#657
Earth Sc
NIMBUS 7
SBUV/TOMS NMC
XN-11A

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1. INTRODUCTION:

The documentation for this data set was originally on paper, kept in NSSDC's Data Set Catalogs (DSCs). The paper documentation in the Data Set Catalogs have been made into digital images, and then collected into a single PDF file for each Data Set Catalog. The inventory information in these DSCs is current as of July 1, 2004. This inventory information is now no longer maintained in the DSCs, but is now managed in the inventory part of the NSSDC information system. The information existing in the DSCs is now not needed for locating the data files, but we did not remove that inventory information.

The offline tape datasets have now been migrated from the original magnetic tape to Archival Information Packages (AIP's).

A prior restoration may have been done on data sets, if a requestor of this data set has questions; they should send an inquiry to the request office to see if additional information exists.

2. ERRATA/CHANGE LOG:

NOTE: Changes are made in a text box, and will show up that way when displayed on screen with a PDF reader.

When printing, special settings may be required to make the text box appear on the printed output.

Version	Date	Person	Page	Description of Change
01				
02				

3 LINKS TO RELEVANT INFORMATION IN THE ONLINE NSSDC INFORMATION SYSTEM:

http://nssdc.gsfc.nasa.gov/nmc/

[NOTE: This link will take you to the main page of the NSSDC Master Catalog. There you will be able to perform searches to find additional information]

4. CATALOG MATERIALS:

a. Associated Documents To find associated documents you will need to know the document ID number and then click here. http://nssdcftp.gsfc.nasa.gov/miscellaneous/documents/

b. Core Catalog Materials

REQ. AGENT	RAND NO.	ACQ. AGENT
SAR	V0322	CYN

NIMBUS 7

SBUV/TOMS NMC

XN-11A

No New I.D. Number

THIS DATA SET CATALOG CONSISTS OF 46 MAGNETIC TAPES. THE TAPES ARE 9-TRACK, 1600 BPI AND WERE CREATED ON AN IBM 360/195 COMPUTER. THE TAPES ARE MULTI-FILED, THE FIRST BEING A NIMBUS STANDARD HEADER FILE, WRITTEN IN EBCDIC, FOLLOWED BY BINARY DATA FILES AND ENDING WITH A TRAILER DOCUMENTATION FILE. (YEAR ONE WILL NOT HAVE THE TRAILER DOCUMENTATION FILE.) THE D NUMBERS ALONG WITH THE NUMBER OF FILES AND THE TIME SPANS ARE AS FOLLOWS:

Seq.ID	D#	Files	Time Span
FR 00001	D-73751	7	10/15/78 - 11/25/78
FR 00002	D-73752	9	11/28/78 - 01/20/79
FR 00003	D-73753	9	01/21/79 - 03/17/79
FR 00004	D-73754	9	03/18/79 - 05/12/79
FR 00005	D-73755	9	05/13/79 - 07/07/79
FR 00006	D-73756	10	07/08/79 - 09/08/79
FR 00007	D-73757	10	09/09/79 - 11/10/79
FR 00008	D-73758	9	11/11/79 - 01/05/80
FR 00009	D-73759	9	01/06/80 - 03/01/80
FR 00010	D-73760	10	03/02/80 - 05/03/80
FR 00011	D-73761	9	05/04/80 - 06/28/80
FR 00012	D-73762	9	06/30/80 - 08/30/80
FR 00013	D-73763	7	08/31/80 - 10/25/80
FR 00014	D-73764	10	10/26/80 - 12/27/80
FR 00015	D-73765	10	12/28/80 - 02/21/81
FR 00016	D-73766	9	02/22/81 - 04/18/81
FR 00017	D-73767	~~8~~ 9	04/19/81 - 06/13/81
FR 00018	D-73768	9	06/14/81 - 08/08/81
FR 00019	D-73769	9	08/09/81 - 10/03/81
FR 00020	D-73770	9	10/04/81 - 11/28/81
FR 00021	D-73771	9	11/29/81 - 01/23/82*
FR 00022	D-73772	9	01/24/82 - 03/20/82
FR 00023	D-73773	9	03/21/82 - 05/15/82
FR 00024	D-73774	9	05/16/82 - 07/10/82
FR 00025	D-73775	9	07/11/82 - 09/04/82
FR 00026	D-73776	9	09/05/82 - 10/30/82

Seq.ID	D#	Files	Time Span
FR 00027	D-73777	9	10/31/82 - 12/25/82
FR 00028	D-73778	9	12/26/82 - 02/19/83*
FR 00029	D-73779	9	02/20/83 - 04/16/83
FR 00030	D-73780	9	04/17/83 - 06/11/83
FR 00031	D-73781	8	06/12/83 - 08/06/83
FR 00032	D-73782	10	08/07/83 - 10/01/83
FR 00033	D-73783	9	10/02/83 - 11/26/83
FR 00034	D-73784	8	11/27/83 - 01/21/84
FR 00035	D-73785	8	01/22/84 - 03/17/84*
FR 00036	D-73786	9	03/18/84 - 05/12/84
FR 00037	D-73787	9	05/13/84 - 07/07/84
FR 00038	D-73788	9	07/08/84 - 09/01/84
FR 00039	D-73789	9	09/02/84 - 10/27/84
FR 00040	D-73790	9	10/28/84 - 12/22/84
FR 00041	D-73791	6	12/23/84 - 02/16/85
FR 00042	D-73792	9	02/17/85 - 04/13/85
FR 00043	D-73793	9	04/24/85 - 06/08/85*
FR 00044	D-73794	9	06/09/85 - 08/03/85
FR 00045	D-73795	9	08/04/85 - 09/28/85
FR 00046	D-73796	9	09/29/85 - 11/23/85

BRIEF DESCRIPTION OF NMC GRIDDED DATA XN-11A

This set of gridded meteorological data was supplied by the National Meteorological Center (NMC) and was generated by an IBM 360/195 computer on 9-track, 1600-bpi magnetic tapes. The first file contains in EBCDIC the standard Nimbus 7 header file. The remaining files contain records of heights and temperature data that are gridded in the NMC 65 x 65 polar stereographic grids (both Northern and Southern Hemispheres). Data obtained by radiosondes are mapped at standard pressure levels from 1000 to 100 mbar (16 km), and those by NOAA spacecraft are mapped up to 0.4 mbar (55 km). All maps are analysed for the time period of 1200 GMT. There is a total of 46 tapes covering October 1978 to November 1985. No addition to the data set is expected since the contract between NMC and the Nimbus project had expired. This data set is useful for correlative studies with the Nimbus 7 Solar Backscatter Ultraviolet Spectrometer (SBUV) data.

B-56505-000A

NIMBUS 7
NIMBUS OBSERVATION PROCESSING SYSTEMS (NOPS)
TAPE IDENTIFICATION T632131
GRIDDED NMC METEOROLOGICAL DATA

NASA
National Aeronautics and Space Administration

GODDARD SPACE FLIGHT CENTER
GREENBELT, MARYLAND

NIMBUS 7
NIMBUS OBSERVATION PROCESSING SYSTEMS (NOPS)
TAPE IDENTIFICATION T632131
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ABSTRACT

The National Meteorological Center (NMC) gridded data are generated by an IBM 360/195 computer at the National Oceanic and Atmospheric Administration on a nine-track, 1600-bpi tape. The first file contains the Nimbus Observation Processing System Standard Header, in extended binary-coded decimal interchange code (EBCDIC). The remaining files contain data records as described in this document or NMC Office Note 84. Tables and explanations have been taken directly from NMC Office Note 84.

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ACRONYMS

BPI	Bit per inch
CCT	Computer-compatible tape
EBCDIC	Extended binary-coded decimal interchange code
ERB	Earth radiation budget
ID	Identification
IPD	Information Processing Division
ILT	Image-location tape
LSB	Least significant bit
MSB	Most significant bit
NMC	National Meteorological Center
NOAA	National Oceanic and Atmospheric Administration
NOPS	Nimbus Observation Processing System
PDFC	Project Data Format Code
SACC	Science and Applications Computer Center
SBUV	Solar and back-scattered ultraviolet
SHF	Standard header file
SHR	Standard header record
TDF	Trailing documentation file
TOMS	Total-Ozone Measurement System

NIMBUS 7

NIMBUS OBSERVATION PROCESSING SYSTEM (NOPS)

TAPE IDENTIFICATION T632131

GRIDDED NMC METEOROLOGICAL DATA

1. REQUIREMENT IDENTIFICATION

The requirement identification is SBUV/TOMS National Meteorological Center (NMC) tape specification number T632131. The Project Data Format Code (PDFC) for this tape is NMFR. The two-letter header code is FR.

2. INPUT DATA SOURCE

Standard Meterological Data

3. OPERATING MODE

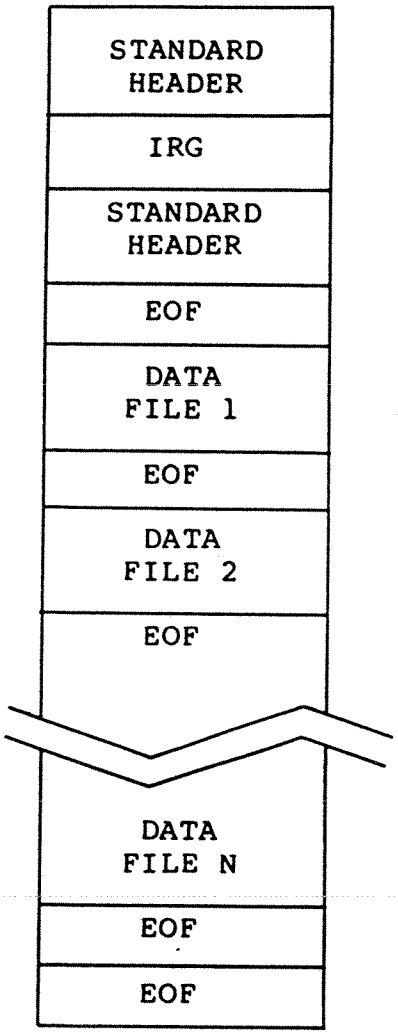
Daily Operations

4. STANDARD HEADER SPECIFICATION AND TAPE DOCUMENTATION

4.1 GENERAL

All computer-compatible tapes (CCT's), used as interfaces within NOPS, require some form of identification. This rule applies to all CCT's that are currently defined by a NOPS tape specification and that are also used for distribution or archiving purposes.

In addition to defining a "latest" product, data relating to previous products that went into the making of the "latest" product provide useful information when system problems occur.



There is one type of data file: contour maps, Northern and Southern Hemispheres.

- Data in the contour map files contain contour map matrices.
- Data types can be identified by the record identification (ID) field described in the text.
- Information from the shipping letter is very useful because the different types of data files have different block sizes.
- This tape type will not contain the trailing documentation file (TDF) Revision B.

Figure 1. Gross Format

The purpose of this revision to existing NOPS tape specificaitons is to define a scheme that allows the recording of the genealogy of a "latest" product and that, in general, adheres to existing tape-documentation standards.

In brief, the system is as follows:

1. A documentation file that consists of a string of physical records follows the data on any tape defined by a current NOPS tape specification. This will be referred to as a trailing documentation file (TDF) and will be the last file on a tape when it exists. (Year 1 tapes are exempt.) The TDF will appear only when specifically stated in the tape specification.

2. The standard NOPS header file remains as defined, with minor modifications to the standard header record (SHR) that reflects both the existence of a TDF and adherence to the Information Processing Division (IPD) standard for sequence numbers.

The following sections define the NOPS SHR's and file. Data files, currently defined in NOPS tape specification, remain unchanged.

4.2 STANDARD HEADER RECORD

The SHR will consist of one physical record consisting of five logical records of 126 extended binary-coded decimal interchange code (EBCDIC) characters. The first 126 characters will remain as previously defined, with the exception of character 1 and those characters that define the sequence number (40-45). Character 1 will contain an asterisk (*) and will notify all systems that a TDF is likely to follow the main data files and

that the next logical record contains information relevant to complete identification. As of the implementation date of this specification, all sequence numbers will have the following IPD standard form:*

Characters 40-44 = Sequence number for this particular product

Character 45 = The existing hypen remains unless there is a remake of the tape. In this case, an ascending alpha character will replace the hyphen, and the most recent reason for remake will be recorded in logical record 4 of the header.

Character 47 = This will remain as a blank unless it is needed to remove ambiguities in character 40. This may occur if data are being acquired on October 24, 1988.

This scheme will uniquely identify any tape used in conjunction with the tape specification number, the project data format code, and the subsystem identification.

The second logical record, consisting of 126 characters, will contain information that is required to complete the history of the product:

Characters 1-12 = Software program name and version number.

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*This does not apply to coastal-zone color scanner (CZCS) data. For CZCS data, characters 40 to 45 represent a 6-digit sequence number.

Characters 13-18 = Program documentation reference number (if it exists).

Characters 20-126 = User-defined comments that may be more relevant to the user than the preceding ones.

The NOPS standard header file will continue to consist of two records, the second being a duplicate of the first. Logical records 3 and 4 may be used for any other purpose if remake information is not required.*

The STD HDR will contain the following:

Two identical records (physical) of 630 characters (8 bits each, followed by an end-of-file).

The first 126 characters of the first record will consist of:

*NIMBUS-7$_b$NOPS$_b$SPEC$_b$NO$_b$T. optional	(1-24 character count)
XXXXXX (*96-digit specification number)	(25-30 character count)
$_b$SO$_b$NO	(31-37 character count)
AA XXXXX (5-digit sequence number)	(38-44 character count)

*In the case of CZCS, these logical records are used to define the genealogy of the image rather than the method of 5.3.
*For CZCS, characters 40 to 45 form a 6-digit sequence number.

Note: *If sequence number is zero; tape is not a finished product (i.e., definitive ephemeris not used, artificial VP data, etc.).

redo character

-X (copy number 1 or 2)	(45,46 character count)
$_{b}$YYYY$_{b}$ (4-character subsystem ID)	(47-52 character count)
YYYY (generation facility ID) facility ID)	(53-56 character count)
bTO_{b}YYY (4-character designated facility ID)	(57-64 character count)
$GEN_{b}19XX_{b}DDD_{b}HHMMSS_{b}$ (date and time tape was generated.)	(107-126 character count)

When required, the second group of 126 characters will contain continuation documentation of the original 126 characters.

The third, fourth, and fifth groups of 126 characters each are intended for the use of the subsystem analysts for further identifications of their data. They may contain blanks, EBCDIC, BDC, binary characters, or zeros.

The second record in the file is a duplicate of the first record for redundancy.

For example, an Earth radiation budget (ERB) matrix tape covering the month of Februrary 1979 is generated by the Science and Applications Computer Center (SACC) and sent to IPD for production of contour maps on 16-mm microfilm. The NOPS STD HDR file on the tape that IPD received would contain two of the following records:

*NIMBUS-7NOPS$_b$SPEC$_B$NO$_b$T134031$_b$SQ$_b$NO$_b$
First day of time period
AA90321-2$_b$ERB$_{bb}$SACC$_b$TO$_b$IPD$_{bb}$START$_b$1979$_b$
032$_b$000432$_b$TO$_b$1979$_b$059$_b$235742$_b$GEN$_b$
1979$_b$104$_b$094500$_b$ followed by 504 blanks
First day of time period may not be first day in the event of multiday-stacked products that are based in an image-location tape (ILT) week.

4.3 TAPE DUPLICATION

Because of the real possibility of an original tape being damaged in handling (resulting in the loss of many computataions), each processing facility within NOPS will generate duplicate copies of master tapes. These duplicates will be delivered to IPD for data-product generation or user-copy generation and will be indicated by the characters "-2" added to the sequence number in the STD HDR. The original will be indicated by the character "-1" and will be retained in a secure environment at the originating facility. Due to tape errors, when IPD returns copy number 2, a new copy will be sent to IPD with the same copy number (but identified on the tape canister as "-2A," then "-2B," for a subsequent redo, etc.).

4.4 SHIPPING LETTERS

IPD will include a shipping letter with every tape distributed. The shipping letter will be printed directly from the first 126 (or 138) characters of the first physical record of the standard header file (SHF). In the event of copies made from CCT's that are not generated in IPD, a new physical record, reflecting IPD as the source and the Nimbus experimenter to whom the tape is being sent as the destination, will be added as the second record of the TDF. All existing records in the TDF will be pushed down, but none will be lost. This record should also replace those in the SHF.

5. POLAR STEREOGRAPHIC MAP RECORDS

Each map record will contain either a Northern or a Southern Hemisphere polar stereographic projection.

The format for both hemispheres of the polar stereographic projection is shown in Figure 2 from the National Meteorological Center (NMC) Office Note 84). Tables 1 through 13 are referenced by the number in the upper left-hand corner of the individual words in Figure 2.

Most NMC data fields can be thought of as some quantity Q on a horizontal or quasi-horizontal surface S at some level L. If the quantity Q is defined in a layer, the limits of the layer are given by S1 at L1 and S2 at L2. In this case, the surface of S1 will be physically above the surface of S2. Another possibility is that the quantity Q is formed by the difference of two fields. These possibilities and many others can be indicated by carefully considered combinations of the markers T, M, N, and X.

The numerical value of the level L for the corresponding surface

NMC Packed Data Fields

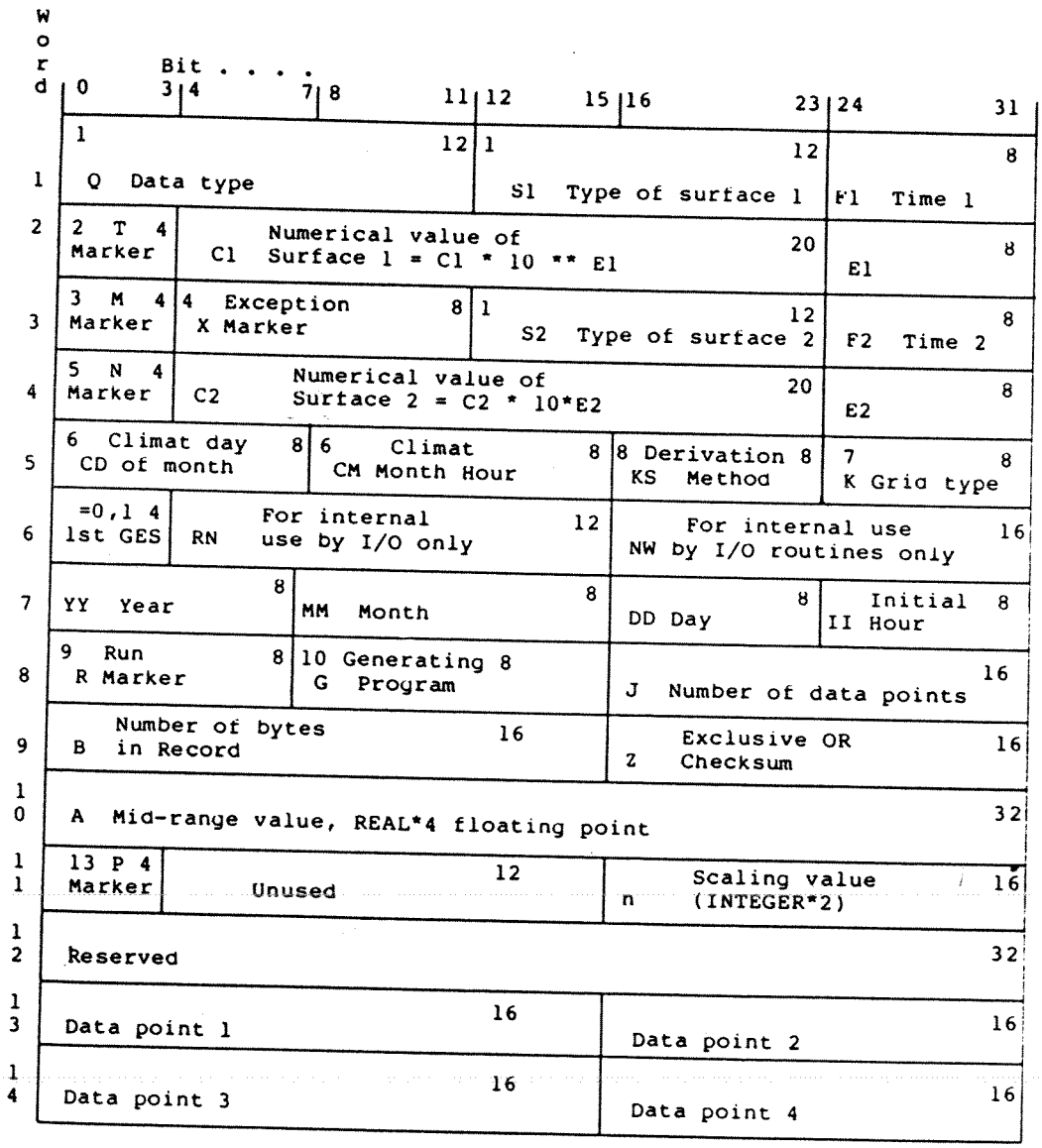

Figure 2. NMC Format for Packed Data Fields (Upper left: table reference, if any; upper right: field size in bits)

S is coded in fullwords 2 and 4 of the format as follows. Represent L as:

$$L \approx C * 10^{**}E$$

where C is a 5-digit signed decimal integer whose high-order digit is nonzero unless L itself is zero, and E is a signed integer, zero if L is zero. For example, if L=500:

C = 50000

E = -2

so that L = 50000 * 10**(-2)

Again, if L = 0.07:

C = 70000

E = -6

so that L = 70000 * 10**(-6)

Table 11 contains the hexadecimal representations of some common values of C. Negative values of C and E are indicated by turning on the high-order bit in the field, thus using a sign-and-magnitude representation inconsistent with IBM arithmetic.

The method for scaling and packing the data is as follows: First, find the maximum and minimum data values QMAX and QMIN, respectively. This determines the midrange value A:

A = (QMAX + QMIN) / 2.0

Now find the binary scaling value n, the least integer such that:

$$(QMAX - A) < 2^{**}n$$

The midrange value A is stored as a 32-bit IBM floating number in fullword 10 of the format, and the binary scaling value n is stored as a halfword iteger in the right half of fullword 11. (Refer to Figure 2.) The data array is now scaled according to:

$$H(j) = (Q(j) - A) * 2^{**}(15 - n),\ j=1,...,J$$

where the scaled values H(j) are rounded and converted to halfword integers and are stored in sequence following fullword 12 of the format. Here, the Q(j) are the given fullword floating numbers, and the array contains J of them. (If the field has dimension two or higher, the points are taken in the order that they occur in storage. J will be the product of the dimensions.) Negative values of n and negtive values of the H(j) that occur after scaling are stored in the standard IBM 2's complement form.

Table 1. Q and S--Parameters and Surfaces

Number Hex	Number Dec	Abbreviation*	Parameter Name	Standard Unit
			Height wrt mean sea level	
1	1	-HGT--	Geopotential	gpm
2	2	-P-ALT	Pressure altitude	gpm
			Distance wrt Earth's surface	
6	6	-DIST-	Geometric distance above	m
7	7	-DEPTH	Geometric distance below	m
8	8	-PRES-	Atmospheric pressure	mb
			Temperature	
10	16	-TMP--	Atmospheric temperature	degree K
11	17	-DPT--	Dewpoint temperature	degree K
12	18	-DEPR-	Dewpoint depression	degree K
13	19	-POT--	Potential temperature	degree K
14	20	-T-MAX	Maximum temperture	degree K
15	21	-T-MIN	Minimum temperature	degree K
			Vertical motion	
28	40	-V-VEL	Vertical velocity dp/dt	mb/sec
29	41	-NETVD	Net vertical displacement	mb
2A	42	-DZDT-	Vertical velocity dz/dt	m/sec
2B	43	-OROW-	Orographic component dz/dt	m/sec
2C	44	-FRCVV	Frictional component dz/dt	m/sec
			Wind	
30	48	-U-GRD	U comp. of wind wrt grid	m/sec
31	49	-V-GRD	V comp. of wind wrt grid	m/sec
32	50	-WIND-	Wind speed	m/sec
33	51	-T-WND	Thermal wind speed	m/sec
34	52	-VW-SH	Vertical speed shear	1/sec
35	53	-U-DIV	Divergent u comp wrt grid	m/sec
36	54	-V-DIV	Divergent v comp wrt grid	m/sec
37	55	-WDIR-	Direction from which wind is blowing (wrt North)	degree
38	56	-WWND-	Westerly comp. of wind	m/sec
39	57	-SWND-	Southerly comp. of wind	m/sec
3A	58	-RATS-	Ratio of speeds	dimensionless
3B	59	-VECW-	Vector wind (spectral)	NA
3C	60	-SFAC-	Steadiness factor	percent
3D	61	-GUST-	Wind gustiness	m/sec

*Abbreviations are 6 characters. A dash (-) is used to indicate a blank when printed.

Table 1. (continued)

Number Hex	Number Dec	Abbreviation*	Parameter Name	Standard Unit
			Fluid flow functions	
48	72	-ABS-V	Absolute vorticity	1/sec
49	73	-REL-V	Relative vorticity	1/sec
4A	74	-DIV--	Divergence	1/sec
50	80	-STRM-	Stream function	m**2/sec
51	81	-V-POT	Velocity potential	m**2/sec
			Moisture	
58	88	-R-H--	Relative humidity	percent
59	89	-P-WAT	Precipitable water	kg/m**2
5A	90	-A-PCP	Accumulated total precip.	meter
5B	91	-P-O-P	Probability of precipitation	percent
5C	92	-P-O-Z	Prob. of frozen precipitation	percent
5D	93	-SNO-D	Snow depth	m
5E	94	-ACPCP	Accumulated convective precip.	m
5F	95	-SPF-H	Specific humidity	kg/kg
60	96	-L-H2O	Liquid water	kg/kg
61	97	-RRATE	Rainfall rate	kg/m**2/sec
62	98	-TSTM-	Probability of thunderstorm	percent
63	99	-CSVR-	Conditional probability of severe local storm	percent
64	100	-CTDR-	Conditional probability major tornado outbreak	percent
65	101	-MIXR-	Mixing ratio	kg/kg
66	102	-PSVR-	Unconditional probability of severe local storm	percent
67	103	-MCONV	Moisture convergence**	kg/kg/sec
68	104	-VAPP-	Vapor presure	mb
			Stability	
70	112	-LFT-X	Lifted index	degree K
71	113	-TOTOS	Total totals	degree K
72	114	-K-X--	k-index	degree K
73	115	-C-INS	Convective instability	degree K
			Wave components	
78	120	-L-WAV	Long wave component of geopotential	gpm
79	121	-S-WAV	Short wave component of geopotential	gpm

* Abbreviations are 6 characters. A dash (-) is used to indicate a blank when printed.

**These fields may have been stored in nonconforming units of g/kg/hr.

Table 1. (continued)

Number Hex	Number Dec	Abbreviation*	Parameter Name	Standard Unit
			Miscellaneous surfaces	
80	128	-MSL--	Mean sea level	
81	129	-SFC--	Earth's surface (base of atmosphere)	
82	130	-TRO	Tropopause	
84	131	-MWSL-	Maximum wind-speed level	
84	132	-PLYR-	Oceanographic primary layer	
			Sigma domain	
90	144	-BDY--	Boundary	
91	145	-TRS--	Troposphere	
92	146	-STS--	Stratosphere	
93	147	-QCP--	Quiet cap	
94	148	-SIG--	Entire atmosphere	
			Miscellaneous parameters	
A0	160	-DRAG-	Drag coefficients	dimensionless
A1	161	-LAND-	Land/sea	dimensionless
A2	162	-KFACT	k factors (700 mb to 500 mb normal ratio)	dimensionless
A3	163	-10TSL	Conversion consts (1000 mb to sea-level pressure)	dimensionless
A4	164	-7TSL-	Sea-level pressure specification from 700-mb heights	mb/m
A5	165	-RCPOP	Regression coefficients for probability of precip.	percent/m
A6	166	-RCMT-	Regression coefficients for mean temperature	deg K/m
A7	167	-RCMP-	Regression coefficients for mean precipitation	dimensionless
A8	168	-ORTHP	Orthogonal pressure function	mb
A9	169	-ALBDO	Albedo	dimensionless
AA	170	-ENFLX	Energy flux	watt/m**2
AB	171	-HEATR	Heating rate	deg K/sec
AC	172	-ENRGY	Energy statistics	NA
AD	173	-TOTHF	Total heat flux	watt/m**2
AE	174	-SEHF	Sensible/evaporated heat flux	watt/m**2
AF	175	-SORAD	Solar heat flux	watt/m**2

* Abbreviations are 6 characters. A dash (-) is used to indicate a blank when printed.

**These data types (Q) do not use the standardized ON 84 identification schemeandmay have been stored in nonstandard units. Contact NMC/CAC/AIB for further information.

Table 1. (continued)

Number Hex	Number Dec	Abbreviation*	Parameter Name	Standard Unit
B0	176	-LAT--	Latitude	degree N
B1	177	-LON--	Longitude	degree W
B2	178	-RADIC	Radar intensity	NA
B8	184	-PROB-	Probability	percent
B9	185	-CPROB	Conditional probability	percent
BA	186	-USTAR	Surface friction velocity	m/sec
BB	187	-TSTAR	Surface friction temperature	degree K
BC	188	-MIXHT	Mixing height	m
C8	200	-RDNCE	Radiance**	watt/m**2/sr/m
C9	201	-BRTMP	Brightness temperature**	degree K
CA	202	-TCOZ-	Total column ozone**	kg/m**2
CB	203	-OZMR-	Ozone mixing ratio**	kg/kg
			Oceanographic variables	
130	304	-UOGRD	U comp. of current wrt grid	m/sec
131	305	-VOGRD	V comp. of current wrt grid	m/sec
180	384	-WTMP-	Water temperature	degree K
181	385	-WVHGT	Height of wind-driven waves	m
182	384	-SWELL	Height of sea swells	m
183	387	-WVSWL	Combined height of waves and swell	m
184	388	-WVPER	Period of wind-driven waves	sec
185	389	-WVDIR	Direction from which waves are moving (wrt North)	degree
186	390	-SWPER	Period of sea swells	sec
187	391	-SWDIR	Direction from which swells are moving (wrt North)	degree
188	392	-ICSEA	Ice-free sea	percent
190	400	-HTSGW	Significant wave height	m
191	401	-PERPW	Primary wave period	sec
192	402	-DIRPW	Direction from which primary waves are moving (wrt North)	degree

* Abbreviations are 6 characters. A dash (-) is used to indicate a blank when printed.

** These data types (Q) do not use the standardized ON 84 identification scheme and may have been stored in nonstandard units. Contact NMC/CAC/AIB for further information.

Table 1. (concluded)

Number Hex	Number Dec	Abbreviation*	Parameter Name	Standard Unit
193	403	-PERSW	Secondary wave period	sec
194	404	-DIRSW	Direction from which secondary waves are moving (wrt North)	degree
195	405	-WCAPS	White-cap coverage	percent

*Abbreviations are 6 characters. A dash (-) is used to indicate a blank when printed.

Table 2. T--Time Marker (4 bits)

T (Dec)	Meaning	F1*	F2*
0	Instantaneous field (e.g., a 500 mb height forecast: Q)	Fcst time of Q	0
1	Field formed from two fields whose valid times are equal but whose forecast times may or may not be equal (e.g., difference between two analyses (times equal) or difference between a forecast and the verifying analysis (times unequal): Q2 - Q1)	Fcst time of Q2	Fcst time of Q2 - fcst time of Q1
2	Field formed from two fields whose forecast times are equal but whose valid times are unequal (e.g., a tendency field formed by differencing two analyses which are 12 hours apart : Q2 - Q1)	Fcst time of Q1 and Q2	Valid time of Q2 - valid time of Q1
3	Field formed from two fields whose initial times are equal but whose forecast times are unequal (e.g., a forecast tendency field: Q2 - Q1)	Fcst time of Q2	Fcst time of Q2 - fcst time of Q1
4	Field of normal values averaged over a number of days, where F1 = number of days and F2 = 0, or averaged over a number of years, where F1 = 0 and F2 = number of years.	Days used in average -or- 0	0 -or- Years used in average
5	Noninstantaneous field (e.g., a field of forecast probability of precipitation during some time period).	Fcst time at end of period	Fcst time at end of period - fcst time at bgng

*F1 and F2 are in hours unless N = 15 (Table 5) or unless half-days, days, or years are specified.

Table 2. T--Time Marker (4 bit) (concluded)

T (Dec)	Meaning	F1*	F2*
6	Field of time-averaged values (e.g., a 5-day height mean: (Q1+Q2+Q3+Q4+Q5)/5 with F1 the fcst time of Q1 in half days and F2 = 8 half days).	Fcst time of bgng of period in half-days, high-order bit on if negative	Length of period in half-days
7	Field of differences between two fields of time-averaged values of type T = 6 (e.g., the difference of two 5-day height means Q2 - Q1, Q2 centered at D+8, Q1 centered at D+3).	Fcst time of Q2 in half days	Fcst time of Q2 - fcst time of Q1 in half-days
10	Same meaning as case T = 2 except F1 and F2 are in days.		

*F1 and F2 are in hours unless N = 15 (Table 5) or unless half-days, days, or years are specified.

Table 3. M--Level Difference Marker (4 bits)

M	Value
0	Indicates that S2 and L2 are not applicable. (In this case S2 = L2 = 0)
1	Indicates a field formed by taking the value of Q at S1 minus the value of Q at S2.
2	Indicates a field of Q for an entire layer bounded by S1 and S2.

Table 4. X--Exception Marker (8 bits)

X	Value
0	Indicates that the initial date/time of the field is the same as the current date/time of the observation cycle.
1	Indicates that the initial date/time of the field is 6 hours prior to the current date/time of the observation cycle.
2	Indicates that the intial date/time of the field is 12 hours prior to the current date/time of the observation cycle.
n	Indicates that the initial date/time of the field is 6n hours prior to the current date/time of the observation cycle.
80	Special-use marker to indicate a field produced with spectral-wave truncation.
255	Not applicable. The exception marker does not apply to this field.

Table 5. N--Miscellaneous Marker (4 bits)

M	Value
0	None of the following
1	Spectral specification
2	Zonal coefficient
3	Spectral amplitude
4	Spectral phase angle
.	
.	
.	
15	F1 and/or F2 are in half-days

Table 6. CM and CD--Climatology Markers (8 bits each)

CM	Month-Hour
00	Not applicable
01	JAN - 0000 GMT
02	FEB - 0000 GMT
.	.
.	.
.	.
12	DEC - 0000 GMT
13	JAN - 1200 GMT
14	FEB - 1200 GMT
.	.
.	.
.	.
24	DEC - 1200 GMT

CD	Day of Month
00	Not applicable
01	1st day of month
02	2nd day of month
.	.
.	.
.	.
31	31st day of month

Table 7. K--Grid Type

K Hex	K Dec	Grid	Grid Increment
0	0	1977 point N. Hemisphere polar stereographic grid (octagon) oriented 80W, North Pole at (24,26).	381 km at 60N
1	1	1679 point (73x23) Mercator grid with (1,1) at (OW,48.09S), (73,23) at (OW, 48.09N), I increasing eastward, Equator at J=12.	5 degs of longitude
2	2	1752 point (73x24) Mercator grid for latitudes 49.73S to 49.73N.	5 degs of longitude
3	3	3021 point (53x57) N. Hemisphere polar stereographic grid oriented 80W, North Pole at (27,29).	381 km at 60N
4	4	510 point (17x30) subset of grid type 0 (N. Am. & Can.) for FD(U,V,T) fields.	381 km at 60N
5	5	3021 (53x57) N. Hemisphere polar stereographic grid oriented 105W, North Pole at (27,49).	190.5 km at 60N
6	6	1977 point octagonal subset of grid type 5, North Pole at (24,46). (N. Am.)	190.5 km at 60N
7	7	2329 point N. Hemisphere polar stereographic grid (octagon) oriented 80W.	381 km at 60N
8	8	5104 point (116x44) Mercator grid with (1,1) at (0W,48.67S) and (116,44) at (3.1035W,61.05N), I increasing eastward, Equator at J=19.	3.1035 degs of longitude
9	9	143 U.S. cities for TDL wind, cloud, flight weather and max/min products.	
A	10	216 U.S. cities for TDL probability of precipitation (POP).	
B	11	286 U.S. cities for TDL pcpn amount.	

Table 7. K--Grid Type (Continued)

K Hex	K Dec	Grid	Grid Increment
C	12	1702 point (74x23) Mercator grid for latitudes 48.09S to 48.09N.	5 degs of longitude
D	13	576 point (36x16) N. Hemisphere longitude/latitude LRPG diamond array--pole stored at top of every 10 degs of longitude--for latitudes 90N to 15S.	
E	14	108 U.S. stations for TDL max/min temps.	
F	15	40 U.S. stations for TDL max/min temps.	
10	16	1560 point (39x40) N. Hemisphere polar stereographic grid (Eastern U.S.) oriented 80W.	95.25 km at 60N
11	17	221 point (17x13) subset of grid type 5 (U.S.) for TDL trajectory model, North Pole at (76,21).	190.5 km at 60N
12	18	Reserved.	
13	19	1977 point S. Hemisphere polar stereographic grid (octagon) oriented 100E South Pole at (24,26).	381 km at 60S
14	20	2655 point (45x59) Mercator grid for latitudes 30S to 30N.	1.5 degs of longitude
15	21	1387 point (73x19) N. Hemisphere longitude/latitude grid for latitudes 0N to 90N.	5 degs
16	22	1387 point (73x19) S. Hemisphere longitude/latitude grid for latitudes 90S to 0S.	5 degs
17	23	783 point (29x27) subset of grid type 5 for TDL boundary layer model.	190.5 km at 60N
18	24	651 point (31x21) subset of grid type 5 (U.S.) for TDL probability of precipitation (POP) facsimile product. North Pole at 15,41).	190.5 km at 60N

Table 7. K--Grid Type (Continued)

K Hex	K Dec	Grid	Grid Increment
19	25	3021 point (53x57) S. Hemisphere polar stereographic grid oriented 100E, South Pole at (27,29).	381 km at 60S
1A	26	2385 point (53x45) subset of grid type 5, North Pole at (27,49).	190.5 km at 60N
1B	27	4225 point (65x65) N. Hemisphere polar stereographic grid oriented 80W, North Pole at (33,33).	381 km at 60N
1C	28	4225 point (65x65) S. Hemisphere polar stereographic grid oriented 100E, South Pole at (33,33).	381 km at 60S
1D	29	5365 point (145x37) N. Hemisphere longitude/latitude grid for latitudes 0N to 90N, (1,1) at (0E, 0N).	2.5 degs
1E	30	5365 point (145x37) S. Hemisphere longitude/latitude grid for latitudes 90S to 0S. (1,1) at (0E,90S).	2.5 degs
1F	31	327 point TDL field composed of 4 grids: U.S. (255 points), Alaska (56 points), Hawaii (12 points) and Puerto Rico (4 points). See TDL Technical Memo 74-14.	
20	32	744 point (24x31) subset of grid type 26 (U.S.). See TDL Tech. Memo 74-14	190.5 km at 60N
21	33	8326 point (181x46) N. Hemisphere longitude/latitude grid for latitudes 0N to 90N, (1,1) at (0E,0N).	2 degs
22	34	8326 point (181x46) S. Hemisphere longitude/latitude grid for latitudes 90S to 0S, (1,1) at (0E,90S).	2 degs
23	35	228 U.S. cities for TDL MOS max/min temps.	

Table 7. K--Grid Type (Continued)

K Hex	K Dec	Grid	Grid Increment
24	36	1558 point (41x38) subset of grid type 26 (U.S.), North Pole at (19,42). See TDL Tech. Memo 74-14.	190.5 km at 60N
25	37	5365 point (145x37) N. Hemisphere longitude/latitude grid for latitudes 1.25N to 88.75N. (1,1) at (1.25E,1.25N), row 37 fictitious.	2.5 degs
26	38	5365 point (145x37) S. Hemisphere longitude/latitude grid for latitudes 88.75S to 1.25S. (1,2) at (1.25E,88.75S), row 1 fictitious.	2.5 degs
27	39	8326 point (181x46) N. Hemisphere longitude/latitude grid for latitudes 1N to 89N, (1,1) at (1E,1N), row 46 fictitious.	2 degs
28	40	8326 point (181x46) S. Hemisphere longitude/latitude grid for latitudes 89S to 1S, (1,2) at (1E,89S), row 1 fictitious.	2 degs
29	41	850 point (34x25) N. Hemisphere longitude/latitude grid for latitudes 22N to 46N, (1,1) at (87W,22N).	1 deg
2A	42	Not assigned.	
2B	43	4225 point (65x65) N. Hemisphere polar stereographic grid oriented 105W, North Pole at (33,33).	381 km at 60N
2C	44	4225 point (65x65) S. Hemisphere polar stereographic grid oriented 75E, South Pole at (33,33).	381 km at 60S
2D	45	2425 point (97x25) N. Hemisphere longitude/latitude grid for latitudes 0N to 90N, (1,1) at (0E,0N).	3.75 degs
2E	46	2425 point (97x25) S. Hemisphere longitude/latitude grid for latitudes 90S to 0N, (1,1) at (0E,90S).	3.75 degs

Table 7. K--Grid Type (Continued)

K Hex	K Dec	Grid	Grid Increment
2F	47	10057 point (113x89) N. Hemisphere polar seterographic grid oriented 105W North Pole at (41,161).	47.625 km at 60N
30	48	3477 point (61x57) N. Hemisphere polar stereographic grid oriented 105W North Pole at (27,49).	190.5 km at 60N
31	49	16641 point (129x129) N. Hemisphere polar stereographic grid oriented 80W, North Pole at (65,65).	190.5 km at 60N
32	50	16641 point (129x129) S. Hemisphere polar stereographic grid oriented 100E South Pole at (65,65).	190.5 km at 60S
33	51	Available for future use	
34	52	Available for future use	
35	53	5967 point (117x51) Mercator grid with (1,1) at (0W,61.05S) and (117,51) at (0W,61.05N), I increasing eastward and Equator at J=26.	3.1035 degs of longitude
36	54	1050 point (35x30) subset of grid type 51 for TDL boundary layer model. (Eastern 2/3 of U.S.), oriented 80W, North Pole at (1,75).	95.25 km at 60N
37	55	6177 point (87x71) N. Hemisphere polar stereographic grid oriented 105W, North Pole at (44,38).	254 km at 60N
38	56	6177 point (87x71) N. Hemisphere polar stereographic grid oriented 105W, North Pole at (40,73).	127 km at 60N
39	57	240 point (15x16) subset of grid type 5.	190.5 km at 60N
3A	58	100 U.S. cities for 24-hour accumulated precipitation.	

Table 7. K--Grid Type (Continued)

K Hex	K Dec	Grid	Grid Increment
3B	59	5293 point (79x67) subset of grid type 56 (used for LFM II mountains). North Pole at (40,73).	127 km at 60N
3C	60	3249 point (57x57) N. Hemisphere polar stereographic grid oriented 105W, North Pole at (29,49).	190.5 km at 60N
3D	61	Spectral coefficients, scalar fields. (961 COMPLEX*8 words).	30 modes
3E	62	Spectral coefficients, U- or V-component fields. (992 COMPLEX*8 words).	30 modes
3F	63	1095 point (73x15) longitude/latitude grid for latitudes 35S to 35N, (1,1) at (0,35S) and I increasing eastward.	5 degs
40	64	65x65 Mesh size is 1/8 mesh size of std. FNOC hemisphere grid.(Gulf stream)	
41	65	65x65 Mesh size is 1/8 mesh size of std. FNOC hemisphere grid.(Southern CA)	
42	66	2701 point (73x37) longitude/latitude grid for latitudes 90S to 90N (1,1) at (0,90S) and I increasing eastward.	5 degs
43	67	13689 point (117x117) N.W. Atlantic polar stereographic grid oriented 80W, North Pole at (9,317).	23.8125 km at 60N
44	68	13689 point (117x117) Gulf of Mexico polar stereographic grid oriented 105W, North Pole at (-35,361).	23.8125 km at 60N
45	69	13689 point (117x117) Gulf of Alaska polar stereographic grid oriented 105W, North Pole at (177,209).	23.8125 km at 60N
46	70	13689 point (117x117) Californian Pacific polar stereographic grid oriented 105W, North Pole at (169,285).	23.8125 km at 60N

Table 7. K--Grid Type (Continued)

K Hex	K Dec	Grid	Grid Increment
47	71	13689 point (117x117) Mexican Pacific polar stereographic grid oriented 105W, North Pole at (137,377).	23.8125 km at 60N
FF	255	Not applicable.	

Table 8. Derivation Marker (8 bits)

KS	Derivation method
0	None of the following
1	Hough spectral method
2	Field formed by subtracting a climatological normal from each data value; e.g., a field of departures from normal heights.

Table 9. R--Run Marker (8 bits)

R	Run
0	New operational run (LFM)
1	1st operational run in a given observation cycle (RADAT)
2	2nd operational run (RAOB)
3	3rd operational run (OPNL)
4	4th operational run
5	5th operational run (FINAL)

Table 10. G--Generating Program (8 bits)

G Hex	G Dec	Name of Program Generating Data	Map Label
0	0	Objective analysis	
1	1	Barotropic fcst model (NMC ON 15)	BATROP
2	2	Mesh model 1958 (NMC ON 15)	
3	3	Mesh model 1964 (imprv. terr.) (NMC ON 15)	
4	4	Reed 1000 mb fcst model (NMC Tech. Memo 26)	
5	5	3-level baroclinic fcst model (NMC TM22)	
6	6	4-level baroclinic fcst model	
7	7	4-layer primitive equation model (PE)	
8	8	6-layer PE model	
9	9	Maximum and minimum temperature fcst	
A	10	Sea height and swell fcst	
B	11	Tropical analysis	
C	12	Tropical fcst	
D	13	Bat analysis	
E	14	Tropical fcst	
F	15	Tropical fcst with satellite modification	
10	16	Subsynoptic advection model	
11	17	Compute long-wave components	
12	18	Trajectory fcst	
13	19	Limited-area fine mesh (LFM) analysis	LFM
14	20	Limited-area fine mesh (LFM) fcst	LFM1
15	21	Perfect prog precipitation fcst	
16	22	Hough analysis	HOUGH
17	23	Eddy analysis and SANBAR fcst (NHC Miami)	
18	24	NWRC/NCAR climatology data	
19	25	Snow cover	
1A	26	Planetary boundary layer analysis and fcst	
1B	27	Extended fcst data processor	
1C	28	PE and trajectory model output statistics	
1D	29	9-layer global PE model (5 deg mesh)	
1E	30	9-layer N. H. PE model (2.5 deg mesh)	
1F	31	6-layer PE model (360/195 version)	6LPE

Table 10. G--Generating Program (8 bits) (Continued)

G Hex	G Dec	Name of Program Generating Data	Map Label
20	32	Sea-surface temp. code using NESS temps	
21	33	Land-shelter temperature analysis	
22	34	Energy statistics code	
23	35	9-layer global PE model (2.5 deg mesh)	
24	36	As above except used for 6-hour cycle	
25	37	3-layer global PE model	
26	38	7-layer PE Hemis. fine mesh model, 190.5 km	7LPE
27	39	Nested grid model	
28	40	9-layer N. H. PE model (2 deg mesh)	
29	41	LFM with 127 km grid increment	LFM2
2A	42	7-layer PE model (381 km grid)	7LCM
2B	43	Optimum interpolation analysis program	OPTIN
2C	44	Sea surface temperature analysis	
2D	45	Spectral model Global 24 mode 12 layer	SMG2C
2E	46	Spectral model Global 30 mode 12 layer	SMG3C
2F	47	Spectral model Hemis. 24 mode 12 layer	SMH2C
30	48	Spectral model Hemis. 30 mode 12 layer	SMH3C
31	49	Ozone Analysis Tiros Operational	TOVS
32	50	Spectral model Global 24 mode 6 layer	SMG26
33	51	Spectral model Global 30 mode 6 layer	SMG36
34	52	Ozone Analysis Nimbus 7	SBUV
35	53	LFM fourth-order (NWS TPB 300)	LFM
36	54	Spectral model Hemis. 24 mode 6 layer	SMH26
37	55	N. American sea-level pressure analysis	
38	56	N. H. sea-level pressure analysis	
39	57	European Center for Median Range Wea. Fcst.	ECMWF
3A	58	Fleet Numerical Oceanography Center	FNOC
3B	59	Air Force Global Weather Central	AFGCW
3C	60	NWS Central Region	CRGN
3D	61	NWS Western Region	WRGN
3E	62	NWS Eastern Region	ERGN
3F	63	Spectral model Global 40 mode 12 layer	SMG4C

Table 11
Hexadecimal Equivalents for Common Values of C (Coding of L)

Decimal	Hexadecimal
10000	02710
16667	04116
15000	03A98
15240	03B88
18290	04772
20000	04E20
21340	0535C
25000	061A8
27315	06AB3
27430	06B26
30000	07530
30480	07710
33333	08235
35000	088B8
36580	08EE4
40000	09C40
41667	0A2C3
42670	0A6AE
45000	0AFC8
50000	0C350
55000	0D6D8
58333	0E3DD
60000	OEA60
65000	0FDE8
66667	1046B
70000	11170
75000	124F8
80000	13880
83333	14585
85000	14C08
90000	15F90
91400	16508
91667	16613
95000	17318
99000	182B8

Table 12
Examples of Identifier Words for Common Fields

(1) A 1000 mb height analysis on a 65x65 N. Hem. grid:

00100800 00271081 00000000 00000000 0000001B

(2) A 500 mb height analysis on a 65x65 N. Hem. grid:

00100800 00C35082 00000000 00000000 0000001B

(3) A 500 mb temperature analysis on a 65x65 N. Hem. grid:

010000800 00C35082 00000000 00000000 0000001B

(4) A 500 mb 12-hour height forecast on a 65x65 N. Hem. grid:

0010080C 00C35082 00000000 00000000 0000001B

(5) A 500 mb 12-hour height forecast on a 53x45 LFM grid:

0010080C 00C35082 00000000 00000000 0000001A

(6) A 12-hour forecast of the potential temperature in the boundary layer, expressed in sigma coordinates, on a 2.5 long/lat grid:

0130900C 00000000 20009000 00271084 0000001D

(7) A 100 mb height tendency forecast field, for 6 to 18 hours after the initial time, which is 12 hours prior to the date/time of the file:

00100812 30271082 0020000C 00000000 0000001B

(8) A field of surface precipitation which is forecast to be accumulated between 24 and 30 hours after the initial time:

05A0811E 30000000 00000006 00000000 0000001B

Table 13. P--Packing Marker (4 bits)

P	Value
0	All sixteen bits are used for packing
1	One bit used for packing
2	Two bits used for packing
.	
.	
.	
15	Fifteen bits used for packing

INPUT PARAMETERS ARE: ED SR=1=2 1 1 1

TAPE NO. 1 FILE NO. 1
RECORD 1 LENGTH 630
*NIMBUS-7 NOPS SPEC NO T632131 SQ NO FR00046-2 NWS NOAA TO IPD START 1985 272 000000 TO 1985 327
239999 GEN 1985 329 187417 NIMBUS-7 NOPS SPEC NO T632131 SQ NO FR00046-2 NWS NOAA TO IPD START 1
985 272 000000 TO 1985 327 239999 GEN 1985 329 187417

Nimbus 7
NMCT
XN-11A
D-73796
09/29/85-11/23/85

TAPE NO. 1 FILE NO. 1
RECORD 2 LENGTH 630
*NIMBUS-7 NOPS SPEC NO T632131 SQ NO FR00046-2 NWS NOAA TO IPD START 1985 272 000000 TO 1985 327
239999 GEN 1985 329 187417 NIMBUS-7 NOPS SPEC NO T632131 SQ NO FR00046-2 NWS NOAA TO IPD START 1
985 272 000000 TO 1985 327 239999 GEN 1985 329 187417

XN

***** JOB DONE.
$WEO LPS

$$
$EXE TPDUMP BS

DUMP OF TAPE SIN-13

INPUT TAPE SIN-13 ON TB1
DATA INPUT H9 NF 9 SR 7 1 1 SR 8 1 1 SR 9 1 1 SR 9 LAST 2

FILE	INPUT RECS. 1	INPUT RECS. 2	DATA RECORDS INPUT 2	MAX. SIZE 630	READ ERROR SUMMARY PERM 0	ZERO B 0	SHORT 0	UNDEF. 0	INPUT RETRIES #RECS. 0	TOTAL # 0

FILE 7 RECORD 1 LENGTH 8508BYTES

(0)	213C0000	21380000	00100800	00271081	00000000	00000000	0000001B	0000084D	550B030C	00001081
(40)	21322FB4	C16A3700	00000009	00000000	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85
(80)	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85
(120)	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85
(160)	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85
(200)	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85
(240)	1D851D85	1DD51D38	1C921BED	1B571ACF	1A641D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85
(280)	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85
(320)	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85
(360)	1D851D85	1CCC1D85	1E131E6D	1E831E4F	1E041D9F	1D151C45	1B681AB1	1A451A57	1A731A58	19DE1D85
(400)	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85
(440)	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85
(480)	1D851D85	1D851D85	1C631C76	1CCD1D4C	1DC91E17	1E431E1C	1DD51DAA	1DA71DB3	1D481C70	1B781AB7
(520)	1A971AEF	1B271ACC	19DA185A	17AD1D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85
(560)	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85
(600)	1D851D85	1D851D85	1D851D85	1D851C30	1BF61C1D	1C951CE8	1D371D90	1DDB1DDE	1D831D2D	1CE01CED
(640)	1D5F1D98	1D371C4F	1B421AA7	1AF71B55	1B5C1ADC	19EF1924	187E1812	1D851D85	1D851D85	1D851D85
(680)	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85
(720)	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1B961B2E	1ACA1AF4	1B861C13	1C751C38	1D031D5D
(760)	1D821D43	1CAB1C03	1BAB1C07	1CF21D68	1CE71B9E	1A4D19E2	1A9B1B68	1BCA1B6C	1ABF1A3A	19CB196B
(800)	192A1D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85
(840)	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851AF8	1B461AF3	1A3619D1	1A041AA8
(880)	1B2D1B98	13F71C4B	1C891CA1	1C6B1BBD	1A8B1996	19CE1B62	1CD61D0F	1BD11A11	19011958	1AC313D8
(920)	1C101BE5	1BCA1B28	1A8719EB	19C51A02	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85
(960)	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851ACA	1B671B83	
(1000)	1A9B1982	18E81919	197E19ED	1AB71356	1B5A1B61	19881B40	19EE17D4	164D16CD	194A1BB1	1C721B75
(1040)	19C31889	186A1973	1B251C1C	1C641C48	1C191B81	1AC11A25	1A4F1AC6	1D851D85	1D851D85	1D851D85
(1080)	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85
(1120)	1D851A98	1B401BF3	1BB81AEA	19C218EE	186C1814	18B41983	19A41989	19E61A91	1A601853	151F130C
(1160)	13DB16E2	19D31AEC	1A6E1972	18D618E3	19E51B37	1C401CDD	1D131CE2	1C8E1BB4	13081AD9	13221378
(1200)	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85
(1240)	1D851D85	1D851D85	1A541A91	1AEA1BEA	1CA81CE9	1C1F1B64	1A2D18C0	188B18B6	18C1182F	17C41903
(1280)	1A381960	16851378	123C134D	15CA1830	196E1978	193D19A3	1AA71B67	1C401D32	1DE91E41	1E251D9C
(1320)	1CEA1BF8	1B781B8E	1BA41882	1B3F1D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85
(1360)	1D851D85	1D851D85	1D851D85	1D851D85	1AB71AF6	1B241BEA	1CD41DD1	1E3E1E8B	1E271C82	1B231A7D
(1400)	1A2 19BE	187C197B	1B3E1AAA	17DC14D4	13591390	150616ED	188D1942	19241900	19821AA9	1C2E1D7E
(1440)	1E5B1F03	1F341EF0	1E611D80	1CC91C32	1BF21BCE	13601AFE	1A8E1D85	1D851D85	1D851D85	1D851D85
(1480)	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1AF71B6E	1BCE1C2B	1C8D1D43	1E0F1F4C
(1520)	1FC71F79	1E581D68	1CA11B23	19E41B7D	1E6C1F37	1B9816BC	14141429	1588175A	19581A8B	1A5D1980
(1560)	18EC18EE	1A561C49	1E601EA9	20352030	1EA51ED9	1F281D6C	1D051C95	1C391BB4	1AF91AD4	1A9E1D85
(1600)	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851B79	1C201C75
(1640)	1C6C1C38	1C151CC9	1DAA1EAE	1EA21E23	1DE11D36	1B911BA8	201E2490	23B81D77	172413E3	14261683
(1680)	19451B3D	1BF41B66	1A5F1A0E	1ABA1B26	1C2B1E7A	20552194	217F210B	20581F96	1F121E38	1D981CB6
(1720)	1C261B9B	135C1383	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85
(1760)	1D851B2D	1BD11C4C	1C5A188C	1A47199F	19FE1AEF	1BC81C75	1D2C1DE9	1CF11C01	1E9F24DD	292227F1
(1800)	21981A69	14BD12E1	158119F4	1C111B86	1A09191B	19781AA1	1A901AA3	1C011EFA	21982239	22D922CF
(1840)	22892190	205A1E8F	1D4F1C06	1BAE1BB3	1C631C7D	1D851D85	1D851D85	1D851D85	1D851D85	1D851D85
(1880)	1D851D85	1D851D85	1D851AF9	1B6C13EA	1C361B73	1A121847	17C21864	196A1A6E	137A1D3E	1E0E1D86
(1920)	1DF621E8	2703294D	28E425B4	1F56179D	131A143F	18E91AA8	17FD149E	13B714B9	15D2171F	17891863
(1960)	1B5E1ED5	216F232C	24EB2534	24652266	20221D65	1BE21AFE	1B381BFF	1D041CFA	1D851D85	1D851D85
(2000)	1D851D85	1D851D85	1D851D85	1D851D85	1D851AEF	196A1BE5	1C5E1BF2	1B0D193F	18821881	195A1A3E
(2040)	1AFC1C14	1D4D1E0D	1E352025	24472755	27F4280A	270122C3	1B931601	156A17B6	176A13D4	10F91133
(2080)	123D124F	13161412	14E416E2	1AC81ED2	2203254D	26E8265C	24462162	1E831BEB	1AD61A8A	1B111C4B

PRINTED IN U.S.A.

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(  7080)  CE87CB75  CB0CCA4B  C971C8F9  C917C96D  C9D7CA89  CB04CAC7  CA4DCA39  CA55CA74  CAF8CCD2  CD4BCEA9
(  7120)  D072D293  D4BAD71B  D9DBDC6A  DD04DAC9  D6FCD337  D0B1CE6C  CB16C8C7  CA03CCD0  CDEFCEA4  CF78CF7A
(  7160)  D035D16D  D123CF9C  CDE6CC41  CA0EC644  C335C53A  C31ACF54  D069CF63  CD95CCAF  CCB6CCCB  CCB0CC84
(  7200)  CC47CBD4  CB87CB35  CB69CBC0  CBD7CB9A  CAF3CA13  C98AC95A  C953C9AB  CA7FCB3F  CB2CCAAC  CA89CA62
(  7240)  CA04CA2B  CB14CC51  CDB7CF8C  D199D351  D495D5E2  D764D7EE  D6BCD410  D0EBCF3C  CEC4CE8B  CED5CF80
(  7280)  CEE6CCEB  CC2DCC9D  CCD6CE22  D0A1D26B  D277D0E5  CE0BCA72  C707C592  C7F1CC53  CEFECFAF  CF11CD7D
(  7320)  CC7BCC84  CCD4CCE7  CCBCCC6B  CBEECBA3  CB26CB57  CBBCCBED  CBC5CB4A  CA97C9F5  C958C8F8  C93BC9FA
(  7360)  CABCCB03  CAEACAD5  CA86C9F4  C9CCCA56  CB4CCCB8  CEB1D0C8  D245D2F2  D370D3F6  D405D364  D1A4CF3D
(  7400)  CF122E54  CFA6CE22  CF0CCE34  CD6ACC39  CC77CBFA  CC89CF10  D217D302  D19ECF0B  CCAACB34  CAABCBF8
(  7440)  CDFBCEAD  CE71CDCC  CCC6CC1D  CC2CCC96  CCCFCCA5  CC52CBE1  CB9FCAFF  CB20CB75  CBC6CBCE  CB72CACD
(  7480)  C9F2C918  C8D9C937  C9A9CA1C  CA9DCAED  CB17CAD4  CA4EC9EA  CA12CA93  CBB7CD70  CE36D077  D119D16E
(  7520)  D15FD0FF  D09BCF9C  CE31CDA7  CDD5CDCE  CD98CDBC  CE0CCE21  CE17CD79  CC66CBED  CD4FCFE0  D114D092
(  7560)  CF50CE52  CE02CDD7  CDE2CDED  CD8CCCD6  CC36CBF1  CBD7CBD7  CC10CC44  CC30CBF9  CBA7CB71  CAE8CAFB
(  7600)  CB42CBB5  CC03CBDB  CB2CCA17  C944C948  C9B2C9E3  CA02CA6F  CB00CB57  CB47CAE5  CA84CA5C  CA89CB3A
(  7640)  CC5ECD88  CE5ACF04  CF6ECE10  CE74CE1C  CD7BCCD4  CCC5CCEC  CCD9CCA2  CCD0CDD0  CF1ECF90  CEC4CD79
(  7680)  CC68CC62  CD88CEB7  CF21CED5  CE49CDD7  CD8DCD0A  CC3CCBCA  CBB2CBB0  CBCBCBC0  CB98CB8B  CB8DCB86
(  7720)  CB7ACB44  CB23CAE3  CAEEC322  CB8FCC00  CC22CB96  CA7CC9CF  C3EECA3F  CA4ECA43  CA83CAEE  C363C394
(  7760)  CB66CB16  CAEFCB16  CB7ACC10  CCAFCD24  CDBDCE11  CD63CCAB  CC59CBD6  CB7ACB83  CBA1CBBD  CBBFCBFE
(  7800)  CD7ECFAA  D098CFD9  CE40CCC4  CBF0CC11  CCE5CD7E  CDABCD63  CC84CBCA  CB74CAED  CAC5CB72  CC0ACC0E
(  7840)  CBC4C38A  C354C31B  CB07CB03  CAF7CAEE  CAE1CAE7  C30BC361  CBC5CC06  CBB1CAC0  CA29CA3A  CA5ECA49
(  7880)  CA66CADC  CB48CB90  CBAFCB93  CB65CB74  CBC7CC23  CC77CCD1  CD1DCD8B  CDB2CCE7  CC0ECB91  C308CA31
(  7920)  CA8FCA8B  CAA9CADE  CB5ACCB5  CEADCFC7  CF49CDB5  CC26CB3C  CB18CB8A  CC0FCC7E  CC85CBCA  CB02CAC6
(  7960)  CA82CA5C  CAFCC338  CBDBC3BC  CB9EC356  CB01CAF1  CAE1CAE1  CAE1CAE1  CAE7CAFC  CB31CB77  CBB2CB85
(  8000)  CAD1CA42  CA18C9F2  C9C7CA22  CAFFCBA1  CBC7CBA3  CB71CB76  C3DDCC8B  CD24CD77  CD98CDB8  CDEACDF1
(  8040)  CD5CCC9A  CBDFCB13  CA6BC9EB  C9AEC9C4  CA1CCAAF  CB8DCC98  CD15CCBB  CBD4CAC9  CA43CA5C  CABECB3A
(  8080)  CBBDCC45  CC9ACC47  CB76CACE  CA7ACA91  CAF6CB4A  CB84CB83  CB3CCAF9  CAE1CAE1  CAE1CAE1  CAE1CAE3
(  8120)  CAEBC381  C32BC357  CB39CAC7  CA58C9FE  C99BC968  C9C7CA9A  C35CCB91  CB48CB1A  CB62CC18  CD3ACE55
(  8160)  CEADCE80  CE3ECE03  CDFFCE0D  CDD9CD0E  CBC2CA72  C97BC90B  C925C980  C9DDCA3F  CA6FCA2A  C9BCC94A
(  8200)  C8F1C938  C9E4CA6E  CAECC39F  CCDCCE73  CE23CE65  CD52CC1E  C32ACAE6  CB01CB3A  CB36CB04  CAE8CAE1
(  8240)  CAE1CAE1  CAE1CAE1  CAE1CAE3  CAE9CAF9  CB0ECAFF  CAC5CA78  CA15C9A8  C979C9A6  CA24CAD4  CB17CAC2
(  8280)  CAA6CB29  CC08CD59  CED6CF4D  CEC9CE2B  CD81CD62  CE2DCEA8  CDF5CC60  CA9FC962  C8E1C8EA  C907C917
(  8320)  C91CC8CC  C829C78A  C71AC74A  C86EC935  CA67CAF4  CC2ECE94  D19FD378  D38DD26A  CFBDCCE9  CB72CAFA
(  8360)  CAFBCAFA  CAE5CAE1  CAE1CAE1  CAE1CAE1  CAE1CAE1  CAE1CAE1  CAE5CAEE  CAE3CAC3  CA85CA21  C9B3C996
(  8400)  C9ABCA01  CAA0CADE  CA83CA6A  CB06CBED  CD35CECF  CF5BCEAF  CDF5CD28  CCEBCE01  CEC9CE26  CC8FCABE
(  8440)  C973C8E2  C8E9C8D4  C8BEC8A5  C829C76B  C6B5C63D  C6A4C826  C9B0CA73  CB10CCA1  CEC3D3A8  D614D681
(  8480)  D55ED204  CE16C3CC  CAFBCAE1  CAE7CAE1  CAE1CAE1  CAE1CAE1  CAE10000
```

FILE	INPUT RECS.	DATA RECORDS INPUT	MAX. SIZE	READ ERROR SUMMARY PERM	ZERO B	SHORT	UNDEF.	INPUT RETRIES #RECS.	TOTAL#
9	588	590	8508	0	0	0	0	0	0

EOJ DUMP STOPPED AFTER FILE 9 # OF PERMANENT READ ERRORS 0

START TIME 01/08/87 12:17:41 STOP TIME 01/08/87 12:24:28

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$$
$ASS IN HT1
$NOR
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