PIONEER 11

STARLIGHT/ZODIACAL LIGHT EXPERIMENT

73-019A-15A

PIONEER 11

STARLIGHT/ZODIACAL LIGHT TAPE

73-019A-15A

Tape Format

This dataset has been restored. It consists of 1 tape. The DS tape is 9-track, 6250 bpi. The DR tape is a 3480 cartridge. The data were originally written in UNIVAC 1100 36-bit words. They have been converted to ASCII. The DR and DS numbers along with the corresponding D numbers and time spans are as follows:

DR #	DS#	DD#	FILES	TIME SPAN
DR004404	DS004404	DD046760	7	02/26/74 - 09/24/74

TAPE FORMAT

File 1 of the tape is a header file, containing two records. The rest of the files are data files and contain one header record, followed by data records.

The header records are fixed length and contain ASCII zero values for any unused space. Each data record is divided into four sectors. Each sector contains 16 header words (items 1-16 on format below), and a variable number of 14-word elements, one for each star in the sector (the number of stars is contained in item 6 of the sector header).

Following is a more detailed description of each part of the tape.

Header file

Record 1:

Item #	Format	Description
1	I5	# of data files on tape (directory file not included)
2	I5	# of days on tape
3	I5	Spacecraft - Pioneer (10 or 11)
4	A6	Day of year map was made DAY/YR
5	A6	Number of this tape
6	A6	Input tape number (ignore)
7	A6	Is input tape corrected (ignore)
8	I5	# of sections for day
9-243	Repeat items 4-8 for each remaining day	

Record 2:

Item #	Format	Description
1	A6	Day of year map was made
2	I5	File # where data is located (directory file not included)
3	I5	Section #
4	F6.2	First look angle in section
5	F6.2	Last look angle in section
6	F6.2	Minimum elongation
7	F6.2	Maximum elongation
8-336	Repeat of items 1-7 for each section of every day	

Data File

Record 1: (header record)

Item #	Format	Description
1	A6	Day of year map was made
2	A6	Input tape # (ignore)
3	I5	Section #
4	I5	Start time of observations for this section, hours (GMT)
5	I5	Start time of observations for this section, minutes (GMT)
6	I5	Start time of observations for this section, seconds (GMT)
7	I5	Stop time of observations for this section, hours (GMT)
8	I5	Stop time of observations for this section, minutes (GMT)
9	I5	Stop time of observations for this section, seconds (GMT)
10	A6	Element name containing position data (ignore)
11	F7.2	Right ascension of +z spin axis
12	F7.2	Declination of +z spin axis
13	F7.2	Correction for look angle
14	F7.2	Correction for sector
15	F7.2	Clock angle of equator
16	F7.2	Clock angle of sun
17	F7.2	Cone angle of sun
18	I6	# of stars used to get pointing correction
19	F7.2	Standard deviation of correction for look angle
20	F7.2	Standard deviation of correction fo sector.
21	I5	# of look angles included in this section
22-111	F7.2	Look angles included in this section

Data Records (records 2-n):

Item #	Format	Description
Sector Header (written once for each of four sectors in record)		
1	F10.2	Right ascension of center of field of view
2	F10.2	Declination of center of field of view
3	F10.2	Elongation angle of sun
4	I6	Sector - azimuthal angle label of field of view
5	F10.2	Look angle - polar angle label of field of view
6	I6	# of stars in field of view
7	F10.2	BP - Blue brightness (Parallel channel) in EDR units.
8	F10.2	RP - Red brightness (Parallel channel) in EDR units.
9	F10.2	BS - Blue brightness (Senkrecht channel) in EDR units.
10	F10.2	RS - Red brightness (Senkrecht channel) in EDR units.
11	F10.2	BPc } Brightness after star subtraction and corrected
12	F10.2	RPc } for secular decay in units of $S_{10}(V)$
13	F10.2	BSc }
14	F10.2	RSc
15	F10.2	BCTOT = BPc + BSc
16	F10.2	RCTOT = RPc + RSc
The individual stars that were subtracted (written once for each star in sector)		
17a	I6	Declination of star * 1000
17b	I6	Right ascension of star * 100
18a	I6	BS of star * 1000
18b	I6	BP of star * 1000
18c	I6	IF1 - Flag denoting stellar anomalies (see section 3)
19a	I6	RS of star * 1000
19b	I6	RP of star * 1000
19c	I6	IF2 - Flag denoting spectral type (see section 3)
20	F10.2	Dwell time
21	F10.2	Vignetting correction for BP channel
22	F10.2	Vignetting correction for RP channel
23	F10.2	Vignetting correction for BS channel
24	F10.2	Vignetting correction for RS channel

REQ. AGENT	RAND NO.	ACQ. AGENT
LSM	V0108	WSC

PIONEER 11

73-019A-15A

STARLIGHT/ZODIACAL LIGHT EXPERIMENT

This data set catalog consists of one tape. The tape is 9 Track, 1600 BPI, Odd Parity, Binary, and 7 files. The tape was created on the Univac 1110 computer. The time span with 'D' and 'C' numbers follow:

D#	C#	Time Span
D-46760	C-21877	5/28/74-9/24/74

Revised September 1981

PIONEER 10/11 BACKGROUND SKY TAPE (BST)

USER'S GUIDE

Experiment: Pioneer 10/11 Starlight/Zodiacal Light

NSSDC Experiment #'s: Pioneer 10-72-012A-14
Pioneer 11-73-019A-15

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The Background Sky Tape (BST) contains the reduced data of photo-polarimetric measurements of the brightness of the sky as viewed from the deep-space probes Pioneer 10 and 11. The NSSDC will provide the user with the first two papers of a series of articles dealing with the Pioneer 10/11 Starlight/Zodiacal Light Experiment. The first of these defines the scope of the investigation and describes the instrument; the second explains the reduction process leading to the creation of BST. They are referred to in this guide as Paper I and Paper II, respectively.

PIONEER BACKGROUND SKY TAPE

1. TAPE SPECIFICATIONS AND FORMAT

Tape specifications: 9 Track, ~~1600~~ 6250 BPI, Odd Parity, unformatted 36 bit words binary tape created on the Univac 1110.

FILE 1: Directory File - A printed copy of the Directory file is provided with each tape.

RECORD 1:

Computer Word	Format	Description
1	I	# of data files on tape (directory file not included)
2	I	# of days on tape
3	I	Spacecraft - Pioneer (10 or 11)
4	A	Day of year map was made DAY/YR
5	A	Number of this tape
6	A	Input tape # (ignore)
7	A	Is input tape corrected (ignore)
8	I	# of <u>sections</u> for day
9-13		Repeat computer words 4-8 for each remaining day.
14-18		" " " " " " " "
19-23		" " " " " " " "
24-28		" " " " " " " "
29-33		" " " " " " " "
.		" " " " " " " "
.		" " " " " " " "
.		" " " " " " " "
239-243		" " " " " " " "
		(maximum of 48 days)

RECORD 2:

1	A	Day of year map was made
2	I	File # where data is located (directory file not included)
3	I	Section #
4	F	First <u>look angle</u> in section
5	F	Last look angle in section
6	F	Minimum <u>elongation</u>
7	F	Maximum elongation
8-14		Repeat words 1-7 for each section of every day.
15-21		" " " " " " " " "
22-28		" " " " " " " " "
29-35		" " " " " " " " "
36-42		" " " " " " " " "
43-49		" " " " " " " " "
50-56		" " " " " " " " "
57-63		" " " " " " " " "
.		" " " " " " " " "
30-336		To a maximum of 48 sections

Note: Words that are underlined are defined in section 2 of this [illegible].

FILE 2: Data File

RECORD 1: Header Information

Computer Word	Format	Description
1	A	Day of year map was made.
2	A	Input tape # (ignore).
3	I	Section #.
4	I	Start time of observations for this section, hours (GMT).
5	I	" " " " " " " minutes "
6	I	" " " " " " " seconds "
7	I	Stop time of observations for this section, hours (GMT).
8	I	" " " " " " " minutes "
9	I	" " " " " " " seconds "
10	A	Element name containing position data (ignore).
11	F	Right ascension of +z spin axis.
12	F	Declination of +z spin axis.
13	F	Correction for look angle.
14	F	Correction for sector.
15	F	Clock angle of equator.
16	F	Clock angle of sun.
17	F	Cone angle of sun.
18	I	# of stars used to get pointing correction.
19	F	Standard deviation of correction for look angle. (See note 1, page 8.
20	F	Standard deviation of correction for sector.
21	I	# of look angles included in this section.
22-111	F	Look angles included in this section.

RECORD 2: 4 Sectors per record

1	F	Right ascension of center of field of view.
2	F	Declination of center of field of view.
3	F	Elongation angle of sun.
4	I	Sector - azimuthal angle label of field of view.
5	F	Look angle - polar angle label of field of view.
6	I	# of stars in field of view.
7	F	BP - Blue brightness (Parallel channel) in EDR units.
8	F	RP - Red brightness (Parallel channel) in EDR units.
9	F	BS - Blue brightness (Senkrecht channel) in EDR units.
10	F	RS - Red brightness (Senkrecht channel) in EDR units.
11	F	BPc
12	F	RPc
13	F	BSc
14	F	RSc
		Brightness after star subtraction and corrected for secular decay in EDR units.
15	F	BCTOT = BPc + BSc.
16	F	RCTOT = RPc + RSc.

The individual stars that were subtracted

17	BIT 0-17	Declination of star * 1000 - if 0 bit is set then declination is negative.
	BIT 18-35	Right ascension of star * 100.
18	BIT 0-15	BS of star * 1000
	16-31	BP of star * 1000
	32-35	IF1 - Flag denoting stellar anomalies (see section 6).
19	BIT 0-15	RS of star * 1000
	16-31	RP of star * 1000
	32-35	IF2 - Flag denoting spectral type (see section 6).

Computer Word	Format	Description
20	F	Dwell time.
21	F	Vignetting correction for BP channel.
22	F	Vignetting correction for RP channel.
23	F	Vignetting correction for BS channel.
24	F	Vignetting correction for RS channel.
25-32	F	Repeat computer words 17-24 for second star.
.	F	Repeat computer words 17-24 for each remaining
.	.	star in field of view (8 computer words are
.	F	required per star).
.	F	Repeat computer words 1-16 for sector 2.
.	.	Repeat computer words 17-24 for each star in
.	F	this field of view.
.	F	Repeat computer words 1-16 for sector 3.
.	.	Repeat computer words 17-24 for each star in
.	F	this field of view.
.	F	Repeat computer words 1-16 for sector 4.
.	.	Repeat computer words 17-24 for each star in
.	F	this field of view.

Variable length, Maximum 1664 words.

RECORD 3: Repeat record 2 for sectors 5, 6, 7, 8
. Repeat record 2 for sectors .....
. Repeat record 2 for sectors .....
. Repeat record 2 for sectors .....
RECORD 17: Repeat record 2 for sectors 61, 62, 63, 64

RECORD 18-33: Repeat records 2-17 for next look angle.

RECORD 34-N: Repeat records 2-17 for each remaining (L) look angle in section #1.
$N = 16L + 1$.

FILE 3: Repeat FILE 2 for section 2.

FILE 4-(M+1): Repeat FILE 2 for each remaining (up to M) section of day.

Repeat files 2-(M+1) for each day.

This tape has a maximum of 49 files, including the directory file.

2. PARAMETER DEFINITIONS

section	Each day's observations of the sky may be broken up into a number of sections (up to 8). The sections are delineated by look angle. Pointing corrections are determined for each section (Paper I - the need for sectioning; Paper II - the pointing of sections).
look angle	The polar angle between the +z spin axis and the pointing direction of the instrument as determined by telemetry (Papers I and II).
elongation	The angle between pointing direction and the sun.
+ z spin axis	That end of the spacecraft spin axis which points toward the earth. If one's thumb points toward + z, the spacecraft spins according to a right-hand rule.
sector	One spacecraft spin is divided into 64 sectors (Paper I).
clock angle	The true azimuthal angle swept out by the spin of the spacecraft. The clock angle is zero at that node of the ecliptic at which the instrument is rotating into the northern hemisphere (Paper II).
cone angle	True polar angle between + z spin axis and pointing of instrument (Paper II).
BP, RP, BS, RS Parallel Senkrecht Note: The EDR (Experiment Data Record) unit is a unit of relative instrument response. All reduction is performed in these units, including star subtraction. Absolute calibration is to be applied to the final results BY THE USER.	The radiance reading (in relative or EDR units) as given by the four channels of the imaging photopolarimeter (IPP). The B designation stands for blue, the R for red. The S and P designations represent orthogonal directions of polarization. Define an "instrumental" coordinate system based on a Senkrecht (S) direction, which is parallel to the IPP rotation axis and perpendicular to the spacecraft spin axis, and a direction Parallel (P) to the spacecraft spin axis; i.e., the S vector is along the longer side of the effective field-of-view and the P vector is along the shorter. Assume the light source observed with the IPP is partially plane-polarized. This light can be divided into an unpolarized part, I_u, and a completely plane polarized component, I_{pol}. Let the amplitude of the polarized component be $\vec{E}_{pol}$ where $\lvert\vec{E}_{pol}\rvert^2 = I_{pol}$. If θ is the angle between the S direction and the plane of polarization, the component of $\vec{E}_{pol}$ in the S direction is $\lvert\vec{E}_{pol}\rvert \cos\theta$, and the component in the P direction is $\lvert\vec{E}_{pol}\rvert \sin\theta$. The intensities seen by the S

and P channels are therefore

$$I_s = \frac{1}{2} I_u + I_{pol} \cos^2\theta$$

$$I_p = \frac{1}{2} I_u + I_{pol} \sin^2\theta$$

where I_s corresponds to absolutely calibrated BS or RS readings and I_p corresponds to absolutely calibrated BP or RP readings.

Primary Results

BPc, RPc, BSc, RSc — Stand for corrected values of BP, RP, BS, and RS, respectively. The corrections applied (see Paper II) are:
1) foreground stars have been subtracted,
2) the secular decay of the instrument sensitivity is accounted for.

ABSOLUTE CALIBRATION MUST BE APPLIED BY THE USER. THE CONVERSION TO $S_{10}(V)$ OR CGS UNITS IS GIVEN IN SECTIONS 3 AND 4 OF THIS GUIDE.

BP of star
RP of star
BS of star
RS of star

The values that the IPP would read if the star was scanned at a cone angle of 90° (Paper II).

dwell time — That fraction of 1/64 of the spacecraft spin period for which the star is in the instrumental field of view (Paper II).

vignetting correction — This term, on the average, is near 1. It corrects for the fact that the instrument response varies depending on the position of the stars in the field of view (Paper II).

(B-V) calculated — For some stars, a B-V color index is not available. This index is needed to determine the IPP response to any given star. B-V was therefore calculated from spectral type information as described in Paper II.

3. PIONEER 10 ABSOLUTE CALIBRATION

The effective wavelength (λ eff) is defined as the average over wavelength weighted by the channel spectral transmission, T (λ). The equivalent bandpass ($\Delta\lambda$) is defined by $\Delta\lambda T_{max} = \int T(\lambda)d\lambda$. The brightnesses listed in the BST (BPc, RPc, BSc, RSc) are in EDR or relative units. To convert them to $S_{10}(V)$'s - the equivalent number of 10th visual magnitude stars of solar color per square degree - they must be multiplied by the calibration constants (C) given below:

Channel	λ eff	$\Delta\lambda$	C
BP	4392A	829A	0.619
RP	6390A	936A	0.648
BS	4363A	818A	0.697
RS	6508A	1038A	0.761

The total blue (red) brightness in $S_{10}(V)$ units is the sum of the two blue (red) channels:

TOTAL BLUE BRIGHTNESS IN $S_{10}(V)$ UNITS = 0.619 BPc + 0.697 BSc,

TOTAL RED BRIGHTNESS IN $S_{10}(V)$ UNITS = 0.648 RPc + 0.761 RSc.

The $S_{10}(V)$ unit contains the solar spectral distribution; i.e., a source of solar color has the same $S_{10}(V)$ value at all wavelengths. The conversion to absolute units therefore depends on the effective wavelength of each Pioneer channel. The conversion of $S_{10}(V)$ units to absolute units for each channel of Pioneer 11 is listed below:

Channel	Conversion
Bp	$1\ S_{10}(V) = 1.17 \times 10^{-9}$ ergs $cm^{-2}s^{-1}sr^{-1}A^{-1}$
Rp	$1\ S_{10}(V) = 1.08 \times 10^{-9}$ ergs $cm^{-2}s^{-1}sr^{-1}A^{-1}$
Bs	$1\ S_{10}(V) = 1.15 \times 10^{-9}$ ergs $cm^{-2}s^{-1}sr^{-1}A^{-1}$
Rs	$1\ S_{10}(V) = 1.06 \times 10^{-9}$ ergs $cm^{-2}s^{-1}sr^{-1}A^{-1}$

4. PIONEER 11 ABSOLUTE CALIBRATION

The effective wavelength (λeff) is defined as the average over wavelength weighted by the channel spectral transmission, T (λ). The equivalent band-pass ($\Delta\lambda$) is defined by $\Delta\lambda T_{max} = \int T(\lambda)d\lambda$. THE BRIGHTNESSES LISTED IN THE BST (BPc, RPc, BSc, RSc) ARE IN EDR OR RELATIVE UNITS. TO CONVERT THEM TO $S_{10}(V)$'s - the equivalent number of 10th visual magnitude stars of solar color per square degree - THEY MUST BE MULTIPLIED BY THE CALIBRATION CONSTANTS (C) GIVEN BELOW:

Channel	λ eff	$\Delta\lambda$	C
BP	4445A	844A	0.674
RP	6508A	889A	0.810
BS	4388A	790A	0.624
RS	6453A	978A	0.903

The total blue (red) brightness in $S_{10}(V)$ units is the sum of the sum of the two blue (red) channels:

TOTAL BLUE BRIGHTNESS IN $S_{10}(V)$ UNITS = 0.674BPc + 0.624 BSc,

TOTAL RED BRIGHTNESS IN S_{10} (V) UNITS = 0.810 RPc + 0.903 RSc.

The $S_{10}(V)$ unit contains the solar spectral distribution; i.e., a source of solar color has the same $S_{10}(V)$ value at all wavelengths. The conversion to absolute units therefore depends on the effective wavelength of each Pioneer channel. The conversion of $S_{10}(V)$ units to absolute units for each channel of Pioneer 11 is listed below:

Channel	Conversion
Bp	$1\ S_{10}(V) = 1.20 \times 10^{-9}$ ergs $cm^{-2}\ s^{-1}\ sr^{-1}\ A^{-1}$
Rp	$1\ S_{10}(V) = 1.06 \times 10^{-9}$ ergs $cm^{-2}\ s^{-1}\ sr^{-1}\ A^{-1}$
Bs	$1\ S_{10}(V) = 1.18 \times 10^{-9}$ ergs $cm^{-2}\ s^{-1}\ sr^{-1}\ A^{-1}$
Rs	$1\ S_{10}(V) = 1.07 \times 10^{-9}$ ergs $cm^{-2}\ s^{-1}\ sr^{-1}\ A^{-1}$

5. NOTES AND USER PRECAUTIONS

1) The uncertainty (1 standard deviation) in the corrections for look angle and sector significantly influences the quality of the data. If the instrument pointing is not determined accurately, the star subtraction process can introduce large errors. Nominal values for computer words 19 and 20, File 2, Record 1, are 0.15 and 0.40, respectively.

2) The foreground star subtraction process, while greatly reducing the effect of stars brighter than about 6.5 mag, nevertheless introduces its own set of errors. These are mainly caused by two effects: 1) stars very near the edge of the field may be subtracted from the wrong FOV; 2) the color corrections for the 12,500 foreground stars are based on the statistics of only a few hundred standard stars. There exists a natural scatter in this calibration which may contribute large errors to FOV's containing stars brighter than about 2nd magnitude.

   The above errors are recognized as an abnormally high or low reading in one FOV with respect to the neighboring fields. For Pioneer 10, the number of FOV's which have this defect is much less than 10% for the blue channels and greater than 10% for the red channels. The RS channel is inherently very "noisy", and this also contributes, along with the color statistics, to the higher number of erroneous red channel FOV's.

3) FOV's with elongation angles smaller than about 45° contain some stray light contributions. To analyze these data, the user should contact the experimenter directly.

6. CODING OF FLAGS DESIGNATING SPECTRAL TYPE

IF1		IF2	
0	Normal star	0	
1	Moderately reddened	1	Type O
2	Marginal variable	2	B
3	Very reddened	3	A
4	Lum class I	4	F
5	Probable significant variable	5	G
6	Significant variable	6	K
7	Sig. variable + class I	7	M
8	Sig. variable + very reddened or Very reddened + class I + sig. var.	8	Very late
9	Sig. variable + moderately reddened or Moderately reddened + class I + sig. var	9	Type O + (B-V) calculated*
10	Probably sig. var. + class I	10	B + (B-V) calculated
11	Prob. sig. var. + very reddened or Very reddened + class I + prob. sig. var.	11	A + (B-V) calculated
12	Prob. sig. var. + moderately reddened or Mod. reddened + class I + prob. sig. var.	12	F + (B-V) calculated
13	Moderately reddened + class I or Moderately reddened + class I + mar. var.	13	G + (B-V) calculated
14	Marginal variable + class I	14	K + (B-V) calcualted
15	Very reddened + class I or Very reddened + class I + mar. var.	15	M + (B-V) calculated

*See (B-V) calculated, page 5.

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37. D. W. Schuerman, J. L. Weinberg, and F. Giovane, The Pioneer 10/11 Starlight/Zodiacal Light Experiment II. Data Reduction and Analysis, in preparation, for Planetary Space Sci. (PAPER II)

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39. R. Dumont* and D. W. Schuerman, General Inversion of the Zodiacal Light Brightness Integral - Applications to an Out-of-Ecliptic Mission, in preparation, for Planetary Space Sci.

40. D. W. Schuerman, The Brightness/Unit Volume of the Zodiacal Light as Determined from Pioneer 10, to be presented to Cosmic Dust Panel, COSPAR 1978, Innsbruck.

41. J. L. Weinberg and D. W. Schuerman, Pioneer 10 Observations of Changes in Zodiacal Light Polarization with Heliocentric Distance, to be presented to Cosmic Dust Panel, COSPAR 1978, Innsbruck.

Selected topics of other papers in earlier stages of preparation:

The Calibration and Use of Diffuse Sources (Planetary and Space Science); Weinberg, Sparrow, and Beeson

The Light of the Night Sky Revisited (Sky and Telescope); Weinberg

Polarization Reversal in the Zodiacal Light (Astronomy and Astrophysics); Weinberg, Sparrow, and Hahn

An Observational Model of the Brightness and Polarization of the Zodiacal Light (Astronomy and Astrophysics); Weinberg and Misconi

A Search for Diffuse Optical Radiation associated with the Magellanic Stream; Weinberg, Schuerman, Toller, Giovane, Beeson

Zodiacal Light and the Asteroid Belt: the View from Pioneer 11; Schuerman, Weinberg, Toller, Giovane, Beeson

Pioneer 10 Observations of the Shape of the Zodiacal Cloud; Schuerman, Toller, Misconi, Weinberg, Giovane, Beeson

March 1978

*Visiting Astronomer

DS 004404

ASCII LIST OF DS004404

FILE 1 RECORD 1 1407 BYTES

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    6    6   11148/74D0360 D0360 NO        1236/74D0805 D0360 NO        1 57/74 D0360D0360    YES    1178/74 D0360D0360    YES    11
06/74 D0360D0360    YES    1267/74 D0479D0479  YES      1
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ASCII LIST OF DS004404

FILE 1 RECORD 2 1921 BYTES

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 148/74    1    1 29.88170.97 16.05179.38236/74    2    1 29.88170.20 25.19174.35 57/74    3    1 29.88169.23 27.54171.10178/74    4
    1 29.88170.89 16.74179.66106/74    5    1 29.91170.92 20.72179.54267/74    6    1 29.65166.59 28.20171.64000000    0    0  0.00
 0.00  0.00  0.00000000    0    0  0.00  0.00  0.00  0.00000000    0    0  0.00  0.00  0.00  0.00000000    0    0  0.00  0.00  0.00
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.00  0.00  0.00  0.00000000    0    0  0.00  0.00  0.00  0.00000000    0    0  0.00  0.00  0.00  0.00000000    0    0  0.00  0.00  0
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000    0    0  0.00  0.00  0.00  0.00000000    0    0  0.00  0.00  0.00  0.00000000    0    0  0.00  0.00  0.00  0.00000000    0
0  0.00  0.00  0.00  0.00000000    0    0  0.00  0.00  0.00  0.00000000    0    0  0.00  0.00  0.00  0.00000000    0    0  0.00  0.0
0  0.00  0.00000000    0    0  0.00  0.00  0.00  0.00000000    0    0  0.00  0.00  0.00  0.00000000    0    0  0.00  0.00  0.00  0.0
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ASCII LIST OF DS004404

FILE 2 RECORD 1 757 BYTES

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88  31.72  33.55  35.38  37.22  39.05  40.88  42.72  44.55  46.38  48.22  50.05  51.88  53.72  55.55  57.39  59.22  61.05  62.89  64
.72  66.55  68.39  70.22  72.05  73.89  75.72  77.55  79.39  81.22  83.05  84.89  86.72  88.55  90.39  92.22  94.05  95.89  97.72  9
9.55 101.39 103.22 105.06 106.89 108.72 110.56 112.39 114.22 116.06 117.89 119.72 121.56 123.39 125.22 127.06 128.89 130.72 132.56 1
34.39 145.39 147.22 149.06 150.89 152.73 154.55 156.39 158.23 160.06 161.89 163.73 165.56 167.39 169.23 170.97   0.00   0.00   0.00
  0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
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ASCII LIST OF DS004404

FILE 2 RECORD 2 2078 BYTES

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    -21.48    -18.79  -430   163   559   660     0   619   669     0      0.69      1.19      1.11      1.27      1.14  -429   481
 457   536     0 65523    29     0      0.55      0.31      0.35      0.78      1.06  -432   125  1293  1379     0  1014  1059     0
      0.01      0.02      0.09      0.03      0.10    181.51    -23.93     39.29     2     29.88     4      0.00      0.00      0.00
      0.00    -76.61    -32.87    -61.81    -28.45   -138.42    -61.32  -432   125  1293  1379     0  1014  1059     0      0.88
  1.13      1.04      1.15      1.02  -434   227   833   913     0   381   424     0      0.70      1.10      1.19      1.01      1.
05  -432    78 65297 65394     0 65257 65305     0      0.45      1.24      1.09      1.15      1.13  -434   477   274   364     0
  86   132     0      0.30      0.94      0.99      0.77      0.90    184.37    -23.03     40.05     3     29.88     5      0.00
  0.00      0.00      0.00    -32.22    -12.61    -27.98    -13.02    -60.20    -25.63  -434   227   833   913     0   381   424
 0      0.22      0.70      0.93      0.87      0.86  -432    78 65297 65394     0 65257 65305     0      0.27      1.09      1.16
    1.30      1.22  -434   477   274   364     0    86   132     0      0.62      1.06      1.19      1.07      1.05  -437    77   9
61  1037     0   405   445     0      0.67      1.12      1.00      1.15      1.26  -437   118   320   419     0   342   392     0
    0.67      1.11      0.94      1.17      1.18    187.09    -21.86     40.73     4     29.88     3      0.00      0.00      0.00
    0.00     -3.48     -1.40     -3.05     -1.51     -6.53     -2.91  -437    77   961  1037     0   405   445     0      0.06
0.88      0.96      1.21      1.31  -437   118   320   419     0   342   392     0      0.01      0.87      0.90      1.22      1.24
  -440   228   425   511     0   146   191     0      0.25      1.08      1.06      0.93      1.19
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ASCII LIST OF DS004404

FILE 7 RECORD 1 757 BYTES

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267/74D0479     1     8     6    42    13    11   4026741P 165.58    8.00  -1.80-298.01  22.67 356.05    3.25    23    0.07    0.22    69  29.
65  31.49  33.32  35.15  36.99  38.82  40.65  42.49  44.32  46.16  47.99  49.82  51.66  53.40  55.24  57.07  58.90  60.74  62.57  64
.40  66.24  67.98  69.82  71.65  73.48  75.32  77.15  78.98  80.82  82.48  84.31  85.98  87.81  89.64  91.48  93.31  95.14  96.98  9
8.64 100.47 102.31 104.14 105.97 107.80 109.44 111.10 112.85 114.68 116.51 118.35 120.18 122.01 123.85 125.60 127.43 129.26 132.53 1
34.36 146.86 150.69 152.44 154.19 155.76 157.59 159.43 161.26 163.09 164.84 166.59    0.00    0.00    0.00    0.00    0.00    0.00    0.00
  0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00
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ASCII LIST OF DS004404

FILE 7 RECORD 2 1098 BYTES

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    109.58    125.66  -436   408 64943 65000     1 65425 65483     0      0.80      1.09      1.12      1.08      1.23    174.83
-22.12     29.31     2     29.65     0     41.48     48.42     45.04     52.65     48.13     56.41     53.94     61.18    102.06
117.60    177.78    -21.08     29.08     3     29.65     2     48.09     49.70     52.78     53.25     52.55     56.06     60.32
 58.77    112.87    114.84  -437   457    33    89     0   398   458     0      0.34      0.32      0.33      0.75      1.02  -442
  81   979  1022     0   471   552     0      0.11      1.00      1.07      0.85      1.19    180.58    -19.77     28.86     4     2
9.65     2     68.04     51.66     69.94     57.80     59.76     53.08     65.91     59.78    125.67    112.85  -437   457    33
89     0   398   458     0      0.20      0.30      0.37      0.84      1.13  -442    81   979  1022     0   471   552     0      0.
67      1.10      1.13      1.12      1.24
```

D-46760

DUMP OF TAPE X409

Files 1) header
2) 148/74
3) 236/74
4) 57/74
5) 178/74
6) 106/74
7) 267/74

INPUT TAPE X409 ON MT4
DATA INPUT 09 NF 7 FL 7 2 0

148 · 74

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(432)	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
(480)	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
(528)	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
(576)	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
(624)	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
(672)	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
(720)	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
(768)	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
(816)	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
(864)	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
(912)	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
(960)	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
(1008)	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
(1056)	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
(1104)	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
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(1248)	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000
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FILE 1 RECORD 2 LENGTH 2016BYTES

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(1968)	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000	000000000000

FILE	INPUT RECS.	DATA RECORDS INPUT	MAX. SIZE	READ ERROR SUMMARY PERM	ZERO B	SHORT	UNDEF.	INPUT RETRIES #RECS.	TOTAL#
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FILE 2 RECORD 74 1 LENGTH 666BYTES

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(144)	206433040611	206451570652	206470314632	206507040611	206525570652	206544314632	206563044672	206601570652
(192)	206620320713	206637044672	206655574733	206674320713	206713050754	206731574733	206750324774	206767050754
(240)	207402700406	207412152376	207421424366	207430700406	207440152376	207447426416	207456700406	207466154427
(288)	207475426415	207504702437	207514154427	207523430447	207532702437	207542156457	207551430447	207560702437
(336)	207570156457	207577430447	207606704467	207616156457	207625432477	207634704467	207644160510	207653432477
(384)	207662706520	207672160510	207701434530	207710706520	207720162540	207727434530	207736706520	207746162540
(432)	207755434530	207764710550	207774162540	210401617270	210405344264	210411072274	210414617270	210442620305
(480)	210446345301	210452073311	210455620305	210461346315	210465073311	210470621321	210474346315	210500074325
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FILE 2 RECORD 2 LENGTH 1104BYTES

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(144)	715741042765	003444020600	777714000723	200431532444	177477625566	177542173107	200617100514	201417075641
(192)	720175043342	012064053060	007730041064	172632147322	173630444464	175550366277	173721603766	175611266003
(240)	210553006276	572201063441	206472221665	000000000002	205736101422	000000000004	000000000000	000000000000
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(384)	722343043444	006404034420	002764015203	200547206276	201432307117	201461416416	201402506356	201413522545
(432)	720116043577	776107773440	775647770626	177712125520	201474153242	201427134245	201446746504	201440640673
(480)	722735043632	002110013300	000530004114	177457434421	200737110533	200774436643	200614514134	200714216403
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(768)	725115044021	007404040320	003124015722	200531146655	201436442724	201400235655	201447505302	201502444373
(816)	725166044010	002400015060	002530014205	200527234503	201434006427	200740362234	201452711376	201456552556
(864)	210566133224	572242163513	206505666163	000000000004	205736101422	000000000003	000000000000	000000000000
(912)	000000000000	000000000000	575102530667	576230747420	575171473472	576175004376	574136112171	575212766007
(960)	725115044021	007404040320	003124015722	174713322215	200700346375	200752671453	201465274350	201517656262
(1008)	725166044010	002400015060	002530014205	171713752307	200677477513	200716263240	201470571237	201475102254
(1056)	730344044622	003244017760	001110005764	176774167115	201424700757	201417136711	200735607762	201457413031

FILE	INPUT RECS.	DATA RECORDS INPUT	MAX. SIZE	READ ERROR SUMMARY PERM	ZERO B	SHORT	UNDEF.	INPUT RETRIES #RECS.	TOTAL#
2	1169	1169	5472	0	0	0	0	0	0