**File Name = JS98SNii.DSj** for JOSIE-1998

**File extension: DSj =**

Data set of an individual sonde:      ii = 01 – 27 for JOSIE-1998

**DS0:** This is the Base Data Set (=**BDS**) for further investigations

Full data set (included time response parts 1 (in Troposphere) and 2 (in Stratosphere) with time resolution of 2.5 second.

**DS1: Subset of DS0: Full Profile, excluded time responses (A & B)**

Sub data set (excluded time response parts A (in Troposphere) and B (in Stratosphere) with time resolution of 2.5 second, response tests parts are replaced by linear interpolation between begin and end values of the individual reported parameters.

**DSR:Subset of DS0: Time Responses (A & B)**

Sub data set only time response parts 1 (in Troposphere) and 2 (in Stratosphere) with time resolution of 2.5 second.

**DS2 -> DS**8 are derived data from DS1-data with larger time steps

   DS2:   Time step = 5.0 s

   DS3:   Time step = 10.0 s

   DS4:   Time step = 20.0 s

   DS5:   Time step = 30.0 s

   DS6:   Time step = 60.0 s

   DS7:   Time step = 120.0 s

   DS8:   Time step = 180.0 s

   DS9:   Time step = 240.0 s

*>>>>> JOSIE 1998/1999 Data Format <<<<<*

```
JS98SN01.DS1  = File Name
   1            *Rec_Nr_GC      [Unity ]*
   1            *Sonde_Nr_GC    [Unity ]*
   1            *Flag_GC        [Unity ]*
  51            *Sim_Nr_GC      [Unity ]*
   1            *Sim_Sub_Nr     [Unity ]*
6A4087          *Sonde_Code     [String]*
  2A            *Sonde_Stock    [String]*
 8.18000E+01    *Motor_Cur_Pre  [mA    ]*
 5.73600E+01    *Mass_Bef_Pre   [gram  ]*
 1.00000E-02    *I_Back_Bef_Pre [microA]*
 2.24053E+02    *Flow_Rate_Pre  [ml/min]*
 2.96050E+02    *T_Lab_Pre      [Kelvin]*
 1.01200E+03    *P_Lab_Pre      [hPa   ]*
 1.50000E-01    *I_Back_Aft_Pre [microA]*
 2.50300E+01    *Resp_Time_Pre  [second]*
 1.01000E+00    *Conv_Eff_Pre   [Unity ]*
 1.73000E+00    *Offset_Pre     [ppbv  ]*
 5.68900E+01    *Mass_Aft_Pre   [gram  ]*
 5.53100E+01    *Mass_Bef_Post  [gram  ]*
 2.00000E-02    *I_Back_Bef_Post[microA]*
 2.27988E+02    *Flow_Rate_Post [ml/min]*
 8.35000E+01    *Motor_Cur_Post [mA    ]*
 2.96950E+02    *T_Lab_Post     [Kelvin]*
 1.01200E+03    *P_Lab_Post     [hPa   ]*
 1.07000E+00    *Conv_Eff_Post  [Unity ]*
 1.45000E+00    *Offset_Post    [ppbv  ]*
 1.50000E-01    *I_Back_Aft_Post[microA]*
 1.66000E+01    *Resp_Time_Post [second]*
 5.51800E+01    *Mass_Aft_Post  [gram  ]*
   1            *Sonde_Type     [Unity ]*
   3            *Sens_Sol_Type  [Unity ]*
   2            *Contributor_Nr [Unity ]*
-1.00000E+02    *Resp_Time_1A   [second]*
-9.80000E+01    *Resp_Time_1B   [second]*
 3.49900E+03    *Resp_Time_2A   [second]*
 3.90100E+03    *Resp_Time_2B   [second]*
 3.84782E+02    *TOC_EC1        [DU    ]*
 3.85980E+02    *TOC_EC2        [DU    ]*
 3.84782E+02    *TOC_EC3        [DU    ]*
 3.85980E+02    *TOC_EC4        [DU    ]*
 3.73034E+02    *TOC_OPM        [DU    ]*
 9.69469E-01    *TOC_Norm_Fact_1[Unity ]*
 9.66460E-01    *TOC_Norm_Fact_2[Unity ]*
 9.69469E-01    *TOC_Norm_Fact_3[Unity ]*
 9.66460E-01    *TOC_Norm_Fact_4[Unity ]*
 4.98071E-01    *Flight_H2O_Loss[gram  ]*
```

```
Rec_Nr      * Time_Day  * Time_Sim  * Pres_ESC  * Temp_ESC  * Temp_Inlet * Alt_Sim    *

[Unity]     * [Seconds] * [Seconds  * [hPa]     * [Kelvin]  * [Kelvin]   * [Km]       *


PO3_OPM     * I_ECC_RAW * Temp_ECC  * PO3_ECC_RAW* PO3_ECC_BG1* PO3_ECC_BG2* PO3_ECC_BG3*

[mPa]       * [micro-amp]* [Kelvin]  * [mPa]      * [mPa]      * [mPa]      * [mPa]      *


PO3_ECC_BG4* Validity_Nr* TOC_EC1   * TOC_EC2    * TOC_EC3    * TOC_EC4    * TOC_OPM    *

[mPa]       * [Unity]    * [DU]      * [DU]       * [DU]       * [DU]       * [DU]       *

EC1_Dev_OPM* EC2_Dev_OPM* EC3_Dev_OPM* EC4_Dev_OPM* EC1_Rel_OPM* EC2_Rel_OPM* EC3_Rel_OPM*

[mPa]       * [mPa]      * [mPa]      * [mPa]      * [Percent] * [Percent] * [Percent]  *


EC4_Rel_OPM* Delta_Alt  * H2O_Loss_Sn*

[mPa]       * [Km]       * [gram]     *
```

*>>>>> JOSIE 1998/1999 Data Format <<<<<*

A.  **Rec_Nr**=          Record Number

B.  **Time_Day**=        Local day time (in seconds)

C.  **Time_Sim**=        Actual simulation time (in seconds; start simulation time = 0)

D.  **Pres_ESC**=        Pressure inside chamber (in hPa)

E.  **Temp_ESC**=        Temperature inside chamber measured at O3-Manifold (in K)

F.  **Temp_Inlet**=      Actual temperature at air intake of the sonde, exterior styrofoam box (in K)

G.  **Alt_Sim**=         Actual simulation height, integrated sum of hydrostatic equation (in km)

H.  **PO3_OPM**=         Actual ozone pressure measured by UV-Photometer (in mPa).

I.  **I_ECC_RAW**=       ECC-sensor current signal (in µA): No corrections

J.  **Temp_ECC**=        Temperature of the ECC-Pump, measured exterior at the pump (in K)

K.  **PO3_ECC_RAW**= Ozone pressure (in mPa):     No corrections

L.  **PO3_ECC_BG1**=  Ozone pressure (in mPa) according BG1- corrections

M.  **PO3_ECC_BG2**=  Ozone pressure (in mPa) according BG2- corrections

N.  **PO3_ECC_BG3**=  Ozone pressure (in mPa) according BG3- corrections

O.  **PO3_ECC_BG4**=  Ozone pressure (in mPa) according BG4- corrections

P.  **Validity_Nr**=     Status Number to inform about the record validity

Q.  **TOC_EC1**=         Integrated ozone column (in DU) using PO3_ECC_BG1 corrected ozone

R.  **TOC_EC2**=         Integrated ozone column (in DU) using PO3_ECC_BG2 corrected ozone

S.  **TOC_EC3**=         Integrated ozone column (in DU) using PO3_ECC_BG3 corrected ozone

T.  **TOC_EC4**=         Integrated ozone column (in DU) using PO3_ECC_BG4 corrected ozone

U.  **TOC_OPM**=         Integrated ozone column (in DU) using PO3_OPM ozone

V.  **EC1_Dev_OPM**=  Difference PO3_BG1 – PO3_OPM (in mPa)

W.  **EC2_Dev_OPM**=  Difference PO3_BG2 – PO3_OPM (in mPa)

X.  **EC3_Dev_OPM**=  Difference PO3_BG3 – PO3_OPM (in mPa)

Y.  **EC4_Dev_OPM**=  Difference PO3_BG4 – PO3_OPM (in mPa)

Z.  **EC1_Rel_OPM**=  Relative Difference (PO3_BG1 – PO3_OPM)/PO3_OPM *100 (in %)

>>>>> *JOSIE 1998/1999 Data Format* <<<<<

AA. **EC2_Rel_OPM**= Relative Difference (PO3_BG2 – PO3_OPM)/PO3_OPM *100 (in %)

BB. **EC3_Rel_OPM**= Relative Difference (PO3_BG3 – PO3_OPM)/PO3_OPM *100 (in %)

CC. **EC4_Rel_OPM**= Relative Difference (PO3_BG4 – PO3_OPM)/PO3_OPM *100 (in %)

DD. **Delta_Alt**= Altitude Step (in Km)

EE. **Flight_H2O_Loss**= Loss of water of sensing solution due to evaporation (in gram)

***Note::***

**BG1**: Background current <u>before</u> exposure with ozone, Full Correction

Pumpflow correction after Komhyr 1986

**BG2**: Background current <u>before</u> exposure with ozone, PO2-Correction

Pumpflow correction after Komhyr 1986

**BG3**: Background current <u>after</u> exposure with ozone, Full Correction

Pumpflow correction after Komhyr 1986

**BG4**: Background current <u>after</u> exposure with ozone, PO2 Correction

Pumpflow correction after Komhyr 1995 (STOIC-1989)

>>>>> *JOSIE 1998/1999 Data Format* <<<<<

The actual simulated altitude was calculated step by step as the cumulative sum of the height difference between two successive measured pressure levels plus corresponding air temperatures using the hydrostatic equation[1].

| Pump Flow Correction Table | | | | |
|---|---|---|---|---|
| Pressure (hPa) | Correction after Komhyr 1986 (Handbook) (2.5 cm3 cathode solution) | Correction after Komhyr 1995 (STOIC-1989) (2.5 cm3 cathode solution) | Difference Komhyr 1995– Komhyr 1986 | Remarks |
| 1000 | 1.000 | 1.000 | 0 | |
| 200 | 1.007 | 1.000 | -0.007 | |
| 100 | 1.010 | 1.007 | -0.003 | |
| 50 | 1.015 | 1.018 | -0.003 | |
| 20 | 1.033 | 1.041 | -0.008 | |
| 10 | 1.054 | 1.066 | -0.008 | |
| 7 | 1.068 | 1.087 | -0.019 | |
| 5 | 1.087 | 1.124 | -0.037 | |
| 3 | - | 1.241 | - | |

Science Pump Corporation (SPC-6A ozone sonde) recommend the Komhyr 1986 correction table while ENSCI recommend for the 1Z/2Z sonde the Komhyr 1995 (STOIC-1989) correction table.

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[1] Hydrostatic equation is defined as $\Delta Z = \dfrac{R}{g} * \dfrac{T_{i+1} + T_i}{2} * Ln\left(\dfrac{P_i}{P_{i+1}}\right)$ , whereby R= gas constant, g= gravity constant, T= temperature, P= pressure and indices i and i+1 are representing the two succeeding pressure levels

*>>>>> JOSIE 1998/1999 Data Format <<<<<*