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Hanford Meteorological Station Computer Codes

Volume 1 - The GEN Computer Code

J. W. Buck
G. L. Andrews

July 1987

Prepared for the U.S. Department of Energy
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PREFACE

This volume is the first of several volumes that describe computer programs routinely used at the Hanford Meteorological Station (HMS) (e.g., data entry programs). Each volume, which documents one computer code, consists of a program overview, user's guide, description of input, a detailed program description and flowchart, and a source listing of the code.

The first seven volumes will present the data entry programs used at the HMS for archiving and checking various types of data. All of these programs use a data entry form to facilitate data input, and each code calls the same series of subroutines that control and display the data entry form at the user's terminal. The subroutines were generated from the program FORMEDIT, which was developed by John Wiberg of the Computer Science staff in the Engineering Physics Department at Pacific Northwest Laboratory. An informal user's guide to the FORMEDIT program that describes how to create, modify, and eliminate data entry forms is available from the HMS system manager.

SUMMARY

The Hanford Meteorological Station, operated by Pacific Northwest Laboratory, issues general weather forecasts twice a day. The GEN computer code is used to archive the 24-hour forecasts and apply quality assurance checks to the forecast data. This code accesses an input file, which contains the date and hour of the previous forecast, and an output file, which contains 24-hour forecasts for the current month. As part of the program, a data entry form consisting of 14 fields that describe various weather conditions must be filled in. The information on the form is appended to the current 24-hour monthly forecast file, which provides an archive for the 24-hour general weather forecasts.

This report consists of several volumes documenting the various computer codes used at the Hanford Meteorological Station. This volume describes the implementation and operation of the GEN computer code at the station.

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INTRODUCTION

The Hanford Meteorological Station (HMS) was established in 1944 on the Hanford Site for collecting and archiving meteorological data and providing weather forecasts for Hanford project activities. The HMS is located in the northwest quadrant of the Hanford Site and is operated by the Pacific Northwest Laboratory (PNL).

Twenty-four hour general weather forecasts are made twice a day at the HMS in support of operations and research for the U.S. Department of Energy at Richland (DOE-RL) and associated contractors within the Hanford Site boundaries. These forecasts are issued at 0700 Local Time and 1500 Local Time each day throughout the year. Although the forecasts are issued at local times they are applied to Pacific Standard Time (PST) forecast time periods. A forecast consists of predictions of the average wind speed and associated gusts at the 50-foot level, the sky cloud cover, the maximum and minimum temperature at the 5.5-foot level, and the expected weather (e.g., thunderstorm, dust storm, snow, etc.). Forecasters use the GEN computer code to archive and apply quality assurance checks to the 24-hour general forecasts, which are stored in monthly disk files on the HMS computer system (DEC VAX 11/750).

The following sections in the volume describe the implementation and operation of the GEN computer code. Appendix A contains a description and flowchart of the GEN computer code and Appendix B contains a source listing of the GEN computer code.

THE GEN COMPUTER CODE

The GEN computer code provides a method for archiving data obtained from the 24-hour general weather forecasts. The code has replaced manual entry of data via computer cards and a keypunch. The GEN code was written, compiled, and linked on the DEC VAX 11/750 at the HMS and is executed twice a day after the 24-hour general weather forecast is issued to the Hanford contractors.

PROGRAM OVERVIEW

The GEN computer code accesses one input file and one output file. The input file contains the date and hour the previous forecast was issued, and the output file consists of 24-hour forecasts for the current month. The convention used in naming the monthly forecast files is GENFCSTxxx.DAT where the xxx is the three-character abbreviation of the current month (e.g., AUG for August). (Refer to Appendix A for more information about input/output operations.)

The program begins by displaying a data entry form on the terminal screen (Fig. 1), and you will be prompted to enter data for each input field in the form. The program fills in the date and hour fields by accessing an input file to obtain the current date and hour. You can exit the data entry form after filling in all the input fields. The screen will clear, and a prompt to make any needed corrections will appear on the screen. Once all the input values are correct, you can exit the program and the forecast will be appended to the current 24-hour monthly forecast file.

```
        HMS TWENTY-FOUR HOUR GENERAL FORECAST INPUT FORM

           DATE: xxxxxx          HOUR: xx          FCST ID: xx
      MAX TEMP: xxxxx                            MIN TEMP: xxxxx
       SKY DAY: xxxxx       WIND DAY: xxxxx        WX DAY: xxxxx
      SKY NGHT: xxxxx      WIND NGHT: xxxxx       WX NGHT: xxxxx
      SKY TRMW: xxxxx      WIND TRMW: xxxxx       WX TRMW: xxxxx
```

FIGURE 1. Example of the Data Entry Form Used by the GEN Computer Code

USER'S GUIDE FOR THE GEN COMPUTER CODE

This section describes how to invoke the GEN computer code on the HMS DEC VAX 11/750 computer and how to respond to the various prompts associated with the code. We assume that you know how to access the FCST account on the HMS computer, and that you have some basic knowledge of the VAX operating system. To use the data entry form, the terminal must be in the DEC VT100 terminal mode. To determine the terminal status, simply type SHOW TERMINAL and depress the RETURN key. A list of terminal characteristics will appear on the screen. Check to make sure the terminal type is set to VT100. If it is not, type SET TERMINAL/VT100 and depress the RETURN key. Currently, the HMS is equipped with several Tektronix 4107 terminals that can emulate the VT100 terminal.

Basically, there are six steps to executing the GEN computer code, filling in the data entry form, and terminating the program. These steps are listed below and each step will be discussed in detail in the following paragraphs:

- log in to the HMS computer (need the FCST password)
- type RUN GEN, then depress the RETURN key
- fill in the data entry form
- exit the form
- answer "yes" or "no" to "corrections needed" prompt
- terminate program.

By logging in to the FCST account, you will be placed in the [FCST] directory and can immediately invoke the GEN computer code. You must know the password to the FCST account before logging in to the HMS computer. To log in, depress the RETURN key a couple of times. The computer will respond with the prompt USERNAME:. Enter FCST and depress the RETURN key. The computer will then respond with the prompt PASSWORD:. Enter the correct password. If you fail to answer either of these prompts correctly the computer will repeat the appropriate prompt. You will be given three chances to enter the correct response.

The executable version of the GEN code is invoked by typing RUN GEN and depressing the RETURN key. The screen will clear and the data entry form will appear on the terminal. You can now begin data entry. A current

executable version (GEN.EXE) of the GEN computer code is permanently stored in the [FCST] directory; a backup version is kept in the [FCST.DATA_ENTRY] directory. If problems occur during the execution of the code refer to the "Trouble Shooting" section of this volume for help.

The data entry form will appear on the screen as shown in Figure 1 with the cursor in field three (FCST ID). The date and hour fields (first and second fields, respectively) are filled in by the program. A prompt will appear on the screen below the data entry form for each field. Included with each prompt is a default value and a valid range or list of matching values the input value must match. All prompts request an integer value for input. To enter data into a field, simply type in the requested data and depress the RETURN key. To enter the default value, simply depress the ENTER key, or the SELECT DEFAULT key on some Tektronix terminals, without entering any data into the field. The input value will appear in the field (assuming a valid value was entered) while the cursor moves from left to right into the next field. After data are entered in the rightmost field, the cursor will move down one line to the leftmost field. When a value has been entered into each field, you should check the fields for any mistakes, and if corrections are needed use the up, down, right, and left arrow keys (e.g., ↑,↓,→,←) located at the top of the keyboard to move within the form. Once you are satisfied that the entered values are correct, depress the EXIT key to exit the form. You may exit the data entry form from any field.

The GEN program applies two phases of quality assurance to the input data. The first phase is applied as you enter the input data for each field. An error message will appear at the bottom of the form if the input value is not within the valid range or valid list of matching numbers, and you will then be given the opportunity to enter another value for that field. The second phase occurs when you exit the form and the "need corrections" prompt appears below the information entered in the form. You can check the input values for validity and make necessary corrections.

After exiting the form, the program displays the information entered into the data entry form on the terminal in the format in which it will be appended to the monthly file (e.g., GENFCSTxxx.DAT). A prompt will appear

just below the information asking if you would care to make any corrections. If no corrections are needed an N or n should be entered and the program will append the data to the monthly file. If corrections are needed a Y or y should be entered. Entry of a Y or y will cause the program to return to the data entry form mode. This time, the previously entered values will appear in their respective fields. Incorrect value(s) can be corrected by using the arrow keys to move the cursor to the appropriate field. When all corrections have been made, you can exit the form by depressing the EXIT key. The data entry form may be exited from any field; it is not necessary to move to the last field.

The GEN program is terminated by answering n(o) or N(o) to the "need corrections" prompt. The entered data will be appended to the monthly file and the program will terminate with a FORTRAN STOP message written to your terminal. The monthly data files for the 24-hour general forecasts are located in the [FCST.DAT] directory. Each file contains all of the 24-hour general forecasts for any single month.

DESCRIPTION OF INPUT

The data entry form consists of 14 fields; numeric (integer) values must be provided for 12 of these fields. The program provides the values for the first two fields, which are the date and hour fields. When you move the cursor to one of the other 12 input fields, the code provides a prompt related to the required input. The prompt consists of a brief description of the field, the valid range or list of matching numbers the input value must fall within, and a default value (refer to the "User's Guide" section for information on how to input the default value). Table 1 contains a reference table for each of the input fields.

The following list describes each input field, the associated range or list of matching values, and the default value.

1) DATE OF FORECAST - The 24-hour general forecasts are issued daily.

TABLE 1. Reference Guide to Input Fields

Input Field	Description	Range or List/Default
date of forecast	YYMMDD	860101-990101 / 999999
hour of forecast	HH	7,15 / 7
forecaster ID	identifies forecaster	1 - 9 / 0
max temperature	degrees Fahrenheit	-13 - 125 / 99999
min temperature	degrees Fahrenheit	-37 - 92 / 99999
sky cover day forecast	cloud amount code	1 - 4 / 0
wind speed day forecast	wind code	5,10,15,20,25 / 0
weather day forecast	weather code	0 - 194 / 0
sky cover night forecast	cloud amount code	1 - 4 / 0
wind speed night forecast	wind code	5,10,15,20,25 / 0
weather night forecast	weather code	0 - 194 / 0
sky cover next day	cloud amount code	1 - 4 / 0
wind speed next day	wind code	5,10,15,20,25 / 0
weather next day	weather code	0 - 194 / 0

GEN computer code has been programmed to generate the date and hour of the forecast. The date is determined by reading in the GENFCST_DATE.DAT file, which contains one record with the date and hour of the previous 24-hour forecast. The date and hour are then incremented for the current forecast period and written into the date and hour input fields in the data entry form. You cannot change these input fields using the GEN computer code. However, you can change the GENFCST_DATE.DAT file to reflect the desired date. The date format is YYMMDD: where YY is the last two digits of the current year (e.g., 87 for 1987), MM is the numerical equivalent of the month (e.g., 04 represents April), and DD is the day of the month. An example of a date is 870421 which is April 21, 1987. The range of the date is 860101 (i.e., January 1, 1986)

through 990101 (i.e., January 1, 1999). The default value for the date is 999999 (refer to the "User's Guide" section for details on entering default values). This value indicates that the date is missing for the forecast.

2) HOUR OF FORECAST - The hour is determined in conjunction with the date, as discussed above. The hour format is HH: where HH is one of two numerical values (07 or 15). These values designate the specific times at which the 24-hour general forecasts are made. The valid matching values are 07 and 15 and the default value for the hour is 07. All times are in local time.

3) FORECASTER IDENTIFICATION CODE - Each forecaster is assigned an identification (id) code that must be entered in the data entry form to indicate who issued the forecast. The range of this code is from 1 through 9; the default value is 0.

4) MAXIMUM TEMPERATURE FOR FORECAST PERIOD - The input value for this field is the maximum temperature forecast for the next 24 hours in units of whole degrees Fahrenheit (°F). The range of valid values for this forecast parameter is from -13°F through 125°F. This range is based on the all-time extreme low (-3°F) and high (115°F) maximum temperature for the Hanford Site, with 10°F added to each value. The default value for the maximum temperature is 99999, which indicates the value was not forecast.

5) MINIMUM TEMPERATURE FOR FORECAST PERIOD - The input value for this field is the minimum temperature forecast for the next 24 hours in units of whole degrees Fahrenheit (°F). The range of valid values for this forecast parameter is from -37°F through 92°F. This range is based on the all-time extreme low (-27°F) and high (82°F) minimum temperature for the Hanford Site, with 10°F added to each value. The default value for the minimum temperature is 99999, which indicates the value was not forecast.

6) SKY COVER CODE FOR DAYTIME - The input value for this field is a sky condition code for the period between 0700-1900 PST on the day of the forecast. The valid range is 1 through 4, which represents

the code values for the sky condition. Each code depicts the forecasted amount of cloud cover and whether a ceiling will or will not occur. A list of the codes and a brief description for each are given in Table 2. The default value for sky condition is 0, which indicates the forecast for this condition is missing. A forecast of no cloud cover (e.g., clear skies) during the period between 0700-1900 PST would be 1.

TABLE 2. List of Sky Condition Codes

Code	Description
1	Average sky cover during the period must be $\geq$0 and $<$4.0 tenths with or without a ceiling
2	Average sky cover during the period must be $>$3.9 and $\leq$10.0 tenths without a ceiling
3	Average sky cover during the period must be $>$3.9 and $<$8.0 tenths with a ceiling
4	Average sky cover during the period must be $>$7.9 and $\leq$10.0 tenths with a ceiling

7) WIND FORECAST FOR DAYTIME - The input value for this field is a wind speed code for the period between 0700-1900 PST on the day of the forecast. The valid matching values are 05, 10, 15, 20, and 25. There are five wind speed codes that depict the forecasted wind speed and gustiness. A list of the codes and a brief description for each are given in Table 3. The default value for this condition is 0, which indicates the forecast for this condition is missing. A forecast of no wind (e.g., calm conditions) during the period between 0700-1900 PST would be 05.

8) WEATHER CODE FOR DAYTIME - The input value for this field is a weather code for the period between 0700-1900 PST on the day of the forecast. The valid range is 0 through 194. There are 14 weather codes that depict the forecasted weather. A list of the codes

TABLE 3. List of Wind Speed Codes

Code	Description
05	Average 50-ft wind speed <15 mph and peak gust at 50 ft <15 mph
10	Average 50-ft wind speed <15 mph and peak gust at 50 ft ≥15 mph
15	Average 50-ft wind speed between (inclusive) 10-20 mph and peak gust at 50 ft >20 mph
20	Average 50-ft wind speed between (inclusive) 15-25 mph and peak gust at 50 ft >25 mph
25	Average 50-ft wind speed >25 mph and peak gust at 50 ft >25 mph

and a brief description for each are given in Table 4. The default value is 0, which indicates no weather is expected.

9) SKY COVER CODE FOR NIGHTTIME - The input codes for this field are the same as those for item (6), except the period of time is from 1900-0700 PST into the next day.

10) WIND FORECAST FOR NIGHTTIME - The input codes for this field are the same as those for item (7), except the period of time is from 1900-0700 PST into the next day.

11) WEATHER CODE FOR NIGHTTIME - The input codes for this field are the same as those for item (8), except the period of time is from 1900-0700 PST into the next day.

12) SKY COVER CODE FOR NEXT DAY - The input codes for this field are the same as those for item (6), except the period of time is from 0700-1900 PST the next day.

TABLE 4. List of Weather Codes

Code	Description
000	No weather
004	Fog or ground fog; visibility less than or equal to 6 miles
060	Light rain or light rain showers; <.06-in. total during the period
064	Light rain or light rain showers and fog; <.06 in. total during the period
070	Light snow or light snow showers; <.06-in. equivalent total water during the period
074	Light snow or light snow showers and fog; <.06-in. equivalent total water during the period
090	Light thunder, ice pellets, or hail; <.06-in. equivalent total water during the period
094	Light thunder, ice pellets, or hail and fog; <.06-in. equivalent total water during the period
160	Moderate/heavy rain or rain showers; ≥.06-in. total during the period
164	Moderate/heavy rain or rain showers and fog; ≥.06-in. total during the period
170	Moderate/heavy snow or snow showers; ≥.06-in. equivalent total water during the period
174	Moderate/heavy snow or snow showers and fog; ≥.06-in. equivalent total water during the period
190	Moderate/heavy thunder, ice pellets, or hail; ≥.06-in. equivalent total water during the period
194	Moderate/heavy thunder, ice pellets, or hail and fog; ≥.06-in. equivalent total water during the period

13) WIND FORECAST FOR NEXT DAY - The input codes for this field are the same as those for item (7), except the period of time is from 0700-1900 PST the next day.

14) WEATHER CODE FOR NEXT DAY - The input codes for this field are the same as those for item (8), except the period of time is from 0700-1900 PST the next day.

TROUBLE-SHOOTING THE GEN COMPUTER COOE

This section will help resolve problems that may occur during the implementation and operation of the GEN computer code. We assume that you are familiar with the VAX EDT editor and the VAX operating system commands. Basically, there are three types of failure or problem areas: terminal (i.e., CRT), system, and/or program. The following sections will discuss typical problems or failures that may occur when using the GEN computer code and the suggested recovery procedures. If a series of recovery actions are suggested, apply each sequentially until the problem or failure is resolved.

TERMINAL PROBLEMS/FAILURES

Problem: Terminal does not respond.

Recovery: Determine if terminal is on. On Tektronix terminals the on/off switch is located in the front and to the right.

Determine if the dimmer switch is turned all the way down. On Tektronix terminals the dimmer switch is located in the front and to the right. Turn the switch clockwise to increase the light intensity on the screen.

If the above actions fail to get a response from the terminal, ask the instrument specialist (the HMS Room 125) to check the terminal.

SYSTEM PROBLEMS/FAILURES

Problem: System does not respond to operating system commands or carriage returns.

Recovery: Check with the Emergency Meteorological System (EMS) computer manager (Eric Stephan, 376-1107, or Ora Gifford, 373-3216) to see if the HMS computer system is down for maintenance or repair.

If the EMS computer manager indicates the HMS computer system is operating, turn the terminal off, wait approximately 15 to 20 seconds, and turn the terminal back on. Depress the RETURN

key several times to get attention of the computer system.

If the above actions fail ask an instrument specialist to examine the computer and notify the EMS computer manager.

PROGRAM PROBLEMS/FAILURES

Problem: Terminal not correctly displaying data entry form.

Recovery: Depress the CTRL key and the Y key simultaneously to get to the dollar sign prompt. Type SET TERMINAL/VT100 and depress RETURN. Try running the program again.

Depress the SETUP key at the top of the keyboard. The terminal should respond with an asterisk. Type CODE ANSI and depress RETURN, then depress the SETUP key. Try running the problem again.

Problem: Terminal displaying garbled data.

Recovery: Depress the SETUP key at the top of the keyboard. The terminal should respond with an asterisk. Type CODE ANSI, depress RETURN, then depress the SETUP key.

Problem: Program GEN.EXE cannot be found or program has been "trashed" in some way.

Recovery: Copy backup version to the FCST directory. Type COPY [FCST.DATA_ENTRY]GEN.EXE [FCST]GEN.EXE. Try program again.

Problem: Input file ([FCST.PREVIOUS_DATE]GENFCST_DATE.DAT) or output file ([FCST.DAT]GENFCSTxxx.DAT where xxx is the three-character abbreviation of the current month) cannot be found.

Recovery: Check the [FCST.PREVIOUS_DAT] directory for the input file or the [FCST.DAT] directory for the output file.
If file(s) is intact, try copying the backup version of GEN.EXE to the [FCST] directory (see above for directions).
Try running the code again.

APPENDIX A

PROGRAM DESCRIPTION AND FLOWCHART

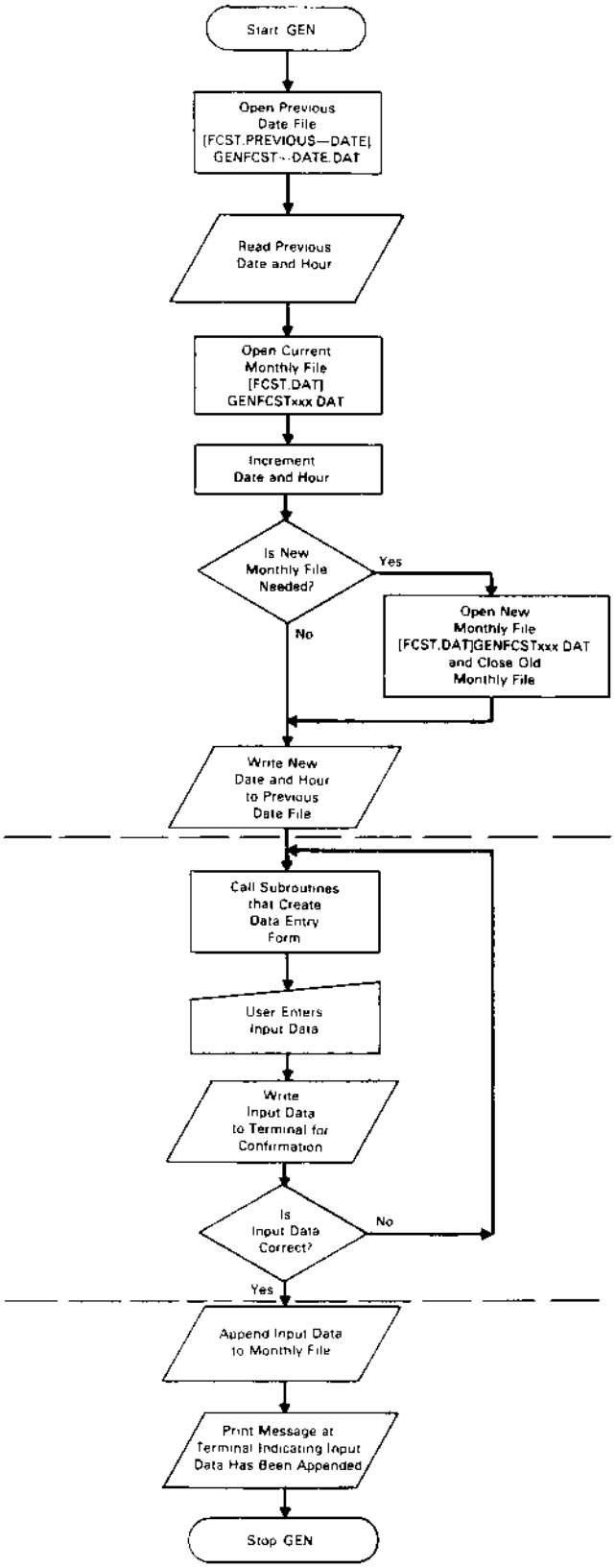
This discussion describes in detail the operations and logical flow of the GEN computer code. A flow chart indicating the general operations and logical sequence of the GEN code is shown at the end of this appendix. The flowchart is divided into three sections by two dashed lines. The top and bottom sections are transparent and do not require user input. The middle section involves the data entry form that requires input. The following three paragraphs will provide a detailed description of the operations within each section. For a more in-depth review of the operations and logical sequence of the program refer to the source listing in Appendix B.

The program begins by opening and reading the data in the file GENFCST_DATE.DAT, which contains one record with the date and time of the most recent forecast. The GENFCST_DATE.DAT file resides in the [FCST.PREVIOUS_DATE] sub-directory. The month from that date is then used to open the file GENFCSTxxx.DAT (where xxx is the three-character abbreviation for the current month), which contains the 24-hour general forecast data for the current month. The GENFCSTxxx.DAT file resides in the [FCST.DAT] sub-directory. The next step involves incrementing the date and time that is obtained from the GENFCST_DATE.DAT file. Once this is accomplished the incremented date and time are written over the original data in the GENFCST_DATE.DAT file. If the incremented date crosses over into the next month, a new GENFCSTxxx.DAT file is opened (where xxx will then reflect the new month). At this point the code calls several subroutines that control and display a data entry form at your terminal.

The GEN code uses a data entry form to facilitate data entry. The form consists of several input fields (see Fig. 1 in the main text), each of which represents a forecast parameter. Each field is displayed in reverse video to highlight the field length. You will be prompted from the bottom of the form for an input value (the fields are initially blank). The prompt consists of a brief description of the field, the valid range or list of numbers the input value must meet, and a default value. You must enter a valid integer value before the cursor moves to the next field. If the numeric value is valid, the number is displayed in the appropriate field and the cursor moves to the next field, moving from left to right. If the input value is not valid, an

error message occurs at the bottom of the form while the cursor remains in that field, and you will be prompted again for the same field.

After entering all the input data, you may terminate the data entry form process by depressing the EXIT key on the Tektronix 4107 terminal. The screen is then cleared and the input data are displayed at the terminal in the data format it will be appended to in the GENFCSTxxx.DAT file. You will then be asked if any corrections are needed before the record is appended to the current monthly file. If corrections are needed, the code returns to the data entry form, which is displayed with the input values you have entered. You can move to the appropriate input field(s) (refer to the "User's Guide" section for information on how to move the cursor within the form) and change the value(s). Once all the value(s) are corrected, the data record is again displayed on the screen and you will again be given an opportunity to correct any mistakes. If no corrections are needed, the data are appended to the GENFCSTxxx.DAT file and a message is displayed on the screen indicating the forecast has been appended to the current monthly file. The program terminates when the message FORTRAN STOP appears on the terminal.


Start GEN
Open Previous Date File [FCST.PREVIOUS—DATE] GENFCST--DATE.DAT
Read Previous Date and Hour
Open Current Monthly File [FCST.DAT] GENFCSTxxx.DAT
Increment Date and Hour
Is New Monthly File Needed?
Yes
No
Open New Monthly File [FCST.DAT]GENFCSTxxx.DAT and Close Old Monthly File
Write New Date and Hour to Previous Date File
Call Subroutines that Create Data Entry Form
User Enters Input Data
Write Input Data to Terminal for Confirmation
Is Input Data Correct?
No
Yes
Append Input Data to Monthly File
Print Message at Terminal Indicating Input Data Has Been Appended
Stop GEN

APPENDIX B

GEN SOURCE CODE LISTING

```
0001    C ********************************************************************
0002    C
0003    C       PROGRAM: GEN.FOR
0004    C
0005    C       PROGRAMMER: GREGG ANDREWS
0006    C
0007    C       FUNCTION: THIS PROGRAM WAS DEVELOPED TO FACILITATE THE ARCHVING
0008    C                 OF TWENTY FOUR HOUR FORECASTS. THE PROGRAM ACCESSES
0009    C                 A PREVIOUS_DATE FILE TO CHECK WHEN THE LAST DATA ENTRY
0010    C                 WAS THEN INCREMENTS THE DATE AND MAKES CALLS TO
0011    C                 SUBROUTINES TO CREATE THE INPUT FORM. THE DATA IS
0012    C                 ENTERED AND THEN WRITTEN TO A MONTHLY FILE. THE
0013    C                 PROGRAM WILL CREATE A NEW MONTHLY FILE WHEN NECESSARY.
0014    C
0015    C       DATE: 1/27/86
0016    C
0017    C ********************************************************************
0018
0019        INCLUDE 'ERDS$INCLUDE:FORMFLAGS.INC'
0057        DIMENSION MONTH_NAME(12)
0058
0059        Byte         Form_Interface_Record(   56)
0060        Integer*4     Iflags( 14)      ! Form flags
0061    C
0062    C         Type         Name             Field Prompt String
0063    C
0064        Integer*4     I_VAR001         ! Date (860101 - 990101)/ Default = 99999
0065        Integer*4     I_VAR002         ! Hour of Forecast (7 or 15)/ Default = 7
0066        Integer*4     I_VAR003         ! Forecaster Identification (1 - 9)/ Default = 0
0067        Integer*4     I_VAR004         ! Maximum Temp (-10 - +115)/ Default = 99999
0068        Integer*4     I_VAR005         ! Minimum Temp (-27 - +80)/ Default = 99999
0069        Integer*4     I_VAR006         ! Sky Coverage Day Fcst (1 - 4)/ Default = 0
0070        Integer*4     I_VAR007         ! Wind Day Fcst (10 - 25)/ Default = 0
0071        Integer*4     I_VAR008         ! Weather Day Fcst (4 - 194)/ Default = 0
0072        Integer*4     I_VAR009         ! Sky Coverage Night Fcst (1 - 4)/  Default = 0
0073        Integer*4     I_VAR010         ! Wind Night Fcst (10 - 25)/ Default = 0
0074        Integer*4     I_VAR011         ! Weather Night Fcst (4 - 194)/ Default = 0
0075        Integer*4     I_VAR012         ! Sky Coverage Trmw (1 - 4)/ Default = 0
0076        Integer*4     I_VAR013         ! Wind Fcst Trmw (10 - 25)/ Default = 0
0077        Integer*4     I_VAR014         ! Weather Fcst Trmw (4 - 194)/ Default = 0
0078
0079        INTEGER*4 YEAR, MONTH, DAY, HOUR, DAYS_IN_MONTH(12),
0080       .            DAYS_IN_MONTH_LY(12)
0081
0082        CHARACTER*1 SELECT
0083        CHARACTER*3 MONTH_NAME
0084
0085        Equivalence  (Form_Interface_Record, I_VAR001)
0086
0087        Common /Form_Record/ I_VAR001, I_VAR002, I_VAR003, I_VAR004,
0088       .                     I_VAR005, I_VAR006, I_VAR007, I_VAR008,
```

```
0089        .                        I_VAR009, I_VAR010, I_VAR011, I_VAR012,
0090        .                        I_VAR013, I_VAR014
0091
0092        DATA DAYS_IN_MONTH/31, 28, 31, 30, 31, 30, 31, 31, 30, 31,
0093        .                    30, 31/
0094
0095        DATA DAYS_IN_MONTH_LY/31, 29, 31, 30, 31, 30, 31, 31, 30,
0096        .                        31, 30, 31/
0097
0098           DATA MONTH_NAME/'JAN', 'FEB', 'MAR', 'APR', 'MAY', 'JUN',
0099        .                  'JUL', 'AUG', 'SEP', 'OCT', 'NOV', 'DEC'/
0100
0101
0102        MONTH_FLAG = 0
0103
0104        OPEN(UNIT=10, FILE='[FCST.PREVIOUS_DATE]GENFCST_DATE.DAT',
0105        .       STATUS='OLD', IOSTAT=IER)
0106        IF(IER .NE. 0) WRITE(*,10) IER
0107     10 FORMAT(/5X,'Error Opening [FCST.PREVIOUS_DATE]GENFCST_DATE',
0108        .         '.DAT Code - ',I4)
0109
0110
0111     C....... READ PREVIOUS DATE AND HOUR FROM GENFCST_DATE FILE
0112     C....... AND OPEN MONTHLY FILE.
0113
0114
0115        READ(10,'(4I2)') YEAR, MONTH, DAY, HOUR
0116
0117           OPEN(UNIT=15, FILE='[FCST.DAT]GENFCST'//MONTH_NAME(MONTH)//
0118        .       '.DAT', STATUS='OLD', ACCESS='APPEND',
0119        .       CARRIAGECONTROL='LIST', IOSTAT=IER)
0120          IF(IER .NE. 0) WRITE(*,80) IER, MONTH_NAME(MONTH)
0121     80   FORMAT(/5X,'Error Opening [FCST.DAT]GENFCST',A3,
0122        .            '.DAT Code - ', I4)
0123
0124
0125     C....... INCREMENT DATE AND OPEN NEW MONTHLY FILE IF NEEDED
0126
0127
0128        IF(HOUR .EQ. 15) THEN
0129           HOUR = 7
0130           IF(DAY.EQ.31 .AND. MONTH.EQ.12) THEN      ! check for end of year
0131
0132              YEAR  = YEAR + 1
0133              MONTH = 1
0134              DAY   = 1
0135              MONTH_FLAG = 1
0136              OPEN(UNIT=11, FILE='[FCST.DAT]GENFCST'//
0137        .              MONTH_NAME(MONTH)//
0138        .              '.DAT', STATUS='NEW', CARRIAGECONTROL='LIST',
0139        .              IOSTAT=IER)
0140              IF(IER .NE. 0) WRITE(*,20) IER, MONTH_NAME(MONTH)
0141     20       FORMAT(/5X,'Error Opening [FCST.DAT]GENFCST',A3,
0142        .              '.DAT Code - ', I4)
```

```
0143
0144          ELSE
0145
0146             IF(MOD(YEAR,4) .EQ. 0) THEN          ! check for leap year
0147
0148                IF(DAY.EQ.DAYS_IN_MONTH_LY(MONTH)) THEN
0149
0150                   MONTH = MONTH + 1
0151                   DAY = 1
0152                       MONTH_FLAG = 1
0153                   OPEN(UNIT=11, FILE='[FCST.DAT]GENFCST'//
0154                           MONTH_NAME(MONTH)//'.DAT', STATUS='NEW',
0155                           CARRIAGECONTROL='LIST', IOSTAT=IER)
0156                   IF(IER .NE. 0) WRITE(*,20) IER, MONTH_NAME(MONTH)
0157
0158                ELSE
0159
0160                   DAY = DAY + 1
0161
0162                ENDIF
0163
0164             ELSE
0165
0166                IF(DAY.EQ.DAYS_IN_MONTH(MONTH)) THEN
0167
0168                   MONTH = MONTH + 1
0169                   DAY = 1
0170                       MONTH_FLAG = 1
0171                   OPEN(UNIT=11, FILE='[FCST.DAT]GENFCST'//
0172                           MONTH_NAME(MONTH)//'.DAT', STATUS='NEW',
0173                           CARRIAGECONTROL='LIST', IOSTAT=IER)
0174                   IF(IER .NE. 0) WRITE(*,20) IER, MONTH_NAME(MONTH)
0175
0176                ELSE
0177
0178                   DAY = DAY + 1
0179
0180                ENDIF
0181
0182             ENDIF
0183
0184          ENDIF
0185
0186       ELSE
0187
0188          HOUR = 15
0189
0190       ENDIF
0191
0192    C..... WRITE NEW DATE AND HOUR TO PREVIOUS DATE FILE
0193
0194
0195       BACKSPACE (UNIT=10,IOSTAT=IER)
0196       IF(IER.NE.0) WRITE(*,30) IER
```

```
0197    30  FORMAT(//5X,' Error During Backspace Code - ',I4/
0198       .         5X,' Check [FCST.PREVIOUS_DATE]GENFCST_DATE.DAT File')
0199        WRITE(10,'(4I2)') YEAR, MONTH, DAY, HOUR
0200
0201
0202    C..... FIX DATE TO THE VARIABLES I_VAR001
0203
0204
0205        I_VAR001 = (YEAR*10000) + (MONTH*100) + DAY
0206        I_VAR002 = HOUR
0207
0208
0209    C..... PREVENT USER FROM ENTERING DATE AND FORCE CURSOR TO START
0210    C..... AT FIRST VARIABLE
0211
0212
0213        IFLAGS(1) = FWS_NO_WRITE
0214        IFLAGS(2) = FWS_NO_WRITE
0215        IFLAGS(3) = FWS_FORCE_START
0216
0217
0218    C..... MAKE CALLS TO SUBROUTINES TO CREATE INPUT FORM AND ENTER DATA
0219
0220
0221    100 CALL SUBPROCESS_OPEN_IO
0222        CALL SELECT_ANSI
0223        Call FW_Form_Open (12, 'HWSFORMS.FRM', IOerror)
0224        Call FW_Form_Input ('GENFCST', Form_Interface_Record,
0225       .                              Iflags, Ierror, User_Check, *990)
0226        Call FW_Form_Close (IOerror)
0227        CALL SUBPROCESS_CLOSE_IO
0228
0229
0230    C..... WRITE DATA TO SCREEN AS WILL BE WRITTEN TO FILE AND
0231    C..... PROMPT FOR CORRECTION
0232
0233
0234        TYPE *,' '
0235        TYPE *,' '
0236        TYPE *,' '
0237        TYPE *,' The Following Data Record Will be Appended to ',
0238       .         'Monthly General Forecast File :'
0239
0240           WRITE(*,40)
0241    40  FORMAT(//1X,'123456789 123456789 123456789 123456789 ',
0242       .             '123456789 123456789 123456789')
0243
0244        WRITE(*,50) I_VAR001, I_VAR002, I_VAR003, I_VAR004,
0245       .             I_VAR005, I_VAR006, I_VAR007, I_VAR008,
0246       .             I_VAR009, I_VAR010, I_VAR011, I_VAR012,
0247       .             I_VAR013, I_VAR014
0248
0249    50  FORMAT(/,1X,I6,2I2,11I5)
0250
```

```
0251        SELECT = 'N'
0252
0253    300 TYPE *,' Do You Need To Make Any Corrections ?'
0254        TYPE *,' Enter N or Y'
0255        READ(*,'(A)') SELECT
0256
0257        IF(((SELECT.NE.'Y') .AND. (SELECT .NE. 'y')) .AND.
0258         .     ((SELECT.NE.'N') .AND. (SELECT .NE. 'n'))) GOTO 300
0259
0260
0261        IF(SELECT.EQ.'Y' .OR. SELECT.EQ.'y') GOTO 100
0262
0263
0264    C..... WRITE DATA TO MONTHLY FILE
0265
0266
0267        IF(MONTH_FLAG .EQ. 1) THEN
0268           LUN = 11
0269        ELSE
0270              LUN = 15
0271           ENDIF
0272
0273        WRITE(LUN, 60) I_VAR001, I_VAR002, I_VAR003, I_VAR004,
0274         .                I_VAR005, I_VAR006, I_VAR007, I_VAR008,
0275         .                I_VAR009, I_VAR010, I_VAR011, I_VAR012,
0276         .                I_VAR013, I_VAR014
0277    60  FORMAT(I6,2I2,11I5)
0278
0279
0280        TYPE *,' '
0281        TYPE *,' '
0282        TYPE *,' Data Appended to:  [FCST.DAT]GENFCST'
0283         .//MONTH_NAME(MONTH)//'.DAT File.'
0284        TYPE *,' '
0285        TYPE *,' '
0286
0287        GO TO 200
0288
0289    990 TYPE *,' '
0290        TYPE *,'          Error During Form Input - Call Gregg A.'
0291           TYPE *,'              Home 946-5482    Work 376-0138'
0292    200 Call Exit
0293        END


PROGRAM SECTIONS

   Name                    Bytes   Attributes

 0 $CODE                    1891   PIC CON REL LCL   SHR   EXE   RD NOWRT LONG
 1 $PDATA                    732   PIC CON REL LCL   SHR NOEXE   RD NOWRT LONG
 2 $LOCAL                    480   PIC CON REL LCL NOSHR NOEXE   RD   WRT LONG
 3 FORM_RECORD                56   PIC OVR REL GBL   SHR NOEXE   RD   WRT LONG
```

Total Space Allocated 3159

ENTRY POINTS

Address	Type	Name	References
0-00000000		GEN$MAIN	

VARIABLES

Address	Type	Name	Attributes	References
2-000000C8	I*4	DAY		79 115= 130 134= 148 151= 160(2)= 166 169= 178(2)= 199 205
2-000000CC	I*4	HOUR		79 115= 128 129= 188= 199 206
2-000000D4	I*4	IER		104=A 106(2) 117=A 120(2) 136=A 140(2) 153=A 158(2) 171=A 174(2) 195= 196(2)
2-000000DC	I*4	IERROR		224A
2-000000D8	I*4	IOERROR		223A 226A
3-00000000	I*4	I_VAR001	COMM EQUIV	64 85 87 205= 244 273
3-00000004	I*4	I_VAR002	COMM EQUIV	65 87 206= 244 273
3-00000008	I*4	I_VAR003	COMM EQUIV	66 87 244 273
3-0000000C	I*4	I_VAR004	COMM EQUIV	67 87 244 273
3-00000010	I*4	I_VAR005	COMM EQUIV	68 87 244 273
3-00000014	I*4	I_VAR006	COMM EQUIV	69 87 244 273
3-00000018	I*4	I_VAR007	COMM EQUIV	70 87 244 273
3-0000001C	I*4	I_VAR008	COMM EQUIV	71 87 244 273
3-00000020	I*4	I_VAR009	COMM EQUIV	72 87 244 273
3-00000024	I*4	I_VAR010	COMM EQUIV	73 87 244 273
3-00000028	I*4	I_VAR011	COMM EQUIV	74 87 244 273
3-0000002C	I*4	I_VAR012	COMM EQUIV	75 87 244 273
3-00000030	I*4	I_VAR013	COMM EQUIV	76 87 244 273
3-00000034	I*4	I_VAR014	COMM EQUIV	77 87 244 273
**	I*4	LUN		268= 270= 273
2-000000C4	I*4	MONTH		79 115= 117 120 130 133= 136 140 148 150(2)= 153 156 166 168(2)= 171 174 199 205 282
2-000000D0	I*4	MONTH_FLAG		102= 135= 152= 170= 267
2-000000BC	CHAR	SELECT		82 251= 255= 257(4) 261(2)
2-000000E0	R*4	USER_CHECK		224A
2-000000C0	I*4	YEAR		79 115= 132(2)= 146 199 205

ARRAYS

Address	Type	Name	Attributes	Bytes	Dimensions	References
2-00000038	I*4	DAYS_IN_MONTH		48	(12)	79 92D 166
2-00000068	I*4	DAYS_IN_MONTH_LY		48	(12)	79 95D 148
3-00000000	L*1	FORM_INTERFACE_RECORD	COMM EQUIV	56	(56)	59 85 224A
2-00000000	I*4	IFLAGS		56	(14)	60 213= 214=
			215= 224A			
2-00000098	CHAR	MONTH_NAME		36	(12)	57 83 98D
			117 120 136 140 153			
			158 171 174 282			

PARAMETER CONSTANTS

Type	Name	References
I*4	FMS_FIELD_BOLD	43 47#
I*4	FMS_FIELD_UNDERLINE	43 47#
I*4	FMS_FORCE_START	43 47# 215
I*4	FMS_NO_ECHO	43 47#
I*4	FMS_NO_SEE	43 47#
I*4	FMS_NO_WRITE	43 47# 213 214
I*4	FMS_SET_ERROR	43 47#
I*4	FMS_SET_EXCEPTION	43 47#
I*4	FMS_USER_CHECK	43 47#

LABELS

Address	Label	References
1-0000011F	10'	106 107#
1-0000019F	20'	140 141# 156 174
1-000001D6	30'	196 197#
1-00000233	40'	240 241#
1-00000281	50'	244 249#
1-00000291	60'	273 277#
1-00000168	80'	120 121#
0-000003A0	100	221# 261
0-0000075C	200	287 292#
0-00000510	300	253# 257
0-00000708	990	224A 289#

FUNCTIONS AND SUBROUTINES REFERENCED

Type	Name	References
	FM_FORM_CLOSE	226

```
      FM_FORM_INPUT                                 224
      FM_FORM_OPEN                                  223
      FOR$EXIT                                      292
      FOR$OPEN                                      104       117       136       153       171

      SELECT_ANSI                                   222
      SUBPROCESS_CLOSE_IO                           227
      SUBPROCESS_OPEN_IO                            221


  +-----------------------------------------------+
  |           KEY TO REFERENCE FLAGS              |
  |   =   - Value Modified                        |
  |   #   - Defining Reference                    |
  |   A   - Actual Argument, possibly modified    |
  |   D   - Data Initialization                   |
  |  (n)  - Number of occurrences on line         |
  +-----------------------------------------------+


COMMAND QUALIFIERS

  FOR/LIS/CROSS/CHECK=ALL GEN

  /CHECK=(BOUNDS,OVERFLOW,UNDERFLOW)
  /DEBUG=(NOSYMBOLS,TRACEBACK)
  /STANDARD=(NOSYNTAX,NOSOURCE_FORM)
  /SHOW=(NOPREPROCESSOR,NOINCLUDE,MAP,NODICTIONARY,SINGLE)
  /WARNINGS=(GENERAL,NODECLARATIONS,NOULTRIX)
  /CONTINUATIONS=19  /CROSS_REFERENCE  /NOD_LINES  /NOEXTEND_SOURCE  /F77
  /NOG_FLOATING  /I4  /NOMACHINE_CODE  /OPTIMIZE


COMPILATION STATISTICS

  Run Time:          5.25 seconds
  Elapsed Time:      44.51 seconds
  Page Faults:       730
  Dynamic Memory:    456 pages
```

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