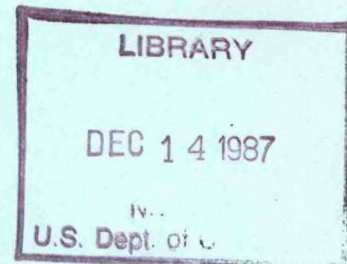NOAA Eastern Region Computer Programs
and Problems NWS ERCP -   No. 42

COARS FAMILY OF PROGRAMS

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Wilmington, Delaware

Scientific Services Division
Eastern Region Headquarters
November 1987

**U.S. DEPARTMENT OF
COMMERCE** / National Oceanic and
Atmospheric Administration / National Weather
Service

NOAA TECHNICAL MEMORANDUM

National Weather Service, Eastern Region Computer Programs and Problems

The Eastern Region Computer Programs and Problems (ERCP) series is a sub-
set of the Eastern Region Technical Memorandum series. It will serve as
the vehicle for the transfer of information about fully documented AFOS
application programs. The format ERCP - No. 1 will serve as the model
for future issuances in this series.

1   An AFOS version of the Flash Flood Checklist. Cynthia M. Scott,
    March 1981. (PB81 211252).

2   An AFOS Applications Program to Compute Three-Hourly Stream Stages.
    Alan P. Blackburn, September 1981. (PB82 156886).

3   PUPPY (AFOS Hydrologic Data Reporting Program). Daniel P. Provost,
    December 1981. (PB82 199720).

4   Special Search Computer Program. Alan P. Blackburn, April 1982.
    (PB83 175455).

5   Conversion of ALEMBICS Workbins. Alan P. Blackburn, October 1982.
    (PB83 138313).

6   Real-Time Quality Control of SAOs. John A. Billet, January 1983.
    (PB83 166082).

7   Automated Hourly Weather Collective from HRR Data Input. Lawrence
    Cedrone, January 1983 (PB83 167122).

8   Decoders for FRH, FTJ and FD Products. Cynthia M. Scott, February 1983.
    (PB83 176057).

9   Stability Analysis Program. Hugh M. Stone, March 1983. (PB83 197947).

10 Help for AFOS Message Comp. Alan P. Blackburn, May 1983. (PB83 213561).

11 Stability and Other Parameters from the First Transmission RAOB Data.
    Charles D. Little, May 1983. (PB83 220475).

12 TERR, PERR, and BIGC: Three Programs to Compute Verification Statistics.
    Matthew R. Peroutka, August 1983. (PB84 127521).

13 Decoder for Manually Digitized Radar Observations. Matthew R. Peroutka,
    June 1983. (PB84 127539).

14 Slick and Quick Data Entry for AFOS Era Verification (AEV) Program.
    Alan P. Blackburn, December 1983. (PB84 138726).

15 MDR--Processing Manually Digitized Radar Observations. Matthew R.
    Peroutka, November 1983. (PB84 161462) (Revised June 1985, PB85-220580/AS)

16 RAMP: Stability Analysis Program. Hugh M. Stone, February 1984.(PB84 161447)

17 ZONES. Gerald G. Rigdon, March 1984. (PB84 174325)

18 Automated Analysis of Upper Air Soundings to Specify Precipitation
    Type. Joseph R. Bocchieri and Gerald G. Rigdon, March 1984.
    (PB84 174333)

19 Verification of Asynchronous Transmissions. Lawrence Cedrone,
    March 1984. (PB84 189885)

20 AFOS Hurricane Plotter. Charles Little, May 1984. (PB84 199629)

21 WARN - A Warning Formatter. Gerald G. Rigdon, June 1984. (PB84 204451)

22 Plotting TDL Coastal Wind Forecasts. Paula Severe, June 1984 (Revised)
    (PB84 220789)

23 Severe Weather Statistics STADTS Decoder (SWX) and Plotter (SWY).
    Hugh M. Stone, June 1984. (PB84 213693)

24 WXR. Harold Opitz, August 1984. (PB84 23722) (Revised August 1985,
    PB84 100815/AS)

25 FTASUM: Aviation Forecast Summaries. Matthew Peroutka, August 1984.
    (PB85 112977)

26 SAOSUM: A Short Summary of Observations. Matthew Peroutka, October 1984.
    (PB85 120384)

27 TRAJ - Single Station Trajectory Plot. Tom Niziol, December 1984.
    (PB85 135002)

28 VIDTEX. Gerald G. Rigdon, February 1985. (PB85 175669/AS)

29 Isentropic Plotter. Charles D. Little, February 1985. (PB85 175651/AS)

30 CERR: An Aviation Verification Program. M. Peroutka, April 1985.
    (PB85 204824/AS)

31 Correlation and Regression Equation - REGRS. Hugh M. Stone, May 1985.
    (PB85 213353/AS)

32 Scatter Diagram and Histogram Program - SCATR. Hugh M. Stone, May 1985.
    (PB85 213346/AS)

33 TIMCHEK. Gerald G. Rigdon, June 1985. (PB85-221257/AS)

34 A MOS Temperature - PoP Forecast Plot. William C. Randel, October 1985.
    (PB86 120029/AS)

35 ROTODRAW. Thomas Niziol, November 1985 (PB86 131828/AS)

36 LAWEB: Data Processing for the Great Lakes. William C. Randel and
    Matthew R. Peroutka, March 1986. (PB86 176658/AS)

37 Convective Parameters & Hodograph Program - Convect. Hugh M. Stone,
    April 1986.(PB86-197225/AS)

38 DWXR - SHEF Product Compression Program. Harold H. Opitz,
    September 1986.

39 CRASHQ: Listing Products Being Transmitted At the Time of a Crash.
    William C. Randel, January 1987 (PB87-151890/AS)

40 AVGPLOT and AVGCLIM. Alan Blackburn, March 1987 (PB87-180626/AS)

41 Severe Weather Potential (SPOT) Plotfile Generator. Ken LaPenta,
    July 1987.

NOAA Eastern Region Computer Programs and Problems
NWS ERCP - No. 42

COARS FAMILY OF PROGRAMS

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Acknowledgements

A project of this magnitude requires the cooperation, coordination and support of several key individuals. I would like to express sincere thanks to the following:

COARS FAMILY OF PROGRAMS

LAWRENCE CEDRONE
WSO WILMINGTON, DE

I. Introduction

This document presents a series of AFOS Application programs
developed with the intention of partially automating airways encoded
surface observations, while electronically recording all observed
weather phenomena. These tasks are accomplished through a series of
AFOS preformats/messages and the application programs.

All data used by these programs is made available through AFOS
preformats. The various fields within each preformat are structured
to allow for the largest possible entry, although these long entries
will rarely occur. Since this allowance must be made, the programs
have been structured in a manner that would not impose strict input
requirements on the user. Each program will search and find the
appropriate characters within a field regardless of their location.
Therefore it is not necessary for data to be left or right justfied
within a particular field and extraneous space characters have no
detrimental effects.

A total of 83 quality control checks are performed on each
surface observation while it is being formulated by the SAO encoder
program. The observed weather elements are formatted into the
standard airways code, as well as recorded into the standard formats
of Meteorological Forms 10A and 10B. Use of this system will
completely eliminate the need for hand written forms as they are known
today. Specials are coded as type 13 messages so that AFOS sites may
set console alerts to signal their receipt.

A complete and very detailed explanation of system set-up and
usage can be found in the COARS USERS MANUAL, available from the
Eastern Region's DATAC Division.

An AFOS site interested in using, and permitted to use, this
system must realize that a certain learning process is necessary.
Experienced weather observers will have to adjust the manner in which
they've been accustomed to entering their data into AFOS. A minimum 4
week period will be needed to gain familiarity, but once gained, COARS
will prove its usefulness.

II. Methodology and Software Structure

The COARS system consists of several programs and files, so an installation macro, SETUP.MC, has been provided. Once this is run, and the database products added, all that needs to be done is (1) edit the 10B.DT file for local information and antecedent data, (2) edit the end-of-day macros EOD.MC and PRT10B.MC to reflect the site ID and (3) construct a local R-value file using the program RVAL.

RVAL

RVAL is executed only once after COARS has been first installed. The pressure reduction values used for input are already available on station in WBAN Form 54-7.3 (Pressure Reduction Ratio Table).

RVAL is an interactive program executed at the system console (Dasher). The program types instructions at the console telling the user what data must be entered and how to input it. The user is given the option of creating a new file, editing an existing R-value file or aborting the program. Since this program can take 5 to 10 minutes, the abort option is included just in case the user begins the program and then finds there is not enough time to complete it before a higher priority task must be accomplished, either by the individual or by the AFOS system. The edit option is available in case an error is made during the initial program run.

Using the station's WBAN Form 54-7.3 as reference, the user inputs the beginning and ending temperatures for which pressure reduction values already exist. Using these temperature values as boundaries, the program will then request the decimal portion of the reduction value for each corresponding temperature within the boundaries. The program prompts the user with a temperature value and the user responds by typing in the necessary correction factor. Processing ends when the upper boundary (highest temperature) has been reached.

The newly created file RVAL.DT is then given permanent and write protected attributes. Upon program completion the user must make a hard copy of this file (preferably at the PPM) and verify its accuracy. If there are any errors, the operator can rerun RVAL using the edit option to correct the mistake(s). Figure 1 is the R-Value file for WSO Wilmington, De.

Once the RVAL.DT file is complete and correct, this program can be deleted from disk.

SAO Encoder - SAO, SAP1, SESP and SAOII

The SAO Encoder portion of COARS is comprised of four executable programs: SAO.SV, SAP1.SV, SESP.SV and SAOII.SV. SAO and SAOII are executed each time a weather observation is generated; SESP creates single-element specials while SAP1 creates all other ob types. The

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TMP	R	TMP	R	TMP	R
-60		1	1.0031	62	1.0029
-59		2	1.0031	63	1.0029
-58		3	1.0031	64	1.0029
-57		4	1.0031	65	1.0029
-56		5	1.0031	66	1.0029
-55		6	1.0031	67	1.0029
-54		7	1.0031	68	1.0029
-53		8	1.0031	69	1.0029
-52		9	1.0031	70	1.0029
-51		10	1.0031	71	1.0029
-50		11	1.0031	72	1.0029
-49		12	1.0031	73	1.0029
-48		13	1.0031	74	1.0029
-47		14	1.0031	75	1.0029
-46		15	1.0030	76	1.0028
-45		16	1.0030	77	1.0028
-44		17	1.0030	78	1.0028
-43		18	1.0030	79	1.0028
-42		19	1.0030	80	1.0028
-41		20	1.0030	81	1.0028
-40		21	1.0030	82	1.0028
-39		22	1.0030	83	1.0028
-38		23	1.0030	84	1.0028
-37		24	1.0030	85	1.0028
-36		25	1.0030	86	1.0028
-35		26	1.0030	87	1.0023
-34		27	1.0030	88	1.0028
-33		28	1.0030	89	1.0028
-32		29	1.0030	90	1.0028
-31		30	1.0030	91	1.0028
-30		31	1.0030	92	1.0028
-29		32	1.0030	93	1.0029
-28		33	1.0030	94	1.0028
-27		34	1.0030	95	1.0028
-26		35	1.0033	96	1.0028
-25		36	1.0030	97	1.0028
-24		37	1.0030	98	1.0028
-23		38	1.0030	99	1.0028
-22		39	1.0030	100	1.0029
-21		40	1.0038	101	
-20	1.0032	41	1.0029	102	
-19	1.0032	42	1.0029	103	
-18	1.0032	43	1.0029	104	
-17	1.0032	44	1.0029	105	
-16	1.0032	45	1.0023	106	
-15	1.0032	46	1.0029	107	
-14	1.0032	47	1.0029	108	
-13	1.0032	48	1.0029	109	
-12	1.0032	49	1.0023	110	
-11	1.0032	50	1.0029	111	
-10	1.0032	51	1.0029	112	
-9	1.0032	52	1.0029	113	
-8	1.0032	53	1.0029	114	
-7	1.0031	54	1.0029	115	
-6	1.0031	55	1.0029	116	
-5	1.0031	56	1.0029	117	
-4	1.0031	57	1.0029	118	
-3	1.0031	58	1.0029	119	
-2	1.0031	59	1.0029	120	
-1	1.0031	60	1.0029		
0	1.0031	61	1.0029		

Figure 1. Sample RVAL.DT
for WSO ILG

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observer needs only to start the first program (command RUN:SAO), for it queues the next (either SAP1.SV or SESP.SV) which in turn queues the last (SAOII.SV) via the process of program chaining. Figure 2 illustrates the chaining process (SESP branch not shown).

Observed weather parameters are entered into the AFOS database through the product cccOSOxxx using the preformat cccMCPOSO (Figure 3). This product containing the raw data is manipulated by the programs in order to produce cccSAOxxx.

SAO.SV is a small program whose purpose is to gather several data items needed by SAP1.SV. These items include reading the run command line switches via the ICE2.CM file to determine the mode of operation, formulating the necessary keynames, identifying a site's local time zone and determining the current date/time (UTC) and day/date/time (LST). Within SAO.SV are two subroutine modules:

ID - forms the keynames of the input product (cccOSOxxx) and the output product (cccSAOxxx). Reads the ICE2.CM file and determines mode of program execution.

LTZ - reads a site's AFOSGEN file to determine its local time zone.

If the observation is to be a single-element special (/S, /SC or /SL switches used), SAO will chain to SESP.SV. Otherwise, it executes SAP1.SV.

SAP1.SV is the work horse of the system where observations are formulated, checked for accuracy, stored and transmitted. The upper half of MF1-10B (columns 17-38) is also generated and recorded by this program. Within this portion of the SAO encoder, not only is the raw data used to formulate an observation, but also certain parameters are automatically created based on the input data. Examples of this include:

with surface and tower visibilities entered, program will decide which is the prevailing and place the other into a properly formatted remark

computation of sea level pressure in millibars from altimeter setting

computation of altimeter setting from station pressure
    or
computation of station pressure from altimeter setting

computation of dew point from dry bulb/wet bulb

computation of relative humidity

computation of 3 hour pressure tendency groups
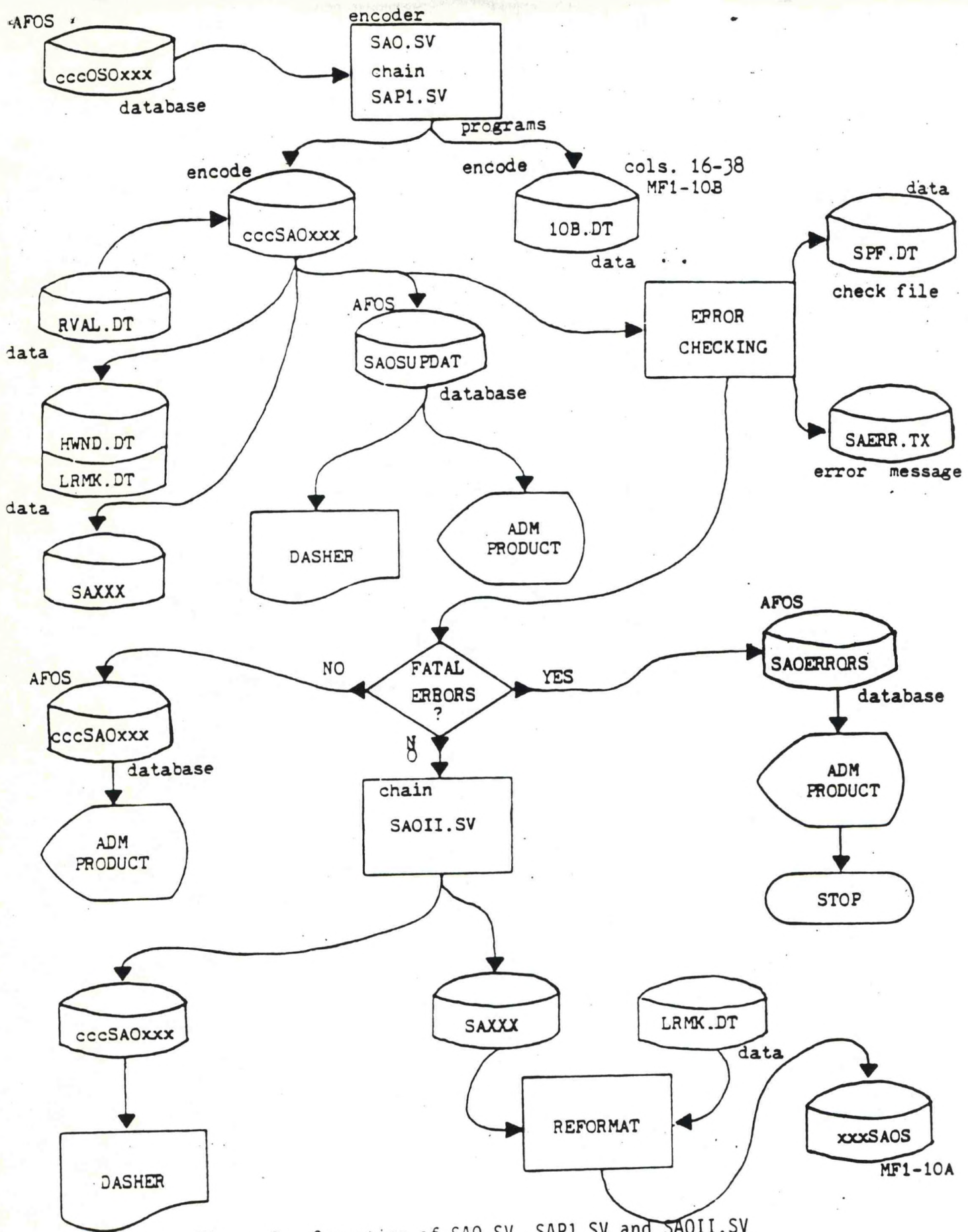
Figure 2. Operation of SAO.SV, SAP1.SV and SAOII.SV

```
TTAA00 KILG 221237

OBS TYPE          LOW LYR AMT    AMT OPQ   CLD TYPE   CIG DSGNTR   CLD HGT
    [ ]               .[ ]       [ ]   [ ]     [ ]    [   ]        [    ]
NXT LYR AMT         SUMMATION    TOT OPQ   CLD TYPE   CIG DSGNTR   CLD HGT
    [ ]               [  ]       [ ]   [ ]     [ ]    [   ]        [    ]
    [ ]               [  ]       [ ]   [ ]     [ ]    [   ]        [    ]
    [ ]               [  ]       [ ]   [ ]                 TEMP      DWPNT
   SFC      TWR                                           DRY/B     WET/B         WIND
   VSBY     VSBY     WEATHER / OBSTRUCTIONS      ] [      ]  [      ]  [         ]
[       ] [       ] [                            OTHER REMARKS                   ]
QNH/STA PRES    RVR REMARK
[        ]    [            ] [
. . . . . . . . . . . . . . . . . . . . ADDITIONAL REMARKS . . . . . . . . . . . . . .
[                                                                                ]
. . . . . . . . . . . . . . . . . . . ADDITIVE DATA. . . . . . . . . . . . . . . . . .
  3/6 HR    CLOUD   MINUTES OF    WATER            SNOW         24 HR       MAX/MIN
  PRECIP    CODE    SUNSHINE     EQUIVALENT        DEPTH        PRECIP       TEMP
[         ] 1[    ] 98[      ] 902[      ] 903[      ] 904[      ] 2[        ] 4[        ]
XTRA REMARKS[
Z TIME OF OB     OBSRVR INITS
[        ]          [      ]      PLACE CURSOR HERE [ ] AND STRIKE ENTER      [  ]
                                                                           PAGE  01
```

Figure 3. Sample cccMCP0S0 for entering observed data.

formulation of a partial obscuration remark based upon obscuring phenomena/cloud entries

Data manipulated by this program is obtained from the database product cccOSOxxx. Each field of this product is checked character by character to insure its validity within the field and then entire fields are tested against other fields for accuracy. This is the basis of the error checking routine.

An integer array of 82 elements is used in error checking. If an error is found, a particular element is set to zero, otherwise it is set to equal one. During program execution this array is checked and if any element equals zero an error message is written to the error file and an error flag is set. Toward the end of program execution this flag is checked. If on, the error message product is stored into the database, the observation is neither stored nor transmitted and the program terminates. If the error flag is off the observation is stored and transmitted and processing continues by chaining to program SAOII.SV.

Within the SAP1 program there are 24 subroutine modules, most of which relate directly to a field in the input data (cccOSOxxx):

SAOMCP - extracts the entire OSO message from the database and places it into an integer array of unpacked ASCII characters.

SKY - formulates and outputs the sky condition portion of an observation and sets pointers for a cloud code group and/or a partial obscuration remark.

SFCVS and TWRVS - test and output prevailing visibility and set pointers for a possible visibility remark and/or an RVR remark.

WX - tests and outputs the weather portion of the observation and sets flags for weather remarks.

TEMP - not called for specials. Tests the temperature value.

PRESS - tests the input pressure value and from it computes station pressure or altimeter setting and then sea level pressure. It then outputs sea level pressure and temperature.

DWPT - not called for specials. Tests the value input for dew point or wet bulb. If wet bulb, computes dew point. Also computes RH. Outputs dew point to the observation.

WND - tests validity of the wind entry and outputs the wind and altimeter setting.

RVR - called when prevailing visibility is one mile or less. Checks runway visual range entry and writes it as an SAO remark.

REM1 - writes a partial obscuration remark and/or a surface/tower visibility remark to the observation.

REM2 - formats and outputs all observer entered remarks. Tests for the entry of certain mandatory remarks based upon previously encoded data. Also will output a pressure rising/falling rapidly remark if appropriate for hourly observations. This routine also, when appropriate, creates an RDOS file of "local" remarks (those that are not transmitted within an observation, but are recorded on MF1-10A).

APPRR - computes, formulates and writes a 3 hourly pressure tendency group, combined with 3/6 hourly precipitation amounts.

ADDAT - tests for the entry of and validity of certain additive data. Checks are performed on the minutes of sunshine group at 08 UTC, a cloud code group, if appropriate, at 3 hourly observations and a max/min or "4" group at 6 hourly observations. Also writes all additive data to the observation.

REM3 - based upon previouly encoded data, this routine tests the validity of the type of observation and searches the observer entered remarks for the logging of the beginning and ending of weather entries. This routine also maintains two RDOS files. One records the wind speed of each hourly observation and the other is a parameter file that is tested against the "next" observation.

XTREM - encodes extra remarks into the SAO (remarks such as RADAT, tide gage readings and/or city readings).

COPY - writes the entire observation as a string of characters into an RDOS file entitled "SAXXX". This is the file used in writing the observation into the MF1-10A format.

NXLN - called only if the encoded observation is more than one line (72 characters) long. It will reformat the report into a second or third line each having a maximum of 72 characters with the second and third lines indented 4 spaces to the right.

RARV - used to extract raw data from certain fields while setting pointers based on the characters entered.

W10B - writes all cloud layer information, temperature, dewpoint, station pressure and relative humidity on the Dasher and to the 10B.DT file (along with the APP group). Creates and stores the AFOS product "SAOSUPDAT".

SAD - used to extract the significant or needed digits from a real number.

CITAP - function to convert two single digit integers into packed ASCII characters.

NUM - function to convert unpacked ASCII characters into an integer number of 1 to 5 digits.

SAERR - based upon an array subscript and its value, this routine will read error messages from the error text file and write them into the AFOS product "SAOERRORS".

Methods used in computing dew point from dry bulb/wet bulb readings and altimeter settings and/or station pressures are based on equations from the Smithsonian Meteorological Tables and were modified from a Basic language program entitled MAPSO, in use in the National Weather Service's Alaskan Region. Computation of relative humidty is made available through the RH function of the Topeka library (TOP.LB).

SAP1 will encode message type 13 in the communications header of specials and corrections, so the specials alert in AFOS load AOD 12.00 can be used.

If the observation is to be a single-element special, SAO will execute SESP.SV instead of SAP1. SESP also takes its input data from cccOSOxxx, but only reads the current weather and the remarks entries. Other entries are ignored. It makes only one check - to make sure the current weather is "TORNADO", "FUNNEL CLOUD" or "WATER SPOUT" - before creating and storing the observation. If the current weather is in error, it returns an error message. SESP calls three subroutines: SAOMCP, CITAP and COPY (described under SAP1 above).

Both SAP1 and SESP call SAOII.SV as the final step in encoding the observation. Its functions include writing the completed SA to the Dasher and creating and maintaining an RDOS file of an entire day's collection of observations in the format of an MF1-10A. This program will also, at 3 hour increments, produce "back-up" copies of the MF1-10A and 10B and the hourly wind file in USER1 on DZ0.

Subroutine modules within SAOII.SV are:

CORREM - generates the column 13 correction remark "COR ####" (UTC) in the MF1-10A file.

NEWDAY - when processing the first observation of a new day, this routine creates the MF1-10A file with its appropriate headings.

CHK10A - also on the first observation, CHK10A ensures that the newly created xxxSAOS contains all proper headings.

SPCS - initializes the prescribed elements of an integer array to ASCII spaces.

NWLN - places specific characters into data positions 1-8 of the MF1-10A for second and third lines of a single observation.

FLCPY - copies the MF1-10A, 10B.DT and HWND.DT files into USER1
during the hour of 3 hourly observations.

Synoptic Data - WSM

Stations that manually compose and transmit synoptic observations
must run the program WSM after the synoptic ob has been completed
(every six hours). Its sole purpose is to simply write a copy of an
already existing synoptic ob from the database into the user's MF1-10A
file. (The 10A file is on disk as filename xxxSAOS, where xxx is the
using site's 3-letter ID.)

COARS users who do not record synoptics do not need this program
and can delete it from disk.

Processing within this program is very simplistic. First the
site's SKEL file is read to determine its node and local ID. From
these WSM constructs the keyname for the SSM product as well as the
xxxSAOS filename. Next, one AFOS block of data is read from the
current version of the SSM (a synoptic should never be more than one
block long) and reformatted by removing its headers, carriage
return/line feed characters and any end of message identifiers. It is
then output to occupy one complete line of the MF1-10A replica (or
two, if necessary).

If the current version of a synoptic is not available or if
system errors interfere with a sucessful program run, the program will
abort and return an error to the user. The synoptic product should be
checked and the program rerun.

End of day processing - PR10A, XTDSS, PR10B and ARCFILES

The last four COARS programs involve closing out one day's files
and starting those of a new day. These tasks are accomplished through
a series of RDOS macros (Figure 4) which manipulate files and execute
the programs.

The first to be carried out is the end of day macro EOD.MC, which
MUST be executed at or near midnight LST...or...after the last
observation of one day and BEFORE the first observation of the new
day. EOD provides backup copies of the day's 10A, 10B.DT and hourly
wind files. After some additional file manipulation it will cause two
copies of the MF1-10A to be printed at the PPM, via the program
PR10A.SV. EOD should only be run at this time of day and never more
than once!

Once EOD is carried out, observations for the new day may begin,
but the previous day's data is not yet complete since the MF1-10B must
still be compiled. This is accomplished via two additional programs
which are driven by two other macros.

```
EOD.MC

MESSAGE
DELETE OLD10A OLD10B
XFER/A 10B.DT OLD10B/R
PRINT OLDWINDS
PR10A.SV;PR10A.SV
RENAME XXXSAOS OLD10A
TYPE MSG1




  P10B.MC

  MESSAGE
  XTDSS
  MESSAGE

  PRT10B.MC

  MESSAGE
  PR10B.SV
  DELETE SAD.DT WXL.DT
  PRINT XXX10B.DT XXX10B.DT
  ARCFILES.SV
  TYPE MSG3




  C10B.MC

  MESSAGE
  XTDSS
  PRT10B.MC
  MESSAGE

  Figure 4.  End-Of-Day Macros
```

Since some of the data required for the MF1-10B is beyond the scope of the SAO encoder, it must be entered manually into AFOS products to become available for electronic processing. The three products used for this are cccSADxxx (6 and 24 hour summaries), cccBEWxxx (beginning and ending of weather events) and ccc24Pxxx (log of hourly precipitation amounts). Information is entered into these products as needed to reflect the true occurrences of a day's weather. Figures 5 through 7 show the preformats for these products.

This data is extracted from the AFOS database and incorporated into the complete MF1-10B via two programs: XTDSS.SV, whose purpose is to construct RDOS files containing the SAD and BEW information, and PR10B.SV, which takes information from different sources and properly formats it into the MF1-10B replica.

PR10A produces an automated replica of the standard Meteorological Form 1-10A including all appropriate headings and column alignment. The actual size of the form is as near as physically possible to the standard, given the hardware available. The actual width of the form is about 1/2 inch greater that the standard but its length is identical, and yet it is capable of containing 75 lines of observations. (In order to maintain the uniform length, "blank" lines are output as part of the form whenever it is necessary to make up the difference between the actual number of observations in any one day and the number of observations possible on the form. These "blank" lines do contain printed characters in order to maintain column distinction throughout the form.) Dashed lines are printed to mark the top and bottom of the form to indicate where the paper must be torn or cut before it is archived locally or mailed to the National Climatic Center.

The program does little more than read and write data, one line at a time. The input file is the user's MF1-10A file (named xxxSAOS) in SYSZ and the output device is the Printer Plotter Module (PPM).

Processing begins by reading the local id from the site's AFOS SKEL file to retrieve the xxx in xxxSAOS. The output device is then opened and a form feed of 20 lines is output. This is to insure that the actual printing of data is accomplished on paper that has not dried out while sitting at or near the print mechanism of the PPM.

First a string of hyphen characters are output to mark the beginning of the form, next data transfer is accomplished by reading from the 10A file xxxSAOS and writing to the PPM until the end of the 10A file is encountered. If the 10A file contains less than 75 lines of data, the differing number of lines are then output as "blank" lines. If by chance the 10A contains more than 75 lines, the end of the first form is marked and a form feed is output. Then a new form, page two of the same day with all appropriate headings, is generated via the same process until the end of the 10A file is encountered. At that point the program will again form feed paper at the PPM and then terminate. See Figure 8 for a sample completed 10A.

XTDSS is executed via the P10B MACRO of the COARS end of day

TTAA00 KILG 150926   SYNOPTIC OBSERVATIONS

	TIME LST	PRECIP INS.	SNOW FALL	SNOW DEPTH	MAX TEMP.	MIN TEMP.	STATE OF GRND	SOIL TEMP.
MID TO	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]		
	MID	[ ]	[ ]	[ ]	[ ]	[ ]		

* * * * * * * * * * * STATION PRESSURE COMPUTATIONS * * * * * * * * * * * * *

	TIME LST	STATION PRESSURE	BAROGRAPH READING	BAROGRAPH CORRECTION
	[ ]	[ ]	[ ]	[ ]
	[ ]	[ ]	[ ]	[ ]
	[ ]	[ ]	[ ]	[ ]
	[ ]	[ ]	[ ]	[ ]

* * * * * * * * * * * END OF DAY SUMMARY IS ON NEXT PAGE. * * * * -----> [ ]
  | | | | | | | | | GO TO END OF PAGE 2 BEFORE ENTERING | | | | ----->
                   SUMMARY OF DAY (MIDNIGHT TO MIDNIGHT)

24HR MAX TEMP	24HR MIN TEMP	24HR PRECIP WATER EQUIV	24HR SNOWFALL UNMLTD INS.	SNOW DEPTH	PEAK WIND SPD KTS	DIR	TIME LST	WATER EQUIV (INS)
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

REMARKS, NOTES AND MISCELLANEOUS PHENOMENA

***** U MUST ENTER TIME OF SUNRISE [   ] & TIME OF SUNSET [   ] *****
      TOT MINS OF SUNSHINE   [   ]   PERCENT OF PSBL SUNSHINE [   ]
      CHARACTER OF SUNRISE [   ]   CHARACTER OF SUNSET [   ]

FASTEST 1-MIN WND SPD[   ]MPH / FASTEST MILE[   ]DIRECTION[   ]TIME[   ]

TIME CHECK - CLOCK CORRECT TO NEAREST MINUTE AT: [   ]
[   ]
[   ]
[   ]
[   ]
[   ]
[   ]

Figure 5. Six-hourly and daily data preformat cccMCPSAD

TTAA00 KILG 100037

! ! ENTER THE BEGINNING AND ENDING OF WEATHER EVENTS IN THE PROPER COLUMNS ! !
* * * * TAB TO THE END OF PAGE TWO BEFORE ENTERING <--- VERY IMPORTANT * * * *

```
      EVENT              TIME BEGAN           TIME ENDED
[ NONE        ]          [        ]           [        ]
[             ]          [        ]           [        ]
[             ]          [        ]           [        ]
[             ]          [        ]           [        ]
[             ]          [        ]           [        ]
[             ]          [        ]           [        ]
[             ]          [        ]           [        ]
[             ]          [        ]           [        ]
[             ]          [        ]           [        ]
[             ]          [        ]           [        ]
[             ]          [        ]           [        ]
[             ]          [        ]           [        ]
[             ]          [        ]           [        ]
[             ]          [        ]           [        ]
[             ]          [        ]           [        ]          [ ]
[             ]          [        ]           [        ]
[             ]          [        ]           [        ]
[             ]          [        ]           [        ]
[             ]          [        ]           [        ]
[             ]          [        ]           [        ]
[             ]          [        ]           [        ]
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[             ]          [        ]           [        ]
[             ]          [        ]           [        ]
[             ]          [        ]           [        ]
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[             ]          [        ]           [        ]
[             ]          [        ]           [        ]
[             ]          [        ]           [        ]
[             ]          [        ]           [        ]
[             ]
      EVENT              TIME BEGAN           TIME ENDED
* * *        ! ! TAB TO END OF PAGE BEFORE ENTERING ! ! * * *                  [ ]
```

Figure 6.   Weather log preformat cccMCPBEW

TTAA00 KILG 100209

24 HOUR PRECIPITATION LOG

```
  00-01    01-02    02-03    03-04    04-05    05-06    06-07    07-08
[       ] [       ] [       ] [       ] [       ] [       ] [       ] [       ]

  08-09    09-10    10-11    11-12    12-13    13-14    14-15    15-16
[       ] [       ] [       ] [       ] [       ] [       ] [       ] [       ]

  16-17    17-18    18-19    19-20    20-21    21-22    22-23    23-24
[       ] [       ] [       ] [       ] [       ] [       ] [       ] [       ]
```

* * * * * * ENTER HOURLY PRECIP AMOUNTS INCLUDING A DECIMAL POINT * * * * * *

PLACE CURSOR HERE [ ] THEN STRIKE ENTER

[ ]
PAGE 01

Figure 7. 24-hour precipitation preformat cccMCP24P

NATIONAL LEATHER SERVICE
WILMINGTON, DE

SURFACE LEATHER OBSERVATIONS
MF1-10A

THU MAR 26 1987
STATION ELEVATION   88.8 FEET

TO CONVERT LST TO GMT ADD 5 HOURS

TY PE	TIME LST	SKY AND CEILING (HUNDREDS OF FEET)	PREVAILING VISIBILITY	LEATHER & OBSTRUCTIONS TO VISION	SEA LVL PRS MBS	TMP oF	DEW PT. oF	WIND DIR 10-36	SPD KTS	CHARACTER	ALTIMETR SET. INS.	REMARKS AND SUPPLEMENTAL CODED DATA	OBSR INTS
1	2	3	4	5	6	7	8	9	10	11	12	13	15
SA	10851	M44 OVC	10		1361	491	461	16	181		9931/ 81588 15// 63		JFS
SA	10158	M39 BKN	10		1291	491	451	16	881		9911		JFS
SA	10258	M36 BKN	10		1221	491	461	16	881		9891		JFS
RS	10352	M32 BKN /////// 3855)	7		1191	491	471	15	851		9881/ 717 1588 (COR		JFS
SA	10352	M32 BKN /////// 8857)	7		1191	491	471	15	851		9881/ 717 1588 (COR		JFS
SA	10450	M31 BKN	7		1191	491	471	15	841		9891		JFS
SP	10520	M29 BKN	7					88	881		9891		JFS
SA	10558	M27 BKN	7		1191	481	461	16	841		9881		JFS
SA	10653	M25 OVC	8		1261	581	471	17	841		9981/ 387 15// 48		CS
SA	10751	M22 OVC	8		1331	531	481	27	871		9921		CS
SP	10808	22 SCT	8					24	861		9921		CS
SA	10853	25 SCT	10		1291	581	481	27	111		9911		CS
SA	10953	35 SCT	10		1291	621	441	29	151		9911/ 183 1588		CS
SA	11052	44 SCT	10		1291	621	431	38	121		9911		LC
SA	11150	44 SCT	10		1221	651	481	29	121G28		9891		LC
SA	11253	E58 BKN	10		1191	651	391	31	131		9881/ 818 1588 48		LC
SA	11332	E58 BKN	10		1161	641	381	32	131		9871		LC
SA	11451	E55 BKN	10		1121	641	371	38	881G18		9861		RDH
SA	11558	55 SCT	10		1161	661	381	29	851		9871/ 583 1488		LC
SA	11658	55 SCT	10		1161	651	371	38	891		9871		RDH
SA	11753	CLR	10		1261	611	381	35	871		9981/FEU SC		RDH
SA	11853	CLR	10		1331	571	361	36	861		9921/CI U 317 1881 67		RDH
SA	11952	CLR	10		1391	561	361	36	851		9941		RDH
SA	12852	CLR	10		1411	571	361	88	841		9951		RDH
SA	12154	CLR	8		1441	521	361	85	831		9961/ 312		RDH
SA	12258	CLR	8		1481	491	381	88	881		9971		CKD
SA	12351	CLR	8		1481	481	361	88	881		9971		

Figure 8.   Completed MF1-10A   (reduced in size for publication)
(Note corrected observation)

functions. Its purpose is to convert two manually produced AFOS database products into RDOS files in SYSZ. (Since all of the data needed by COARS will not always be available at the same time, a method of capturing some of the data had to be established. The RDOS files captured by XTDSS can be manipulated sometime in the future, while the AFOS products can be updated for the new day.) These files will be processed further when the complete MF1-10B is compiled and printed.

The first database product accessed by this program is cccSADxxx which contains the 6 hourly and summary of the day data; the equivalent of the standard 10B, columns 42 thru 50, 59 thru 65, 66 thru 73, 80 and 90. The second product accessed is cccBEWxxx, the beginning and ending of weather log; columns 82 thru 88 of the standard 10B.

Activity within the program begins by reading the SKEL file in order to formulate the database keynames that will be accessed. The output filenames are set within the program. The relationship of keyname to filename is:

cccSADxxx = SAD.DT ... and ... cccBEWxxx = WXL.DT

The .main portion of XTDSS simply forms the needed key/file names and provides to the user possible error conditions messages and a status message. The actual data transfer takes place within subroutine XT, which is called twice. (This routine is a modified version of subroutine XTPK authored in 1983.) The first call to this routine extracts the product cccSADxxx by placing each data field of input onto its own line of output. This is accomplished by converting each end of data field (octal 11) to a carriage return (octal 15). (Although the output file will contain lines of data, it is actually written as blocks of data.) The second call to this subroutine follows the same process as the first with one adjustment. If there are no weather events during a given day, the product cccBEWxxx should contain the word NONE as its first and only entry. During this second call to the routine, a check is made to see if the word NONE is present. If it is, then the output file (WXL.DT) is deleted from disk and the program ends. If NONE is not present, then processing continues in the same manner by placing each input field onto an output line.

PR10B is the next program executed (via PRT10B.MC) in producing daily weather records. It uses input from several disk files and one AFOS product in order to output a complete replica of Meterological Form 1-10B, with all appropriate headings, columns and column numbers. As with the 10A form, the length of the document is equivalent to the standard, the width is again slightly larger. The top and bottom of the form is marked by hyphen characters. The file generated by this program is titled xxx10B.DT, where xxx equals the three letter identifier of the local site.

This program makes use of FORTRAN standard READ/WRITEs using the alphanumeric (A) format. Since the data required for the 10B form

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will always be of varying length and type, the A format was used because it will accept this differing data.

Processing within this program begins as with many of the others, by reading the SKEL to determine the site's identity in order to construct file and keynames. Next the output file is created and data transfer begins. The file 10B.DT, containing sky condition, temperatures, etc. is read in. The information is rearranged into its proper columns when output. A check is then made to see if hourly precipitation amounts exist from the AFOS product ccc24Pxxx. If they do, they are then output for the corresponding hourly period in column 40.

Once the 10B.DT file is exhausted, a large portion of the file SAD.DT is read in, reformatted, and then output. At the proper location, a check is made for the existence of WXL.DT. If it is on disk, it is read, then output simultaneously with the remainder of the SAD.DT file. If the beginning and ending of weather log (WXL.DT) should contain more than 20 entries (the maximum number permitted on one page in order to maintain proper paper length) then a second page of the MF1-10B will be created. This second page will contain the station identifier information, the day/date group and then only the remainder of the weather log. Figure 9 shows a sample completed 10B.

PR10B.SV does provide to the user two pieces of automated data. The average sky cover, sunrise to sunset, and midnight to midnight, is computed and output by the program, freeing the observer from one more quality control error.

This program calls one subroutine, XTPK. Its purpose is to convert the AFOS product ccc24Pxxx (the hourly precipitation log) into an RDOS file.

Finally, PRT10B.MC calls the program ARCFILES to "archive" the day's files onto DP2. Each filename is given a two-character date extension. COARS will use up two floppies per month for this, so an entire year of data can be kept on a 24-floppy set.

If errors are found in the current 10B output from the data input in cccSADXXX, cccBEWxxx or ccc24Pxxx, the operator may correct these products and then run C10.MC. This invokes XTDSS again and then reruns PRT10B.MC. If 10B.DT is more than 1 day old, though, pen and ink corrections should be made to the printed forms.

Figure 10 is an COARS "flowchart" showing the observer's activity throughout the day.

III. Cautions and Restrictions

Once the COARS system is installed and in use, all observations must be entered into it to maintain proper records. A "local" mode is available to catch up with observations created and sent by other means during AFOS outages.

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Erroneous and subsequently corrected observations must still be crossed out by hand on the MF1-10 forms output by COARS. The forms should also be cut to size on the lines provided.

The end-of-day programs do not check the supplemental data entered.

IV. References

Brehm, F.: Fortran Utility Library - UTIL.LB, AFOS System Programming Note No.16.

Chiusane, D.: CFSTO, AFOS System Programming Note No.93.

National Weather Service. Federal Meteorological Handbook #1 Surface Observations. U.S. Department of Commerce, Washington D.C. February 1, 1982.

Schuster, M.: Background Programming with AFOS, AFOS System Programming Note No.90.

Sunkel, W.: The Topeka Library (TOP.LB), NWS CRCP No. 7

NOTE: Due to space limitations, COARS source code has not been included in this CP. Source code may be obtained from Eastern Region SSD or the AFOS Applications Library maintained by TDL.

NATIONAL WEATHER SERVICE
WILMINGTON, DE

TO CONVERT LST TO GMT ADD 5 HOURS

TIME LST	STATION PRESS. INS. 17.	DRY BLB (F) 18.	DEW PT. (F) 19.	REL HUMI 120.	SKY COV (X) 121.	LOWEST LAYER AMT 22.	TYPE 23.	HGT 24.	SECOND LAYER TOT 25.	AMT 26.	TYPE 27.	HGT 28.	THIRD LAYER SUM TOT 29.	AMT 30.	TYPE 31.	HGT 32.	FOURTH LAYER SUM TOT 33.	AMT 34.	TYPE 35.	HGT 36.	TOT SKY 37.	MET OPQ PRS THD 38.	3HR CHG 40.	HRLY PCPN
																					101	8	1.845	
0051	29.845	49	46	89	10	10	SC	1M 44													8			
0158	29.825	49	45	86	8	8	SC	1M 39													8			
0258	29.805	49	46	89	8	8	SC	1M 36													9	7	1.858	
0352	29.795	49	47	93	9	9	SC	1M 32													9			
0458	29.795	49	47	93	9	9	SC	1M 31													8			
0558	29.795	48	46	93	8	8	SC	1M 27													101	3	1.020	
0653	29.815	58	47	89	10	10	SC	1M 25													101			
0751	29.835	53	48	83	10	10	SC	1M 22													11			
0853	29.825	58	48	69	1	1	SC	25													21	1	1.018	
0953	29.825	62	44	52	2	2	SC	35													31			
1052	29.825	62	43	50	3	3	CU	44													41			
1158	29.805	65	48	48	4	4	CU	44													71	8	1.838	
1253	29.795	65	39	38	7	7	SC	1E 58													71			
1352	29.785	64	38	38	7	7	SC	1E 58													61			
1451	29.775	64	37	37	6	6	SC	1E 55													31	5	1.818	
1558	29.785	66	38	36	3	3	SC	55													21			
1658	29.785	65	37	35	2	2	SC	55													81			
1753	29.815	61	38	42	8	8	SC	68													81	3	1.858	
1853	29.835	57	36	45	8	8	CI	258													81			
1952	29.855	56	36	47	8	8															81			
2052	29.868	57	36	45	8	8															81	3	1.835	
2154	29.878	52	36	54	8	8															81			
2258	29.888	49	38	66	8	8															81			
2351	29.888	48	36	63	8	8																		

SYNOPTIC OBSERVATIONS

TIME LST 42.	PRECIP INCHES 44.	SNOW FALL 45.	SNOW DEPTH 46.	MAX TEMP 47.	MIN TEMP 48.	STATE OF GRND 50.	SOIL TEMP 56.
MID TO 0048	8	8		49	49		
0048	T	8	8	51	49		
0648	8	8	8	58	48		
1251	8	8	8	67	58		
1858	8	8	8	67	57		
MID	8	8	8	57	47		

STATION PRESSURE COMPUTATIONS

TIME LST 59.	STATION PRESSURE 63.	BAROMETER READING 64.	BAROMETER CORRECTION 65.
0049	29.845	29.869	-.815
0649	29.815	29.828	-.005
1253	29.795	29.805	-.010
1851	29.835	29.825	+.010

SUMMARY OF THE DAY (MIDNIGHT TO MIDNIGHT)

24-HR MAX. TEMP. (F) 66.	24-HR MIN. TEMP. (F) 67.	24-HR PRECIP WATER EQUIV. (INS.) 68.	24-HR SNOW- FALL UNMLTD (INS) 69.	SNOW DEPTH (INS) 78.	PEAK WIND SPEED (KTS.) 71.	DIREC- TION 72.	TIME LST 73.	SKY COVER SUNRISE TO SUNSET 78.	MIDNIGHT TO MIDNIGHT 79.	WATER EQUIV (INS.) 88.	WEATHER AND OBSTRUCTIONS TO VISION TYPE 82.	BEGAN 83.	ENDED 84.
67	47	8	8	8	26	NW	1285	5	4				

90. REMARKS, NOTES AND MISCELLANEOUS PHENOMENA

TIME OF SUNRISE 0557   TIME OF SUNSET 1828
TOTAL MINUTES OF SUNSHINE   PERCENT OF POSSIBLE SUNSHINE
CHARACTER OF SUNRISE   CHARACTER OF SUNSET

FASTEST ONE MINUTE WIND SPEED 17 MPH /OR/ FASTEST MILE   DIRECTION 29   AT 0953   LST

TIME CHECK - CLOCK CORRECT TO NEAREST MINUTE AT: 0700E

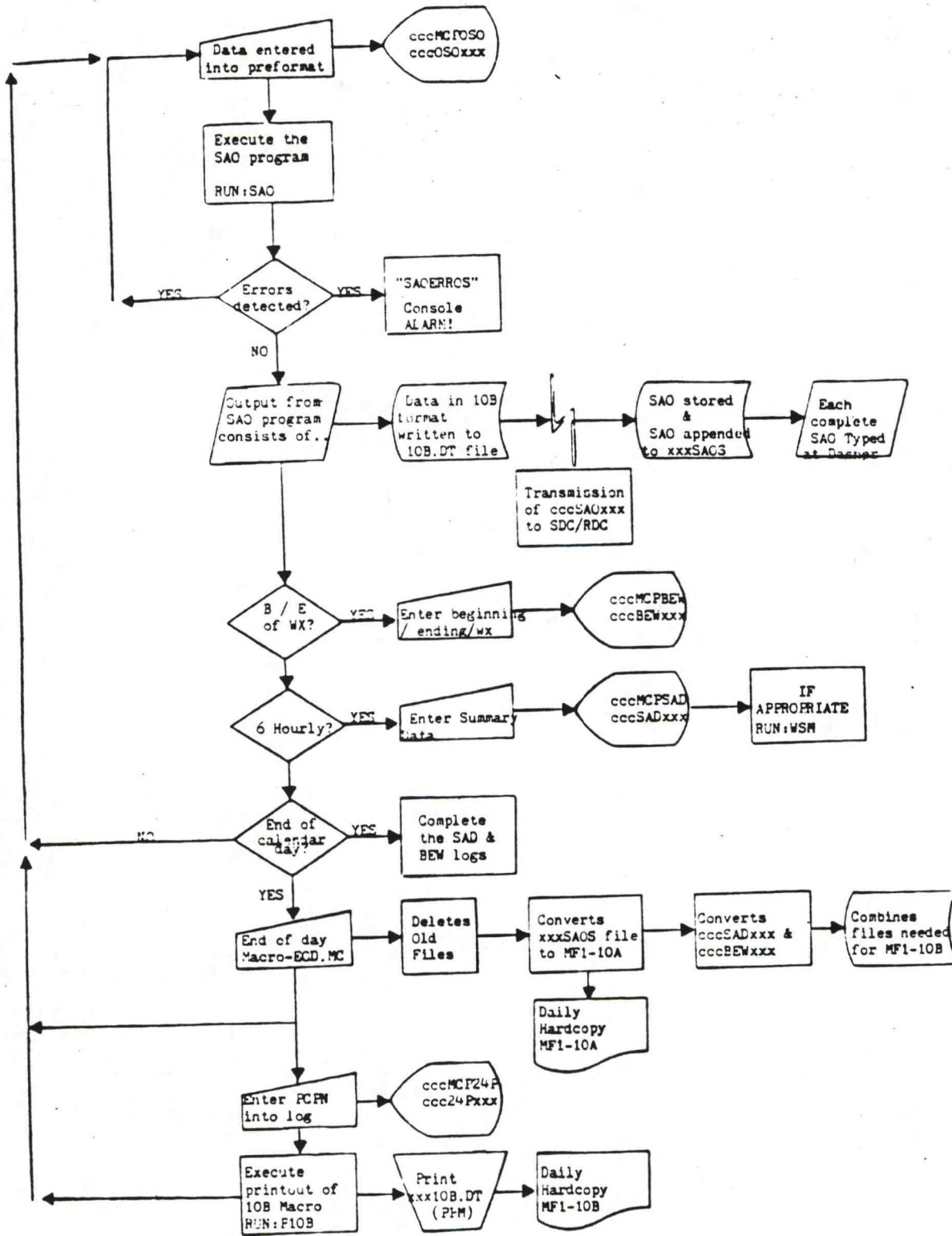Figure 9.   Completed MF1-10B (reduced)

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Figure 10. Daily COARS activities.

V.

COARS - SETTING UP

PART A: INFORMATION AND INSTALLATION

PROGRAM NAME: RVAL

AAL ID:
REVISION NO.: 1.00

PURPOSE: Creates an RDOS file RVAL.DT containing the local site's R (pressure reduction ratio) values.

PROGRAM INFORMATION:

Development Programmer:
  Lawrence Cedrone
Location: WSO ILG
Phone: (FTS) 487-6142
Language: DG FORTRAN IV/5.20
Date: 5/01/87
Running Time: 5-10 minutes, depending on operator speed
Disk Space:
  Program   24 RDOS blocks
  Data   5   "   "

Maintenance Programmer:
  Lawrence Cedrone
Location: WSO ILG
Phone: (FTS) 487-6142
Type: Standard, interactive
Revision Date:

PROGRAM REQUIREMENTS

Program Files:

Name	Disk Location	Comments
RVAL.SV	APPL1	

Data Files:

Name	Disk Location	R/W	Comments
RVAL.DT	SYSZ	W	Table of R-values (permanent and write-protected)

AFOS Products:

ID	Action	Comments
none		

LOAD LINE

RLDR RVAL <UTIL FORT>.LB

PROGRAM INSTALLATION

1.   SETUP.MC will move RVAL.SV from the floppy to APPL1 and create a link to
it in the master partition.

COARS - SETTING UP

PART B: EXECUTION AND ERROR CONDITIONS

PROGRAM NAME: RVAL

AAL ID:
REVISION NO.: 1.00

PROGRAM EXECUTION:

1. At the Dasher, type RVAL (carriage return).

2. The program will give you the choice of creating a new RVAL.DT, editing an existing one or aborting the program. The abort option was included in case the operator realizes that the entire file can't be completed in one sitting. You cannot stop in the middle and add more later.

3. For the first two options, the program will prompt you to enter the data from the local WBAN Form 54-7.3 (Pressure Reduction Ratio Table). If you're creating a new file, it asks for the lowest and highest temperatures for which the table has an R-value. Then it asks for the decimal portion only of the R-value for each temperature within those bounds. If you're editing an existing RVAL.DT, it will ask which temperature has the R-value that needs correcting.

4. Once the table is complete, print or type a copy of the file RVAL.DT and check the values. If there are any errors, correct the file using RVAL's edit option.

5. If there are no errors, move RVAL.DT to APPL1 and create a link to it in SYSZ. RVAL.SV can be removed from the opertational disk. (It would be a good idea to make a backup copy of RVAL.DT on a floppy.)

ERROR CONDITIONS

Messages from ADM	Meaning
none	

Dasher Messages	Meaning
none	

COARS - TAKING OBSERVATIONS

PART A: INFORMATION AND INSTALLATION

PROGRAM NAME:

AAL ID:
REVISION NO.:

SAO	2.20
SAP1	2.20
SESP	1.00
SAOII	2.00

PURPOSE: The overall purpose of these programs is to create a properly formatted surface observation cccSAOxxx from the data entered into the product cccOSOxxx. The observed data is also recorded in several files for use in creating the day's MF1-10A and MF1-10B.

SAO reads the command line, assembles keynames for input and output products and determines the local time zone and the date/time groups (local and UTC). This information is written to the file SAFL. SAO then chains either to SAP1 or, if the ob is a single-element special, to SESP. Both programs read SAFL, compose the observation using the input data in cccOSOxxx, and store the ob (transmitting if required) if there are no serious errors. SAP1 also generates the upper portion of MF1-10B (columns 17-38). Both then chain to SAOII, which writes the completed ob to the Dasher and also maintains the 24-hour observation file in MF-10A format. Every three hours SAOII backs up the MF1-10A and B files on disk.

PROGRAM INFORMATION:

Development Programmer:
  Lawrence Cedrone
Location: WSO ILG
Phone: (FTS) 487-6142
Language: DG FORTRAN IV/5.20
Date:

SAO.SV	-	06/20/87
SAP1.SV	-	06/15/87
SESP.SV	-	08/18/87
SAOII.SV	-	05/01/87

Maintenance Programmer:
  Lawrence Cedrone
Location: WSO ILG
Phone: (FTS) 487-6142
Type: Chain
Revision Date:
  SAO.SV (2.10) - 05/01/87
  SAP1.SV (2.10)- 05/01/87

Running Time: 10-35 seconds depending on length and type of observation

Disk Space:
  Program   211 RDOS blocks
  Data   53   "   "   max

PROGRAM REQUIREMENTS

Program Files:

Name	Disk Location		Comments
SAO.SV	APPL1		
SAP1.SV	APPL1		
SESP.SV	APPL1		
SAOII.SV	APPL1		

Data Files:

Name	Disk Location	R/W	Comments
SAFL	SYSZ	W/R	passes data between 3 programs
RVAL.DT	APPL1	R	Local R-values (created w/RVAL)
SAERR.TX	APPL1	R	Canned error messages
SAOERRORS	SYSZ	W	Error messages for particular run of SAO; product SAOERRORS
cccSAOxxx	SYSZ	W	Actual ob; product cccSAOxxx
SAxxx	SYSZ	W/R	Actual ob in MF1-10A format
SAOSUPDAT	SYSZ	W	Dewpoints; product SAOSUPDAT
HWND.DT	SYSZ, USER1	W	Hourly wind data
LRMK.DT	SYSZ	W/R	Local remarks; written to MF1-10A
SPF.DT	APPL1	R/W	Parameter file
xxxSAOS	SYSZ, USER1	W	MF1-10A
10B.DT	SYSZ, USER1	W	24 hrs of MF1-10B cols 16-38
10A.HD	APPL1	R	Headings of MF1-10A

AFOS Products:

ID	Action	Comments
cccMCPOSO	Msg Comp	MUST be fields-only
cccOSOxxx	Msg Comp	contains input SA data
cccSAOxxx	Store	Actual ob output; alert
SAOSUPDAT	Store	Supplementary data; alert
SAOERRORS	Store	Error messages - must be alarmed at observer console

LOAD LINE

RLDR SAO ID LTZ MMHDR <TOP UTIL FORT>.LB
RLDR SAP1 SAOMCP SKY SAERR SFCVS TWRVS WX TMP PRESS DWPT WND RVR REM1 REM2
REM3 APPRR ADDAT XTREM COPY NXLN W10B SAD RARV CITAP NUM <TOP BG UTIL
FORT>.LB 17/C
RLDR SESP SAOMCP CITAP COPY <BG UTIL FORT>.LB
RLDR SAOII CORREM SPCS CITAP NEWDAY NWLN FLCPY TWARO CHK10A <BG UTIL FORT>.LB

PROGRAM INSTALLATION

1. SETUP.MC will install SAO.SV, SAP1.SV, SESP.SV, SAOII.SV and the necessary data files in APPL1 and create links to them in the master partition.

2. Add cccMCPOSO (1 version), cccOSOxxx (2 versions), SAOSUPDAT (8 versions) and SAOERRORS (8 versions) to the database. There are four types of the preformat available: one for stations that report both RVR and minutes of sunshine (file MCPOSP001), one for those that report RVR only (MCPOSO002), one for those that report minutes of sunshine only (MCPOSO003) and one for those that report neither (MCPOSO004). Store the preformat appropriate for your station into cccMCPOSO (at an ADM type STORE:DPx:MCPOSO00y cccMCPOSO, where x is the floppy drive number and y is the preformat number). Use the KEY: command to alarm SAOERRORS and alert cccSAOxxx and SAOSUPDAT at the observer's console.

3. Edit the file 10B.DT an an ADM to reflect local conditions and enter initial data. Change

day/date group	to current day/date
station name	to site name
elevation	to site elevation
conversion to UTC	to proper number of hours

Then, enter all data for the 24 hours previous to the hour you will be running SAO for the first time. Data must be right justified and the bar must always remain in column #78. See ERCP #42, Appendix B or the COARS User's Manual for editing instructions.

4. Make sure the R-value table has been created with RVAL.SV.

COARS - TAKING OBSERVATIONS

PART B: EXECUTION AND ERROR CONDITIONS

PROGRAM NAME:	AAL ID:
	REVISION NO.:
SAO	2.20
SAP1	2.20
SESP	1.00
SAOII	2.00

PROGRAM EXECUTION:

1. The observed weather data should be entered in product cccOSOxxx using the preformat cccMCPOSO (M:OSO). Justification is not necessary; see ERCP #42, Appendix C, for full instructions.

2. Once the data is entered, start the ob creation process by running SAO:

RUN:SAO [/L,/C,/F,/S,/SC,/SL]

NORMAL OBSERVATION - Type RUN:SAO.

CORRECTION - To correct the previous observation sent, enter the correct data in cccOSOxxx (retaining the original time of observation) and type RUN:SAO/C. This will create, transmit and record a correction to the previous observation ("COR" in the observation, column 13 remark "COR hhmm" in MF1-10A).

LOCAL - For a local observation, type RUN:SAO/L. This will create and record an observation but not transmit it. This can be used to enter missed observations after an AFOS failure: enter each observation in cccOSOxxx and then run SAO/L, beginning with the earliest missed ob. The same procedure can be used if the system clock has been set wrong: process each observation again from the time the clock went wrong. (In this case you should also purge all copies of cccOSOxxx before restoring the observations.) If either problem extended past midnight, you will have to close out the first day with the usual end-of-day procedures and then begin entering the observations for the second day. See the COARS User's Manual for more detailed instructions. A wrong date will only cause problems on the first observation of the day; re-enter that ob and run SAO/L.

FORCE TRANSMIT - To force transmit an observation, type RUN:SAO/F. This is a failsafe in case COARS will not accept the observation but there really is no error. This does not stop the error checking, so the operator will still get the fatal error message.

SINGLE ELEMENT SPECIAL - Type RUN:SAO/S. Only the current weather and remarks parts of the preformat will be read and checked.

SINGLE ELEMENT SPECIAL CORRECTION - To correct the ob previously sent when it is a single element special, type RUN:SAO/SC.

SINGLE ELEMENT SPECIAL LOCAL - To enter but not transmit a single element special (for recovery - see LOCAL above), type RUN:SAO/SL.

3. If a fatal error occurs, edit cccOSOxxx and rerun SAO. The aborted observation can be checked by displaying the file cccSAOxxx (DSP:cccSAOxxx) - this may indicate where the error is. If a non-fatal error occurs, the observation will be sent, but should be checked in case a correction is necessary. Remarks can sometimes cause problems.

The method described with the LOCAL switches above is preferred for data recovery. If it is not feasible, you can use E:F/10B.DT to enter all data up to the current hour. If the down time extends past midnight, you must enter all data for the first day, close out that day with the usual end-of-day macros, then enter the data for the next day. See ERCP #42, Appendix B or the COARS User's Manual.

If the observation type is a special or if the observation is a correction, the COARS generated observation will be encoded as type E, per AOD 12.00.

ERROR CONDITIONS

Messages from ADM	Meaning
RDG SYS FILE	Problem reading SKEL or ICE2.CM
RUN LINE	Error in run line
RDG PREFORMAT	Can't access cccOSOxxx
TIME OF OB	Ob time not within +/-5 min of system clock
TYPE OF OB	Unknown ob type
TEMP MISSING	Temp missing from hourly or local
10A FILE...CHECK DASHER	Can't open xxxSAOS

Dasher Messages	Meaning
UNABLE TO OBTAIN R VALUE... SLP MISSING	No sea level pressure
ERROR ENCOUNTERED WHILE CREATING MF-10A FILE FOR NEW DAY...	Can't read xxxSAOS

COARS - RETREIVING SYNOPTIC DATA

PART A: INFORMATION AND INSTALLATION

PROGRAM NAME: WSM

AAL ID:
REVISION NO.: 1.10

PURPOSE: WSM writes a copy of a synoptic observation into the MF1-10A file xxxSAOS. Stations that manually compose and transmit synoptic observations should run this program after each ob is sent (every six hours). Stations that do not record synoptic observations do not need this program.

PROGRAM INFORMATION:

Development Programmer:
  Lawrence Cedrone
Location: WSO ILG
Phone: (FTS) 487-8280
Language: DG FORTRAN IV/5.20
Date: 09/23/87
Running Time: 15 seconds
Disk Space:
    Program   14 RDOS blocks
    Data   0 extra - writes to existing xxxSAOS file

Maintenance Programmer:
  Lawrence Cedrone
Location: WSO ILG
Phone: (FTS) 487-8280
Type: Standard
Revision Date: 05/01/87 (1.00)

PROGRAM REQUIREMENTS

Program Files:

Name	Disk Location	Comments
WSM.SV	APPL1	

Data Files:

Name	Disk Location	R/W	Comments
xxxSAOS	SYSZ	W	MF1-10A
SKEL	SYSA	R	for ccc and xxx

AFOS Products:

ID	Action	Comments
cccSSMxxx	Read	Local synoptic observation

LOAD LINE
RLDR WSM <BG UTIL FORT>.LB

PROGRAM INSTALLATION

1.   SETUP.MC will install WSM.SV in APPL1 and create a link to it in the master partition.

COARS - RETRIEVING SYNOPTIC OBSERVATIONS

PART B: EXECUTION AND ERROR CONDITIONS

PROGRAM NAME: WSM

AAL ID:
REVISION NO.: 1.10

PROGRAM EXECUTION:

1. After the synoptic observation has been stored, type RUN:WSM at an ADM.

ERROR CONDITIONS

Messages from ADM

JOB WRITING SM ABORTED!
            ERROR:FILE I/O

Meaning

Could not extract SSM from
the AFOS database. Re-store
ob and re-run WSM.

Dasher Messages

Meaning

COARS - END OF DAY

PART A: INFORMATION AND INSTALLATION

PROGRAM NAME: PR10A

AAL ID:
REVISION NO.: 1.00

PURPOSE: Prints out a copy of MF1-10A on the PPM as part of the end-of-day routine. (May be run at any time for copies of current or past MF1-10A's.) The copy is a close to the standard MF1-10A as the hardware allows (length identical, width about 1/2 inch larger) and can hold 75 lines of observations. If there are more than 75 lines, a second page is produced.

PROGRAM INFORMATION:

Development Programmer:
  Lawrence Cedrone
Location: WSO ILG
Phone: (FTS) 487-6142
Language: DG FORTRAN IV/5.20
Date: 05/01/87
Running Time: 22 seconds
Disk Space:
    Program   27 RDOS blocks
    Data   10-12 RDOS blocks

Maintenance Programmer:
  Lawrence Cedrone
Location: WSO ILG
Phone: (FTS) 487-6142
Type: Standard
Revision Date:

PROGRAM REQUIREMENTS

Program Files:

Name	Disk Location	Comments
PR10A.SV	APPL1	
EOD.MC	APPL1	End-of-day macro

Data Files:

Name	Disk Location	R/W	Comments
xxxSAOS	SYSZ,DP<2,3>	R	local MF1-10A file (current in SYSZ, old files on floppies)
OLD10A	SYSZ	R	yesterday's MF1-10A
SKEL	SYSA	R	to obtain local xxx

AFOS Products:

ID	Action	Comments
none		

<u>LOAD LINE</u>
RLDR PR10A <UTIL FORT>.LB

<u>PROGRAM INSTALLATION</u>

1.   SETUP.MC will move PR10A.SV, EOD.MC and MSG1 to APPL1 and create a link
to them from the master partition.

2. Edit the macro EOD.MC: change the XXX in XXXSAOS to the local site id.

COARS - END OF DAY

PART B: EXECUTION AND ERROR CONDITIONS

PROGRAM NAME: PR10A

AAL ID:
REVISION NO.: 1.00

PROGRAM EXECUTION:

1. PR10A is routinely executed by the end of day macro EOD.MC. EOD should only be run near midnight LST or before the first ob of the new day and then only once!

2. PR10A itself can be executed manually at any time to obtain a copy of the current or previous MF1-10A's. At an ADM, type

RUN:PR10A   or   RUN:PR10A/0   or   RUN:PR10A/x/nn

Running the program with no switches prints out the current MF1-10A. Using the 0 (letter O) switch prints out yesterday's MF1-10A from the file OLD10A in SYSZ. To reprint an old 10A from a floppy, use 2 or 3 for x to indicate the drive where the floppy is and substitute the date of the data desired for nn. To print a 10A for the twelfth from a floppy in DP3, for example, type RUN:PR10A/3/12.

3. The program will formfeed 20 lines at the beginning to eject any dried-out PPM paper. Cut the finished MF1-10A on the dashed lines to reduce it to standard length before sending to NCDC or archiving locally.

ERROR CONDITIONS

Messages from ADM	Meaning
none	

Dasher Messages	Meaning
ERROR ENCOUNTERED WHILE PRINTING...	PPM off or out of paper
FILE DOES NOT EXIST ON THAT FLOPPY	No xxxSAOS file in drive indicated

COARS - END OF DAY

PART A: INFORMATION AND INSTALLATION

PROGRAM NAME: XTDSS

AAL ID:
REVISION NO.: 1.00

PURPOSE: Converts cccSADxxx and cccBEWxxx to RDOS files SAD.DT and WXL.DT, respectively. (Program PR10B will use these files to create the MF1-10B.)

PROGRAM INFORMATION:

Development Programmer:
 Lawrence Cedrone
Location: WSO ILG
Phone: (FTS) 487-6142
Language: DG FORTRAN IV/5.20
Date: 5/1/87
Running Time: 10 seconds
Disk Space:
 Program   27 RDOS blocks
 Data   2-4 "   "

Maintenance Programmer:
 Lawrence Cedrone
Location: WSO ILG
Phone: (FTS) 487-6142
Type: Standard
Revision Date:

PROGRAM REQUIREMENTS

Program Files:

Name	Disk Location	Comments
XTDSS.SV	APPL1	
P10.MC	APPL1	Executing macro

Data Files:

Name	Disk Location	R/W	Comments
SAD.DT	SYSZ	W	cccSADxxx in RDOS file form
WXL.DT	SYSZ	W	cccBEWxxx in RDOS file form
SKEL	SYSA	R	

AFOS Products:

ID	Action	Comments
cccSADxxx	Read	six-hourly and daily summary data
cccBEWxxx	Read	weather log (cols. 82-88 of 10B)
cccMCPSAD	Msg Comp	MUST be fields-only
cccMCPBEW	Msg Comp	" " "

<u>LOAD LINE</u>
RLDR XTDSS XT <BG UTIL FORT>.LB

<u>PROGRAM INSTALLATION</u>

1.   SETUP.MC will move XTDSS.SV and P10.MC to APPL1 and create a link to them
in the master partition.

2.   Add cccMCPSAD, cccMCPBEW, and four versions each of cccSADxxx and
cccBEWxxx to the database. The MCP's must be set to fields-only. Store the
files MCPSAD and MCPBEW into the preformats.

COARS - END OF DAY

PART B: EXECUTION AND ERROR CONDITIONS

PROGRAM NAME: XTDSS

AAL ID:
REVISION NO.: 1.00

PROGRAM EXECUTION:

1. cccSADxxx and cccBEWxxx must be completely filled out before executing XTDSS. cccSADxxx holds the 6-hourly/synoptic data and the summary of the day. It should be started using M:SADxxx at 06Z, edited at each 6-hour ob thereafter with E:SADxxx, and completed with the summary data at midnight. cccBEWxxx data can be entered at any time of day. The BEW preformat can hold up to 23 events; if there are more, continue them in column 90 of cccSADxxx. If there are no events for the day, just create the BEW product with M:BEWxxx, tab below the word "NONE", and store.

2. XTDSS is executed by the P10 macro.

ERROR CONDITIONS

Messages from ADM	Meaning
none	

Dasher Messages	Meaning
ERROR ENCOUNTERED WHILE READING SKEL FILE	Could not open SKEL
ERROR ENCOUNTERED WHILE READING SUMMARY OF DAY PRODUCT...	Problem reading cccSADxxx, re-enter and re-run P10
ERROR ENCOUNTERED WHILE READING THE BEGIN-NING AND ENDING OF WEATHER PRODUCT...	Problem reading cccBEWxxx, re-enter and re-run P10

COARS - END OF DAY

PART A: INFORMATION AND INSTALLATION

PROGRAM NAME: PR10B

AAL ID:

REVISION NO.: 1.00

PURPOSE: Outputs a copy of MF1-10B as a disk file. Like the MF1-10A, the form is slightly wider than standard and is marked with cutting lines for length and width. Besides assembling information from several files and the 24P product, PR10B calculates the average sky cover from sunrise to sunset and from midnight to midnight.

PROGRAM INFORMATION:

Development Programmer:
  Lawrence Cedrone
Location: WSO ILG
Phone: (FTS) 487-8280
Language: DG FORTRAN IV/5.20
Date: 5/1/87
Running Time: 30 seconds
Disk Space:
    Program   44 RDOS blocks
    Data   8   "   "

Maintenance Programmer:
  Lawrence Cedrone
Location: WSO ILG
Phone: (FTS) 487-8280
Type: Standard
Revision Date:

PROGRAM REQUIREMENTS

Program Files:

Name	Disk Location	Comments
PR10B.SV	APPL1	
PRT10B.MC	APPL1	Executing macro

Data Files:

Name	Disk Location	R/W	Comments
xxx10B.DT	SYSZ	W	10B form output
10B.DT	SYSZ	R	Stored day's obs
WXL.DT	SYSZ	R	Weather log
SAD.DT	SYSZ	R	Summary of day
OLD10B	SYSZ	W	Yesterday's 10B
WRKFILE	SYSZ	W/R	holds ccc24Pxxx
SKEL	SYSA	R	For local xxx

AFOS Products:

ID	Action	Comments
ccc24Pxxx	R	Hourly precip amounts
cccMCP24P	Msg Comp	MUST be fields-only

LOAD LINE
RLDR PR10B XTPK <BG UTIL FORT>.LB

PROGRAM INSTALLATION

1. SETUP.MC will move PR10B.SV, PRT10B.MC and MSG3 to APPL1 and create links to them from SYSZ.

2. Add ccc24Pxxx (purge parameter 6 hours) and cccMCP24P (fields-only) to the database. Store the file MCP24P into the preformat.

3. Edit PRT10B.MC: change the XXX in XXX10B.DT to the local site id.

COARS - END OF DAY

PART B: EXECUTION AND ERROR CONDITIONS

PROGRAM NAME: PR10B   AAL ID:
                                        REVISION NO.: 1.00

PROGRAM EXECUTION:

1. If precipitation has occured, the product ccc24Pxxx must be created using M:24Pxxx after the raingauge chart has been worked up. If the chart has not been changed yet and all end-of-day processing up to PRT10B.MC has been done, COARS may be used to start the next days's observations but the previous day's 10B form cannot be generated.

2. PR10B.SV is run via the end of day macro PR10B.MC

ERROR CONDITIONS

Messages from ADM	Meaning
none	

Dasher Messages	Meaning
PROCESSING OF MF10-B ABORTED...	bad sunrise or sunset time in file SAD.DT

ARCHIVING COARS DATA

PART A: INFORMATION AND INSTALLATION

PROGRAM NAME: ARCFILES

AAL ID:
REVISION NO.: 1.10

PURPOSE: ARCFILES moves copies of xxxSAOS, xxx10B.DT and OLDWINDS (renaming it xxxWINDS) to DP2.   The filenames are given 2-digit date extensions.

PROGRAM INFORMATION:

Development Programmer:
  Lawrence Cedrone
Location: WSO ILG
Phone: (FTS) 487-6142
Language: FORTRAN IV/5.20
Date: 09/26/87
Running Time: 20 seconds
Disk Space:
    Program   30 RDOS blocks
    Data   uses existing files

Maintenance Programmer:
  Lawrence Cedrone
Location: WSO ILG
Phone: (FTS) 487-6142
Type: Standard
Revision Date: 05/01/87 (1.00)

PROGRAM REQUIREMENTS

Program Files:

Name	Disk Location	Comments
ARCFILES.SV	APPL1	
PRT10B.MC	APPL1	Executing macro

Data Files:

Name	Disk Location	R/W	Comments
xxxSAOS	SYSZ	R/W	Read from SYSZ, written to DP2
xxx10B.DT	SYSZ	R/W	" "
OLDWINDS	SYSZ	R/W	" "

AFOS Products:

ID	Action	Comments
none		

<u>LOAD LINE</u>
RLDR ARCFILES MNTH SPCS CITAP WFLS <BG UTIL FORT>.LB

<u>PROGRAM INSTALLATION</u>

1. SETUP.MC will move ARCFILES.SV to APPL1 and create a link to it in SYSZ.

2. A set of 24 floppies will be needed to archive one year's worth of data.

ARCHIVING COARS DATA

PART B: EXECUTION AND ERROR CONDITIONS

PROGRAM NAME: ARCFILES.SV
AAL ID:
REVISION NO.: 1.10

PROGRAM EXECUTION:

Normally, ARCFILES is executed by the PRT10B macro. If necessary, it can be executed separately by typing RUN:ARCFILES on an ADM or ARCFILES on the Dasher.

ARCFILES will fill two floppies per month; start new ones on the first and the sixteenth.

ERROR CONDITIONS

Messages from ADM	Meaning
NO FLOPPY	See first Dasher message below
CHECK DASHER	See second Dasher message below

Dasher Messages	Meaning
PROGRAM ARCFILES FAILED... NO FLOPPY IN DP2	Insert floppy and rerun ARCFILES
PROGRAM ARCFILES FAILED DUE TO A PROBLEM WITH DP2 THE FLOPPY IN DP2 MAY BE FULL...OR THE FLOPPY OR THE DRIVE MAY BE DAMAGED	Check drive/floppy. Rerun ARCFILES once problem is solved.

APPENDIX A

ERROR MESSAGES RETURNED BY THE SAO ENCODER OF COARS

The message returned in SAOERRORS will begin with one of the two lines below, depending on whether the error was fatal or not.

* * * DUE TO THE FOLLOWING ERROR(S) - SFC OB WAS NOT TRANSMITTED!
! ! ! ! NON-FATAL ERROR(S) DETECTED - SFC OB WAS TRANSMITTED!

FATAL ERRORS

Cloud Cover

One of the first four error messages is output whenever COARS finds errors while encoding the sky condition (errors 1-14). It indicates in which of the cloud layers the error occurred.

....ERRORS FOUND IN THE 1ST CLOUD LAYER....
....ERRORS FOUND IN THE 2ND CLOUD LAYER....
....ERRORS FOUND IN THE 3RD CLOUD LAYER....
....ERRORS FOUND IN THE 4TH CLOUD LAYER....

1. LAYER AMOUNT GREATER THAN 10!
2. SUMMATION AMOUNT GREATER THAN 10 /OR/ LESS THAN PREVIOUS SUMMATION!
3. LAYER AMOUNT EXCEEDS SUMMATION /OR/ SUM EXCEEDS TOTAL OF ALL LAYERS!
4. TOTAL OPAQUE LESS THAN PREVIOUS TOTAL OPAQUE /OR/ EXCEEDS SUMMATION!
5. INVALID TYPE OF CLOUD OR OBSCURATION!
6. NO CLOUDS RECORDED, BUT LAYER AMOUNT OR SUMMATION NOT EQUAL TO ZERO
7. CEILING DESIGNATOR NOT AN E...M.. OR W!
8. MORE THAN ONE CEILING DESIGNATOR!
9. UNNECESSARY CEILING DESIGNATOR / OR DESIGNATOR MISSING!
10. TOTAL OBSCURATION WITHOUT TOTAL OPAQUE CONDITION!
11. CLOUDS AT A HEIGHT EQUAL TO OR LESS THAN PREVIOUS LAYER!
12. CLOUDS RECORDED WITHOUT A HEIGHT / OR HEIGHT WITHOUT CLOUDS!
13. CLOUD HEIGHT NOT COMPATIBLE WITH CLOUD TYPE!
14. INVALID CLOUD HEIGHT!

(Frequently one error in sky condition may trigger more than one error message.)

Surface Visibility

15. INVALID VALUE ENTERED FOR SURFACE VISIBILITY!
16. INVALID VALUE ENTERED FOR TOWER VISIBILITY!
17. SURFACE VISIBILITY LESS THAN 7 MILES WITHOUT A WEATHER ENTRY!
18. VISIBILITY 7 MILES OR MORE, WITH OBSCURING PHENOMENON!

Weather and/or Obscuring Phenomena

19. UNKNOWN TYPE OF WEATHER!
20. L, F, S, O WEATHER ENTRY RULE IN ERROR!
21. HEAVY DRIZZLE OR HEAVY SNOW WITH VISIBILITY GREATER THAN 1/4 MILE!
22. LGT DRZL OR LGT SNOW & VSBY LESS THAN 5/8 MI WITHOUT OB. PHENOM!
23. VISIBILITY 7 MILES OR MORE, WITH OBSCURING PHENOMENON!
24. MODERATE L OR MODERATE SNOW WITH VSBY GREATER THAN 1/2 MI!
25. ERROR IN ENTRY FOR TORNADO / OR FUNNEL CLOUD / OR WATER SPOUT

Temperature and/or Dewpoint

26. TEMPERATURE VALUE BEYOND ALLOWABLE EXTREMES! (-60 to +126)
27. TEMPERATURE TOO WARM FOR FREEZING PRECIPITATION! (>+35)
28. TEMPERATURE TOO COLD FOR LIQUID PRECIPITATION! (<+28)
29. TEMPERATURE NOT WITHIN ALLOWABLE RANGE FOR REPORTING SNOW! (-41 to +42)
30. TEMPERATURE NOT WITHIN ALLOWABLE RANGE FOR REPORTING ICE FOG!
         (-41 to +16)
31. TEMPERATURE NOT WITHIN ALLOWABLE RANGE FOR REPORTING ICE PELLETS!
         (+9 to +44)
32. TEMPERATURE NOT WITHIN ALLOWABLE RANGE FOR REPORTING ICE CRYSTALS!
         (-41 to +15)
33. DEW POINT VALUE IS BEYOND ALLOWABLE EXTREMES! (-60 to +90)
34. DEW POINT EXCEEDS TEMPERATURE!
35. TEMPERATURE / DEW POINT SPREAD IS TOO GREAT TO REPORT FOG! (>8F)
36. DEW POINT MISSING!

Pressure

37. PRESSURE VALUE IN ERROR! (must be 4 or 5 digits)

Wind

38. WIND DIRECTION IN ERROR! (must be between 00 and 36)
39. WIND SPEED TOO LOW TO BE REPORTING BLOWING PHENOMENA! (must be >9kt)
40. WIND CALM...SPEED OR DIRECTION IN ERROR!
41. WIND ENTRY IN ERROR!

Column 13 Remarks

42. SURFACE VSBY 1 MILE OR LESS ... RVR REMARK MISSING OR IN ERROR!
43. CB ENTERED AS A CLOUD TYPE ... CB REMARK MISSING! (need CB or T)

44. VARIABLE CEILING HEIGHT ENTERED ... VARIABILITY REMARK MISSING!
45. VARIABLE VISIBILITY ENTERED ... VARIABILITY REMARK MISSING!
46. THUNDER OCCURRING ... THUNDER REMARK MISSING!
47. HAIL OCCURRING ... HAIL REMARK MISSING! (hail stone size)

Additive Data

48. CLOUD CODE GROUP MISSING OR IN ERROR!
49. MINUTES OF SUNSHINE GROUP MISSING OR IN ERROR!
50. MAX / MIN ... OR 4 GROUP MISSING OR IN ERROR!

Specials

51. OBSERVATION SHOULD BE A SPECIAL, NEW OCCURRENCE OF CLOUDS BLO 1000
    FT
52. OBSERVATION SHOULD BE A SPECIAL, CEILING CATEGORY (abv/blw 500, 1000,
    3000 ft)
53. OBSERVATION SHOULD BE A SPECIAL, VISIBILITY CATEGORY! (abv/blw 1, 11/2,
    2, 3 miles)
54. OBSERVATION SHOULD BE A SPECIAL, BEGINNING OR ENDING OF THUNDER!
55. OBSERVATION SHOULD BE A SPECIAL, BEGINNING OF SEVERE TSTM (T+)
56. OBSERVATION SHOULD BE A SPECIAL, BEGINNING OR ENDING OF FRZG RAIN!
57. OBSERVATION SHOULD BE A SPECIAL, BEGINNING OR ENDING OF FRZG DRZL!
58. OBSERVATION SHOULD BE A SPECIAL, BEGINNING OR ENDING OF HAIL!
59. OBSERVATION SHOULD BE A SPECIAL, BEGINNING OR ENDING OF ICE PELLETS
60. OBSERVATION SHOULD BE A SPECIAL, BEGINNING OR ENDING OF TORNADO!
61. OBSERVATION SHOULD BE A SPECIAL, BEGINNING OR ENDING OF FUNNEL CLD!
62. OBSERVATION SHOULD BE A SPECIAL, BEGINNING OR ENDING OF WATER SPOUT!

NONFATAL ERRORS (except for #83 which is fatal)

Essential Remarks

63. Remark for the ending of a thunderstorm not found!
64. Remark for the beginning of a thunderstorm not found!
65. Remark for the beginning of a severe thunderstorm not found!
66. Remark for the ending of freezing rain not found!
67. Remark for the beginning of freezing rain not found!
68. Remark for the ending of rain not found!
69. Remark for the beginning of rain not found!
70. Remark for the ending of drizzle not found!
71. Remark for the beginning of drizzle not found!
72. Remark for the ending of hail not found!
73. Remark for the beginning of hail not found!
74. Remark for the ending snow not found!
75. Remark for the beginning of snow not found!
76. Remark for the ending of ice pellets not found!
77. Remark for the beginning of ice pellets not found!
78. Remark for your current weather of tornado not found!
79. Remark for your current weather of funnel cloud not found!
80. Remark for your current weather of water spout not found!

81. Check your temperature, more than 10 degree change during past hour!
82. Check your dew point, more than 10 degree change during past hour!
83. Check your pressure, more than .100 inch change during past hour! *

* FATAL   - If this pressure change did actually occur, run SAO with /F to force transmit the observation.

APPENDIX B: EDITING THE 10B.DT FILE

Since the file 10B.DT contains essential information for COARS and is also very _inflexible_ in its structure, edit it with care. There are only two situations where the file must be edited: (1) installing the program and (2) restoring data after an AFOS outage (without running COARS repeatedly in local mode). Manual editing after initial setup is discouraged.

Figure B-1 shows a sample 10B.DT. The first seven lines of the file contain heading information. Note the station name in the upper left and the date in the upper right (for the headings on the 10A and 10B forms), the station elevation at the upper right (for pressure reduction), and the LST/GMT conversion value. When installing the program, all these must be changed for the local site.

The next 24 lines hold 24 hour's worth of data. The format for the data in the file is illustrated by the line for 0050 LST. Sky condition, temperature (also used for pressure reduction), dewpoint, relative humidity, station pressure, pressure tendency and pressure change are recorded for each hour (see legend). Each line should be considered a continuous string of characters - spaces only occur when the data does not completely fill its field. There are no spaces separating fields. The vertical bar must appear in column 78.

Each line of the file must always contain 78 visible characters (this plus the invisible carriage return and linefeed at the end of each line makes 80 total characters) and the file must always be 32 lines long. The file size will always be 2560 bytes. The vertical bar must always appear in column 78 (it lines up with the "T" in FEET for the station elevation).

Editing 10B.DT when installing the program

1. Start at an ADM with E:F/10B.DT and answer the questions ("Y" to overwrite). Figure B-2 shows the inital 10B.DT.

2. Replace the day/date group on line 1 with the current date. Each new character should go into the same column location as the old one.

3. Change "WSO WILMINGTON, DE" to the local station name.

4. Change the station elevation, making sure not to move the decimal point. The elevation may range from 0.0 to 9999.9 feet.

5. Change the LST/GMT conversion factor (number of hours) if necessary.

6. Now enter the temperature, dewpoint and station pressure for the 24 hours preceding the first observation you want to take using COARS.

All numbers should be right justified in their fields. Leading zeroes are not necessary but can be used if it makes entering the data easier. The station pressure values must follow the column alignment (decimal point under the "R").

7. After all the data is entered, double check that the vertical bar appears in column 78 of each line. Figure B-3 shows the file after the initial setup.

<u>Restoring data after AFOS outage</u>

It is preferrable to "catch up" by running COARS in the local mode for each observation missed, but this may not always be feasible. In this case, you must enter <u>all</u> data for the missed observations by hand: each cloud layer (broken down by cloud cover amount), 2-letter cloud identifiers, ceiling designators, cloud height, summation values, and total sky cover values. Also needed are the temperature, dewpoint, relative humidity, station pressure, pressure tendency and 3-hour pressure changes. At the end, recheck that the vertical bar is in column 78!

If the outage extended across local midnight, you must fill in the data for the first day, run the end-of-day procedures, and then continue the 10B.DT for the next day (not forgetting to change the day/date line).

This procedure does not fill in the xxxSAOS file, so MF-10A must exist in paper form.

Figure B-1:

KEY TO 10B.DT DATA ARRANGEMENT

NATIONAL WEATHER SERVICE   MFI-10B   THU MAR 26 1987
WILMINGTON, DE   STATION ELEVATION   80.0 FEET

TO CONVERT LST TO GMT ADD 5 HOURS

TIME LST	FIRST LAYER	SECOND LAYER	SMI	THIRD LAYER	SMI	FORTH LAYER	TOTO CVOP	TMP	DP	RH	PRES	?T CHG / 3HR CHG
0051	XXAAAAAM!!!	XXAAAAAM!!!	SS	XXAAAAAM!	SS	XXAAAAAM!!!	TTOO	###	$$$	&&&	%%.%%%	?.000
0150	8SC M 39						8 8	49	45	8	829.825	
0250	8SC M 36						8 8	49	46	8	829.805	
0352	9SC M 32						9 9	49	47	9	829.795	7.050
0450	9SC M 31						9 9	49	47	9	829.795	
0550	8SC M 27						8 8	48	46	9	829.795	
0653	10SC M 25						10 10	50	47	8	829.815	3.020
0751	10SC M 22						10 10	53	48	8	829.835	
0853	1CUFRA 25	6SC E 50	6	3AS 120	9	1CI 250	10 10	58	48	6	829.825	
0953	2SC 35						2 2	62	44	5	829.825	1.010
1052	3CU 44						3 3	62	43	5	829.825	
1150	4CU 44						4 4	65	40	4	829.805	
1253	7SC E 50						7 7	65	39	3	829.795	8.030
1353	3AC 90						3 3	63	34	3	829.970	
1451	3AC 100	1CI 250	4				4 4	61	36	3	829.960	
1552	4AC 100	5CI E250	9				9 9	59	32	3	829.940	8.060
1652	4AC 100	2CI E200	6				6 5	57	24	2	829.920	
1751	6AC M 85	2CI 200	8				8 7	54	27	3	829.900	
1850	8AC M 80	1CI 200	9				9 8	51	28	4	829.900	6.040
1950	10AC M 75						10 10	50	34	5	829.900	
2050	10SC M 60						10 10	50	40	6	829.890	
2150	10SC M 60						10 10	49	44	8	829.890	6.010
2251	10SC M 55						10 10	50	46	8	829.860	
2351	8SC M 45	4SC 60	10				10 10	49	46	8	829.860	

IF MANUALLY EDITING, PLACE CURSOR TO RIGHT OF : ON THIS LINE BEFORE ENTERING :

LEGEND TO LINE BEGINNING WITH TIME OF 00##

##	- LOCAL STANDARD TIME OF OBSERVATION
XX	- TENTHS OF SKY COVER (REPEATES 4 TIMES FOR 4 POSSIBLE LAYERS
AAAAA	- CLOUD TYPE IDENTIFIER (UP TO 5 LETTERS - CUFRA/STFRA)
M	- CEILING DESIGNATOR
!!!	- CLOUD HEIGHT
SS	- SUMMATION AMOUNT (FROM THAT CLOUD LAYER AND BELOW)
TT	- TOTAL SKY COVER
OO	- TOTAL OPAQUE SKY COVER
###	- 3 CHARACTER TEMPERATURE FIELD
$$$	- 3 CHARACTER DEWPOINT FIELD
&&&	- 3 CHARACTER RELATIVE HUMIDITY FIELD
%%.%%%	- 6 CHARACTER STATION PRESSURE FIELD
?	- PRESSURE TENDENCY INDICATOR
.000	- 3 HOUR PRESSURE CHANGE

Figure B-2   - BLANK 10B.DT - FOR INITIAL SYSTEM SETUP

NATIONAL WEATHER SERVICE   MF1-10B   THU MAR 26 1987
WILMINGTON, DE   STATION ELEVATION   80.0 FEET

TO CONVERT LST TO GMT ADD 5 HOURS

TIME! FIRST	!SECOND	!	THIRD	!	FORTH	!TOTO!	!	!STA	!3HR!
LST ! LAYER	!LAYER	!SM! LAYER	!SM! LAYER	!CVOP!TMP!DP!RH!PRES!T!CHG!
00##XXAAAAAM!!!XXAAAAAM!!!SSXXAAAAAM!!!SSXXAAAAAM!!!TTPP ###$$$ %%.%%%
0150	###$$$ %%.%%%
0250	###$$$ %%.%%%
0350	###$$$ %%.%%%
0450	###$$$ %%.%%%
0550	###$$$ %%.%%%
0650	###$$$ %%.%%%
0750	###$$$ %%.%%%
0850	###$$$ %%.%%%
0950	###$$$ %%.%%%
1050	###$$$ %%.%%%
1150	###$$$ %%.%%%
1250	###$$$ %%.%%%
1350	###$$$ %%.%%%
1450	###$$$ %%.%%%
1550	###$$$ %%.%%%
1650	###$$$ %%.%%%
1750	###$$$ %%.%%%
1850	###$$$ %%.%%%
1950	###$$$ %%.%%%
2050	###$$$ %%.%%%
2150	###$$$ %%.%%%
2250	###$$$ %%.%%%
2350	###$$$ %%.%%%

IF MANUALLY EDITING, PLACE CURSOR TO RIGHT OF ! ON THIS LINE BEFORE ENTERING

NATIONAL WEATHER SERVICE   MF1-10B   THU MAR 26 1987
WILMINGTON, DE   STATION ELEVATION   80.0 FEET

TO CONVERT LST TO GMT ADD 5 HOURS

TIME! LST !	FIRST LAYER	!SECOND !LAYER	! !SM!	THIRD LAYER	! !SM!	FORTH LAYER	!TOTO! !CVOP!	! !TMP!	! !DP!	!STA !RH!PRES!	!3HR !CHG!
0051								49	46	29.845	
0150								49	45	29.825	
0250								49	46	29.805	
0352								49	47	29.795	
0450								49	47	29.795	
0550								48	46	29.795	
0653	1CUFRA	25 1SC	35 2	4AC	E120 6	4CI	2501010	50	47	8929.8153.020!
0751								53	48	29.835	
0853								58	48	29.825	
0953								62	44	29.825	
1052								62	43	29.825	
1150								65	40	29.805	
1252								64	35	30.000	
1353								63	34	29.970	
1451								61	36	29.960	
1552								59	32	29.940	
1652								57	24	29.920	
1751								54	27	29.900	
1850								51	28	29.900	
1950								50	34	29.900	
2050								50	40	29.890	
2150								49	44	29.890	
2251								50	46	29.860	
2351								49	46	29.860	

IF MANUALLY EDITING, PLACE CURSOR TO RIGHT OF ! ON THIS LINE BEFORE ENTERING !

THIS IS HOW THE TEMP. DEWPOINT AND STATION PRESSURE SHOULD
APPEAR IN THE 10B.DT FILE AFTER SET-UP AND BEFORE USING THE
SAO PROGRAM FOR THE FIRST TIME.

DON'T FORGET TO CHANGE THE DAY/DATE LINE, THE STATION ELEVA-
TION AND IF NECESSARY, THE LST TO GMT CONVERSION.

! ! NOTE: THE LINE BEGINNING WITH 0653 IS AN EXAMPLE OF HOW
ONE LINE OF THE FILE MAY LOOK AFTER COMPLETING A 3/6 HOURLY
OBSERVATION. (SEE CHAPTER 3 OF USERS MANUAL FOR DETAILS ON
MANUALLY ENTERING CLOUD LAYER INFORMATION)! !

APPENDIX C: HOW TO ENTER OBSERVATIONS

To enter data for the SAO program, type M:OSOxxx at an ADM (xxx is the local id). Fill out the header block (addressee must be OOOI), tab to the bottom and hit ENTER. The following single page preformat will appear. (The numbers in the fields do not appear in the actual preformat, they are just labels for the explanations in this Appendix.)

cccOSOxxx

OBS TYPE	LOW LYR AMT	AMT OPQ	CLD TYPE	CIG DSGNTR	CLD HGT
[1]	[2]	[3]	[4]	[5]	[6]

NXT LYR AMT	SUMMATION	TOT OPQ	CLD TYPE	CIG DSGNTR	CLD HGT
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

SFC VSBY	TWR VSBY	WEATHER / OBSTRUCTIONS	TEMP DRY/B	DWPNT WET/B	WIND
[7]	[8]	[9]	[10]	[11]	[12]

QNH/STA PRES	RVR REMARK	OTHER REMARKS
[13]	[14]	[15]

. . . . ADDITIONAL REMARKS . . . .
[   ]

. . . . ADDITIVE DATA . . . .

3/6 HR PRECIP	CLOUD CODE	MINUTES OF SUNSHINE	WATER EQUIVALENT		SNOW DEPTH		24 HR PRECIP	MAX/MIN TEMP
[17 A]	1[B]	98[#C#]	902[D]	903[D]	904[E]	904[E]	2[F]	4[G]

XTRA REMARKS[18

Z TIME OF OB	OBSRVR INITS	
[19]	[20]	PLACE CURSOR HERE [21] AND STRIKE ENTER [ ]

IMPORTANT: The SAO program will bypass any leading spaces in the data fields, so the data does not have to be left-justified (except for remarks). A one-digit temperature can appear in the rightmost, leftmost or center positions in the temperature field.

In the explanations that follow, paragraph numbers correspond to the labeled fields in the preformat above.

1. OBS TYPE = Type of observation. Enter as applicable: SA, RS, SP or L.

2. LOW LYR AMT = Lowest layer amount. Enter the amount of sky covered by the lowest observed cloud layer. (0 - 10).
   NOTE: If sky is clear, no need to enter zeros in 1st cloud layer line: just leave the cloud field blank and make your first entry at sfc vsby. If zero tenths of any cloud type is present, it is necessary to enter zero tenths of cloud, type and height.

3. AMT OPQ = Amount opaque. Enter the amount of the lowest layer that is opaque. (0 - 10).

4. CLD TYPE = Cloud type. This field is large enough to hold the five letter abbreviation for STFRA and CUFRA as well as the standard two letter abbreviations of all other cloud types.

5. CIG DSGNTR = Ceiling Designator. Enter, as needed, the single letter identifier that defines how ceiling height was determined. (Table A3-12 FMH1).

6. CLD HGT = Cloud height. Enter the numeric value of the cloud height.

            * * * * Do not enter leading zeros * * * *

                 900 feet is entered as 9
                1500 feet is entered as 15
               25000 feet is entered as 250

7. SFC VSBY = Surface visibility. Enter the appropriate value for prevailing visibility. Use values from FMH1 Table A3-2.

8. TWR VSBY = Tower visibility. Enter as needed the appropriate value for tower visibility from FMH1 Table A3-2. Program will insert correct visibility in the SAO and will include the appropriate remark.

9. WEATHER / OBSTRUCTIONS = Weather and/or obstructions to vision. Enter the contractions in accordance with FMH1 Table A3-3 defining the event(s) occurring at the time of observation.

10. TEMP DRY/B = Temperature or dry bulb reading. Enter the observed temperature. If the Hygro is inoperative, enter the dry bulb reading to include a decimal point and a tenths digit.

        EXAMPLE: Hygro OK   Temp = 77.3   enter 77

                  Hygro OUT   Dry bulb = 77.3 enter 77.3

11. DWPNT WET/B = Dew point or wet bulb reading. Enter the observed dew point temperature. If Hygro is inoperative, enter the wet bulb reading to the nearest tenth of a degree. The program will compute dew point from the temp and wet bulb entries.

        EXAMPLE: Dew Cell OK.   Dew point = -10.7   enter -11
                  Dew Cell OUT   Wet Bulb = -10.7   enter -10.7

If entries for both fields (10 and 11) include a decimal point, the program will interpret the values to be dry bulb and wet bulb. It will then compute the dew point value for your observation.

12. WIND = Wind. Enter the observed wind plus any character in accordance with FMH1.

13. QNH/STA PRESS = Altimeter setting or station pressure. Enter the pressure reading normally used at your station. The value that is entered MUST be the complete pressure reading.

   A. ALTIMETER SETTING is entered as two digits, a decimal point, and TWO decimal digits. ie: 29.92 When ALTIMETER is entered, the program will automatically compute station pressure and sea level pressure.

   B. STATION PRESSURE is entered as two digits, a decimal point and THREE decimal digits. ie: 29.875 When STATION PRESSURE is entered, the program will automatically compute sea level pressure and altimeter setting.

14. RVR REMARK = Runway visual range remark. Enter if prevailing surface visibility is 1 mile or less. If your station does not transmit RVR data, this field of the preformat MUST be filled with number symbols. "#"

15. OTHER REMARKS = Any column 13 remarks in accordance with FMH1. A total of one and a half lines of ADM screen are available for remarks. Remarks MUST begin in the first field and can then extend into the second field.

   Any remarks not routinely transmitted must be placed inside a pair of parenthesis; eg., (AIRCRAFT MISHAP). Remarks inside parenthesis will not be transmitted, but they will be included in the observation when it is written to the 10A form.

   Include beginning and ending times significant weather events and precipitation. IE: TB12 RB13E23SB33, etc.

   NOTE: The SAO program will generate a few remarks on it's own, based on data already entered into the preformat fields. Therefore, the following remarks are NOT to be entered by the observer.

   A. PARTIAL OBSCURATION REMARK. If, for example, within the sky condition entry, 1 tenth of sky is covered by fog, the program will output a -X as part of the sky condition and F1 as a remark.

   B. SURFACE or TOWER VISIBILITY REMARK. If values are entered for both surface and tower visibility, the program will place the lower value into the body of the observation as the prevailing visibility, and then place the other value into a correctly formatted col 13 remark.

   Example: SFC VSBY = 11/2, TWR VSBY = 7/8
   7/8 will be transmitted as prevailing vsby, SFC VSBY 11/2 will be transmitted in remarks.

C   A PRESSURE RISING RAPIDLY or PRESSURE FALLING RAPIDLY remark will automatically be added to an SA or RS, based on the previous hourly. However, if either pressure change remark is required in a SPecial, then the observer must include the remark in the proper remark field of the preformat.

17 ADDITIVE DATA   NOTE The APP group is automatically computed and formatted by the SAO program for all the 3/6 hourly observations

A. 3/6 HR PRECIP = Enter the appropriate precipitation amount. This entry is in the form currently used for col 13. A tenth of an inch would be entered as 10, an hundredth as 01, one and a half as 50 ONE.

    ALL OTHER ADDITIVE DATA IS TO BE ENTERED IN ACCORDANCE WITH FMH-1.

B. CLOUD CODE GROUP. Enter the appropriate code numbers identifying the observed clouds. Do not enter the 1 to identify the group, since it is already in the program. DO enter all three figures, including 0's or /'s as appropriate.

C. MINUTES OF SUNSHINE. Enter at 08Z if appropriate. No need to enter the group identifier 98. If your site does not transmit this data, this field of the preformat must be filled with number symbols ###.

D. WATER EQUIVALENT. Enter the encoded value(s) as needed at 18Z. Again, the group identifiers are already in place.

E. SNOW DEPTH. Encode and enter as needed on 3 and 6 hourlies.

F. 24 HOUR PRECIPITATION. Encode and enter as needed at 12Z or as required at your station. A 24 hour precip amount of 15 hundredths would be entered as 0015. The 2 identifier is already in place.

G. MAX/MIN. Enter the appropriate value as required at your station. If your site transmits only a maximum, or only a minimum temperature in the 6 hourly observation, then only enter one value. It will be encoded into the observation as a max or min. If your site normally transmits a 4 group in the 6 hourly observation, then enter the two appropriate values (Max and Min). A completely encoded 4 group will be generated by the program.

    NOTE No quality control checks are made on the additive data. The observer must assure correct data entry!

18. XTRA REMARKS = Miscellaneous Remarks. Use this field to enter miscellaneous data, such as; Tide remarks, City temperatures and/or RADAT information.

19. Z TIME OF OB = Time of observation in Universal Coordinated Time. Enter the 4 digit value representing the official UTC of the observation.

20. OBSRVR INITS = Observers initials. Enter the 2 or 3 characters that identify the observer.

21. If needed, tab cursor to **PLACE HERE** field, then strike enter key.

Once the product cccOSOxxx is stored, run the program:

RUN:SAO

(See Part V for variations on the RUN:SAO command line.)

NOTE 1: If the observation is a SP, there is no need to clear the temp/dew point fields, the program ignores these fields when the ob type is a SP.

NOTE 2: Moving the cursor through the OSO preformat can be accomplished several ways.

Use the TAB key for moving from field to field across the screen.

Use the RETURN key to bypass a complete line when certain entries are not needed.

At times the ARROW keys are useful for positioning the cursor.

Once you become familiar with the preformat, you'll discover which method is most efficient for YOU when entering the necessary data.

APPENDIX D: HOW TO ENTER SUPPLEMENTAL DATA

The additional data needed to complete the MF1-10B must be entered separately using three preformats. This should be the first task accomplished on each day's midnight shift, before starting the end-of-day macros.

Product cccSADxxx is used to record synoptic or 6-hourly data as well as the summary of the day information (MF1-10B columns 42-50, 56, 59, 63-65 and columns 66-73, 78-80 and 90).

Product cccBEWxxx is used to record the type and beginning and ending of weather events (MF1-10B columns 82-88). The preformat is large enough to accomodate 23 separate events but falls short of holding the 36 possible entries allowed for on the paper 10B. If more than 23 entries are needed on any given day they MUST be continued in the column 90 section of cccSADxxx.

Product ccc24Pxxx is used to log hourly precipitation amounts (MF1-10B column 40). If rainfall occurs during the day, this product must be completed BEFORE the MF1-10B is printed on the PPM.

cccMCPSAD

SYNOPTIC OBSERVATIONS

	TIME LST	PRECIP INS.	SNOW FALL	SNOW DEPTH	MAX TEMP.	MIN TEMP.	STATE OF GRND	SOIL TEMP.
MID TO	[ ]	[ ]	[ ]		[ ]	[ ]		
	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
MID	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

* * * * * * * * * * * * STATION PRESSURE COMPUTATIONS * * * * * * * * * * * * *

TIME LST	STATION PRESSURE	BAROGRAPH READING	BAROGRAPH CORRECTION
[ ]	[ ]	[ ]	[ ]
[ ]	[ ]	[ ]	[ ]
[ ]	[ ]	[ ]	[ ]
[ ]	[ ]	[ ]	[ ]

END OF DAY SUMMARY IS ON NEXT PAGE. # # # # =====>
! ! ! ! ! ! ! ! ! GO TO END OF PAGE 2 BEFORE ENTERING ! ! · ! ! =====>   [ ]

SUMMARY OF DAY (MIDNIGHT TO MIDNIGHT)

24HR MAX TEMP	24HR MIN TEMP	24HR PRECIP WATER EQUIV	24HR SNOWFALL UNMLTD INS.	SNOW DEPTH	PEAK WIND SPD KTS	DIR	TIME LST	WATER EQUIV (INS)
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

REMARKS, NOTES AND MISCELLANEOUS PHENOMENA

***** U MUST ENTER TIME OF SUNRISE [   ] and TIME OF SUNSET [   ] *****
TOT MINS OF SUNSHINE [   ] PERCENT OF PSBL SUNSHINE [   ]
CHARACTER OF SUNRISE [   ] CHARACTER OF SUNSET [   ]

FASTEST 1-MIN WND SPD [   ]MPH OR FASTEST MILE [   ] DIRECTION[   ] TIME[   ]

TIME CHECK - CLOCK CORRECT TO NEAREST MINUTE AT: [   ]

[   ]
[   ]
[   ]
[   ]
[   ]
[   ]

For the 06Z observation. call up the **sad** preformat with **M:SADxxx**. Tab through the header page. ensuring that the addressee is 000 before striking enter.

The two page preformat will come up on the screen.

Enter the data normally recorded at your site for each appropriate field. Stations in the Eastern Standard time zone will enter data into two lines of the synoptic portion of the preformat (MID-00## and 00##).

At subsequent 6 hourlies (12 18. & 00Z)call up the **sad** preformat in the edit mode (**E:SADxxx**). Be certain the addressee is 000 before continuing. While in the edit mode, all previously recorded data of the current day will be displayed. Tab to the appropriate line(s) and make your entries: include time checks and any column 90 remarks on page 2. Again. be certain to go to the end of page 2 before entering.

At midnight (LST) close out the day's record by again calling up the sad in the edit mode (**E:SADxxx**). Proceed with entering the "**MID**" synoptic portion, then complete the summary of the day on page 2.

Beginning and Ending of Weather Log

Data may be entered into the beginning-and-ending-of-weather-log at any time during the calendar day. It is imperative that this product BE entered daily so that valid information is always in the "current" version. The COARS software is going to look at only 1 version of this log, so the current version of the log must contain only today's weather events. not yesterdays. With this in mind, please note that the preformat message contains the word NONE as its first entry. On days when there are no weather events, process the log by simply placing the cursor beneath the word "NONE" and strike enter.

A portion of the preformat follows:

cccMCPBEW

! ! ENTER THE BEGINNING AND ENDING OF WEATHER EVENTS IN THE PROPER COLUMNS ! !

EVENT		TIME BEGAN		TIME ENDED	
[NONE	]	[	]	[	]
[	]	[	]	[	]
[	]	[	]	[	] . ETC.

...IF ADDITIONAL ENTRIES ARE NEEDED, PLACE THEM COLUMN 90 OF THE SUMMARY OF THE DAY PRODUCT cccSADxxx...

Data entry for weather log:

For first entry of the day call up product using **M:BEWxxx**

Insure that addressee is 000 ... tab through header page and strike enter.

Replace the word "N O N E" with the appropriate event...enter beginning using LST.

With the cursor in any blank field, enter the product.

Subsequent events for the same day are entered by calling up the preformat using the edit mode...**E:BEWxxx** and by placing the proper information into the appropriate column(s).

If they were N O weather events for a particular day this product must still be generated at the end of the day. Simply call up the product using **M:BEWxxx** ... tab through the header page, place the cursor in any field BELOW the word "N O N E" and strike enter.

---

24 HOUR PRECIPITATION LOG

cccMCP24P

```
   00-01   01-02   02-03   03-04   04-05   05-06   06-07   07-08
 [     ] [      ] [      ] [      ] [     ] [     ] [     ] [      ]
                                etc,
```

* * * * * ◄ ENTER HOURLY PRECIP AMOUNTS INCLUDING A DECIMAL POINT * * * * * *

Data entry for precipitation log:

Generate this product each day in which a precipitation event occurred. If precipitation did not occur during the calendar day, by-pass this product!

If precipitation did occur, complete this preformat **AFTER** working up the rain gage chart. Fulfilling the Weather Service requirement of changing charts daily after a rainfall event provides the data needed for this product. But since this product is called for at the beginning of a midshift its quite possible that the chart for the day just ended has not yet been changed. If this is the case and if you do not intend to change the chart during the mid shift, advise the upcoming day shift personnel that the chart **MUST** be changed and the events **MUST** be worked up for this precipitation log. Also, the computer generated MF1-10B form is **NOT** to be generated until after this log has been finalized.

NOAA SCIENTIFIC AND TECHNICAL PUBLICATIONS

The National Oceanic and Atmospheric Administration was established as part of the Department of Commerce on October 3, 1970. The mission responsibilities of NOAA are to assess the socioeconomic impact of natural and technological changes in the environment and to monitor and predict the state of the solid Earth, the oceans and their living resources, the atmosphere, and the space environment of the Earth.

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