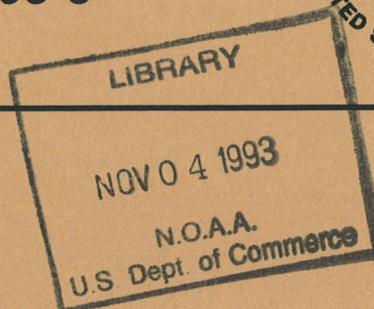


QC  
B51  
.U6  
T32  
no.93-3

NOAA Techniques Development Laboratory  
Computer Program NWS TDL CP 93-3



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## DECODING SATELLITE CLOUD PRODUCTS

Silver Spring, Md.  
October 1993

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**U.S. DEPARTMENT OF  
COMMERCE**

**National Oceanic and  
Atmospheric Administration**

**National Weather  
Service**

## PREFACE

The Techniques Development Laboratory's (TDL's) computer program (CP) series is a subset of TDL's technical memorandum series. The CP series documents computer programs written at TDL primarily for the Automation of Field Operations and Services (AFOS) computers.

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

### NOAA Techniques Development Laboratory Computer Program NWS TDL

- CP 83-1 Gross Sectional Analysis of Wind Speed and Richardson Number. Gilhousen, Kemper, and Vercelli, May 1983. (PB83205062)
- CP 83-2 Simulation of Spilled Oil Behavior in Bays and Coastal Waters. Hess, October 1983. (PB84122597)
- CP 83-3 AFOS-Era Forecast Verification. Heffernan, Newton, and Miller, October 1983. (PB84129303)
- CP 83-4 AFOS Monitoring of Terminal Forecasts. Vercelli, December 1983. (PB84145697LL)
- CP 83-5 Generalized Exponential Markov (GEM) Updating Procedure for AFOS. Herrmann, December 1983. (PB84154822LL)
- CP 84-1 AFOS Display of MDR Data on Local Map Background. Newton, July 1984. (PB84220797)
- CP 84-2 AFOS Surface Observation Decoding. Perrotti, September 1984. (PB85137586)
- CP 84-3 AFOS-Era Forecast Verification. Miller, Heffernan, and Ruth, September 1984. (PB86148319LL)
- CP 85-1 AFOS Monitoring of Terminal Forecasts. Vercelli and Norman, May 1985. (PB85236388LL)
- CP 85-2 AFOS Terminal Forecast Decoding. Vercelli, Norman, and Heffernan, October 1985. (PB86147360LL)
- CP 85-3 AFOS-Era Forecast Verification. Ruth, Miller, and Heffernan, October 1985. (PB86148319LL)
- CP 87-1 AFOS Terminal Aerodrome Forecast Formatting. Wantz and Eggers, July 1987. (PB8810449LL)
- CP 87-2 AFOS-Era Forecast Verification. Ruth and Alex, July 1987. (PB88125570LL)
- CP 87-3 Forecast Review. Wolf, July 1987. (PB88125588LL)
- CP 87-4 AFOS Monitoring of MDR Data Using Flash Flood Guidance. Norman and Newton, October 1987. (PB88137450LL)
- CP 87-5 AFOS Terminal Forecast Quality Control. Vercelli and Leaphart, December 1987. (PB88169925LL)
- CP 88-1 AFOS Terminal Forecast Decoding. Vercelli and Leaphart, August 1988. (PB89101240LL)
- CP 89-1 Structure Flow Diagram Generator. Adams, March 1989. (PB89195978AS)
- CP 89-2 String Search. Adams, March 1989. (PB89195986AS)
- CP 89-3 Extended Memory Library for AFOS Applications. Leaphart, June 1989. (PB92216290)

(Continued on inside back cover)

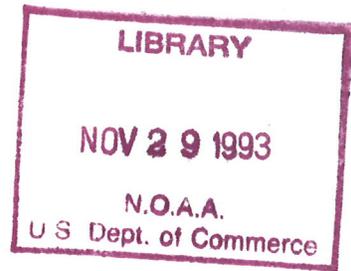
QC  
851  
U6  
T32  
no. 93-3

NOAA Techniques Development Laboratory  
Computer Program NWS TDL CP 93-3

# DECODING SATELLITE CLOUD PRODUCTS

Robert A. Beasley

Techniques Development Laboratory  
Silver Spring, Md.  
October 1993



UNITED STATES  
Department of Commerce  
Ronald H. Brown  
Secretary

National Oceanic and  
Atmospheric Administration  
D. James Baker  
Under Secretary

National Weather Service  
Elbert W. Friday, Jr.  
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TABLE OF CONTENTS

	Page
1. Introduction	1
2. Methodology and Software Structure	1
3. Procedures	2
4. Cautions	2
5. References	3
6. Program Information and Procedures for Installation and Execution	4
A. Program Information and Installation Procedure	4
B. Program Execution and Error Conditions	6
Tables and Figures	10

## DECODING SATELLITE CLOUD PRODUCTS

Robert A. Beasley

### 1. INTRODUCTION

This program, SCPDEC, decodes Satellite Cloud Product (SCP) collectives as described in National Weather Service (NWS) Technical Procedures Bulletin (TPB) No. 410 (NWS 1993), and which are transmitted on the National Weather Service's Automation of Field Operations and Services (AFOS) system (NWS 1989 and NWS 1992a). Decoded data are output to a Real Time Disk Operating System (RDOS) (Data General Corporation 1974 and 1978) file SCPDATA. The SCP's are part of the complementary technology designed to augment Automated Surface Observing System (ASOS) (NWS 1992b) reports. ASOS cannot detect clouds higher than 12,000 ft above ground level (AGL).

SCPDEC operates in a manner very similar to the SAO Decoder (SAODECII) (Beasley 1993), also developed and maintained by the Techniques Development Laboratory (TDL). Command line switches allow the user to specify the date, time, and time interval of the observations which are to be decoded, as well as the list of AFOS products and SCP sites included therein which are to be retrieved for decoding. Other switches afford the user with still more options such as diagnostic output on the Dasher and/or a line printer or Printer Plotter Module (PPM).

Successfully decoded satellite cloud data for each station listed in the specified station list (SCPSTNLIST) from each SCP product listed in the AFOS key list (SCPKEYLIST), will be written to the RDOS file SCPDATA.

### 2. METHODOLOGY AND SOFTWARE STRUCTURE

Data flow and program relationships from initiation to the writing of each decoded observation to the RDOS file SCPDATA are illustrated in Fig. 1. SCPDEC executes in the following manner: (1) reads the optional switches from the command line and subsequently sets specific logical and integer variables; (2) reads the user specified AFOS SCP product list (SCPKEYLIST.kk--see Fig. 2) and the user specified station list (SCPSTNLIST.nm--see Fig. 3); (3) alphabetizes the station decoding list and optionally writes to disk the alphabetized file; (4) opens and reads the specified SCP products from the AFOS database; (5) decodes the data from the specified stations within the SCP products; (6) passes each decoded observation through a gross error check routine which assigns an error return code, and (7) finally writes the decoded data to the RDOS file SCPDATA (see Table 1).

All SCP's are transmitted as collectives, namely a collection of satellite cloud data for several stations within one AFOS product or key. For each station within the collective, the date, time, middle and high cloud amount, lowest and highest estimated levels of the cloud tops, and the effective cloud amount are given. This program affords the user the opportunity to decode only those stations desired from the collectives. A sample SCP collective is illustrated in Fig. 4. For more information on SCP's, the user should refer to TPB No. 410 as noted in the Introduction.

A list of mostly fatal errors, that should seldom occur, are listed in Section 6, Part B. In most instances, the occurrence of any of the errors listed there are the result of system or disk-related problems. Gross errors in observations are noted through the error return code, which is the ninth word of each station's record in the SCPDATA file.

### 3. PROCEDURES

The supplemental data decoder is initiated from the DASHER by entering:

```
SCPDEC/L/S/X mmddy/D kk/K nn/N bbbbbb/R hhmm/T
```

This entry will execute all actions from setting the optional switches to decoding the observations and writing them to the RDOS file SCPDATA. The command line switches are defined in Section 6, Part B.

A minimum of two RDOS files must be established prior to running the program: (1) a list of AFOS SCP products (SCPKEYLIST) to be used, and (2) a list of the stations included therein (SCPSTNLIST) which are to be decoded. Master copies of these files are provided with the original SCPDEC package. However, most forecast offices will desire to either modify these files or create new ones. Editing can be performed using any standard RDOS file editor [e.g., "e:/f" at the AFOS Alphanumeric Display Module (ADM)]. The list used by SCPDEC is determined through the two-letter RDOS extension on the file names. Each line in the SCPKEYLIST contains the AFOS product identifier (7-9 characters) for the SCP collectives which are to be read. Then, each line in the SCPSTNLIST contains the three-letter identifier for the stations which are to be extracted from the products read.

The complete set of programs runs in less than 32K words of memory. As with all application programs, the execution time varies with the number of observations to be decoded and the AFOS work load. It takes approximately 1 minute to decode 100 stations. In normal field operations, the time required to execute the program would be on the order of 20 seconds or less, as it would only be necessary to decode one collective.

### 4. CAUTIONS

- a. The maximum number of keys allowed in the SCPKEYLIST.kk is 10.
- b. The maximum number of stations allowed in the SCPSTNLIST.nm is 500.
- c. The default extension for the SCPKEYLIST.kk is "00". This file must exist unless you specify otherwise through the local "K" switch.
- d. The default extension for the SCPSTNLIST.nm is "00". This file must exist unless you specify otherwise through the local "N" switch.
- e. The use of the "S" switch results in the SCPSTNLIST.nm being rewritten alphabetically by station ID. The file SCPSTNLIST.nm must not be attribute-protected if the global "S" switch is to be used.
- f. A minimum of 60 RDOS blocks should be available for installation of SCPDEC, and its required files (SCPKEYLIST.kk, SCPSTNLIST.nm, and SCPDATA). This does not all have to be available in one directory or on one disk, as you can move the files to other directories and establish

appropriate links. See Section 6, Part A below for a complete breakdown of the RDOS block sizes required for SCPDEC and its related files.

- g. Six digits are required for specification of a base decoding date through the local "D" switch. The format is two digits for the month (mm), two digits for the day (dd), and the last two digits of the year (yy). Any number of digits other than six will result in a fatal error.
- h. Four digits are required for specification of a base decoding time through the local "T" switch. The format is two digits for the hour (hh) and two digits for the minutes (mm). Any number of digits other than four will result in a fatal error.
- i. Six digits are required for specification of the range values. The range values specify the amount of time in minutes to subtract and add, respectively, from the base or anchor decoding time (the default system time or the time specified through the local "T" switch). The first three digits (bbb) denote the value to subtract from the anchor time to obtain the starting time of the decoding interval, while the last three digits denote the value to add to the anchor time to get the ending time of the decoding interval. Any number of digits other than six will result in a fatal error.
- k. This decoder is designed to recognize SCP's in the format prescribed in TPB No. 410. Observations deviating from this format will likely be decoded erroneously and in some cases may result in a fatal program error.

## 5. REFERENCES

- Beasley, R. A., 1993: AFOS Surface Observation Decoding. NOAA Techniques Development Laboratory Computer Program NWS TDL CP 93-2, National Weather Service, NOAA, U.S. Department of Commerce, 74 pp.
- Data General Corporation, 1974: RDOS/DOS User's Handbook, Ordering No. 093-000053, Data General Corporation, Southboro, Massachusetts, 235 pp.
- \_\_\_\_\_, 1978: RDOS/DOS User's Handbook, Ordering No. 093-000105, Data General Corporation, Southboro, Massachusetts, 216 pp.
- National Weather Service 1989: AFOS Handbook No. 2, Vol. 1, National Oceanic and Atmospheric Administration, U.S. Department of Commerce.
- \_\_\_\_\_, 1992a: Guide to AFOS System Z, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, 266 pp.
- \_\_\_\_\_, 1992b: ASOS User's Guide, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, 77 pp.
- \_\_\_\_\_, 1993: The Satellite-Derived Cloud Cover Product. NWS Technical Procedures Bulletin No. 410, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, (in preparation).

6. PROGRAM INFORMATION AND PROCEDURES FOR INSTALLATION AND EXECUTION

PART A: PROGRAM INFORMATION and INSTALLATION PROCEDURE

PROGRAM NAME: SCPDEC

AAL ID: DBC082

Revision No.: 02.01

FUNCTION: Extracts and decodes satellite cloud product (SCP) reports from user specified stations contained within user specified SCP products.

PROGRAM INFORMATION:

Development Programmer(s):

Robert A. Beasley

Location: Techniques Development  
Laboratory

Phone: 301-713-0056

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

Save file creation dates: SCPDEC  
Original release/revision 01.00 -  
TDL release/revision 2.00 -

Maintenance Programmer(s):

Robert A. Beasley

Location: Techniques Development  
Laboratory

Phone: 301-713-0056

July 1993  
August 1993

Running time:

0.5 - 0.6 second per observation

Disk space:

Program files:

SCPDEC.SV

Data files:

SCPKEYLIST.kk

SCPSTNLIST.nn

SCPDATA

- 51 RDOS blocks  
-  $(10 * n_{keys})/512$  RDOS blocks  
-  $(10 * n_{stns})/512$  RDOS blocks  
-  $(1 + (30 * n_{stns}))/512$  RDOS blocks

PROGRAM REQUIREMENTS

Program files:

NAME

SCPDEC.SV

Data files:

<u>NAME</u>	<u>Disk location</u>	<u>READ/WRITE</u>	<u>COMMENTS</u>
SCPKEYLIST.kk	Master directory	R	Created by RDOS text editor
SCPSTNLIST.mn	Master directory	R/W	Created by RDOS text editor and optionally alphabetized by SCPDEC.
SCPDATA	Master directory	W	Written by SCPDEC

AFOS Products:

<u>ID</u>	<u>ACTION</u>	<u>COMMENTS</u>
CCCSCPER1	Read	CCC = your local AFOS node;
CCCSCPCR1	Read	SCP = satellite cloud product;
CCCSCPSR1	Read	ER1 = eastern region collective;
CCCSCPWR1	Read	CR1 = central region collective;
		SR1 = southern region collective;
		WR1 = western region collective.

LOAD LINE

```

RLDR/P/E SCPDEC SCPDEC/S SCPDEC.LM/L 11/C SCPREV ^
RCOMLN DECINTV CHGDT SORTSTNS CNVRTMTH GETYEAR GETCLDDAT GROSSERR ^
WRSCPDAT NAFREAD AFDTIM DCMPR ^
BMOVE CCAT ICEQAL ILEN INITAR IPANDEC SEARCH WMOV ^
<BG UTIL FORT SYS AFOSE>.LB
  
```

PROGRAM INSTALLATION

1. Move the executable module SCPDEC.SV to the master directory (usually SYSZ) or to an applications directory with links to the master directory. Under any circumstances, make sure you create proper links if you use an applications directory instead of the master directory.
2. Create at least one key list (SCPKEYLIST.kk) using an RDOS text editor. The key list file should also reside in, or be linked to, the master directory.
3. Create one or more station lists (SCPSTNLIST.mn), also using an RDOS text editor. The station list must also either reside in, or be linked to, the master directory.

PART B: PROGRAM EXECUTION and ERROR CONDITIONS

PROGRAM NAME: SCPDEC

AAL ID: DEC082

Revision No.: 02.01

PROGRAM EXECUTION

1. Run SCPDEC.

At the DASHER or ADM enter:

SCPDEC/L/S/X mmddy/D kk/K nn/N bbbeee/R hhmm/T

Definition of switches:

GLOBAL

/L = Print program diagnostic information on the Dasher. This includes information about decoded and non-decoded observations.

/S = Write the alphabetically sorted station list (SCPSTNLIST.nm) to RDOS. The previous SCPSTNLIST.nm file will be overwritten.

/X = Print formatted SCP data on the line printer or PPM. See Fig. 5 for a sample printout.

LOCAL

mmddy/D = The decoding interval is to be anchored on this date. The month is specified by "mm", the day by "dd", and the year by "yy". Note, six digits must always be specified when using this switch. Specify only the last two digits of the year.

kk/K = Specifies the list of SCP's (SCPKEYLIST.kk) which are to be read. The RDOS extension "kk" is specified through this switch. Two characters must always be specified.

nn/N = Specifies the stations for which SCP data are to be decoded from the products listed in the SCPKEYLIST.kk file. The RDOS extension "nn" is specified through this switch. Two characters must always be specified when using this switch.

bbbeee/R = defines the range of time which is to be used for the decoding interval. The value "bbb" is subtracted from the anchor time and the value "eee" is added to the anchor time. Six digits must always be specified when using this switch.

hhmm/T = The anchor time of the decoding interval must start on this time. Four digits must always be specified when using this switch.

Defaults (Switch not used):

Global

- /L = Do not print diagnostic information on the Dasher.
- /S = Do not write the alphabetized station list (SCPSTNLIST.nm) to disk. The list will still be sorted alphabetically in memory for efficiency.
- /X = Do not print formatted output of the SCPDATA file on the line printer or PPM.

Local

- /D = Use the current system date as the anchor time of the decoding interval.
  - /K = Use the SCP product list SCPKEYLIST.00.
  - /N = Use the SCP station list SCPSTNLIST.00.
  - /R = Use the default range of 150 minutes (120 minutes before and 30 minutes after the anchor time).
  - /T = Use the current system time as the anchor time of the decoding interval.
2. Before executing the program, you must establish a list of SCP products to be read (SCPKEYLIST.kk) and a list of stations to be decoded (SCPSTNLIST.nm). See Fig. 2 and Fig. 3 for examples of these lists, respectively.
  3. If a program error occurs, it will be denoted at the Dasher most often by the phrase "[#] ERROR", where "#" refers to the error number listed in Section 6, Part B.

PROGRAM ERROR CONDITIONS

<u>ERROR CONDITIONS</u>	<u>MEANING</u>
"[1]: ERROR OBTAINING SYSTEM DATE." ROUTINE: SCPDEC	Probable system or disk related problem.
"[2]: ERROR GETTING CHANNEL ICHN1." ROUTINE: SCPDEC	Probable system or disk related problem.
"[3]: ERROR OPENING FILE SCPKEYLIST.kk" ROUTINE: SCPDEC	The product key list SCPKEYLIST.kk cannot be found. Check for existence of file and links.
"[4]: ERROR CLOSING FILE ICHN1." ROUTINE: SCPDEC	Probable system or disk related problem.

"[5]: ERROR GETTING CHANNEL ICHN2." ROUTINE: SCPDEC	Probable system or disk related problem.
"[6]: ERROR OPENING FILE SCPSTNLIST.nn." ROUTINE: SCPDEC	The product key list SCPSTNLIST.nn cannot be found. Check for existence of file and links.
"[7]: ERROR CLOSING FILE ICHN2." ROUTINE: SCPDEC	Probable system or disk related problem.
"[8]: ERROR CREATING RANDOM FILE SCPDATA." ROUTINE: SCPDEC	SCPDATA file is attribute protected, file space is exhausted, or possible disk related problem.
"[9]: ERROR GETTING CHANNEL ICHRSD." ROUTINE: SCPDEC	Probable system or disk related problem.
"[10]: ERROR OPENING FILE SCPDATA." ROUTINE: SCPDEC	SCPDATA file does not exist or cannot be located. Check for existence of file and links.
"[11]: ERROR IN OPENING COMMUNICATIONS CHANNEL." ROUTINE: RCOMLN	Probable system or disk related problem.
"[12]: ERROR OPENING SCPSTNLIST.nn FOR ALPHABETIZING. ROUTINE: SORTSTNS	Global "S" switch has been specified to rewrite alphabetized SCPSTNLIST.nn to disk. SCPSTNLIST.nn is attribute protected.
"[13]: ERROR - UNABLE TO OBTAIN THE SPECIFIED PRODUCT ---> CCCSCPXXX". ROUTINE: SCPDEC	Cannot find AFOS product CCCSCPXXX. Add product to Wish List or PILEDIT permanently into the AFOS database.
"[14]: ERROR - INVALID AFOS PRODUCT ---> CCCSCPXXX". ROUTINE: SCPDEC	Product CCCSCPXXX was opened but cannot be read. Product may be scrambled and MODIFY should be run.
"[15]: ERROR - CANNOT OBTAIN PREVIOUS VERSION OF SPECIFIED PRODUCT ---> CCCSCPXXX". ROUTINE: SCPDEC	Previous version of CCCSCPXXX not available in database. Increase number of versions of product if desired.
"[16]: ERROR - UNABLE TO OBTAIN MONTH OF PRODUCT ---> CCCSCPXXX". ROUTINE: SCPDEC	Could not find product month on the third line of the SCP product. Product may be bad or formatted incorrectly.

"[17]: ERROR - UNABLE TO OBTAIN YEAR OF PRODUCT ---> CCCSCPXXX". ROUTINE: SCPDEC	Year of product, which is obtained from the system year could not be obtained. Desired product month should not differ by more than one from the system month.
"[18]: ERROR - INVALID PRODUCT, EXCESSIVE NUMBER OF ATTEMPTS TO FIND MONTH IN PRODUCT ---> CCCSCPXXX". ROUTINE: SCPDEC	Could not find product month on the third line of the SCP product after 125 tries, which is equivalent to 25 lines per AFOS page.
"[19]: ERROR WRITING DECODED DATA FOR STATION XXX". ROUTINE: WRSCP DAT	Unable to write decoded data for station XXX to the SCPDATA file.

Table 1. Format of the SCPDATA file. Note: the last word in the file is always an octal 203. Thus, the total number of words in the file is always  $(15 * N_{stns}) + 1$ . "Blank" in the column labeled "Contents" denotes an undefined word which may be used in future revisions of this program. "Blank" and "-99" in the column labeled "Default" denote missing data.

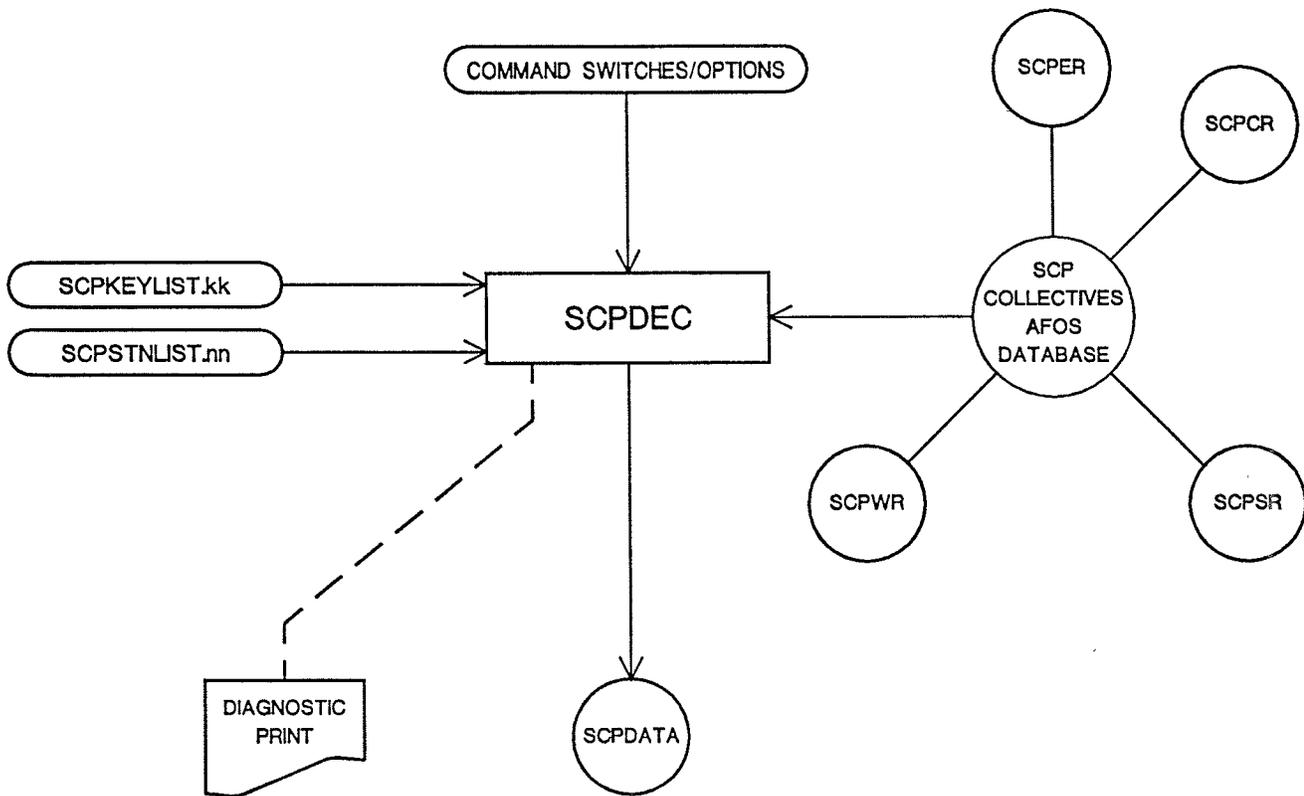
Word Number	Contents	Variable Type	Default
1-2	Station call letters ( <i>4 letters max</i> )	Packed ASCII	blank
3	Product month (from within product)	Integer	-99
4	Product day (from mass media header)	Integer	-99
5	Product year (assumed from system)	Integer	-99
6	Product time (from mass media header)	Integer	-99
7	Blank	Integer	-99
8	Blank	Integer	-99
9	Error return code (see Table 2)	Integer	-99
10	Middle cloud amount (see Table 3)	Integer	-99
11	High cloud amount (see Table 3)	Integer	-99
12	Lowest determined cloud height (in hundreds of feet)	Integer	-99
13	Highest determined cloud height (in hundreds of feet)	Integer	-99
14	Blank	Integer	-99
15	Effective cloud amount (percent)	Integer	-99

Table 2. Error return codes (word 9) for each decoded SCP station.

Error Return Code (n)	Definition
1	All data appears to be correct.
2	No middle or high cloud data is given.
3	Cloud condition is clear (CLR), but lowest and/or highest cloud level data are not zero.
4	Cloud condition is mostly clear (MCLR), but lowest and/or highest cloud level data appear incorrect (e.g., both are zero).
5	Cloud data exists, but lowest and/or highest cloud level data appear incorrect (e.g., both are zero).
6	Cloud data exists, but the effective cloud amount (ECA) is zero or missing.
7	Both error codes 4 and 6 are applicable.
8	Both error codes 5 and 6 are applicable.
n+10	Missing date in addition to error condition listed for n.
n+100	Missing time in addition to error condition listed for n and/or n+10.

Table 3. Middle (631 mb - 400 mb pressure levels) and high cloud amount (400 mb pressure level to tropopause) translation codes.

Three Letter SCP Code	Integer Translation
CLR	0
MCLR	1
SCT	2
BKN	3
OVC	4



---

Figure 1. Data flow and program relationships for SCPDEC. Program tasks are designated by boxes and AFOS and RDOS disk files by circles. The oval denotes optional user command input. The dashed line denotes optional flow.

CCCSCPER1  
CCCSCPCR1  
CCCSCPSR1  
CCCSCPWR1

---

Figure 2. The master SCPKEYLIST.00 distributed with the initial SCPDEC package. "CCC" stands for the local AFOS node.

ABQ, ACT, ACY, AGS, AHN, AKO, AMA, AST, ATL, BFL, BHM, BIS, BLU, BOI, BRO,  
BTM, BTR, CHS, CLT, CMX, CNK, COS, CPR, CSG, CUU, DAY, DDC, DEN, DFW, DSM,  
DTW, ELP, EYW, FMY, FNT, FSM, GEG, GLD, GRI, GYM, HLC, HSI, IAD, ICT, INL,  
JAN, LAN, LAS, LAX, LBB, LBF, LCH, LEX, LGB, LHX, LIT, LNK, MCI, MCK, MCN,  
MEI, MEM, MGM, MKE, MOT, MSN, MSP, MTJ, MTY, OKC, OLM, OMA, ORD, PBI, PIA,  
PIT, PUB, RAP, RFD, ROA, SAT, SAV, SCK, SDF, SEA, SFO, SGF, SLC, SMP, SMX,  
SPI, SPS, STJ, STL, SUX, SXT, TLH, TOP, TUL, TUP, TUS, UIL, Y62, YKM

---

Figure 3. The master list of SCP stations in the SCPSTNLIST.00 included with the initial SCPDEC package. In the actual RDOS file, only one station is included per line.

NMCSGPSR1

TBUS22 KWBC 061840

SATELLITE-DERIVED CLOUD INFORMATION FOR MID (CLD TOPS 631-400 MB) AND  
 HIGH LEVEL (CLD TOPS ABOVE 400 MB)

(AUG)

STA	DA/TIMEZ	MID	HIGH	CLD TOP	ECA
ABQ	06/1824	SCT		120-210	0
ACT	06/1825	SCT	SCT	120-380	42
AGS	06/1825		OVC	150-380	59
AHN	06/1825	OVC		150-380	65
AMA	06/1824	SCT		210-210	1
ATL	06/1825		OVC	230-330	89
BHM	06/1825		OVC	180-380	93
BTR	06/1826	SCT	SCT	120-380	17
CSG	06/1825		OVC	190-380	65
CUU	06/1827	SCT		190-190	0
DFW	06/1825	OVC		160-330	76
ELP	06/1825	SCT	SCT	120-260	35
FSM	06/1824	SCT		210-210	3
GYM	06/1827	SCT	SCT	190-300	2
JAN	06/1825		OVC	150-380	50
LBB	06/1825	SCT	SCT	150-380	26
LCH	06/1826	SCT	SCT	120-380	10
LIT	06/1824	OVC		190-440	92
MCN	06/1825		BKN	170-440	39
MEI	06/1825		BKN	150-380	43
MEM	06/1824		OVC	190-380	86
MGM	06/1825		OVC	300-440	88
OKC	06/1824	BKN		120-330	50
SAT	06/1826	CLR			0
SAV	06/1826	SCT	SCT	120-440	3
SPS	06/1825	BKN		120-330	71
TLH	06/1826	MCLR		190-230	5
TUL	06/1824	SCT		120-210	8
TUP	06/1825		OVC	230-330	92
STA	DA/TIMEZ	MID	HIGH	CLD TOP	ECA

Figure 4. A sample SCP collective for the NWS Southern Region (CCCSCPSR1).

The third line below the communications header (TBUS22...) indicates the product month. The definitions of the abbreviations in the header line are: STA - station ID; DA/TIMEZ - day of month and time in UTC of the data for that station; MID - middle cloud amount; HIGH - high cloud amount; CLD TOP - lowest and highest estimates of cloud top in hundreds of ft; and ECA - effective cloud amount in percent.

SCP DECODED OUTPUT [SCPDATA] FOR 10/ 6/1993 14 8Z

[01-02]	[03]	[04]	[05]	[06]	[07]	[08]	[09]	[10]	[11]	[12]	[13]	[14]	[15]
STNID	MTH	DAY	YEAR	TIME		ERRRTN	NCM	NCH	LFIELD	HFIELD			ECA
ABQ	10	6	1993	1324		1	0	-99	-99	-99			0
ACT	10	6	1993	1326		1	0	-99	-99	-99			0
AGS	10	6	1993	1325		1	-99	4	230	380			85
AHN	10	6	1993	1325		1	-99	4	230	440			88
AMA	10	6	1993	1324		1	0	-99	-99	-99			0
ATL	10	6	1993	1325		1	2	2	120	440			7
BHM	10	6	1993	1325		1	0	-99	-99	-99			0
BTR	10	6	1993	1326		1	0	-99	-99	-99			0
CSG	10	6	1993	1325		1	-99	3	120	440			37
CUU	10	6	1993	1327		1	-99	4	240	380			90
DFW	10	6	1993	1325		1	0	-99	-99	-99			0
ELP	10	6	1993	1325		1	-99	4	120	440			60
FSM	10	6	1993	1324		1	0	-99	-99	-99			0
GYM	10	6	1993	1327		1	-99	4	180	380			69
JAN	10	6	1993	1325		1	0	-99	-99	-99			0
LBB	10	6	1993	1324		1	0	-99	-99	-99			0
LCH	10	6	1993	1326		6	0	-99	-99	-99			0
LIT	10	6	1993	1324		1	0	-99	-99	-99			0
MCN	10	6	1993	1325		1	-99	4	260	380			71
MEI	10	6	1993	1325		1	0	-99	-99	-99			0
MEM	10	6	1993	1324		1	0	-99	-99	-99			0
MGM	10	6	1993	1325		6	2	-99	210	210			0
OKC	10	6	1993	1324		1	0	-99	-99	-99			0
SAT	10	6	1993	1327		1	0	-99	-99	-99			0
SAV	10	6	1993	1326		1	-99	4	300	440			91
SPS	10	6	1993	1324		1	0	-99	-99	-99			0
TLH	10	6	1993	1326		1	-99	4	260	440			83
TUL	10	6	1993	1323		1	0	-99	-99	-99			0
TUP	10	6	1993	1324		1	0	-99	-99	-99			0

- STNID - Three or four letter station ID.
- MTH - Month of product (obtained from third line of product).
- DAY - Day of this station.
- YEAR - Year of this station (assumed to be the same as the system).
- TIME - Universal Time Coordinated of the this station.
- ERRRTN - Error return code for this station. (See Table 2).
- NCM - Middle cloud amount for this station.
- NCL - Low cloud amount for this station.
- LFIELD - Lowest estimated top for clouds in hundreds of feet.
- HFIELD - Highest estimated top for clouds in hundreds of feet.
- ECA - Effective cloud amount in percent.

Figure 5. A sample of the diagnostic printout obtained on the PPM or line printer from using the global "X" switch. Definitions of the abbreviations are also listed. See Table 1 for more information.

(Continued from inside front cover)

Computer Program NWS TDL

- CP 92-1 Separating Individual Synoptics from within Synoptic Collectives.  
Beasley, August 1992. (PB92232313)
- CP 93-1 AFOS Profiler Software System. Battel, Leaphart, Moeller, and  
Petrie, August 1993.
- CP 93-2 AFOS Surface Observation Decoding. Beasley, September 1993.