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Hanford Meteorological Station Computer Codes

Volume 2 - The PROD Computer Code

G. L. Andrews
J. W. Buck

September 1987

Prepared for the U.S. Department of Energy
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Pacific Northwest Laboratory
Richland, Washington 99352

PREFACE

This volume is the second in a series of 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 listing of the source code.

The first seven volumes 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

At the end of each work shift (day, swing, and graveyard), the Hanford Meteorological Station (HMS), operated by Pacific Northwest Laboratory, issues a forecast of the 200-ft-level wind speed and direction and the weather for use at B Plant and PUREX. These forecasts are called production forecasts. The PROD computer code is used to archive these production forecasts and apply quality assurance checks to the forecasts. The code accesses an input file, which contains the previous forecast's date and shift number, and an output file, which contains the production forecasts for the current month. A data entry form consisting of 20 fields is included in the program. The fields must be filled in by the user. The information entered is appended to the current production monthly forecast file, which provides an archive for the production forecasts. This volume describes the implementation and operation of the PROD computer code at the HMS.

ACKNOWLEDGMENTS

The authors would like to thank the staff at the Hanford Meteorological Station for their assistance during the preparation of this document. Special thanks to the HMS Project Manager Dana Hoitink for his continued support and Van Ramsdell for his helpful suggestions and ideas.

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INTRODUCTION

The Hanford Meteorological Station (HMS) was established in 1944 on the Hanford Site to collect and archive meteorological data and to provide 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).

The HMS staff makes weather forecasts 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 production forecasts are issued each day throughout the year at the end of each work shift [0800, 1600, and 2400 Pacific Standard Time (PST) and 0700, 1500, and 2300 Pacific Daylight Time (PDT)]. Each production forecast covers an 8-hour interval (e.g., the 0800 forecast covers the 0900-1600 period). Production forecasts consist of hour-by-hour predictions of the 200-ft-level wind speed and direction and expected weather (e.g., fog, rain, snow, etc.) for an 8-hour period. Forecasters use the PROD computer code to archive and apply quality assurance checks to the production forecasts. The archive is maintained in disk files on the HMS computer system (DEC VAX 11/750).

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

THE PROD COMPUTER CODE

The PROD computer code provides a method for archiving data obtained from the 8-hour production forecasts. The code has replaced manual entry of data via computer cards and a keypunch. The PROD code was written, compiled, and linked on the DEC VAX 11/750 at the HMS and is executed three times a day after the production forecast is issued to the Hanford contractors.

PROGRAM OVERVIEW

The PROD computer code accesses one input file and one output file. The input file contains the previous forecast's date and shift number, and the output file consists of production forecasts for the current month. The convention used in naming the monthly forecast files is PRODUCTxxx.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). The length of each field is indicated by the number of X's next to the field name. The program fills in the date and shift number fields by accessing an input file to obtain the previous forecast's date and shift number. You are then prompted to enter data for the remaining input fields. You can exit the data entry form after filling in all the input fields. The screen clears, and a prompt to make any needed corrections appears on the screen. Once all the input values are correct, you can exit the program and the forecast is appended to the current monthly production forecast file.

USER'S GUIDE FOR THE PROD COMPUTER CODE

This section describes how to invoke the PROD 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. The terminal must be in the DEC VT100 terminal mode before executing the PROD computer code. To determine the terminal status, simply type SHOW

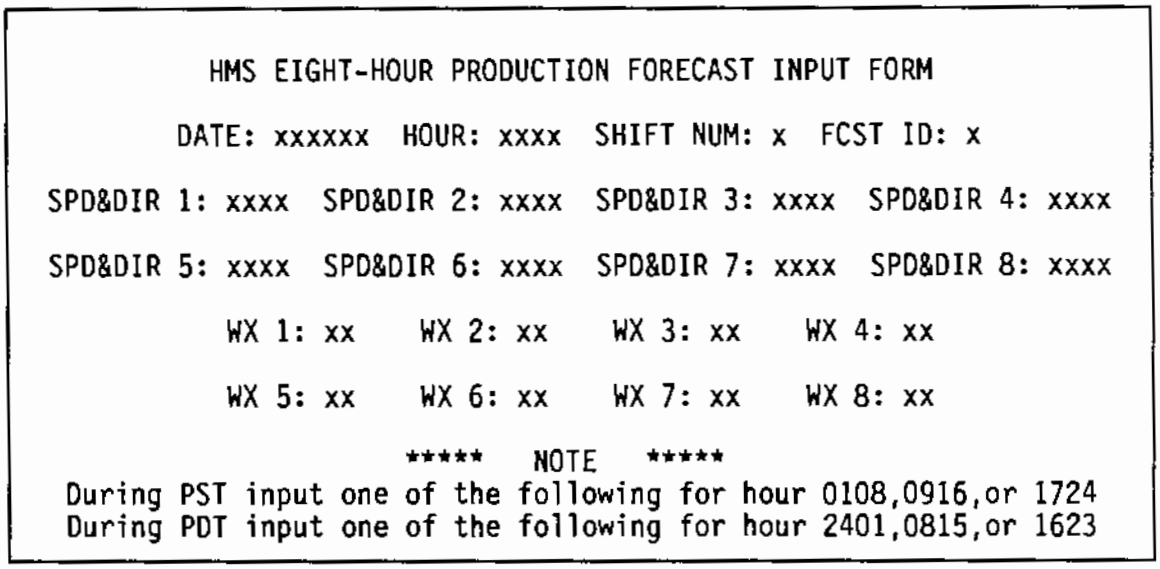


FIGURE 1. Example of the Data Entry Form Used by the PROD Computer Code

TERMINAL and depress the RETURN key. A list of terminal characteristics appears 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 PROD computer code, filling in the data entry form, and terminating the program. These steps are listed below, and each step is discussed in detail in the following paragraphs:

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

To log in, depress the RETURN key a couple of times. The computer responds with the prompt USERNAME:. Enter FCST and depress the RETURN key. The computer then responds with the prompt PASSWORD:. You must know the password to the FCST account before logging in to the HMS computer. Enter the correct password. If you fail to answer either of these prompts correctly the computer repeats

the appropriate prompt. You are given three chances to enter the correct response. By logging in to the FCST account, you are placed in the [FCST] directory and can immediately invoke the PROD computer code.

The PROD code is invoked by typing RUN PROD and depressing the RETURN key. When this action is done, the screen clears and the data entry form appears. You can now begin data entry. If problems occur during the execution of the code refer to the "Trouble Shooting" section of this volume for help.

The data entry form appears on the screen as shown in Figure 1 with the cursor in field two (HOUR). The date and shift number fields (first and third fields, respectively) are filled in by the program. A prompt appears on the screen at the bottom of the data entry form for each field. Included with each prompt is a default value and a valid range or list of values from which the input must be selected. To enter data into a field, simply type in the requested data and depress the RETURN key. Integers are used for all input. The default value may be entered by depressing the ENTER key or the SELECT DEFAULT key, which is found on some Tektronix terminals. This action enters the default value. The input value appears 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 moves down one line to the leftmost field. When values have been entered in all fields, you should check the fields for any mistakes. If corrections are needed, use the up, down, right, and left arrow keys (↑,↓,→,←) 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 PROD program provides for 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 appears at the bottom of the form if the input value is not within the valid range or valid list of matching numbers, and you are then given the opportunity to enter another value for that field. The second phase occurs when you have exited 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 is appended to the monthly file (e.g., PRODUCTxxx.DAT). A prompt appears just below the information asking if you would care to make any corrections. If no corrections are needed, enter a N or n and the program appends the data to the monthly file. If corrections are needed, enter a Y or y and the program returns to the data entry form mode. At this time, the entered values appear in their respective fields. Incorrect value(s) can be corrected by using the arrow keys to move the cursor to the appropriate field(s). 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 PROD program is terminated by answering n(o) or N(o) to the "need corrections" prompt. The entered data is appended to the monthly file and the program terminates with a FORTRAN STOP message written to your terminal. The monthly data files for the 8-hour production forecasts are located in the [FCST.DAT] directory. Each file contains all of the 8-hour production forecasts for any single month.

DESCRIPTION OF INPUT

The data entry form consists of 20 fields; numeric (integer) values must be provide for 18 of these fields. The program provides the values for the date and shift number fields. When you move the cursor to one of the other 18 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 numbers from which the input value must be selected, and a default value (refer to the "User's Guide" section for information on how to input the default value). Table 1 describes 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 - 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

TABLE 1. Reference Guide to Input Fields

Input Field	Description	Range or List/Default
DATE	YYMMDD	860101-990101 / 999999
HOUR	FHLH	0108, 0916, 1724[(a)] / 9999 2407, 0815, 1623[(b)]
SHIFT NUM	shift	1, 2, 3 / 1
FCST ID	identifies forecaster	1 - 9 / 0
SPD&DIR 1	spd & dir, first hour	0104 - 3630 / 9999
SPD&DIR 2	spd & dir, second hour	0104 - 3630 / 9999
SPD&DIR 3	spd & dir, third hour	0104 - 3630 / 9999
SPD&DIR 4	spd & dir, fourth hour	0104 - 3630 / 9999
SPD&DIR 5	spd & dir, fifth hour	0104 - 3630 / 9999
SPD&DIR 6	spd & dir, sixth hour	0104 - 3630 / 9999
SPD&DIR 7	spd & dir, seventh hour	0104 - 3630 / 9999
SPD&DDIR 8	spd & dir, eighth hour	0104 - 3630 / 9999
WX 1	weather code, first hour	4 - 9 / 0
WX 2	weather code, second hour	4 - 9 / 0
WX 3	weather code, third hour	4 - 9 / 0
WX 4	weather code, fourth hour	4 - 9 / 0
WX 5	weather code, fifth hour	4 - 9 / 0
WX 6	weather code, sixth hour	4 - 9 / 0
WX 7	weather code, seventh hour	4 - 9 / 0
WX 8	weather code, eighth hour	4 - 9 / 0

[(a)] during PST

[(b)] during PDT

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 - The hour format is FHLH: where FH is the first hour of the forecast period and LH is the last hour of the forecast period. There is a message at the bottom of the data entry form that describes which entry to make during PST or PDT. The list of valid matching values are 0108, 0916, 1724, 2407, 0815, and 1623. The value 0108 would be entered during PST at the end of the graveyard shift for the period 0100 to 0800 PST. The value 2407 would be entered during PDT at the end of the graveyard shift for the period 2400 to 0700 PDT. The default value for the hour is 9999, which indicates a missing hour.

3) SHIFT NUM - The input value for this field is a code that identifies the shift on which the forecast was made. The codes for the graveyard, day, and swing shifts are 1, 2, and 3, respectively.

4) FCST ID - Each forecaster is assigned an identification (id) code that he must enter in the data entry form to indicate who issued the forecast. The range of the id code is from 1 through 9; the default value is 0. The 0 default value indicates an id has not been assigned.

5) SPD&DIR 1 - The input value for this field is the 200-ft level forecast wind speed and direction for the first hour of the production forecast period. The code for this field consists of four digits, with the first two digits indicating the wind direction and the last two digits indicating the wind speed (e.g., 3604). The wind direction is entered in 10-degree increments. Thus, 10 degrees is represented by 01 (360 degrees = 36). The wind speed is entered in miles per hour (mph) and ranges from 04 to 30 mph. For example, the wind speed and direction code for a 25-mph wind from 180 degrees

would be 1825. Wind speeds less than four mph are not considered. The default is 9999, which indicates wind speed and direction are not forecast.

6) SPD&DIR 2 - The input value for this field is the 200-ft level forecast wind speed and direction for the second hour of the production forecast period. The range and default values are the same as those for item 5.

7) SPD&DIR 3 - The input value for this field is the 200-ft level forecast wind speed and direction for the third hour of the production forecast period. The range and default values are the same as those for item 5.

8) SPD&DIR 4 - The input value for this field is the 200-ft level forecast wind speed and direction for the fourth hour of the production forecast period. The range and default values are the same as those for item 5.

9) SPD&DIR 5 - The input value for this field is the 200-ft level forecast wind speed and direction for the fifth hour of the production forecast period. The range and default values are the same as those for item 5.

10) SPD&DIR 6 - The input value for this field is the 200-ft level forecast wind speed and direction for the sixth hour of the production forecast period. The range and default values are the same as those for item 5.

11) SPD&DIR 7 - The input value for this field is the 200-ft level forecast wind speed and direction for the seventh hour of the production forecast period. The range and default values are the same as those for item 5.

12) SPD&DIR 8 - The input value for this field is the 200-ft level forecast wind speed and direction for the eighth hour of the production forecast period. The range and default values are the same as those for item 5.

13) WX 1 - The input value for this field is the expected weather for the first hour of the forecast period. The value is a code that ranges from 4 to 9. Table 2 indicates the description for each weather code. The default is 0, indicating no weather is expected.

TABLE 2. List of Weather Codes

Code	Description
4	Fog
5	Drizzle
6	Rain
7	Snow
8	Showers
9	Freezing Precipitation

14) WX 2 - The input value for this field is the expected weather for the second hour of the forecast period. The range and default values are the same as those for item 13.

15) WX 3 - The input value for this field is the expected weather for the third hour of the forecast period. The range and default values are the same as those for item 13.

16) WX 4 - The input value for this field is the expected weather for the fourth hour of the forecast period. The range and default values are the same as those for item 13.

17) WX 5 - The input value for this field is the expected weather for the fifth hour of the forecast period. The range and default values are the same as those for item 13.

18) WX 6 - The input value for this field is the expected weather for the sixth hour of the forecast period. The range and default values are the same as those for item 13.

19) WX 7 - The input value for this field is the expected weather for the seventh hour of the forecast period. The range and default values are the same as those for item 13.

20) WX 8 - The input value for this field is the expected weather for the eighth hour of the forecast period. The range and default values are the same as those for item 13.

TROUBLE-SHOOTING THE PROD COMPUTER CODE

This section provides information that may help resolve problems that occur when operating the PROD 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 discuss problems or failures that may occur when using the PROD computer code and suggested recovery procedures. If a series of recovery actions are suggested, you should try them in sequence until the problem or failure is resolved. Remember that the date and shift number are incremented each time you execute the PROD program. Therefore, you may need to edit the [FCST.PREVIOUS_DATE]PRODUCT_DATE.DAT file to reflect the desired date and shift number after you have tried the recovery procedures.

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 15 to 20 seconds, and turn the terminal back on. Depress the RETURN key several times to get the 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 program 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 PROD.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]PROD.EXE [FCST]PROD.EXE. Try running the program again.

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

Recovery: Check the [FCST.PREVIOUS_DATE] 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 PROD.EXE to the [FCST] directory (see above for directions).
Try running the code again.

APPENDIX A

PROGRAM DESCRIPTION AND FLOWCHART

APPENDIX A

PROGRAM DESCRIPTION AND FLOWCHART

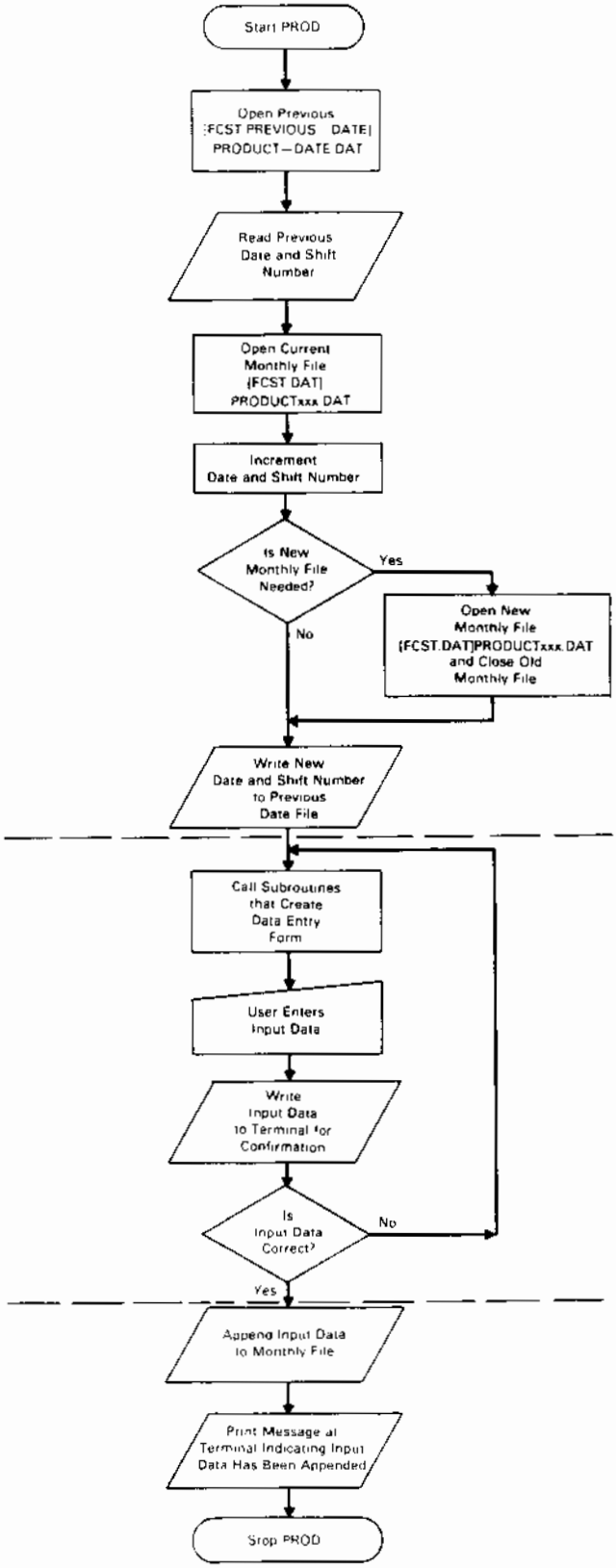
This discussion describes, in detail, the operations and logical flow of the PROD computer code. A flow chart indicating the general operations and logical sequence of the PROD code is shown at the end of this appendix. The flowchart is divided into three sections by two dashed lines. The top and bottom sections are transparent to the user and do not require input from you. The middle section involves the data entry form, which requires input from you. The following three paragraphs describe 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 the file PRODUCT_DATE.DAT, which contains one record with the previous forecast's date and shift number. The program then reads the data. The PRODUCT_DATE.DAT file resides in the [FCST.PREVIOUS_DATE] sub-directory. The month from that date is then used to open the file PRODUCTxxx.DAT (where xxx is the three-character abbreviation for the current month), which contains the production forecast data for the current month. The PRODUCTxxx.DAT file resides in the [FCST.DAT] sub-directory. The date and time are then incremented and entered into the PRODUCT_DATE.DAT file. If the incremented date crosses over into the next month, a new PRODUCTxxx.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 PROD 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 variable. Each field is displayed in reverse video to highlight the field length. The fields are initially blank. Prompts appear at the bottom of the form for an input value to describe the data required for the current field. The prompt consists of a brief description of the field, the valid range or list of values from which the input must be selected, and a default value. A valid entry must be made in the current field 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 when the ENTER key is depressed. If the input value is not valid, an error message appears at the bottom of the form and the cursor remains in that field. When this occurs, the prompt reappears.

After entering all the input data, the data entry process is terminated 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 used in the PRODUCTxxx.DAT file. You are then asked if any corrections are needed before the record is appended to the current monthly file. If no corrections are needed answer "no" to the "need corrections" prompt. The data are then appended to the PRODUCTxxx.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. If corrections are needed answer "yes" to the "need corrections" prompt. The code returns to the data entry form and the input values entered by you are displayed. 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 values are corrected, the data record is again displayed on the screen and you are given another opportunity to correct any mistakes.


Start PROD
Open Previous
[FCST.PREVIOUS_DATE]
PRODUCT—DATE.DAT
Read Previous
Date and Shift
Number
Open Current
Monthly File
[FCST.DAT]
PRODUCTxxx.DAT
Increment
Date and Shift Number
Is New
Monthly File
Needed?
Yes
No
Open New
Monthly File
[FCST.DAT]PRODUCTxxx.DAT
and Close Old
Monthly File
Write New
Date and Shift Number
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 PROD

APPENDIX B

PROD SOURCE CODE LISTING

```
0001    C ***************************************************************
0002    C
0003    C       PROGRAM: PROD.FOR
0004    C
0005    C       PROGRAMMER: GREGG ANDREWS
0006    C
0007    C       FUNCTION: THIS PROGRAM WAS DEVELOPED TO FACILITATE THE ARCHVING
0008    C                 OF EIGHT HOUR PRODUCTION 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
0020          INCLUDE 'ERDS$INCLUDE:FORMFLAGS.INC'
0058          DIMENSION MONTH_NAME(12)
0059
0060          Byte         Form_Interface_Record(   80)
0061          Integer*4     Iflags( 20)      ! Form flags
0062    C
0063    C         Type         Name            Field Prompt String
0064    C
0065          Integer*4     I_VAR001         ! Date (860101 - 990101)/ Default = 999999
0066          Integer*4     I_VAR002         ! Hour (0100,0916,1724,2407,0815, or 1523)/ Default = 9999
0067          Integer*4     I_VAR003         ! Shift Number (1 - 3)/ Default = 1
0068          Integer*4     I_VAR004         ! Forecaster Identification (1 - 9)/ Default = 0
0069          Integer*4     I_VAR005         ! Wind Spd and Dir Hour 1 (0104 - 3630)/ Default = 9999
0070          Integer*4     I_VAR006         ! Wind Spd and Dir Hour 2 (0104 - 3630)/ Default = 9999
0071          Integer*4     I_VAR007         ! Wind Spd and Dir Hour 3 (0104 - 3630)/ Default = 9999
0072          Integer*4     I_VAR008         ! Wind Spd and Dir Hour 4 (0104 - 3630)/ Default = 9999
0073          Integer*4     I_VAR009         ! Wind Spd and Dir Hour 5 (0104 - 3630)/ Default = 9999
0074          Integer*4     I_VAR010         ! Wind Spd and Dir Hour 6 (0104 - 3630)/ Default = 9999
0075          Integer*4     I_VAR011         ! Wind Spd and Dir Hour 7 (0104 - 3630)/ Default = 9999
0076          Integer*4     I_VAR012         ! Wind Spd and Dir Hour 8 (0104 - 3630)/ Default = 9999
0077          Integer*4     I_VAR013         ! Weather Hour 1 (4 - 9)/ Default = 0
0078          Integer*4     I_VAR014         ! Weather Hour 2 (4 - 9)/ Default = 0
0079          Integer*4     I_VAR015         ! Weather Hour 3 (4 - 9)/ Default = 0
0080          Integer*4     I_VAR016         ! Weather Hour 4 (4 - 9)/ Default = 0
0081          Integer*4     I_VAR017         ! Weather Hour 5 (4 - 9)/ Default = 0
0082          Integer*4     I_VAR018         ! Weather Hour 6 (4 - 9)/ Default = 0
0083          Integer*4     I_VAR019         ! Weather Hour 7 (4 - 9)/ Default = 0
0084          Integer*4     I_VAR020         ! Weather Hour 8 (4 - 9)/ Default = 0
0085
0086          INTEGER*4 YEAR, MONTH, DAY, SHIFT, DAYS_IN_MONTH(12),
0087                    DAYS_IN_MONTH_LY(12)
0088
```

```
0089          CHARACTER*1 SELECT
0090          CHARACTER*3 MONTH_NAME
0091
0092          Equivalence  (Form_Interface_Record, I_VAR001)
0093
0094          Common /Form_Record/ I_VAR001, I_VAR002, I_VAR003, I_VAR004,
0095         .                     I_VAR005, I_VAR006, I_VAR007, I_VAR008,
0096         .                     I_VAR009, I_VAR010, I_VAR011, I_VAR012,
0097         .                     I_VAR013, I_VAR014, I_VAR015, I_VAR016,
0098         .                     I_VAR017, I_VAR018, I_VAR019, I_VAR020
0099
0100          DATA DAYS_IN_MONTH/31, 28, 31, 30, 31, 30, 31, 31, 30, 31,
0101         .                   30, 31/
0102
0103          DATA DAYS_IN_MONTH_LY/31, 29, 31, 30, 31, 30, 31, 31, 30,
0104         .                      31, 30, 31/
0105
0106           DATA MONTH_NAME/'JAN', 'FEB', 'MAR', 'APR', 'MAY', 'JUN',
0107         .                 'JUL', 'AUG', 'SEP', 'OCT', 'NOV', 'DEC'/
0108
0109
0110          MONTH_FLAG = 0
0111
0112          OPEN(UNIT=10, FILE='[FCST.PREVIOUS_DATE]PRODUCT_DATE.DAT',
0113         .      STATUS='OLD', IOSTAT=IER)
0114          IF(IER .NE. 0) WRITE(*,10) IER
0115    10    FORMAT(/5X,'Error Opening [FCST.PREVIOUS_DATE]PRODUCT_DATE',
0116         .        '.DAT Code - ',I4)
0117
0118
0119    C..... READ PREVIOUS DATE AND HOUR FROM SUMMARY DATE FILE
0120    C..... AND OPEN MONTHLY FILE
0121
0122
0123          READ(10,'(4I2)') YEAR, MONTH, DAY, SHIFT
0124
0125           OPEN(UNIT=15, FILE='[FCST.DAT]PRODUCT'//MONTH_NAME(MONTH)//
0126         .      '.DAT', STATUS='OLD', ACCESS='APPEND',
0127         .      CARRIAGECONTROL='LIST', IOSTAT=IER)
0128             IF(IER .NE. 0) WRITE(*,80) IER, MONTH_NAME(MONTH)
0129    80       FORMAT(/5X,'Error Opening [FCST.DAT]PRODUCT',A3,
0130         .           '.DAT Code - ', I4)
0131
0132
0133    C..... INCREMENT DATE AND OPEN NEW MONTHLY FILE IF NEEDED
0134
0135          IF(SHIFT .EQ. 2) THEN
0136             SHIFT = 3
0137             IF(DAY.EQ.31 .AND. MONTH.EQ.12) THEN      ! check for end of year
0138
0139                YEAR  = YEAR + 1
0140                MONTH = 1
0141                DAY   = 1
0142                MONTH_FLAG = 1
```

```
0143              OPEN(UNIT=11, FILE='[FCST.DAT]PRODUCT'//
0144             .      MONTH_NAME(MONTH)//
0145             .      '.DAT', STATUS='NEW', CARRIAGECONTROL='LIST',
0146             .      IOSTAT=IER)
0147              IF(IER .NE. 0) WRITE(*,20) IER, MONTH_NAME(MONTH)
0148    20        FORMAT(/5X,'Error Opening [FCST.DAT]PRODUCT',A3,
0149             .      '.DAT Code - ', I4)
0150
0151            ELSE
0152
0153              IF(MOD(YEAR,4) .EQ. 0) THEN          ! check for leap year
0154
0155                IF(DAY.EQ.DAYS_IN_MONTH_LY(MONTH)) THEN
0156
0157                  MONTH = MONTH + 1
0158                  DAY = 1
0159                   MONTH_FLAG = 1
0160                  OPEN(UNIT=11, FILE='[FCST.DAT]PRODUCT'//
0161             .         MONTH_NAME(MONTH)//'.DAT', STATUS='NEW',
0162             .         CARRIAGECONTROL='LIST', IOSTAT=IER)
0163                  IF(IER .NE. 0) WRITE(*,20) IER, MONTH_NAME(MONTH)
0164
0165                ELSE
0166
0167                  DAY = DAY + 1
0168
0169                ENDIF
0170
0171              ELSE
0172
0173                IF(DAY.EQ.DAYS_IN_MONTH(MONTH)) THEN
0174
0175                  MONTH = MONTH + 1
0176                  DAY = 1
0177                   MONTH_FLAG = 1
0178                  OPEN(UNIT=11, FILE='[FCST.DAT]PRODUCT'//
0179             .         MONTH_NAME(MONTH)//'.DAT', STATUS='NEW',
0180             .         CARRIAGECONTROL='LIST', IOSTAT=IER)
0181                  IF(IER .NE. 0) WRITE(*,20) IER, MONTH_NAME(MONTH)
0182
0183                ELSE
0184
0185                  DAY = DAY + 1
0186
0187                ENDIF
0188
0189              ENDIF
0190
0191            ENDIF
0192
0193          ELSE IF(SHIFT .EQ. 3) THEN
0194
0195            SHIFT = 1
0196
```

```
0197          ELSE
0198
0199             SHIFT = 2
0200
0201          ENDIF
0202
0203
0204    C..... WRITE NEW DATE TO PREVIOUS DATE FILE
0205
0206
0207          BACKSPACE (UNIT=10,IOSTAT=IER)
0208          IF(IER.NE.0) WRITE(*,30) IER
0209    30    FORMAT(//5X,' Error During Backspace Code - ',I4/
0210         .        5X,' Check [FCST.PREVIOUS_DATE]PRODUCT_DATE.DAT File')
0211          WRITE(10,'(4I2)') YEAR, MONTH, DAY, SHIFT
0212
0213
0214    C..... FIX DATE TO THE VARIABLES I_VAR001 AND SET I_VAR003 TO SHIFT
0215
0216
0217          I_VAR001 = (YEAR*10000) + (MONTH*100) + DAY
0218          I_VAR003 = SHIFT
0219
0220
0221
0222    C..... PREVENT USER FROM ENTERING DATE AND FORCE CURSOR TO START
0223    C..... AT FIRST VARIABLE
0224
0225
0226          IFLAGS(1) = FWS_NO_WRITE
0227          IFLAGS(3) = FWS_NO_WRITE
0228          IFLAGS(2) = FWS_FORCE_START
0229
0230
0231    C..... MAKE CALLS TO SUBROUTINES TO CREATE INPUT FORM AND ENTER DATA
0232
0233
0234    100   CALL SUBPROCESS_OPEN_IO
0235          CALL SELECT_ANSI
0236          Call FW_Form_Open (12, 'HMSFORMS.FRM', IOerror)
0237          Call FW_Form_Input ('PRODUCT', Form_Interface_Record,
0238         .                            Iflags, Ierror, User_Check, *990)
0239          Call FW_Form_Close (IOerror)
0240          CALL SUBPROCESS_CLOSE_IO
0241
0242
0243    C..... WRITE DATA TO SCREEN AS WILL BE WRITTEN TO FILE AND
0244    C..... PROMPT FOR CORRECTION
0245
0246
0247          TYPE *,' '
0248          TYPE *,' '
0249          TYPE *,' '
0250          TYPE *,' The Following Data Record Will be Appended to ',
```

```
0251          .         'Monthly Production Forecast File :'
0252
0253           WRITE(*,40)
0254     40    FORMAT(//1X,'123456789 123456789 123456789 123456789 ',
0255          .           '123456789 123456789 123456789')
0256           WRITE(*,50) I_VAR001, I_VAR002, I_VAR003, I_VAR004,
0257          .            I_VAR005, I_VAR006, I_VAR007, I_VAR008,
0258          .            I_VAR009, I_VAR010, I_VAR011, I_VAR012,
0259          .            I_VAR013, I_VAR014, I_VAR015, I_VAR016,
0260          .            I_VAR017, I_VAR018, I_VAR019, I_VAR020
0261
0262     50    FORMAT(/,1X,I6,1X,I4,1X,I1,1X,I1,1X,9(I4,1X),8I2)
0263
0264           SELECT = 'N'
0265
0266     300   TYPE *,' Do You Need To Make Any Corrections ?'
0267           TYPE *,' Enter N or Y'
0268           READ(*,'(A)') SELECT
0269
0270           IF(((SELECT.NE.'Y') .AND. (SELECT .NE. 'y')) .AND.
0271          .   ((SELECT.NE.'N') .AND. (SELECT .NE. 'n'))) GOTO 300
0272
0273           IF(SELECT.EQ.'Y' .OR. SELECT.EQ.'y') GOTO 100
0274
0275
0276     C..... WRITE DATA TO MONTHLY FILE
0277
0278
0279           IF(MONTH_FLAG .EQ. 1) THEN
0280             LUN = 11
0281           ELSE
0282              LUN = 15
0283            ENDIF
0284
0285           WRITE(LUN, 60) I_VAR001, I_VAR002, I_VAR003, I_VAR004,
0286          +               I_VAR005, I_VAR006, I_VAR007, I_VAR008,
0287          +               I_VAR009, I_VAR010, I_VAR011, I_VAR012,
0288          +               I_VAR013, I_VAR014, I_VAR015, I_VAR016,
0289          +               I_VAR017, I_VAR018, I_VAR019, I_VAR020
0290     60    FORMAT(I6,1X,I4,1X,I1,1X,I1,1X,9(I4,1X),8I2)
0291
0292
0293           TYPE *,' '
0294           TYPE *,' '
0295           TYPE *,' Data Appended to:  [FCST.DAT]PRODUCT'
0296          .//MONTH_NAME(MONTH)//'.DAT File.'
0297           TYPE *,' '
0298           TYPE *,' '
0299
0300           GO TO 200
0301
0302     990   TYPE *,' '
0303           TYPE *,'          Error During Form Input - Call Gregg A.'
0304            TYPE *,'              Home 948-5482    Work 378-0138'
```

```
0305    200     Call Exit
0306            END
```

PROGRAM SECTIONS

	Name	Bytes	Attributes
0	$CODE	2023	PIC CON REL LCL SHR EXE RD NOWRT LONG
1	$PDATA	773	PIC CON REL LCL SHR NOEXE RD NOWRT LONG
2	$LOCAL	604	PIC CON REL LCL NOSHR NOEXE RD WRT LONG
3	FORM_RECORD	80	PIC OVR REL GBL SHR NOEXE RD WRT LONG
	Total Space Allocated	3380	

ENTRY POINTS

Address	Type	Name	References
0-00000000		PROD$MAIN	

VARIABLES

Address	Type	Name	Attributes	References
2-000000E0	I*4	DAY		86 123= 137 141= 155 158= 167(2)= 173 178= 185(2)= 211 217
2-000000EC	I*4	IER		112=A 114(2) 125=A 128(2) 143=A 147(2) 160=A 163(2) 178=A 181(2) 207= 208(2)
2-000000F4	I*4	IERROR		237A
2-000000F0	I*4	IOERROR		236A 239A
3-00000000	I*4	I_VAR001	COMM EQUIV	65 92 94 217= 256 285
3-00000004	I*4	I_VAR002	COMM EQUIV	66 94 256 285
3-00000008	I*4	I_VAR003	COMM EQUIV	67 94 218= 256 285
3-0000000C	I*4	I_VAR004	COMM EQUIV	68 94 256 285
3-00000010	I*4	I_VAR005	COMM EQUIV	69 94 256 285
3-00000014	I*4	I_VAR006	COMM EQUIV	70 94 256 285
3-00000018	I*4	I_VAR007	COMM EQUIV	71 94 256 285
3-0000001C	I*4	I_VAR008	COMM EQUIV	72 94 256 285
3-00000020	I*4	I_VAR009	COMM EQUIV	73 94 256 285
3-00000024	I*4	I_VAR010	COMM EQUIV	74 94 256 285
3-00000028	I*4	I_VAR011	COMM EQUIV	75 94 256 285
3-0000002C	I*4	I_VAR012	COMM EQUIV	76 94 256 285
3-00000030	I*4	I_VAR013	COMM EQUIV	77 94 256 285
3-00000034	I*4	I_VAR014	COMM EQUIV	78 94 256 285
3-00000038	I*4	I_VAR015	COMM EQUIV	79 94 256 285
3-0000003C	I*4	I_VAR016	COMM EQUIV	80 94 256 285
3-00000040	I*4	I_VAR017	COMM EQUIV	81 94 256 285

```
3-00000044  I*4  I_VAR018                  COMM EQUIV    82       94       256      285
3-00000048  I*4  I_VAR019                  COMM EQUIV    83       94       256      285
3-0000004C  I*4  I_VAR020                  COMM EQUIV    84       94       256      285
    **      I*4  LUN                                    280=     282=     285

2-000000DC  I*4  MONTH                                   86       123=     125      128      137      140=
                                          143      147      155      157(2)=  160      163
                                          173      175(2)=  178      181      211      217
                                          295
2-000000E8  I*4  MONTH_FLAG                             110=     142=     159=     177=     279
2-000000D4  CHAR SELECT                                 89       264=     268=     270(4)   273(2)
2-000000E4  I*4  SHIFT                                  88       123=     135      136=     193      195=
                                          199=     211      218
2-000000F8  R*4  USER_CHECK                             237A

2-000000D8  I*4  YEAR                                   88       123=     139(2)=  153      211      217
```

ARRAYS

```
  Address  Type  Name                     Attributes       Bytes  Dimensions      References

2-00000050  I*4  DAYS_IN_MONTH                             48  (12)                86       100D     173
2-00000080  I*4  DAYS_IN_MONTH_LY                          48  (12)                86       103D     155
3-00000000  L*1  FORM_INTERFACE_RECORD     COMM EQUIV      80  (80)                60        92      237A
2-00000000  I*4  IFLAGS                                    80  (20)                61       226=     227=
                                            228=     237A

2-000000B0  CHAR MONTH_NAME                                38  (12)                58        90      106D
                                            125      128      143      147      160
                                            163      178      181      295
```

PARAMETER CONSTANTS

```
 Type  Name                                    References

  I*4  FM$_FIELD_BOLD                            44       48#
  I*4  FM$_FIELD_UNDERLINE                       44       48#
  I*4  FM$_FORCE_START                           44       48#      228
  I*4  FM$_NO_ECHO                               44       48#
  I*4  FM$_NO_SEE                                44       48#

  I*4  FM$_NO_WRITE                              44       48#      226      227
  I*4  FM$_SET_ERROR                             44       48#
  I*4  FM$_SET_EXCEPTION                         44       48#
  I*4  FM$_USER_CHECK                            44       48#
```

LABELS

```
  Address  Label                                 References
```

```
1-00000122  10'                                    114       115#
1-000001A2  20'                                    147       148#      183       181
1-000001D9  30'                                    208       209#
1-00000238  40'                                    253       254#
1-00000284  50'                                    256       262#

1-000002A7  60'                                    285       290#
1-0000016B  80'                                    128       129#
0-000003AC  100                                    234#      273
0-000007E0  200                                    300       305#
0-00000558  300                                    268#      270

0-0000078C  990                                    237A      302#
```

FUNCTIONS AND SUBROUTINES REFERENCED

```
Type  Name                                         References

      FM_FORM_CLOSE                                239
      FM_FORM_INPUT                                237
      FM_FORM_OPEN                                 236
      FOR$EXIT                                     305
      FOR$OPEN                                     112       125       143       160       178

      SELECT_ANSI                                  235
      SUBPROCESS_CLOSE_IO                          240
      SUBPROCESS_OPEN_IO                           234
```

```
+-----------------------------------------+
|          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 PROD

/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:	5.85 seconds
Elapsed Time:	38.85 seconds
Page Faults:	785
Dynamic Memory:	456 pages

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