

**SYSTRAN (Systems Analysis Translator):
A Digital Computer Program
Supplement One**

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Foreword

This report is the first in a series of reports to supplement AMRL-TR-65-133, *SYSTRAN (Systems Analysis Translator): A Digital Computer Program*, D. J. Lajeunesse, E. B. Weis, Jr., T. J. Hogan, Aerospace Medical Research Laboratories, Wright-Patterson Air Force Base, Ohio, July 1965. The work described herein was performed during the period October 1964 to August 1965. The work in the report was done in support of Project 7231, "Biomechanics of Aerospace Operations," Task 723101, "Effects of Vibration and Impact."

The report describes extensions of the capability of SYSTRAN and includes additional program listings.

Copies of the complete Binary Program tape or the complete Symbolic Program tape will be available to authorized requestors from Mr. K. W. Bauman or Mr. D. J. Lajeunesse of the Digital Computation Division, Research and Technology Division, Wright-Patterson Air Force Base, Ohio.

This technical report has been reviewed and is approved.

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Abstract

SYSTRAN was originally developed around a data acquisition system and was primarily intended for use in analysis of periodic and transient signals. Although the system included some capability for handling random data it was limited. These additions have been made for the purpose of handling unusual data (including random). Extensions of the capability of the original program, corrections to the original program, and listings of all modifications and additions are described. In particular this report describes the addition of computing capability for accomplishing Digital Filtering, Probability Density Function Calculation, and Random Number Generation. The report discusses all aspects of the program essential to competent usage.

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Contracts

SECTION I

Introduction

SYSTRAN was originally developed around a data acquisition system and was primarily intended for use in analysis of periodic and transient signals. Although the system included some capability for handling random data it was limited. The additions then have been for the purpose of handling unusual data (including random). The Random Number generator is a checkout tool (for SYSTRAN as well as for the systems engineer), the Filter System provides for the modification of the spectral content of a sequence for the purposes of more cogent analysis and the Probability Density System provides the ability to check on the applicability of various methods of analysis and on assumptions of stationarity.

All considerations regarding the usage and structure of SYSTRAN are outlined in AMRL-TR-65-133 (ref 3). The remainder of this report will simply be a supplement to the previous report. The additions described in this supplement cause a change in Load Deck. The new Load Deck is listed in Appendix II.

SECTION II

The Filter System

The Filter System provides a means of passing a time series through a digital filter to obtain a new filtered time series for analysis.

Filter System Monitor

Control is transferred to the Filter System Monitor when the Job Monitor encounters a *BEGIN FILTER SYSTEM control card. The system monitor in turn recognizes the following control cards *FILTER, *OPTION, *COPY, and *RESET, and controls the operation of the system according to the specifications present on these cards.

System Input-Output

The Filter System obtains its time data input from the Old Master Time Data File. It also provides a means of copying a Binary Time Data File onto the Old Master Time Data File so that edited data may be passed through the system in the same Job in which the edit was accomplished. The Filter System output is written on the Binary Time Data File so that it will be available for use in any system which uses this file as input. The ability to produce hard copy prints and plots of the filtered data is also present in the system. The hard copy output data is presented in its normalized and calibrated form. Since the filter process is performed dynamically (one buffer (200 pts) at a time) throughout the test, the plots are scaled dynamically with reference to the actual minimum and maximum obtained by the filtered or original unfiltered data over each buffer for each input channel.

System Mathematics

The purpose of this discussion is to present the mathematics involved in the convolution (Ormsby) digital filter technique. This is a method for operating on a time series to produce a new time series whose power density spectrum is altered by the filter operation.

The output of a general linear filter (not necessarily realizable) can be given as follows:

F*(w) = H(w)F(w) (1)

where

F*(w) is the Fourier Transform of the altered series

F(w) " " " " " " original "

H(w) " " " " " " filter

This can also be written as (in the time domain):

f*(tau) = integral from -infinity to infinity of h(t)f(t-tau)dt (2)

where

f*(t) is the filtered f(t)

h(t) is the impulse response of the filter

A numerical approximation to this integral is as follows (trapezoidal rule):

$$f^*(\tau_j) = \sum_i [h(t_i) f(t_i - \tau_j) + h(t_{i+1}) f(t_{i+1} - \tau_j)] \left(\frac{t_{i+1} - t_i}{2} \right) \quad (3)$$

If the t_i are equally spaced:

$$\frac{t_{i+1} - t_i}{2} = \frac{\Delta t}{2} \quad (4)$$

and therefore:

$$f^*(\tau_j) = \frac{\Delta t}{2} \sum_i [h(t_i) f(t_i - \tau_j) + h(t_{i+1}) f(t_{i+1} - \tau_j)] \quad (5)$$

In general $h(t_i)$ is nonzero for all values of i . In the special case we are concerned with, $h(t_i)$ will be nonzero (approximately) only for values of i from I_1 to I_2 . Therefore:

$$f^*(\tau_j) = \frac{\Delta t}{2} \sum_{I_1}^{I_2} [h(t_i) f(t_i - \tau_j) + h(t_{i+1}) f(t_{i+1} - \tau_j)] \quad (6)$$

In general τ_j takes on values from $-\infty$ to $+\infty$ but in fact the choice of the $\tau=0$ reference point will be arbitrary for many experiments.

This development is true for arbitrary $f(t)$ but practically the application of the theory is limited to the case where:

$$\int_{-\infty}^{\infty} f(t) dt = 0 \quad (7)$$

The $f(t)$ discussed herein do not necessarily have this condition.

Therefore let

$$f(t) = A + f'(t) \quad (8)$$

where

$$\int_{-\infty}^{\infty} f(t) dt = A \quad (9)$$

$$\int_{-\infty}^{\infty} f'(t) dt = 0 \quad (10)$$

then

$$f^*(\tau_j) = \frac{\Delta t}{2} \sum_{I_1}^{I_2} [h(t_i) (A + f'(t_i - \tau_j)) + h(t_{i+1}) (A + f'(t_{i+1} - \tau_j))] \quad (11)$$

$$f^*(\tau_j) = \frac{\Delta t}{2} \sum_{I_1}^{I_2} [A(h(t_i) + h(t_{i+1})) + h(t_i) f'(t_i - \tau_j) + h(t_{i+1}) f'(t_{i+1} - \tau_j)] \quad (12)$$

$$f^*(\tau_j) = A \frac{\Delta t}{2} \sum_{I_1}^{I_2} [h(t_i) + h(t_{i+1})] + \frac{\Delta t}{2} \sum_{I_1}^{I_2} [h(t_i) f'(t_i - \tau_j) + h(t_{i+1}) f'(t_{i+1} - \tau_j)] \quad (13)$$

This shows that we can correct for a nonzero mean process by subtracting the mean in the beginning and then, at the end, adding the mean value times the integral of the impulse response of the filter.

In the Filter System, $f^*(t)$ is computed as one of the output channels on the Binary Time Data File. The function, $f(t)$, is input to the system as one of the input channels on the Old Master Time Data File. The function, $h(t)$, is one of the filter functions as defined by the specifications on the *OPTION control card. The pivotal element corresponds to τ_j . The t_i are the time points of the filter around τ_j at Δt intervals. The number of points in the filter (width) is $I_2 - I_1$. A is the norm for each channel and it is taken as the first point of each channel on the Old Master Time Data File. This norm is subtracted from each data point prior to filtering and consequently the first point of each channel on the output Binary Time Data File is zero.

Filter Options

M=1

$$h(t) = \frac{\sin \omega_c t}{\pi t} = \frac{\omega_c}{\pi} \frac{\sin \omega_c t}{\omega_c t}$$

$$|H(\omega)| = 1 \quad -\omega_c \leq \omega \leq \omega_c \quad \angle H(\omega) = 0^\circ \text{ for all } \omega$$

M=2

$$h(t) = \frac{\sin^2 \frac{\omega_c}{2} t}{\pi^2 f_c t^2} = \frac{\omega_c}{2\pi} \left(\frac{\sin \frac{\omega_c}{2} t}{\frac{\omega_c}{2} t} \right)^2$$

$$|H(\omega)| = \frac{\omega}{\omega_c} + 1 \quad -\omega_c \leq \omega \leq 0$$

$$= -\frac{\omega}{\omega_c} + 1 \quad 0 \leq \omega \leq \omega_c \quad \angle H(\omega) = 0^\circ \text{ for all } \omega$$

Special Considerations

The excellence of the filtering operation in terms of the frequency rolloff characteristics and the accuracy of the filter gain is related to the cutoff frequencies and the filter width. A very low frequency filter must be quite wide to be accurate. Since the filter function is assumed to be zero outside the convolution range, some accuracy is sacrificed when this is not true.

The ability to input the filter function provides a limited ability to accomplish sum and difference filters (weighted average filters) as well as simple recursive filters. The Copy Option also provides the ability to filter the filtered data (ad infinitum).

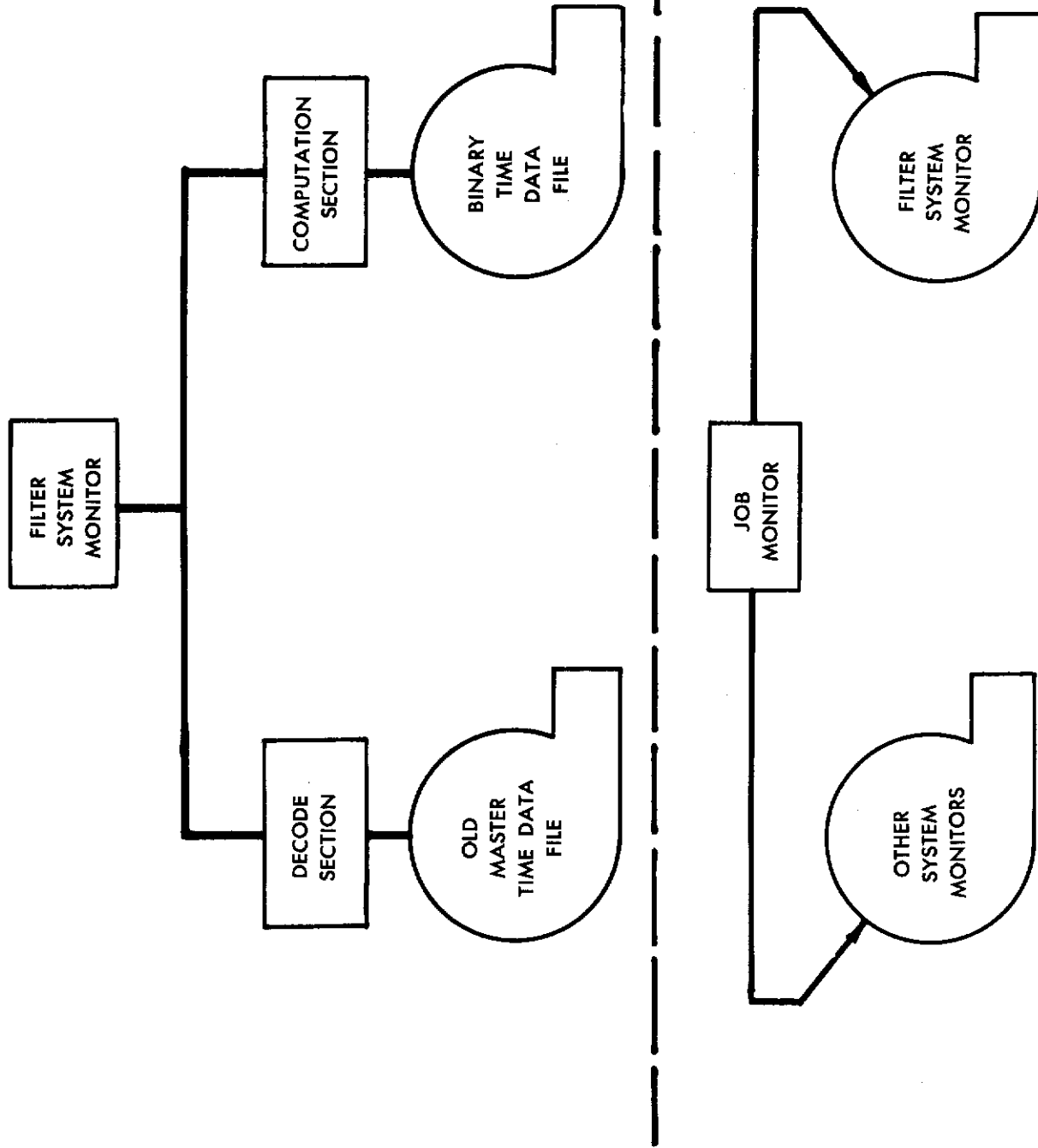


FIGURE 1 — THE FILTER SYSTEM

When the system input is in integer form, the computational subroutine floats, normalizes, and calibrates the data before the filter is applied. The filter point is then reconverted to integer form for the purpose of output on the Binary Time Data File.

The delta t which is used by the Filter System must be set in the Time System.

Filter System Control Cards

*BEGIN FILTER SYSTEM

This card is recognized by the Job Monitor and effects the loading of the Filter System control program. See Figure 1 for control diagram.

*COPY

The card is recognized by the Filter System Control program and affects the copy of the Binary Time Data File onto the Old Master Time Data File.

*FILTER, TEST /[(I₁, I₂)], CHIN /[(J₁, J₂, . . . J_n)],

CHOUT /[(K₁, K₂, . . . K_n)], OPTION /[(L₁, L₂, . . . L_n)],

OUTPUT /[(M₁, M₂, . . . M_n)], CAL /[(C₁, C₂, . . . C_n)]

This card defines the filter control for the input test I₁ onto the output test I₂ in the following way:

Filter input channel J_i calibrated by C_i onto output channel K_i using filter option L_i, and prepare a printed and plotted output of J_i and K_i if and only if M_i ≠ 0 (i= 1, 2, . . . , n). The OUTPUT and/or CAL fields may be omitted in which case M_i=0 and C_i=1 (i=1, 2, . . . n). The maximum value of n is 14, J_i may be equal to J_k for any i and k, each K_i must be unique, L_i may be equal to zero in which case the channel J_i will be passed onto K_i modified only to the extent that K_i will be equal to J_i (Normalized) *C_i. The maximum value of J_i and K_i is 14. Only 5 unique nonzero L_i values may be used to set the n L_i values in the OPTION field. A maximum of 20 test combinations (I₁, I₂) may be specified on one *FILTER control card set. Each TEST field establishes the start of a set of fields containing one TEST, one CHIN, one CHOUT, one OPTION, and possibly one OUTPUT and/or one CAL field.

*OPTION, NUMBER/[L], WIDTH/[N]

FREQ/[(F₁, F₂)], VALUES/ $\left[\begin{array}{c} C(M) \\ I/J(V, V, . . . V) \end{array} \right]$

This control card sets the option specifications in the following manner:

Set Filter option L, (corresponding to some nonzero L_i present in the OPTION field of a *FILTER card with width N, (i.e., N points in length) where F₁ and F₂ are input values available to the filter option computation subroutine which may be used as specifications in the definition of the filter function (normally used as lower and upper cutoff frequencies, respectively). The VALUES field defines the setup of the filter function in one of the following manners:

VALUES/[C(M)]

Compute the filter function according to computation method M as defined in the filter option computation subroutine.

VALUES/[I/J](V₁, V₂, . . . V_n)]

Set the filter function as the values V₁, V₂, . . . V_n such that the pivotal element is V_J. At most, 5 options (5 unique values of L) may be specified on any one *OPTION control card set. The maximum width of any filter function is 151. The maximum value of M depends on the setup of the filter function subroutine (presently 10 allowed, but defined only for M=1 and M=2).

*RESET,

OPTION
FILTER
BOTH

OPTION -- Destroys the filter function definitions and expects a redefinition of these functions.

FILTER -- Destroys the filter control fields and expects a redefinition of these fields.

BOTH -- Accomplishes both of the above.

A *FILTER (*OPTION) control card set is defined as any series of sequential *FILTER (*OPTION) control cards.

As soon as both a *FILTER control card set and an *OPTION control card set is obtained by the program the computation will be performed.

The *FILTER and *OPTION control cards may be continued from physical card to physical card provided none of these cards begin with a C in column one and the break from one card to the next is at the end of a field. One exception to the last restriction is in the VALUES field on the *OPTION card. If the input option is specified, the V_i values may span more than one card provided each V_i value is totally on one card.

SECTION III

The Probability Density System

The Probability System provides a means for obtaining the first and/or second order probability density functions of a time series as well as for the development of statistical measures of the "goodness-of-fit" of the first order density function to a given function (usually normal) and statistical measures of the stationarity of the time series.

Probability System Monitor

Control is transferred to the Probability System when the JOB MONITOR encounters a *BEGIN PROBABILITY SYSTEM control card. The system monitor, in turn, recognizes the control cards *COPY and *PROBABILITY and controls the operation of the system according to the specifications present on these cards. See Figure 2 for control diagram.

System Input-Output

The Probability System obtains its time data from the New Master Time Data File. It also provides a means of copying a Binary Time Data File onto the New Master Time Data File so that the System output can be written on the Binary Time Data File for further processing by the Filter System or other systems which obtain their input from the Binary Time Data File. The system also produces hard copy prints and plots of all computations requested including the statistical measures of normality and stationarity. The first order probability density functions are calculated and plotted from the minimum to the maximum specified in the LIMITS field on the *PROBABILITY control card. The second order probability density functions are plotted as two-dimensional intensity or contour plots, for each value requested, using four significant figures of accuracy for the intensity and up to 25 values for each random variable axis. All plots are normalized and calibrated.

Probability Density System Mathematics

- 1) 1st order probability density function

$$PD1 (K_2, L) = PD1 (K_2, L) + 1$$

$$\text{where } L = \left(\frac{K_1(t) - \text{MIN}}{\text{MAX} - \text{MIN}} \right) + 1 \quad (1 \leq L \leq N)$$

$K_1(t)$ is the time series value

- 2) 2nd order probability density function

$$PD2 (I, J, n_1) = PD2 (I, J, n_1) + 1$$

$$\text{where } I = \left(\frac{K_1(t) - \text{MIN}}{\text{MAX} - \text{MIN}} \right) + 1 \quad (1 \leq I \leq N)$$

$$J = \left(\frac{K_1(t + \frac{n}{t}) - \text{MIN}}{\text{MAX} - \text{MIN}} \right) + 1 \quad (1 \leq J \leq N)$$

n_1 = Number of t values corresponding to a particular τ_1 $(1 \leq N \leq 25)$

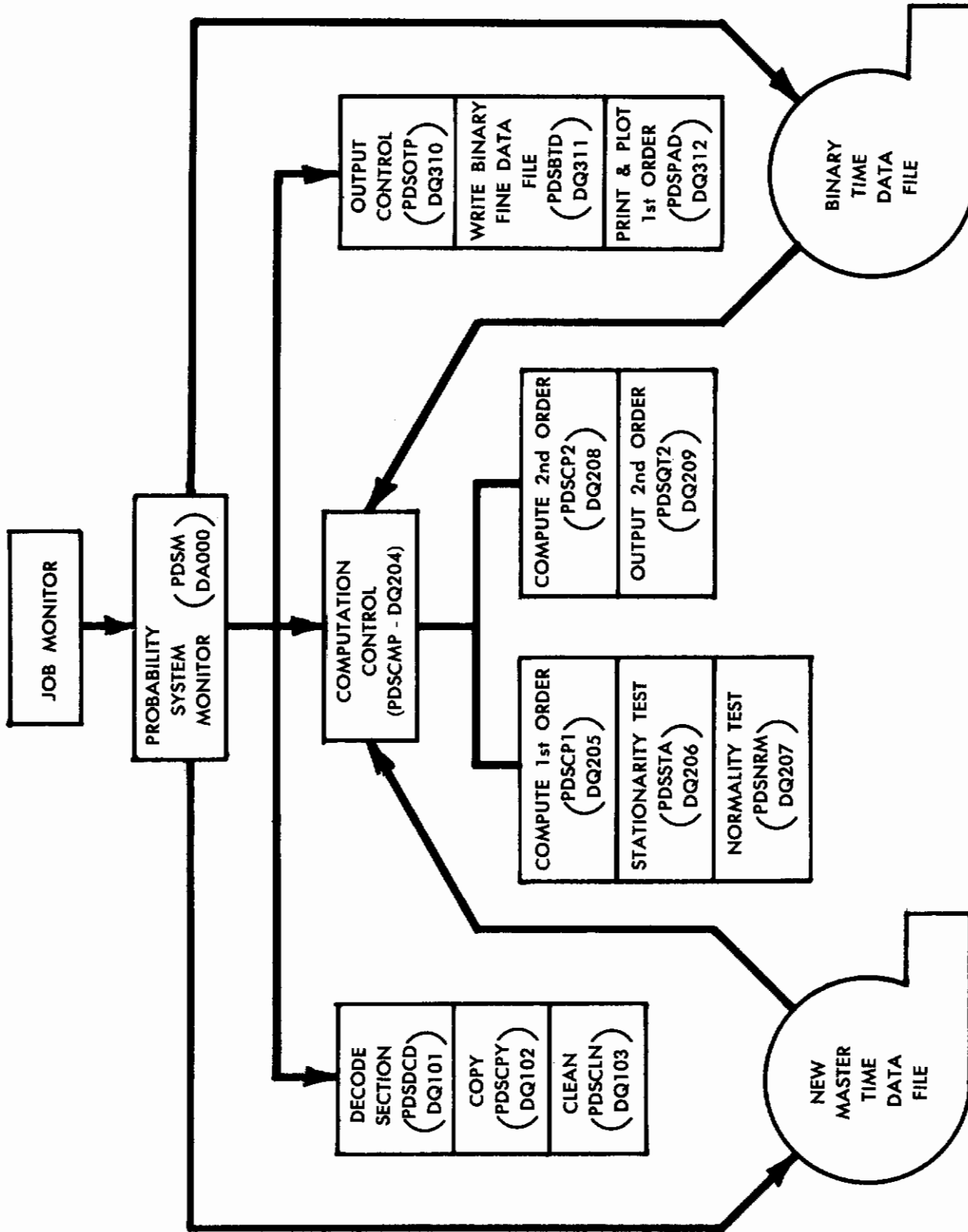


FIGURE 2 -- THE PROBABILITY DENSITY SYSTEM

3) Final Computation for 1st and 2nd order

$$PD1 (K, L)_F = \frac{PD1 (K_2, L)}{\left(\frac{MAX - MIN}{N}\right) \sum_{i=1}^N PD1 (K_2, i)}$$

where

K_2 is the output channel

$$PD2 (I, J, n_1)_F = \frac{PD1 (K_2, I)_F * PD2 (I, J, n_1)}{\frac{MAX - MIN}{N} \sum_{j=1}^N PD2 (I, j, n_1)}$$

$$PD2 (I, J, n_1)_F = \frac{PD1 (K_2, I) * PD2 (I, J, n_1)}{\left(\frac{MAX - MIN}{N}\right) \sum_{k=1}^N PD1 (K_2, k) \sum_{j=1}^m PD2 (I, j, n_1)}$$

4) Normality

The Chi-Square test for normality outlined in reference 1 is implemented. For this test, the calculated distribution function is compared to the normal distribution (this is the option $M=1$; if $M=0$, this test is bypassed; no other options are now defined) as follows:

$$\chi^2 = \sum_{i=1}^K \frac{(n_i - \pi_i N)^2}{\pi_i N}$$

where

n_i is the number of values in the i^{th} interval of the distribution function

N is the total number of samples over which the distribution function is calculated

π_i is the probability that a point would fall into the i^{th} interval if the distribution were normal.

The value of χ^2 is printed out long with all necessary parameters such that the "goodness-of-fit" determination can be made by reference to a table of the Chi-Square distribution.

5) Stationarity

The tests for stationarity outlined in reference 1 are implemented (A, B, and C). All of these tests are included under option $IO=1$. If $IO=0$, this test is bypassed. No others are yet defined.

TEST A

Estimates of the mean square value of the signal are calculated over intervals, each of which is NP points long, the first interval starting at point NT and there being NS points between each interval (NS may be negative). The mean square value of the signal over the entire function is also calculated. Using the 1st and 2nd values in the values field as the lower and upper values (respectively) for the probability interval to be considered (from a Chi-Square table), the number of estimates of the mean square value which fail to fall into the normalized interval are counted. (That is, the number of intervals whose mean square value fails.) Using the probability interval specified in the 3rd value of the values field, the probability of this number of failures is calculated from a binomial distribution.

The equations are as follows:

$$\text{Prob} \left[\sigma_x^2 \frac{\chi_l^2}{n-1} \leq \overline{X_i^2} \leq \sigma_x^2 \frac{\chi_u^2}{n-1} \right] = P$$

where σ_x^2 is the mean squared value calculated over the entire function

χ_l^2 is the lower Chi-Square value

χ_u^2 " " upper " " " "

$n=2*B*NP*\Delta T$

P=the probability interval

B is the idealized bandwidth

$$\text{Prob} [i \leq k] = \sum_{i=1}^k \frac{N!}{i!(N-i)!} (1-P)^i (P)^{N-i}$$

where N is the number of intervals

P is the probability interval

k is the number of failures

Each mean squared estimate is printed out as is the number of failures and the probability of this number of failures along with all significant parameters.

TEST B

In this test the ratio of the estimated normalized variance of the mean squared values to the theoretical normalized variance of the mean squared values is calculated and output along with significant parameters so that a test can be made using a table of Chi-Square values.

The equations are as follows:

$$\text{the ratio is } \frac{\frac{S^2}{\sigma_x^2}}{\frac{1}{B * NP * \Delta T}}$$

$$\text{where } S^2 = \frac{1}{N} \sum_{i=1}^N (\overline{X_i^2})^2 - (\overline{X^2})^2$$

N is the number of intervals

$\overline{X^2}$ is the mean squared value over the entire function

This ratio is distributed as $\frac{\chi^2}{N}$

TEST C

In this test, the maximum and minimum of the estimates of the mean square value are found and their ratio calculated and output along with all significant parameters for use in a test for stationarity using tables of the Fmax statistic.

Probability Density System Control Cards

*BEGIN PROBABILITY SYSTEM

This card is recognized by the JOB MONITOR and effects the loading of the Probability System control program.

*COPY, TESTS/ [All
M₁, M₂, . . . , M_{nm}]

This card causes the indicated tests (m₁ . . . M_{nm}) to be copied from the Binary Time Data File onto the New Master Time Data File.

*PROBABILITY, TEST/[(I₁, I₂)], CH/[(K₁, K₂)], CAL/[C], PD/[L], LIMITS/[N (MIN, MAX)], TZERO/[I_t], TMAX/[J_t], DISTRIBUTION/[M], STATIONARITY/[IO (J, NP, NT, NS, B)], TAU/[NN(n₁, n₂, n₃, . . . n_{nn})], SAMPLE/[K_t], NORM/(NR), VALUES
(. . .)

This card causes the following to be accomplished; compute the 1st thru the Lth order (max 2nd order) Probability Density (PD) Functions of Test I₁, channel K₁ calibrated by C, outputting the first order PD function as channel K₂ of Test I₂ on the Binary Time Data File. The 1st order PD function is to be computed using N (max 200) equal intervals over the range MIN to MAX. The 2nd order PD (if specified) is to be computed using N, if N ≤ 25, or 25 equal intervals over the range MIN to MAX for the NN tau shifts n₁, n₂, n₃, . . . n_{nn} (Δt intervals). The PD functions are to be computed using every K_tth point of the input channel from the L_tth point thru the J_tth point. If the DISTRIBUTION field is present and M ≠ 0, compute the test for normality using the Mth defined distribution function (see Mathematics of the System). If the STATIONARITY field is present, compute the test for stationarity using the IOth option defined with a bandwidth of B using J intervals each interval being K_t * NP points in length. The first interval starting at point K_t * NT with each successive interval starting at K_t * NS points beyond the end of the previous interval (the NT, NP, and NS are referenced to the Δt of the original function). The input channel norm value is either given by NR or if NR is missing it is taken as the first point on the channel.

Special Considerations

Only one input and output test (I₁, I₂) may be specified on any one *PROBABILITY control card.

A maximum of 14 output channels may be specified on any one *PROBABILITY control card. Each channel so specified must be unique and range in value from 1 to 14.

The range over which the stationarity test is run must be contained in the range defined by the TZERO and TMAX fields.

i.e., $NT \leq I_t$

and $NT - NS + J(NP + NS) \leq J_t$

Maximum number of Tau shifts is 10.

i.e., $NN \leq 10$

Contrails

If the SAMPLE field is not present, K_t is assumed to be 1.

If the CAL field is not present, C is assumed to be 1.

If the TZERO field is not present, I_t is assumed to be 1.

The outputted 1st order PD function present on the Binary Time Data File is always floating point in form and normalized.

The printed PD functions will be given in both normalized and unnormalized form.

The plots of the 2nd order PD functions are presented as the first four significant figures of the unnormalized function.

The copy option will copy the tests in the order in which they are given on the *COPY card.

The PD functions are determined on the normalized calibrated data and as such, the MIN and MAX fields are the actual values of the minimum and maximum of the input function after calibration and normalization.

If the test field is missing on the *COPY card, this field will be assumed to be TEST/ALL.

SECTION IV

The Random Number Generator

The Random Number Generator provides a means of generating a sequence of numbers with a uniform distribution, converting to another distribution and placing the final sequence on the New Master Time Data File for use by other Systems which take the data from the New Master Time Data File as input.

Random Number Control System

The Random Number Generator is written to be included under the Auxiliary System. Therefore, with the Random Number Generator System in the Load Deck, control is transferred to the system when the JOB MONITOR encounters a *BEGIN AUXILIARY SYSTEM control card. See figure 3 for a control diagram. The Random Number Generator recognizes the *RANDOM control card. The Random Number Generator produces, as hard copy, only the last random number generated on the SYSTRAN Output File.

Loading the Random Number Generator

In order to use this system, it is necessary to replace the \$IBLDR AA893 card in the Load Deck with the following:

Column 1	16	
\$IEDIT		
DECK AA893	}	The Random Number Generator Decks
DECK AA894		
DECK AA895		
DECK AA896		
\$IEDIT		SYSLB2, SRCH1

The Program listing is included in Appendix I.

The Mathematics

The Random Number Generator produces a sequence of numbers in the range 0 to 1 according to the following recursion formula (see reference 2).

gamma_{i+1} = 5^{15} gamma_i [MODULO 2^{35}]

where gamma_i is input from the START field on the *RANDOM control card.

This formula generates a sequence of numbers with an essentially uniform distribution on the interval 0 to 1. The Random Number Generator has the options of outputting the uniform sequence or accomplishing a transformation to a normal sequence according to the value of K in the KEY field on the *RANDOM control card. When K=0, the sequence is uniform. When K=1, the uniform sequence is transformed as follows:

gamma_i = mu + sigma { sign (gamma_i - .5) [v - (a_0 + a_1 v + a_2 v^2) / (1 + b_1 v + b_2 v^2 + b_3 v^3)] }

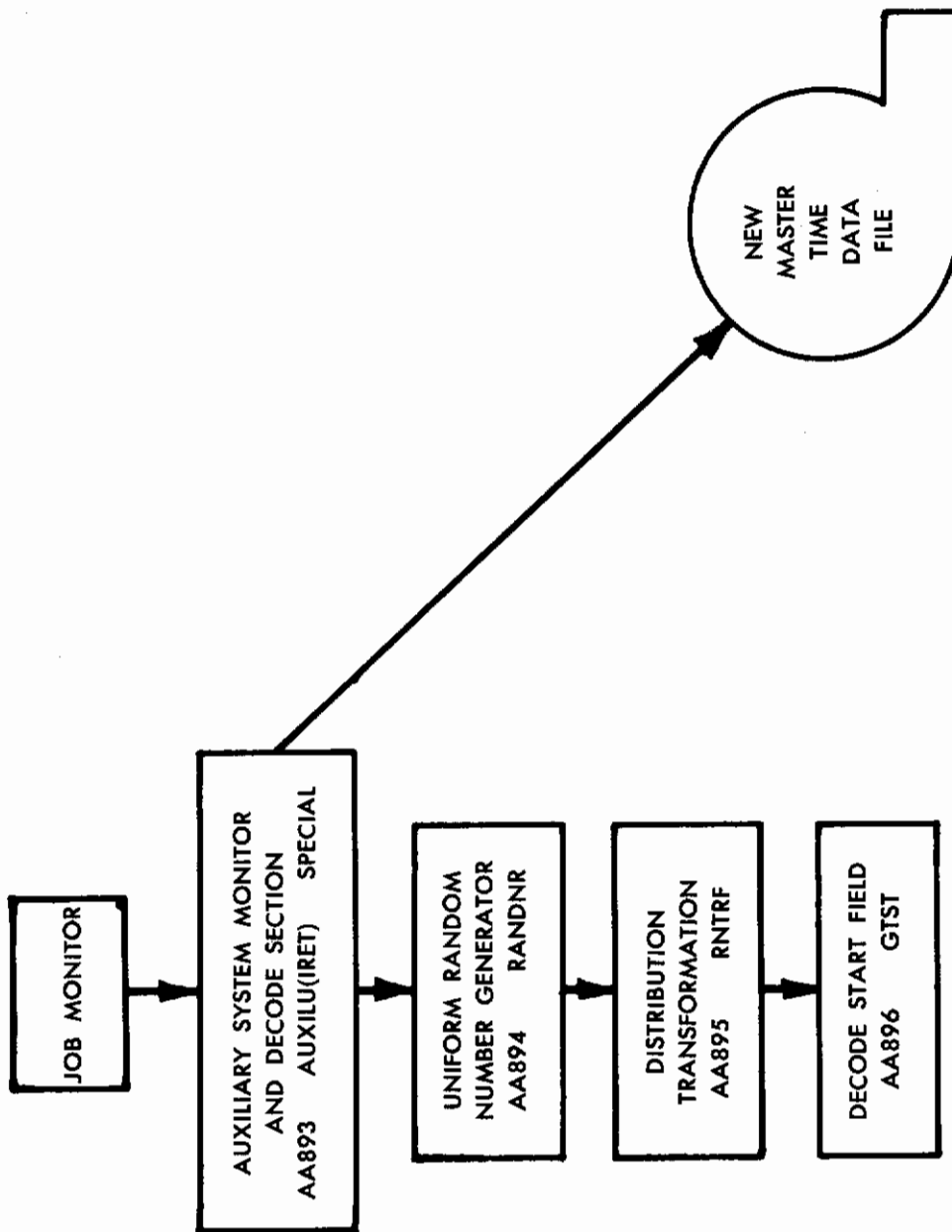


FIGURE 3 — RANDOM NUMBER GENERATOR

where μ is input from the MEAN field on the *RANDOM control card
 σ is input from the SIG field on the *RANDOM control card
sign is a function whose value is -1 if its argument is negative and +1 if positive
or zero

$$v = \sqrt{-2 \log_e \frac{1}{2} (1 - |1 - 2 \gamma_1|)}$$

$$a_0 = 2.515517$$

$$a_1 = 0.802853$$

$$a_2 = 0.010328$$

$$b_1 = 1.432788$$

$$b_2 = 0.189269$$

$$b_3 = 0.001308$$

The Random Number Generator Control Cards

*BEGIN AUXILIARY SYSTEM

When the JOB MONITOR encounters this card, control is transferred to the Random Number Generator System if these decks have been included in the SYSTRAN Load Deck.

*RANDOM, TEST/I, CH/J, MEAN/[], SIG/[], START/[OCTAL], NUM/N, KEY/K, CH/M, MEAN/[], etc.

When the Random Number Generator Control System encounters this card, it will be treated as follows. A sequence of N numbers will be generated and transformed as indicated by option K, starting with the OCTAL number in the start field. If K is 0 the numbers will be uniformly distributed on the interval 0 to 1 and the MEAN and SIG fields will be meaningless. If K=1, the numbers will have a normal distribution with mean and standard deviation as indicated in the MEAN and SIG fields. No options are defined for K other than 0 or 1. The sequence of numbers will be written on the New Master Time Data File as channel J of Test I. The last number in the sequence will be written on the SYSTRAN Output File. If the number of random numbers specified in the NUM fields for a given test on different channels is different, each channel will contain the maximum number specified in the NUM fields and the associated mean value will be inserted on each channel for which the NUM field is less than the maximum to bring the point count for every channel to the maximum value.

SECTION V

Modifications

Transform Generator

In order to provide the ability to remove any time translation from the input data, SYSTRAN has been modified to compute the time point about which the first moment of the area (under the input function) is centered according to the following equations:

$$\bar{t} = \frac{\int_{T_0}^{T_{\max}} t |f(t)| dt}{\int_{T_0}^{T_{\max}} |f(t)| dt}$$

where $f(t)$ is the input data

T_0 is the starting point for the Transformer Generator

T_{\max} is the ending point for the Transformer Generator

\bar{t} is the time point about which the area is centered

The computed \bar{t} is stored in the third ID word of the Binary Transform Data File for each channel. This is done automatically on each entry to the Transform Generator. The value of the integral

$$\int_{T_0}^{T_{\max}} f(t) dt$$

is printed on the SYSTRAN Output File along with \bar{t} for each input channel. This change affects only deck TB425. The new deck is listed in the Appendix I.

Fouriertran System Load Option

The computed value of \bar{t} for each channel is loaded from the Binary Transform Data File into a specific FOURIERTRAN constant for use in the Translator option as follows:

```
*DEFINE, F/[N]/[M], CH/[L], CAL/[C]
```

This loads the \bar{t} for channel [L] into the imaginary part of the FOURIERTRAN constant K[M] and the transform of channel [L] into FOURIERTRAN function F[N]. The previous usage of the *DEFINE control card is still valid, but will not affect the loading of \bar{t} .

This option has been provided for two reasons. One, the transform of a channel with a time translation in it can be modified to remove the translation by multiplying it by $e^{j\omega\bar{t}}$ in the Translator Option. Two, the Inverse Transform of the modified function can be computed with greater accuracy since the integrals will be better approximations. This change affects only deck FO285. The new deck is listed in the Appendix I.

Inverse Transform

In order to compute the Inverse Transform of a function modified as above, it is necessary to compute the Transform for negative values of time. To accomplish this, a new field has been added to the *INFO control card.

*INFO, DTIME/[D], NTIME/[M], STIME/[S]

The DTIME and NTIME fields are unchanged. [S] specifies the starting time value for the Inverse Transform System. The System is otherwise unchanged. This change affects only deck FK282. The new deck is listed in the Appendix.

Correlation System

The Correlation System program originally accepted a maximum Tau shift of 600 Δt . This has been changed to allow a maximum Tau shift as follows:

$$\tau \text{ max} = (600 \Delta t * 1400)/L$$

L = Maximum Channel Subscript

(e.g., if channels 13 and 14 are not used this would be 12)

This modification requires the use of an additional file, B(1) (Old Master Transform Data File). Care should be taken to preserve any data on this file prior to entry into the Correlation System. The decks listed in the original SYSTRAN report include this change.

Time System

The binary tape editor in the Time System originally accepted data in 6000 word blocks. This caused the truncation of the last block of data if the data did not fill the final 6000 words. This has been changed so that the truncation will not occur. The modified decks are correct in the appendix in the original SYSTRAN report.

Frequency System (Matrix)

There is an error in the program listing in the original report in the matrix output plot routine. This is deck FN 279. Card FN 279035 should be changed to:

IF(k-1) 130, 125, 125

Regression System

As of 10 January 1966 the decks listed below have major changes in them. These changes will be supplied on request.

RE 133

RE 234

RE 336

APPENDIX I Program Listing

PART 1

CROSS REFERENCE BETWEEN DECK NAMES AND ROUTINE NAMES AND FUNCTION

THE DECK NAMES ARE COMPRISED OF 5 CHARACTERS WHICH CONSTITUTE THE 4 FIELDS DEFINED BELOW.

FIELD	CHARACTERS	TYPE	USAGE
1	1	ALPHABETIC	SYSTEM GROUP CODE
2	2	ALPHABETIC	OVERLAY LINK NAME
3	3	NUMERIC	LINK OCCURENCE NUMBER
4	4-5	NUMERIC	DECK POSITION NUMBER

SYSTEM GROUP CODES

CODE	SYSTEM GROUP
J	JOB MONITOR
T	TIME
R	REGRESSION
U	UTILITY
C	CORRELATION
F	FREQUENCY
A	AUXILIARY
L	FILTER SYSTEM
D	PROBABILITY DENSITY SYSTEM

Contrails

DECK NAME	ROUTINE NAME	ROUTINE FUNCTION	PAGE
TB425	INTG	TRANSFORM GENERATOR SYSTEM	22
FK282	ANFI	INVERSE TRANSFORM SYSTEM	26
FO285	LOAD	TRANSFORM LOAD OPTION	30
LA996	FILTER	FILTER SYSTEM CONTROL PROGRAM	35
LP197	DCFLT	FILTER SYSTEM DECODE PROGRAM	37
LP298	FLTERC	FILTER SYSTEM COMPUTATION ROUTINE	43
LP299	OPTSET	SET FILTER OPTIONS	49
DA000	PDSM	PROBABILITY DENSITY SYSTEM MONITOR	51
DQ101	PDSDCD	P. D. SYSTEM CARD DECODE ROUTINE	51
DQ102	PDSCPYP	COPY H. T. D. F. ONTO N. M. T. D. F.	56
DQ103	PDSGLN	CLEANUP CONTROL ARRAY	58
DQ204	PDSCMP	COMPUTATION CONTROL PROGRAM	58
DQ205	PDSCP1	COMPUTE 1ST ORDER P. D. FUNCTION	61
DQ206	PDSSTA	STATIONARITY TEST PROGRAM	62
DQ207	PDSNRM	NORMALITY TEST PROGRAM	64
DQ208	PDSCP2	2ND ORDER P. D. COMPUTATION PROGRAM	66
DQ209	PDSOT2	2ND ORDER P. D. OUTPUT ROUTINE	68
DQ310	PDSOTP	P. D. OUTPUT CONTROL PROGRAM	69
DQ311	PDSBTC	WRITE BINARY TIME DATA FILE	69
DQ312	PDSPAP	PRINT AND PLOT FIRST ORDER P. D. FUNCTIONS	70
AA893	AUXILU	AUXILIARY SYSTEM MONITOR	73
AA894	(MAP)		76
AA895	RNTRF		76
AA896	(MAP)		77

THE FOLLOWING DECKS CONTAIN THE MODIFICATIONS
SPECIFIED IN THIS SUPPLEMENT TO SYSTRAN WHICH
PERTAIN TO THE GENERATION OF AND LOADING OF
THE TIME TRANSLATION VALUE AND THE INITIALIZATION
OF THE STARTING TIME IN THE INVERSE TRANSFORM
SYSTEM

Contrails

\$ORIGIN	A,CK2,NOREW	000
\$IBFTC	TB425 M94,FULIST,REF,XR6	TB425000
	SUBROUTINE INTG	TB425001
C	TRANSFORM GENERATOR SYSTEM	TB425002
	LOGICAL SWITCH	TB425003
	LOGICALZERO,NZER	TB425004
	COMMON NFREQ,DT,FREQ(100),RA(82),ISWTC(10),DAY,DOY,YEAR	TB425005
	COMMON /MAINC/F(600,14),IB(2800),SUM(100,14,2),ID(20),IDO(4),	TB425006
	INDR(15),T,J,JJ,K,L,N,ARG,SINE,COSINE,	TB425007
	ISSINA(100),SSINB(100),SCOSA(100),SCOSB(100),DUMMY(352)	TB425008
	DIMENSION IC(14,200)	TB425009
	DIMENSION FIC(14,200),FNOR(14)	TB425010
	EQUIVALENCE(FIC,IB),(FNOR,FNOR)	TB425011
	DIMENSION ISRT(50,4)	TB425012
	EQUIVALENCE(IB,IC)	TB425013
	DIMENSION SUMTFT(14),SUMFT(14)	TB425014
	DIMENSION SUMAT(14)	TB425015
	EQUIVALENCE(IDO(3),R9UTSU)	TB425016
1	FORMAT (38H TIME VALUE OF FIRST MOMENT OF AREA = 1PE12.5,	TB425017
	*5X,5HTEST 16,5X,8HCHANNEL 12,5X,15HAREA OF F(T) = 1PE12.5)	TB425018
4	FORMAT (80A1)	TB425019
5	FORMAT (1H 8CA1)	TB425020
6	FORMAT (A6)	TB425021
7	FORMAT (I6)	TB425022
	DATA COMMA,SLASH,TEST,INTE/1H,,1H/,1HT,4HSAMP/	TB425023
	DATA CHK/1HC/	TB425024
	DATA PAUS/4HPAUS/	TB425025
	DATA ZRT,NOT/1HZ,1HN/	TB425026
	DO 400 J=1,50	TB425027
	ISRT(J,1)=0	TB425028
	ISRT(J,2)=1	TB425029
	ISRT(J,3)=1	TB425030
	ISRT(J,4)=1000000	TB425031
400	CONTINUE	TB425032
	CALL KLOSE (1,3)	TB425033
	REWIND 1	TB425034
	REWIND 2	TB425035
	CALL SWTHON (28)	TB425036
	CALL SWTHON (29)	TB425037
	I=0	TB425038
	IF(SWITCH(2,1,3)) GO TO 9	TB425039
	CALL SWTHOF(2)	TB425040
	GO TO 10	TB425041
9	CALL SWTHON (2)	TB425042
10	CALL CARD	TB425043
	CALL PACK (2,5,WO,RA)	TB425044
	IF(NZER(WO,INTE))GO TO 9C	TB425045
30	J=5	TB425046
31	J=J+1	TB425047
	IF(NZER(RA(J),COMMA)) GO TO 31	TB425048
	J=J+1	TB425049
	IF(ZERO(RA(J),COMMA)) GO TO 10	TB425050
	I=I+1	TB425051

Contrails

34	Q=RA(J)	TB425052
35	J=J+1	TB425053
	IF(NZER(RA(J),SLASH))GO TO 35	TB425054
	L1=J+1	TB425055
36	J=J+1	TB425056
	IF(NZER(RA(J),COMMA))GO TO 36	TB425057
	L2=J-1	TB425058
	CALL PACK (L1,L2,WO,RA)	TB425059
	CALL RITE31	TB425060
	WRITE (31,6) WO	TB425061
	CALL READ31	TB425062
	READ (31,7) IW	TB425063
	IF(ZERO(Q,TEST))GO TO 40	TB425064
	IF(ZERO(Q,ZRT)) GO TO 50	TB425065
	IF(ZERO(Q,NOT)) GO TO 55	TB425066
	ISRT(I,2)=IW	TB425067
	GO TO 41	TB425068
40	ISRT(I,1)=IW	TB425069
41	J=J+1	TB425070
	IF(ZERO(RA(J),COMMA)) GO TO 10	TB425071
	GO TO 34	TB425072
50	ISRT(I,3)=IW	TB425073
	GO TO 41	TB425074
55	ISRT(I,4)=IW	TB425075
	GO TO 41	TB425076
90	IF(SWITCH(3,1,2,3)) GO TO 110	TB425077
	WRITE (1) NFREQ,FREQ	TB425078
	CALL CLOCK (ITIME)	TB425079
100	DO 105 I=1,14	TB425080
	NOR(I)=0	TB425081
	SUMTFT(I)=0.	TB425082
	SUMFT(I)=0.	TB425083
	SUMAT(I)=0.	TB425084
	DO 105 J=1,100	TB425085
	SUM(J,I,1)=0.0	TB425086
	SUM(J,I,2)=0.0	TB425087
105	CONTINUE	TB425088
	ICOSw=1	TB425089
	T=0.0	TB425090
	TFSUSU=0.0	TB425091
	NOR(15)=0	TB425092
108	N=0	TB425093
	READ (2) ID	TB425094
	IF(ID(1)+ID(2)+ID(3))120,110,120	TB425095
110	DO 115 J=1,4	TB425096
115	IDO(J)=0	TB425097
	WRITE (1) IDO	TB425098
	END FILE 1	TB425099
	REWIND 1	TB425100
	REWIND 2	TB425101
	RETURN	TB425102
120	READ (2) IP	TB425103
	IF(NOR(15))121,121,130	TB425104
121	NOR(15)=10	TB425105
	DO 122 J=1,14	TB425106
	NOR(J)=IC(J,1)	TB425107
122	CONTINUE	TB425108
123	DO 126 L=1,50	TB425109

Contrails

	IF (ID(1)-ISRT(L,1))124,125,124	TB425110
124	IF (ISRT(L,1))127,127,126	TB425111
125	ISR=ISRT(L,2)	TB425112
	IMNM=ISRT(L,3)	TB425113
	INMN=ISRT(L,4)	TB425114
	DTU=ISR	TB425115
	DTU=DT*DTU	TB425116
	GO TO 128	TB425117
126	CONTINUE	TB425118
127	DTU=DT	TB425119
	IMNM=1	TB425120
	INMN=32000	TB425121
	ISR=1	TB425122
128	DO 129 L=1,NFREQ	TB425123
	SSINA(L)=0.0	TB425124
	SCOSA(L)=1.0	TB425125
	ARG=FREQ(L)*DTU	TB425126
	CALL SCOSN (ARG,SSINB(L),SCOSB(L))	TB425127
129	CONTINUE	TB425128
	CALL IDSET (ID(4),IMNM,INMN,IDO(3))	TB425129
500	IF (IMNM -200)510,510,505	TB425130
505	READ (2) ID	TB425131
	READ (2) IB	TB425132
	IMNM=IMNM-200	TB425133
	GO TO 500	TB425134
510	N=IMNM-1	TB425135
	MNM=600-N	TB425136
	AMNM=MNM	TB425137
	BT=AMNM*DT	TB425138
	JJ=N+1	TB425139
	N=-N	TB425140
	NNN=N	TB425141
	J=1	TB425142
	GO TO 131	TB425143
130	J=1	TB425144
	JJ=1	TB425145
131	N=N+ID(3)	TB425146
	NNN>NNN+ID(3)	TB425147
	IF (NNN-INMN)133,133,160	TB425148
132	N=N+(IAMN>NNN)	TB425149
	ICOSW=2	TB425150
133	DO 140 K=1,14	TB425151
	L=K+5	TB425152
	IF (ID(L))140,140,135	TB425153
135	IF (ID(20))136,137,136	TB425154
136	F(J,K)=FIC(K,JJ)-FNOR(K)	TB425155
	GO TO 140	TB425156
137	F(J,K)=IC(K,JJ)-NOR(K)	TB425157
140	CONTINUE	TB425158
	J=J+1	TB425159
	JJ=JJ+1	TB425160
	IF (J-N)133,133,145	TB425161
145	IF (ID(2))200,150,200	TB425162
150	IF (N-400)155,155,200	TB425163
155	READ (2) ID	TB425164
	READ (2) IB	TB425165
	JJ=1	TB425166
	IF (NNN-INMN)131,145,145	TB425167

Contrails

```
160 GO TO (132,165), ICOSW TB425168
165 IF (ID(2)) 300,170,300 TB425169
170 READ (2) ID TB425170
    READ (2) IB TB425171
    GO TO 165 TB425172
200 DO 230 K=1,N,ISR TB425173
201 DO 220 L=1,NFREQ TB425174
    DO 210 M=1,14 TB425175
    IF (ID(M+5)) 210,210,205 TB425176
205 SUM(L,M,1)=SUM(L,M,1)+F(K,M)*SCOSA(L) TB425177
    SUM(L,M,2)=SUM(L,M,2)+F(K,M)*SSINA(L) TB425178
    IF (L.NE.1) GO TO 210 TB425179
    SUMTFT(M)=SUMTFT(M)+ABS(F(K,M))*TFSUSU TB425180
    SUMFT(M)=SUMFT(M)+F(K,M) TB425181
    SUMAT(M)=SUMAT(M)+ABS(F(K,M)) TB425182
210 CONTINUE TB425183
    ARG=SCOSA(L) TB425184
    SCOSA(L)=SCOSA(L)*SCOSB(L)-SSINA(L)*SSINB(L) TB425185
    SSINA(L)=SSINA(L)*SCOSB(L)+ARG*SSINB(L) TB425186
220 CONTINUE TB425187
    TFSUSU=TFSUSU+DTU TB425188
230 CONTINUE TB425189
    T=T+BT TB425190
    BT=600.*DT TB425191
    DO 240 L=1,NFREQ TB425192
    ARG=FREQ(L)*T TB425193
    CALL SCOSN (ARG,SSINA(L),SCOSA(L)) TB425194
240 CONTINUE TB425195
    IF (ID(2)) 108,108,300 TB425196
300 IDO(1)=ID(1) TB425197
    IDO(3)=ID(4) TB425198
    IDO(4)=NFREQ TB425199
    DO 315 M=1,14 TB425200
    IF (ID(M+5)) 315,315,305 TB425201
305 DO 310 L=1,NFREQ TB425202
    SUM(L,M,1)=SUM(L,M,1)*DTU TB425203
    SUM(L,M,2)=-SUM(L,M,2)*DTU TB425204
310 CONTINUE TB425205
    RSUTSU=SUMTFT(M)/SUMAT(M) TB425206
    RSUTAR=SUMFT(M)*DTU TB425207
    IDO(2)=M TB425208
    WRITE (10,1) RSUTSU,IDO(1),IDO(2),RSUTAR TB425209
    WRITE (1) IDO TB425210
    WRITE (1) ((SUM(I,M,K),K=1,2),I=1,100) TB425211
315 CONTINUE TB425212
    IX=-1 TB425213
    WRITE (1) IX,IX,IX,IX TB425214
    CALL CLOCK (ITIME) TB425215
    TIME=ITIME TB425216
    TIME=TIME/60. TB425217
2 FORMAT (6H TEST 16,2X,19HINTEGRATION TIME = F7.2,6H SECS.) TB425218
    WRITE (6,2) IDO(1),TIME TB425219
    GO TO 100 TB425220
    END TB425221
```


Contrails

```
$ORIGIN          A,CK2,NOREW
$IBFTC FK282     M94,FULIST,REF,XR6
SUBROUTINE ANTI
C               INVERSE TRANSFORM SYSTEM
LOGICAL SWITCH,ZERO,NZER
COMMON NFREQ,BT,FREQ(100),RA(82),ISWTC(10),DAY,DON,YEAR
COMMON /NUCLC/F(100,20),FR(2000),T(4200),S(80),NH(40),NS,LL,KO
COMPLEX F,FR
C               LOGICAL 4 IS SAVE TAPE
C               FORMAT RECORD 1,4 WORDS, KTEST,NOMG,,0,1...
C               NOMG.LT.100 IMPLIES LAST OMEGA,F(W) SET...
C               RECORD 2,100 OMEGAS
C               RECORD 3, ID AGAIN..IGNORED
C               RECORD 4, 100 F(W)
C               RECORD 5, SAME AS RECORD 1
C               OUTPUT IS CK1,LOGICAL 10
DATA C/1HC/,COMMA/1H,/,PAUS/4HPAUS/,INFO/4HINFO/,DT/2HDT/,NT/2HNT/
DATA KNT,KDT/0,0/,BLANK,STAR/1H,1H*/
DATA STARTT/2HST/
DATA SLASH/1H//
DIMENSION G(2,2000),R(2,2000),ARRAY(100)
EQUIVALENCE (F,G),(FR,R)
1001 FORMAT (2A6)
      J=5
400   J=J+1
      IF(ZERO(RA(J),COMMA)) GO TO 405
      IF(NZER(RA(J),SLASH)) GO TO 400
405   L=J+1
410   J=J+1
      IF(NZER(RA(J),COMMA)) GO TO 410
      CALL PACK (L,J-1,WO,RA)
      CALL RITE31
      WRITE (31,1001) WO
      CALL READ31
      READ (31,1111) ICAS
1     CALL GARD
47    CALL PACK(2,5,WO,RA)
3     IF(ZERO(WO,INFO)) GO TO 5
4     RETURN
5     J=2
      TSTART=0.
      KNT=0
      KDT=0
      KST=0
6     J=J+1
      IF(NZER(RA(J),COMMA))GO TO 6
      J=J+1
12    N=J+1
      CALL PACK (J,N,WO,RA)
      IF(NZER(WO,DT)) GO TO 29
7     J=J+1
      IF(ZERO(RA(J),SLASH)) GO TO 16
      IF(J.LE.82) GO TO 7
```

```
000
FK282000
FK282001
FK282002
FK282003
FK282004
FK282005
FK282006
FK282007
FK282008
FK282009
FK282010
FK282011
FK282012
FK282013
FK282014
FK282015
FK282016
FK282017
FK282018
FK282019
FK282020
FK282021
FK282022
FK282023
FK282024
FK282025
FK282026
FK282027
FK282028
FK282029
FK282030
FK282031
FK282032
FK282033
FK282034
FK282035
FK282036
FK282037
FK282038
FK282039
FK282040
FK282041
FK282042
FK282043
FK282044
FK282045
FK282046
FK282047
FK282048
FK282049
FK282050
FK282051
```


Contrails

	GO TO 44	
16	L1=J+1	FK282052
17	J=J+1	FK282053
19	IF(NZER(RA(J),COMMA)) GO TO 17	FK282054
20	L2=J-1	FK282055
	IF(L2-L1-5)205,205,200	FK282056
200	LN=L1+5	FK282057
	CALL PACK (L1,L2,WO,RA)	FK282058
	L1=LN+1	FK282059
	GO TO 210	FK282060
205	WO=BLANK	FK282061
210	CALL PACK (L1,L2,WO,RA)	FK282062
	CALL RITE31	FK282063
	WRITE (31,1001) WO,WO	FK282064
	CALL READ31	FK282065
	READ (31,1004) DELT	FK282066
1004	FORMAT(E12.5)	FK282067
	KDT=1	FK282068
	IF((KNT.NE.0).AND.(KST.NE.0)). GO TO 43	FK282069
26	IF(NZER(RA(J+1),COMMA)) GO TO 2600	FK282070
	IF(KNT.NE.0) GO TO 43	FK282071
	GO TO 4400	FK282072
2600	CONTINUE	FK282073
	L1=J+1	FK282074
	L2=J+2	FK282075
27	CALL PACK(L1,L2,WO,RA)	FK282076
29	IF(NZER(WO,NT)) GO TO 44	FK282077
30	J=J+1	FK282078
	IF(ZERO(RA(J),SLASH))GO TO 33	FK282079
	IF(J.LE.81) GO TO 30	FK282080
	GO TO 44	FK282081
33	L1=J+1	FK282082
34	J=J+1	FK282083
	IF(ZERO(RA(J),COMMA)) GO TO 36	FK282084
	IF(J.LE.81) GO TO 34	FK282085
	GO TO 44	FK282086
36	L2=J-1	FK282087
	CALL PACK (L1,L2,WO,RA)	FK282088
	CALL RITE31	FK282089
	WRITE (31,1001) WO	FK282090
	CALL READ31	FK282091
	READ (31,1111) NTIME	FK282092
1111	FORMAT(I6)	FK282093
40	KNT=1	FK282094
41	IF((KDT.NE.0).AND.(KST.NE.0)). GO TO 43	FK282095
	J=J+1	FK282096
	IF(NZER(RA(J),COMMA)) GO TO 12	FK282097
	IF(KDT.NE.0) GO TO 43	FK282098
	GO TO 4400	FK282099
43	REWIND 4	FK282100
	IF(SWITCH(1,15)) GO TO 45	FK282101
	NOMG=0	FK282102
	J=1	FK282103
	KK=1	FK282104
53	KJ=KK+99	FK282105
54	READ (4) KTEST,IOMG,INSAV,D	FK282106
	READ(4) (FR(L),L=KK,KJ)	FK282107
	NOMG=NOMG+IOMG	FK282108
		FK282109

Contrails

```
DO 55 MNS=1,INSAV
READ (4) ICAST,D,D,KOUT
READ (4) (F(L,J),L=1,100)
IF(ICAST.NE.ICAS) GO TO 55
KK=KK+100
IF(KOUT.NE.0) GO TO 63
J=J+1
IF(J.GT.20) GO TO 63
55 CONTINUE
IF(KK-KJ)56,53,53
76 NOMG=NOMG-IOMG
GO TO 54
63 CONTINUE
67 IF(NTIME.GT.4200) NTIME=4200
68 DO 71 J=1,NTIME
71 T(LJ)=G(1,1)*R(1,1)
72 TT=TSTART/6.28318
TB=TSTART
CALL CLOCK(ITIME)
73 J=1
74 ARG=TT*R(1,1)
IF(ARG.GE.0.) GO TO 7400
IFXIT=ARG-1.
TQFX=IFXIT
ARG=ARG-TQFX
7400 CONTINUE
CALL SCOSN (ARG,SS,CC)
75 A=G(1,1)*CC-G(2,1)*SS
76 L=2
77 B=TT*R(1,L)
IF(B.GE.0.) GO TO 78
IFXIT=B-1.
TQFX=IFXIT
B=B-TQFX
78 CALL SCOSN (B,SS,CC)
B=G(1,L)*CC-G(2,L)*SS
T(J)=T(J)+(B+A)*(R(1,L)-R(1,L-1))/2.
A=B
L=L+1
IF(L.LE.NOMG) GO TO 77
T(J)=T(J)/3.14159
TB=TB+DELT
TT=TB/6.28318
J=J+1
IF(J.LE.NTIME) GO TO 74
85 TOP=-9.E30
BOT=9.E30
87 CALL CLOCK(ITIME)
TIME=ITIME
TIME=TIME/60.
WRITE (6,1005) TIME
1005 FORMAT(1H0,10X,18HINTEGRATION TIME =,F10.2,5H SEC.)
DO 93J=1,NTIME
IF(T(J).GT.TOP) TOP=T(J)
IF(T(J).LT.BOT) BOT=T(J)
93 CONTINUE
94 RAT=(TOP-BOT)/101.
WRITE(10,1006)KTEST,BOT, TOP,RAT
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FK282110
FK282111
FK282112
FK282113
FK282114
FK282115
FK282116
FK282117
FK282118
FK282119
FK282120
FK282121
FK282122
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FK282149
FK282150
FK282151
FK282152
FK282153
FK282154
FK282155
FK282156
FK282157
FK282158
FK282159
FK282160
FK282161
FK282162
FK282163
FK282164
FK282165
FK282166
FK282167

Contrails

1006	FORMAT(1H1,50X,12HTEST NUMBER ,I6//10X,8HMINIMUM ,1PE12.5,10X, 18HMAXIMUM ,1PE12.5,10X,11HRESOLUTION ,1PE12.5//4X,4HTIME,9X, 24HF(T)//1H ,131(1H.))	FK282168
1007	FORMAT(1H ,0PF12.4,1X,1PE12.5,2H..,100A1,2H..)	FK282169
96	DO 100 J=1,NTIME	FK282170
	AJ=J	FK282171
	TT=(AJ*DELT)-DELT+TSTART	FK282172
	DO 97 L=1,100	FK282173
97	ARRAY(L)=BLANK	FK282174
	L=(T(J)-BOT)/RAT	FK282175
	IF(L.LT.1)L=1	FK282176
	IF(L.GT.100)L=100	FK282177
	ARRAY(L)=STAR	FK282178
100	WRITE(10,1007)TT,T(J),(ARRAY(N),N=1,100)	FK282179
	WRITE(10,1008)	FK282180
	REWIND 4	FK282181
	GO TO 45	FK282182
44	IF(ZERO(WO,STARTT)) GO TO 300	FK282183
4400	CALL WR0UT (1,212)	FK282184
45	CALL CARD	FK282185
	GO TO 47	FK282186
1008	FORMAT(1H ,131(1H.))	FK282187
300	J=J+1	FK282188
	IF(NZER(RA(J),SLASH)) GO TO 300	FK282189
	L1=J+1	FK282190
305	J=J+1	FK282191
	IF(NZER(RA(J),COMMA)) GO TO 305	FK282192
	L2=J-1	FK282193
	W00=BLANK	FK282194
	IF((L2-L1).LT.6) GO TO 310	FK282195
	L3=L1+6	FK282196
	CALL PACK (L3,L2,W00,RA)	FK282197
	L2=L3-1	FK282198
310	CALL PACK (L1,L2,W0,RA)	FK282199
	CALL RITE31	FK282200
	WRITE (31,1001) W0,W00	FK282201
	CALL READ31	FK282202
	READ (31,1004) TSTART	FK282203
	KST=1	FK282204
	IF((KNT.NE.0).AND.(KDT.NE.0)) GO TO 43	FK282205
	J=J+1	FK282206
	IF(ZERO(RA(J),COMMA)) GO TO 4400	FK282207
	GO TO 12	FK282208
	END	FK282209
		FK282210
		FK282211

Contrails

\$ORIGIN	K,CK2,NOREW	000
\$IBFTC	F0285 M94,FULIST,REF,XR6	F0285000
	SUBROUTINE LOAD (ILOAD,IJKLM)	F0285001
C	TRANSFORM LOAD OPTION	F0285002
	LOGICAL SWITCH	F0285003
	COMPLEX F	F0285004
	LOGICAL ZERO,NZER,LIST,KIKOFF	F0285005
	COMMON NFREQ,DT,FREQ(100),RA(82),ISWTCH(10),DAY,DON,YEAR	F0285006
	COMMON/PPCB/IPPCB(41,5),BOT(41),TOP(41)	F0285007
	COMMON /NUCLC/F(100,61),S(80),NT(40),NS,LIST,KIKOFF	F0285008
	DIMENSION FBU(2,100),DEF(40,4),IDEF(40,4),IDCI(4),G(2,100,61)	F0285009
	EQUIVALENCE (IDEF,DEF)	F0285010
	EQUIVALENCE (G,F)	F0285011
	DIMENSION IMOKEY(40)	F0285012
	EQUIVALENCE (IDCI(3),RSLTSU)	F0285013
	DATA SLASH,TEST,COMMA,DEFI,CHK,TH,TL,TF/1H/,4HTEST,1H,,	F0285014
	14HDEFI,1HC,1HH,1HL,1HF/	F0285015
	DATA BLANK /1H /	F0285016
1	FORMAT (80A1)	F0285017
2	FORMAT (1H ,80A1)	F0285018
3	FORMAT (A6)	F0285019
4	FORMAT (I6)	F0285020
7	FORMAT (4A6)	F0285021
8	FORMAT (2E12.0)	F0285022
	NRWS=9	F0285023
	CALL SWTHOF (13)	F0285024
	DO 100 I=1,40	F0285025
100	NT(I)=0	F0285026
200	IF(ISWTCH(1)-9)201,204,201	F0285027
201	IF(SWTH(1,2)) GO TO 2030	F0285028
	REWIND 1	F0285029
	CALL SWTHON (28)	F0285030
	READ (1)I,(FBU(1,J),J=1,100)	F0285031
	DO 203 J=1,NFREQ	F0285032
	IF(ABS(FREQ(J)-FBU(1,J))-FREQ(J)*1.E-6)203,203,202	F0285033
202	CALL WROUT (21,215)	F0285034
	CALL SWTHON (13)	F0285035
203	CONTINUE	F0285036
2030	LAST=0	F0285037
	NRWS=9	F0285038
	ISWTCH(1)=9	F0285039
	ISWTCH(4)=LAST	F0285040
	ISWTCH(5)=NRWS	F0285041
204	DO 205 I=1,40	F0285042
	IMOKEY(I)=0	F0285043
	DO 205 J=1,4	F0285044
	IDEF(I,J)=0	F0285045
205	CONTINUE	F0285046
	LAST=ISWTCH(4)	F0285047
	NRWS=ISWTCH(5)	F0285048
	I=1	F0285049
	J=6	F0285050
206	IF(ZERO(RA(J),SLASH)) GO TO 210	F0285051

Contrails

	J=J+1	F0285052
	IF(J-80)206,206,207	F0285053
207	CALL WR0UT (12,216)	F0285054
	CALL SWTHON (13)	F0285055
208	CALL CARD	F0285056
	CALL PACK (2,5,WO,RA)	F0285057
	IF(ZERO(WO,DEF1)) GO TO 216	F0285058
	GO TO 1000	F0285059
210	L1=J-4	F0285060
	L2=J-1	F0285061
	CALL PACK (L1,L2,WO,RA)	F0285062
	IF(ZERO(WO,TEST)) GO TO 211	F0285063
	CALL WR0UT (11,217)	F0285064
	CALL SWTHON (13)	F0285065
	GO TO 208	F0285066
211	L1=J+1	F0285067
212	J=J+1	F0285068
	IF(NZER(RA(J),COMMA))GO TO 212	F0285069
	L2=J-1	F0285070
	IF(L2-L1)207,213,213	F0285071
213	CALL PACK (L1,L2,WO,RA)	F0285072
	CALL RITE31	F0285073
	WRITE (31,3)WO	F0285074
	CALL READ31	F0285075
	READ (31,4)ITEST	F0285076
215	CALL CARD	F0285077
216	CALL PACK (2,5,WO,RA)	F0285078
	IF(NZER(WO,DEF1)) GO TO 235	F0285079
	J=6	F0285080
217	IF(ZERO(RA(J),SLASH))GO TO 219	F0285081
218	J=J+1	F0285082
	IF(J-80)217,217,215	F0285083
219	KK=0	F0285084
	IF(ZERO(RA(J-1),TH)) GO TO 222	F0285085
	IF(ZERO(RA(J-1),TL)) GO TO 220	F0285086
	IF(ZERO(RA(J-1),TF)) GO TO 221	F0285087
	CALL WR0UT (11,218)	F0285088
	CALL SWTHON (13)	F0285089
	GO TO 208	F0285090
220	KK=KK+1	F0285091
221	KK=KK+1	F0285092
222	KK=KK+1	F0285093
	IMOK=0	F0285094
	L1=J+1	F0285095
223	J=J+1	F0285096
	IF(NZER(RA(J),SLASH)) GO TO 300	F0285097
	IMOK=1	F0285098
	GO TO 301	F0285099
300	IF(NZER(RA(J),COMMA))GO TO 223	F0285100
301	L2=J-1	F0285101
	IF(L2-L1)207,225,224	F0285102
224	IF(L2-L1-6)225,226,226	F0285103
225	CALL PACK (L1,L2,WO,RA)	F0285104
	WOO=BLANK	F0285105
	GO TO 227	F0285106
226	L2=L1+5	F0285107
	CALL PACK (L1,L2,WO,RA)	F0285108
	L1=L2+1	F0285109

Contrails

	L2=J-1	F0285110
	CALL PACK (L1,L2,W00,RA)	F0285111
227	CALL RITE31	F0285112
	WRITE (31,7) W0,W00	F0285113
	CALL READ31	F0285114
	GO TO (228,228,229),KK	F0285115
228	READ (31,4) IDEF(I,KK)	F0285116
	IF(IMOK.NE.0) GO TO 310	F0285117
	GO TO 230	F0285118
229	READ (31,8) DEF(I,3)	F0285119
230	IF(IDEF(I,1))231,234,231	F0285120
231	IF(IDEF(I,2))232,234,232	F0285121
232	IF(DEF(I,3))233,234,233	F0285122
233	IDEF(I,4)=1	F0285123
	I=I+1	F0285124
234	J=J+1	F0285125
	IF(ZERO(RA(J),COMMA)) GO TO 215	F0285126
	GO TO 218	F0285127
235	I=I-1	F0285128
	IF(IDEF(I,4))240,236,240	F0285129
236	CALL WR0UT (12,219)	F0285130
	GO TO 1000	F0285131
240	IF(SWITCH(2,2,13)) GO TO 1000	F0285132
	IF(LAST)243,243,241	F0285133
241	IF(ITEST-LAST)242,242,243	F0285134
242	IF(NRWS.EQ.0) GO TO 248	F0285135
	NRWS=0	F0285136
	REWIND 1	F0285137
	READ (1)(FBU(1,J),J=1,100)	F0285138
243	READ (1) IDCI	F0285139
	IF(IDCI(1))242,242,244	F0285140
244	READ (1) FB0	F0285141
	IF(IDCI(1)-ITEST)245,250,245	F0285142
245	READ (1) IDCI	F0285143
	IF(IDCI(1))243,247,246	F0285144
246	READ (1) FB0	F0285145
	GO TO 245	F0285146
247	IF (NRWS)242,248,242	F0285147
248	CALL WR0UT (15,220)	F0285148
	GO TO 1000	F0285149
250	K=IDCI(2)	F0285150
	DO 252 I=1,40	F0285151
	IF(K-IDEF(I,1))252,251,252	F0285152
251	IDEF(I,4)=0	F0285153
	CAL=DEF(I,3)	F0285154
	L=IDEF(I,2)	F0285155
	GO TO 260	F0285156
252	CONTINUE	F0285157
253	READ (1) IDCI	F0285158
	IF(IDCI(1))280,280,254	F0285159
254	READ (1) FB0	F0285160
	GO TO 250	F0285161
260	DO 265 I=1,NFREQ	F0285162
	G(1,I,L)=FBU(1,I)*CAL	F0285163
	G(2,I,L)=FBU(2,I)*CAL	F0285164
265	CONTINUE	F0285165
	IF(IMOKEY(I).EQ.0) GO TO 253	F0285166
	IMOK=IMOKEY(I)	F0285167

Contrails

	G(2, IMOK, 61)=RSUTSU	F0285168
	GO TO 253	F0285169
280	DO 285 I=1,40	F0285170
	IF(IDEF(I,4))281,285,281	F0285171
281	CALL WROUT (13,221)	F0285172
	GO TO 1000	F0285173
285	CONTINUE	F0285174
	ILOAD=0	F0285175
	IJKLM=ITEST	F0285176
290	ISWTCH(5)=NRWS	F0285177
	!SWTCH(4)=LAST	F0285178
	RETURN	F0285179
1000	ILOAD=1	F0285180
	CALL SWTHON (13)	F0285181
	GO TO 290	F0285182
310	L1=J+1	F0285183
315	J=J+1	F0285184
	IF(NZER(RA(J),COMMA)) GO TO 315	F0285185
	L2=J-1	F0285186
	CALL PACK (L1,L2,W0,RA)	F0285187
	CALL RITE31	F0285188
	WRITE (31,7) W0	F0285189
	CALL READ31	F0285190
	READ (31,4) IMOKEY(I)	F0285191
	GO TO 230	F0285192
	END	F0285193

Contrails

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Contrails

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$ORIGIN          O,CK2,NOREW                                000
$IBFTC LA996     M94/2,XR6,LIST                            LA996000
  SUBROUTINE FILTER                                       LA996001
C      FILTER SYSTEM CONTROL PROGRAM                       LA996002
  LOGICAL ZERO,NZER,SWITCH                                LA996003
  COMMON NFREQ,DT,FREQ(100),RA(82),ISWTC(10),DAY,DON,YEAR,IDPT LA996004
  COMMON/FILTEC/IFILT(9,14,20),IOPT(6,5),IOP(5,152),      LA996005
  1INBUF(14,200,3),IOBUF(14,200),IDIN(20),IDOUT(20),INOTST,INDOPT LA996006
  DIMENSION FILT(9,14,20),OPT(6,5),OP(5,152),BUF(14,200,3), LA996007
  IOBUF(14,200),IZS(1)                                    LA996008
  EQUIVALENCE (IFILT,FILT),(IOPT,OPT),(IOP,OP),(INBUF,BUF), LA996009
  1(IOBUF,OBUF),(IZS(1),IFILT(1,1,1))                    LA996010
  DATA COPY,FILX,OPT1,STAR/4HCOPY,4HFILT,4HOPT1,3HEND/,  LA996011
  1RESET/4HRESE/,BOTH/4HBOTH/,BEGIN/4HBEGI/,COMMA/1H,/,JJB/3HJOB/ LA996012
  REWIND 12                                               LA996013
  DO 80 J=1,14505                                         LA996014
  IZS(J)=0                                                LA996015
80  CONTINUE                                              LA996016
  INOTST=0                                                LA996017
  INDOPT=0                                                LA996018
90  IFLTST=0                                              LA996019
  IOPTST=0                                                LA996020
100 CALL CARD                                             LA996021
105 CALL PACK (2,5,WO,RA)                                  LA996022
  IF(NZER(WO,FILX)) GO TO 110                             LA996023
  CALL DCFLT (1)                                           LA996024
  IFLTST=1                                                 LA996025
  IF(IOPTST.NE.0) GO TO 200                               LA996026
  GO TO 105                                                LA996027
110 IF(NZER(WO,OPT1)) GO TO 115                           LA996028
  CALL DCFLT (2)                                           LA996029
  IOPTST=1                                                 LA996030
  IF(IFLTST.NE.0) GO TO 200                               LA996031
  GO TO 105                                                LA996032
115 IF(NZER(WO,RESET)) GO TO 135                          LA996033
  J=5                                                       LA996034
120 J=J+1                                                 LA996035
  IF(NZER(RA(J),COMMA)) GO TO 120                          LA996036
  CALL PACK (J+1,J+4,WO,RA)                                LA996037
  IF(ZERO(WO,BOTH)) GO TO 130                              LA996038
  IF(NZER(WO,FILX)) GO TO 125                             LA996039
  IFLTST=0                                                 LA996040
  INOTST=0                                                LA996041
121 DO 122 IJ=1,14                                        LA996042
  DO 122 IK=1,20                                           LA996043
  DO 122 IM=1,9                                            LA996044
  IFILT(IM,IJ,IK)=0                                       LA996045
122 CONTINUE                                              LA996046
  GO TO 100                                                LA996047
125 IOPTST=0                                              LA996048
  INDOPT=0                                                LA996049
  DO 127 IJ=1,5                                           LA996050
  IOPT(4,IJ)=0                                             LA996051
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Contrails

127	CONTINUE	LA996052
	GO TO 100	LA996053
130	IFLTST=0	LA996054
	IOPTST=0	LA996055
	INOTST=0	LA996056
	INDOPT=0	LA996057
	DO 131 IJ=1,5	LA996058
	IOPT(4, JJ)=0	LA996059
131	CONTINUE	LA996060
	GO TO 121	LA996061
135	IF(NZER(WO,COPY)) GO TO 150	LA996062
	IF(SWITCH(1,3)) GO TO 155	LA996063
	REWIND 2	LA996064
	REWIND 12	LA996065
140	READ (2) IDOUT	LA996066
	IF(IDOUT(1).EQ.0) GO TO 145	LA996067
	READ (2) IOBUF	LA996068
	WRITE (12) IDOUT	LA996069
	WRITE (12) IOBUF	LA996070
	GO TO 140	LA996071
145	WRITE (12) IDOUT	LA996072
	ENDFILE 12	LA996073
	REWIND 12	LA996074
	REWIND 2	LA996075
	CALL SWTHON (29)	LA996076
	CALL SWTHON (33)	LA996077
	GO TO 100	LA996078
150	IF(ZERO(WO,BEGIN)) GO TO 160	LA996079
	CALL PACK (2,4,WO,RA)	LA996080
	IF(ZERO(WO, JJB)) GO TO 205	LA996081
	IF(ZERO(WO,STAR)) GO TO 205	LA996082
	CALL WROUT (2,700)	LA996083
155	CALL SWTHON (4)	LA996084
	CALL SWTHON (3)	LA996085
	RETURN	LA996086
160	CALL PACK (7,10,WO,RA)	LA996087
	IF(NZER(WO,FILX)) GO TO 205	LA996088
	GO TO 90	LA996089
200	IF(SWITCH(1,4)) GO TO 105	LA996090
	CALL FLTERC	LA996091
	GO TO 105	LA996092
205	DO 210 J=1,19	LA996093
210	IDOUT(J)=0	LA996094
	IF(SWITCH(1,4)) GO TO 155	LA996095
	WRITE (2) IDOUT	LA996096
	ENDFILE 2	LA996097
	REWIND 2	LA996098
	RETURN	LA996099
	END	LA996100

Contrails

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$ORIGIN P,CK2,NOREW
$IBFTC LP197 M94/2,XR7,LIST
SUBROUTINE DCFLT (IQI)
C FILTER SYSTEM DECODE PROGRAM
LOGICAL ZERO,NZER,SWITCH
COMMON NFREQ,DT,FREQ(100),RA(82),ISWTCH(10),DAY,DOM,YEAR,IOPT
COMMON/FILTEC/IFILT(9,14,20),IOPT(6,5),IOP(5,152),
1INBUF(14,200,3),IOBUF(14,200),IDIN(20),IDOUT(20),INOTST,INOOPT
DIMENSION FILT(9,14,20),OPT(6,5),OP(5,152),BUF(14,200,3),
1OBUF(14,200),WO(14),WOO(14),ITOF(5),ITST(6)
EQUIVALENCE (IFILT,FILT),(IOPT,OPT),(IOP,OP),(INBUF,BUF),
1(OBUF,OBUF)
DATA FILTX,TEST,CHIN,CHOUT,OPTI,OUTP,CAL,NUMB,WIDT,
1FREQX,VALUE,CC,QI,COMMA,SLASH,RPRN,LPRN/3FIL,3HTES,
23HCHI,3HCHO,3HOPT,3HOUT,3HCAL,3HNUM,3HWID,3HFRE,3HVAL,1HC,
31HI,1H,,1H/,1H),1H(/,STAR/1H*/,BLANK/1H /
1 FORMAT (14A6)
2 FORMAT (14I6)
3 FORMAT (7E12.0)
4 FORMAT (47H ***** THE CHIN, CHOUT, OPTION, OUTPUT AND CAL,
129H FIELDS DO NOT AGREE IN THEIR,
221H ARGUMENT COUNT *****)
5 FORMAT (44H ***** THE ABOVE CARD SPECIFIES MORE THAN 14,
115H CHANNELS *****)
6 FORMAT (43H ***** THE ABOVE CARD SPECIFIES MORE THAN 5,
128H UNIQUE FILTER OPTIONS *****)
GO TO (100,400),IQI
C100* *FILTER DECODE SECTION
100 J=5
DO 101 L=1,4
101 ITST(L)=0
KK=INOTST
105 J=J+1
IF(NZER(RA(J),COMMA)) GO TO 105
110 J=J+1
IF(NZER(RA(J),COMMA)) GO TO 140
CALL CARD
J=1
IF(NZER(RA(J),STAR)) GO TO 140
112 CALL PACK (2,4,00,RA)
IF(ZERO(00,FILTX)) GO TO 105
INOTST=KK
ITOF(1)=IFILT(8,1,1)
K=1
IF(ITOF(1).EQ.0) K=0
DO 135 JJ=1,KK
DO 130 L=1,14
ITOFX=1
DO 115 M=1,K
IF((IFILT(8,L,JJ).EQ.ITOF(M)).OR.(IFILT(8,L,JJ).EQ.0)) GO TO 113
GO TO 115
113 ITOFX=0
115 CONTINUE
IF(ITOFX.EQ.0) GO TO 130
120 K=K+1
IF(K.GT.5) GO TO 125
ITOF(K)=IFILT(8,L,JJ)
GO TO 130
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LP197000
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LP197049
LP197050
LP197051
LP197052
LP197053
LP197054
LP197055
LP197056
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Contrails

125	WRITE (6,6)	LP197057
	CALL SWTHON (4)	LP197058
	RETURN	LP197059
130	CONTINUE	LP197060
135	CONTINUE	LP197061
	RETURN	LP197062
140	CALL PACK (J,J+2,00,RA)	LP197063
	IF(ZERO(00,TEST)) GO TO 150	LP197064
	IF(ZERO(00,CAL)) GO TO 200	LP197065
	KK=2	LP197066
	IF(ZERO(00,CHIN)) GO TO 300	LP197067
	KK=3	LP197068
	IF(ZERO(00,CHOUT)) GO TO 300	LP197069
	KK=8	LP197070
	IF(ZERO(00,OPTI)) GO TO 300	LP197071
	KK=5	LP197072
	IF(ZERO(00,OUTP)) GO TO 300	LP197073
143	CALL WROUT (2,701)	LP197074
144	CALL SWTHON (4)	LP197075
145	CALL CARD	LP197076
	J=1	LP197077
	IF(NZER(RA(1),STAR)) GO TO 145	LP197078
	GO TO 112	LP197079
C150*	*DECODE TEST FIELD	LP197080
150	IF(((ITST(1).EQ.0).OR.(((ITST(2).NE.0).AND.(ITST(3).NE.0)).AND.(ITSLP197081	
	IT(4).NE.0))) GO TO 155	LP197082
	IF(((ITST(2).NE.0).OR.(ITST(3).NE.0)).OR.(ITST(4).NE.0)) GO TO 143LP197083	
	DO 152 L=1,14	LP197084
	IFILT(2,L,KK)=L	LP197085
	IFILT(3,L,KK)=L	LP197086
	FILT(4,L,KK)=1.	LP197087
	IFILT(5,L,KK)=0	LP197088
	IFILT(8,L,KK)=0	LP197089
152	CONTINUE	LP197090
	GO TO 159	LP197091
155	DO 158 L=3,6	LP197092
	IF(ITST(L).LT.0) GO TO 158	LP197093
	IF(ITST(L).EQ.ITST(2)) GO TO 158	LP197094
	WRITE (6,4)	LP197095
	GO TO 144	LP197096
158	CONTINUE	LP197097
159	KK=KK+1	LP197098
	IF(KK.LE.20) GO TO 160	LP197099
	WRITE (6,7)	LP197100
	GO TO 144	LP197101
7	FORMAT (46H ***** MORE THAN 20 TESTS ARE CALLED FOR *****)	LP197102
160	J=J+1	LP197103
	IF(NZER(RA(J),LPRN)) GO TO 160	LP197104
	LL=0	LP197105
	L=J+1	LP197106
165	J=J+1	LP197107
	IF(ZERO(RA(J),RPRN)) GO TO 170	LP197108
	IF(NZER(RA(J),COMMA)) GO TO 165	LP197109
	M=J-1	LP197110
	LL=1	LP197111
	GO TO 165	LP197112
170	IF(LL.NE.0) GO TO 175	LP197113
	CALL PACK (L,J-1,WO(1),RA)	LP197114

Contrails

	WO(2)=WO(1)	LP197115
	GO TO 180	LP197116
175	CALL PACK (L,M,WO(1),RA)	LP197117
	M=M+2	LP197118
	CALL PACK (M,J-1,WO(2),RA)	LP197119
180	CALL RITE31	LP197120
	WRITE (31,1) WO(1),WO(2)	LP197121
	CALL READ31	LP197122
	READ (31,2) IFILT(1,1,KK),IFILT(9,1,KK)	LP197123
	DO 185 J=1,14	LP197124
	IFILT(1,J,KK)=IFILT(1,1,KK)	LP197125
	IFILT(9,J,KK)=IFILT(9,1,KK)	LP197126
	FILT(4,J,KK)=1.	LP197127
185	IFILT(5,J,KK)=0	LP197128
	ITST(1)=1	LP197129
	ITST(2)=0	LP197130
	ITST(3)=0	LP197131
	ITST(4)=0	LP197132
	ITST(5)=-1	LP197133
	ITST(6)=-1	LP197134
	GO TO 105	LP197135
C200*	*DECODE CAL FIELD	LP197136
200	J=J+1	LP197137
	IF(NZER(RA(J),LPRN)) GO TO 200	LP197138
	L=J+1	LP197139
	IS=1	LP197140
	N=1	LP197141
205	J=J+1	LP197142
	IF(ZERO(RA(J),RPRN)) GO TO 220	LP197143
	IF(NZER(RA(J),COMMA)) GO TO 205	LP197144
207	WOO(N)=BLANK	LP197145
	IF((J-L).GT.6) GO TO 215	LP197146
	MM=J-1	LP197147
210	CALL PACK (L,MM,WO(N),RA)	LP197148
	N=N+1	LP197149
	IF((N.GT.14).AND.(IS.EQ.1)) GO TO 230	LP197150
	L=J+1	LP197151
	GO TO (205,225),IS	LP197152
215	K=L+6	LP197153
	MM=L-1	LP197154
	CALL PACK (K,J-1,WOO(N),RA)	LP197155
	GO TO 210	LP197156
220	IS=2	LP197157
	GO TO 207	LP197158
225	N=N-1	LP197159
	ITST(5)=N	LP197160
	CALL RITE31	LP197161
	WRITE (31,1) (WO(I),WOO(I),I=1,N)	LP197162
	CALL READ31	LP197163
	READ (31,3) (FILT(4,I,KK),I=1,N)	LP197164
	GO TO 105	LP197165
230	WRITE (6,4)	LP197166
	GO TO 144	LP197167
C300*	*DECODE CHIN, CHOUT, OUTPUT, AND OPTION FIELDS	LP197168
300	J=J+1	LP197169
	IF(NZER(RA(J),LPRN)) GO TO 300	LP197170
	IS=1	LP197171
	N=1	LP197172

Contrails

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305 L=J+1
310 J=J+1
    IF(ZERO(RA(J),RPRN)) GO TO 315
    IF(NZER(RA(J),COMMA)) GO TO 310
313 CALL PACK (L,J-1,WO(N),RA)
    N=N+1
    IF((N.GT.14).AND.(IS.EQ.1)) GO TO 335
    GO TO (305,320),IS
315 IS=2
    GO TO 313
320 N=N-1
    CALL RITE31
    WRITE (31,1) (WO(I),I=1,N)
    CALL READ31
    READ (31,2) (IFILT(KL,I,KK),I=1,N)
    IF(KL.EQ.2) ITST(2)=N
    IF(KL.EQ.3) ITST(3)=N
    IF(KL.EQ.5) ITST(6)=N
    IF(KL.EQ.8) ITST(4)=N
    IF((KL.LT.2).OR.(KL.GT.3)) GO TO 105
    DO 325 L=1,N
    IF(IFILT(KL,L,KK).GT.14) GO TO 335
325 CONTINUE
    GO TO 105
335 IF((KL.LT.2).OR.(KL.GT.3)) GO TO 230
    WRITE (6,5)
    GO TO 144
C400* * DECODE *OPTION CONTROL CARD
400 J=5
    KK=INCOPT
405 J=J+1
    IF(NZER(RA(J),COMMA)) GO TO 405
410 J=J+1
    IF(NZER(RA(J),COMMA)) GO TO 415
    CALL CARD
    J=1
    IF(NZER(RA(1),STAR)) GO TO 415
412 CALL PACK (2,4,OO,RA)
    IF(ZERO(OO,OPTI)) GO TO 405
    INCOPT=KK
    RETURN
415 CALL PACK (J,J+2,OO,RA)
    II=1
    IF(ZERO(OO,NUMB)) GO TO 430
    IF(ZERO(OO,WIDT)) GO TO 431
    IF(ZERO(OO,FREQX)) GO TO 525
    IF(ZERO(OO,VALUE)) GO TO 500
    CALL WROUT (2,702)
420 CALL SWTHON (4)
425 CALL CARD
    J=1
    IF(NZER(RA(1),STAR)) GO TO 425
    GO TO 412
430 II=II+1
431 II=II+1
432 J=J+1
    IF(NZER(RA(J),SLASH)) GO TO 432
    L=J+1
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LP197230
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Contrails

435	J=J+1	LP197231
	IF(NZER(RA(J),COMMA)) GO TO 435	LP197232
	WOO(1)=BLANK	LP197233
	IF((J-L).GT.6) GO TO 445	LP197234
	MM=J-1	LP197235
440	CALL PACK (L,MM,WOO(1),RA)	LP197236
	CALL RITE31	LP197237
	WRITE (31,1) WOO(1),WCO(1)	LP197238
	GO TO 450	LP197239
445	MM=L+6	LP197240
	CALL PACK (MM,J-1,WOO(1),RA)	LP197241
	MM=MM-1	LP197242
	GO TO 440	LP197243
450	CALL READ31	LP197244
	GO TO (460,470-480).II	LP197245
460	READ (31,3) OPI(3,KK)	LP197246
	GO TO 410	LP197247
470	READ (31,2) IOPT(2,KK)	LP197248
	IOPT(5,KK)=(IOPT(2,KK)/2)+1	LP197249
	IF(IOPT(2,KK).GT.151) GO TO 565	LP197250
	GO TO 410	LP197251
480	KK=KK+1	LP197252
	IF(KK.LE.5) GO TO 485	LP197253
	WRITE (6,6)	LP197254
	GO TO 420	LP197255
485	READ (31,2) IOPT(1,KK)	LP197256
	GO TO 410	LP197257
C500*	* DECODE VALUES FIELD	LP197258
500	J=J+1	LP197259
	IJ=4	LP197260
	IF(NZER(RA(J),SLASH)) GO TO 500	LP197261
	J=J+1	LP197262
	IF(ZERO(RA(J),CC)) GO TO 510	LP197263
	IF(ZERO(RA(J),OI)) GO TO 520	LP197264
	CALL WR0UT (2,703)	LP197265
	GO TO 420	LP197266
510	J=J+1	LP197267
	IF(NZER(RA(J),LPRN)) GO TO 510	LP197268
	L=J+1	LP197269
515	J=J+1	LP197270
	IF(NZER(RA(J),RPRN)) GO TO 515	LP197271
	CALL PACK (L,J-1,WOO(1),RA)	LP197272
	CALL RITE31	LP197273
	WRITE (31,1) WOO(1)	LP197274
	CALL READ31	LP197275
	READ (31,2) IOPT(4,KK)	LP197276
	IOPT(4,KK)=-IOPT(4,KK)	LP197277
	GO TO 405	LP197278
520	J=J+1	LP197279
	IF(NZER(RA(J),SLASH)) GO TO 520	LP197280
	IOPI(KK,1)=IOPT(1,KK)	LP197281
	L=J+1	LP197282
525	J=J+1	LP197283
	IF(NZER(RA(J),LPRN)) GO TO 525	LP197284
	IF(II.EQ.1) GO TO 528	LP197285
	CALL PACK (L,J-1,OO,RA)	LP197286
	CALL RITE31	LP197287
	WRITE (31,1) OO	LP197288

Contrails

	CALL READ31	LP197289
	READ (31,2) IOPT(5, KK)	LP197290
528	N=1	LP197291
	M=0	LP197292
	IS=1	LP197293
530	L=J+1	LP197294
535	J=J+1	LP197295
	IF(ZERO(RA(J), RPRN)) GO TO 550	LP197296
	IF(NZER(RA(J), COMMA)) GO TO 535	LP197297
532	WOO(N)=BLANK	LP197298
	IF((J-L).GT.6) GO TO 545	LP197299
	MM=J-1	LP197300
540	CALL PACK (L, MM, WOO(N), RA)	LP197301
	GO TO 555	LP197302
545	MM=L+6	LP197303
	CALL PACK (MM, J-1, WOO(N), RA)	LP197304
	MM=MM-1	LP197305
	GO TO 540	LP197306
550	IS=3	LP197307
	GO TO 532	LP197308
555	IF(((N+M).EQ.IOPT(2, KK)).OR.(((I.EQ.1).AND.(N.EQ.2)))) GO TO 600	LP197309
	IF(IS.EQ.3) GO TO 565	LP197310
560	IF(N.EQ.14) GO TO 575	LP197311
	N=N+1	LP197312
561	IF(NZER(RA(J+1), COMMA)) GO TO 530	LP197313
	CALL CARD	LP197314
	J=0	LP197315
	IF(NZER(RA(1), STAR)) GO TO 530	LP197316
565	WRITE (6,8) IOPT(1, KK)	LP197317
	GO TO 420	LP197318
575	IS=2	LP197319
577	CALL RITE31	LP197320
	WRITE (31,1) (WOO(I), WOO(I), I=1, N)	LP197321
	CALL READ31	LP197322
	IF(I.EQ.1) GO TO 590	LP197323
	KJ=M+2	LP197324
	KKJ=M+1+N	LP197325
	READ (31,3) (OP(KK, I), I=KJ, KKJ)	LP197326
	GO TO (530, 580, 405), IS	LP197327
580	M=M+N	LP197328
	N=1	LP197329
	IS=1	LP197330
	GO TO 561	LP197331
590	READ (31,3) OPT(3, KK), OPT(6, KK)	LP197332
	GO TO 405	LP197333
600	IF(IS.NE.3) GO TO 565	LP197334
	GO TO 577	LP197335
8	FORMAT (21H ***** OPTION NUMBER I6,15H IS INCORRECTLY, 114H DEFINED *****)	LP197336
	END	LP197337
		LP197338

Contrails

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$ORIGIN      P,CK2,NOREW
$IBFTC LP298  M94/2,XR6,LIST
SUBROUTINE FLTRC
C          FILTER SYSTEM COMPUTATION ROUTINE
LOGICAL SWITCH,ZERO,NZER
COMMON NFREQ,DT,FREQ(100),RA(82),ISWTC(10),DAY,DON,YEAR,IDPT
COMMON/FILTEC/IFILT(3,14,20),IOPT(6,5),IOP(5,152),INBUF(14,200,3),
1IOBUF(14,200),IDIN(20),IDOUT(20),INOTST,INOOPT
DIMENSION FILT(9,14,20),OPT(6,5),OP(5,152),BUF(14,200,3),
10BUF(14,200),IDD(3),ICLK(20),NORM(14),FNORM(14),PA(100),IOC(14)
EQUIVALENCE (IFILT,FILT),(IOPT,OPT),(IOP,OP),(INBUF,BUF),
1(IOBUF,OBUF),(SUM,ISUM),(NORM,FNORM),(TOP,ITOP),(BOT,IBOT)
9  FORMAT (41H ***** TEST CALLED FOR IS NOT ON THE TAPE)
1  FORMAT (41H ***** UNDEFINED OPTICN NO. ENCOUNTERED  I6)
DIMENSION IOTCH(5),IOTOP(5),FMTO(7),BN(5),CN(5),IKS(5),CHA(6)
DATA FMTO(1),FMTO(3),FMTO(5),FMTO(7)/
*1H(.6H (1X,1,5H),1X,3HA1)/,(BN(I),CN(I),I=1,5)/
*1H2,3H100,1H3,2H90,1H4,2H80,1H5,2H70,1H6,2H60/
DATA FMF,FMI/6HPE10.3,2HI9/,8LANK/1H /
2  FORMAT (1H1,55X,20HFILTERED DATA OUTPUT,40X,3A3/3X,10HINPUT TEST,
*17,3X,11HOUTPUT TESTI7,4X,13HINPUT CHANNELI3,3X,
*17HOUTPUT CHANNEL(S),2X,I2,1H,I2,1H,I2,1H,I2)
3  FORMAT (1H0,57X,16HPLOT DISCRPTION/5X,9HCHARACTER,12X,
*5HTRACE,16X,7HMINIMUM,12X,7HMAXIMUM,9X,10HRESOLUTION,10X,
*10HOPTION NO.)
4  FORMAT (8X,1H.,14X,13HINPUT CHANNELI3,3(6X,1PE12.5))
44  FORMAT (8X,1H.,14X,13HINPUT CHANNELI3,3(9X,I6,3X))
5  FORMAT (8X,A1,13X,14HOUTPUT CHANNELI3,3(6X,1PE12.5),12X,I2)
55  FORMAT (8X,A1,13X,14HOUTPUT CHANNELI3,3(9X,I6,3X),12X,I2)
6  FORMAT (2X,5HINPUT,3X,5(4X,I2,4X))
EQUIVALENCE (IRES,RES),(AOUT,IAOUT)
7  FORMAT (61X,10HBUFFER NO.I4)
DATA (CHA(I),I=1,6)/1H+,1H-,1H*,1H',1H0,1H./,CROSS/1HX/
DIMENSION AOUT(6),IAOUT(6)
8  FORMAT (8X,1HX,13X,18HTRACE INTERSECTION)
IREWS=-1
DO 100 J=1,20
ICLK(J)=0
100 CONTINUE
REWIND 12
IF(SWITCH(2,3,4)) RETURN
DO 150 J=1,INOOPT
IF(IOPT(4,J).GE.0) GO TO 150
CALL OPTSET (J)
IOP(J,1)=IOPT(1,J)
IOPT(4,J)=IOP(J,1)
150 CONTINUE
IF(SWITCH(2,3,4)) RETURN
160 READ (12) IDIN
IF(IDIN(1).EQ.0) GO TO 900
DO 170 J=1,INOTST
IF(ICLK(J).NE.0) GO TO 170
IF(IDIN(1).NE.IFILT(1,1,J)) GO TO 170
IREWS=1
JT=J
ICLK(JT)=1
GO TO 200
170 CONTINUE
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Contrails

175	READ (12) DUM	LP298057
	READ (12) IDIN	LP298058
	IF(IDIN(2).EQ.0) GO TO 175	LP298059
	READ (12) DUM	LP298060
	GO TO 160	LP298061
200	I=1	LP298062
205	IDO(1)=IDIN(3)	LP298063
	READ (12) ((INBUF(K,L,I),K=1,14),L=1,200)	LP298064
	IF(IDIN(2).NE.0) GO TO 215	LP298065
	I=I+1	LP298066
	IF(I.GT.3) GO TO 210	LP298067
	READ (12) IDIN	LP298068
	GO TO 205	LP298069
210	LB=10	LP298070
	GO TO 220	LP298071
215	LB=1	LP298072
220	IDOUT(1)=IFILT(9,1,JT)	LP298073
	IDOUT(2)=0	LP298074
	IDOUT(4)=0	LP298075
	IDOUT(5)=0	LP298076
	DO 225 J=1,14	LP298077
	JJ=IFILT(3,J,JT)+5	LP298078
	KK=1	LP298079
	IF(JJ.LE.5) KK=0	LP298080
	IDOUT(JJ)=KK	LP298081
	IDOUT(5)=IDOUT(5)+KK	LP298082
225	CONTINUE	LP298083
	IDOUT(20)=IDIN(20)	LP298084
	KTP=1	LP298085
	IF(IDIN(20).NE.0) KTP=2	LP298086
	IK=-1	LP298087
	I=1	LP298088
	IK=-1	LP298089
	DO 230 K=1,14	LP298090
	ICI=IFILT(2,K,JT)	LP298091
	ICO=IFILT(3,K,JT)	LP298092
	IF(ICO.EQ.0) GO TO 230	LP298093
	NORM(K)=INBUF(ICI,1,1)	LP298094
230	IDBUF(K,1)=0	LP298095
	IDUT=1	LP298096
	IN=2	LP298097
250	DO 400 K=1,14	LP298098
	IF(IFILT(3,K,JT).EQ.0) GO TO 400	LP298099
	ICI=IFILT(2,K,JT)	LP298100
	ICO=IFILT(3,K,JT)	LP298101
	ION=IFILT(8,K,JT)	LP298102
253	GO TO (255,260),KTP	LP298103
255	IFILT(6,K,JT)=10000000	LP298104
	IFILT(7,K,JT)=-10000000	LP298105
	GO TO 265	LP298106
260	FILT(6,K,JT)=1.E+36	LP298107
	FILT(7,K,JT)=-1.E+36	LP298108
265	DO 270 L=1,5	LP298109
	IF(ION.NE.IDP(L,1)) GO TO 270	LP298110
	IF(ION.EQ.0) GO TO 370	LP298111
	ION=L	LP298112
	GO TO 275	LP298113
270	CONTINUE	LP298114

Contrails

	IF(ION.EQ.0) GO TO 370	LP298115
	WRITE (6,1) ION	LP298116
272	CALL SWTHON (4)	LP298117
	CALL SWTHON (3)	LP298118
273	RETURN	LP298119
275	IN1=IN-IOPT(5,ION)+1	LP298120
	IF(ION.EQ.0) GO TO 370	LP298121
	IF(IN1.GE.1) GO TO 290	LP298122
	IF(IK.GT.0) GO TO 280	LP298123
	IN1=1	LP298124
	I1=1	LP298125
	N1=IOPT(5,ION)-IN+2	LP298126
	GO TO 300	LP298127
280	I1=I-1	LP298128
	N1=2	LP298129
	IF(I1.LE.0) I1=3	LP298130
	IN1=IDD(I1)+IN1	LP298131
	GO TO 300	LP298132
290	I1=I	LP298133
	IK=1	LP298134
	N1=2	LP298135
300	IN2=IN+IOPT(2,ION)-IOPT(5,ION)	LP298136
	IF(IN2.LE.IDD(I)) GO TO 320	LP298137
	I2=I+1	LP298138
	IF(I2.GT.3) I2=1	LP298139
	IF(LB.EQ.I) GO TO 310	LP298140
	IN2=IN2-IDD(I)	LP298141
	N2=IOPT(2,ION)+1	LP298142
	GO TO 330	LP298143
310	IN2=IDD(I)	LP298144
	I2=I	LP298145
	N2=IOPT(5,ION)+IDD(I)-IN+1	LP298146
	GO TO 330	LP298147
320	I2=I	LP298148
	N2=IOPT(2,ION)+1	LP298149
330	ISUM=0	LP298150
	DO 350 N=N1,N2	LP298151
	GO TO (335,340),KTP	LP298152
335	ASUM=(INBUF(ICI,IN1,I1)-NORM(K))	LP298153
	SUM=SUM+ASUM*FILT(4,K,JT)*OP(ION,N)	LP298154
	GC TO 345	LP298155
340	SUM=SUM+(BUF(ICI,IN1,I1)-FNORM(K))*FILT(4,K,JT)*OP(ION,N)	LP298156
345	IN1=IN1+1	LP298157
	IF(IN1.LE.IDD(I1)) GO TO 350	LP298158
	IN1=1	LP298159
	I1=I1+1	LP298160
	IF(I1.GT.3) I1=1	LP298161
350	CONTINUE	LP298162
	GO TO (355,360),KTP	LP298163
355	IOBUF(ICO,IN)=SUM*DT	LP298164
	GO TO 385	LP298165
360	OBUF(ICO,IN)=SUM*DT	LP298166
	GO TO 385	LP298167
370	GO TO (375,380),KTP	LP298168
375	OBUF(ICO,IN)=INBUF(ICI,IN,I)-NORM(K)	LP298169
	IOBUF(ICO,IN)=OBUF(ICO,IN)*FILT(4,K,JT)	LP298170
	GO TO 385	LP298171
380	OBUF(ICO,IN)=(BUF(ICI,IN,I)-FNORM(K))*FILT(4,K,JT)	LP298172

Contrails

385	IF(IFILT(5,K,JT).EQ.0) GO TO 390	LP298173
	GO TO (386,387),KTP	LP298174
386	IF((INBUF(ICI,IN,I)-NORM(K)).GT.IFILT(7,K,JT))	LP298175
	1IFILT(7,K,JT)=INBUF(ICI,IN,I)-NORM(K)	LP298176
	IF((INBUF(ICI,IN,I)-NORM(K)).LT.IFILT(6,K,JT))	LP298177
	1IFILT(6,K,JT)=INBUF(ICI,IN,I)-NORM(K)	LP298178
	GO TO 388	LP298179
387	IF((BUF(ICI,IN,I)-FNORM(K)).GT.FILT(7,K,JT))	LP298180
	1FILT(7,K,JT)=BUF(ICI,IN,I)-FNORM(K)	LP298181
	IF((BUF(ICI,IN,I)-FNORM(K)).LT.FILT(6,K,JT))	LP298182
	1FILT(6,K,JT)=BUF(ICI,IN,I)-FNORM(K)	LP298183
388	IF(IOBUF(ICQ,IN).GT.IFILT(7,K,JT)) IFILT(7,K,JT)=IOBUF(ICQ,IN)	LP298184
	IF(IOBUF(ICQ,IN).LT.IFILT(6,K,JT)) IFILT(6,K,JT)=IOBUF(ICQ,IN)	LP298185
390	IN=IN+1	LP298186
	IF(IN.LE.IDD(I)) GO TO 275	LP298187
	IN=1	LP298188
	IF(IR.EQ.-1) IN=2	LP298189
400	CONTINUE	LP298190
	IDOUT(3)=IDD(I)	LP298191
	IF(LB.EQ.1) IDOUT(2)=1	LP298192
	WRITE (2) IDOUT	LP298193
	WRITE (2) IOBUF	LP298194
	DO 405 K=1,14	LP298195
405	IOC(K)=0	LP298196
	DO 410 K=1,14	LP298197
	IF(IFILT(5,K,JT).NE.0) GO TO 420	LP298198
410	CONTINUE	LP298199
	GO TO 500	LP298200
420	DO 490 K=1,14	LP298201
	IF(IFILT(5,K,JT).EQ.0) GO TO 490	LP298202
	IF(IOC(K).NE.0) GO TO 490	LP298203
	IOC(K)=1	LP298204
	IPC=IFILT(2,K,JT)	LP298205
	L=1	LP298206
	DO 425 M=K,14	LP298207
	IF(IPC.NE.IFILT(2,M,JT)) GO TO 425	LP298208
	IF(IFILT(5,M,JT).EQ.0) GO TO 425	LP298209
	IOTCH(L)=IFILT(3,M,JT)	LP298210
	IOTOP(L)=IFILT(8,M,JT)	LP298211
	IOC(M)=1	LP298212
	IKS(L)=M	LP298213
	L=L+1	LP298214
425	CONTINUE	LP298215
	L=L-1	LP298216
	WRITE (10,2)DAY,DON,YEAR,IFILT(1,1,JT),IFILT(9,1,JT),IPC,	LP298217
	1(IOTCH(N),N=1,L)	LP298218
	WRITE (10,3)	LP298219
	M=IKS(1)	LP298220
	ITOP=IFILT(7,M,JT)	LP298221
	IBOT=IFILT(6,M,JT)	LP298222
	DO 430 J=1,L	LP298223
	M=IKS(J)	LP298224
	IF(ITOP.LT.IFILT(7,M,JT)) ITOP=IFILT(7,M,JT)	LP298225
	IF(IBOT.GT.IFILT(6,M,JT)) IBOT=IFILT(6,M,JT)	LP298226
430	CONTINUE	LP298227
	GO TO (431,432),KTP	LP298228
431	A=ITOP	LP298229
	B=IBOT	LP298230

Contrails

	C=100-(L-1)*10	LP298231
	IRES=(A-B)/C	LP298232
	WRITE (10,44) IPC,IBOT,ITOP,IRES	LP298233
	FMTO(4)=FMI	LP298234
	GO TO 435	LP298235
432	C=100-(L-1)*10	LP298236
	RES=(TOP-BOT)/C	LP298237
	WRITE (10,4) IPC,BOT,TOP,RES	LP298238
	FMTO(4)=FMF	LP298239
435	FMTO(2)=BN(L)	LP298240
	FMTO(6)=CN(L)	LP298241
	MM=IDD(I)	LP298242
	DO 439 J=1,L	LP298243
	KQJ=IKS(J)	LP298244
	GO TO (436,438),KTP	LP298245
436	WRITE (10,55) CHA(J),IOTCH(J),IFILT(6,KQJ,JT),IFILT(7,KQJ,JT), IRES,IOTOP(J)	LP298246
	GO TO 439	LP298247
438	WRITE (10,5) CHA(J),IOTCH(J),FILT(6,KQJ,JT),FILT(7,KQJ,JT), *RES,IOTOP(J)	LP298248
439	CONTINUE	LP298249
	WRITE (10,8)	LP298250
	WRITE (10,7) IOUT	LP298251
	WRITE (10,6) (IOTCH(KQJ),KQJ=1,L)	LP298252
	DO 485 J=1,MM	LP298253
	DO 440 M=1,100	LP298254
440	PA(M)=BLANK	LP298255
	GO TO (441,460),KTP	LP298256
441	IAOUT(1)=INBUF(IPC,J,I)-NORM(K)	LP298257
	DO 445 JJ=1,L	LP298258
	JM=IOTCH(JJ)	LP298259
	IAOUT(JJ+1)=IOBUF(JM,J)	LP298260
	IS=((IAOUT(JJ+1)-IBOT)*(100-(L-1)*10)/((ITOP-IBOT)))+1	LP298261
	IF(IS.GT.(100-(L-1)*10)) IS=100-(L-1)*10	LP298262
	IF(NZER(PA(IS),BLANK)) GO TO 444	LP298263
	PA(IS)=CHA(JJ)	LP298264
	GO TO 445	LP298265
444	PA(IS)=CROSS	LP298266
445	CONTINUE	LP298267
	IS=((IAOUT(1)-IBOT)*(100-(L-1)*10)/((ITOP-IBOT)))+1	LP298268
	IF(IS.GT.(100-(L-1)*10)) IS=100-(L-1)*10	LP298269
	IF(NZER(PA(IS),BLANK)) GO TO 450	LP298270
	PA(IS)=CHA(6)	LP298271
	GO TO 480	LP298272
450	PA(IS)=CROSS	LP298273
	GO TO 480	LP298274
460	AOUT(1)=BUF(IPC,J,I)-FNORM(K)	LP298275
	DO 470 JJ=1,L	LP298276
	JM=IOTCH(JJ)	LP298277
	AOUT(JJ+1)=OBUF(JM,J)	LP298278
	RES=100-(L-1)*10	LP298279
	IS=((AOUT(JJ+1)-BOT)*RES/(TOP-BOT))+1	LP298280
	IF(IS.GT.(100-(L-1)*10)) IS=100-(L-1)*10	LP298281
	IF(NZER(PA(IS),BLANK)) GO TO 465	LP298282
	PA(IS)=CHA(JJ)	LP298283
	GO TO 470	LP298284
465	PA(IS)=CROSS	LP298285
470	CONTINUE	LP298286
		LP298287
		LP298288

Contrails

	IS=((IAOUT(1)-BOT)*RES/(TOP-BOT))+1.	LP298289
	IF(IS.GT.(100-(L-1)*10)) IS=100-(L-1)*10	LP298290
	IF(NZER(PA(IS),BLANK)) GO TO 475	LP298291
	PA(IS)=CHA(6)	LP298292
	GO TO 480	LP298293
475	PA(IS)=CROSS	LP298294
480	NUMO=100-(L-1)*10	LP298295
	NUMA=L+1	LP298296
	WRITE (10,FMT0) ((IAOUT(KQK),KQK=1,NUMA),(PA(KQK),KQK=1,NUMO)	LP298297
485	CONTINUE	LP298298
490	CONTINUE	LP298299
500	IF(I.EQ.LR) GO TO 600	LP298300
	I=I+1	LP298301
	IF(I.GT.3) I=1	LP298302
	IN=1	LP298303
	IOUT=IOUT+1	LP298304
	IF(IR.NE.-1) GO TO 510	LP298305
	IR=1	LP298306
	GO TO 250	LP298307
510	IF(LB.LT.4) GO TO 250	LP298308
	GO TO (520,530,540),I	LP298309
515	READ (12) IDIN	LP298310
	IDDIKK)=IDIN(3)	LP298311
	IF(IDIN(2).NE.0) LB=KK	LP298312
	READ (12) ((INBUF(K,L,KK),K=1,14),L=1,200)	LP298313
	GO TO 250	LP298314
520	KK=2	LP298315
	GO TO 515	LP298316
530	KK=3	LP298317
	GO TO 515	LP298318
540	KK=1	LP298319
	GO TO 515	LP298320
600	DO 605 L=1,INOTST	LP298321
	IF(ICK(L).EQ.0) GO TO 160	LP298322
605	CONTINUE	LP298323
	RETURN	LP298324
900	DO 905 L=1,INOTST	LP298325
	IF(ICK(L).EQ.0) GO TO 910	LP298326
905	CONTINUE	LP298327
	RETURN	LP298328
910	IF(IREWS.LT.0) GO TO 920	LP298329
	IREWS=-1	LP298330
	REWIND 12	LP298331
	GO TO 160	LP298332
920	WRITE (6,9)	LP298333
	CALL SWTHON (3)	LP298334
	CALL SWTHON (4)	LP298335
	RETURN	LP298336
	END	LP298337

Contrails

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$IBFTC LP299 M94/2,XR6,LIST LP299000
SUBROUTINE OPTSET (J) LP299001
C SET FILTER OPTIONS LP299002
COMMON NFREQ,DT,FREQ(100),RA(82),ISWTC(10),DAY,DON,YEAR,IOPT LP299003
COMMON/FILTEC/IFILT(9,14,20),IOPT(6,5),IOP(5,152),INBUF(14,200,3), LP299004
1IOBUF(14,200),IDIN(20),IDOUT(20),INOTST,INNOPT LP299005
DIMENSION FILT(9,14,20),OP(5,152),OPT(6,5) LP299006
EQUIVALENCE (IFILT,FILT),(IOP,OP),(IOPT,OPT) LP299007
C IOPT(1,J) - OPTION NUMBER LP299008
C IOPT(2,J) - OPTION WIDTH LP299009
C IOPT(3,J) - CUTOFF VALUE (FREQUENCY 1) LP299010
C IOPT(4,J) - OPTION KEY (NEGATIVE) LP299011
C IOPT(5,J) - PIVOTAL ELEMENT FOR CONVOLUTION INTEGRAL LP299012
C IOPT(6,J) - CUTOFF VALUE (FREQUENCY 2) LP299013
C THE PIVOTAL ELEMENT MUST BE SET IN THIS ROUTINE LP299014
C UNLESS THE INPUT OPTION IS SPECIFIED OR THE PIVOTAL LP299015
C ELEMENT IS (WIDTH/2+1) LP299016
KK=-IOPT(4,J) LP299017
II=10 LP299018
KW=IOPT(2,J) LP299019
GO TO (100,200,300,400,500,600,700,800,900,1000),KK LP299020
100 IOPT(5,J)=KW/2+1 LP299021
A=IOPT(5,J)-1 LP299022
ST=-A*DT LP299023
DO 105 K=1,KW LP299024
OP(J,K+1)= SIN(6.28318*ST*OPT(3,J))/(ST*3.1415926. LP299025
ST=ST+DT LP299026
105 CONTINUE LP299027
RETURN LP299028
200 IOPT(5,J)=KW/2+1 LP299029
A=IOPT(5,J)-1 LP299030
ST=-A*DT LP299031
DO 205 K=1,KW LP299032
OP(J,K+1)=(SIN(3.14159*ST*OPT(3,J))**2)/(9.869588*OPT(3,J)*ST*ST) LP299033
ST=ST+DT LP299034
205 CONTINUE LP299035
RETURN LP299036
300 II=II-1 LP299037
400 II=II-1 LP299038
500 II=II-1 LP299039
600 II=II-1 LP299040
700 II=II-1 LP299041
800 II=II-1 LP299042
900 II=II-1 LP299043
1000 WRITE (6,1) II LP299044
CALL SWTHON (3) LP299045
CALL SWTHON (4) LP299046
RETURN LP299047
1 FORMAT (28H ***** FILTER OPTION NUMBER 12, LP299048
*21H HAS NOT BEEN DEFINED) LP299049
END LP299050
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Contrails

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Contracts

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$ORIGIN      A,CK2,NOREW                                000
$IBFTC DA000 M94/2,XR6,LIST                            DA000000
      SUBROUTINE PDSM                                  DA000001
C          PROBABILITY DENSITY SYSTEM MONITOR          DA000002
      LOGICAL ZERO,NZER,SWITCH                          DA000003
      COMMON NFREQ,DT,FREQ(100),RA(82),ISWCH(10),DAY,DON,YEAR,IDPT DA000004
      COMMON/PROBAR/ITST(2),ICH(2,14),ICONT(25,14),PD1(14,200), DA000005
      *PD2(25,25,10),IDIN(20),IDOUT(20),BUF(14,200),CAL(14),VARD(14), DA000006
      *DMEAN(14),VARS(14),SMEAN(14),KNC,ANRM(14),VALUS(14,5) DA000007
      DATA COP,PRB/4HCOPY,4HPRB/                       DA000008
      REWIND 13                                         DA000009
      REWIND 2                                          DA000010
      CALL SWTHON (7)                                   DA000011
      CALL SWTHOF (6)                                   DA000012
      CALL CARD                                         DA000013
100     CALL PACK (2,5,WO,RA)                           DA000014
      IF(ZERO(WO,PRB)) GO TO 150                        DA000015
      IF(ZERO(WO,COP)) GO TO 150                       DA000016
      IF(SWITCH(4,3,5,6,7)) GO TO 120                 DA000017
      IF(SWITCH(1,8)) GO TO 115                       DA000018
      DO 110 J=1,19                                     DA000019
      IDOUT(J)=0                                       DA000020
110     CONTINUE                                       DA000021
      WRITE (2) IDOUT                                  DA000022
      ENDFILE 2                                         DA000023
115     REWIND 2                                       DA000024
      REWIND 13                                        DA000025
      RETURN                                           DA000026
120     CALL SWTHON (3)                                 DA000027
      RETURN                                           DA000028
150     CALL SWTHOF (7)                                 DA000029
      CALL PDSDCD (WO)                                  DA000030
      IF(SWITCH(1,5)) GO TO 100                        DA000031
      IF(SWITCH(1,6)) GO TO 200                       DA000032
      GO TO 100                                        DA000033
200     CALL PDSCMP                                     DA000034
      IF(SWITCH(1,6)) GO TO 100                       DA000035
      CALL PDSQTP                                       DA000036
      GO TO 100                                        DA000037
      END                                              DA000038
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$ORIGIN      Q,CK2,NOREW                                000
$IBFTC DQ101 M94/2,XR6,LIST                            DQ101000
      SUBROUTINE PDSDCD (WO)                           DQ101001
C          P. D. SYSTEM CARD DECODE ROUTINE           DQ101002
      LOGICAL ZERO,NZER,SWITCH                          DQ101003
      COMMON NFREQ,DT,FREQ(100),RA(82),ISWCH(10),DAY,DON,YEAR,IDPT DQ101004
      COMMON/PROBAB/ITST(2),ICH(2,14),ICONT(25,14),PD1(14,200), DQ101005
      *PD2(25,25,10),IDIN(20),IDOUT(20),BUF(14,200),CAL(14),VARD(14), DQ101006
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Contrails

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*DMEAN(14), VARS(14), SMEAN(14), KNC, ANRM(14), VALUS(14,5)          DQ101007
DIMENSION CONT(25,14), TSTS(13), DAT(11), ITT(13)                    DQ101008
EQUIVALENCE (ICONT,CONT)                                             DQ101009
DATA PRB,STAR/ 4HPRB,1H*/,(TSTS(I),I=1,13)/                          DQ101010
*2HTE,2HCH,2HCA,2HPD,2HL1,2HTZ,2HTM,2HSA,2HTA,2HDI,2HST,2HNO,2HVA/  DQ101011
DATA SLASH,COMMA,RPRN,LPRN,TAPE/1H/,1H,,1H),1H(,4HTAPE/,BLANK/1H /  DQ101012
1  FORMAT (11A6)                                                    DQ101013
2  FORMAT (11I6)                                                    DQ101014
3  FORMAT (5E12.0)                                                  DQ101015
4  FORMAT (16,2E12.0)                                               DQ101016
5  FORMAT (5I6,E12.0)                                               DQ101017
   IF(ZERO(WO,PRB)) GO TO 200                                       DQ101018
   CALL SWTHON (8)                                                  DQ101019
   CALL PDSCPY                                                       DQ101020
   CALL PACK (2,5,WO,RA)                                           DQ101021
   IF(ZERO(WO,PRB)) GO TO 200                                       DQ101022
   RETURN                                                            DQ101023
200 CALL SWTHOF(8)                                                  DQ101024
    DO 210 J=1,14                                                    DQ101025
    ICH(1,J)=0                                                       DQ101026
    ANRM(J)=0.                                                       DQ101027
    DO 205 K=1,25                                                    DQ101028
    ICONT(K,J)=0                                                     DQ101029
205  CONTINUE                                                       DQ101030
    CAL(J)=0.                                                       DQ101031
    DO 210 K=1,200                                                   DQ101032
    PD1(J,K)=0.                                                      DQ101033
210  CONTINUE                                                       DQ101034
    DO 215 J=1,25                                                    DQ101035
    DO 215 K=1,25                                                    DQ101036
    DO 215 L=1,10                                                    DQ101037
    PD2(J,K,L)=0.                                                   DQ101038
215  CONTINUE                                                       DQ101039
    CALL SWTHON (6)                                                  DQ101040
    DO 220 J=1,13                                                    DQ101041
220  ITT(J)=1                                                       DQ101042
    NISFF=1                                                          DQ101043
    KNC=0                                                            DQ101044
    J=5                                                              DQ101045
225  J=J+1                                                           DQ101046
    IF(NZER(RA(J),COMMA)) GO TO 225                                  DQ101047
227  IF(NZER(RA(J+1),COMMA)) GO TO 235                              DQ101048
    CALL CARD                                                         DQ101049
    IF(NZER(RA(1),STAR)) GO TO 230                                  DQ101050
    CALL PDSCLN (ITT)                                               DQ101051
    RETURN                                                            DQ101052
230  J=0                                                             DQ101053
235  J=J+1                                                           DQ101054
    CALL PACK (J,J+1,WO,RA)                                         DQ101055
    DO 240 L=1,13                                                    DQ101056
    IF(NZER(WO,TSTS(L))) GO TO 240                                  DQ101057
    LL=L                                                              DQ101058
    GO TO 250                                                         DQ101059
240  CONTINUE                                                       DQ101060
242  CALL WROUT (1,801)                                             DQ101061
    CALL SWTHON (5)                                                  DQ101062
    CALL SWTHOF(6)                                                  DQ101063
245  CALL CARD                                                       DQ101064
```

Contrails

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IF(NZER(RA(1),STAR)) GO TO 245
RETURN
250 IF(ITT(LL).NE.1) GO TO 260
CALL PDCLN (ITT)
KNC=KNC+1
DO 255 L=NISFF,13
255 ITT(L)=0
260 ITT(LL)=1
GO TO (270,270,300,315,350,315,315,315,400,315,450,500,525),LL
270 J=J+1
IF(NZER(RA(J),LPRN)) GO TO 270
L=J+1
275 J=J+1
IF(NZER(RA(J),COMMA)) GO TO 275
M=J-1
N=J+1
280 J=J+1
IF(NZER(RA(J),RPRN)) GO TO 280
CALL PACK (L,M,WO,RA)
CALL PACK (N,J-1,WA,RA)
CALL RITE31
WRITE (31,1) WO,WA
CALL READ31
READ (31,2) I1,I2
GO TO (285,290),LL
285 ITST(1)=I1
ITST(2)=I2
IF(NISFF.NE.1) GO TO 242
NISFF=2
GO TO 225
290 ICH(1,KNC)=I1
ICH(2,KNC)=I2
GO TO 225
300 J=J+1
IF(NZER(RA(J),SLASH)) GO TO 300
L=J+1
305 J=J+1
IF(NZER(RA(J),COMMA)) GO TO 305
M=J-1
WA=BLANK
IF((M-L).LE.5) GO TO 310
N=L+6
CALL PACK (N,M,WA,RA)
M=N-1
310 CALL PACK (L,M,WO,RA)
CALL RITE31
WRITE (31,1) WO,WA
CALL READ31
READ (31,3) CAL(KNC)
GO TO 227
315 J=J+1
IF(NZER(RA(J),SLASH)) GO TO 315
L=J+1
320 J=J+1
IF(NZER(RA(J),COMMA)) GO TO 320
CALL PACK (L,J-1,WO,RA)
CALL RITE31
WRITE (31,1) WO
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DQ101065
DQ101066
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DQ101121
DQ101122

Contrails

```
CALL READ31
READ (31,2) I1
I2=1
GO TO (242,242,242,345,242,340,335,330,242,325),LL
325 I2=I2+1
330 I2=I2+1
335 I2=I2+1
340 I2=I2+4
345 ICONT(I2,KNC)=I1
GO TO 227
350 J=J+1
IF(NZER(RA(J),SLASH)) GO TO 350
L=J+1
355 J=J+1
IF(NZER(RA(J),LPRN)) GO TO 355
CALL PACK (L,J-1,DAT(1),RA)
IS=2
360 L=J+1
365 J=J+1
IF(ZERO(RA(J),COMMA)) GO TO 370
IF(ZERO(RA(J),RPRN)) GO TO 380
IF((J-L).LT.5) GO TO 365
CALL PACK (L,J,DAT(IS),RA)
368 IS=IS+1
GO TO 360
370 IF(IS.NE.2) GO TO 375
DAT(2)=BLANK
IS=3
375 CALL PACK (L,J-1,DAT(IS),RA)
GO TO 368
380 IF(IS.NE.4) GO TO 385
DAT(4)=BLANK
385 CALL PACK (L,J-1,DAT(5),RA)
390 CALL RITE31
WRITE (31,1) (DAT(I),I=1,5)
CALL READ31
READ (31,4) ICONT(2,KNC),CONT(3,KNC),CONT(4,KNC)
GO TO 225
400 J=J+1
IF(NZER(RA(J),SLASH)) GO TO 400
L=J+1
405 J=J+1
IF(NZER(RA(J),LPRN)) GO TO 405
CALL PACK (L,J-1,DAT(1),RA)
K=0
IS=2
410 L=J+1
415 J=J+1
IF(ZERO(RA(J),RPRN)) GO TO 425
IF(NZER(RA(J),COMMA)) GO TO 415
420 CALL PACK (L,J-1,DAT(IS),RA)
IF(K.NE.0) GO TO 430
IS=IS+1
GO TO 410
425 K=1
GO TO 420
430 IF(IS.GT.11) GO TO 242
CALL RITE31
```

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DQ101123
DQ101124
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DQ101180
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Contrails

	WRITE (31,1) (DAT(I),I=1,IS)	DQ101181
	CALL READ31	DQ101182
	M=14+IS	DQ101183
	READ (31,2) (ICONT(I,KNC),I=15,M)	DQ101184
	GO TO 225	DQ101185
450	J=J+1	DQ101186
	IF(NZER(RA(J),SLASH)) GO TO 450	DQ101187
	L=J+1	DQ101188
455	J=J+1	DQ101189
	IF(NZER(RA(J),LPRN)) GO TO 455	DQ101190
	CALL PACK (L,J-1,DAT(1),RA)	DQ101191
	IS=2	DQ101192
460	L=J+1	DQ101193
465	J=J+1	DQ101194
	IF(NZER(RA(J),COMMA)) GO TO 465	DQ101195
	CALL PACK (L,J-1,DAT(IS),RA)	DQ101196
	IS=IS+1	DQ101197
	IF(IS.LE.5) GO TO 460	DQ101198
	L=J+1	DQ101199
470	J=J+1	DQ101200
	IF(NZER(RA(J),RPRN)) GO TO 470	DQ101201
	M=J-1	DQ101202
	DAT(6)=BLANK	DQ101203
	IF((M-L).LT.6) GO TO 475	DQ101204
	CALL PACK (L,L+5,DAT(6),RA)	DQ101205
	L=L+6	DQ101206
475	CALL PACK (L,M,DAT(7),RA)	DQ101207
	CALL RITE31	DQ101208
	WRITE (31,1) (DAT(I),I=1,7)	DQ101209
	CALL READ31	DQ101210
	READ (31,5) (ICONT(I,KNC),I=9,14)	DQ101211
	GO TO 225	DQ101212
500	J=J+1	DQ101213
	IF(NZER(RA(J),LPRN)) GO TO 500	DQ101214
	IF(NZER(RA(J+1),RPRN)) GO TO 505	DQ101215
	ANRM(KNC)=TAPE	DQ101216
	GO TO 225	DQ101217
505	L=J+1	DQ101218
510	J=J+1	DQ101219
	IF(NZER(RA(J),RPRN)) GO TO 510	DQ101220
	M=J-1	DQ101221
	DAT(1)=BLANK	DQ101222
	IF((M-L).LT.6) GO TO 515	DQ101223
	CALL PACK (L,L+5,DAT(1),RA)	DQ101224
	L=L+6	DQ101225
515	CALL PACK (L,M,DAT(2),RA)	DQ101226
	CALL RITE31	DQ101227
	WRITE (31,1) DAT(1),DAT(2)	DQ101228
	CALL READ31	DQ101229
	READ (31,3) ANRM(KNC)	DQ101230
	GO TO 225	DQ101231
525	J=J+1	DQ101232
	IF(NZER(RA(J),LPRN)) GO TO 525	DQ101233
	IS=1	DQ101234
	K=0	DQ101235
530	L=J+1	DQ101236
535	J=J+1	DQ101237
	IF(ZERO(RA(J),COMMA)) GO TO 540	DQ101238

Contrails

	IF(ZERO(RA(J),RPRN)) GO TO 550	DQ101239
	IF((J-L).LT.6) GO TO 535	DQ101240
	CALL PACK (L,J-1,DAT(1S),RA)	DQ101241
	IS=IS+1	DQ101242
	L=J	DQ101243
	GO TO 535	DQ101244
540	CALL PACK (L,J-1,DAT(1S),RA)	DQ101245
	IS=IS+1	DQ101246
	IF(1S.NE.1((1S/2)*2)) GO TO 545	DQ101247
	DAT(1S)=BLANK	DQ101248
	IS=IS+1	DQ101249
545	IF(K.EQ.0) GO TO 530	DQ101250
	GO TO 555	DQ101251
550	K=1	DQ101252
	GO TO 540	DQ101253
555	CALL RITE31	DQ101254
	IS=IS-1	DQ101255
	ISS=IS/2	DQ101256
	WRITE (31,1) (DAT(1),I=1,1S)	DQ101257
	CALL READ31	DQ101258
	READ (31,3) (VALUS(KNC,I),I=1,ISS)	DQ101259
	GO TO 225	DQ101260
	END	DQ101261

\$IBFTC	DQ102 M94/2,XR6,LIST	DQ102000
	SUBROUTINE PDSCPY	DQ102001
C	COPY B. T. D. F. ONTO N. M. T. D. F.	DQ102002
	LOGICAL ZERO,NZER,SWITCH	DQ102003
	COMMON NFREQ,DT,FREQ(100),RA(82),ISWTCH(10),D,DN,Y,1DPT	DQ102004
	COMMON/PROBAB/ITST(2),1CH(2,14),1CONT(25,14),PD1(14,200),	DQ102005
	*PD2(25,25,10),1DIN(20),1DOUT(20),BUF(14,200),CAL(14),VARD(14),	DQ102006
	*DMEAN(14),VARS(14),SMEAN(14),KNC,ANRM(14),VALUS(14,5)	DQ102007
	DATA COMMA,SLASH, TS,AL,STAR/1H,,1H/, 1HT,1HA,1H*/	DQ102008
1	FORMAT (I6)	DQ102009
2	FORMAT (A6)	DQ102010
	ITQ=0	DQ102011
	J=4	DQ102012
100	J=J+1	DQ102013
	IF(NZER(RA(J),COMMA)) GO TO 100	DQ102014
	IF(NZER(RA(J+1),COMMA)) GO TO 105	DQ102015
	CALL CARD	DQ102016
	J=0	DQ102017
	IF(ZERO(RA(1),STAR)) GO TO 200	DQ102018
105	J=J+1	DQ102019
	IF(ZERO(RA(J),TS)) GO TO 115	DQ102020
	CALL WR0UT (1,802)	DQ102021
	CALL SWTH0N (5)	DQ102022
110	CALL CARD	DQ102023
	IF(NZER(RA(1),STAR)) GO TO 110	DQ102024
	RETURN	DQ102025
115	J=J+1	DQ102026
	IF(NZER(RA(J),SLASH)) GO TO 115	DQ102027
	IF(NZER(RA(J+1),AL)) GO TO 125	DQ102028
120	CALL CARD	DQ102029

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	IF(NZER(RA(J),STAR)) GO TO 120	DQ102030
	GO TO 200	DQ102031
125	L=J+1	DQ102032
130	J=J+1	DQ102033
	IF(NZER(RA(J),COMMA)) GO TO 130	DQ102034
	CALL PACK (L,J-1,WO,RA)	DQ102035
	CALL RITE31	DQ102036
	WRITE (31,2) WO	DQ102037
	CALL READ31	DQ102038
	READ (31,1) ITEST	DQ102039
	GO TO 205	DQ102040
140	IF(NZER(RA(J+1),COMMA)) GO TO 125	DQ102041
	CALL CARD	DQ102042
	J=0	DQ102043
	IF(NZER(RA(1),STAR)) GO TO 125	DQ102044
150	DO 155 J=1,19	DQ102045
155	IDIN(J)=0	DQ102046
	WRITE (13) IDIN	DQ102047
	ENDFILE 13	DQ102048
	REWIND 13	DQ102049
	WRITE (6,3) ITQ	DQ102050
3	FORMAT (22H XXXXX COPY COMPLETED I6,12H TESTS XXXXX)	DQ102051
	RETURN	DQ102052
200	ITEST=-1	DQ102053
205	IRW=0	DQ102054
210	READ (2) IDIN	DQ102055
	IF(IDIN(1).NE.0) GO TO 225	DQ102056
	IF(ITEST.LT.0) GO TO 150	DQ102057
	IF(IRW.NE.0) GO TO 215	DQ102058
	REWIND 2	DQ102059
	IRW=1	DQ102060
	GO TO 210	DQ102061
215	WRITE (6,4) ITEST	DQ102062
4	FORMAT (12H ***** TEST I6,31H IS NOT ON THE INPUT TAPE *****)	DQ102063
	CALL SWTHON (5)	DQ102064
	GO TO 140	DQ102065
225	IF(ITEST.LT.0) GO TO 250	DQ102066
	IF(IDIN(1).EQ.ITEST) GO TO 250	DQ102067
230	READ (2) BUF	DQ102068
	IF(IDIN(2).NE.0) GO TO 210	DQ102069
	READ (2) IDIN	DQ102070
	GO TO 230	DQ102071
250	ITQ=ITQ+1	DQ102072
255	WRITE (13) IDIN	DQ102073
	READ (2) BUF	DQ102074
	WRITE (13) BUF	DQ102075
	IF(IDIN(2).NE.0) GO TO 260	DQ102076
	READ (2) IDIN	DQ102077
	GO TO 255	DQ102078
260	IF(ITEST.GT.0) GO TO 140	DQ102079
	GO TO 210	DQ102080
	END	DQ102081

Contrails

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$IBFTC DQ103 M94/2,XR6,LIST DQ103000
SUBROUTINE PDSCLN (ITS) DQ103001
C CLEANUP CONTROL ARRAY DQ103002
LOGICAL ZERO,NZER,SWITCH DQ103003
COMMON NFREQ,DT,FREQ(100),RA(82),ISWCH(10),D,DN,Y,IDPT DQ103004
COMMON/PROBAB/ITST(2),ICH(2,14),ICONT(25,14),PD1(14,200), DQ103005
*PD2(25,25,10),IDIN(20),IDOUT(20),BUF(14,200),CAL(14),VARD(14), DQ103006
*DMEAN(14),VARS(14),SMEAN(14),KNC,ANRM(14),VALUS(14,5) DQ103007
DATA ALNK/1H / DQ103008
DIMENSION ITS(12) DQ103009
IX=0 DQ103010
IF(ITS(1).EQ.1) GO TO 100 DQ103011
WRITE (6,1) DQ103012
1 FORMAT (37H ***** TEST FIELD NOT SPECIFIED *****) DQ103013
IX=1 DQ103014
100 IF(ITS(2).EQ.1) GO TO 105 DQ103015
WRITE (6,2) DQ103016
IX=1 DQ103017
2 FORMAT (35H ***** CH FIELD NOT SPECIFIED *****) DQ103018
105 IF(ITS(3).EQ.1) GO TO 110 DQ103019
CAL(KNC)=1. DQ103020
110 IF(ITS(4).EQ.1) GO TO 115 DQ103021
ICONT(1,KNC)=1 DQ103022
115 IF(ITS(5).EQ.1) GO TO 120 DQ103023
WRITE (6,3) DQ103024
IX=1 DQ103025
3 FORMAT (39H ***** LIMITS FIELD NOT SPECIFIED *****) DQ103026
120 IF(ITS(6).NE.1) ICONT(5,KNC)=1 DQ103027
IF(ITS(7).NE.1) ICONT(6,KNC)=999999 DQ103028
IF(ITS(12).NE.1) ANRM(KNC)=ALNK DQ103029
IF(ITS(8).NE.1) ICONT(7,KNC)=1 DQ103030
IF((ITS(9).EQ.1).OR.(ICONT(1,KNC).EQ.1)) GO TO 125 DQ103031
WRITE (6,4) DQ103032
IX=1 DQ103033
4 FORMAT (36H ***** TAU FIELD NOT SPECIFIED *****) DQ103034
125 IF(IX.NE.1) GO TO 130 DQ103035
CALL SWTHON (5) DQ103036
130 RETURN DQ103037
END DQ103038
```

```
$ORIGIN Q,CK2,NOREW 000
$IBFTC DQ204 M94/2,XR6,LIST DQ204000
SUBROUTINE PDSCMP DQ204001
C COMPUTATION CONTROL PROGRAM DQ204002
LOGICAL ZERO,NZER,SWITCH DQ204003
COMMON NFREQ,DT,FREQ(100),RA(82),ISWCH(10),DAY,DON,YEAR,IDPT DQ204004
COMMON/PROBAB/ITST(2),ICH(2,14),ICONT(25,14),PD1(14,200), DQ204005
*PD2(25,25,10),IDIN(20),IDOUT(20),BUF(14,200),CAL(14),VARD(14), DQ204006
*DMEAN(14),VARS(14),SMEAN(14),KNC,ANRM(14),VALUS(14,5) DQ204007
DIMENSION NP(14),NQ(14),I2OS(2,200) DQ204008
DIMENSION IANRM(14) DQ204009
EQUIVALENCE (ANRM,IANRM) DQ204010
DATA ITBLK/1H / DQ204011
1 FORMAT (18H ***** INPUT TEST I6,19H IS NOT ON THE TAPE) DQ204012
```

Contrails

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2   FORMAT (21H ***** MINIMUM RANGE 16,                DQ204013
   *20H TOO LARGE FOR TEST I6)                             DQ204014
3   FORMAT (37H ***** MINIMUM RANGE IS TOO LARGE FOR,   DQ204015
   *6H TEST I6,15H INPUT CHANNEL I3,16H OUTPUT CHANNEL I3) DQ204016
4   FORMAT (40H ***** MAXIMUM RANGE CALLED FOR ON TEST I6, DQ204017
   *4H OF I6,39H DELTA T IS NOT AVAILABLE. THE MAXIMUM,    DQ204018
   *20H ALLOWABLE RANGE IS I6)                             DQ204019
   REWIND I3                                               DQ204020
   REWIND I1                                               DQ204021
   ITSX=0                                                  DQ204022
   ITSXM=0                                                 DQ204023
C   INITIALIZATION SECTION                                DQ204024
   DO 100 J=1,14                                           DQ204025
   VARD(J)=0.                                             DQ204026
   DMEAN(J)=0.                                           DQ204027
   VARS(J)=0.                                             DQ204028
   SMEAN(J)=0.                                           DQ204029
   NP(J)=-2                                               DQ204030
   NQ(J)=0                                                DQ204031
   IF(ICONT(6,J).LT.ITSXM) GO TO 95                       DQ204032
   ITSXM=ICONT(6,J)                                       DQ204033
   ITSXMJ=J                                               DQ204034
95  DO 100 K=1,200                                         DQ204035
   PD1(J,K)=0                                             DQ204036
100 CONTINUE                                             DQ204037
   CALL PDSSTA (NQ,NP,-1)                                  DQ204038
   I20=0                                                  DQ204039
   DO 105 J=1,KNC                                         DQ204040
   IF(ICONT(1,J).EQ.2) I20=I20+1                         DQ204041
105 CONTINUE                                             DQ204042
C   INIALIZE INPUT DATA TAPE                             DQ204043
200 READ (13) IDIN                                        DQ204044
   IF(IDIN(1).EQ.ITST(1)) GO TO 220                       DQ204045
   IF(IDIN(1).EQ.0) GO TO 210                             DQ204046
   READ (13) BUF                                          DQ204047
   GO TO 200                                              DQ204048
210 WRITE (6,1) ITST(1)                                   DQ204049
   CALL SWTHON (5)                                        DQ204050
   REWIND I3                                             DQ204051
   RETURN                                                DQ204052
220 ITS=10000000                                         DQ204053
   JL=-2                                                 DQ204054
   READ (13) BUF                                          DQ204055
   DO 225 J=1,KNC                                         DQ204056
   IF(ICONT(5,J).LT.ITS) ITS=ICONT(5,J)                  DQ204057
   JPC=ICH(1,J)                                          DQ204058
   IF(IANRM(J).NE.ITBLK) GO TO 225                       DQ204059
   ANRM(J)=BUF(JPC,1)                                    DQ204060
   IF(IDIN(20).EQ.0) ANRM(J)=IANRM(J)                    DQ204061
225 CONTINUE                                             DQ204062
230 IF(ITS.LE.IDIN(3)) GO TO 255                          DQ204063
   READ (13) BUF                                          DQ204064
   IF(IDIN(2).NE.0) GO TO 240                             DQ204065
   READ (13) IDIN                                         DQ204066
   ITS=ITS-IDIN(3)                                       DQ204067
   ITSX=ITSX+IDIN(3)                                     DQ204068
   CALL PDSSTA (ITSX,NP,-1)                               DQ204069
   DO 235 J=1,KNC                                         DQ204070
```

Contrails

235	NQ(J)=NQ(J)+IDIN(3)	DQ204071
	GO TO 230	DQ204072
240	WRITE (6,2) -ITS,ITST(1)	DQ204073
	CALL SWTHON (5)	DQ204074
	RETURN	DQ204075
250	READ (13) BUF	DQ204076
255	DO 270 J=1,KNC	DQ204077
	IF((ICONT(5,J)-NQ(J)).GT.IDIN(3)) GO TO 270	DQ204078
	IF(NP(J).NE.-2) GO TO 270	DQ204079
	NP(J)=0	DQ204080
	NQ(J)=ICONT(5,J)	DQ204081
270	CONTINUE	DQ204082
C	COMPUTE CYCLE	DQ204083
	CALL PDSCP1 (NQ,NP)	DQ204084
	CALL PDSNRM (NQ,NP,1)	DQ204085
	CALL PDSSTA (NQ,NP,1)	DQ204086
305	IF(I20.EQ.0) GO TO 400	DQ204087
	I1ST2=1	DQ204088
	DO 315 J=1,KNC	DQ204089
	IF(ICONT(1,J).NE.2) GO TO 315	DQ204090
	I1ST2=J	DQ204091
	GO TO 320	DQ204092
315	CONTINUE	DQ204093
	I20=0	DQ204094
	GO TO 400	DQ204095
320	CALL PDSCP2 (JL,I1ST2,I20S,NQ(I1ST2))	DQ204096
	JL=2	DQ204097
400	IF((IDIN(2).EQ.0).OR.(NQ(ITSXMJ).LT.ITSXM)) GO TO 600	DQ204098
401	KK=0	DQ204099
	DO 405 J=1,KNC	DQ204100
	IF(NP(J).NE.-2) GO TO 405	DQ204101
	WRITE (6,3) ITST(1),ICH(1,J),ICH(2,J)	DQ204102
	KK=1	DQ204103
405	CONTINUE	DQ204104
	IF(KK.EQ.0) GO TO 410	DQ204105
	CALL SWTHON (5)	DQ204106
	RETURN	DQ204107
410	CALL SWTHOF (6)	DQ204108
C	CONTROL SECTION FOR FINAL COMPUTATION AND OUTPUT	DQ204109
C	OF STATIONARITY AND NORMALITY TESTS AND FINAL	DQ204110
C	PASS FOR 2ND ORDER PROBABILITY FUNCTIONS	DQ204111
	CALL PDSNRM (NQ,NP,0)	DQ204112
	CALL PDSSTA (NQ,NP,0)	DQ204113
	IF(I20.EQ.0) GO TO 505	DQ204114
	CALL PDSCP2 (0,I1ST2,I20S,NQ(I1ST2))	DQ204115
	L=I1ST2+1	DQ204116
	IF(I20.EQ.1) GO TO 505	DQ204117
	WRITE (11) IDIN	DQ204118
	WRITE (11) BUF	DQ204119
	DO 412 J=1,19	DQ204120
412	IDIN(J)=0	DQ204121
	WRITE (11) IDIN	DQ204122
	ENDFILE 11	DQ204123
	REWIND 11	DQ204124
	DO 415 J=L,KNC	DQ204125
	NQ(J)=ITSX	DQ204126
415	CONTINUE	DQ204127
	DO 500 J=L,KNC	DQ204128

Contrails

```
JL=-1
IF(ICON(1,J).NE.2) GO TO 500
REWIND 11
420 READ (11) IDIN
IF(IDIN(1).EQ.0) GO TO 435
READ (11) BUF
IF((NQ(J)+IDIN(3)).GE.ICON(5,J)) GO TO 430
425 NQ(J)=NQ(J)+IDIN(3)
GO TO 420
430 CALL PDSCP2(JL,J,I20S,NQ(J))
JL=1
IF((NQ(J)+IDIN(3)).LT.ICON(6,J)) GO TO 425
435 CALL PDSCP2(0,J,I20S,NQ(J))
500 CONTINUE
505 RETURN
600 IF(I20.LE.1) GO TO 605
WRITE (11) IDIN
WRITE (11) BUF
605 READ (13) IDIN
IF(IDIN(1).EQ.ITST(1)) GO TO 250
WRITE (6,4) ITST(1),ITSXM,NQ(ITSXMJ)
GO TO 401
END
```

DQ204129
DQ204130
DQ204131
DQ204132
DQ204133
DQ204134
DQ204135
DQ204136
DQ204137
DQ204138
DQ204139
DQ204140
DQ204141
DQ204142
DQ204143
DQ204144
DQ204145
DQ204146
DQ204147
DQ204148
DQ204149
DQ204150
DQ204151

```
$IBFTC DQ205 M94/2,XR6,LIST
SUBROUTINE PDSCP1 (NQ,NP)
C COMPUTE 1ST ORDER P. D. FUNCTION
COMMON NFREQ,DT,FREQ(100),RA(82),ISWCH(10),DAY,DON,YEAR,IDMPT
COMMON/PROBAB/ITST(2),ICH(2,14),ICON(25,14),PD1(14,200),
*PD2(25,25,10),IDIN(20),IDOUT(20),BUF(14,200),CAL(14),VARD(14),
*DMEAN(14),VARS(14),SMEAN(14),KNC,ANRM(14),VALUS(14,5)
DIMENSION NP(14),CCNT(25,14),IBUF(14,200),IPD1(14,200)
EQUIVALENCE (ICON,CONT),(BUF,IBUF),(PD1,IPD1)
DIMENSION NQ(14)
M=IDIN(3)
IFF=1
IF(IDIN(20).NE.0) IFF=2
DO 300 J=1,KNC
N=0
IF(NP(J).LT.0) GO TO 300
IPC=ICH(1,J)
JPC=ICH(2,J)
IF(NP(J).EQ.0) N=(ICON(5,J)-((ICON(5,J)-1)/200)*200)-1
N=N+1
NM=ICON(7,J)
DO 200 L=N,M,NM
GO TO (110,120),IFF
110 Q=IBUF(IPC,L)
GO TO 125
120 Q=BUF(IPC,L)
125 Q=(Q-ANRM(J))*CAL(J)
F=ICON(2,J)
NPA=ICON(2,J)
I=(Q-CCNT(3,J))*F/(CONT(4,J)-CONT(3,J))
```

DQ205000
DQ205001
DQ205002
DQ205003
DQ205004
DQ205005
DQ205006
DQ205007
DQ205008
DQ205009
DQ205010
DQ205011
DQ205012
DQ205013
DQ205014
DQ205015
DQ205016
DQ205017
DQ205018
DQ205019
DQ205020
DQ205021
DQ205022
DQ205023
DQ205024
DQ205025
DQ205026
DQ205027
DQ205028
DQ205029

Contrails

```
IF(I.LT.1) I=1
IF(I.GT.NPA) I=NPA
IPD1(JPC,I)=IPD1(JPC,I)+1
NQ(J)=NQ(J)+NM
IF(NQ(J).LE.ICONT(6,J)) GO TO 200
NP(J)=-1
GO TO 300
200 CONTINUE
NP(J)=1
300 CONTINUE
RETURN
END
```

```
$IBFTC DQ205 M94/2,XR6,LIST
SUBROUTINE PDSSTA (NQ, NP, I)
C STATIONARITY TEST PROGRAM
COMMON NFREQ, DT, FREQ(100), RA(82), ISWTCH(10), DAY, DON, YEAR, IDP
COMMON/PROBAB/ITST(2), ICH(2,14), ICONT(25,14), PD1(14,200),
*PD2(25,25,10), IDIN(20), IDOUT(20), BUF(14,200), CAL(14), VARD(14)
*DMEAN(14), VARS(14), SMEAN(14), KNC, ANRM(14), VALUS(14,5)
DIMENSION CONT(25,14), IPD1(14,200), NQ(14), NP(14), IBUF(14,200)
EQUIVALENCE (ICONT,CONT), (PD1,IPD1), (BUF,IBUF)
1 FORMAT (1H1,44X,28HSTATIONARITY TESTS ON TEST (16,2X,16,1H)/
*1H0,41X,14HINPUT CHANNEL I2,10X,15HOUTPUT CHANNEL I2/6X,
*17HNO. OF INTERVALS I3,5X,15HINTERVAL WIDTH I6,5X,
*13HSTARTING PT. I6,5X,12HSKIP LENGTH I6,5X,
*10HBANDWIDTH IPE12.5)
7 FORMAT (1H0,52X,28HMEAN SQUARED INTERVAL VALUES/
*1H0,6(20H INT MEAN SQUARED ),A1)
2 FORMAT (6(1X,I3,2X,IPE12.5,2X))
3 FORMAT (1H0,56X,19HSTATIONARITY TEST A/20X,
*30HNO. OF INTERVALS PASSING TEST I6,10X,
*30HNO. OF INTERVALS FAILING TEST I6/28X,
*25HPROBABILITY OF LESS THAN I3,20H FAILURES GIVEN P = IPE12.5,
*4H IS IPE12.5)
4 FORMAT (1H0,56X,19HSTATIONARITY TEST A/54X,
*24HALL INTERVALS PASS TEST A1)
5 FORMAT (1H0,56X,19HSTATIONARITY TEST B/30X,
*16HSAMPLE VARIANCE IPE12.5,10X,24HTOTAL MEAN SQUARED VALUE,
*1X,IPE12.5/16X,32HTHEORETICAL NORMALIZED VARIANCE ,
*1PE12.5,14X,30HESTIMATED NORMALIZED VARIANCE IPE12.5/
*29X,43HRATIO OF ESTIMATED TO THEORETICAL VARIANCE ,
*1PE12.5,2X,5HOVER I3,10H INTERVALSA1)
6 FORMAT (1H0,56X,19HSTATIONARITY TEST C/30X,
*29HMAXIMUM MEAN SQUARE ESTIMATE IPE12.5,14X,
*29HMINIMUM MEAN SQUARE ESTIMATE IPE12.5/26X,
*25HRATIO OF MAX TO MIN OVER I3,11H INTERVALS ,
*12HGIVEN ?BT = IPE12.5,4H IS IPE12.5)
DIMENSION CHIS(14,100)
DATA BLANK/1H /
IF(I)100,500,120
100 DO 105 J=1,14
DO 105 L=1,100
105 CHIS(J,L)=0.
```


Contrails

```

    ICTS=NQ(1)+1
    RETURN
120  IFI=1
    IF(IDIN(20).NE.0) IFI=2
    DO 200 J=1,KNC
    ISR=ICCNT(7,J)
    KK=IDIN(3)
    LL=ICONT(10,J)
    ICU=ICH(1,J)
    IF(ICCNT(12,J).GT.(ICTS+IDIN(3))) GO TO 200
    IF(ICCNT(9,J).EQ.0) GO TO 200
    N=ICONT(10,J)*(ICONT(11,J)+ICONT(13,J))-ICONT(13,J)+ICONT(12,J)
    IF(ICTS.GT.N) GO TO 200
    DO 170 K=1,KK,ISR
    ITSU=ICTS+K-1
    DO 160 L=1,LL
    ICNS1=ICONT(12,J)+(L-1)*(ICONT(11,J)+ICONT(13,J))
    ICNS2=ICNS1+ICONT(11,J)
    IF(ITSU.LT.ICNS1) GO TO 170
    IF(ITSU.GT.ICNS2) GO TO 160
    GO TO (140,145),IFI
140  Q=IBUF(ICU,K)
    GO TO 150
145  Q=BUF(ICU,K)
150  CHIS(J,L)=CHIS(J,L)+((Q-ANRM(J))*CAL(J))**2
160  CONTINUE
170  CONTINUE
200  CONTINUE
    ICTS=ICTS+IDIN(3)
    RETURN
500  DO 900 J=1,KNC
    IF(ICCNT(9,J).EQ.0) GO TO 900
    NPPI=ICONT(11,J)
    NI=ICONT(10,J)
    WRITE (10,1)ITST,(ICH(L,J),L=1,2),(ICONT(L,J),L=10,14)
    Q=NPPI/ICONT(7,J)
    DO 505 L=1,NI
505  CHIS(J,L)=CHIS(J,L)/Q
    WRITE (10,7) BLANK
    WRITE (10,2) (L,CHIS(J,L),L=1,NI)
    SIG2X=VARD(J)+OMEAN(J)**2
    QQ=NPPI-1
    DEM=2.*ICONT(14,J)*QQ*DT
    FRS=SIG2X*VALUS(J,1)/DEM
    FLS=SIG2X*VALUS(J,2)/DEM
    IYES=0
    INO=0
    DO 515 L=1,NI
    IF((FRS.LE.CHIS(J,L)).AND.(FLS.GE.CHIS(J,L))) GO TO 510
    INO=INO+1
    GO TO 515
510  IYES=IYES+1
515  CONTINUE
    SUM=0.
    IF(INO.EQ.0) GO TO 550
    F=NI
    DO 540 L=1,INO
    SUM=SUM+F*((1.-VALUS(J,3))**L)*(VALUS(J,3)**(NI-L))
    DQ206041
    DQ206042
    DQ206043
    DQ206044
    DQ206045
    DQ206046
    DQ206047
    DQ206048
    DQ206049
    DQ206050
    DQ206051
    DQ206052
    DQ206053
    DQ206054
    DQ206055
    DQ206056
    DQ206057
    DQ206058
    DQ206059
    DQ206060
    DQ206061
    DQ206062
    DQ206063
    DQ206064
    DQ206065
    DQ206066
    DQ206067
    DQ206068
    DQ206069
    DQ206070
    DQ206071
    DQ206072
    DQ206073
    DQ206074
    DQ206075
    DQ206076
    DQ206077
    DQ206078
    DQ206079
    DQ206080
    DQ206081
    DQ206082
    DQ206083
    DQ206084
    DQ206085
    DQ206086
    DQ206087
    DQ206088
    DQ206089
    DQ206090
    DQ206091
    DQ206092
    DQ206093
    DQ206094
    DQ206095
    DQ206096
    DQ206097
    DQ206098

```

Contrails

```
Q=NI-L
QQ=L+1
F=F*Q/QQ
540 CONTINUE
WRITE (10,3) IYES,INO,INO,VALUS(J,3),SUM
GO TO 600
550 WRITE (10,4) BLANK
600 E2=2./DEM
SMN=0.
SVR=0.
DO 610 L=1,NI
SMN=SMN+CHIS(J,L)
SVR=SVR+CHIS(J,L)**2
610 CONTINUE
Q=NI
SMN=SMN/Q
SVR=SVR/Q
S2=SVR-SMN*SMN
BAT=S2/(SIG2X*SIG2X)
RAT=BAT/E2
WRITE (10,5) S2,SIG2X,E2,BAT,RAT,NI,BLANK
SMAX=0
SMIN=1.E+38
DO 650 L=1,NI
IF(CHIS(J,L).GT.SMAX) SMAX=CHIS(J,L)
IF(CHIS(J,L).LT.SMIN) SMIN=CHIS(J,L)
650 CONTINUE
FMAX=SMAX/SMIN
WRITE (10,6) SMAX,SMIN,NI,DEM,FMAX
900 CONTINUE
RETURN
END
```

DQ206099
DQ206100
DQ206101
DQ206102
DQ206103
DQ206104
DQ206105
DQ206106
DQ206107
DQ206108
DQ206109
DQ206110
DQ206111
DQ206112
DQ206113
DQ206114
DQ206115
DQ206116
DQ206117
DQ206118
DQ206119
DQ206120
DQ206121
DQ206122
DQ206123
DQ206124
DQ206125
DQ206126
DQ206127
DQ206128
DQ206129
DQ206130

```
$IBFTC DQ207 M94,XR6,LIST
SUBROUTINE PDSNRM (NQ,NP,I)
C NORMALITY TEST PROGRAM
COMMON NFREQ,DT,FREQ(100),RA(82),ISWTCH(10),DAY,DOY,YEAR,IDP
COMMON/PROBAB/ITST(2),ICH(2,14),ICONT(25,14),IPD1(14,200),
*PD2(25,25,10),IDIN(20),IDOUT(20),IBUF(14,200),CAL(14),VARD(14),
*DMEAN(14),VARS(14),SMEAN(14),KNC,ANRM(14),VALUS(14,5)
DIMENSION ICONT(25,14),IPD1(14,200),NQ(14),NP(14)
EQUIVALENCE (ICONT,CONT),(IPD1,IPD1)
DIMENSION IBUF(14,200),NDI(14)
EQUIVALENCE (BUF,IBUF)
1 FORMAT (1H1,55X,21HNORMALITY TEST VALUES/1H0,45X,
*11HINPUT TEST 16,5X,12HOUTPUT TEST 16/1H0,7X,
*13HINPUT CHANNEL,12X,14HOUTPUT CHANNEL,17X,4HMEAN,20X,
*8HVARIANCE,15X,13HNO. PTS. USED)
2 FORMAT (13X,13,22X,13,19X,1PE12.5,14X,1PE12.5,16X,16)
3 FORMAT (1H0,10X,14HINPUT CHANNEL 12,10X,15HOUTPUT CHANNEL 12,
*10X,20HCHI-SQUARED VALUE = 1PE12.5,10X,17HNO. OF INTERVALS 13)
DATA ISW/O/,BLANK/1H /
IF((I.EQ.ISW).OR.(I.EQ.C)) GO TO 200
ISW=1
```

DQ207000
DQ207001
DQ207002
DQ207003
DQ207004
DQ207005
DQ207006
DQ207007
DQ207008
DQ207009
DQ207010
DQ207011
DQ207012
DQ207013
DQ207014
DQ207015
DQ207016
DQ207017
DQ207018
DQ207019
DQ207020

Contrails

```

      DO 100 J=1,14
      ND(J)=0
      VARD(J)=0.
      DMEAN(J)=0.
100   CONTINUE
200   IF(I.EQ.0) GO TO 500
      DO 400 J=1,KNC
      IF(NP(J).LT.-1) GO TO 400
      IF(ND(J).GE.NQ(J)) GO TO 400
      IF(ND(J).EQ.0) GO TO 205
      I1=1
      GO TO 210
205   I1=ICONT(5,J)-((ICONT(5,J)-1)/200)*200
210   ND(J)=NQ(J)
      I2=IDIN(3)
      IF(NQ(J).LT.ICONT(6,J)) GO TO 220
      I2=ICONT(6,J)-((ICONT(6,J)-1)/200)*200
220   IPC=ICH(1,J)
      IFF=1
      IS1=ICONT(7,J)
      IF(IDIN(20).NE.0) IFF=2
      DO 300 L=I1,I2,IS1
      GO TO (230,240),IFF
230   Q=IBUF(IPC,L)
      GO TO 250
240   Q=BUF(IPC,L)
250   Q=(Q-ANRM(J))*CAL(J)
      DMEAN(J)=DMEAN(J)+Q
      VARD(J)=VARD(J)+Q*Q
300   CONTINUE
400   CONTINUE
      RETURN
500   DO 510 J=1,KNC
      IQ=(ICONT(6,J)-ICONT(5,J)+1)/ICONT(7,J)
      Q=IQ
      DMEAN(J)=DMEAN(J)/Q
      VARD(J)=(VARD(J)/Q)-DMEAN(J)*DMEAN(J)
      IF(J.EQ.1) WRITE (10,1) IFST,BLANK
      WRITE (10,2) (ICH(L,J),L=1,2),DMEAN(J),VARD(J),IQ
510   CONTINUE
      DO 900 J=1,KNC
      IF(ICONT(8,J).EQ.0) GO TO 900
      IOPT=ICONT(8,J)
      GO TO (600,650,700,750,800,850),IOPT
600   SUM=0.
      L=ICONT(2,J)
      X1=CONT(3,J)
      DX=(CONT(4,J)-CONT(3,J))
      Q1=ICONT(2,J)
      DX=DX/Q1
      DO 610 K=1,L
      SUMI=0.
      DXU=DX/8.
      SUMI=1./EXP(.5*((X1-DMEAN(J))**2)/VARD(J))
      DO 605 M=2,8
      X1=X1+DXU
      SUMI=SUMI+2./EXP(.5*((X1-DMEAN(J))**2)/VARD(J))
605   CONTINUE
```

Contrails

```
X1=X1+DXU
SUMI=SUMI+1./EXP(.5*((X1-DMEAN(J))*2)/VARD(J))
SUMI=SUMI*DXU/(2.*SQRT(6.28318*VARD(J)))
ICU=ICH(2,J)
Q1=IPD1(ICU,K)
Q1=((Q1/(DX*Q)-SUMI)**2)/SUMI
SUM=SUM+Q1
610 CONTINUE
WRITE (10,3) (ICH(L,J),L=1,2),SUM,ICONT(2,J)
GO TO 900
650 CONTINUE
700 CONTINUE
750 CONTINUE
800 CONTINUE
850 CONTINUE
900 CONTINUE
RETURN
END
```

DQ207079
DQ207080
DQ207081
DQ207082
DQ207083
DQ207084
DQ207085
DQ207086
DQ207087
DQ207088
DQ207089
DQ207090
DQ207091
DQ207092
DQ207093
DQ207094
DQ207095
DQ207096

```
$IBFTC DQ208 M94/2,XR6,LIST
SUBROUTINE PDSCP2 (IS,K,ISO,NQ)
C 2ND ORDER P. D. COMPUTATION PROGRAM
COMMON NFREQ,DT,FREQ(100),RA(82),ISWTC(10),DAY,DON,YEAR,IDMPT
COMMON/PROBAB/ITST(2),ICH(2,14),ICONT(25,14),PDI(14,200),
*PD2(25,25,10),IDIN(20),IDOUT(20),BUF(14,200),CAL(14),VARD(14),
*DMEAN(14),VARS(14),SMEAN(14),KNC,ANRM(14),VALUS(14,5)
DIMENSION IPD2(25,25,10),ISO(2,200),CONT(25,14)
EQUIVALENCE (PD2,IPD2),ICONT,CONT)
DIMENSION IBUF(14,200)
EQUIVALENCE (BUF,IBUF)
IQR=1
IF (IS) 100,300,150
100 DO 105 J=1,25
DO 105 L=1,25
DO 105 M=1,10
IPD2(J,L,M)=0
105 CONTINUE
DO 110 J=1,200
ISO(1,J)=0
ISO(2,J)=0
110 CONTINUE
ISP=((ICONT(5,K)-1)/200)*200
ISP=ICONT(5,K)-ISP
I=1
112 IPC=ICH(1,K)
IEP=IDIN(3)
IF (IABS(19).EQ.2) GO TO 115
ITFE=NQ+IEP
IF (ITFE.GT.ICONT(6,K)) IEP=ICONT(6,K)
GO TO 120
115 IF (NQ.GE.ICONT(6,K)) IEP=ICONT(6,K)
120 JLMX=25
IF (ICONT(2,K).LT.25) JLMX=ICONT(2,K)
Q=JLMX
```

DQ208000
DQ208001
DQ208002
DQ208003
DQ208004
DQ208005
DQ208006
DQ208007
DQ208008
DQ208009
DQ208010
DQ208011
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DQ208013
DQ208014
DQ208015
DQ208016
DQ208017
DQ208018
DQ208019
DQ208020
DQ208021
DQ208022
DQ208023
DQ208024
DQ208025
DQ208026
DQ208027
DQ208028
DQ208029
DQ208030
DQ208031
DQ208032
DQ208033
DQ208034

Contrails

	R=Q/(CONT(4,K)-CONT(3,K)).	DQ208035
	GO TO 200	DQ208036
150	I=2	DQ208037
	ISP=1	DQ208038
	DO 160 L=1,200	DQ208039
160	ISO(2,L)=0	DQ208040
	GO TO 112	DQ208041
200	IFE=1	DQ208042
	IF(IDIN(20).NE.0) IFE=2	DQ208043
	ISM=IGCNT(7,K)	DQ208044
201	IF(IEP.LE.200) GO TO 204	DQ208045
	IEP=IEP-200	DQ208046
	GO TO 201	DQ208047
204	DO 220 L=ISP,IEP	DQ208048
	GO TO (205,210),IFE	DQ208049
205	Q=IBUF(IPC,L)	DQ208050
	GO TO 215	DQ208051
210	Q=BUF(IPC,L)	DQ208052
215	Q=(Q-ANRM(K))*CAL(K)	DQ208053
	IN=(Q-CONT(3,K))*R+1.	DQ208054
	IF(IN.GT.JLMX) IN=JLMX	DQ208055
	ISO(1,L)=IN	DQ208056
220	CONTINUE	DQ208057
	IF(I.EQ.1) RETURN	DQ208058
225	NTV=IGCNT(15,K)+15	DQ208059
	DO 250 J=1,200,ISM	DQ208060
	IF(ISO(1,J).EQ.0) GO TO 250	DQ208061
	DO 240 L=16,NTV	DQ208062
	M=ICONT(L,K)+J	DQ208063
	LL=1	DQ208064
	IF(M.LE.200) GO TO 230	DQ208065
	LL=2	DQ208066
	M=M-200	DQ208067
230	IM=ISO(LL,M)	DQ208068
	IN=ISO(1,J)	DQ208069
	IF((IM.EQ.0).OR.(IN.EQ.0)) GO TO 240	DQ208070
	IL=L-15	DQ208071
	IPD2(IN,IM,IL)=IPD2(IN,IM,IL)+1	DQ208072
240	CONTINUE	DQ208073
250	CONTINUE	DQ208074
	DO 260 L=1,200	DQ208075
	ISO(1,L)=ISO(2,L)	DQ208076
260	CONTINUE	DQ208077
	IF(IQR.EQ.1) RETURN	DQ208078
	CALL PDSOT2 (K)	DQ208079
	RETURN	DQ208080
300	IQR=2	DQ208081
	DO 305 L=1,200	DQ208082
	ISO(2,L)=0	DQ208083
305	CONTINUE	DQ208084
	GO TO 225	DQ208085
	END	DQ208086

Contrails

```
SIBFTG DQ209 M94/2, XR7, LIST DQ209000
SUBROUTINE PDSQT2 (K) DQ209001
C 2ND ORDER P. D. OUTPUT ROUTINE DQ209002
COMMON NFREQ, DT, FREQ(100), RA(82), ISWTCH(10), DAY, DON, YEAR, IDMP T DQ209003
COMMON/PROBAR/ITST(2), ICH(2,14), ICONT(25,14), IPD1(14,200), DQ209004
*IPD2(25,25,10), IDIN(20), IDOUT(20), BUF(14,200), CAL(14), VARD(14), DQ209005
*DMEAN(14), VARS(14), SMEAN(14), KNC, ANRM(14), VALUS(14,5) DQ209006
DATA AMS/5H-----/, BLK/1H / DQ209007
DIMENSION IA(25), PA(25), NA(10) DQ209008
DIMENSION CONT(25,14) DQ209009
EQUIVALENCE (ICONT, CONT) DQ209010
1 FORMAT(1H1,46X,38H2ND ORDER PROBABILITY DENSITY FUNCTION, DQ209011
*20X,3A3/23X,11HINPUT TEST I6,5X,12HOUTPUT TEST I6,5X, DQ209012
*14HINPUT CHANNEL I3,5X,15HOUTPUT CHANNEL I3,A1/ DQ209013
*28X,10HTAU SHIFT IPE12.5,20X,21HNORMALIZATION FACTOR IPE12.5) DQ209014
2 FORMAT (4X,I3,4X,I3I2X,F7.4)/15X,I3(2X,F7.4)) DQ209015
4 FORMAT (1H0,3X,3HJ /,25(I3,2H /)) DQ209016
5 FORMAT (3X,1HI,3H -,25A5) DQ209017
6 FORMAT (I4,3H /,25(I4,1H/)) DQ209018
7 FORMAT (6X,1H-,25A5) DQ209019
8 FORMAT (1H0) DQ209020
NI=ICONT(2,K) DQ209021
IF(NI.GT.25) NI=25 DQ209022
Q=NI DQ209023
DO 100 L=1,10 DQ209024
100 NA(L)=0 DQ209025
NT=ICONT(15,K) DQ209026
DO 105 M=1,NI DQ209027
DO 105 J=1,NI DQ209028
DO 105 L=1,NT DQ209029
NA(L)=NA(L)+IPD2(M,J,L) DQ209030
105 CONTINUE DQ209031
DO 200 L=1,NT DQ209032
LL=L+15 DQ209033
Q=ICONT(LL,K) DQ209034
Q=Q*DT DQ209035
R=NA(L) DQ209036
WRITE (10,1) DAY,DON,YEAR,ITST,ICH(1,K),ICH(2,K),BLK,Q,R DQ209037
WRITE (10,8) DQ209038
DO 130 M=1,NI DQ209039
DO 120 N=1,NI DQ209040
PA(N)=IPD2(M,N,L) DQ209041
PA(N)=PA(N)/R DQ209042
120 CONTINUE DQ209043
WRITE (10,2) M,(PA(I),I=1,NI) DQ209044
130 CONTINUE DQ209045
WRITE (10,1) DAY,DON,YEAR,ITST,ICH(1,K),ICH(2,K),BLK,Q,R DQ209046
WRITE (10,4) {I,I=1,NI} DQ209047
WRITE (10,5) DQ209048
DO 150 M=1,NI DQ209049
DO 140 N=1,NI DQ209050
IA(N)=(IPD2(M,N,L)*1000)/NA(L) DQ209051
140 CONTINUE DQ209052
WRITE (10,6) M,(IA(I),I=1,NI) DQ209053
WRITE (10,7) {AMS,I=1,NI} DQ209054
150 CONTINUE DQ209055
200 CONTINUE DQ209056
RETURN DQ209057
```


Contracts

END

DQ209058

```
$BREGIN      Q,CK2,NOREW
$IBFTO DQ310  M94/2,XR6,LIST
SUBROUTINE PDSOTP
C           P. D. OUTPUT CONTROL PROGRAM
LOGICAL ZERO,NZER,SWITCH
COMMON NFREQ,DT,FREQ(100),RA(82),ISWTC(10),DAY,DON,YEAR,IDPT
COMMON/PROBAB/ITST(2),ICH(2,14),ICONT(25,14),PD1(14,200),
*PD2(25,25,10),IDIN(20),IDOUT(20),BUF(14,200),CAL(14),VARD(14),
*DMEAN(14),VARS(14),SMEAN(14),KNC,ANRM(14),VALUS(14,5)
DO 200 J=1,KNC
IF(ICONT(1,J).LT.1) GO TO 200
CALL PDSPAP (J)
200 CONTINUE
CALL POSBTD
RETURN
END
```

000
DQ310000
DQ310001
DQ310002
DQ310003
DQ310004
DQ310005
DQ310006
DQ310007
DQ310008
DQ310009
DQ310010
DQ310011
DQ310012
DQ310013
DQ310014

```
$IBFTO DQ311  M94/2,XR6,LIST
SUBROUTINE POSBTD
C           WRITE BINARY TIME DATA FILE
COMMON/PROBAB/ITST(2),ICH(2,14),ICONT(25,14),PD1(14,200),
*PD2(25,25,10),IDIN(20),IDOUT(20),BUF(14,200),CAL(14),VARD(14),
*DMEAN(14),VARS(14),SMEAN(14),KNC,ANRM(14),VALUS(14,5)
DIMENSION IPD1(14,200)
EQUIVALENCE (PD1,IPD1)
DIMENSION CONT(25,14)
EQUIVALENCE (ICONT,CONT)
IDOUT(1)=ITST(2)
IDOUT(2)=1
IDOUT(3)=200
IDOUT(4)=0
IDOUT(5)=KNC
IDOUT(20)=1
DO 100 J=6,19
IDOUT(J)=0
100 CONTINUE
DO 105 J=1,KNC
L=ICH(2,J)+5
IDOUT(L)=1
105 CONTINUE
DO 200 J=1,KNC
IF(ICONT(1,J).LT.1) GO TO 200
IOC=ICH(2,J)
ISU=0
INP=ICONT(2,J)
DO 110 L=1,INP
ISU=ISU+IPD1(IOC,L)
110 PD1(IOC,L)=IPD1(IOC,L)
```

DQ311000
DQ311001
DQ311002
DQ311003
DQ311004
DQ311005
DQ311006
DQ311007
DQ311008
DQ311009
DQ311010
DQ311011
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DQ311013
DQ311014
DQ311015
DQ311016
DQ311017
DQ311018
DQ311019
DQ311020
DQ311021
DQ311022
DQ311023
DQ311024
DQ311025
DQ311026
DQ311027
DQ311028
DQ311029
DQ311030

Contrails

```
Q=ISU
R=(CONT(4,J)-CONT(3,J))
T=ICONT(2,J)
R=R/T
DO 120 L=1,INP
PD1(IOC,L)=PD1(IOC,L)/(R*Q)
120 CONTINUE
L=INP+1
IF(L.GT.200) GO TO 200
DO 130 M=L,200
PD1(IOC,M)=0.
130 CONTINUE
200 CONTINUE
WRITE (2) IDOUT
WRITE (2) PD1
RETURN
END
```

DQ311031
DQ311032
DQ311033
DQ311034
DQ311035
DQ311036
DQ311037
DQ311038
DQ311039
DQ311040
DQ311041
DQ311042
DQ311043
DQ311044
DQ311045
DQ311046
DQ311047

```
$IBFTC DQ312 M94/2,XR6,LIST
SUBROUTINE POSPAP (I)
C PRINT AND PLOT FIRST ORDER P. D. FUNCTIONS
DIMENSION CONT(25,14),IPD1(14,200),PA(100)
COMMON NFREQ,DT,FREQ(100),RA(82),ISWCH(10),DAY,DON,YEAR,IDPT
COMMON/PROBAB/ITST(2),ICH(2,14),ICONT(25,14),PD1(14,200),
*PD2(25,25,10),IDIN(20),IDOUT(20),BUF(14,200),CAL(14),VARD(14),
*DMEAN(14),VARS(14),SMEAN(14),KNC,ANRM(14),VALUS(14,5)
EQUIVALENCE (ICONT,CONT),(PD1,IPD1)
DATA STAR,CROSS,BLANK/1H*,1HX,1H /,LOTS/0777777777777/
DATA ONE/1H1/
1 FORMAT (1H1,46X,38H1ST ORDER PROBABILITY DENSITY FUNCTION,
*30X,3A3/1H0,14X,11HINPUT TEST I6,10X,12HOUTPUT TEST I6,10X,
*14HINPUT CHANNEL I4,10X,15HOUTPUT CHANNEL I4/1H0,10X,
*18HRANGE OF FUNCTION 1PE13.6,4H TO 1PE13.6,10X,
*17HNO. OF INTERVALS I6,17H INTERVAL WIDTH 1PE13.6)
2 FORMAT (5X,3H X(I3,3H) 1PE13.6,7H . -)
3 FORMAT (A1,2X,14H VALUE ACTUAL I9,5X,1H.100A1)
4 FORMAT (5X,I3,13H(TH) INTERVAL,10X,1H.100A1)
5 FORMAT (18H VALUE NORMALIZED 1PE12.5,2H .100A1)
6 FORMAT (5X,3H X(I3,3H) 1PE13.6,7H . -)
7 FORMAT (17X,27HHISTOGRAM VALUES MINIMUM I9,3X,
*8HMAXIMUM I9,3X,6HTOTAL I9,3X,11HRESOLUTION 1PE12.5/
*A1)
K=ICH(2,I)
N=ICONT(2,I)
F=N
FIV=(CONT(4,I)-CONT(3,I))/F
ISMX=0
ISMN=LOTS
IST=0
DO 100 J=1,N
IF(IPD1(K,J).GT.ISMX) ISMX=IPD1(K,J)
IF(IPD1(K,J).LT.ISMN) ISMN=IPD1(K,J)
IST=IST+IPD1(K,J)
100 CONTINUE
```

DQ312000
DQ312001
DQ312002
DQ312003
DQ312004
DQ312005
DQ312006
DQ312007
DQ312008
DQ312009
DQ312010
DQ312011
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DQ312013
DQ312014
DQ312015
DQ312016
DQ312017
DQ312018
DQ312019
DQ312020
DQ312021
DQ312022
DQ312023
DQ312024
DQ312025
DQ312026
DQ312027
DQ312028
DQ312029
DQ312030
DQ312031
DQ312032
DQ312033
DQ312034
DQ312035

Contrails

```
RES=ISMX-ISMN
RES=100./RES
T=CONT(3,1)
J=1
L=12
X=BLANK
WRITE (10,1) DAY,DON,YEAR,ITST,(ICH(L,I),L=1,2),
*(CONT(K,I),K=3,4),ICONT(2,I),FIV
WRITE (10,7) ISMN,ISMX,IST,RES,BLANK
WRITE (10,2) J,T
DO 200 J=1,N
M=J+1
T=T+FIV
DO 110 LN=1,100
PA(LN)=BLANK
110 CONTINUE
XX=IPD1(K,J)-ISMN
IX=XX*RES+1.
IF(IX.LT.1) IX=1
IF(IX.GT.100) IX=100
DO 130 LN=1,IX
IF(((J/2)*2).EQ.J) GO TO 120
PA(LN)=STAR
GO TO 130
120 PA(LN)=CROSS
130 CONTINUE
WRITE (10,3) X,IPD1(K,J),PA
WRITE (10,4) J,PA
Q=IPD1(K,J)
QQ=IST
Q=Q/QQ
X=BLANK
WRITE (10,5) Q,PA
WRITE (10,6) M,T
IF(J.NE.L) GO TO 200
X=ONE
L=L+15
200 CONTINUE
RETURN
END
```

DQ312036
DQ312037
DQ312038
DQ312039
DQ312040
DQ312041
DQ312042
DQ312043
DQ312044
DQ312045
DQ312046
DQ312047
DQ312048
DQ312049
DQ312050
DQ312051
DQ312052
DQ312053
DQ312054
DQ312055
DQ312056
DQ312057
DQ312058
DQ312059
DQ312060
DQ312061
DQ312062
DQ312063
DQ312064
DQ312065
DQ312066
DQ312067
DQ312068
DQ312069
DQ312070
DQ312071
DQ312072
DQ312073
DQ312074
DQ312075

THE FOLLOWING DECKS AA893 THRU AA896 ARE THE
DECKS NECESSARY FOR THE AUXILIARY SYSTEM
WHICH DEFINE THE RANDOM NUMBER GENERATOR.

FOR THE PROPER OPERATION OF THIS AUXILIARY
SYSTEM THESE DECKS MUST REPLACE THE \$IBLDR
CARD FOR DECK AA893 WHICH IS CURRENTLY IN
THE LOAD DECK.

DECK AA893 MUST BE PRECEDED BY THE FOLLOWING
CARD

COL 1 16
\$IEDIT

DECK AA896 MUST BE FOLLOWED BY THE FOLLOWING
CARD

COL 1 16
\$IEDIT SYSLB2,SRCH1

Contrails

```
ORIGIN          A,CK2,NOREW                                000
$IBFTC AA893    M94/2,XR6,LIST                            AA893000
SUBROUTINE AUXILU (IRET)                                  AA893001
C              AUXILIARY SYSTEM MONITOR                  AA893002
C  IRET=1  - A CARD WILL BE READ UPON RETURNING TO THE JOB MONITOR. AA893003
C          THIS CARD MUST BE A *BEGIN CONTROL CARD OR ANY CARD AA893004
C          OR SERIES OF CARDS WHICH ARE READ AND PROCESSED AA893005
C          IN THE CARD ROUTINE AND ARE IN TURN AA893006
C          FOLLOWED BY A *BEGIN CONTROL CARD. AA893007
C  IRET=2  - A CALL TO THE CARD ROUTINE PRECEEDS THE RETURN. AA893008
C          THIS SETS A *BEGIN, *JOB, OR *END CARD INTO THE AA893009
C          CARD ARRAY TO BE PROCESSED BY THE JOB MONITOR. AA893010
COMMON NFREQ,DT,FREQ(100),RA(82),ISWTCH(10),DAY,DON,YEAR AA893011
LOGICAL SWITCH,ZERO,NZER AA893012
C THE REMAINING PORTION OF THE PROGRAM IS TO BE AA893013
C WRITTEN BY THE USER AA893014
C THIS SYSTEM IS INCLUDED TO ENABLE A USER OF SYSTRAN AA893015
C TO UTILIZE THE DATA GENERATED BY THE SYSTEM IN AA893016
C A SPECIALIZED MANNER WHICH THE USER DESIRES. AA893017
C THE DATA LINKAGE BETWEEN THIS SYSTEM AND THE AA893018
C OTHER SYSTEMS OF SYSTRAN MUST BE ACCOMPLISHED AA893019
C THROUGH THE USE OF THE PROGRAM FILES. AA893020
C 40000 (OCTAL) CELLS ARE AVAILABLE FOR THIS SYSTEM AA893021
C ANY OF THE ROUTINES PRESENT IN THE JOB MONITOR ARE AA893022
C AVAILABLE FOR USE IN THIS SYSTEM. AA893023
C IN USING ANY PROGRAM FILES THE USER SHOULD AA893024
C BE SURE AND CHECK THE PROPER SWITCHES TO SEE AA893025
C IF THE FILE HAS BEEN GENERATED PROPERLY. AA893026
C*** AA893027
C*** AA893028
COMMON/RANDNC/ITEST,CONT(14,6),ID(20),BUF(14,200) AA893029
DIMENSION ICONT(14,6),TYPE(6),NL(14),SP(14) AA893030
EQUIVALENCE (CONT,ICONT) AA893031
DATA TEST,RAND,COMMA,SLASH,STAR/2HTE,4HRAND,1H,,1H/,1H*/ AA893032
DATA ISTRN/0343277244615/,BLANK/1H / AA893033
DATA (TYPE(I),I=1,6)/2HCH,2HME,2HSI,2HST,2HNU,2HKE/ AA893034
1  FORMAT (38H ***** NO TESTS OF RANDOM NUMBERS HAVE, AA893035
*15H BEEN GENERATED) AA893036
2  FORMAT (6A6) AA893037
3  FORMAT (6I6) AA893038
4  FORMAT (3E12.0) AA893039
5  FORMAT (43H FINAL RANDOM NUMBER IN SERIES FOR CHANNEL 12, AA893040
* 5H WAS 012) AA893041
CALL SWTHOF (3) AA893042
ITEST=C AA893043
REWIND 13 AA893044
IRET=2 AA893045
100 CALL CARD AA893046
IF(NZER(RA(1),STAR))GO TO 115 AA893047
CALL PACK (2,5,WO,RA) AA893048
IF(ZERO(WO,RAND)) GO TO 105 AA893049
IF(ITEST.NE.0) GO TO 200 AA893050
CALL SWTHON (3) AA893051
```

Contrails

	WRITE (6,1)	AA893052
	RETURN	AA893053
105	J=5	AA893054
110	J=J+1	AA893055
	IF(NZER(RA(J),COMMA)) GO TO 110	AA893056
	GO TO 120	AA893057
115	J=0	AA893058
120	IF(ZERO(RA(J+1),COMMA)) GO TO 100	AA893059
	J=J+1	AA893060
	CALL PACK (J,J+1,WO,RA)	AA893061
	IF(NZER(WO,TEST)) GO TO 140	AA893062
	IF(ITEST.NE.0) GO TO 205	AA893063
122	DO 125 L=1,14	AA893064
	CONT(L,3)=1.	AA893065
	ICONT(L,4)=ISTRN	AA893066
	ICONT(L,6)=0	AA893067
	ICONT(L,1)=0	AA893068
	NL(L)=0	AA893069
	ICONT(L,5)=0	AA893070
125	ICONT(L,2)=0	AA893071
	NLI=1	AA893072
130	J=J+1	AA893073
	IF(NZER(RA(J),SLASH)) GO TO 130	AA893074
	L=J+1	AA893075
135	J=J+1	AA893076
	IF(NZER(RA(J),COMMA)) GO TO 135	AA893077
	CALL PACK (L,J-1,WO,RA)	AA893078
	CALL RITE31	AA893079
	WRITE (31,2) WO	AA893080
	CALL READ31	AA893081
	READ (31,3) ITEST	AA893082
	GO TO 120	AA893083
140	DO 145 L=1,6	AA893084
	IF(NZER(WO,TYPE(L))) GO TO 145	AA893085
	LL=L	AA893086
	GO TO 162	AA893087
145	CONTINUE	AA893088
	CALL WROUT (1,910)	AA893089
	CALL SWTHON (3)	AA893090
148	J=J+1	AA893091
	IF(NZER(RA(J),COMMA)) GO TO 148	AA893092
	GO TO 120	AA893093
150	J=J+1	AA893094
	IF(NZER(RA(J),SLASH)) GO TO 150	AA893095
	L=J+1	AA893096
155	J=J+1	AA893097
	IF(NZER(RA(J),COMMA)) GO TO 155	AA893098
	CALL RITE31	AA893099
	GO TO (160,170,170,190,160,160),LL	AA893100
160	CALL PACK (L,J-1,WO,RA)	AA893101
	WRITE (31,2) WO	AA893102
	CALL READ31	AA893103
	READ (31,3) ICONT(NLI,LL)	AA893104
	GO TO 120	AA893105
162	IF(NL(LL).NE.0) GO TO 165	AA893106
	NL(LL)=1	AA893107
	GO TO 150	AA893108
165	NLI=NLI+1	AA893109

Contrails

	DO 168 L=1,14	AA893110
	NL(L)=0	AA893111
168	CONTINUE	AA893112
	NL(LL)=1	AA893113
	IF(NLI.LE.14) GO TO 150	AA893114
	CALL WRDOUT (1,911)	AA893115
	CALL SWTHON (3)	AA893116
	NLI=1	AA893117
	GO TO 150	AA893118
170	WOO=BLANK	AA893119
	M=J-1	AA893120
	IF((J-L).LE.6) GO TO 175	AA893121
	CALL PACK (L+6,M,WOO,RA)	AA893122
	M=L+5	AA893123
175	CALL PACK (L,M,WO,RA)	AA893124
	WRITE (31,2) WO,WOO	AA893125
	CALL READ31	AA893126
	READ (31,4) CONT(NLI,LL)	AA893127
	GO TO 120	AA893128
190	CALL GTST (L,J-1,CONT(NLI,4),RA)	AA893129
	GO TO 120	AA893130
200	KR=1	AA893131
	GO TO 210	AA893132
205	KR=2	AA893133
210	IF(SWITCH(1,3)) GO TO (1000,122),KR	AA893134
	ID(1)=ITEST	AA893135
	MNP=0	AA893136
	DO 213 KJ=1,14	AA893137
	ID(KJ+5)=0	AA893138
	DO 213 K=1,200	AA893139
	BUF(KJ,K)=0.	AA893140
213	CONTINUE	AA893141
	ID(2)=0	AA893142
	ID(4)=1	AA893143
	ID(20)=1	AA893144
	ID(5)=0	AA893145
	DO 215 KJ=1,14	AA893146
	K=ICONT(KJ,1)+5	AA893147
	IF(K.LT.6) GO TO 215	AA893148
	ID(K)=1	AA893149
	ID(5)=ID(5)+1	AA893150
	SP(K-5)=CONT(KJ,4)	AA893151
	IF(ICONT(KJ,5).GT.MNP) MNP=ICONT(KJ,5)	AA893152
215	CONTINUE	AA893153
	DO 290 KJ=1,MNP,200	AA893154
	KAJ=KJ+200	AA893155
	KAE=200	AA893156
	IF(KAJ.GT.MNP) KAE=MNP-KJ	AA893157
	DO 280 LJ=1,14	AA893158
	IF(ID(LJ+5).EQ.0) GO TO 280	AA893159
	DO 220 LM=1,14	AA893160
	IF(ICONT(LM,1).NE.LJ) GO TO 220	AA893161
	ISN=LM	AA893162
	GO TO 225	AA893163
220	CONTINUE	AA893164
	GO TO 280	AA893165
225	DO 270 LM=1,KAE	AA893166
	IF((KJ+LM).GT.ICONT(ISN,5)) GO TO 260	AA893167

Contrails

	CALL RANDNR (SP(LJ),A)	AA893168
	IF((KJ+LM).EQ.ICONT(ISN,5)) WRITE (10,5) LJ,SP(LJ)	AA893169
	IF(ICONT(ISN,6).EQ.0) GO TO 240	AA893170
	CALL RNTRF (ICONT(ISN,6),A,CONT(ISN,2),CONT(ISN,3))	AA893171
240	BUF(LJ,LM)=A	AA893172
	GO TO 270	AA893173
260	BUF(LJ,LM)=CONT(ISN,2)	AA893174
270	CONTINUE	AA893175
280	CONTINUE	AA893176
	IF(KAJ.GT.MNP) ID(2)=1	AA893177
	ID(3)=KAE	AA893178
	WRITE (13) ID	AA893179
	WRITE (13) BUF	AA893180
290	CONTINUE	AA893181
	GO TO(1000,122),KR	AA893182
1000	DO 1005 J=1,19	AA893183
	ID(J)=0	AA893184
1005	CONTINUE	AA893185
	WRITE (13) ID	AA893186
	ENDFILE 13	AA893187
	REWIND 13	AA893188
	CALL SWTHON (29)	AA893189
	RETURN	AA893190
	END	AA893191

	\$IBMAP AA894 20,M94	AA894000
	ENTRY RANDNR	AA894001
RANDNR	SAVE (4)	AA894002
	LDQ* 3,4	AA894003
	MPY GENERA	AA894004
	STQ* 3,4	AA894005
	CLA AAA	AA894006
	LGL 28	AA894007
	FAD AAA	AA894008
	STO* 4,4	AA894009
	RETURN RANDNR	AA894010
GENERA	OCT 343277244615	AA894011
AAA	OCT 172000000100	AA894012
	END	AA894013

	\$IBFTC AA895 M94/2,XR6,LIST	AA895000
	SUBROUTINE RNTRF (KEY,R,U,SIG)	AA895001
	GO TO (100,200,300,400,500),KEY	AA895002
100	Q=ABS(1.-2.*R)	AA895003
	Q=.5*(1.-Q)	AA895004
	Q=-2.*ALOG(Q)	AA895005
	V=SQRT(Q)	AA895006
	SIGN=1.	AA895007
	IF((R-.5).LT.0.)SIGN=-1.	AA895008
	Q=2.515517+.802853*V+.010328*V*V	AA895009

Contrails

QQ=1.+1.432788*V+.189269*V*V+.001308*V*V*V
R=((V-Q/QQ)*SIGN)*SIG+U

RETURN
200 CONTINUE
300 CONTINUE
400 CONTINUE
500 CONTINUE
RETURN
END

AA895010
AA895011
AA895012
AA895013
AA895014
AA895015
AA895016
AA895017
AA895018

\$IBMAP AA896 20,M94
ENTRY GTST
GTST SAVE (1,2,4)
CAL* 3,4
PAC 0,1
CLA* 4,4
PAC 0,2
TIX **1,2,1
SXD A,2
CLA 6,4
SUB ONE
STA B
ZAC
B LDQ **,1
RQL 3
LGL 3
TXI **1,1,-1
A TXH B,1,**
SLW* 5,4
RETURN GTST
ONE OCT 1
END

AA896000
AA896001
AA896002
AA896003
AA896004
AA896005
AA896006
AA896007
AA896008
AA896009
AA896010
AA896011
AA896012
AA896013
AA896014
AA896015
AA896016
AA896017
AA896018
AA896019
AA896020
AA896021

Contracts

Load Deck

If the Probability and Filter Systems are included on the SYSTRAN Binary Program Tape, an expanded Load Deck is necessary. Of course, the Random Number Generator can also be put on the Program Tape in place of the normal Auxiliary System. If this is done, the appropriate \$IBLDR cards must be included in the Load Deck.

The Load Deck, exclusive of the Random Number Generator, is listed below.

```

IBB WR00
$EXECUTE
$IBJOB SYSTRN
$POOL
$IEDIT
$IBLDR J0001
$IBLDR J0002
$IBLDR J0003
$IBLDR J0004
$IBLDR J0005
$IBLDR J0006
$IBLDR J0007
$IBLDR J0008
$IBLDR J0009
$ORIGIN A,CK2,NOREW
$IBLDR JA110
$IBLDR JA111
$ORIGIN A,CK2,NOREW
$IBLDR TA212
$ORIGIN B,CK2,NOREW
$IBLDR TB113
$IBLDR TB114
$ORIGIN B,CK2,NOREW
$IBLDR TB215
$IBLDR TB216
$ORIGIN B,CK2,NOREW
$IBLDR TB317
$IBLDR TB318
$ORIGIN C,CK2,NOREW
$IBLDR TC119
$ORIGIN C,CK2,NOREW
$IBLDR TC220
$IBLDR TC221
$ORIGIN C,CK2,NOREW
$IBLDR TC322
$IBLDR TC323
$ORIGIN C,CK2,NOREW
$IBLDR TC424
$ORIGIN B,CK2,NOREW
$IBLDR TB425
$IBLDR TB426
$ORIGIN A,CK2,NOREW
$IBLDR RA428
$ORIGIN D,CK2,NOREW
$IBLDR RD129
$IBLDR RD130
$IBLDR RD131
$ORIGIN D,CK2,NOREW
$IBLDR RD232
$ORIGIN E,CK2,NOREW
$IBLDR RE133
$ORIGIN E,CK2,NOREW
$IBLDR RE234
$IBLDR RE235

```

Contrails

\$ORIGIN	E,CK2,NOREW
\$IBLDR RE336	
\$IBLDR RE337	
\$IBLDR RE338	
\$IBLDR RE339	
\$ORIGIN	A,CK2,NOREW
\$IBLDR UA540	
\$IBLDR UA541	
\$IBLDR UA542	
\$IBLDR UA543	
\$ORIGIN	F,CK2,NOREW
\$IBLDR UF144	
\$ORIGIN	G,CK2,NOREW
\$IBLDR UG145	
\$IBLDR UG146	
\$IBLDR UG147	
\$ORIGIN	G,CK2,NOREW
\$IBLDR UG248	
\$ORIGIN	F,CK2,NOREW
\$IBLDR UF249	
\$ORIGIN	F,CK2,NOREW
\$IBLDR UF350	
\$ORIGIN	A,CK2,NOREW
\$IBLDR CA651	
\$IBLDR CA652	
\$ORIGIN	H,CK2,NOREW
\$IBLDR CH153	
\$ORIGIN	I,CK2,NOREW
\$IBLDR CI154	
\$ORIGIN	I,CK2,NOREW
\$IBLDR CI255	
\$ORIGIN	H,CK2,NOREW
\$IBLDR CH256	
\$IBLDR CH257	
\$IBLDR CH258	
\$ORIGIN	Z,CK2,NOREW
\$IBLDR CZ257	
\$ORIGIN	Z,CK2,NOREW
\$IBLDR CZ258	
\$ORIGIN	H,CK2,NOREW
\$IBLDR CH359	
\$IBLDR CH360	
\$ORIGIN	H,CK2,NOREW
\$IBLDR CH461	
\$ORIGIN	H,CK2,NOREW
\$IBLDR CH562	
\$ORIGIN	J,CK2,NOREW
\$IBLDR CJ163	
\$ORIGIN	J,CK2,NOREW
\$IBLDR CJ264	
\$IBLDR CJ265	
\$ORIGIN	A,CK2,NOREW
\$IBLDR FA766	
\$ORIGIN	K,CK2,NOREW
\$IBLDR FK167	
\$ORIGIN	L,CK2,NOREW
\$IBLDR FL168	

Contrails

196 4401

\$ORIGIN	L,CK2,NOREW
\$IBLDR FL269	
\$IBLDR FL270	
\$IBLDR FL271	
\$IBLDR FL272	
\$ORIGIN	M,CK2,NOREW
\$IBLDR FM173	
\$ORIGIN	M,CK2,NOREW
\$IBLDR FM274	
\$ORIGIN	L,CK2,NOREW
\$IBLDR FL375	
\$IBLDR FL376	
\$IBLDR FL377	
\$ORIGIN	N,CK2,NOREW
\$IBLDR FN178	
\$ORIGIN	N,CK2,NOREW
\$IBLDR FN279	
\$IBLDR FN280	
\$IBLDR FN281	
\$ORIGIN	K,CK2,NOREW
\$IBLDR FK282	
\$ORIGIN	K,CK2,NOREW
\$IBLDR FK383	
\$ORIGIN	O,CK2,NOREW
\$IBLDR FO184	
\$ORIGIN	O,CK2,NOREW
\$IBLDR FO285	
\$ORIGIN	O,CK2,NOREW
\$IBLDR FO386	
\$IBLDR FO387	
\$IBLDR FO388	
\$IBLDR FO389	
\$ORIGIN	O,CK2,NOREW
\$IBLDR FO490	
\$ORIGIN	O,CK2,NOREW
\$IBLDR FO591	
\$IBLDR FO592	
\$ORIGIN	A,CK2,NOREW
\$IBLDR AA893	
\$ORIGIN	A,CK2,NOREW
\$IBLDR LA996	
\$ORIGIN	P,CK2,NOREW
\$IBLDR LP197	
\$ORIGIN	P,CK2,NOREW
\$IBLDR LP298	
\$IBLDR LP299	
\$ORIGIN	A,CK2,NOREW
\$IBLDR DA000	
\$ORIGIN	Q,CK2,NOREW
\$IBLDR DQ101	
\$IBLDR DQ102	
\$IBLDR DQ103	
\$ORIGIN	Q,CK2,NOREW
\$IBLDR DQ204	
\$IBLDR DQ205	
\$IBLDR DQ206	
\$IBLDR DQ207	
\$IBLDR DQ208	
\$IBLDR DQ209	

Contrails

\$ORIGIN Q,CK2,NOREW
\$IBLDR DQ310
\$IBLDR DQ311
\$IBLDR DQ312
\$EDIT
\$EOF

SYSTRAN DATA DECK

\$EOF

References

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Contrails

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13. ABSTRACT SYSTRAN was originally developed around a data acquisition system and was primarily intended for use in analysis of periodic and transient signals. Although the system included some capability for handling random data it was limited. The additions have been made for the purpose of handling unusual data (including random). Extensions of the capability of the original program, corrections to the original program, and listings of all modifications and additions are described. In particular this report describes the addition of computing capability for accomplishing Digital Filtering, Probability Density Function Calculation, and Random Number Generation. The report discusses all aspects of the program essential to competent usage.			

Security Classification

14.	KEY WORDS	LINK A		LINK B		LINK C	
		ROLE	WT	ROLE	WT	ROLE	WT
	Communication theory, signals Data processing systems Complex variables Correlation Techniques Curve fitting Fourier analysis Integral transforms Matrix algebra Numerical analysis Probability						

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