#515

Earth Science

NIMBUS 4

GRIDDED MONTHLY MEAN 5 DEG. x 5 DEG.

GRIDDED MONTHLY MEAN OZONE PROFILE

70-025A-05M

70-025A-05N

NO NEW I.D. ASSIGNED

Table of Contents

---

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 This inventory information is now no longer maintained in the DSCs, but is now managed in the inventory part of the NSSDC information system.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	RD#	ACQ. AGENT
LSM	V0074	RWP

NIMBUS 4

GRIDDED MONTHLY MEAN 5 DEG. X 5 DEG.

70-025A-05M

This data set consists of 1, 9track, 1600 BPI,255 files IBM standard label tape.

D#	C#	FILES	TIMESPAN
D-43685	C-21376	255	APRIL 1970 - APRIL 1977

70-025A-05M

This tape contains monthly mean analysis of BUV total ozone in Dobson units, for the period of April 1970 through April 1977. There are 2664 data points per month, arranged on a latitude/longitude grid of 37x72 points (5^{o}x5^{o} lat/lon). The data is from the North Pole to the South Pole, and from 0^{o} longitude to 355^{o} longitude eastward (e.g. 90^{o}N, 72 values; 85^{o}N, 72 values; 80^{o}N, 72 values).

The tape characteristics are as follows:

nine tracks

1600 BPI density

IBM standard label

8 bits/byte

4 byte/word

One file/month = 85 files

Each file contain 2 records. The first is a 3 integer word (12 byte) date record (month/day/year). Disregard the values for day. The second record contains 2664 gridded ozone data real words (10656 bytes). A zero word means no data.

Enclosed is an example of a Fortran program that reads the tape.

```
C                   OZPRT
C                   OZONE PRINT PROGRAM
C
        REAL*4 A(37,72)
        READ (10,1000) IM,ID,IY
        READ (10,1100) A

        PRINT 1200,IM,ID,IY
        PRINT 1300,A

        STOP
1000    FORMAT(3A4)
1100    FORMAT(10(255A4),114A4)
1200    FORMAT(1X,3I4)
1300    FORMAT(1X,19F5.1/,1X,18F5.1)
        END
```

For further information contact:

Harold D. Bowman II
NOAA/NMC/CAC
301- 763-8071

D-43685
4/1970 - 4/1977

DUMP OF TAPE X-409

INPUT TAPE X-409 ON MT2
DATA INPUT H9 NF 255 SR 2 1 1 SR 254 1 1

FILE	INPUT RECS.	DATA RECORDS INPUT	MAX. SIZE	READ ERROR SUMMARY PERM	ZERO B	SHORT	UNDEF.	INPUT RETRIES #RECS.	TOTAL#
1	3	3	8	0	0	0	0	0	0

FILE 2 RECORD 1 LENGTH 70 18BYTES
(0) 00000004 0000001E 00000046 00000000 0000

FILE	INPUT RECS.	DATA RECORDS INPUT	MAX. SIZE	READ ERROR SUMMARY PERM	ZERO B	SHORT	UNDEF.	INPUT RETRIES #RECS.	TOTAL#
2	2	2	10656	0	0	0	0	0	0

FILE 254 RECORD 1 LENGTH 77 18BYTES
(0) 00000004 00000020 00000040 00000000 0000

FILE	INPUT RECS.	DATA RECORDS INPUT	MAX. SIZE	READ ERROR SUMMARY PERM	ZERO B	SHORT	UNDEF.	INPUT RETRIES #RECS.	TOTAL#
254	2	2	10656	0	0	0	0	0	0

EOJ DUMP STOPPED AFTER FILE 255 # OF PERMANENT READ ERRORS 0

START TIME 03/27/81 16:23:45 STOP TIME 3/27/31 16:29:84

2845
.49

REQ. AGENT	RAND NO.	ACQ. AGENT
LSM	V0107	YPS

NIMBUS 4

GRIDDED MONTHLY MEAN OZONE PROFILE

70-025A-05N

This data set catalog consists of one tape. It is 9 track, 1600 BPI, with 77 files. The tape was created on an IBM 360 computer. The time span and 'D' and 'C' numbers follow:

D#	C#	TIME SPAN
D-46728	C-21872	APRIL 1970 - DECEMBER 1976

T.70-0251-05N

This tape contains monthly mean analyses of BUV mixing ratios at 30, 10, 5, 2, and 1 mb for the period April 1970 - December 1976. The data are arranged on a latitude/longitude grid of 37x72 points (5^{o}x5^{o} lat/long.). The data start at the North Pole and end at the South Pole, from 0^{o} longitude to 355^{o} eastward (e.g. 90^{o}N, 72 values; 85^{o}N, 72 values; 80^{o}N, 72 values; etc.).

The tape characteristics are as follows:

Nine tracks

1600 BPI density

8 bits/byte

One file/month = 77 files

IBM nonlabelled

Each file contain 12 records. The first is a 3 integer word (12 byte) date record (month/day/year). Disregard the values for day. The second record consists of 37x72 integer words giving the number of data points used in averaging each 5^{o}x5^{o} lat/long. grid. The next ten records consist of 37x72 gridded fields of ozone mixing ratios and standard deviations (i.e. 10 mb ozone mixing ratio in microgram/gram, 10 mb standard deviations in microgram/gram, 5 mb ozone mixing ratio, 5 mb standard deviation, ...).

For further information contact:

Ronald M. Nagatani
NOAA/NMC/CAC
301-763-8071

70-025A-05G

TAPE FORMATS AND DESCRIPTIONS TO ACCOMPANY THE OZONE PROFILE TAPES (DPFL AND CPFL) FOR THE NIMBUS-4 BACKSCATTER ULTRAVIOLET EXPERIMENT

OZONE PROCESSING TEAM

JULY 1980

GODDARD SPACE FLIGHT CENTER
GREENBELT, MD

CAUTION: The use of this data to determine long term ozone trends without a thorough understanding of the issues discussed in the Nimbus 4 BUV Users Guide can lead to erroneous conclusions.

OZONE PROCESSING TEAM

Albert J. Fleig[1], Team Manager

Donald F. Heath[2], Instrument Scientist

Kenneth F. Klenk[3], SASC Manager

Suraiya Ahmad[3]

P.K. Bhartia[3]

James Gatlin[4]

Ernest Hilsenrath[2]

Bruce Guenther[2]

Marilyn Hinman[3]

Larry Novak[5]

V.G. Kaveeshwar[3]

Arlin J. Krueger[2]

David Lee[3]

Richard D. McPeters[2]

Alvin J. Miller[6]

Hongwoo Park[3]

Wilbur Schneider[3]

Peter M. Smith[3]

Charles G. Wellemeyer[3]

THIS DOCUMENT WAS PREPARED BY
SYSTEMS AND APPLIED SCIENCES CORPORATION
UNDER CONTRACT NO. NAS5-23854

[1] Laboratory for Atmospheric Sciences, GSFC

[2] Laboratory for Planetary Atmospheres, GSFC

[3] Systems and Applied Sciences Corporation

[4] Earth Observations Systems Division, GSFC

[5] Information Extraction Division, GSFC

[6] Upper Air Branch, NOAA

TABLE OF CONTENTS PAGE

LIST OF TABLES PAGE

SECTION 1 - INTRODUCTION

The Backscattered Ultraviolet (BUV) experiment was proposed by D.F. Heath and J.V. Dave for the Nimbus 4 satellite. The details of the experiment have been described by Heath, D.F., Krueger, A.J., and Mateer, C.L.,(Nimbus 4 User's Guide, Goddard Space Flight Center, Greenbelt, Maryland 20771, 1970). The experiment is capable of retrieving total ozone as well as the vertical distribution of ozone (ozone profile) in the stratosphere. The mathematical approach for the total ozone algorithm was developed by Dave, J.V. and Mateer, C.L.,("A Preliminary Study on the Possibility of Estimating Total Atmospheric Ozone from Satellite Measurements", Journal of the Atmospheric Sciences, 24, pp. 414-427, 1967). The foundations of the ozone profile algorithm have been discussed by Mateer, C.L.,("A Review of Some Aspects of Inferring the Ozone Profile by Inversion of Ultraviolet Radiances", Mathematics of Profile Inversion, Ed., L. Colin, NASA Technical Memorandum TMX-62, 150, 1972).

The BUV experiment started operating in April 1970 and continued to send data through April 1977, at which time the operation was discontinued due to loss of spacecraft power. For the first two and a half years the BUV coverage was essentially uniform over the globe. After August 1972, the instrument operated with reduced coverage due to the need to conserve the spacecraft power. Initially, the data was processed through the algorithms developed by C.L. Mateer and the results have been published by Mateer, C.L., Heath, D.F., and Krueger, A.J.,("Estimation of Total Ozone from Satellite Measurements of Backscattered Ultraviolet Earth Radiances", J. Atmos. Sci, 28, 1307-1311, 1971). Because of the increased awareness of the importance of ozone data and the value of the Nimbus 4 data as the only global measurement available in the early 1970's, the Ozone Processing Team (OPT) was formed in 1976. The total ozone data for all the seven years has been archived by the OPT. This data set is described in a NASA Technical Memorandum ("User's Guide to the Nimbus 4 Backscattered Ultraviolet Experiment Data Sets, Ozone Processing Team, NASA TM78069, Goddard Space Flight Center, Greenbelt, Maryland 20771, 1978).

The BUV profile data set is now complete and archived in the NSSDC. Any of the archived products may be obtained by writing the National Space Sciences Data Center, Goddard Space Flight Center, Greenbelt, Maryland 20771. This profile data set is a result of 3 years of effort by the OPT to improve the available retrieval algorithms and to create a consistent data set over the life span of the experiment. The resulting data has been validated using internal consistency checks and by comparing it with external ground truth measurements such as Umkeher, ozonesonde and rocket measurements. Documents detailing the algorithm, the validation effort, and the instrument performance are being prepared and will be available shortly. A User's Guide entitled

"User's Guide for the Nimbus 4 BUV Ozone Profile Data Sets" is near completion and will be sent to all requestors when available. It will address the problems associated with using this data set to infer long-term trends in the atmospheric ozone. All users of this data set are cautioned to become familiar with the issues discussed in this User's Guide before interpreting the trends which exist in the data set.

The purpose of this document is to describe the tape formats and descriptions of the ozone profile tapes which have been archived at NSSDC. The profile data set is archived in 3 different sets of tapes:

a. Detailed Profile Tapes (DPFL)

b. Compress Profile Tapes (CPFL)

c. Daily Zonal Means Tapes, DZP (using geodetic coordinates) and DZPM (using geomagnetic coordinates)

Section 2 of this document describes the tape formats of DPFL tapes. Detail descriptions of the certain words in the data record are also given where necessary. Section 3 and 4 contain a similar description for the CPFL tapes and the DZPM tapes respectively. Section 5 gives a catalog of all the tapes archived. Finally, Appendix A contains a brief discussion of the dark current correction applied to the measured radiances and the Appendix B gives a sample computer program to read and print the contents of a CPFL tape along with a sample output.

SECTION 2 - DETAILED PROFILES

2.1 Tape Structure

The Detailed Profile (DPFL) Tape contains the ozone profile calculated from the data on Detailed Total Ozone (DTOZ) Tape. It consists of a header file, a number of data files (one for each orbit) and a trailer file.

The header file is the first file on the tape and is used to identify the tape. It has satellite identification and also information regarding the program that made this tape, the version number and date of version of the program. This file consists of two physical records of 600 bytes each. The formats of the header file records are presented in Table 2.1.

Each data file contains a header record followed by data records. The header record contains the unique number of input tapes used to produce the profile data, the orbit number of the data and day and the job ID of the actual production run. The format of the header record is described in Table 2.2. Each data record contains the radiance and position information and the retrieved profiles for each scan. The quantities in groups of eight correspond to eight monochromator channels with wavelength bands centered at 2555, 2735, 2830, 2876, 2922, 2975, 3019, 3058A^{O}. Similarly the retrieved profile is given at 16 discrete pressure levels (0.3 mb, 0.4 mb, 0.5 mb, 0.7 mb, 1.0 mb, 1.5 mb, 2.0 mb, 3 mb, 4 mb, 5 mb, 7 mb, 10 mb, 15 mb, 20 mb, 30 mb, and 40 mb). Table 2.3 describes the format of a data record. The last logical record of a data file is a trailer record. It contains the summary of data processed in the data file and an error summary for data rejected during processing. The tape format for the trailer record is described in Table 2.4.

The last file on the tape is the trailer file. It gives the summary of all the data processed to create this profile tape. The format of the trailer file is given in Table 2.5.

2.2 Data Control Block Information

Tape is 9-track IBM compatible, binary, non-labelled.

Record Format (RECFM) = Fix-Blocked (FB)
Logical Record Length (LRECL) = 600 Bytes
Blocksize (BLKSIZE) = 30,000 Bytes
Density (DEN) = 1600 BPI (DEN = 3)

2.3 Tape Record Formats

The tape record formats are given in Tables 2.1 - 2.5. A detailed description of the words in each record follows the tables wherever necessary.

TABLE 2.1

HEADER FILE OF DPFL TAPE

RECORD 1

WORD	DESCRIPTION	TYPE
1	Satellite ID (Nimbus 4)	R*8 EBCDIC
2	Experiment ID (BUV)	R*8 EBCDIC
3	Program Name (BUVPFL)	R*8 EBCDIC
4	Date of Program Version (April 1980)	R*8 EBCDIC
5	Version No. of Program (Vers 04)	R*8 EBCDIC
6	Unique No. of Output Tape	R*8 EBCDIC
7-10	DCB of the Output Tape 4 Words (RECFM=FB, LRECL=600 BLK=16000† DEN=3)	R*8 EBCDIC
11-12	Day of Week and Date of Job Run (e.g. Tues., Jan. 18, 1979) Two R*8 Words	R*8 EBCDIC
13	Starting Month of Data (e.g. Month = 01)	R*8 EBCDIC
14	Ending Month of Data (e.g. Month = 02)	R*8 EBCDIC
15	Calendar Year of Data (e.g. 70 for 1970)	R*8 EBCDIC
REST	Annotation (= 77777777)	R*8 EBCDIC

RECORD 2

1	Number of Files on Output Tape (= -77)	R*4
2	Total Number of Logical Records in Header File (always 2)	R*4
3	Start Day of First Orbit	R*4
4	Start Time of First Orbit (seconds)	R*4
5	Starting Lat. (-90 to +90) of First Orbit	R*4
6	Starting Long. (0 to 360W) of First Orbit	R*4
7-LAST	Spares (= -77.)	R*4

†ERROR: The blocksize of 16000 written in Words 7-10 is incorrect. The actual value is 30000.

TABLE 2.2

HEADER RECORD OF DPFL TAPE

4-BYTE WORD	DESCRIPTION	TYPE
1	Logical Sequence Number (always 1.0)	R*4
2	Spare (0.0)	R*4
3-4	Unique No. of Input Tape	R*8 EBCDIC
5-8	Day and Date of the Job Run Two R*8 Words (e.g. Tues, Jan 18, 1979)	R*8 EBCDIC
9-10	Job ID (e.g. ZM2SABUV)	R*8 EBCDIC
11	Day of the Beginning of the First Good Scan of the First Orbit on the Output Tape	R*4
12	Time in Secs. of Day for (11) Above	R*4
13	Lat. (-90 to +90) at (11) Above	R*4
14	Long. (0 to 360W) at (11) Above	R*4
15	Week No. of the Start of the Orbit	R*4
16	Orbit No.	R*4
17-18	Program Name (BUVPFL)	R*8 EBCDIC
19-20	Version Date (Apr 80)	R*8 EBCDIC
21-22	Version No. (Vers 04)	R*8 EBCDIC
23	β_o, Photometer Gain Factor	R*4
24	β_o, Monochromator Gain Factor	R*4
25-26	Day of Job Run (e.g. 79.018 = Jan. 18, 1979)	R*3 EBCDIC
27-150	Annotation = (-77.)	R*4

TABLE 2.3

DATA RECORD OF DPFL TAPE (150 R*4 WORDS)

WORD 1-150	DESCRIPTION
1	Logical Sequence Number
2	Orbit Number of the Data
3	Day at Start of Scan
4	Seconds of Day
5	Latitude (Average for Profile Computation)
6	Longitude (Average for Profile Computation)
7	Solar Zenith Angle (Average for Profile Computation)
8	Terrain Pressure (atm)
9	Reflectivity
10	Total Ozone (atm-cm)
11-18	8-Monochromator N-Values (255.5-305.8nm)
19	Dark Current Code
20	Error Code
21	Lower First Guess Mixing Fraction
22	First Guess Total Ozone (atm-cm)
23-24	Parameters C and σ
25	Pressure level (mb) of Upper First Guess Join
26-27	Multiple Scattering Mixing Fractions(297.5 nm and 305.8 nm)
28-35	Q-Values Corrected for Multiple Scattering and Surface Reflectivity (255.5-305.8 nm)
36-43	Cut-Off Levels (mb) for Each Channel Integration (255.5-305.8 nm)
44-51	Pressure Levels where Contribution Functions Peak (mb)
52-59	Initial residuals (255.5-305.8 nm)
60-67	Spares (-77)
68	Ozone Center of Gravity Pressure (mb)
69-84	First Guess Cumulative Ozone Amount (matm-cm) at the 16 Pressure Levels
85-100	First Guess Mixing Ratio in (μgm/gm) at the 16 Pressure Levels
101-116	Final Cumulative Ozone Amount in atm-cm at the 16 Pressure Levels given in text
117-132	Final Mixing Ratio (μgm/gm) at the 16 Pressure Levels given in text*
133-136	Photometer reflectivities for Four Longer Wavelength Profile Channels (292.2, 297.5, 301.9, 305.8 nm)
137	Effective Surface Pressure (atm)
138-141	Multiple Scattering and Reflectivity Correction to Q for Four Longer Wavelength Profile Channels (292.2, 297.5, 301.9, 305.8 nm) (in atm)
142	Total Ozone Used for Multiple Scattering (atm-cm)
143-150	Weight for Each Profile Wavelength (255.5 nm - 305.8mn)

*Note: Mixing ratios at pressure levels outside the validity range have been set negative.

The following is a detailed description of certain words on the DPFL data record:

WORD	DESCRIPTION
(1)	Logical sequence number of the scan in the file. It always starts with two since one is the logical sequence number of the header record.
(2)	Orbit number is counted from launch.
(3)	Day number from Julian calendar
(4)	Seconds of day are given in universal time. Each scan is completed in 32 seconds.
5-7	These quantities are given for the subsatellite point at the midpoint of the sequence of radiance measurements needed to infer the profile.
(5)	Latitude is positive in the northern hemisphere and negative in the southern.
(6)	Longitude is 0 to 360^{o} increasing westward from Greenwich.
(7)	Solar zenith angle. Profiles are inverted for solar zenith angles from 0 to 85.7^{o}.
(8)	Terrain height is obtained by interpolation of tables based on NOAA/NMC terrain height tape.
(9)	Reflectivity is the best value computed by the total ozone algorithm.
(10)	Total ozone is the best value computed by the total ozone algorithm.
(11-18)	Eight monochromator N-values are given, one for each wavelength from 255.5 to 305.8 nm respectively. The N-value for each wavelength is defined as the ratio of the nadir backscattered radiance (I) to the solar irradiance (F) in logarithmic units such that : $N = -100 \log_{10}(I/F)$
(19)	Dark current correction code. Codes 4,5 and 6 represent scans with large uncorrectable dark current. For these codes, profiles are not retrieved.

WORD	DESCRIPTION
(19 - Cont.)	The definitions of the code values are as follows:

Code	Definition
1	0-4999 counts/sec
2	5000-10,999 cps
3	11000-19,999 cps
4	>20,000 cps
5	Instrument saturation
6	No night time data available - presumed to be like Code 4
7	No night time data available - presumed to be like Code 1
8	No night time data available - presumed to be like Code 2
9	No night time data available - presumed to be like Code 3

(20) Inversion error code. The definitions of the error codes are as follows:

Code	Definition
Ø	Good scan
1	Bad or missing N-values (includes cam position problems in profile channels)
2	Flagged best Omega value (other than cam motion and other than SZA greater than upper limit 85.7°)
3	Radiation Anomaly
4	Sigma is either too low (<.3) or too large (>.8)
5	C is either too low (<.5) or too large (>5)
6	Bad initial residues. First guess Q-values differ from observed Q-value by more than 40 percent.
7	Bad pressure levels. Retrieved pressure level is either negative or pressure at upper level is greater than the pressure at lower level.

WORD	DESCRIPTION	
(20 - Cont.)	Code	Definition
	9	Bad measurements of total ozone channels because of cam position problems
	10	Solar zenith angle greater than limit (85.7^{o})
	11	Reflectivity outside range (-0.05 to +1.05)
	12	Photometer reflectivity at measurement time of a profile channel's measurement was out of range (-.05 to +1.05)
	13	Mixing ratio too large (greater than 23.0)
	14	Height of ozone center of gravity outside the range (10-100 mb)

(21) Weight used to mix the climatological profiles from adjacent latitude bands to obtain the lower first guess. This weight is determined by the latitude of the scan's field of view.

(22) Cumulative ozone amount (matm-cm) at 1 atm pressure level for the first guess profile. This number may be slightly different from Word 10 due to several factors including terrain height and the upper level first guess.

(23) Parameter C of the exponential ozone model. It represents the ozone (matm-cm) above a pressure of 1 mb.

(24) Parameter σ of exponential ozone model represents ratio of ozone to air scale height. The equation relating ozone(X), in matm-cm to the parameters C, σ is given by

$X(P) = C\ P^{1/\sigma}$ where P is the pressure in mb. The parameters C and σ are determined using the radiances of the two shorter wavelength channels 273.5 and 283.0 nm.

(25) Pressure (mb) above which the exponential ozone model is used in the first guess construction.

(26) Mixing fraction used in correcting multiple scattering correction for the 297.5 channel.

(27) Similar to Word (27) but applies to 305.8 nm channel.

WORD	DESCRIPTION
(28-35)	The observed Q-values for channels 255.5-305.8 such that Word (28) applies to 255.5 channel and Word (35) applies to 305.8 corrected for multiple scattering and non-zero surface reflectivity effects. Q-values are defined as $$Q = \frac{4\pi}{\beta P(\theta)} \; 10^{-N/100}$$ where β is the air scattering coefficient and $P(\theta)$ is the scattering phase function which is given by $$P(\theta) = 0.7629 \; (1 + 0.932 \cos^2\theta)$$ where θ is the solar zenith angle and N is measured N-value.
(36-43)	Pressures in mb for which integrations are done for calculating first guess Q-values for channels (255.5-305.8) such that Word (36) corresponds to the pressure for channel 255.5 and Word (43) corresponds to the pressure for channel 305.8.
(44-51)	Pressures in mb of the maximum radiance contribution to the first guess Q-values for each of the channels (255.5-305.8) such that Word (44) applies to the 255.5 channel and Word (51) the 305.8 channel.
(52-59)	Initial residuals for the channels 255.5 through 305.8 such that Word (52) applies to the 255.5 channel and Word (59) applies to the 305.8 channel. The initial residual is the fraction of the observed radiance which is unaccounted for by the first guess and the multiple scattering.
(68)	Pressure (mb) above which the ozone is half of the total ozone.
(69-84)	First guess cumulative ozone amount or overburden (matm-cm) for the 16 standard pressure levels (0.3, 0.4, 0.5, 0.7, 1.0, 1.5, 2.0, 3.0, 6.0, 5.0, 7.0, 10.0, 15.0, 30.0, 40.0 mb).
(85-100)	Similar to Words (69-84) but represents the mixing ratios (microgram/gm) at the 16 standard pressure levels.
(101-116)	Cumulative ozone amounts at the 16 standard pressure levels for the final retrieved profile.

WORD	DESCRIPTION
(117-132)	Mass mixing ratios at the 16 standard pressure levels for the final retrieved profile. The partial pressure P_3 in nanobars can be obtained from the mass mixing ratio R_3 by the following equation: $P_3 = R_3 \cdot P/1.657$ Note that the mixing ratios are set negative for pressure levels lying outside the determined validity range.
(133-136)	Photometer reflectivities for channels 292.2-305.8 nm. The reflectivities are computed from photometer measurements taken at the same time as the monochromator measurements. They are used in estimating the multiple scattering corrections.
(137)	Effective surface pressure is computed using the reflectivity in Word 9. This pressure is used to define the lower boundary for the radiance integration.
(142)	Total ozone in matm-cm integrated to 1.0 atm and is equal to the best ozone (Word 10) in absence of high terrain.
(143-150)	Relative weights applied to channels 255.5 through 305.8 nm such that Word (143) applies to channel 255.5 and Word (150) to channel 305.8 nm. The weights are zero for the 255.5 and 301.9 nm channels. The weights are unity for the 273.5, 283.0 and 287.6 nm channels. For the longer channels the weights are determined by the estimated errors in their multiple scattering correction.

TABLE 2.4

TRAILER RECORD OF DPFL TAPE

4-BYTE WORD	DESCRIPTION	TYPE
1	Negative of Log. Seq. No. (= N, where N-2 = No. of Scans for this Orbit)	R*4
2	Orbit No.	R*4
3	Day at the End of the Last Scan of the Orbit	R*4
4	Time in Secs. of Day for (3) Above	R*4
5	Lat. (-90.0 to +90.0) at (3) Above	R*4
6	Long. (0 to 360.0W) at (3) Above	R*4
7	-77.	R*4
8	-77.	R*4
9-10	Unique No. of the Input Tape	R*8
11	No. of Scans Read from DTOZ Tape	R*4
12	No. of Good Profile Scans	R*4
13	No. of Scans Rejected for bad N-values Including Scans with Cam Problems in Profile Channels	R*4
14	No. of Scans Rejected for No Total Ozone being available. (Does not include those scans counted for words 21 and 22)	R*4
15	No. Scans Rejected for Radiation-Anomaly	R*4
16	No. Scans Rejected for Bad Value of Sigma	R*4
17	No. Scans Rejected for Bad Value of C	R*4
18	No. Scans Rejected for Anomalous Initial Residuals	R*4
19	No. Scans Rejected for Retrieving Bad Pressure Levels	R*4
20	Spare (0.)	R*4
21	No. Scans Rejected for Cam Not in Position for Total Ozone Channels	R*4
22	No. Scans Rejected for Solar Zenith Angle Greater than Upper Limit (85.7^{o})	R*4
23	No. Scans Rejected for Reflectivity being Outside the Range (-0.05 to +1.05) in total Ozone Channels	R*4
24	No. Scans Rejected for Bad Reflectivity	R*4
25	No. Scans Rejected Bad Mixing Ratio >23.0	R*4
26	No. Scans Rejected for Height of Ozone Center of Gravity Outside the Range (10-100 mb)	R*4
27-150	Spare (-77.)	R*4

TABLE 2.5

TRAILER FILE OF DPFL TAPE

4-BYTE WORD	DESCRIPTION	TYPE
1	Trailer File Identifier (Always -1.0)	R*4
2	No. of Files on the Output Tape (Including Header File and the Trailer File)	R*4
3	Day at the End of the Last Scan of the Orbit on Tape	R*4
4	Time in Secs of Day for (3) Above	R*4
5	Lat. (-90.0 to +90.0) at (4) Above	R*4
6	Long. (0.0 to 360.0W) at (4) Above	R*4
7	No. of DTOZ-Tape Files Read	R*4
8	Spare (-77.)	R*4
9-10	Unique No. of the Input Tape	R*8 EBCDIC
11-26	Same as Words 11-26 on Trailer Record Totaled for Entire File	R*4
27-150	Spares (-77.)	R*4

SECTION 3 - COMPRESSED OZONE PROFILES

3.1 Tape Structure

The Compressed Profile Tape (CPFL) contains one or more years of ozone profiles calculated from radiances measured by BUV instrument on the Nimbus 4 satellite. The tape is made from several Detailed Profile Tapes (DPFL).

There are only data files on this tape and each file contains only data records (i.e. no header or trailer records). In addition, only a subset of the DPFL data record has been selected as the data record of the CPFL.

3.2 Data Control Block Information

Tape is 9-track IBM compatible, binary, non-labelled.

Record Format (RECFM) = Fix-Blocked (FB)
Logical Record Length (LRECL) = 200 Bytes
Blocksize (BLKSIZE) = 30,000 Bytes
Density (DEN) = 1600 BPI (DEN = 3)

3.3 Tape Record Format

The tape record formats for the data record are given in Table 3.1. A detailed description of the words in the record follows the table wherever necessary.

TABLE 3.1

DATA RECORD OF CPFL TAPE

WORD	DESCRIPTION	TYPE
1	Sequence Number	R*4
2	Orbit Number	R*4
3	Year	R*4
4	Julian Day	R*4
5	Time in Seconds of Day	R*4
6	Latitude	R*4
7	Longitude	R*4
8	Solar Zenith Angle	R*4
9	Reflectivity	R*4
10	Total Ozone	R*4
11-18	Eight Monochromator N-Values (255.5-305.9 nm)	R*4
19	Anomaly Code (Dark Current)	R*4
20-32	Ozone Above at 13 Standard Pressure Levels (.7 mb-40 mb)	R*4
33-45	Mixing Ratios at 13 Standard Pressure Levels (.7 mb-40 mb) *	R*4
46	Pressure Level (mb) where Ozone is Half of Total Ozone	R*4
47	Pressure Level (mb) for the Peak of Second Contribution Function	R*4
48	Pressure Level (mb) for the Peak of last contribution function	
49-50	Parameter C and Sigma for Short Channels	R*4

*Note: Mixing ratios at pressure levels outside the validity range have been set negative.

The following is a detailed description of certain words on the CPFL data record:

WORD	DESCRIPTION
(1)	Logical sequence number of the scan in the file. It always starts with two since one is the logical sequence number of the header record.
(2)	Orbit number if counted from launch.
(5)	Seconds of day are given in universal time. Each scan is completed in 32 seconds.
6-8	These quantities are given for the subsatellite point at the midpoint of the sequence of radiance measurements needed to infer the profile.
(6)	Latitude is positive in the northern hemisphere and negative in the southern.
(7)	Longitude is 0 to 360^{o} increasing westward from Greenwich.
(8)	Solar zenith angle. Profiles are inverted for solar zenith angles from 0 to 85.7^{o}.
(9)	Reflectivity is the best value computed by the total ozone algorithm.
(10)	Total ozone is the best value computed by the total ozone algorithm.
(11-18)	Eight monochromator N-values are given, one for each wavelength from 255.5 to 305.8 nm respectively. The N-value for each wavelength is defined as the ratio of the nadir backscattered radiance (I) to the solar irradiance (F) in logarithmic units such that: $N = -100 \log_{10}(I/F)$
(19)	Dark current correction code. The definitions of the code values are as follows:

Code	Definition
1	0-499 counts/sec
2	5000-10,999 cps
3	11000-19,999 cps
7	No night time data available - presumed to be like Code 1
8	No night time data available - presumed to be like Code 2
9	No night time data available - presumed to be like Code 3

WORD	DESCRIPTION
(20-32)	Cumulative ozone (matm-cm) amounts at 13 pressure levels (0.7, 1.0, 1.5, 2.0, 3.0, 5.0, 6.0, 7.0, 10.0, 15.0, 30.0, 40.0 mb).
(33-45)	Mixing ratios (micrograms/gm) for the above 13 pressure levels (0.7-40 mb). Mixing ratios outside the validity range have been set negative.
(49)	Parameter C of the exponential ozone model. It represents the ozone above 1 mb in matm-cm.
(50)	Parameter σ of the exponential ozone model and represents ratio of ozone to air scale height.
	The equation relating ozone (X), in matm-cm to the parameters C, σ is given by $X(P) = C\ P^{1/\sigma}$ where P is the pressure in mb. The parameters C and σ are determined using the radiances of the two shorter wavelength channels 273.5 and 283.0 nm.

SECTION 4 - DAILY ZONAL MEANS

4.1 Tape Structure

The Daily Zonal Profile Tape contains the average and standard deviation for the cumulative ozone (matm-cm), mixing ratio (microgram/gm) and partial pressure (nanobars) at various pressure levels. The tape is generated from the compressed profile (CPFL) tapes. Daily statistical analyses are performed in specified latitude zones for an entire year. The latitude zones are defined to be 10° wide. Hence, there are in all 17 latitude zones centered at -80°, -70°, -60°, ..., 60°, 70° and 80°. The standard deviation of the mean is computed using the following expression:

$$\sigma = \sqrt{\frac{\sum_{i=1}^{N} \chi_i^2 - N\left(\sum_{i=1}^{N} \chi_i\right)^2}{N-1}}$$

where χ_i is the value of the ozone profile at the i^{th} data point within a latitude zone containing N data points.

There are two tapes - DZP and DZPM. The DZP tape contains the data set produced with geodetic coordinates, whereas for the DZPM, tape geomagnetic coordinates are used.

The two tapes have the same format. There are only data files on this tape and each file contains only data records (no header or trailer records present). Each file contains one year's worth of data for a given pressure level. Each logical record corresponds to data for one latitude zone. Thus there are 17 logical records per day (one for each latitude zone where the first record for the day is zone -80° and the 17th record is for zone $+80^{\circ}$). The data is arranged sequentially by day within the file.

4.2 Data Control Block Information

Tape is 9-track IBM compatible, binary, non-labelled.

Record Format (RECFM) = Fix-Blocked (FB)
Logical Record Length (LRECL) = 40 Bytes
Blocksize (BLKSIZE) = 16,000 Bytes
Density (DEN) = 1600 BPI (DEN = 3)

4.3 Tape Record Format

The tape record format is given in Table 4.1.

TABLE 4.1

DATA RECORD OF DZP/DZPM TAPES

4-BYTE WORD	DESCRIPTION	TYPE
1	Co-ordinate indicators =+1 Geomagnetic Co-ordinate (DZPM Tape) =-1 Geodetic Co-ordinate (DZP Tape)	I*4
2	Julian Day	I*4
3	Number of Points in the Latitude Zone	I*4
4	Pressure level in mb at which zonal means are calculated	R*4
5	Mid point of latitude zone	
6	Average cumulative ozone (matm-cm) above the Pressure Level given in word 4 for the Latitude Zone given in word 5	R*4
7	Standard Deviation of Word (6)	R*4
8	Average Mixing Ratio (μgm/gm for the Latitude Zone given in word 5	R*4
9	Standard Deviation For Word (8)	R*4
10	Average Ozone Partial Pressure (nanobars) for the Latitude Zone given in word 5	R*4

SECTION 5 - TAPE CATALOG

The entire DPFL data set is contained in thirty-seven 9-track tapes. Each DPFL tape contains one month to six month's worth of data. Table 5.1 contains a list of these tapes and describes the time coverage for each DPFL tape. The number of files in each tape varies from about 190 files in April, 1971, to slightly over 500 files for July-December 1972. When reading the tapes, a check for the presence of the trailer file (see Word 1 of Table 2.5) should be made to ensure the end of data on the tape (likewise a check for the presence of a trailer record should be made for the end of each data file).

Since the CPFL tapes is a stripped-down data set from the DPFL, the entire CPFL data set is contained in only four 9-track tapes with a total of 37 files, each of which corresponds to one DPFL tape coverage. Table 5.1 also lists these tapes and describes the time coverage for each CPFL tape and file. Table 5.2 gives a brief outline of the content of the DZP/DZPM tape.

TABLE 5 .1

TAPE CATALOG FOR PROFILE TAPES

DPFL Tape #	CPFL Tape #/File #	TIME RANGE Mo/Year
1	1/1	4/70
2	1/2	5/70
3	1/3	6/70
4	1/4	7/70
5	1/5	8/70
6	1/6	9/70
7	1/7	10/70
8	1/8	11/70
9	1/9	12/70
10	2/1	1/71
11	2/2	2/71
12	2/3	3/71
13	2/4	4/71
14	2/5	5/71
15	2/6	6/71
16	2/7	7/71
17	2/8	8/71
18	2/9	9/71
19	2/10	10/71
20	2/11	11/71
21	2/12	12/71
22	3/1	1/72
23	3/2	2/72
24	3/3	3/72
25	3/4	4/72
26	3/5	5/72
27	3/6	6/72

TABLE 5.1 (CONT.)

DPFL Tape #	CPFL Tape #/File #	TIME RANGE Mo/Year
28	3/7	7/72 - 12/72
29	4/1	1/73 - 6/73
30	4/2	7/73 - 12/73
31	4/3	1/74 - 6/74
32	4/4	7/74 - 12/74
33	4/5	1/75 - 6/75
34	4/6	7/75 - 12/75
35	4/7	1/76 - 6/76
36	4/8	7/76 - 12/76
37	4/9	1/77 - 5/77

TABLE 5.2

CONTENTS OF DZP/DZPM TAPE

FILE #	PRESSURE (mb)	YEAR
1-8	0.7	1970-77
9-16	1.0	1970-77
17-24	1.5	1970-77
25-32	2.0	1970-77
33-40	3.0	1970-77
41-48	4.0	1970-77
49-56	5.0	1970-77
57-64	7.0	1970-77
65-72	10	1970-77
73-80	15	1970-77
81-88	20	1970-77
89-96	30	1970-77
97-104	40	1970-77
105-112	1000	1970-77

APPENDIX A - DARK CURRENT CORRECTION

The BUV instrument contains a sensitive photomultiplier tube to detect and amplify the weak backscattered radiation from the earth around 250 nm. Even in the absence of any incoming signal, such tubes generally produce an output current called "dark current". The magnitude of this current is affected, among other things, by the ionizing charged particle background produced by cosmic rays. Despite careful shielding, the BUV instrument upon launch was found to be extremely sensitive to the charged particles that are trapped in certain areas of the magnetic anomaly over the earth. Most prominent of these lies over the southern part of the Atlantic ocean called "South Atlantic Anomaly". For the 255 nm channel of the instrument, the background count was found to be orders of magnitude higher than the expected signal when the satellite passed over the heart of the anomaly. Other less intense areas were found in the auroral horns over the mid latitudes in both hemispheres.

In order to retrieve as much data as possible, the OPT sponsored a detailed study of the dark current output of the instrument from an analysis of the data collected during the night time. This study was performed by E.G. Stassinopoulos, et. al. They have published the details of this work (Stassinopoulos, E.G., L.L. Felton, and R.A. Goldberg, "Nimbus-4 BUV Dark Current Study: Seasonal Background Models", NASA TM-80302, May 1979). The study resulted in a high spatial resolution computer coded map of the dark current count for each of the four seasons. For a given latitude and longitude, a dark current code is assigned. The definition of the code is as follows:

Code	Definition
1	0-4999 counts/sec
2	5000-10,999 cps
3	11000-19,999 cps
4	>20,000 cps
5	Instrument saturation
6	No night time data available - presumed to be like Code 4
7	No night time data available - presumed to be like Code 1
8	No night time data available - presumed to be like Code 2
9	No night time data available - presumed to be like Code 3

A correction to the measured output is made only if it is determined that the 2735A° channel will not have an error exceeding ∿1% as a result of the uncertainties in applying the correction. Based on this criterion, no profile is retrieved for Codes 4 and 5 which causes a large gap over the South Atlantic in the processed data.

Codes 6,7,8 and 9 were assigned to those areas over the earth which remain in daylight or twilight over the entire season, thus preventing an estimation of the dark current.

APPENDIX B - PROGRAM TO READ CPFL TAPE

A sample program is given here which reads the Compressed Profile Tape on the GSFC IBM 360-91.

The program reads from data cards the volume serial number of the CPFL tape, the first and last file to be read and the number of scans to be printed from each file. The tape is mounted on unit 12, positioned to the specified files and desired number of scans printed.

A sample printout is shown below. Not all of the data contained in the data record is printed. This allows each scan to be summarized on one line.

```
C*************************************************************************
C
C     PROGRAMME TO READ COMPRESSED PROFILE TAPE
C
C*************************************************************************
C
C     SUMMARY OF VARIABLES
C       * IFILES    STARTING FILE NUMBER
C       * IFILEE    ENDING FILE NUMBER
C       * NSCAN     NUMBER OF SCANS TO BE PRINTED FROM EACH FILE
C       * REC       ARRAY CONTAINING THE DATA RECORD READ
C       *TAPEIN     VOLUME SERIAL NUMBER OF INPUT TAPE (CPFL TAPE)
C
C*************************************************************************
C
      REAL*8 TAPEIN
      DIMENSION REC(50)
C
C**** READ IN VOLUME SERIAL NUMBER OF TAPE,RANGE OF FILES TO BE READ
C**** AND NUMBER OF SCANS TO BE PRINTED FROM EACH FILE
C
      READ(5,1000)TAPEIN,IFILES,IFILEE,NSCAN
      WRITE(6,2000)TAPEIN,IFILES,IFILEE,NSCAN
C
C**** MOUNT THE INPUT TAPE
C
      CALL MOUNT(1,12,TAPEIN,1)
C
C**** PROCESS FILES ONE AT A TIME.FROM EACH FILE PRINT THE DESIRED
C**** NUMBER OF SCANS
C
      DO 300 IFILE=IFILES,IFILEE
      CALL POSN(1,12,IFILE)
      WRITE(6,2100)IFILE
      WRITE(6,2200)
      I=0
  100 CONTINUE
      I=I+1
      CALL FREAD(REC,12,LENH,&200,&199)
      IF(I.LE.NSCAN)WRITE(6,2300)(REC(J),J=2,10),REC(49),
     .              REC(50),REC(46),REC(33),(REC(J),J=34,44,2)
      GO TO 100
  199 CONTINUE
      WRITE(6,2399)I
      GO TO 100
  200 CONTINUE
      WRITE(6,2400)I
  300 CONTINUE
      WRITE(6,2500)
      STOP
C
C*******************
C     FORMATS
C*******************
C
 1000 FORMAT(A8,3I5)
 2000 FORMAT(//3X,'VOLUME SERIAL NUMBER OF INPUT TAPE :',T53,A8/
     .       3X,'RANGE OF FILES TO BE READ :',T45,I8,'  THROUGH',I5/
     .       3X,'NUMBER OF SCANS TO BE PRINTED FROM EACH FILE:',T45,I8/)
 2100 FORMAT(//3X,38('*')/3X,'*',T41,'*'/3X,'*',T6,'CPFL TAPE ',
     .       'POSITIONED TO FILE ',I4,T41,'*'/3X,'*',T41,'*'/
     .       3X,38('*')/)
 2200 FORMAT(/'     ORBIT  YEAR   DAY    SECS   LAT   LONG   SZA   ',
     .       'RFLCT  OZONE    C   SIGMA  PHALF ..MIXING RATIO',
     .       '(MICROGRAM/GM)...'/T86,'0.7MB  1.0MB  2.0MB  4.0MB  ',
     .       '7.0MB  15.MB  30MB')
 2300 FORMAT(1X,F9.0,2F6.0,F8.0,F6.1,F7.1,F6.1,2F7.3,F7.2,2X,F6.3,
     .       F5.1,7F7.2)
 2399 FORMAT('***** TAPE READ ERROR ENCOUNTERED IN READING SCAN',I6,
     .       ' ,  READ NEXT SCAN')
 2400 FORMAT(/3X,'TOTAL SCANS READ :',I6/)
 2500 FORMAT(//3X,'.........JOB COMPLETED SUCCESSFULLY.........')
C
      END
) OF DATA
```

VOLUME S[illegible]L NUMBER OF INPUT TAPE : BUV36
RANGE O[illegible]FILES TO BE READ : 1 THROUGH 3
NUMBER OF SCANS TO BE PRINTED FROM EACH F 5

****
* *
* CPFL TAPE POSITIONED TO FILE 1 *
* *
****

ORBIT	YEAR	DAY	SECS	LAT	LONG	SZA	RFLCT	OZONE	C	SIGMA	PHALF	..MIXING RATIO(MICROGRAM/GM)... 0.7MB	1.0MB	2.0MB	4.0MB	7.0MB	15.MB	30MB
35.	1970.	100.	80801.	63.3	178.8	57.6	0.798	0.489	1.50	0.604	67.7	4.10	5.22	8.49	11.13	10.90	8.67	7.62
35.	1970.	100.	80833.	64.9	180.6	59.4	0.896	0.496	1.51	0.611	70.1	4.03	5.13	8.63	11.41	10.56	8.20	7.29
35.	1970.	100.	80865.	66.6	182.5	61.1	0.945	0.504	1.47	0.596	69.7	3.98	5.16	8.88	11.07	10.35	8.15	7.37
35.	1970.	100.	80897.	68.2	184.7	62.9	0.902	0.516	1.40	0.581	76.8	3.83	5.05	9.02	11.15	10.27	8.10	7.54
35.	1970.	100.	80929.	69.7	187.2	64.7	0.951	0.518	1.42	0.589	75.4	3.87	5.05	8.92	11.21	10.43	8.17	7.63

TOTAL SCANS READ : 12321

****
* *
* CPFL TAPE POSITIONED TO FILE 2 *
* *
****

ORBIT	YEAR	DAY	SECS	LAT	LONG	SZA	RFLCT	OZONE	C	SIGMA	PHALF	..MIXING RATIO(MICROGRAM/GM)... 0.7MB	1.0MB	2.0MB	4.0MB	7.0MB	15.MB	30MB
305.	1970.	121.	7713.	-64.8	192.6	81.1	0.134	0.401	2.29	0.498	56.0	7.46	11.10	12.82	11.22	9.77	8.20	-7.29
305.	1970.	121.	7745.	-63.1	194.3	79.3	0.369	0.394	2.26	0.445	56.8	7.47	12.06	12.21	11.32	9.94	8.17	-7.18
305.	1970.	121.	7777.	-61.5	195.8	77.6	0.376	0.382	2.17	0.497	51.2	6.63	10.61	13.23	11.83	10.14	8.16	-6.97
305.	1970.	121.	7809.	-59.8	197.2	75.8	0.501	0.353	2.07	0.527	51.8	6.08	9.36	13.99	12.62	10.25	7.94	-6.49
305.	1970.	121.	7841.	-58.1	198.5	74.0	0.257	0.340	1.95	0.512	47.8	5.64	8.92	15.05	12.94	10.13	7.70	-6.19

TOTAL SCANS READ : 19026

****
* *
* CPFL TAPE POSITIONED TO FILE 3 *
* *
****

ORBIT	YEAR	DAY	SECS	LAT	LONG	SZA	RFLCT	OZONE	C	SIGMA	PHALF	..MIXING RATIO(MICROGRAM/GM)... 0.7MB	1.0MB	2.0MB	4.0MB	7.0MB	15.MB	30MB
721.	1970.	152.	6049.	-58.2	191.1	81.1	0.436	0.343	1.87	0.574	48.1	5.45	7.91	11.01	9.50	8.65	7.82	-6.88
721.	1970.	152.	6081.	-56.5	192.3	79.3	0.439	0.313	1.90	0.557	48.5	5.48	8.20	11.70	9.86	8.72	7.64	-6.40
721.	1970.	152.	6113.	-54.8	193.4	77.5	0.444	0.296	1.88	0.517	43.8	5.58	8.54	12.12	10.71	9.04	7.59	-6.10
721.	1970.	152.	6145.	-53.1	194.4	75.7	0.439	0.265	1.88	0.539	36.4	5.40	8.30	12.84	10.90	9.49	8.02	-5.75
721.	1970.	152.	6177.	-51.4	195.4	74.0	0.585	0.262	1.82	0.482	35.1	5.41	9.14	13.62	11.50	10.09	8.49	-5.82

TOTAL SCANS READ : 18026

.....JOB COMPLETED SUCCESSFULLY.....

D-46728
4/70 - 12/76

DUMP OF TAPE X402

INPUT TAPE X402 ON MT1
DATA INPUT H9 NF 77 FL 1 1 0 SR 77 1 1

FILE 1 RECORD month 1 LENGTH year 16BYTES
(0) 00000004 00000020 00000046 00000000 0000

FILE	INPUT RECS.	DATA RECORDS INPUT	MAX. SIZE	READ ERROR SUMMARY PERM	ZERO B	SHORT	UNDEF.	INPUT RETRIES #RECS.	TOTAL#
1	12	12	10656	0	0	0	0	0	0

FILE 77 RECORD month 1 LENGTH year 12BYTES
(0) 0000000C 00000020 0000004C 00000000 0000

FILE	INPUT RECS.	DATA RECORDS INPUT	MAX. SIZE	READ ERROR SUMMARY PERM	ZERO B	SHORT	UNDEF.	INPUT RETRIES #RECS.	TOTAL#
77	12	12	10656	0	0	0	0	0	0

EOJ DUMP STOPPED AFTER FILE 77 # OF PERMANENT READ ERRORS 0

START TIME 11/16/81 08:29:40 STOP TIME 11/16/81 08:30:54

$$
$ASS IN MT4 OUT MT1