linkedit Autogen as an Overlay Region A subsystem.

If Autogen is to be a resident subsystem, remove the INSERT cards. If Autogen is to be a dynamically loaded subsystem, code the ICOMLINK parameter AUTOGEN=NO.

Verify that the Autogen Subsystem Control Table entry specifies residency (SYCTTBL macro OVLY= parameter) corresponding to Intercomm linkedit options.

3.9 INTERCOMM EXECUTION JCL

A DD card for Autogen output must be supplied as illustrated in Figure 3-7 (DCB parameter required for File Handler).

```
//autopch DD SYSOUT=B,DCB=(LRECL=80,BLKSIZE=n*80)
or
//autopch DD DSN=membername(membername),DISP=SHR,DCB=(DSORG=PS)
or
//autopch DD DSN=filename,DISP=NEW,
//          DCB=(DSORG=PS,LRECL=80,BLKSIZE=n*80,RECFM=FB),
//          UNIT=unit,VOL=SER=volser,SPACE=(n*80,(x,y),RLSE)
```

autopch is the SPALIST specified ddname (default is AUTOGPCH).

n indicates the number of records per block.

unit and volser are user-supplied standard JCL specifications.

x and y vary according to the anticipated number of fields and maps produced by one execution. "x" may be estimated as $x = (\text{no. of fields} + 4) * (\text{no. of maps})$.

Figure 3-7. Autogen Output DD Card

A DD card for the Autogen Store/Fetch work file must be supplied (if a DD card for a Store/Fetch data set shared with other applications is not already present in JCL). The DD card is shown in Figure 3-8.

```
//INSTORn DD DSN=username, DISP=SHR,
           DCB=(DSORG=DA,OPTCD=EF,LIMCT=m)
```

n is the SPALIST specified ddname (default is INSTOR0).

Figure 3-8. Autogen Store/Fetch DD Card

Appendix A

OUTPUT USER EXIT

A.1 USE OF THE USER EXIT

The Autogen Output User Exit is provided for the user who wishes to intercept the Autogen macro output. For example, it might be used to submit a job to the system via HASP's internal reader, or it may be directed to some data set as backup to the original output.

A.2 USER EXIT CODING CONVENTIONS

The exit routine is user-coded, must be reentrant, and must have a CSECT (entry point) name of ISGUOUT. Register conventions are shown in Figure A-1.

	Register	Description
I N P U T	13	Save Area
	15	Entry Point Address (ISGUOUT)
	1	If negative, then initial call and (R1)=2's complement of map group name address. If positive, then (R1)=address of record to write. If zero, then final call; no more data for map group.
	0, (2-12)	Not used.
O U T P U T	15	If 0, then Autogen Output routine writes macro card to Autogen data set. If not 0, then no output performed.

Figure A-1. Output User Exit Register Conventions

Any Intercomm facilities available for reentrant subsystem use may be used by this user exit.



Appendix B

USING AUTOGEN ON TELETYPE (DATASPEED) 40/1 AND 2 TERMINALS

NOTE: This section contains information unique to Teletype (Dataspeed) 40/1 and 2 terminals using the Autogen facility. It supplements the main sections of this manual. It also assumes full understanding of the Teletype (Dataspeed) 40/1 and 2 "Terminal Dependent Considerations" in Section 5 of the Operating Reference Manual.

B.1 Features Permitted

All supported features in the Autogen Facility may be used to create maps (which are 3270 compatible) on a Teletype 40/1,2 (DS40) Terminal.

Note that the Teletype (Dataspeed) Model 40/4 is a 3270 compatible terminal and is operated as such.

B.2 Operational Considerations**B.2.1 One Field Autogen Screens**

Autogen screens with only one field to be entered, or where only the first field in the map needs to be entered, may have the response entered in S/R mode as one field input. More than one field requires entry in Batch mode. Batch mode entry of multiple fields in an Autogen map must use the TAB key (generates HT symbol) to 'skip' from field to field.

B.2.2 Batch Mode Entering

The message ending character must be provided for entry in Batch mode.

After entering data in a map in Batch mode and before sending, the cursor must be positioned to HOME (depress HOME key). Additionally, for a switched line terminal, depress the CURSOR TAB key before depressing the SEND key (make sure a READ time-out has not occurred).

B.2.3 No Response Required Screens

If a Map requires no response (TNAME-S-N, NUMTYPE, etc.) the RETURN key may be depressed in S/R mode without entering any data on a switched line terminal. On a leased line terminal, one PAD character (space) must be entered before depressing the RETURN key.

B.2.4 LAYOUT Screen

When creating/working with the LAYOUT screen, the NEW LINE key may be depressed to prevent transmission of extra blanks at the end of a line beyond significant data. Be careful not to clear previously created data on a line when changing the LAYOUT screen (indicating attributes, numeric field types, names). If this happens by mistake when depressing the NEW LINE key, re-key the data for that line exactly before sending back the screen. The message ending character may be keyed after the last significant non-blank data; all 24 lines do not need to be sent. Always depress HOME key before starting to work on the screen.

Leased line terminals only -- After depressing the HOME key and just before sending the screen, one PAD character must be entered (use CHAR INSERT key) in the first position of the first line.

B.2.5 PNames and CHGERR Screens

Entering pairs of names in the PNames and CHGERR screens (Normal or Revise mode): pairs should be entered starting in column 1. One or more pairs may be entered on one line, followed by NL (depress NEW LINE key) to position the cursor to the beginning of the next line. The end of the last unprotected line in this area on the screen is protected; if a pair(s) of names is entered on this line, use the TAB key to position the cursor to the next input field (end of screen).



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