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NOAA Techniques Development Laboratory
Computer Program NWS TDL CP 93–6

NOAA WEATHER RADIO CLIMATOLOGICAL DATA REPORTS

Silver Spring, Md.
December 1993

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PREFACE

...es Development Laboratory's (TDL's) computer program (CP) ...t of TDL's technical memorandum series. The CP series ...r programs written at TDL primarily for the Automation of ... and Services (AFOS) computers.

The format for the series follows that given in the AFOS Handbook 5, Reference Handbook, Volume 6: Applications Programs, Part 1: Policy and Procedures, published by the Office of Technical Services/AFOS Operations Division.

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Computer Program NWS TDL

CP 83-1 Gross Sectional Analysis of Wind Speed and Richardson Number. Gilhousen, Kemper, and Vercelli, May 1983. (PB83205062)
CP 83-2 Simulation of Spilled Oil Behavior in Bays and Coastal Waters. Hess, October 1983. (PB84122597)
CP 83-3 AFOS-Era Forecast Verification. Heffernan, Newton, and Miller, October 1983. (PB84129303)
CP 83-4 AFOS Monitoring of Terminal Forecasts. Vercelli, December 1983. (PB84145697LL)
CP 83-5 Generalized Exponential Markov (GEM) Updating Procedure for AFOS. Herrmann, December 1983. (PB84154822LL)
CP 84-1 AFOS Display of MDR Data on Local Map Background. Newton, July 1984. (PB84220797)
CP 84-2 AFOS Surface Observation Decoding. Perrotti, September 1984. (PB85137586)
CP 84-3 AFOS-Era Forecast Verification. Miller, Heffernan, and Ruth, September 1984. (PB86148319LL)
CP 85-1 AFOS Monitoring of Terminal Forecasts. Vercelli and Norman, May 1985. (PB85236388LL)
CP 85-2 AFOS Terminal Forecast Decoding. Vercelli, Norman, and Heffernan, October 1985. (PB86147360LL)
CP 85-3 AFOS-Era Forecast Verification. Ruth, Miller, and Heffernan, October 1985. (PB86148319LL)
CP 87-1 AFOS Terminal Aerodrome Forecast Formatting. Wantz and Eggers, July 1987. (PB8810449LL)
CP 87-2 AFOS-Era Forecast Verification. Ruth and Alex, July 1987. (PB88125570LL)
CP 87-3 Forecast Review. Wolf, July 1987. (PB88125588LL)
CP 87-4 AFOS Monitoring of MDR Data Using Flash Flood Guidance. Norman and Newton, October 1987. (PB88137450LL)
CP 87-5 AFOS Terminal Forecast Quality Control. Vercelli and Leaphart, December 1987. (PB88169925LL)
CP 88-1 AFOS Terminal Forecast Decoding. Vercelli and Leaphart, August 1988. (PB89101240LL)
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CP 89-2 String Search. Adams, March 1989. (PB89195986AS)
CP 89-3 Extended Memory Library for AFOS Applications. Leaphart, June 1989. (PB92216290)

(Continued on inside back cover)

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NOAA WEATHER RADIO CLIMATOLOGICAL DATA REPORTS

James E. Calkins[1] and Gary F. Battel[1]

1. INTRODUCTION

As part of its modernization program, the National Weather Service (NWS) is planning to replace the aging consoles which control the broadcast sequence of the National Oceanic and Atmospheric Administration (NOAA) Weather Radio (NWR). To achieve this goal, the current manually-intensive console systems will be replaced with modern, computerized Console Replacement Systems (CRS). The new consoles will be capable of accepting hydrometeorological text products and converting these text products into speech. These systems will ultimately be interfaced with the Advanced Weather Interactive Processing Systems (AWIPS), which will allow the forecaster to control and provide products to the CRS.

It is anticipated that the first of the new systems will be fielded before AWIPS. To take advantage of this situation, the NWS will interface the systems with the Automation of Field Operations and Services (AFOS) system. Furthermore, the NWS will generate text products, store them in the AFOS database, transmit them to the CRS, and have the CRS convert them into speech for broadcast. This will give the NWS experience with this process in preparation for AWIPS, and it will assist local offices in carrying out their missions during the transition to AWIPS.

The Office of Meteorology (OM) selected the Climatological Data Reports (CDR) to be among the first products for automatic NWR preparation. These consist of daily (both morning and evening) and monthly summaries. Towards this end, the Techniques Development Laboratory (TDL) has developed this software application to generate the CDR products. This document provides a description of the software and associated files, the set-up procedures, methods for tailoring the system, and a description of the product.

2. SOFTWARE STRUCTURE

The following section describes the data flow, the individual subprograms, and the instructions for executing the software. Both daily and monthly CDR's consist of two sections. The first section contains standard climate information such as temperatures and precipitation, and the optional second section contains any non-standard elements, such as river heights or tidal information.

The first section is formatted by AFOS applications on a Data General (DG) S/230 minicomputer. The user selects the weather elements to appear in this portion of the report, and the software generates the report. The second section is optionally formatted by the user on an IBM-compatible personal computer (PC), spell checked, and quality controlled by a PC application. The two sections of the report are merged, stored in the database, and ultimately sent to the new console.

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[1] General Sciences Corporation, under contract to the Techniques Development Laboratory, Office of Systems Development, National Weather Service.

A. Data Flow

The generation of a daily report is a multi-step process, involving both AFOS and optionally the PC. The data flow for this application is depicted in Figs. 1a and 1b.

On the AFOS side, the macro CLIMO1.MC is executed to run program CREMAC which creates the command line for the Surface Aviation Observation (SAO) Decoder, SAODECII (Beasley 1993). CREMAC also places instructions to run both SAODECII and the program FILLDAT into a macro called SAOMAC.MC, and if requested by the user via command line switches, repeats the process for multiple stations. When SAOMAC is executed, SAODECII is run and the decoded observations are placed into the data file SAODATASUP. Next, FILLDAT is run, which reads SAODATASUP, retrieves the required hourly SAO information, and stores the data in the CLIDAY.nn files, where 'nn' ranges from '01' to '04', and each 'nn' represents a different user-selected station. FILLDAT also stores the daily maximum and minimum temperatures, total precipitation, total snowfall, and snow depth data into an intermediate AFOS product (cccCHKCLn, where 'n' ranges from '1' to '4') for each station for user verification. A message on the Alphanumeric Display Module (ADM) or Dasher terminal informs the user to examine, and if necessary, edit the data, so that the processing can continue. CLIMO2.MC executes CLISUM for each station, which reads each AFOS product, updates the monthly weather elements in files cccCLSAVn, and produces the daily Climatological Data Report text product for the NWR. Also, optionally, a climatological report, suitable for the NOAA Weather Wire Service (NWWS), is produced. Both products are displayable on the ADM.

In addition to the standard information included in a climate report (see Figs. 2a and 2b for examples of the standard portion of the daily CDR's), the user may add free-formatted text by transferring each AFOS product to a PC, and creating or editing a text file (USRTXT) on the PC to be appended to each AFOS product. This file must be spell-checked by a word processor, quality checked and merged with the AFOS product by the PC program CRSTRANS, and transmitted to AFOS. The file is then stored into the database and, in the future, transmitted to the NWR console.

In order to produce a monthly report, CLISUM is executed on AFOS. Upon execution, the standard section of the text product is generated (see Fig. 2c). The user may add free-formatted text on the PC, as discussed in the preceding paragraph. Each final product is transmitted and stored in the AFOS database, and in the future, will be transmitted to the NWR console, or the products can be printed and read over the NWR.

Applications can be run from either an ADM or a Dasher by typing an execution statement via a command line. Command line switches can be set to select some options.

B. Software Description

The definitions of the important files and programs are presented below. Figs. 1a and 1b depict the relationships between each software file and program.

Preformat cccMCPCDR

This climatological reports application requires that the user choose most of the options, such as weather elements, and some CRS instructions from preformat screen cccMCPCDR for the morning, evening, and monthly reports (Figs. 3a, 3b, and 3c, respectively), where 'ccc' represents the local AFOS node identifier of the product to be produced (e.g., IND for Indianapolis). As a result of editing this preformat, the resulting database product (cccCDRxxx) defines the output to be created by the CDR program. The 'xxx' represents the local AFOS station identifier of the product to be produced (e.g., EVV for Evansville).

Program SAODECII

The SAODECII program decodes hourly weather data from many sources of observations, which are stored in the AFOS database. SAODECII uses the input station decoding list CCCLIST.xx and switches in a command line to create the output file SAODATASUP containing hourly weather data.

Files CCCLIST.xx

The CCCLIST.xx files each contain one user-selected station to be decoded by program SAODECII, where the 'xx' represents any 2-character identifier selected by the user. The 'xx' selected is later identified to program CREMAC by a command line switch as the file on which to operate. Each file should consist of only two lines, the first containing the 9-character product name for the user-selected SAO (e.g., WBCSAOIAD for Dulles Airport), and the second containing the string '999999999'.

File SAODATASUP

SAODECII, using the input station from CCCLIST.xx, decodes the surface airways messages and creates the file SAODATASUP, containing hourly weather data and supplemental information derived from SAO's. The FILLDAT program uses information from SAODATASUP, such as the hourly temperatures, 12- and 24-h maximum and minimum temperatures, 3-h snowfall totals, 3- and 6-h precipitation totals, and hourly precipitation totals from Automated Surface Observation System (ASOS) stations.

Program MKSTATS1

The MKSTATS1 program, part of the climate program F6 (Schwein 1985) software, is used to help create the data files STATS.nn, which contain the normals and records for the climate site. If the STATS.nn files already exist at your office, MKSTATS1 will not be needed until the climatological normals are recomputed (once every 10 years). Since the CLISUM program (discussed below) will update the STATS.nn files whenever a new record is established, MKSTATS1 will not be needed, unless CLISUM is not executed on the day of a new record.

Files STATS.nn

Each STATS.nn file, containing normals and records for the climate site, is built from 13 other files, is created by the climate program F6 software (Schwein 1985), or else is supplied on diskette with this CP. These 13 files contain, on a daily basis, normal temperatures (NORM), normal heating degree days (HDD), normal cooling degree days (CDD), normal precipitation totals (PCPN), normal minutes of sun (SUN) (not used with this software package), sunrise times (SUNRISE) in Local Standard Time (LST), sunset times (SUNSET) (LST), maximum temperature records (RECHIGH), minimum temperature records (RECLOW), the years of the maximum temperature records (MAXYR), the years of the minimum temperature records (MINYR), normal maximum temperatures (NMAX), and normal minimum temperatures (NMIN).

Files CLIMAT.nn

Also used with program F6 software, each CLIMAT.nn (known as CLIMAT.ID by program F6) contains, on a monthly basis, normal temperatures, normal heating degree days, and normal cooling degree days.

Program EDSNOW

The EDSNOW program is used to create the snow climatology data files (SNOWSTATS.nn), or if SNOWSTATS.nn exists, to edit the data.

Files SNOWSTATS.nn

The SNOWSTATS.nn files are created to supplement the STATS.nn and CLIMAT.nn files. Each file contains normal snowfall totals on both a daily and a monthly basis. These files must be created by using program EDSNOW.

Program CREMAC

The CREMAC program creates a macro (SAOMAC.MC) containing the command line (including switches) needed to link and unlink to the appropriate files, and to run SAODECII to create the SAODATASUP file containing observations from the time CREMAC was last run to the present time. Instructions to run the program FILLDAT follow this command line. This macro must be run prior to editing the AFOS database file cccCHKCLn and the execution of CLISUM. If no new observations have been stored since the last run of CREMAC, an error message indicating this condition is placed in SAOMAC.MC, and SAODECII and FILLDAT are not executed.

Program FILLDAT

The FILLDAT program reads the file SAODATASUP (created by SAODECII), and retrieves the maximum and minimum temperatures, the daily precipitation, the snowfall totals, and the 1200 UTC snow depth. The program then updates the data file CLIDAY.nn, and creates the AFOS database file cccCHKCLn, which must be verified or edited before the remaining processes can be completed. FILLDAT is run by the macro SAOMAC.MC for each station.

Product cccCHKCLn

The cccCHKCLn product (see Fig. 4) contains the daily maximum and minimum temperatures, total precipitation, total snowfall, and snow depth calculated by the program FILLDAT. The 'ccc' represents the local AFOS node identifier, and the 'n' is a number from '1' to '4', assigned by the program to each station in order of execution. The forecaster needs to verify this product, and edit it if the data are incorrect, before processing can continue.

Program CLISUM

The program CLISUM is intended to be run twice a day, once in the early morning hours after midnight LST, and once during the late afternoon. If CLISUM is run between midnight and 1 p.m. LST, a morning report is produced. If CLISUM is run between 1 p.m. and midnight LST, an evening report is produced. After each morning report, the data from the previous day is stored in cccCLSAVn to be used later for the monthly report.

CLISUM processes and updates the monthly and annual data (cccCLSAVn), and normals and records (STATS.nn, SNOWSTATS.nn, CLIMAT.nn), and creates a daily morning, daily evening, or monthly climatological summary for the stations in CDRLIST.nn. The first process in CLISUM is the initialization process, which includes reading the data files, reading the command line and processing any switches, reading the preformat product, and determining which report is to be produced. After this has been accomplished, an opening phrase is developed in the format found in CDRLIST.nn. A climatological summary corresponding to the report type is then produced, by calculating the weather parameters, updating the CLIDAY.nn file, and then building a text product from these values. When the morning report is run, the program may then optionally produce a report suitable for NWWS, which is stored into the AFOS database as cccWRKsss, where 'ccc' represents the local AFOS node identifier, and 'sss' represents the local AFOS station identifier for which the report was prepared. Finally, the data files are updated, and the text product (cccCLINWn) is stored into the AFOS database, where 'ccc' represents the local AFOS node identifier, and 'n' represents a number from '1' to '4' assigned by the program for each station executed. Because the data files are updated, it is important to execute the software for the morning report each day. If this report is not generated, the cccCLSAVn products will be in error, and must be corrected by editing this AFOS product.

Files CDRLIST.nn

The daily morning (CDRLIST.00), the daily evening (CDRLIST.01), and the monthly (CDRLIST.02) input files contain a list of stations for which to generate reports. Opening phrase formats are also included in these files. Examples of these files are seen in Figs. 5a, 5b, and 5c.

Files CLIDAY.nn

The CLIDAY.nn files are created when CREMAC is run for the first time, and are updated each time FILLDAT is executed. 'nn' ranges from '01' to '04', and represents different user-selected stations. Each CLIDAY.nn file contains maximum and minimum temperatures, precipitation and snowfall totals, and hourly temperatures. Three days of data are stored for more accurate greatest 24-h precipitation and snowfall calculations.

Product cccCLSAVn

The cccCLSAVn products, where 'ccc' represents the local AFOS node identifier and 'n' ranges from '1' to '4' representing separate user-selected stations, contain the observed month-to-date, season-to-date, and year-to-date totals. This product must be edited initially to contain the up-to-date observed values, and is then subsequently updated by CLISUM when it is run each morning. If erroneous data appear in this product, they must be corrected via the ADM.

Macro CLIMO1.MC

The CLIMO1.MC macro (Fig. 6a) simplifies the execution of the CDR software. CLIMO1.MC will execute both CREMAC and SAOMAC.MC (Fig. 6b), which in turn runs SAODECII and FILLDAT.

Macro CLIMO2.MC

The CLIMO2.MC macro (Fig. 6c) executes CLISUM once for each station requested by the user. CLISUM links and unlinks the correct data files for each station.

Program CRSTRANS

The PC program CRSTRANS is executed after the forecaster has optionally transmitted the AFOS database files to the PC, and created and spell-checked the free-formatted text files. CRSTRANS converts numerical values into text, and reads two user input files. The first file (CONVERT) contains a list of words or abbreviations and their substitutions (e.g., "West Virginia" can be substituted for "WV"). The second file (REJECT) contains a list of words or abbreviations to be rejected, such as "MT", which might represent "mountain", "mount", or "MONTANA", which forces the program to prompt the user for a substitution. Finally, CRSTRANS merges the two sections of the report into a final product to be transmitted and stored into the AFOS database and ultimately processed by the future CRS.

Files CONVERT and REJECT

The CONVERT file contains a list of entries and their substitutions, which are read by the program CRSTRANS. For example, the user may list "N" and "NORTH", which enables the program to substitute "NORTH" each time it encounters the entry "N". The REJECT file contains a list of entries which force the program CRSTRANS to prompt the user for a substitution. The user may accept the original entry or substitute a new one. The purpose of this file is to ensure that words with ambiguous pronunciations or ambiguous abbreviations in the free-formatted text file are not inappropriately broadcast by the CRS. For example, the user might list "OR". When the program encounters an "OR" entry, it will flag the word and wait for the user to accept the word or substitute an alternate word, such as "OREGON".

Similarly, the new console will be programmed to always pronounce "WIND" in this manner: "THE WIND IS FROM THE NORTH". Therefore, the new console will not pronounce "WIND" in the intended manner in this sentence: "THE STORM WILL WIND ITS WAY TOWARDS THE NORTHEAST". To prevent such an occurrence, the REJECT file can be edited to include "WIND".

3. SET UP PROCEDURES

These set-up instructions are designed to guide the user through the initial orientation period. After becoming familiar with the software, the user should refer to Section 4 (Tailoring the System).

A. Adding Product Identifiers to the AFOS Data Key File

Before products can be stored in the database, the data key files which point to the locations of the products in the database must be edited to allow the product storage to occur. There are two methods to accomplish this task:

- Run the programs PILEDIT and EDITMERGE to update the database permanently, or
- Use the AFOS command "WISH:ADD".

In either case, the incoming SAO's for the stations of interest must be stored in the database before the SAO decoder is executed. Since the stations for which you are producing a Climatological Report are probably larger cities near your office, it is likely that you are already storing enough versions for that station. However, it is recommended that you store at least 72 versions of that station's SAO's, to ensure that 24 hours of observations will be decoded.

The products that CLISUM creates must also be added to the database. These products are in the form "cccCLINWn", "cccCLMNWn", and "cccWRKsss", where 'ccc' is the local AFOS node identifier, 'n' represents a number from '1' to '4' corresponding to a station in the CDRLIST.nn file, and 'sss' represents the station ID for which the report was prepared. "cccWRKsss" only needs to be added if you want to produce the weather wire report.

In addition, the preformat products (cccMCPCDR and cccCDRxxx), the intermediate products (cccCHKCLn and cccMCPCHK), and the monthly/annual data products (cccMCPCLS and cccCLSAVn) must also be added, where 'ccc' is the local AFOS node identifier, 'xxx' is the local station identifier, and 'n' represents a number from '1' to '4', corresponding to a station in the CDRLIST.nn file. Finally, the "Fields Only" flag must be set to "1" for cccMCPCDR, cccMCPCHK, and cccMCPCLS.

B. Downloading Software into the User Directory on the S/230

The software on the RDOS starter diskettes must be downloaded into the appropriate directories, with links established from the main directory (e.g., SYSZ) to the user directories. The diskettes contain four dump files (i.e., files created by the RDOS "DUMP" command, each of which contains one or more files), and three additional files and three preformats which belong in the database.

The CDR1 and CDR2 dump files contain most of the required climate software. Using the RDOS "LOAD" command with the '/R' and '/V' switches, load the required files from CDR1 into your user directory. The '/R' switch will replace any previous version of these files, and the '/V' switch will verify that the loading process has successfully completed. The CDR2 dump file should be loaded only if you have never run this software in the past. Otherwise, by loading CDR2, you may overwrite some of your data files.

The CDR3 dump file contains the latest version of the SAODECII program and related files SAODATASUP and CCCLIST.CR. If you do not wish to destroy your current SAODATASUP file, we suggest that you save this file by renaming it, and after the climate software has finished executing, renaming it back, being careful not to destroy the new SAODATASUP file. The CLIMO1.MC macro can be altered to do the renaming before and after the climate software is executed.

The CDR4 dump file contains software related to the F6 climate program. If you have been running this software or have up-to-date versions of the associated data files STATS and CLIMAT.ID, then CDR4 does not need to be loaded. If you have not been running F6, or if your data files contain anything other than 1961-1990 normals and up-to-date temperature records, then you must load CDR4.

In addition, there are several AFOS products that need to be stored in the database. Store and rename TDLMCPCDR to cccMCPCDR, TDLCDRTDL cccCDRxxx, TDLMCPCLS to cccMCPCLS, and TDLCLSAV1 to cccCLSAV1, where 'ccc' stands for your local AFOS node identifier and 'xxx' stands for your local site identifier. If you already store these products, please purge them and store the new versions, since they contain a few enhancements. If you have never run the software before, you should also store and rename TDLMCPCHK to cccMCPCHK, and TDLCHKCL1 to cccCHKCL1. If you wish to create a weather wire climate report, you must also store and rename TDLWRKTDL to cccWRKsss, where 'sss' represents the station ID of the station for which the report will be prepared.

The dump file containing SAODECII.SV and SAODECII.OL should be loaded if your current version of the SAO decoder is earlier than version 7.30.

From the master directory, the following files must be linked to the appropriate directory, unless they reside in the master directory: CLISUM.SV, CLISUM.OL, FILLDAT.SV, FILLDAT.OL, MKSTATS1.SV, CREMAC.SV, EDSNOW.SV, SAODECII.SV, SAODECII.OL, CLIDAY.nn, SNOWSTATS.nn, CLIMAT.nn, STATS.nn, CLIMO1.MC, CLIMO2.MC, SAOMAC.MC, CDRLIST.00, CDRLIST.01, CDRLIST.02, CCCLIST.xx, SAODATASUP, NORMS, HDD, CDD, PCPN, SUN, SUNRISE, SUNSET, RECHIGH, RECLOW, MAXYR, MINYR, NMAX, and NMIN.

C. Downloading Software into the User Directory on the PC

The software on the PC starter diskette must be downloaded into the appropriate user directory. The diskette contains seven files which must be loaded: CRSTRANS.EXE, CONVERT, REJECT, USRTXT, OUTTEXT, CGA.BGI, and EGAVGA.BGI.

D. Executing the Software

The starter system software provided on diskettes for use with the DG system contains files in which options have already been pre-selected. The files enclosed with the software have been edited for National Airport in Washington, DC, and you may want to practice with these files before tailoring the system to your needs. Of course, the software will attempt to decode 72 hours of National Airport observations. If you are not storing at least 24 hours of DCA observations, this practice session will run to completion, but your output text may be filled with phrases indicating missing values. If this is a problem, skip to Section 4 to tailor the system to your needs.

Your next step is to run the macro CLIMO1. This, in turn, executes the program CREMAC that creates the macro SAOMAC.MC. SAOMAC contains instructions to link to the appropriate data files and to run the SAO decoder to create SAODATASUP, which contains up to 3 days (or 72 versions) of observations for each report site. The SAOMAC macro also contains instructions to run FILLDAT, which uses the information in SAODATASUP to calculate the daily maximum and minimum temperatures, total precipitation, snowfall, and 1200 UTC snow depth. FILLDAT stores this information into AFOS database file cccCHKCLn, where 'ccc' represents the local AFOS node identifier, and 'n' represents a station number ('1', in this example) assigned by the software. The appropriate CLIDAY.nn file is updated as well. If more than one station had been specified with a switch in the command line which executes CREMAC, the resultant SAOMAC macro would have included entries for each station.

Now display the cccCHKCL1 file, using the AFOS command 'd:cccCHKCL1', verifying the accuracy of the information, and changing any incorrectly calculated values by typing "e:cccCHKCL1". After verifying the data, execute CLIMO2, which runs the program CLISUM to develop a morning or evening report, depending on the time of day.

Transmit the resultant output file to the PC ("ACOMMS:XMIT m cccCLINWn", where 'm' represents the transmission line number, 'ccc' represents the local AFOS node, and 'n' represents the station number), either manually or automatically. On the PC, create the non-standard free-formatted section of the report by creating a text file, and verify the spelling for accuracy using WordPerfect or some other editing and spell-checking package. Then, quality check the file by executing program CRSTRANS. CRSTRANS contains an option to merge this file with the standard portion of the climate report. Finally, transfer the report to the AFOS database.

4. TAILORING THE SYSTEM

This section is designed for users who have become familiar with CDR software and are ready to tailor the system to meet their specific requirements.

A. Establish Initial Records and Normals

Veteran users who have already established their CLIMAT and STATS files should skip to Section 4.B (Select Preformat Options). The starter diskettes contain CLIMAT and STATS files for many of the stations throughout the United States, generated from data received from the National Climatic Data Center (NCDC), possibly including the stations of interest to your office. However, if the starter diskettes do not contain the appropriate CLIMAT and STATS files, you must edit the 13 files (NORM, HDD, CDD, PCPN, SUN, SUNRISE, SUNSET, RECHIGH, RECLOW, MAXYR, MINYR, NMAX, and NMIN), also contained on diskette, with daily information and create new CLIMAT and STATS files by executing the program MKSTATS1. Instructions for creating these files are found in NWS CRCP-14 (Schwein 1985) and its update (Schwein 1986). The climatological input data used to establish many of these files can be obtained from NCDC (1993).

Since NCDC does not have data for record high and low temperatures and their corresponding dates, the CLIMAT and STATS files are not complete. Therefore, this information must be generated by using the MKSTATS1 program. The CLIMAT file contains monthly normal temperatures and monthly heating and cooling degree days. The input to this file is entirely interactive. The STATS file is built from the 13 daily files, which we have supplied on the starter diskette. Each of the 13 files needs to be edited to contain daily normal and extreme values for each day of the year for your station.

If you already have valid CLIMAT.ID and STATS files for your station, do not alter them, because they can be used by CLISUM without change. However, create links from the master directory to these files: "LINK CLIMAT.01 userdirectory:CLIMAT.ID", and "LINK STATS.01 userdirectory:STATS.01". If you currently have CLIMAT.ID and STATS for more than one station, create links from the master directory to these files. Link the '01' files to your first station, the '02' files to your second station, and the '03' and '04' files to the third and fourth stations, respectively. It is very important that you remember the association of the station number with each station, because other CDR software applications require this same association.

To create (or update) the SNOWSTATS.nn data files, the program EDSNOW must be executed. Each SNOWSTATS.nn contains 366 values (including February 29) for normal daily snowfall, followed by 12 values for normal monthly snowfall. The daily snowfall totals are not needed at this time and do not need to be altered. When SNOWSTATS.nn is created, all totals are initialized to "0", so any monthly normal that is "0" does not need to be edited. The program prompts the user for the 'nn' extension of the file to be edited. If the file does not exist, it is created, and is then ready to be edited. If you are generating reports for only one station, from the master directory, link SNOWSTATS.01 to your user directory, by typing: "LINK SNOWSTATS.01 userdirectory:SNOWSTATS.01". If you generate reports for more than one station, link SNOWSTATS.02 to SNOWSTATS.02 in your user directory, ensuring that your station numbers are the same as for the STATS.nn files. Use the same convention for files '03' and '04' if needed.

To execute EDSNOW, simply type "EDSNOW" at the Dasher terminal. At the first prompt, type "1" to edit SNOWSTATS.01 and type "1" at the next prompt to change monthly normals, followed by a "0" at the next prompt to change all months. Enter normals for each month in tenths of inches (e.g. "0.5 inches" should be entered as "5"). Repeat for all 12 months, if normals are greater than zero. Trace values should be entered as "-2". When complete, enter "0" at the "More Changes" prompt to exit EDSNOW. If you wish to edit/create SNOWSTATS.02 repeat the process, entering "2" at the first prompt.

Individual monthly normals may be changed in a similar fashion. However, keep in mind that the normals are in tenths.

B. Select Preformat Options

Three preformats must be edited in order to run this application: cccMCPCDR, cccMCPCHK, and cccMCPCLS, with their respective database products cccCDRxxx, cccCHKCLn, and cccCLSAVn.

The cccMCPCDR preformat is divided into three distinct sections: Daily MORNING report options, daily EVENING report options, and MONTHLY report options. Type "e:cccCDRxxx" to edit this preformat product.

At the beginning of each section there are seven fields: Periodicity, effective times, expiration times, and four listening area fields. These will be used when the new console is operational and should be left blank for now.

The first two AFOS pages contain the morning report options consisting of two parts, Yesterday's Data and Today's Data. The third page is the evening report options, and the final page contains the monthly report options.

The broadcast elements for the morning, evening, and monthly reports are not reported by default. By placing an 'X' in the appropriate field, the element will be broadcast. Any character other than an 'X' will result in the element not being included in the output.

For heating degree days, cooling degree days, and snowfall, there are additional fields which control the broadcast content. These fields are labeled "DATE TO START" and "DATE TO END". These fields should contain the date (MMDD) of the first and last day of the year to broadcast the respective groups. If the current date does not fall between these two dates, no elements of that group are included in the report, even if they contain an 'X'. Leaving these additional fields blank will result in their being broadcast all year. When changing these values, keep in mind that the heating degree day season and the snowfall season begin on July 1, and the cooling degree day season begins on January 1.

Note that in the EVENING SECTION, there are no fields for degree day related elements. This is due to the fact that the day's maximum and minimum temperatures may not yet have been reached and thus the degree days can not be calculated.

Also note that in the MONTHLY SECTION, the last field is "RECORD MAX/MIN DAYS". By selecting this option, the monthly report will contain any new (or tied) temperature records, along with the day it occurred, the old record, and the old record year.

The cccMCPCHK preformat is used to edit an intermediate product, cccCHKCLn. This product contains the observed high/low temperatures, precipitation and snowfall amounts, and 12Z snow depth for the climate report. This product must contain some values the first time the program is run, but it is not important what these values are. Type "e:cccCHKCLn" to edit the product and fill all the fields with zeros if they are blank. When running the program in the future, type "d:cccCHKCLn" to display this product, and if any values are in error, edit the product to correct them. Note that the precipitation total must be entered in hundredths with no decimal point (e.g. 1.32 inches should be entered as 132), and the snowfall total and snow depth must be in tenths with no decimal point. Trace values are entered as "-2".

The cccMCPCLS preformat is used to save the monthly and annual observed data for each station. Type "e:cccCLSAVn" to edit the product containing these data. There are three AFOS pages, MONTH 1 data on the first (usually contains data for the current month), MONTH 2 data on the second (contains data at the start of the new month only until the monthly report for the old month is produced), and additional instructions on the third page. Edit the first field on page 1 to contain the three letter station ID for the corresponding data (e.g. "LIT" for Little Rock). Edit the next two groups of fields to contain the daily high and low temperatures for the month. Any missing days, or future days must contain the missing value ("-99"). Edit the next line to contain month-to-date totals for precipitation, snowfall, heating degree days, and cooling degree days. Precipitation must be entered in hundredths of inches with no decimal point, and snowfall in tenths of inches with no decimal point.

The next two lines contain season-to-date and year-to-date values and must be entered in a similar fashion.

The next line is the "MAXIMUM 12Z SNOWDEPTH" field (in tenths of inches, no decimal point) and the day(s) on which it occurred. If the event occurred only once during the month, the "EVENT 1" field must contain the date of the event, and "EVENT 2" must contain "-99". If the maximum 12Z snowdepth occurred twice, place the first date in "EVENT 1" and the second date in "EVENT 2". If the event occurred more than twice, "EVENT 1" must contain the flag for a tie ("999"), and "EVENT 2" must contain the date of the most recent occurrence.

The next line is the "MAXIMUM 24 HOUR PRECIPITATION" amount field (in hundredths of inches, no decimal point) and the days on which it occurred. The format is similar to the "12Z SNOWDEPTH" field except that since one event may span two calendar days, each event is stored as two dates. If all the precipitation occurred during one calendar day, edit the second field in the event to contain "-99". For example, if the maximum 24-hour precipitation total of 1.06 inches of rain occurred only once from 8 a.m. to 2 p.m. (local time) on the third day of the month, fill in the amount field with "106". Place "3" and "-99" in the "EVENT 1" fields, and "-99" and "-99" in the "EVENT 2" fields. However, if the maximum 24-h precipitation of 1.06 inches occurred twice, the first time on the third day, and again from 8 p.m. on the 10th to 2 a.m. on the 11th, the amount field and "EVENT 1" fields are entered as described above. The "EVENT 2" fields must contain "10" and "11". If there were three or more occurrences in the month, store the most recent occurrence in the "EVENT 2" fields, and "999" "-99" in the "EVENT 1" fields. Store the MAXIMUM 24 HOUR SNOWFALL in the same fashion.

The "MONTH 2" data on page two of the preformat will usually contain initialized values ("0" or "-99"), but is used to store data during the time period from the end of a month until the monthly report is produced. For example, if the end of August is reached, new data are stored in the "MONTH 2" section until a monthly report is run, after which "MONTH 2" data are automatically stored in the "MONTH 1" section and "MONTH 2" is initialized.

NOTE: In order to preserve the month-to-date, year-to-date, and season-to-date values for the monthly report, any monthly precipitation, snowfall, or degree days entered in MONTH 2 should NOT be added to the year-to-date or season-to-date totals. The software will automatically add them.

C. Create CCCLIST.xx for SAODECII

Each CCCLIST.xx file contains a station for the program SAODECII to decode. Simply list the station identifier in the format cccSAOxxx, where 'ccc' represents the station's local node identifier, and the 'xxx' represents the local AFOS station identifier. Enter "999999999" on the second line to identify the end of file. This file may be edited at the Dasher terminal by using the RDOS editor or at the ADM using "e:f/filename".

D. Select Opening Phrases

In addition to selecting the preformat options, one must create three CDRLIST's (Figs. 5a, 5b, 5c): CDRLIST.00 for the morning report, CDRLIST.01 for the evening report, and CDRLIST.02 for the monthly report. The evening and monthly CDRLIST's are the same format: Comment line(s), then the station line(s). The morning CDRLIST contains comment line(s) for yesterday's data, the station line(s), followed by comment line(s) for today's data.

The comment line(s), should begin with an ellipsis (...), and any text following the ellipsis will be inserted in the output text prior to the climatological summary. The station line(s) consist of the stations for which to generate reports (cccSAOxxx), followed by a blank space and the station name. If the comment line(s) contain any of the following meta-characters, the appropriate text substitution is made:

1) %CITY is converted to the location of the climatological report. The location is read from the station line (e.g., NATIONAL AIRPORT).
2) %DAY is converted to the day of the week (e.g., FRIDAY).
3) %MONTH is converted to the month (e.g., AUGUST)
4) %DATE is converted to the date (e.g., FOURTEENTH).
5) %YEAR is converted to the year (e.g., NINETEEN NINETY TWO).
6) %TIME is converted to the hour (e.g., FOUR P M)
7) %TIMEZ is converted to the hour and time zone (e.g., FOUR P M EASTERN STANDARD TIME). In addition, any times that are in the climatological summary (e.g., sunrise and sunset times) are also built with the time zone.
8) %Z is used to instruct the morning report to add the time zone (e.g., PACIFIC DAYLIGHT TIME) only to the sunrise and sunset times, without building the time zone in the opening phrase.

The above meta-characters may be used in any order.

For the morning report (CDRLIST.00), please note the following:

- Two opening phrases are recommended--one to preface yesterday's data, and one to preface today's data. The second phrase is in the same format as the first and immediately follows the station lines. (See Fig. 5a.)

- Yesterday's date is substituted for meta-characters in the first opening phrase, and today's date is substituted for the second opening phrase, as shown in Fig. 5a.

E. Edit CLIMO1.MC Macro

The CLIMO1.MC macro on the diskette which accompanies this manual contains instructions to create a CDR for Washington, DC. Therefore, it is necessary to edit this macro for your own stations. CLIMO1.MC contains two commands. The first line needs to be edited, so that it reads: 'CREMAC xx/F xx/F xx/F xx/F'. Each 'xx' corresponds to the 'xx' extension of a CCCLIST.xx file. The ordering is also important, since the first station listed is associated with STATS.01, SNOWSTATS.01, CLIDAY.01, and CLIMAT.01. The remaining stations, if any, are similarly ordered.

F. Create CLIMO2.MC Macro

The CLIMO2.MC macro on the starter diskette must be edited or recreated for your stations. The CLIMO2 macro consists of one CLISUM command for each reporting station. Switches associated with the CLISUM command are explained in the following section. Using the local '/S' switch, assign a new station number to each station (see Fig. 6c).

G. Select CLISUM Options Via Command Line Switches

The purpose of command line switches is to give the user the ability to select options which cannot be scheduled. Currently, the global '/I' and '/S' switches and the local '/E' and '/X' switches cannot be used until the new console is operational.

CLISUM reads these command line switches, which override the preformat and default values.

Global:
- /C - Produces a corrected report. Allows the user to rerun CLISUM without updating the data files again.
- /H - Formats the text portion of the report in a format designed for humans, rather than the new console.
- /I - Directs the new console not to transmit the message, but merely to save the message inactively until some future time (currently not used).
- /M - Instructs CLISUM to produce a monthly report rather than a daily report.
- /S - Directs the new console to save (and inactivate) the message after the expiration time (currently not used).
- /T - Forces standard time year-round.
- /W - Produces an NWWS-compatible climate summary along with the morning report.

Local:
- /A - Sends the output to this addressee.
- /E - Changes the effective time to the requested number of minutes after the nominal hour (currently not used).
- /S - Assigns a station number to the current station.

/X - Changes the expiration time to the requested time (UTC). If the switch time is more than one hour prior to the nominal hour, the expiration time is assumed to be the following day (currently not used).

The global '/C' switch is used to produce a correction of a previous climate report. Unlike a normal execution of CLISUM, the data files are not updated. If a data error is discovered after the report has been produced, simply correct the data files (cccCLSAVn or cccCHKCLn), and rerun CLISUM with the global'/C'.

The global '/H' switch must only be used in the pre-CRS era. It is designed to make the output more readable for forecasters. Each line contains a maximum of 72 characters. There is no hyphenation, numbers appear as values, rather than words, and the printout is double-spaced. This switch will not produce output for the new console.

The global '/M' switch can be used to instruct CLISUM to produce a monthly climatological report instead of a daily report.

The global '/S' and '/I' switches are meaningless without a new console. However, each is designed to place an indicator in the output product. The '/S' switch tells the new console not to delete the message after it expires, but rather to save the message in inactive storage. The '/I' switch tells the new console not to broadcast the incoming message, but merely to save the message in inactive storage. In the CRS era, both of these switches are expected to be rarely used, and so were not included in the preformat screen.

The global '/T' switch forces standard time year-round (no daylight time).

The global '/W' switch will instruct CLISUM to produce, along with the morning report, an additional report for the NWWS (Fig. 7).

The local '/A' switch can be used to send the output to the local CRS or another addressee, perhaps a backup office during a CRS failure. A current use for this switch is to asynchronously transmit the product to a local printer by using your local ID with this switch. In order to perform this, you must also correctly edit your AFOS asynchronous scheduler.

The local '/E' and '/X' switches change the effective time (i.e., the earliest allowable broadcast time) from the current time to some future time, and expiration time of the product from an hour after the nominal hour to the specified future time. This is a new console feature and will not be used until the CRS era.

The local '/S' switch is used to inform the CLISUM program to store the output into database product cccCLINWn, where 'n' corresponds to the argument associated with the '/S' switch. The default value (no switch) is 1.

H. Create CONVERT and REJECT Files

If you intend to transfer any of the products to the PC for further editing, create your own CONVERT file (see Fig. 8a) by entering pairs of words separated by a semicolon (e.g., TX;TEXAS). The first entry on each line is the word to be converted, and the second represents the word which will be substituted. Also, create the REJECT file (see Fig. 8b) of words to be rejected by listing each entry on a separate line. When one of these words is encountered, the user will be prompted for a substitution.

I. Execute CREMAC, SAODECII, and FILLDAT

After all data files are correct and updated, execute the macro CLIMO1.MC, which executes program CREMAC. CREMAC determines the length of time between the last execution time and the present, and creates instructions to run SAODECII for this time period. CREMAC will then create a macro, SAOMAC.MC, to run both the SAODECII and FILLDAT programs, and will link and unlink to the appropriate files for each station. CLIMO1 continues by executing the macro SAOMAC. It is important to note that the first time CREMAC is executed with a new CLIDAY.nn file, the program will prompt the user for a station identifier and time zone at the Dasher terminal.

J. Edit the cccCHKCLn File

Because the AFOS database does not always contain the information needed to generate a CDR, it is imperative that you verify, and if necessary edit, the values generated by the FILLDAT program before proceeding with the remaining steps, by typing the AFOS command "d:cccCHKCLn" on the ADM, where 'ccc' represents the local AFOS node identifier, and the 'n' is a number from '1' to '4', corresponding to the current station for which the report is being generated. If the data are not correct, type the AFOS command "e:cccCHKCLn" on the ADM to edit the data.

K. Execute CLIMO2.MC

The next step in the execution of the software system is running CLIMO2.MC, which executes CLISUM for each station.

L. Transfer Output to the PC

Upon completion of the CLISUM program, the output is stored in the AFOS database as "cccCLINWn". If you need to add a free-formatted section to the report, transfer the file to the PC. Otherwise, display the file on the ADM by typing "CLINWn".

M. Create Free-formatted Text

In some instances, the forecaster will want to add free-formatted non-standardized text to the report generated on AFOS. Therefore, the forecaster must create his file on the PC, using an editor of choice. The forecaster must also spell-check the file using a spell-checker of choice, and finally execute the PC program CRSTRANS, which will quality-control the file, replace numbers with words, perform some substitutions, and allow the forecaster to substitute other words. CRSTRANS allows the user to append this file to the 'cccCLINWn' file transferred from AFOS.

The creation, spell-checking, and quality control of the free-formatted text file is independent of the AFOS processes, and may be performed simultaneously. There is an option in CRSTRANS which allows the forecaster to specify when to merge the free-formatted text to the standard section of the report.

N. Transfer Output to AFOS

The final step in this software system consists of transferring the final product (cccCLINWn) to the AFOS database, and ultimately to the new console. If you produce the optional NWWS report and need to add additional text to it, you can simply type "e:cccWRKxxx" to edit the report and store it with the desired AFOS name.

5. DESCRIPTION OF THE PRODUCT

Figs. 2a, 2b, and 2c are samples of each report type of the CDR product. In the examples, a stream of non-text characters, representing instructions for the new console, precedes the text. The text normally begins with an introductory comment, which is controlled by the user creating the CDRLIST.nn file. Within the introductory comment are several phrases, such as "SEVEN A M EASTERN DAYLIGHT TIME", which the program substituted for the meta-characters placed by the user into the comment line. The elements from the preformat screen selected by the user are then displayed in text form, with all numerals converted to text in order for them to be recognized by the new console. If the product being produced is a daily morning report, a second opening comment may be inserted just prior to the "Climatological Data for Today" section to announce the new section (see line 6 of Fig. 5a). Finally, a non-text character, which indicates the end of message to the new console, is included. If a report is being prepared for more than one station, the process repeats. The optional NWWS report contains the basic information required for this type of report. It is produced in a format which may be edited to meet each station's requirements (see Fig. 7).

6. CAUTIONS

Some important points that should be considered while executing the Climatological Data Report software are given below. To facilitate the operation of this application, it is strongly suggested that these cautions be kept in mind.

1. The CLISUM program is only as accurate as the input data. Ensure that the normals and records in the data files (STATS, SNOWSTATS, CLIMAT) are correct.

2. Degree days are not simply a function of the mean temperature [see National Climatic Center (1993) for climatological normal degree days]. Therefore, it is possible to have both normal heating and cooling degree days for the same day. Ensure that the normal cooling and heating degree days entered in STATS are correct.

3. When the morning climatological report is run, each cccCLSAVn is updated with the month, season, and year-to-date totals. Thus, if the morning report is not run, these totals will be incorrect. If the evening report is run before the morning report, CLISUM will warn the user, and a report will be produced. However, the report will be in error, unless

the cccCLSAVn product had been updated prior to running the evening report.

If the evening report is incorrect, the user should edit the cccCLSAVn product, and then run CLIMO2. When editing cccCLSAVn, remember to change all parameters that have been affected. For example, if precipitation occurred yesterday, remember to change the month-to-date total as well as the year-to-date total. NOTE: If you are changing values in MONTH 2, do NOT change year-to-date or season-to-date totals.

4. If the user attempts to run the morning report twice in one day, CLISUM will terminate on the second attempt, in order to prevent yesterday's data from being added twice to the totals in cccCLSAVn.

5. The monthly report for the previous month must not be executed before running the daily report on the morning of the first of the new month. The daily report at the beginning of the new month completes the updating of the old month's data. If you ignore this rule, a monthly report with incomplete data will be produced, and all of the old month's data will be flagged for deletion. These flagged data will then be deleted when the daily report is executed.

6. To ensure the integrity of the cccCLSAVn files, it is suggested that you occasionally save them onto the RDOS disk, either manually or automatically, with the RDOS command "SAVE:cccCLSAVn userdirectory:cccCLSAVn". This will leave you with a recent backup in case of a database problem.

7. REFERENCES

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8. PROGRAM INFORMATION AND PROCEDURES FOR INSTALLATION AND EXECUTION

I. EDIT MONTHLY NORMAL SNOWFALL VALUES

PART A: PROGRAM INFORMATION AND INSTALLATION PROCEDURES

PROGRAM NAME: EDSNOW

AAL ID: DBC081
Revision No.: 02.01

PURPOSE: Create or update the data files SNOWSTATS.nn, which contains monthly normal snowfall data.

PROGRAM INFORMATION:

Development Programmer:	Maintenance Programmer:
James E. Calkins	James E. Calkins
Location: Techniques Development Laboratory	Location: Techniques Development Laboratory
Phone: 301-713-1768	Phone: 301-713-1768

Language: FORTRAN IV/Rev 5.57
Macro Assembler/Rev 6.30

Save file creation dates: EDSNOW.SV

Original release/Rev 02.00	-	December 1992
First revision/Rev 2.01	-	August 1993

Running time: Variable. Executed interactively.

Disk space:			
	Program files	-	23 RDOS blocks
	Data files	-	2 RDOS block

PROGRAM REQUIREMENTS

Program files:

NAME

EDSNOW.SV

Data files:

NAME	Disk location	READ/WRITE	COMMENTS
SNOWSTATS.nn	User directory	R/W	Contains daily and monthly normals of snowfall.

LOAD LINE

```
RLDR EDSNOW EDSNOWREV INITAR TROUBL OCHN BMOVE ^
  UTIL.LB TOP.LB FORT.LB
```

PROGRAM INSTALLATION

1. Move EDSNOW.SV and SNOWSTATS.nn to applications directory.
2. Create links in the Master Directory to EDSNOW.SV and SNOWSTATS.nn, respectively.

EDIT MONTHLY NORMAL SNOWFALL VALUES

PART B: PROGRAM EXECUTION AND ERROR CONDITIONS

PROGRAM NAME: EDSNOW

AAL ID: DBC081
Revision No.: 02.01

PROGRAM EXECUTION

1. To run EDSNOW interactively at the ADM, enter:

   RUN:EDSNOW

2. Choose station number (1 through 4), month, and monthly normal values to edit.

3. EDSNOW should be executed automatically, since the SNOWSTATS files need to be changed only when in error, or when new climatological normal values are calculated every ten years.

ERROR CONDITIONS

DASHER MESSAGES	MEANING
1. "GETTING CHANNEL - 'file'"	Couldn't obtain I/O channel to 'file.' Probable system or disk problem.
2. "OPENING 'file'"	Couldn't open 'file.' Program not linked to, or located in same directory as 'file.' Establish appropriate links.
3. "READING 'file'"	Trouble reading 'file.' Probable system or disk problem. If SNOWSTATS is a 0 byte file, delete it and rerun.
4. "WRITING 'file'"	Trouble saving 'file.' Probable system or disk problem.

II. CREATE DECODER MACRO

PART A: PROGRAM INFORMATION AND INSTALLATION PROCEDURE

PROGRAM NAME: CREMAC

AAL ID: DBC081
Revision No.: 02.10

PURPOSE: Creates a macro SAOMAC.MC to run programs SAODECII and FILLDAT with appropriate switches.

PROGRAM INFORMATION:

Development Programmer: James E. Calkins	Maintenance Programmer(s): James E. Calkins
Location: Techniques Development Laboratory	Location: Techniques Development Laboratory
Phone: 301-713-1768	Phone: 301-713-1768

Language: FORTRAN IV/Rev 5.57
Macro Assembler/Rev 6.30

Save file creation dates:	CREMAC.SV	
Original release/Rev 02.00	-	December 1992
First revision/Rev 2.10	-	October 1993

Running time: 5 seconds.

Disk space:		
Program file	-	25 RDOS blocks
Data files	-	3 RDOS blocks

PROGRAM REQUIREMENTS

Program files:
NAME

CREMAC.SV

Data files:

NAME	Disk location	READ/WRITE	COMMENTS
CLIDAY.nn	User directory	R/W	Contains data for last 3 days.
SAOMAC	User directory	W	Contains instructions to run SAODECII and update CLIDAY.nn.

LOAD LINE

```
RLDR CREMAC CREMACREV WMOV JULIAN INITAR OCHN TROUBL BMOVE BCONVRT ^
  UTIL.LB TOP.LB FORT.LB
```

PROGRAM INSTALLATION

1. Move CREMAC to the applications directory and create a link in the master directory to CREMAC.

2. If CLIDAY.nn files exist, move them to the applications directory and link them to the master directory. 'nn' ranges from '01' to '04', depending on the number of stations for which to generate reports. If they do not exist, CREMAC will create and initialize these files. However, links must exist to the applications directory for storage.

3. Create a link in the master directory to applications for SAOMAC.MC.

CREATE DECODER MACRO

PART B: PROGRAM EXECUTION AND ERROR CONDITIONS

PROGRAM NAME: CREMAC

AAL ID: DBC081
Revision No.: 02.10

PROGRAM EXECUTION

1. To run CREMAC at the ADM, enter:

   RUN:CREMAC xx/F xx/F xx/F xx/F

   Definition of switches:

   LOCAL

   xx/F = Extension of CCCLIST.xx file for the SAO decoder to use. You may specify up to 4 CCCLIST.xx files.

   Defaults (Switch not used):

   LOCAL

   /F = extension is "CR", 1 station only.

2. A maximum of 72 observations since the last update of CLIDAY.nn will be decoded.

3. CREMAC is manually executed as part of the CLIM01 macro.

ERROR CONDITIONS

DASHER MESSAGES	MEANING
1. "COMMAND LINE ERROR"	Problem with command line format for CREMAC. Rerun CREMAC.
2. "ERROR -- MORE THAN 4 STATIONS"	Too many '/F' switches specified. Edit CLIM01.MC to fix command line and rerun.
3. "GETTING CHANNEL - 'file'"	Couldn't obtain I/O channel to 'file.' Probable system or disk problem.
4. "OPENING 'file'"	Couldn't open 'file.' Program not linked to, or located in same directory as 'file.' Establish appropriate links.
5. "READING 'file'"	Trouble reading 'file.' Probable system or disk problem.

DASHER MESSAGES	MEANING
6. "WRITING 'file'"	Trouble saving newly created CLIDAY.nn. Probable system or disk problem.
7. "WRITING SAOMAC.MC"	Couldn't write SAOMAC.MC. Probable system or disk problem.

III. UPDATE DAILY CLIMATE FILES

PART A: PROGRAM INFORMATION AND INSTALLATION PROCEDURE

PROGRAM NAME: FILLDAT

AAL ID: DBC081
Revision No.: 02.10

FUNCTION: Updates the data files (CLIDAY.nn) for CLISUM using the observations generated by SAODECII (SAODATASUP) and calculates and stores the values for cccCHKCLn.

PROGRAM INFORMATION:

Development Programmer: James E. Calkins	Maintenance Programmer: James E. Calkins
Location: Techniques Development Laboratory	Location: Techniques Development Laboratory
Phone: 301-713-1768	Phone: 301-713-1768
Language: FORTRAN IV/Rev 5.57 Macro Assembler/Rev 6.30	Type: Overlay

Save file creation dates: FILLDAT.SV

Original release/Rev 02.00	-	December 1992
First revision/Rev 2.10	-	October 1993

Running time: 8 seconds.

Disk space: Program files	-	97 RDOS blocks
Data files	-	Variable, up to 14 RDOS blocks, plus 1 RDOS block per station.

PROGRAM REQUIREMENTS

Program files:
NAME

FILLDAT.SV
FILLDAT.OL

Data files:

NAME	Disk location	READ/WRITE	COMMENTS
CLIDAY.nn	User directory	R/W	Contains data for the last 3 days.
SAODATASUP	User directory	R	Contains hourly SAO's from the last run until the present.

AFOS Products:

ID	ACTION	COMMENTS
cccCHKCLn	Write	Holds the standard portion of the climatological report before the free-format text is added. The 'n' represents the station number, ranging from '1' to '4'.

LOAD LINE

```
RLDR FILLDAT FILLDATREV WMOV JULIAN INITAR OCHN TROUBL IPANDEC GETPF ^
APACK FPAT BCONVRT BMOVE CRFILE SEARCH ICEQAL SNOWCALC UTCTOLT ^
[TIME1ZONE TIME2ZONE EVTIMEZN] UTIL.LB TOP.LB FORT.LB
```

PROGRAM INSTALLATION

1. Move FILLDAT.SV and FILLDAT.OL to applications directory and create links in the master directory to applications directory for these files.

2. Create links in the master directory to applications directory for SAODATASUP, CLIDAY.nn and SAOMAC.MC.

3. Verify that SAODATASUP and CLIDAY.nn exist.

UPDATE DAILY CLIMATE FILES

PART B: PROGRAM EXECUTION AND ERROR CONDITIONS

PROGRAM NAME: FILLDAT

AAL ID: DBC081
Revision No.: 02.10

PROGRAM EXECUTION

1. To run FILLDAT at the ADM, enter:

   RUN:FILLDAT n/S

   Definition of switches:

   LOCAL

   n/S = Extension for CLIDAY.nn and cccCHKCLn

   Defaults (Switch not used):

   LOCAL

   /S = CLIDAY.nn and cccCHKCLn extensions are '1', 1 station only.

2. FILLDAT is normally executed by the SAOMAC macro, created by CREMAC.

ERROR CONDITIONS

DASHER MESSAGES	MEANING
1. "AFOS PROD TOO BIG"	Couldn't find End-of-Text character of AFOS product. Purge cccCDRxxx, and reedit (M:CDR). If problem persists, call maintenance programmer.
2. "CAN'T FIND AFOS PRODUCT"	The key from one or more of the preformats was not found in the database. Add the keys to the wish list.
3. "CAN'T FIND CRLF'S"	Couldn't find the several carriage returns and line feeds that separate the sections of the preformat. Either the preformat was stored incorrectly, or the program misread it. Purge cccCDRxxx, and reedit (M:CDR). If problem persists, call maintenance programmer.

DASHER MESSAGES	MEANING
4. "COMMAND LINE ERROR"	Problem with command line format for FILLDAT. Rerun FILLDAT.
5. "CREATING 'FILE'"	Trouble creating file to store in preformat. Probable system or disk problem.
6. "ERROR IN SAODATASUP -- BAD DATAFILE"	SAODATASUP file was not created correctly. Check Dasher output, and rerun CLIMO!.MC, if necessary.
7. "ERROR IN SAODATASUP -- NO OBS"	No observations in SAODATASUP. Check SAODECII command line and output.
8. "FILLDAT FSTORE ERROR"	Problem storing preformat into database. Probable system or disk problem.
9. "GETTING CHANNEL - 'file'"	Couldn't obtain I/O channel to 'file.' Probable system or disk problem.
10. "INCORRECT STATION IN SAODATASUP"	One or more of the stations found in SAODATASUP is not the same as the station in the CLIDAY.nn file. Check the switches used with SAODECII, FILLDAT, and CREMAC. Also check the links to these programs and their data files. If problem persists, call maintenance programmer.
11. "OPENING 'file'"	Couldn't open 'file.' Program not linked to or located in same directory as 'file.' Establish appropriate links.
12. "OPENING OVERLAY"	Overlay file is missing, not linked correctly, or changed. Check the link, and if necessary, reload from the starter diskette.
13. "READING 'file'"	Trouble reading 'file.' Probable system or disk problem.
14. "SAODATASUP NOT FOUND"	Trouble finding SAODATASUP. Check to make sure SAODECII

DASHER MESSAGES	MEANING
	was run and that SAODATASUP is linked to the right directory.
15. "TROUBLE READING BLOCK 0"	Couldn't read block zero of the AFOS product. Purge cccCDRxxx, and reedit (M:CDR). If problem persists, call maintenance programmer.
16. "WRITING 'file'"	Trouble saving 'file.' Probable system or disk problem.

IV. CREATE CLIMATOLOGICAL DATA REPORTS FOR THE NOAA WEATHER RADIO

PART A: PROGRAM INFORMATION AND INSTALLATION PROCEDURE

PROGRAM NAME: CLISUM

AAL ID: DBC081
Revision No.: 2.20

PURPOSE: Creates a daily morning, daily evening, or monthly climatological report, from data compiled from Surface Airways Observations (SAO) in a format compatible with the Console Replacement System of the NOAA Weather Radio, and optionally a NWWS report.

PROGRAM INFORMATION:

Development Programmer: James E. Calkins	Maintenance Programmer: James E. Calkins
Location: Techniques Development Laboratory	Location: Techniques Development Laboratory
Phone: 301-713-0056	Phone: 301-713-0056
Language: FORTRAN IV/Rev 5.57 Macro Assembler/Rev 6.30	Type: Overlay

Save file creation dates: CLISUM.SV

Original release/Rev 02.00	-	December 1992
First revision/Rev 02.10	-	April 1993
Second revision/Rev 02.20	-	October 1993

Running time: 20 seconds.

Disk space:	Program files	-	214 RDOS blocks
	Data files	-	Approx. 24 RDOS blocks per station.

PROGRAM REQUIREMENTS

Program files:

NAME
CLISUM.SV
CLISUM.OL

Data files:

NAME	Disk location	READ/WRITE	COMMENTS
CLIDAY.nn	User directory	R	Contains data for the last 3 days.
CLIMAT.nn	User directory	R	Contains monthly normals of degree days, and average monthly temperatures.

NAME	Disk location	READ/WRITE	COMMENTS
STATS.nn	User directory	R/W	Contains daily normals.
SNOWSTATS.nn	User directory	R	Contains daily and monthly snowfall normals.
CDRLIST.nn	User directory	R	Contains station list and comments for broadcast text.

AFOS Products:

ID	ACTION	COMMENTS
cccCDRxxx	Read	The preformat data. The 'ccc' is the local AFOS node.
cccCHKCLn	Read	The files which hold the standard portion of the climatological report before the free-format text is added. The 'n' represents a station number, ranging from '1' to '4'.
cccCLSAVn	Read/Stored	The files which hold the observed month-to-date, season-to-date, and year-to-date data for each reporting station.
cccCLINWn	Stored	The output products containing the morning or evening climatological report.
cccCLMNWn	Stored	The output products containing the monthly climatological report.
cccWRKsss	Stored	The optional output product containing the NWWS style report.

LOAD LINE

```
RLDR CLISUM CLISUMREV SLARG WMOV SEARCH OCHN TROUBL BMOVE BCONVRT ^
 CRFILE GETPF APACK FPAT IPANDEC ^
 [CLIINIT UTCTOLT ETIME PREFCHK PRESEAS JULIAN, ^
 MORNING EVENING GETMXMN, ^
 SAVINFO GREAT24, EV1PHR, EV2PHR, MON1PHR, MON2PHR, MONTHLY UPDMON ^
 CLIFIN, MRN1PHR, MRN2PHR, CREWWR OPNGPHR] ^
 [NUMBLD CCAT DAYOFWK YEARWORD WDATE ZONEPHR BLDPHR MONWORD, ^
 RDCLISAV, SNOWCALC G24DAYS] ICEQAL INITAR UTIL.LB TOP.LB FORT.LB
```

PROGRAM INSTALLATION

1. Move CLISUM.SV, CLISUM.OL, CLIDAY.nn, SNOWSTATS.nn, STATS.nn, and CLIMAT.nn to applications directory. Create a link in the master directory to CLISUM.SV, CLISUM.OL, CLIDAY.nn, SNOWSTATS.nn, STATS.nn, and CLIMAT.nn, respectively, where 'nn' ranges from '01' to '04', depending on the number of stations for which you generate reports.

2. Create links from master directory to applications for CDRLIST.00, CDRLIST.01, and CDRLIST.02.

3. Verify that the cccCDRxxx, cccMCPCDR, cccCHKCLn, cccMCPCHK, cccCLMNWn, cccCLINWn, cccMCPCLS, and cccCLSAVn keys are in the PIL.

CREATE CLIMATOLOGICAL DATA REPORTS FOR THE NOAA WEATHER RADIO

PART B: PROGRAM EXECUTION AND ERROR CONDITIONS

PROGRAM NAME: CLISUM

AAL ID: DBC081
Revision No.: 02.20

PROGRAM EXECUTION

1. If necessary, execute CREMAC and FILLDAT to update data files.
2. Edit preformat cccMCPCDR to choose options. Enter M:CDR at the ADM.
3. To run CLISUM at the ADM, enter:

```
RUN:CLISUM/C/H/I/M/S/T/W aaa/A eee/E n/S xxx/X
```

Definition of switches:

GLOBAL

/C = Instructs CLISUM to produce a corrected report. The data files will not be updated.
/H = Instructs CLISUM to produce the reports in a written format that is easier for humans to read. This will not produce output for the new console. Instead, it is used only when field testing the software.
/I = Directs the new console to save (and inactivate) the message after the expiration time.
/M = Creates a monthly, rather than daily climatological report.
/S = Directs the new console not to transmit the message, but merely to save the message inactively until some future time.
/T = Forces standard time (suppresses daylight time) year-round.
/W = Creates an additional NWWS-compatible report. Can only be used with the morning report.

LOCAL

aaa/A = Sends the output product to this addressee.
eee/E = Changes the effective time to the requested number of minutes after the nominal hour.
n/S = Specifies the station for which to generate a report. This switch may repeated for a maximum of four stations.
xxx/X = Changes the expiration time to the requested number of minutes after the nominal hour.

Defaults (Switch not used):

GLOBAL

/C = None.
/H = Produces output in broadcast-ready format for the new console.

/I = Directs the new console to broadcast the incoming message.
/M = Produces daily, rather than monthly, report.
/S = Directs the new console to delete the message after it expires.
/T = Switches between standard time and daylight time at the appropriate times of the year.
/W = None.

LOCAL

/A = Locally addressed (000).
/E = Effective time is set to the product's creation time.
/S = Station number is set to '1'.
/X = Expiration time is either 60 minutes after the effective time, or the time specified by the preformat selection.

4. Before running CLISUM for the first time, it is necessary to update cccCLSAVn. Month-to-date, season-to-date, and year-to-date totals must be set, as well as maximum and minimum temperatures already achieved earlier in the month.

ERROR CONDITIONS

DASHER MESSAGES	MEANING
1. "AFOS PROD TOO BIG"	Couldn't find End-of-Text character of AFOS product. Purge cccCDRxxx, and reedit (M:CDR). If problem persists, call maintenance programmer.
2. "CAN'T FIND AFOS PRODUCT"	The key from one or more of the preformats was not found in the database. Add the keys to the wish list.
3. "CAN'T FIND CRLF'S"	Couldn't find the several carriage returns and line feeds that separate the sections of the preformat. Either the preformat was stored incorrectly or the program misread it. Purge ccCDRxxx, and reedit (M:CDR). If problem persists, call maintenance programmer.
4. 'CDRLIST.nn ENTRIES IN ERROR"	Error in the station name or identification in CDRLIST.nn. Edit the file to correct the problem.
5. "COMMAND LINE ERROR"	Command line format in error. Reenter command line.

DASHER MESSAGES	MEANING
6. "CREATING 'file'"	Couldn't create 'file.' Determine if 'file' exists. If so, delete it and rerun program. If problem persists, call maintenance programmer.
7. "FSTORE ERROR CLINWn"	Text product was not stored. Check to ensure that a key exists for this product, and that the current directory is your master directory.
8. "GETTING CHANNEL - 'file'"	Couldn't obtain I/O channel to 'file.' Probable system or disk problem.
9. "ILLEGAL META-CHARACTER IN CDRLIST"	Unacceptable meta-character encountered. Correct the problem in the appropriate CDRLIST and rerun.
10. "INCORRECT MONTH"	Data in cccCLSAVn is not from last month. Edit the product to reflect last month's data.
11. "OPENING 'file'"	Couldn't open 'file.' Program not linked to or located in same directory as 'file.' Establish appropriate links.
12. "OPENING OVERLAY"	Overlay file is missing, not linked correctly, or corrupt. Check the link, and if necessary, reload from the starter diskette.
13. "OVER 15 MAX (MIN) RECORDS FOUND"	If more than 15 new maximum (minimum) records were found when creating the monthly report, an error in STATS.nn is assumed. Run MKSTATS1 to correct errors in the appropriate section.
14. "READING 'file'"	Couldn't read 'file.' Delete 'file.' You may need to reload 'file' from starter diskette or recreate it.
15. "READING SKEL"	Couldn't read the ccc from the SKEL file. Probable system or disk problem.

DASHER MESSAGES	MEANING
16. "SETTING FILE POS"	Couldn't set file position in SKEL file to read the 'ccc'. Probable system or disk problem.
17. "STATION MISSING FROM CDRLIST"	Station identification is not found in CDRLIST.nn. Edit the file to correct the problem.
18. "/S SWITCH ERROR"	Argument used with the local '/S' switch is out of range. Change argument to a value between '1' and '4'.
19. "TROUBLE READING BLOCK 0"	Couldn't read block zero of the AFOS product. Purge cccCDRxxx, and reedit (M:CDR). If problem persists, call maintenance programmer.
20. "WRITING 'file'"	Couldn't write 'file.' Probable system or disk problem.

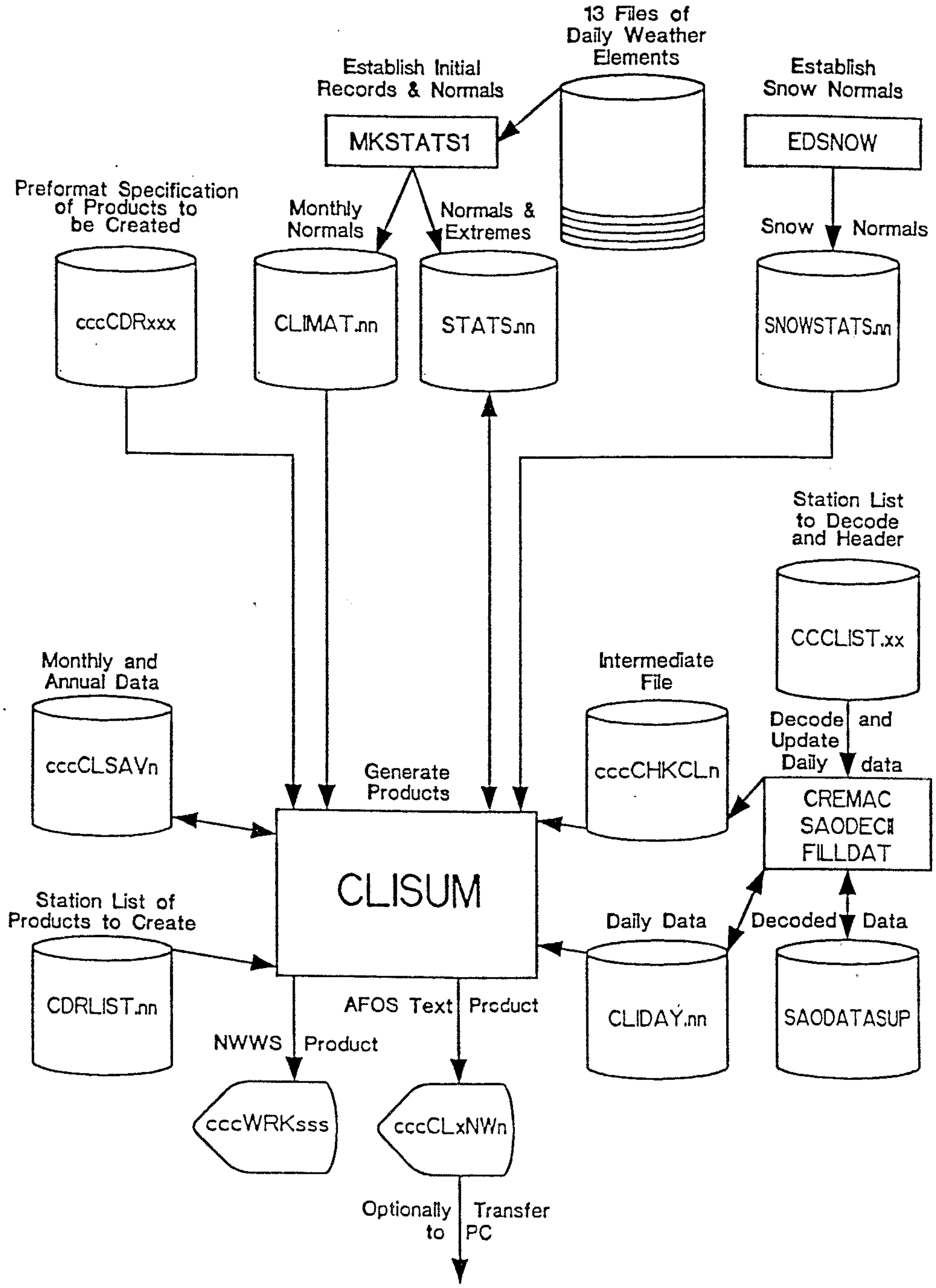
13 Files of Daily Weather Elements
Establish Initial Records & Normals
MKSTATS1
Establish Snow Normals
EDSNOW
Preformat Specification of Products to be Created
cccCDRxxx
Monthly Normals
CLIMAT.nn
Normals & Extremes
STATS.nn
Snow Normals
SNOWSTATS.nn
Station List to Decode and Header
CCCLIST.xx
Monthly and Annual Data
cccCLSAVn
Intermediate File
cccCHKCL.n
Decode and Update Daily data
CREMAC
SAODECI
FILLDAT
Generate Products
CLISUM
Station List of Products to Create
CDRLIST.nn
Daily Data
CLIDAY.nn
Decoded Data
SAODATASUP
NWWS Product
AFOS Text Product
cccWRKsss
cccCLxNWn
Optionally Transfer to PC

Figure 1a. Program flow for the climatological data reports software on the S230.

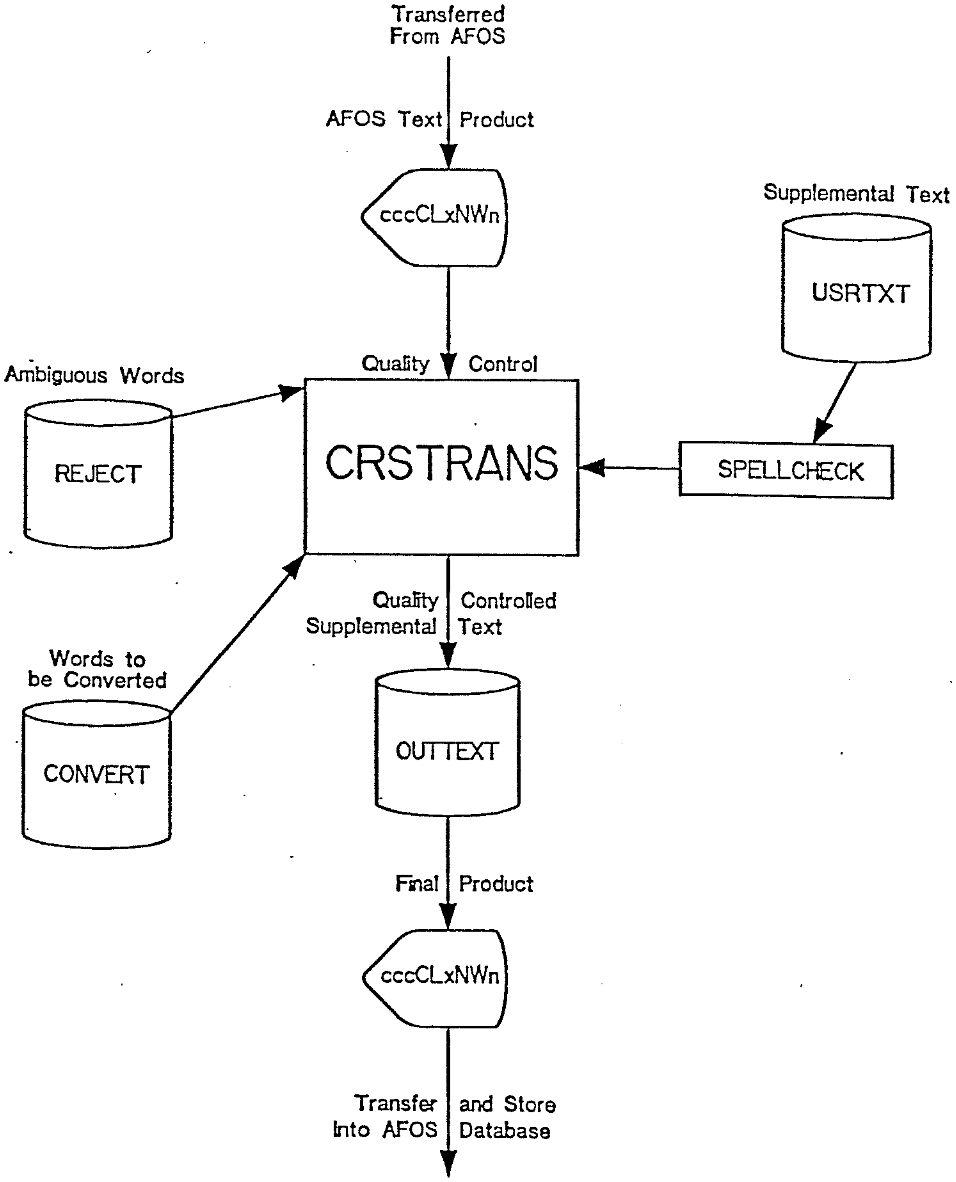
Transferred From AFOS
AFOS Text Product
cccCLxNWn
Supplemental Text
USRTXT
Ambiguous Words
REJECT
Quality Control
CRSTRANS
SPELLCHECK
Quality Controlled Supplemental Text
Words to be Converted
CONVERT
OUTTEXT
Final Product
cccCLxNWn
Transfer and Store Into AFOS Database

Figure 1b. Program flow for the climatological data reports software on the PC.

THE CLIMATOLOGICAL REPORT FOR NATIONAL AIRPORT FOR YESTERDAY, MONDAY OCTOBER EIGHTEENTH, NINETEEN NINETY THREE. YESTERDAY'S HIGH TEMPERATURE WAS SEVENTY TWO DEGREES, THE LOW FIFTY EIGHT, AND THE MEAN SIXTY FIVE, WHICH IS SIX DEGREES ABOVE NORMAL. THE NORMAL HIGH IS SIXTY EIGHT AND THE NORMAL LOW IS FORTY NINE. NO PRECIPITATION FELL YESTERDAY, LEAVING THE MONTHLY TOTAL AT ONE POINT ONE ONE, AND THE ANNUAL TOTAL AT THIRTY POINT SEVEN SIX. THE MONTHLY TOTAL IS ZERO POINT SIX TWO INCHES BELOW NORMAL, AND THE ANNUAL TOTAL IS ONE POINT ZERO SEVEN INCHES BELOW NORMAL. THERE WERE NO HEATING DEGREE DAYS YESTERDAY, LEAVING THE MONTHLY TOTAL AT SIX, WHICH IS FIVE ABOVE NORMAL. THE SEASONAL TOTAL IS ONE THOUSAND SIX HUNDRED AND NINETY ONE, WHICH IS TWO HUNDRED AND EIGHTY ABOVE NORMAL. THE CLIMATOLOGICAL DATA FOR TODAY, TUESDAY OCTOBER NINETEENTH, NINETEEN NINETY THREE. THE NORMAL HIGH TEMPERATURE IS SIXTY EIGHT, THE NORMAL LOW IS FORTY EIGHT, AND THE NORMAL MEAN IS FIFTY EIGHT. THE RECORD HIGH OF NINETY WAS SET IN NINETEEN SIXTY THREE, AND THE RECORD LOW OF THIRTY FIVE WAS LAST REACHED IN NINETEEN EIGHTY NINE. SUNRISE TODAY IS SEVEN TWENTY TWO AM EASTERN DAYLIGHT TIME, AND SUNSET IS SIX TWENTY THREE P M.

Figure 2a. Example of the text portion of a morning climatological report for NOAA weather radio.

THE CLIMATOLOGICAL REPORT AS OF SIX P M EASTERN DAYLIGHT TIME FOR NATIONAL AIRPORT ON FRIDAY, OCTOBER FIFTEENTH, NINETEEN NINETY THREE. TODAY'S HIGH TEMPERATURE WAS SIXTY NINE DEGREES, AND THE LOW WAS FIFTY THREE. THE NORMAL HIGH IS SIXTY NINE, AND THE NORMAL LOW IS FIFTY. THE RECORD HIGH OF NINETY FOUR WAS SET IN NINETEEN SIXTY THREE, AND THE RECORD LOW OF THIRTY SIX WAS SET IN NINETEEN SIXTY NINE. NO PRECIPITATION FELL TODAY, LEAVING THE MONTHLY TOTAL AT TWO POINT TWO FOUR INCHES, AND THE ANNUAL TOTAL AT TWENTY SEVEN POINT ZERO SIX. THE MONTHLY TOTAL IS ZERO POINT SEVEN EIGHT INCHES ABOVE NORMAL, AND THE ANNUAL TOTAL IS FOUR POINT FIVE ZERO INCHES BELOW NORMAL. SUNSET TODAY IS SIX TWENTY NINE P M EASTERN DAYLIGHT TIME. SUNRISE SATURDAY IS SEVEN NINETEEN A M, AND SUNSET IS SIX TWENTY EIGHT P M. TOMORROW'S RECORD HIGH OF EIGHTY SEVEN WAS SET IN EIGHTEEN NINETY SEVEN, AND TOMORROW'S RECORD LOW OF THIRTY FIVE WAS SET IN NINETEEN FIFTY TWO.

Figure 2b. Example of the text portion of an evening climatological report for NOAA weather radio.

THE CLIMATOLOGICAL REPORT FOR NATIONAL AIRPORT FOR THE MONTH OF FEBRUARY. THE HIGHEST TEMPERATURE FOR THE MONTH WAS FIFTY SEVEN DEGREES ON THE THIRD AND FIFTH, AND THE LOWEST FOR THE MONTH WAS ELEVEN ON THE NINETEENTH. THE AVERAGE HIGH WAS FORTY TWO POINT FIVE DEGREES, THE AVERAGE LOW WAS TWENTY SIX POINT ONE, AND THE MEAN WAS THIRTY FOUR POINT THREE, WHICH IS THREE POINT SEVEN DEGREES BELOW NORMAL. THE TOTAL PRECIPITATION FOR THE MONTH WAS TWO POINT TWO SEVEN INCHES, WHICH BROUGHT THE ANNUAL TOTAL TO FIVE POINT ONE SEVEN. THE MONTHLY PRECIPITATION TOTAL WAS ZERO POINT THREE FIVE INCHES BELOW NORMAL, AND THE ANNUAL IS ZERO POINT TWO ONE INCHES BELOW NORMAL. THE GREATEST TWENTY FOUR HOUR PRECIPITATION AMOUNT WAS ZERO POINT NINE ZERO INCHES ON THE TWELFTH. FOUR POINT ONE INCHES OF SNOW FELL DURING THE MONTH, BRINGING THE SEASONAL TOTAL TO FIVE POINT ONE INCHES. THE GREATEST TWENTY FOUR HOUR SNOWFALL AMOUNT WAS THREE POINT ONE INCHES ON THE TWENTY FIRST. THERE WERE EIGHT HUNDRED AND FIFTY FIVE HEATING DEGREE DAYS DURING THE MONTH, WHICH IS EIGHTY FIVE ABOVE NORMAL. THE SEASONAL TOTAL IS THREE THOUSAND TWO HUNDRED AND SEVENTEEN, WHICH IS FIFTEEN ABOVE NORMAL.

Figure 2c. Example of the text portion of a monthly climatological report for NOAA weather radio.

```
TDLMCPCDR
TTAA00 KTDL 031811
                      DAILY CLIMATOLOGICAL MORNING REPORT
PERIODICITY     [        ]
EFFECTIVE TIMES [    ,    ]             EXPIRATION TIMES    [    ,    ]
LISTENING AREA  [                     ]  [                    ]
                [                     ]  [                    ]

                              YESTERDAY'S VALUES
WEATHER ELEMENT       MEASURED      NORM      RECORD      YEAR      DEPARTURE
TEMP:   MAX             [ ]          [ ]        [ ]         [ ]
        MIN             [ ]          [ ]        [ ]         [ ]
        MEAN            [ ]                                             [ ]
PRECIP: DAY             [ ]
        MONTH           [ ]                                             [ ]
        YEAR            [ ]                                             [ ]
DATE TO START REPORTING SNOWFALL       [    ] (0701)        END  [    ] (0630)
        DAY             [ ]
        MONTH           [ ]
        SEASON          [ ]
        12 UTC DEPTH    [ ]

DATE TO START HEATING DEGREE DAYS      [    ] (0701)        END  [    ] (0630)
        DAY             [ ]                                         DEPARTURE
        MONTH           [ ]                                             [ ]
        SEASON          [ ]                                             [ ]
DATE TO START COOLING DEGREE DAYS      [    ] (0101)        END  [    ] (1231)
        DAY             [ ]
        MONTH           [ ]                                             [ ]
        SEASON          [ ]                                             [ ]

                         CLIMATOLOGICAL DATA FOR TODAY
WEATHER ELEMENT         NORMAL            RECORD              YEAR
TEMP:   MAX              [ ]                 [ ]                [ ]
        MIN              [ ]                 [ ]                [ ]
        MEAN             [ ]
SUNRISE                  [ ]                SUNSET              [ ]

                                                                            [ ]
```

Figure 3a. Morning report section of preformat cccMCPCDR which must be edited prior to running the climatological data morning report. User options include instructions for the Console Replacement System; indicators to include weather elements for yesterday and today, record values, departures from normal, and sunrise and sunset. The user selects a weather element for broadcasting by placing an 'X' in the appropriate field.

```
                         DAILY CLIMATOLOGICAL EVENING REPORT

PERIODICITY     [        ]
EFFECTIVE TIMES [    ,    ]              EXPIRATION TIMES   [    ,    ]
LISTENING AREA  [                    ]   [                    ]
                [                    ]   [                    ]

                                TODAY'S VALUES
WEATHER ELEMENT       SO FAR           RECORD      YEAR       NORM
TEMP:   MAX            [ ]              [ ]         [ ]        [ ]
        MIN            [ ]              [ ]         [ ]        [ ]
PRECIP: DAY            [ ]
        MONTH          [ ]                                     [ ]
        YEAR           [ ]                                     [ ]
DATE TO START REPORTING SNOWFALL     [    ] (0701)      END [    ] (0630)
        DAY            [ ]
        MONTH          [ ]
        SEASON         [ ]
        12 UTC DEPTH   [ ]
SUNSET  [ ]
                               TOMORROW'S VALUES
           SUNRISE  [ ]                          SUNSET [ ]
       RECORD HIGH  [ ]  YEAR [ ]            RECORD LOW [ ]  YEAR [ ]      [ ]
```

Figure 3b. Evening report section of preformat cccMCPCDR which may be edited prior to running the climatological data evening report. User options include instructions for the Console Replacement System; indicators to include weather elements for today and tomorrow, record values, and sunrise and sunset. The user selects a weather element for broadcasting by placing an 'X' in the appropraite field.

```
                         MONTHLY CLIMATOLOGICAL REPORT
PERIODICITY     [        ]
EFFECTIVE TIMES [    ,    ]                 EXPIRATION TIMES   [    ,    ]
LISTENING AREA  [                    ]      [                    ]
                [                    ]      [                    ]
WEATHER ELEMENT    START         END            MEASURED    DAYS    DEPARTURE
TEMP:   MAX                                       [ ]        [ ]
        MIN                                       [ ]        [ ]
        AVG MAX                                   [ ]
        AVG MIN                                   [ ]
        MEAN                                      [ ]                 [ ]
PRECIP: MONTH                                     [ ]                 [ ]
        YEAR                                      [ ]                 [ ]
        MAX 24 HR                                 [ ]        [ ]
SNOW:   MONTH     [    ](0701) [    ](0630)       [ ]                 [ ]
        SEASON                                    [ ]                 [ ]
        MAX 24 HR                                 [ ]        [ ]
        MAX DEPTH                                 [ ]        [ ]
HDD:    MONTH     [    ](0701) [    ](0630)       [ ]                 [ ]
        SEASON                                    [ ]                 [ ]
CDD:    MONTH     [    ](0101) [    ](1231)       [ ]                 [ ]
        SEASON                                    [ ]                 [ ]
RECORD MAX/MIN DAYS    [ ]                                                 [ ]
```

Figure 3c. Monthly report section of preformat cccMCPCDR which may be edited prior to running the climatological data monthly report. User options include instructions for the Console Replacement System; indicators to include extremes and means for the month, and seasonal and annual totals. The user selects a weather element for broadcasting by placing an 'X' in the appropriate field.

```
            CLIMATOLOGICAL DATA REPORT INITIAL VALUES

MAXIMUM TEMPERATURE           [   ]

MINIMUM TEMPERATURE           [   ]

PRECIPITATION TOTAL          [    ]          (IN HUNDREDTHS)

SNOWFALL ACCUMULATION         [   ]          (IN TENTHS)

12Z SNOW DEPTH               [    ]          (IN TENTHS)
```

Figure 4. Example of AFOS intermediate product cccCHKCLn, created by program FILLDAT, which must be verified and edited before the final product can be computer-generated. Entries include maximum temperature, minimum temperature, total precipitation, snowfall accumulation, and 1200 UTC snow depth for the day.

```
...THE CLIMATOLOGICAL REPORT FOR %CITY FOR YESTERDAY, %DAY, %MONTH %DATE,
...%YEAR.  %Z
WBCSAODCA NATIONAL AIRPORT
WBCSAORIC RICHMOND
WBCSAOILG WILMINGTON
...THE CLIMATOLOGICAL REPORT FOR TODAY, %DAY, %MONTH %DATE, %YEAR.
```

Figure 5a. Example of CDRLIST.00 which contains comment lines and a list of stations for which to generate a morning climatological report. Values are substituted for the meta-characters (character strings that begin with '%') which appear in the comment lines. The first comment lines introduce the broadcast. The second comment line introduces the section dealing with today's data.

```
...THE CLIMATOLOGICAL REPORT AS OF %TIMEZ FOR %CITY, ON %DAY, %MONTH %DATE,
...%YEAR.
WBCSAODCA NATIONAL AIRPORT
WBCSAORIC RICHMOND
WBCSAOILG WILMINGTON
```

Figure 5b. Example of CDRLIST.01 which contains comment lines and a list of stations for which to generate an evening climatological report. Values are substituted for the meta-characters which appear in the comment lines to introduce the broadcast.

```
...THE CLIMATOLOGICAL REPORT FOR %CITY FOR THE MONTH OF %MONTH.
WBCSAODCA NATIONAL AIRPORT
WBCSAORIC RICHMOND
WBCSAOILG WILMINGTON
```

Figure 5c. Example of CDRLIST.02 which contains a comment line and a list of stations for which to generate a monthly climatological report. Values are substituted for the meta-characters which appear in the comment line to introduce the broadcast.

```
CREMAC NB/F KC/F FA/F AA/F
SAOMAC
```

Figure 6a. Example of the CLIM01.MC macro which executes program CREMAC in order to create the macro SAOMAC.MC. The four switches associated with the CREMAC program represent the 'xx' extensions of the CCCLIST.xx files.

```
MESSAGE *** RUNNING SAO DECODER ***
MESSAGE SAODECII"/"N"/"Y NB"/"C 2"/"E 36000060"/"R
SAODECII/N/Y NB/C 2/E 36000060/R
MESSAGE *** UPDATING CLIDAY ***
FILLDAT 1/S
DELETE/V SAODATASUP
MESSAGE *** RUNNING SAODECODER ***
MESSAGE SAODECII"/"N"/"Y KC"/"C 2"/"E 36000060"/"R
SAODECII/N/Y KC/C 2/E 36000060/R
MESSAGE *** UPDATING CLIDAY ***
FILLDAT 2/S
DELETE/V SAODATASUP
MESSAGE *** RUNNING SAODECODER ***
MESSAGE SAODECII"/"N"/"Y FA"/"C 2"/"E 36000060"/"R
SAODECII/N/Y FA/C 2/E 36000060/R
MESSAGE *** UPDATING CLIDAY ***
FILLDAT 3/S
DELETE/V SAODATASUP
MESSAGE *** RUNNING SAODECODER ***
MESSAGE SAODECII"/"N"/"Y AA"/"C 2"/"E 36000060"/"R
SAODECII/N/Y AA/C 2/E 36000060/R
MESSAGE *** UPDATING CLIDAY ***
FILLDAT 4/S
DELETE/V SAODATASUP
MESSAGE *** CHECK CALCULATIONS AND RUN CLISUM ***
```

Figure 6b. Example of an SAOMAC.MC macro, created by program CREMAC, which executes the SAO decoder and the program FILLDAT in order to create the temporary files cccCHKCLn. The switches associated with SAODECII instruct that program: not to run PLTGEN (/N); to decode the station in the specified CCCLIST (/C); to decode multiple observations for that station (/Y); to decode supplementary data (/E); and to decode observations in the specified time window (/R). The switch modifying FILLDAT assigns a station number to the current station.

```
CLISUM/W 1/S
CLISUM/W 2/S
CLISUM/W 3/S
CLISUM/W 4/S
```

Figure 6c. Example of the CLIMO2.MC macro, which executes the program CLISUM in order to create the product files cccCLINWn and cccCLMNWn. The switches modifying CLISUM are instructing the program to also produce a NWWS-style report, stored in product cccWRKxxx, where 'ccc' is the node identifier, and the 'xxx' is the identifier of the reporting station. The report may be modified by the user. The numbers associated with each station are set by the execution order in the command line which executes program CREMAC.

```
WBCWRKDCA
TTAA00 KWBC 191032

CLIMATIC SUMMARY FOR NATIONAL AIRPORT
NATIONAL WEATHER SERVICE WSFO WBC
632 AM EDT TUE OCT 19 1993

...TEMPERATURE...
HIGH YESTERDAY...  72
LOW  YESTERDAY...  58
MEAN TEMP........  65   DEPARTURE FROM NORMAL...   6
NORMAL HIGH FOR TODAY...  68
NORMAL  LOW FOR TODAY...  48
RECORD HIGH FOR TODAY...  90 SET IN 1963
RECORD  LOW FOR TODAY...  35 SET IN 1989 AND PREVIOUS YEARS

...DEGREE DAY DATA...
HEATING
YESTERDAY...      0 DEPARTURE...    -6
MONTH.......     92 DEPARTURE...    40
SEASON......    125 DEPARTURE...    60
COOLING
YESTERDAY...      0 DEPARTURE...     0
MONTH.......      6 DEPARTURE...     5
SEASON......   1691 DEPARTURE...   280

...PRECIPITATION...
YESTERDAY............   0.00
TOTAL FOR THE MONTH...   1.11
NORMAL MONTH TO DATE..   1.73
TOTAL FOR THE YEAR....  30.76
NORMAL YEAR TO DATE...  31.83

SNOWFALL YESTERDAY...   0.0
SNOWFALL THIS MONTH..   0.0
SNOWFALL THIS SEASON.   0.0

...ASTRONOMICAL DATA...
SUNRISE TODAY.....  722 EDT
SUNSET  TODAY.....  623 EDT
SUNRISE TOMORROW..  723 EDT
SUNSET  TOMORROW..  622 EDT

END...
```

Figure 7. Example of a NWWS-style report, stored in AFOS product cccWRKxxx, where 'ccc' is the node identifier, and 'xxx' is the reporting station identifier. These files may be modified by the user.

```
am;A M
pm;P M
f;fahrenheit
nw;northwest
mph;miles per hour
edt;Eastern Daylight Time
est;Eastern Standard Time
wv;West Virginia
tx;Texas
precip;precipitation
aftn;afternoon
```

Figure 8a. Example of the PC CONVERT file, which contains two entries per line. The first entry on each line represents a word or abbreviation, and the second entry per line represents the word to which the first entry is converted by the CRSTRANS program. The first entry on each line must be entered in lower case, but the CRSTRANS program will search for a match of a text entry in either upper or lower case.

```
in
st
mt
or
ne
lead
bow
refuse
```

Figure 8b. Example of the PC REJECT file, which contains ambiguous entries that cannot automatically be resolved by the quality control application. Each file entry must be lower case, although the CRSTRANS program will search for a match in the text, entered in either upper or lower case. The CRSTRANS program then prompts the user to either accept the word, or replace it with a new entry.

(Continued from inside front cover)

Computer Program NWS TDL

CP 92-1	Separating Individual Synoptics from within Synoptic Collectives. Beasley, August 1992. (PB92232313)
CP 93-1	AFOS Profiler Software System. Battel, Leaphart, Moeller, and Petrie, August 1993.
CP 93-2	AFOS Surface Observation Decoding. Beasley, September 1993. (PB94112042)
CP 93-3	Decoding Satellite Cloud Products. Beasley, October 1993.
CP 93-4	Decoding Nested Grid Model Statistical Forecasts. Beasley, October 1993.
CP 93-5	Retrieving Alphanumeric and Graphic Products from the AFOS Database through the Background Partition. Beasley, November 1993.