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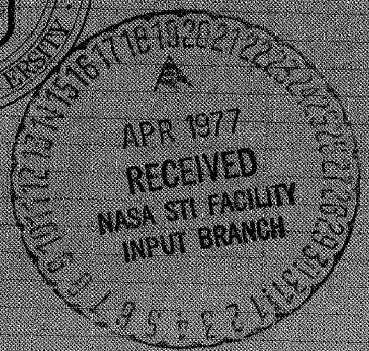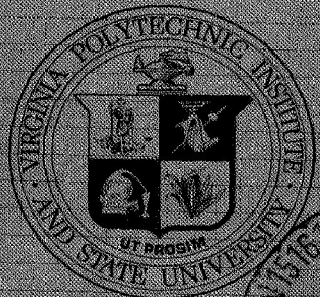
by

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ABSTRACT

Crack growth inspection data gathered during the service life of the C-130 "Hercules" airplane is used in conjunction with a crack propagation rule to estimate the distribution of crack initiation times and of initial crack sizes.

Because at early inspections many small cracks are missed a Bayesian statistical approach is used to calculate the fraction of undetected initiation times as a function of the inspection time and the reliability of the inspection procedure used.

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List of Symbols

a, a_i, a_0, a_u	crack length, crack initiation size = .03 in, initial crack size, ultimate crack size
A, A_k	event, observed crack length
B_k	constant
C, C^*	crack growth parameters
C_1, C_2, C_3, C_4	Constants of integration
da/dN	crack growth per cycle
da/dt	crack growth per flight hour
D, $\bar{D}$	detected and undetected crack
E	event
$f(1/r)$	geometric correction factor
$f_X(x)$, $f'(x)$, $f''(x)$	probability density function general, prior and posterior density function
$g(x)$	function
$F_X(x)$	probability distribution function
i	index
k, k_1, k_2, k_3, k_4	normalizing constants
L	geometric constant
$L(x)$	likelihood function
m_2, m_3, m_4	second, third and fourth moments of data
n, n^*	parameters of crack growth relation
$N(t)$	number of gusts per flight hr
P	probability
r	geometric constant
R	fatigue strength

List of Symbols (Contd.)

$S(t)$	laboratory flight hrs
t, t_i	inspection time, crack initiation time
$V(\cdot)$	coefficient of variation
x, y	variables
x_0	Weibull location parameter
Z_α	αth percentile for normal distribution
$\alpha, \bar{\alpha}$	Weibull shape parameters
$\beta, \bar{\beta}$	Weibull scale parameters
β_1, β_2	moment parameters
γ	Johnson S_B distribution location parameter
$\Gamma(\cdot)$	Gamma function
δ	Dirac function
Δk	stress intensity range
$\Delta\sigma$	stress range
ε	Johnson S_B distribution shape parameter
η	Johnson S_B distribution shape parameter
λ	Johnson S_B distribution shape parameter, Poisson failure rate
ξ	severity index

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Section I

INTRODUCTION

The Lockheed C-130 aircraft has been in use by the U.S. Air Force for more than two decades in various theaters of operation under several commands.

The center wing box of the airplane has been periodically inspected and the size of cracks growing around rivet holes in the skin has been recorded. Small cracks were permitted to grow through several inspections. Eventually cracks were repaired or in some cases the whole center wing box was replaced.

The aim of this paper is to reduce the C-130 service-flight inspection data by means of fracture mechanics and statistical analysis into a form from which the probability of time to crack initiation and the distribution of initial flaw sizes for various locations on the aircraft can be determined.

The importance of the time to crack initiation for the purposes of reliability analysis and maintenance schedules for aircraft has been indicated by numerous authors [1-8]. Though such data has been available for laboratory test specimens [9-10] they have not been computed from actual service inspection records for a large number of full scale structures. For the purposes of crack propagation analysis the time to crack initiation, defined here as the time required for a crack to grow to an inspectable size, is not needed if the initial crack size is known [11-15].

Because initial crack sizes are noninspectable they are computed from crack propagation relations by backward extrapolation [11,12].

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Previous attempts to define the distribution of time to crack initiation for the C-130 and C-141 aircraft [16-18] have not yielded satisfactory results. Impellizzeri [19] discussed methods to evaluate time to crack initiation for the F-4 aircraft but the lack of sufficient data made the problem difficult. In these reports the data was not normalized, that is, the time at first crack sighting was used as the time of crack initiation regardless of crack size. This type of approach is reasonable only if inspection intervals are short so that all the cracks are small and of approximately the same size at first sighting. It is, however, impractical and uneconomical to perform inspections at such short service intervals [5,6].

The inspection records do not contain cracks smaller than .03 inches (.0762 cm) in length. Therefore, this size has been arbitrarily chosen as the minimum inspection size (crack initiation size) (a_i).

Since the objectives of this investigation are to determine the distributions of the times of growth to minimum inspection size (crack initiation) and of initial flaw sizes, crack sizes are normalized with the use of fracture mechanics. A growing crack is extrapolated backwards from its first recorded crack size to .03 inches (minimum inspection size) yielding the time to crack initiation (t_i) [6]. In a similar fashion, the crack is grown backwards to a time equal to zero to yield an initial flaw size (a_0).

All of the C-130 crack inspection data examined refer to rivet holes in the center wing box section of the aircraft (Fig. 1). The center wing box was divided into nearly one hundred inspection locations which were symmetric about the center line of the aircraft.

The original inspection data was received from Warner Robbins Air Logistic Center (ALC/ACDCJ), on a nine track magnetic tape.

The following information is available for each aircraft:

aircraft series
aircraft serial number
total flying hours (at time of inspection)
date of inspection
military command
military base
facility where inspected
number of inspection
crack locations
crack sizes
crack numbers (there may be more than one crack at a location)

In order to perform the discussed computations, crack growth constants were computed for each individual location and were analyzed statistically.

Two approaches were used to describe the rate of crack growth at various locations. One is the more common practice of fixing the crack growth parameters. The second approach is to let the crack growth parameters vary from location to location even though the material, geometry and type of loading are similar between locations.

Only cracks that grew were utilized in the present analysis. These comprise approximately fifteen percent of the total number of rivet holes and consequently conclusions reached are valid for this reduced population.

Statistical distributions were fitted to time to crack initiation and to initial flaw sizes in order to describe their expected behavior at each location. Since only the cracked population was considered, probabilities are conditional on the presence of a crack [20].

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The influence of the modes of operation within the various commands is reflected in the rates of crack propagation indicating more or less severe usage. The data has, as a consequence, been also used to estimate the parameters of the load distributions applied to the airplanes.

Because the method of inspection is not a hundred percent reliable some cracks present in the structure were presumably not discovered. Utilizing an assumed inspection reliability curve combined with a Bayes' approach, the distribution of crack initiation times undetected during an inspection has been estimated [21,22].

Section II

METHODS OF ANALYSIS

1. ### Time to Crack Initiation and Initial Flaw Size

Inspection of the aircraft took place at irregular intervals. As a result raw inspection data points could not be directly compared because the length of time during which cracks have propagated differed for each crack.

Once the crack propagation parameters have been calculated, cracks could be mathematically grown to either a common size or to a common inspection time. Such a "normalization" procedure permits the determination of statistical distributions for "crack initiation times" defined here as the time at which the crack size was .03 in (minimum inspectable crack length), and for "initial crack sizes", the size of cracks at time equal to zero (Fig. 2).

In order to determine the time to crack initiation (t_i) and the initial flaw size (a_0) the "Power Law" crack growth relation [23]

$$da/dN = C(\Delta k)^n \qquad (1)$$

was used.

Here $\Delta k = \Delta\sigma\sqrt{\pi a}\ f(1/r) = $ Stress Intensity Range $\qquad (2)$

$da/dN = $ crack growth per cycle

$C\ \&\ n = $ material constants

$\Delta\sigma = $ stress range

$a = $ crack length

$f\ (1/r) = $ geometric correction factor

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Eq. 1 may be rewritten utlizing Eq. 2 and a rate-of-cycling term, dN/dt as

$$da/dt = C \left(\Delta\sigma\sqrt{\pi a} \; f(1/r) \right)^n dN/dt \tag{3}$$

$$= C \left(\Delta\sigma\sqrt{\pi} \; f(1/r) \right)^n dN/dt \; a^{n/2}$$

Letting $C^* = C \left(\Delta\sigma\sqrt{\pi} \; f(1/r) \right)^n dN/dt \tag{4}$

and

$$n^* = n/2 \tag{5}$$

where C^* is in units of [in./in.$^{n/2}$/flight hours], Eq. 3 becomes

$$da/dt = C^* \, a^{n^*} \tag{6}$$

Eq. 6 is the crack growth relation used in this analysis. Taking the logarithm of Eq. 6 a straight line relation, whose slope is n^* and intercept is log C^*, is obtained.

$$\log (da/dt) = \log C^* + n^* \log a \tag{7}$$

Several methods were tried in attempts to evaluate the parameters of Eq. 6. To determine the crack growth constants C^* and n^* for each growing crack individually the average crack growth rate between two inspections is calculated as the difference in crack sizes divided by the inspection interval evaluated at the average of the two crack sizes and at the mid point of the interval. Because two constants are to be determined a minimum of three successive inspections during which a crack grew are required to produce two points for Eq. 7 (Figs. 2 & 3). Not many cracks were permitted to grow through three inspections.

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Due to this limitation only a relatively small number of the volu-
minous data could be utilized to obtain crack growth parameters for
individual cracks.

2. Linear Least Squares Regression

In order to increase the number of available data points an attempt
was made to evaluate crack growth rate versus crack length data for each
pair of successive inspections and then to use all of these values at a
specific location on the aircraft for individual commands in a linear
regression analysis as shown in Fig. 4.

In a first attempt all the da/dt vs. a_{mean} data were utilized in
order to find characteristic n* and C* values for each location. A
computer program (Statistical Analysis System was used to perform a
linear least squares fit to Eq. 7. The slope and intercept of the line
are the n* and C* values, respectively.

It was found that the exponent, n*, was lower than what had been
anticipated from the examination of aircraft aluminum crack growth curves
[11] and varied considerably. An n* of approximately 1.5 (n=3) had been
expected. It is recognized that n* should be nearly constant in value
since similar material and geometries are used in each aircraft and loca-
tion. Referring to Eq. 4, C* varies with material constant C, material
constant n, geometric correction factor f(1/r) and stress range Δσ.

The variations in n* may be explained as follows: Fig. 5 represents
two ideally growing cracks in the same location but on two different air-
craft within the same command. The only difference between the two is

that aircraft B has experienced higher stress ranges than aircraft A.
Note that both lines have approximately the same slope, n*, but differ in
C* (Table 1) reflecting the difference in stress range. On the other
hand a linear least squares fit of all data points (six) from both air-
craft results in an n* = .92 instead of an average value of 1.01. If
each crack is treated individually and average values of n* and C* are
calculated less error is introduced.

3. Non-linear Regression

In another attempt to use all available data directly the rate of
growth equation (Eq. 6) was integrated

$$da/dt = C^* a^{n^*}$$ (6)

therefore $a^{-n^*} da = C^* dt$

Integrating both sides

$$\int_{a_i}^{a} a^{-n^*} da = C^* \int_{t_i}^{t} dt$$

$$\frac{1}{1-n^*} \left(a^{(1-n^*)} - a_i^{(1-n^*)} \right) = C^* (t - t_i)$$

$$a^{(1-n^*)} = C^*(1-n^*) (t - t_i) + a_i^{(1-n)}$$

$$a = \left[C^*(1-n^*) (t - t_i) + a_i^{(1-n^*)} \right]^{\frac{1}{1-n^*}}$$ (8)

where t_i = time to crack initiation

a_i = crack length at crack initiation = .03 in. is obtained (Fig. 6).

By assuming certain values of n* Eq. 8 may be simplified:

for n* = 2

$$\frac{1}{a} = -C* (t-t_i) + \frac{1}{a_i}$$

$$\frac{1}{a} = C_1 t + C_2 \qquad (9)$$

where $C_1 = -C*$

$$C_2 = C*t_i + \frac{1}{a_i}$$

For n* = 1.5

$$\frac{1}{a} = \left[-\frac{C}{2} (t-t_0) + \frac{1}{\sqrt{a_0}} \right]^2$$

carrying out the operations and factoring yields

$$\frac{1}{a} = C_1 t^2 + C_2 t + C_3 \qquad (10)$$

where

$$C_1 = \frac{C*^2}{4} \; ; \; C_2 = \frac{C*}{\sqrt{a_i}} - \frac{C*^2}{2} t_i$$

$$C_3 = \frac{C*^2}{4} t_i^2 - \frac{C*t_i}{\sqrt{a_i}} + \frac{1}{a_i}$$

Equations 9 and 10 were evaluated again using regression analysis for all $\underline{a}$ versus $\underline{t}$ data for a given location in each command (Fig. 6). Results were again unsatisfactory because n* values were afflicted with a large scatter.

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4. Conjugate Gradients Method

The next approach was an attempt to minimize the square difference between observed and predicted crack length by the method of conjugate gradients.

The function to be minimized may be written as

$$F = \sum_{k=1}^{N} (A_k - a_k)^2 = \sum_{k=1}^{N} \left\{ A_k - \left[a_i^{(1-n^*)} + C^* (1-n^*) (t_k - t_i) \right]^{\frac{1}{1-n^*}} \right\}^2 \quad (11)$$

where
A_k = observed crack length

a_k = predicted crack length

t_k = observed time

To minimize the function, its partial derivatives

$$\frac{\partial F}{\partial C^*} = \sum_{k=1}^{N} -2 (t_k - t_i) \left[A_k - B_k^{(\frac{1}{1-n^*})} \right] B_k^{(\frac{n^*}{1-n^*})} \quad (12)$$

$$\frac{\partial F}{\partial t_i} = \sum_{k=1}^{N} 2C^* \left[A_k - B_k^{(\frac{1}{1-n^*})} \right] B_k^{(\frac{n^*}{1-n^*})} \quad (13)$$

$$\frac{\partial F}{\partial n^*} = \sum_{k=1}^{N} \frac{2n^*}{(1-n^*)^2} \left[A_k - B_k^{(\frac{1}{1-n^*})} \right] B_k^{(\frac{1}{1-n^*})} \ln B_k \left[a_i^{(1-n^*)} \ln a_i + \right.$$

$$\left. C^*(t_k - t_i) \right] \quad (14)$$

are set equal to zero and the nonlinear equations, Eqs. 12-14 are solved simultaneously.

In the above relations

$$B_k = a_i^{(1-n*)} + C*(1-n*) (t_k - t_i)$$

The gradients, $\frac{\partial F}{\partial C*}$, $\frac{\partial F}{\partial t_i}$ and $\frac{\partial F}{\partial n*}$, were used in a computer program (SSP subroutine FMCG). It was not possible to set bounding values in the sub-routine. Therefore, certain physical limitations, such as positive crack length, were violated. The term, $B_k^{(\frac{1}{1-n*})}$, represents crack length and was in some cases forced into the negative region by the FMGC program in order to minimize the function. The method was consequently abandoned.

5. Variable n* Method

Crack growth parameters for individual cracks were also calculated and were then averaged to find representative C* and n* values.

For this method only those da/dt versus a_{mean} data were used in which a crack grew through at least two inspections (three points on an $\underline{a}$ versus $\underline{t}$ curve). Since stress ranges could vary greatly from one inspection to another, not all n* and C* values calculated were acceptable. Therefore, limitations were set on n* (1.0 < n* < 2.5), and on C* (.05 > C*). Many of the cracks that grew sufficiently to be investigated yielded n* and C* outside the acceptable range.

The acceptable parameters for cracks within a given location and command were averaged to yield mean values of $\overline{n*}$ and $\overline{C*}$. These average parameters were then used to extrapolate all cracks that grew, from their first sightings backwards to the time of crack initiation (t_i) and to initial flaw size (a_0).

Table 2 lists the raw data of crack length and inspection times for the relevant locations.

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This method yielded mean values of n* from approximately 1.2 to 1.9 (Table 3). When these n* values were used to calculate a_0, the initial flaw size varied with n*; a lower $\overline{n^*}$ produced a smaller $\overline{a_0}$ (see Figs. 7 and 8). Since initial flaw size in an aircraft should be independent of the life of the aircraft, the values of $\overline{a_0}$ at various locations should be of the same order of magnitude. These results indicated that n* should indeed be a fixed material property.

6. Constant n* Method

A value for the material property n was selected after evaluating crack growth data on 7075 Aluminum from the Rockwell International Fracture Mechanics Data Bank [9] and comparing this to a NASA Langley study on laboratory crack growth of C-130 components [10]. Based on these studies, n=3, i.e., n*=1.5, was chosen.

With n* established, only one additional parameter needs to be determined, hence individual crack growth data, da/dt versus a_{mean} could be used (Fig. 9). It has been mentioned previously that when n* and C* were both allowed to vary, the values of n* and C* were frequently outside an acceptable range. By fixing n* and letting only C* vary, the results yielded a reasonable C* value every time. Due to the increase in the number of reasonable C*'s for all crack locations, more crack locations could be evaluated.

The values of C* for the various growing cracks within a location were averaged to yield a $\overline{C^*}$. This $\overline{C^*}$ value and n*=1.5 were used to extrapolate the $\underline{a}$ versus $\underline{t}$ data of the first crack that grew at a particular location

on an aircraft. The resulting values of t_i and a_0 are shown in Table 3. It might be noted that all the $\overline{a_0}$ values for the various locations were, as expected, of the same order of magnitude (see Section III.2).

Section III

STATISTICAL DESCRIPTION OF THE DATA

Statistical distribution functions have been fitted to the times to crack initiation and to initial flaw sizes. The probablity of time to crack initiation will be discussed first.

1. Time to Crack Initiation Distributions

a. Two Parameter Weibull Distribution

Time to crack initiation (or failure) has in the past been described in terms of the Weibull distribution [24]. The two parameter Weibull probability of failure is given as

$$F_{t_i}(x) = 1 - e^{-(x/\beta)^\alpha} \qquad (15)$$

where $\alpha \doteq 1.2 \, (\sigma/\overline{x})$ is the shape parameter

$\beta = \overline{x}/ \, \Gamma(1 + 1/\alpha)$ is the scale parameter

$\overline{x}$ = mean

σ = standard deviation

This distribution fits most of the data but fails to fit the end points (see Figs. 10 through 17 and Table 4). The lower portion of the data (earliest crack initiation) is considered extremely important, therefore it is necessary to try other statistical models that might fit these points better.

b. Three Parameter Weibull Distribution

The three parameter Weibull distribution

$$F_{t_i}(x) = 1 - e^{-\left(\frac{x-x_0}{\beta-x_0}\right)^{\alpha}} \qquad\qquad (16)$$

has also been used. Because of the possible existence of flaws at time t=0 this distribution function will have a negative lower limit, x_0 and Eq. 16 will have to be restricted to values for $t_i > 0$. Consequently the distribution of crack initation times becomes:

$$F_{t_i}(x) = 0 \qquad\qquad\qquad \text{for } x < 0 \qquad (17a)$$

$$F_{t_i}(0) = 1 - e^{-\left(\frac{-x_0}{\beta-x_0}\right)^{\alpha}} \qquad \text{for } x = 0 \qquad (17b)$$

and

$$F_{t_i}(x) = 1 - e^{-\left(\frac{x-x_0}{\beta-x_0}\right)^{\alpha}} \qquad \text{for } x > 0 \qquad (17c)$$

that is, the probability that the crack initiation time is zero has a fixed, nonzero value. The corresponding density function consists of a Dirac function at $t_i = 0$ with an area given by Eq. 17b and a truncated density function [21]. These functions are schematically shown in Figs. 18 and 19,

Such distributions have also been fitted to the data. There is significant improvement over the fit of the two parameter function, but for very short initiation times this distribution does not exhibit a good fit either. The distributions are presented in Figs. 20-27 and Table 5.

c. Johnson Distributions

Johnson distributions were examined next, due to the fact that the Johnson S_B distribution has four adjustable parameters [24]. In

order to determine which one of three types of Johnson distributions would be applicable, values of β_1 and β_2 were calculated for each data set.

$$\beta_1 = \left(\frac{m_3}{(m_2)^{3/2}} \right)^2 \tag{18}$$

$$\beta_2 = \frac{m_4}{(m_2)^2} \tag{19}$$

where m_2, m_3, and m_4 are second, third and fourth moments of the data, respectively:

$$m_2 = \frac{1}{n} \sum_{i=1}^{n} (x_i - \bar{x})^2 \tag{20}$$

$$m_3 = \frac{1}{n} \sum_{i=1}^{n} (x_i - \bar{x})^3 \tag{21}$$

$$m_4 = \frac{1}{n} \sum_{i=1}^{n} (x_i - \bar{x})^4 \tag{22}$$

From an examination of Table 4 and Fig. 28 [24] it is noted that the Johnson S_L or S_B distributions apply.

The S_B distribution has two shape parameters, γ and η, one location parameter (lower bound), ε, and one scale parameter, λ. The distribution is bounded by ε and $\varepsilon + \lambda$. In the case of time to crack initiation, the range, λ, is unknown but can be estimated by the following equation:

$$\lambda = (x_{0.5} - \varepsilon) \frac{(x_{0.5} - \varepsilon)(x_\alpha - \varepsilon) + (x_{0.5} - \varepsilon)(x_{1-\alpha} - \varepsilon) - 2(x_\alpha - \varepsilon)(x_{1-\alpha} - \varepsilon)}{(x_{0.5} - \varepsilon)^2 - (x_\alpha - \varepsilon)(x_{1-\alpha} - \varepsilon)} \tag{23}$$

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where $x_{0.5}$ = median of the data

x_α = α percentile of data

$x_{1-\alpha}$ = (1-α) percentile of data

Since primary interest lies in fitting the extreme data points, α = 1% was used in most cases. More extreme values were often necessary to assure that λ is positive. In some cases the term $(x_{0.5}-\epsilon)^2 - (x_\alpha-\epsilon)(x_{1-\alpha}-\epsilon)$ becomes negative if extreme values are not chosen. In the case of location 74-90 TAC, an x_α value had to be extrapolated below the lowest data point to obtain a positive λ.

Once ϵ and λ are established, the two shape parameters may be calculated as follows:

$$\eta = \frac{Z_{1-\alpha} - Z_\alpha}{\ln\left[\dfrac{(x_{1-\alpha},-\epsilon)(\epsilon+\lambda-x_\alpha)}{(x_\alpha-\epsilon)(\epsilon+\lambda-x_{1-\alpha})}\right]} \tag{24}$$

$$\gamma = Z_{1-\alpha} - \eta \ln\left(\frac{x_{1-\alpha} - \epsilon}{\epsilon+\lambda - x_{1-\alpha}}\right) \tag{25}$$

where Z_α = the stanrdard normal variate for α 100th percentile

$Z_{1-\alpha}$ = the standard normal variate for (1-α) 100th percentile

Once ϵ, λ, η, and γ have been calculated for each set of data, the following density function can be numerically integrated to find the distribution function

$$f_{t_i}(x) = \frac{\eta}{\sqrt{2\pi}}\frac{\lambda}{(x-\epsilon)(\lambda-x+\epsilon)}\exp\left\{-\frac{1}{2}\left[\gamma + \eta \ln\left(\frac{x-\epsilon}{\lambda-x+\epsilon}\right)\right]^2\right\} \tag{26}$$

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The results of the Johnson S_B distribution for time to crack initiation are shown in Figs. 10 to 17 and the parameters for each location are presented in Table 4.

Because x_α and $x_{1-\alpha}$ may be arbitrarily chosen this family of distribution functions can be made to fit the short initiation time data points, but at the expense of missing the large number of data points in the central region.

d. Statistical Distribution Based on Service Load and Fatigue
   Performance

Because none of the afore discussed distribution functions fit the data equally well in the central region and the extremes, a technique based essentially on the concept of stress-strength interference will also be examined [6].

It is assumed that the fatigue strength, R, of the structure in a laboratory test can be described by a three parameter Weibull distribution. The probability that the fatigue life is shorter than a given value, x is written as

$$F_R(x) = 1 - e^{-\left(\frac{x-x_0}{\beta-x_0}\right)^\alpha} \qquad (27)$$

where R and hence x is measured in laboratory hours.

The statistical density function of the number of gusts that produce significant fatigue damage in the aircraft in t flying hours has been described by Yang [6] as a continuous version of the Poisson process

$$f_{N(t)}(x_1) = (\lambda t)^{x_1} e^{-\lambda t}/\Gamma(x_1+1) \qquad 0 < x_1 < \infty \qquad (28)$$

where the random variable, N(t), is the number of gusts in t flight hrs,

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λ is the average number of significant gusts per flight hr, λt is the average number in t flight hrs and $\Gamma(\cdot)$ is the gamma function.

Because the variance of the Poisson distribution is also λt, the coefficient of variation which is a measure of dispersion becomes

$$V_{N(t)} = 1/\sqrt{\lambda t} \tag{29}$$

The number of gusts N(t) experienced by an aircraft in t flight hrs can be related to the number of equivalent laboratory hrs, S(t) as

$$S(t) = N(t)/\lambda\xi \tag{30}$$

where ξ is a socalled severity index that in the present analysis is assumed to be unity. As a consequence the laboratory spectrum is equivalent to the average flight spectrum.

The density function, of gust loading, Eq. 28 can be transformed with the aid of Eq. 30 into a density function in terms of equivalent laboratory flight hours

$$f_{S(t)}(x) = \lambda t^{x\lambda} e^{-\lambda t} \frac{\lambda}{\Gamma(\lambda x+1)} \tag{31}$$

The probability that a crack will initiate in t flight hours is equivalent to the probability that the fatigue strength, R, is exceeded by the service loading converted to laboratory flight hrs, S(t)

$$F_T(t) = P[R \leq S(t)] \tag{32}$$

Eq. 32 is a form of the classical stress-strength interference relation [25] and can be expressed as

$$F_T(t) = \int_0^\infty F_R(x) \, f_{S(t)}(x) \, dx \tag{33}$$

Where $F_R(x)$ is given by Eq. 27 and $f_{S(t)}(x)$ by Eq. 20. Therefore

$$F_T(t) = \int_0^\infty \left[1 - e^{-\left(\frac{x-x_0}{\beta-x_0}\right)^\alpha} \right] \frac{\lambda(\lambda t)^{\lambda x} e^{-\lambda t}}{\Gamma(\lambda x + 1)} \, dx \tag{34}$$

For convenience of integration a change of variables is introduced:

$$y = \lambda x \quad , \quad dy = \lambda dx \tag{35}$$

Substituting into Eq. 34 the probability of failure becomes

$$F_T(t) = \int_0^\infty \left[1 - e^{-\left(\frac{y-x_0\lambda}{\beta\lambda-x_0\lambda}\right)^\alpha} \right] \frac{(\lambda t)^y e^{-\lambda t}}{\Gamma(y+1)} \, dy \tag{36}$$

Eq. 36 is a convolution integral that requires numerical integration. The values of α, β and x_0 are estimated by fitting a three parameter Weibull distribution to the central part of the crack initiation time data (Table 5).

Because $1/\sqrt{\lambda\beta}$ is a measure of the dispersion in β hrs, a small value of λ produces a large dispersion. Choosing λ values by trial and error ($\lambda\beta$ is usually less than 100) Eq. 36 is evaluated and is

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fitted to the crack initiation time data so that the curve approaches the data in the lower tail (short initiation times) of the distribution as shown in Figs. 29 to 36.

Smaller values of λ tend to bend the lower tail upward and the upper tail downward.

Because short crack initiation times are of interest, the poorer fit at the upper tail is not considered significant.

2. Initial Flaw Size Distributions

It is not unexpected that material imperfections, manufacturing methods and the limitations of inspection techniques produce a certain number of undetected minute cracks even before the aircraft is put into service. Once the average parameters of the crack growth relation are evaluated and t_i is calculated for each crack, Eq. 8 can be further extrapolated backwards to time t=0 to yield an initial crack size as shown in Fig. 2. Only data with extrapolated initial crack sizes greater than zero can be used.

Initial flaw sizes were plotted on normal probability paper. The plots indicated that the distribution functions were not normal; the data did not fall on straight lines. As an alternative the Johnson S_B distribution was again employed. Since .03 inches (.0762 cm) had been chosen as the crack initiation size, the nondefect population (those locations with initial flaws less than .03 inches) ranges from 0.0 to 0.03 inches. Thus, $\varepsilon = 0.0$ and $\lambda = 0.03$. The shape parameters η and λ, were found as previously shown from Eqs. 24 and 25 with $\alpha = 1-2\%$.

The parameters are listed in Table 6. Distribution functions, are presented in Figs. 37 to 44. It is seen that the Johnson S_B distribution fits these extrapolated points very well. Because initial flaw sizes should be independent of loading their distributions should be similar. It is seen from Table 6 that the means and standard deviations are of similar magnitude. As a consequence all initial crack sizes could be considered to belong to the same population. An overall distribution function has been derived for the combined data and is presented in Fig. 45. The mean initial crack size is .00432 in. and has a coefficient of variation of .2%.

The two Commands considered here, TAC (Tactical Air Command and PACAF (Pacific Air Command), had 263 and 223 C-130 Aircraft inspected respectively.

Since two symmetric locations and two holes at each location were all considered to be identical the total number of potential crack sites at one location is 1052 and 892 for TAC and PACAF respectively. Of these 16% in TAC and 30% in PACAF have actually developed growing cracks at the most vulnerable location (75-91, see Table 3). Aircraft operated by PACAF have a greater proportion of growing cracks at all locations while aircraft in the Tactical Air Command developed fewer inspectable and hence extrapolatable cracks. This fact would indicate that PACAF aircraft have been subjected to more severe loading conditions. Such a conclusion is not always born out by the data shown in Table 3. The value of C* for locations 75-91 is greater for PACAF than for TAC but at the same time other locations indicate an opposite trend.

Section IV

THE RELIABILITY OF INSPECTION

1. Distributions of Detected and Undetected Cracks

The probability that an existing crack is detected is a function of a number of circumstances. These include: a.) The method of detection such as radiography, thermography, dye penetrant, ultrasonic or visual inspection, etc., and b.) The sensitivity and accuracy of the instrument or the alertness of the inspector. These conditions are influenced primarily by the size of the crack at the time of inspection.

As a consequence not all cracks are found and the probability, $P[D|a]$, that a crack is detected, given that its length is a, is a function of the crack size.

The methods of inspection or the reliability of the procedure used for crack detection in C-130 airplanes are not available. Data can however be found in the literature on the probability of crack detection in aluminum using various ultrasonic techniques [26]. A set of data from Ref. 26 is shown in Fig. 46 with a Weibull type probability function

$$P[D|a] = 1 - e^{-\left(\frac{a}{\bar{\beta}}\right)^{\bar{\alpha}}} , \qquad (37)$$

where $\bar{\alpha}$ = 2.0 and $\bar{\beta}$ = .075 in. (.19 cm), fitted to it. Similar probability functions have been incorporated in wing failure analyses and have been reviewed by Eggwerts [27].

The C-130 inspection data indicates that cracks shorter than .03 in have not been found. The assumed probability function used here predicts

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that a small fraction, 15%, of such cracks are located, while the probability of detecting a crack .2 in. in length is almost unity.

If the distribution of crack sizes prior to inspection is known, the distributions of detected and undetected cracks may be calculated utilizing the probability of detection function, Eq. 37 in conjunction with Bayes theorem [28,29].

The probability that a flaw of size, $\underline{a}$, will be between x and x+dx given that the flaw is detected may be written as

$$P[x<a<(x+dx)|D] = \frac{P[D|x<a<(x+dx)]P[x<a<(x+dx)]}{P[D]} \tag{38}$$

where D stands for detection, $P[D|x<a<(x+dx)]$ is the probability of detecting a flaw of size $\underline{a}$ (from Eq. 37), $P[x<a<(x+dx)]$ is the probability that the crack size is $\underline{a}$ and $P[D]$ is the total probability of detection independently of size. Eq. 38 may be expressed in terms of density functions as

$$f_a[x|D] = k_1 P[D|a] \, f_a(x) \tag{39}$$

in which $f_a(x)$ is the density function of flaw sizes prior to detection, $f_a[x|D]$ is the density function of detected flaw sizes (posterior density), $P[D|a]$ defined earlier, is called the likelihood function in Bayes' theorem terminology and $k_1 = 1/P[D]$ is a normalizing constant that will make the area under the $f_a(x|D)$ curve equal to unity.

In a similar manner the density function of undetected cracks may also be derived:

$$f_a[x|\overline{D}] = k_2 \, P[\overline{D}|x] \, f_a(x) \tag{40}$$

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where $\bar{D}$ stands for no detection, $P[\bar{D}|x] = 1 - P[D|x]$, and k_2 is a second normalizing constant. The above technique has been utilized by Davidson [21] in a slightly different form with exponential detectability and crack size distribution functions assumed.

Adding Eqs. 39 and 40

$$\frac{f_a(x|D)}{k_1} + \frac{f_a(x|\bar{D})}{k_2} = f_a(x) \tag{41}$$

indicates that the reciprocal normalizing constants, $1/k_1$ and $1/k_2$ represent the fractions of detected and undetected cracks.

Because the density function of cracks before inspection is usually unknown, the posterior function, $f_a[x|D]$, of detected cracks may be used to evaluate the prior, $f_a(x)$, and the density of undetected cracks, $f_a[x|\bar{D}]$, from Eqs. 39 and 40 [29].

As indicated by Eq. 8 crack size is a function of the parameters a_i and t_i and the time of inspection t. As a result Eqs. 39-40 are also dependent on these quantities. Since inspections were carried out at irregular intervals the above relations could only be utilized if detected cracks were mathematically grown to a common inspection time. Alternatively Eqs. 38-41 can be transformed to yield density functions of crack initiation times, t_i, at a common crack size, $a_i = .03$ in (.76 cm).

2. Distributions of Detected and Undetected Crack Initiation Times

Eqs. 39 and 40 may be rewritten in terms of crack initiation times, t_i as

$$f_{t_i}[x|D] = k_3 \, P[D|t_i] \, f_{t_i}(x) \tag{42}$$

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and

$$f_{t_i}[x|\overline{D}] = k_4\left(1-P[D|t_i]\right)f_{t_i}(x) \qquad (43)$$

where $f_{t_i}[x|D]$ and $f_{t_i}[x|\overline{D}]$ are the density functions of detected and un-detected crack initiation times, $P[D|t_i]$ is the likelihood function for detection and $f_{t_i}(x)$ is the prior density function of all crack initiation times.

$P[D|t_i]$ is derived from Eq. 37 by substitution of Eq. 8. Hence

$$P[D|t_i] = 1 - \exp\left\{-\left[\frac{1}{\overline{\beta}^{\alpha}}\left(C^*(1-n^*)(t-t_i) + a_i^{(1-n^*)}\right)^{\frac{\overline{\alpha}}{1-n^*}}\right]\right\} \qquad (44)$$

It should be noted that Eq. 44 becomes equal to unity when

$$(t - t_i) = -\frac{a_i^{(1-n^*)}}{C^*(1-n^*)} \qquad (45)$$

because within this time interval a crack will grow to infinite length. Hence $P[D|t_i]$ will be equal to Eq. 44 for $(t-t_i) < -[a_i^{(1-n^*)}/C^*(1-n^*)]$ and becomes equal to unity for $(t-t_i) \geq -[a_i^{(1-n^*)}/C^*(1-n^*)]$, which indicates that the probability of detecting an initiation time, t_i, depends on the time of inspection, t. As a consequence the density func-tions of detected and undetected initiation times will also become func-tions of the inspection time while the density function of all initiation times should be independent of when the inspection is carried out.

The distributions of t_i described in Section II were derived from long-term records, in some instances covering 7000 hrs of flying time.

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It is therefore not unreasonable to assume that the great majority of cracks have grown to inspectable size and that distributions of crack initiation times derived from these by backward extrapolation are good approximations of the total initiation time distributions. Such an assumption is conservative because long initiation times (small cracks) make up the majority of still undetected initiations.

With this assumption it is possible to determine the density functions of discovered and undiscovered initiation times for an inspection carried out earlier in the life of the structure.

The three parameter Weibull distributions, Eqs. 17, fitted to the derived data of Section II (the convolution integral representation is mathematically more complicated)

$$f_{t_i}(x) = \left[1 - e^{-\left(\frac{x-x_0}{\beta-x_0}\right)^\alpha} \right] \delta(x) + \frac{\alpha}{\beta-x_0} \left(\frac{x-x_0}{\beta-x_0}\right)^{\alpha-1} e^{-\left(\frac{x-x_0}{\beta-x_0}\right)^\alpha} \tag{46}$$

will be used where $\delta(x)$, is a Dirac function.

For specified inspection time, t, crack growth parameters C* and n* and a_i = .03 in., Eqs. 44 and 46 substituted into Eqs. 42 and 43 yield the density functions of detected and undetected initiation times. As in the case of detected and undetected cracks the reciprocal normalizing coefficients add to unity

$$\frac{1}{k_3} + \frac{1}{k_4} = 1 \tag{47}$$

and indicate the fractions of discovered and undiscovered initiation times.

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The results of such calculations are shown at location 76-92, TAC
Command in Figs. 47-49   for inspection times t = 2500, 4000, and 5000
hrs. The parameters of the distribution functions are presented in Table 7.

It should be noted that the density functions for detected and un-
detected initiation times have been divided by their respective normalizing
constants so that the areas under the two curves are proportional to the
fractions of discovered and undiscovered initiation times and the two areas
sum up to the area of the density function for all initiation times.

An examination of Figs. 47-49   indicates an expected trend. If
inspection is performed too early, the majority of initiation times will
remain undetected while more and more crack initiation times are found at
later inspections.

The aforegoing discussion has utilized longterm inspection data to
derive the prior distribution of crack initiation times. Such records are
however usually unavailable for aircraft in service. On the contrary at a
particular inspection time the distribution of observed crack initiation
times is actually the posterior distribution, $f_{t_i}(x|D)$, while the prior
density, $f_{t_i}(x)$, of all initiation times and the density function of undetected
initiation times, $f_{t_i}(x|\overline{D})$, are unknown.

Because the latter two functions are of primary interest Eqs. 42 and 43
may be rewritten using Eq. 47 as

$$f_{t_i}(x) = \frac{f_{t_i}[x|D]}{k_3\ P[D|t_i]} \tag{48}$$

and

$$f_{t_i}(x|\overline{D}) = \frac{(1-P[D|t_i])f_{t_i}[x|D]}{(k_3-1)\ P[D|t_i]} \tag{49}$$

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These equations would predict the density functions of all crack initiation times as well as that of the undetected times provided that inspections are carried out at approximately the same number of flight hours on all aircraft in a fleet.

Section V

CONCLUSIONS

The methods presented indicate the feasibility of determining the statistical distributions of initial crack sizes and times to crack initiation using backward extrapolation of inspection data. It appears that of the two crack propagation parameters the value of n^* is a material constant with a value of $n^* = 1.5$ while the second parameter C^*, in addition to being dependent on material and geometry, is also a function of the stress range.

Evaluation of C^* for each individual growing crack and averaging such values for specific crack locations and military commands yields satisfactory distributions of crack initiation times and initial crack sizes.

Crack initiation times are dependent on both the initial crack size and on C^*, the latter being dependent on location and load, while the distribution of initial crack sizes is independent of these factors.

The three parameter Weibull distribution fits the crack initiation times reasonably well. The convolution integral, that involves the three parameter Weibull distribution of fatigue strength and the Poisson distribution of gust occurrences does not improve the fit appreciably because this method has been developed for the purpose of evaluating laboratory fatigue tests under simulated load spectra rather than for the analysis of service data. Two parameter Weibull or Johnson S_B distributions do not fit the data very well.

The distributions of initial crack sizes on the other hand are well represented by the Johnson S_B distribution. The methods presented permit evaluation of a single initial crack size distribution for all growing cracks independently of the different loads in the two commands or the location of cracks on the wing. Though only four locations were analyzed it is believed that the distribution of initial crack sizes is representative of other locations as well. The information can consequently be used for the prediction of crack growth for the C-130 aircraft as well as for structures made of the same material with similar geometry and having undergone similar manufacturing processes. It is recognized that the distributions of time to crack initiation and initial crack size are not independent of each other but are interrelated through Eq. 8. Consequently a probability transformation can be performed on one of the two distributions to derive the density function of the other. It is obvious that such a transformation will result in distribution functions different from those presented here though it is expected that the derived function would be well approximated by the fitted curves. A transformation will be carried out at a future date.

The Bayesian approach presented here illustrates a method for estimating the proportion of undiscovered crack initiation times at various inspections and indicates the influence of the reliability of crack detection methodology particularly during early inspections when cracks are small.

Because the information concerning the reliability of the particular method of nondestructive examination used for the C-130 aircraft was not available an assumed likelihood function was used. For future systems

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the documentation of NDE reliability should become an integral part of service inspection.

A similar approach may be used to determine the fraction of undetected crack sizes at a particular inspection time. For this purpose cracks would have to be analytically grown to common inspection times and their distributions analyzed. Such work may also be carried out in the future.

The present analyses have utilized average values of the crack propagation parameter C^*. The statistical distributions of the parameter have not been evaluated. Again calculations, with C^* as a random variable, may be performed at a later date.

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TABLE 1

Crack Growth Constants for Two Hypothetical Aircraft

Aircraft A	Aircraft B	Least Squares Fit	Average of A and B
$n^* = 1.02$	$n^* = 1.01$	$n^* = .92$	$n^* = 1.015$
$C^* = .008$	$C^* = .016$	$C^* = .01$	$C^* - .012$

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TABLE 2

C-130 Inspection Data for Selected Locations

Explanation of columns 1-8

Column 1.   Aircraft Identification Number

Column 2.   Location of Rivet Hole (see Fig. 1)

Column 3.   Two Holes at Each Location: (I) Inboard and (O) Outboard

Column 4.   Direction of Crack Growth:(F) Forward and (A) Aft

Column 5.   Crack No. at Rivet Hole. Only First Growing Crack Used

Column 6.   User Command (P) Pacific Air Command, PACAF; (T) Tactical
            Air Command, TAC

Column 7.   Length of Crack in Hundredths of Inches

Column 8.   Inspection Time in Flight Hours

Table (three column-groups, each with columns 1–8)

Group A

1	2	3	4	5	6	7	8
5807180	73	1	F	5	P	6	4904
5807180	73	1	F	5	P	9	5524
5807180	73	0	F	3	P	25	4904
5807180	73	0	L	3	P	50	5082
5807180	73	0	L	2	P	62	5213
5807180	73	1	A	2	P	3	4904
5807180	74	1	A	2	P	6	5334
5807180	74	0	A	1	P	9	5822
5807180	74	1	A	1	P	3	4904
5807180	74	0	A	1	P	12	5334
5807180	74	0	A	2	P	25	5822
5807180	75	1	A	2	P	50	4904
5807180	75	0	A	5	P	62	5082
5807180	75	0	A	5	P	25	5213
5807180	75	1	A	1	P	6	5650
5807180	75	1	A	4	P	19	4904
5807180	76	0	F	4	P	3	5334
5807180	76	0	F	4	P	6	5213
5807180	76	1	F	2	P	31	5822
5807180	76	0	A	2	P	50	4904
5807180	89	1	A	2	P	62	5082
5807180	89	1	A	1	P	12	5213
5807180	89	0	A	1	P	19	5213
5807180	89	1	A	3	P	9	5334
5807180	90	0	A	3	P	6	5213
5807180	90	1	A	1	P	9	5524
5807180	91	1	A	1	P	6	4904
5807180	91	0	A	1	P	12	5082
5807180	91	0	A	1	P	19	5213
5807180	91	0	A	2	P	25	5524
5807180	92	1	A	1	P	3	4904
5807180	92	1	A	1	P	2	5213
5807180	92	0	A	1	P	6	5822
5807240	75	0	A	1	P	9	4594
5807240	75	1	F	1	P	56	5141
5807240	89	0	F	1	P	75	5141
5807240	89	0	F	1	P	162	5211
5807240	91	1	F	1	P	175	5141
5807260	91	0	A	1	P	162	5211
5807260	75	1	F	1	T	175	4802
5807260	75	0	F	1	T	12	5072
5807260	89	1	A	1	T	6	4802
5807260	89		A	1	T	12	5072

Group B

1	2	3	4	5	6	7	8
5807260	89	1	A	1	T	19	5629
5807260	90	1	A	2	T	12	5072
5807260	90	1	A	2	T	75	5629
5807260	91	1	L	2	T	6	4802
5807260	91	1	L	2	T	25	5072
5807260	91	1	A	2	T	100	5340
5807260	91	0	A	1	T	12	4802
5807260	91	0	A	1	P	175	5340
5807270	75	1	A	1	P	9	5040
5807270	75	1	A	1	P	12	5566
5807270	89	1	L	4	P	6	4888
5807270	89	0	L	4	P	19	5040
5807270	89	0	L	4	P	12	5408
5807270	89	1	A	2	P	15	4888
5807270	89	0	A	2	P	31	5566
5807270	89	0	A	2	P	12	5718
5807270	91	1	A	1	P	15	4888
5807270	91	1	A	2	P	3	5566
5807280	91	0	A	2	P	9	4653
5807280	91	1	A	3	P	3	4779
5807280	92	0	A	3	P	9	4653
5807290	73	0	L	1	P	6	4779
5807290	73	1	A	1	P	9	5014
5807290	74	1	A	2	P	15	5189
5807290	74	0	A	2	P	19	5014
5807290	75	0	L	2	P	25	5627
5807290	75	1	L	1	P	37	4831
5807290	75	0	L	1	P	50	5189
5807290	89	0	L	1	P	9	5492
5807290	89	0	L	2	P	12	5014
5807290	89	1	L	2	P	15	5189
5807290	89	0	L	2	P	19	5492
5807290	89	0	L	1	P	6	5627
5807290	90	0	A	3	P	15	5492
5807290	90	0	A	3	P	3	5014
5807290	90	1	A	3	P	6	5345
5807290	91	0	F	2	P	19	5672
5807310	91	1	A	2	P	12	5014
5807310	91	0	A	1	P	6	5345
5807310	73	1	A	1	P	37	5189
5807310	73	0	F	1	P	6	5627
5807310	74	0	F	2	P	37	6072
							6512
							4921
							5785

Group C

1	2	3	4	5	6	7	8
5807310	74	0	L	2	P	44	6072
5807310	76	1	A	1	P	12	4921
5807310	76	1	A	1	P	37	6512
5807310	76	1	A	1	P	100	6685
5807310	89	1	A	1	P	3	4921
5807310	89	1	A	4	P	6	5070
5807310	90	0	A	4	P	3	4921
5807320	90	0	L	1	T	6	5070
5807320	73	1	L	4	T	9	4484
5807320	73	1	A	4	T	6	4554
5807320	75	1	A	1	T	9	4484
5807320	75	1	A	2	T	37	4554
5807320	76	0	L	2	T	50	4484
5807320	76	1	L	1	T	6	4554
5807320	89	1	L	1	P	12	4484
5807320	89	1	L	3	P	6	4554
5807350	73	0	L	3	P	12	4494
5807350	73	0	L	1	P	6	4881
5807350	73	0	A	2	P	9	4722
5807350	73	0	A	2	P	3	5407
5807350	74	1	L	2	P	9	4722
5807350	74	0	L	2	P	6	4881
5807350	74	0	L	2	P	9	4722
5807350	75	0	L	1	P	6	4881
5807350	75	1	A	2	P	9	4494
5807350	76	1	A	2	P	6	5103
5807350	76	1	A	1	P	9	4494
5807350	76	1	A	2	P	3	4660
5807350	89	0	A	2	P	6	4494
5807350	89	1	A	1	P	9	4722
5807350	90	1	F	1	P	6	4881
5807350	90	1	F	1	P	9	5103
5807350	92	1	F	2	P	25	4494
5807360	91	1	F	2	P	3	5103
5807360	91	1	F	1	P	6	5407
5807390	92	1	F	1	P	12	4690
5807390	92	1	F	2	P	15	4771
5807420	89	0	A	2	P	3	5099
5807420	89	0	A	1	P	6	5264
5807430	73	0	A	1	P	3	4268
5807430	73	0	A	1	P	9	4423
5807430	74	0	A	1	P	12	4914
5807430	74	0	A	1	P	19	5253
						12	4914
						19	5253

Table — Section 1

1	2	3	4	5	6	7	8
5959570	75	0	A	2	P	25	4851
5959570	76	0	A	3	P	3	4728
5959570	76	0	A	3	P	6	4984
5959570	89	0	F	5	P	12	4728
5959570	89	0	F	5	P	15	4851
6002940	73	0	A	1	P	6	5043
6002940	73	0	A	1	P	12	5184
6002940	75	1	A	1	P	19	5043
6002940	75	0	A	2	P	22	5308
6002940	90	0	A	2	P	6	5184
6002940	90	1	A	1	P	25	5308
6002940	91	1	A	1	P	31	5043
6002940	91	1	A	1	P	87	5043
6002940	91	1	A	2	P	19	5184
6002950	89	0	A	2	P	6	4751
6002950	89	0	A	1	P	19	5040
6002950	89	0	A	1	P	56	4751
6002950	89	1	A	1	P	12	5040
6002950	91	1	A	1	P	19	5732
6002950	91	1	A	2	P	62	4302
6002950	91	0	A	2	P	3	5040
6002950	91	0	A	1	P	6	5732
6002950	91	1	A	2	P	12	4751
6002950	91	1	A	2	P	9	5040
6002950	92	1	A	2	P	44	5424
6002950	92	1	A	2	P	3	5040
6002950	92	0	A	1	P	37	5424
6002950	92	0	A	2	P	3	5732
6002950	92	0	A	2	P	6	5040
6002970	74	1	A	2	P	3	6084
6002970	74	1	F	2	P	6	3772
6002970	89	1	F	1	P	3	3982
6002970	89	1	F	1	P	6	3772
6002970	90	0	A	1	P	19	3982
6002970	90	0	A	1	P	62	3982
6002970	91	0	A	1	P	3	4100
6002970	91	1	A	1	P	9	3772
6002970	92	1	A	1	P	19	4100
6002970	92	1	A	1	P	25	3772
6002980	73	0	A	1	P	3	4100
6002980	73	0	F	1	P	9	4893
6002980	74	0	F	1	P	19	5029
6002980	74	0	F	1	P	25	4619
6002980	74	1	F	3	P	6	4893
6002980	74		F		P	12	5029
6002980					P	3	4893

Table — Section 2

1	2	3	4	5	6	7	8
5807530	76	0	F	3	P	3	5722
5807530	76	0	F	3	P	25	5908
5807530	89	0	A	2	P	12	5396
5807530	89	0	A	2	P	19	5620
5807530	90	0	F	4	P	3	5722
5807530	90	0	F	4	P	12	6181
5807530	91	1	F	1	P	6	5396
5807530	91	1	F	1	P	9	5620
5807530	91	0	F	4	P	19	5722
5807530	91	0	A	4	P	6	5620
5807530	91	1	A	4	P	12	5722
5807530	92	0	A	1	P	34	5396
5807530	92	1	F	2	P	9	5722
5807530	73	0	F	2	P	12	5374
5807540	73	0	F	2	P	37	5590
5807540	73	0	A	2	P	12	5641
5807540	75	1	F	3	P	62	5374
5807540	75	1	F	4	P	12	5590
5807540	89	1	A	4	P	19	5374
5807540	89	1	A	2	P	19	5590
5807540	89	1	F	2	P	15	5374
5807540	89	0	F	1	P	50	5590
5807540	90	0	F	1	P	6	5374
5807540	90	0	F	1	P	12	5198
5807540	90	0	A	1	P	3	5374
5807550	90	0	F	1	P	25	4292
5807550	90	1	F	1	P	12	4815
5915300	90	1	A	1	P	25	6909
5915300	91	0	F	1	P	3	7395
5915320	91	0	F	1	P	12	6851
5915320	75	1	A	1	P	6	7346
5915360	75	1	F	1	P	12	4325
5915360	89	1	F	1	P	9	4505
5915360	91	1	A	1	P	12	4325
5915360	91	1	A	1	P	25	4505
5915360	73	0	A	2	P	50	4325
5915360	73	0	A	2	P	37	4505
5959570	73	0	F	2	P	87	4574
5959570	74	0	F	2	P	125	4728
5959570	74	1	A	2	P	6	4984
5959570	75	1	A	1	P	25	4728
5959570	75	1	A	2	P	6	4851
5959570	75	0	A		P	25	4574
5959570	75		A		P	6	4728
					P		4574

Table — Section 3

1	2	3	4	5	6	7	8
5807430	75	1	F	1	P	9	5188
5807430	75	1	F	1	P	12	5253
5807430	89	1	F	4	P	12	4914
5807430	89	1	F	4	P	15	5253
5807430	89	0	F	2	P	12	4914
5807430	89	0	F	2	P	15	5253
5807430	91	1	F	2	P	3	4914
5807470	91	1	A	1	P	12	5253
5807470	91	1	A	1	P	12	5020
5807470	91	1	F	3	P	15	5301
5807470	91	0	F	3	P	9	5177
5807470	91	0	A	1	P	6	5356
5807470	91	1	A	4	P	3	5020
5807470	92	0	A	4	P	12	5177
5807470	92	0	A	5	P	3	5177
5807490	92	0	F	5	P	6	5301
5807490	92	0	F	1	P	12	5177
5807490	92	0	F	1	P	44	5301
5807490	92	0	F	1	P	3	4379
5807490	91	1	A	1	P	6	5544
5807490	91	1	A	1	P	12	4379
5807510	91	1	A	2	P	19	5014
5807510	73	0	A	1	P	19	4731
5807520	73	0	A	1	P	25	4961
5807520	75	1	A	1	P	12	4922
5807520	75	1	A	1	P	25	5277
5807520	76	1	A	1	P	6	4666
5807520	76	0	F	1	P	9	4922
5807520	76	0	F	1	P	3	5119
5807520	76	0	A	2	P	6	4922
5637520	89	1	A	1	P	3	4969
5807520	89	1	A	1	P	6	4922
5807520	91	1	A	1	P	9	5119
5807520	91	0	A	1	P	9	4922
5807520	73	0	A	1	P	12	5277
5807530	73	0	F	1	P	9	4922
5637530	74	0	F	1	P	9	5119
5807530	74	1	F	1	P	12	5396
5807530	75	1	F	1	P	19	5620
5807530	75	0	A	4	P	3	5620
5807530	75	0	A	4	P	6	5722
5807530	75		F		P		5396
							5620
							5722
							5620
							5722

Block 1

8	7	6	5	4	3	2	1
4204	12	P	1	F	0	73	6003020
3888	50	P	1	A	1	75	6003020
4204	62	P	1	A	1	75	6003020
3888	9	P	2	A	1	90	6003020
4049	12	P	2	A	1	90	6003020
4049	25	P	2	A	1	91	6003020
4204	62	P	3	A	1	91	6003020
4049	34	P	1	F	1	91	6003020
4358	9	P	1	F	1	92	6003020
3888	19	P	3	F	1	92	6003020
4204	6	P	3	F	1	92	6003020
4204	12	P	1	F	1	92	6003020
4358	3	P	3	F	0	73	6003030
4710	6	P	3	F	0	73	6003030
6294	12	P	1	A	0	74	6003030
4548	6	P	2	F	0	74	6003030
5473	12	P	2	F	0	74	6003030
4548	6	P	2	A	0	74	6003030
4990	12	P	1	A	0	74	6003030
4548	6	P	1	A	0	74	6003030
4990	12	P	4	A	1	75	6003030
6128	44	P	4	A	1	75	6003030
6294	50	P	1	A	1	75	6003030
4548	37	P	1	A	1	75	6003030
5144	50	P	2	A	1	76	6003030
5388	69	P	4	A	0	76	6003030
4710	3	P	4	A	0	76	6003030
4872	9	P	4	A	0	76	6003030
6128	50	P	5	A	0	76	6003030
4548	6	P	5	A	0	76	6003030
4990	15	P	1	F	1	89	6003030
4548	6	P	1	F	1	89	6003030
6128	62	P	2	A	1	89	6003030
5473	3	P	4	A	1	89	6003030
5550	6	P	4	A	0	90	6003030
6294	12	P	4	A	0	90	6003030
4710	3	P	5	F	0	91	6003030
6294	6	P	5	F	0	91	6003030
5144	44	P	1	A	0	90	6003030
5473	6	P	1	A	0	90	6003030
6128	56	P	1	F	1	91	6003030
4710	25	P	1	F	1	91	6003030
6128	50	P	1	A	1	91	6003030
4548	62	P	1	A	1	91	6003030
5388		P		A	1		6003030
5473		P		A	1		6003030

Block 2

8	7	6	5	4	3	2	1
4587	37	P	2	F	1	91	6003000
5001	56	P	2	F	1	91	6003000
5171	94	P	2	F	1	91	6003000
4587	3	P	3	A	0	91	6003000
4719	6	P	3	A	0	91	6003000
4945	15	P	1	A	0	91	6003000
4719	9	P	1	A	1	92	6003000
4945	12	P	3	A	1	92	6003000
5001	15	P	3	A	1	92	6003000
4719	9	P	3	F	0	92	6003010
4945	15	P	3	F	0	75	6003010
4238	6	P	4	F	0	75	6003010
4406	19	P	4	A	1	75	6003010
4238	6	P	1	A	1	75	6003010
4406	19	P	2	F	1	75	6003010
4238	6	P	1	F	0	75	6003010
4582	9	P	1	A	0	89	6003010
4238	19	P	1	A	0	89	6003010
4406	3	P	2	A	0	90	6003010
4238	19	P	2	A	0	90	6003010
4406	12	P	2	A	0	90	6003010
4238	15	P	2	A	0	90	6003010
4582	3	P	3	A	1	90	6003010
4406	6	P	3	A	1	91	6003010
4432	3	P	2	F	1	91	6003010
4406	6	P	2	F	1	91	6003010
4432	12	P	2	F	1	92	6003010
4238	19	P	1	A	1	92	6003010
4582	3	P	1	F	1	92	6003010
4238	6	P	2	F	1	92	6003010
4406	9	P	2	F	1	92	6003010
4432	12	P	2	F	1	92	6003010
4238	9	P	3	F	1	92	6003010
4582	12	P	3	F	1	92	6003010
4238	19	P	4	F	1	92	6003010
4406	3	P	4	F	0	92	6003010
4432	9	P	5	F	0	92	6003010
4582	3	P	5	F	0	92	6003010
4238	9	P	1	F	0	92	6003020
4432	3	P		F	0	73	6003020
4049	6	P		F	0		

Block 3

8	7	6	5	4	3	2	1
5152	6	P	3	F	1	74	6002980
4893	12	P	3	F	1	75	6002980
5152	15	P	3	F	0	75	6002980
4893	9	P	1	A	0	75	6002980
5152	6	P	1	F	1	75	6002980
4893	12	P	4	A	1	76	6002980
5029	3	P	1	A	0	76	6002980
4893	12	P	1	A	1	89	6002980
5029	6	P	1	F	1	89	6002980
4619	19	P	1	A	1	90	6002980
4893	19	P	1	A	1	90	6002980
4619	25	P	2	F	1	92	6002980
4893	6	P	2	F	1	92	6002980
4619	19	P	1	F	0	92	6002980
4893	6	P	1	F	0	92	6002980
4319	9	P	1	F	0	76	6002990
4447	19	P	2	F	0	76	6002990
4148	25	P	2	F	0	89	6002990
4917	12	P	2	F	0	89	6002990
4319	15	P	3	A	1	90	6002990
5655	3	P	4	F	1	90	6002990
4609	9	P	4	F	1	91	6002990
4917	3	P	4	A	1	91	6002990
4609	6	P	1	A	1	91	6002990
4917	12	P	4	A	1	91	6002990
5027	12	P	3	A	1	91	6002990
4917	15	P	3	A	1	91	6002990
5655	12	P	4	A	0	92	6002990
4781	25	P	5	A	0	92	6002990
5190	31	P	3	A	0	73	6002990
4587	75	P	3	A	0	73	6003000
5001	6	P	3	A	0	74	6003000
4719	12	P	4	A	1	74	6003000
5171	6	P	4	A	1	75	6003000
4587	12	P	5	A	1	75	6003000
4719	19	P	3	A	0	75	6003000
4945	50	P	3	F	0	75	6003000
5001	15	P	4	F	0	75	6003000
4587	50	P	5	A	1	75	6003000
4719	62	P	3	A	1	75	6003000
5472	9	P	1	F	0	76	6003000
5765	12	P	1	F	1	76	6003000
4719	9	P	1	A	1	89	6003000
4945	12	P	1	F	1	89	6003000

40

1	2	3	4	5	6	7	8
6003090	90	0	A	2	P	12	4701
6003090	90	0	A	2	P	15	5067
6003090	91	1	A	2	P	100	4516
6003090	91	1	F	2	P	162	5067
6003090	92	0	F	2	P	12	4516
6003090	92	0	A	3	P	19	4923
6003090	92	1	A	3	P	9	4701
6003090	92	1	A	3	P	12	4923
6003090	92	1	F	1	T	19	5067
6003100	73	0	F	1	T	12	4323
6003100	73	0	F	1	T	6	4630
6003100	89	0	F	3	T	12	3803
6003100	89	0	A	3	T	12	4478
6003100	89	1	F	1	T	50	4478
6003100	89	1	F	1	P	25	5615
6003100	90	1	F	1	T	50	3803
6003100	90	0	F	2	P	12	5327
6003100	91	0	A	2	T	62	4323
6003100	91	1	F	3	P	12	5327
6003100	91	0	F	3	T	44	4323
6003100	92	1	F	1	P	12	5615
6109480	92	1	F	1	P	25	4478
6109480	73	0	A	1	P	12	4630
6109480	73	0	A	2	P	25	4387
6109480	73	1	A	2	P	6	4555
6109480	74	1	A	1	P	9	4671
6109480	74	1	A	1	P	6	4961
6109480	74	0	A	2	P	19	4387
6109480	74	0	A	2	P	6	4555
6109480	75	1	A	1	P	19	4387
6109480	75	1	A	1	P	25	4555
6109480	75	1	A	1	P	12	4814
6109480	75	0	A	2	P	25	4387
6109480	75	0	A	2	P	28	4555
6109480	75	1	A	2	P	34	4814
6109480	76	1	A	2	P	6	4961
6109480	76	1	A	2	P	25	4387
6109480	89	0	A	3	P	31	4555
6109480	89	0	F	3	P	34	4961
6109480	89	0	F	3	P	6	5110
6109480	89	0	A	2	P	12	4387
6109480	89	0	A	2	P	3	4555
6109480	89	0	A	2	P	9	4387
6109480	89	0	F	3	P	12	4671

1	2	3	4	5	6	7	8
6003050	91	1	A	1	P	62	4942
6003060	74	1	A	2	P	6	4378
6003060	74	1	A	2	P	12	4791
6003060	90	0	A	1	P	3	4239
6003060	90	0	A	1	P	19	4378
6003060	91	1	A	1	P	19	4239
6003060	91	1	A	1	P	28	4378
6003060	92	1	F	1	P	25	4239
6003060	92	1	F	1	P	31	4491
6003060	92	0	A	1	P	50	4791
6003080	73	0	A	1	T	12	4011
6003080	73	1	A	1	T	25	4215
6003080	74	1	A	1	T	6	4011
6003080	74	0	A	1	T	25	4072
6003080	74	0	A	1	T	37	4215
6003080	75	0	A	1	T	12	4072
6003080	75	1	A	1	T	75	4375
6003083	76	1	A	1	T	100	4557
6003080	76	1	A	1	T	6	4011
6003080	89	0	A	1	T	12	4215
6003080	89	0	A	1	T	6	4011
6003080	89	1	A	1	T	12	4215
6003080	91	1	A	1	T	37	4375
6003080	91	1	F	4	T	12	4696
6003080	91	0	F	4	T	15	4011
6003080	91	0	A	1	T	25	4072
6003080	91	0	A	1	T	100	4215
6003090	92	0	A	2	P	12	4557
6003090	92	0	A	2	P	37	4215
6003090	73	0	A	1	P	25	4696
6003090	73	0	A	2	P	37	4215
6003090	74	0	A	1	P	12	4557
6003090	74	1	A	1	P	19	4516
6003090	75	1	A	4	P	25	4923
6003090	75	1	F	4	P	37	4516
6003090	89	0	F	3	P	50	4923
6003090	89	0	F	1	P	6	5067
6003090	89	0	F	1	P	12	5741
6003090	89	0	A	2	P	50	4516
6003090	89	0	F	2	P	56	4701
6003090	90	0	A	2	P	50	4516
6003090	90	0	A	2	P	56	5067
6003090	90	0	A	2	P	3	4516

1	2	3	4	5	6	7	8
6003030	91	1	A	1	P	125	6128
6003030	91	1	A	1	P	187	6294
6003030	91	0	A	2	P	19	4990
6003030	91	0	F	2	P	87	5905
6003030	92	0	A	2	P	3	4710
6003030	92	0	A	6	P	62	6128
6003030	92	1	A	6	P	3	5550
6003030	92	1	A	6	P	37	6128
6003030	92	0	A	1	P	50	6294
6003040	73	0	A	1	P	3	4630
6003040	73	0	A	2	P	6	4702
6003040	74	0	A	2	P	12	4630
6003040	74	1	F	2	P	19	4702
6003040	75	1	F	2	P	50	4392
6003040	75	1	F	1	P	53	5028
6003040	75	1	F	1	P	69	5176
6003040	76	0	F	3	P	6	4630
6003040	76	0	A	3	P	9	4702
6003040	76	1	F	1	P	12	5028
6003040	76	1	F	7	P	9	4630
6003040	89	0	F	7	P	12	5028
6003040	89	1	F	1	P	19	4630
6003040	89	0	A	1	P	25	5028
6003040	90	1	A	2	P	19	4630
6003040	90	0	F	3	P	25	5176
6003040	90	1	A	3	P	12	4630
6003040	90	0	A	2	P	19	5028
6003040	90	0	F	3	P	12	4630
6003040	91	0	A	4	P	19	5028
6003040	91	1	A	4	P	12	4392
6003040	92	1	F	1	P	69	4630
6003040	92	1	F	7	P	12	4630
6003040	92	0	A	7	P	6	5176
6003050	73	0	A	2	P	12	4630
6003050	73	0	A	2	P	59	4702
6003050	75	1	F	1	P	62	4691
6003050	75	1	F	1	P	62	4942
6003050	76	1	A	1	P	175	5266
6003050	89	0	F	2	P	37	5526
6003050	89	0	F	2	P	41	4691
6003050	91	1	A	1	P	31	4942
6003050	89	0	F	1	P	37	4691
6003050	89	0	A	1	P	37	4942
6003050	91	1	A	1	P	50	4691

Table (page rotated 90°; three column-groups, each with columns 1–8)

Group A

1	2	3	4	5	6	7	8
61095480	89	0	F	4	P	9	4555
61095480	89	0	F	4	P	12	4671
61095480	89	0	F	4	P	19	4814
61095480	90	0	A	1	P	6	4387
61095480	90	0	A	1	P	19	4555
61095480	90	0	A	1	P	25	4814
61095480	90	1	A	2	P	9	4555
61095480	90	1	A	1	P	62	5298
61095480	91	1	A	2	P	87	4387
61095480	91	1	A	1	P	62	4671
61095480	91	1	A	2	P	75	4387
61095480	91	0	A	3	P	81	4961
61095480	91	0	A	3	P	12	4555
61095480	91	1	A	1	P	25	5110
61095480	92	1	A	1	P	6	4387
61095480	92	1	A	1	P	15	4814
61095490	75	1	F	1	T	6	3757
61095490	75	1	A	1	T	12	4166
61095490	76	1	F	2	T	6	3757
61095490	76	1	F	1	T	12	4490
61095490	89	0	F	1	T	6	3757
61095490	89	0	F	1	T	12	4490
61095490	89	1	F	1	T	25	4656
61095490	89	1	F	2	T	12	3757
61095490	92	1	F	1	P	37	4166
61095500	75	0	F	1	P	37	4309
61095500	75	0	F	1	P	100	4968
61095500	76	1	F	1	P	9	4537
61095500	76	1	F	1	P	12	4772
61095500	89	0	F	2	P	6	4537
61095500	89	0	F	3	P	12	4772
61095500	89	1	A	3	P	9	4516
61095500	89	1	F	1	P	3	4537
61095500	89	0	F	1	P	9	4516
61095500	90	0	A	2	P	12	4612
61095500	90	1	A	2	P	19	4516
61095500	90	1	A	2	P	6	4612
61095500	91	1	A	1	P	12	4516
61095500	92	1	A	1	P	50	4772
						75	4516
						25	4516

Group B

1	2	3	4	5	6	7	8
61095500	92	1	A	1	P	37	4772
61095500	92	1	F	1	P	175	5701
61095500	92	1	F	2	P	25	4516
61095500	92	0	F	2	P	37	4537
61095510	73	0	A	2	P	19	4396
61095510	73	0	F	5	P	25	4460
61095510	73	0	F	5	P	3	4396
61095510	75	1	F	1	P	6	4460
61095510	89	1	A	1	P	12	4396
61095510	89	1	F	3	P	3	4460
61095510	90	1	A	3	P	19	4396
61095510	90	0	F	1	P	75	4258
61095510	91	0	F	2	P	87	4396
61095510	91	1	A	2	P	6	4258
61095510	92	1	F	3	P	12	4460
61095510	92	0	F	3	P	25	4682
61095520	73	0	A	1	P	62	4962
61095520	73	0	F	3	P	6	4682
61095520	74	1	F	3	P	12	4962
61095520	74	1	A	1	P	6	4682
61095520	74	0	F	2	P	12	4962
61095520	75	0	F	2	P	25	4682
61095520	75	1	F	3	P	34	4962
61095520	75	0	F	4	P	37	5139
61095520	75	0	A	5	P	6	4682
61095520	75	0	A	5	P	12	4828
61095520	76	1	F	2	P	6	4682
61095520	76	1	A	2	P	12	4962
61095520	76	1	A	3	P	6	4682
61095520	76	1	A	4	P	12	4828
61095520	76	1	F	5	P	6	4682
61095520	76	1	F	2	P	12	4828
61095520	89	0	F	6	P	6	4682
61095520	89	0	F	6	P	12	4962
61095520	89	1	F	2	P	6	4682
61095520	90	1	F	1	P	12	4828
61095520	90	1	F	1	P	50	4682
61095520	91	1	A	1	P	62	4962
61095520	91	1	A	1	P	66	5139

Group C

1	2	3	4	5	6	7	8
61095520	92	1	F	2	P	15	4682
61095520	92	1	F	2	P	25	4962
61095520	92	1	F	2	P	50	5227
61095520	92	0	F	5	P	12	4682
61095520	92	0	F	5	P	25	4828
61095560	73	1	A	2	P	6	4627
61095560	73	1	A	1	P	9	4764
61095560	74	0	A	1	P	6	4403
61095560	74	0	A	3	P	12	4627
61095560	89	1	F	3	P	15	4764
61095560	89	1	F	1	P	19	4627
61095560	89	0	A	1	P	6	4764
61095560	90	0	F	1	P	19	4403
61095560	90	1	F	2	P	9	4764
61095560	90	1	F	1	P	19	4403
61095560	91	1	F	2	P	9	4764
61095560	91	1	F	2	P	62	4403
61095560	91	1	A	1	T	162	4764
61095560	75	1	A	2	T	62	4403
61095570	75	1	A	2	T	81	4627
61095570	75	1	A	2	T	6	3877
61095570	91	1	A	1	T	12	4090
61095570	91	1	F	2	T	6	3877
61095570	91	1	F	2	T	12	4090
61095570	92	1	A	2	T	6	3877
61095570	92	1	A	2	T	15	3952
61095570	92	1	A	2	T	6	3877
61095580	73	1	F	1	T	12	4090
61095580	73	1	F	1	T	6	3877
61095580	75	1	F	1	T	12	3952
61095580	75	1	F	1	T	6	3877
61095580	76	1	F	1	T	12	3952
61095580	76	0	F	1	T	6	3858
61095580	76	0	A	1	T	75	4122
61095580	76	0	F	1	T	100	3858
61095580	76	0	F	1	T	6	4246
61095580	76	0	F	2	T	12	4571
61095580	76	0	F	2	T	25	3858
61095580	76	0	F	2	T	37	4246
						6	4431
						12	4571
						37	4122
						6	4571
							3858

Right panel

1	2	3	4	5	6	7	8
61095800	76	O	A	3	T	25	4431
61095800	76	O	A	3	T	37	4571
61095800	89	I	F	2	T	6	3858
61095800	89	I	F	2	T	25	4571
61095800	89	O	A	1	T	6	3858
61095800	89	O	A	1	T	25	4431
61095800	91	I	A	2	T	12	3858
61095800	91	I	A	2	T	25	4431
61095800	91	O	F	3	T	6	4122
61095800	91	O	A	3	T	25	4571
61095900	73	I	F	1	P	9	3818
61095900	73	I	F	1	P	19	4011
61095900	74	O	F	2	P	3	3818
61095900	74	O	F	2	P	31	5186
61095900	75	I	F	1	P	47	3818
61095900	75	I	A	1	P	50	4011
61095900	75	O	A	4	P	15	4149
61095900	75	O	A	4	P	19	3918
61095900	76	I	A	1	P	9	4315
61095900	76	I	F	2	P	6	3818
61095900	76	O	F	2	P	19	4011
61095900	76	O	A	2	P	3	3818
61095900	89	I	A	1	P	9	4011
61095900	89	I	F	1	P	31	4753
61095900	90	O	F	2	P	6	4315
61095900	90	O	A	2	P	12	4315
61095900	90	I	A	2	P	15	4913
61095900	91	I	A	1	P	3	5186
61095900	91	O	F	1	P	12	3918
61095900	91	O	F	5	P	44	4471
61095900	91	I	F	5	P	19	4753
61095900	91	I	F	2	P	22	4315
61095900	92	O	A	2	P	3	4753
61095900	92	O	A	1	P	6	5186
61095900	73	I	A	1	P	9	4011
61095900	73	I	F	5	P	19	5062
61096000	73	O	F	5	P	9	3774
61096000	73	O	A	2	P	12	4240
61096000	74	I	A	2	P	12	3774
61096000	74	I	A	1	P	31	4053
61096000	75	O	A	1	P	9	3774
61096000	75	O	A	1	P	12	3938
61096000	75	I	A	1	P	12	3774
61096000	75	I	F	1	P	31	3938
61096000	75	O	A	1	P	9	3774
61096000	75	O	A	1	P	12	3938

Middle panel

1	2	3	4	5	6	7	8
61096000	76	O	F	1	P	6	3774
61096000	76	O	F	1	P	12	3938
61096000	91	I	A	1	P	12	3774
61096000	91	I	F	2	P	15	3938
61096000	91	O	A	2	P	3	3774
61096000	91	O	A	1	P	6	3938
61096000	92	I	F	3	P	3	3686
61096000	92	I	F	3	P	6	3774
61096000	92	O	A	1	P	12	3774
61096000	92	O	A	1	P	9	3938
61096100	73	I	F	1	P	3	3732
61096100	73	I	A	1	P	6	4050
61096100	73	O	F	2	P	9	4568
61096100	73	O	F	2	P	3	3732
61096100	73	I	A	3	P	9	4050
61096100	73	I	F	1	P	3	3732
61096100	73	O	F	1	P	6	4050
61096100	75	O	F	1	P	3	3467
61096100	75	I	A	1	P	12	3732
61096100	75	I	F	2	P	19	4050
61096100	76	O	A	2	P	3	3885
61096100	76	O	A	3	P	9	4568
61096100	76	I	A	1	P	6	4352
61096100	76	I	A	2	P	9	4568
61096100	89	O	F	2	P	12	3732
61096100	89	O	A	1	P	3	4208
61096100	89	I	A	1	P	6	4352
61096100	90	I	A	6	P	9	3732
61096100	90	O	A	6	P	19	4352
61096100	90	O	A	5	P	25	3732
61096100	90	I	F	5	P	12	4568
61096100	91	I	F	1	P	19	3885
61096100	91	O	A	1	P	12	4352
61096100	91	O	A	1	P	19	3885
61096100	91	I	F	1	P	31	4208
61096100	92	I	F	2	P	12	3732
61096100	92	O	A	2	P	15	4352
61096400	73	O	F	1	P	6	4568
61096400	73	I	F	1	P	12	4571
61096400	74	I	F	2	P	3	5093
61096400	74	O	A	2	P	12	4352
61096400	74	O	A	1	P	9	4868
61096800	75	I	F	1	P	12	4571
61096800	75	I	A	1	P	15	4705

Left panel

1	2	3	4	5	6	7	8
61096400	89	O	F	1	P	15	4571
61096400	89	O	F	1	P	19	4705
61096400	90	O	A	1	P	6	4352
61096400	90	O	A	1	P	12	4571
61096400	90	O	A	3	P	19	5028
61096400	91	O	F	3	P	37	4571
61096400	91	I	F	1	P	100	4868
61096400	92	I	F	3	P	9	4352
61096400	92	I	F	3	P	12	4705
61096500	75	I	A	1	P	6	4405
61096500	76	I	F	1	P	9	4875
61096500	76	I	F	1	P	3	4557
61096500	89	O	F	2	P	9	4875
61096500	89	O	A	1	P	9	4226
61096500	89	I	F	1	P	12	4405
61096500	91	I	F	3	P	3	4405
61096500	91	I	F	3	P	12	4557
61096500	91	I	A	1	P	50	4191
61096500	91	O	A	3	P	87	4405
61096500	92	O	F	3	P	100	4557
61096500	92	O	F	4	P	12	4557
61096500	92	O	A	4	P	19	4875
61096500	92	I	A	2	P	3	4191
61096500	92	O	A	2	P	19	4709
61096500	74	O	A	1	P	3	4709
61096600	74	I	A	1	P	6	4841
61096600	75	O	A	3	P	3	4709
61096600	90	O	A	3	P	6	4841
61096600	90	O	A	4	P	9	4768
61096600	90	I	A	2	P	12	5094
61096600	91	I	A	2	P	9	4768
61096600	91	I	A	1	P	6	4944
61096600	92	O	A	1	P	12	4768
61096600	92	O	A	3	P	9	4944
61096600	92	O	A	3	P	12	4768
61096600	92	I	A	1	P	50	4944
61096700	74	I	A	1	P	75	4594
61096700	74	O	A	3	P	12	4594
61096700	75	O	A	3	P	3	5094
61096700	90	I	A	2	P	19	3663
61096700	91	I	F	2	P	9	3822
61096700	91	O	F	2	P	12	3822
61096700	92	O	A	2	P	6	4176
61096700	92	O	A	2	P	25	3663
61096800	75	I	A	2	P		4047
61096800	75	I	A	2	P		4630
61096800	75	I	A	2	P		4792

1	2	3	4	5	6	7	8
6126370	75	1	L	3	P	25	4237
6126370	75	0	A	1	P	12	3957
6126370	75	0	A	1	P	19	4127
6126370	76	1	A	2	P	19	3957
6126370	76	1	A	2	P	25	4127
6126370	91	1	A	1	P	6	3957
6126370	91	1	A	1	P	87	4127
6126370	92	1	A	1	P	19	3957
6126370	92	1	A	1	P	25	4127
6126370	92	0	L	4	P	28	4237
6126370	92	0	L	4	P	9	3957
6126370	92	0	L	4	P	12	4004
6126380	73	0	L	1	P	19	4127
6126380	73	0	L	1	P	3	3777
6126380	75	1	L	2	P	31	4106
6126380	75	1	A	2	P	37	3657
6126380	75	1	A	1	P	50	3951
6126380	90	1	A	1	P	3	4106
6126380	90	1	A	1	P	9	3657
6126380	91	1	A	1	P	37	4106
6126380	91	1	A	1	P	50	3657
6126380	92	1	A	1	P	9	3777
6126380	92	0	A	4	P	6	3657
6126390	92	0	L	4	P	12	3951
6126390	74	0	L	1	P	6	3951
6126390	74	0	A	1	P	9	4106
6126390	75	1	A	1	P	12	4423
6126390	75	1	L	1	P	50	4797
6126390	75	1	L	2	P	75	5072
6126390	76	1	A	2	P	50	4423
6126390	76	1	A	1	P	75	4932
6126390	76	1	A	1	P	6	4932
6126390	90	0	L	2	P	15	4423
6126390	90	0	L	2	P	6	4932
6126390	91	1	A	1	P	19	4423
6126390	91	1	A	1	P	6	5072
6126390	91	1	L	1	P	15	4423
6126390	91	1	L	1	P	25	4638
6126390	92	1	A	2	P	50	4932
6126390	92	1	A	2	P	25	4423
6126390	92	1	L	1	P	50	5072
6126430	73	0	A	1	P	9	4932
						15	4932
						6	4206

1	2	3	4	5	6	7	8
6126340	91	0	L	2	P	12	4367
6126340	91	0	L	2	P	15	4492
6126340	91	0	L	2	P	25	4634
6126350	73	0	L	2	P	3	4108
6126350	73	0	A	1	P	12	4379
6126350	74	0	L	5	P	3	4108
6126350	74	0	L	5	P	19	4837
6126350	76	1	A	1	P	12	4108
6126350	76	1	A	2	P	6	4242
6126350	76	0	A	2	P	15	4108
6126350	89	0	L	1	P	25	4531
6126350	89	0	L	2	P	50	4108
6126350	91	1	L	2	P	100	4531
6126350	91	1	L	1	P	159	4108
6126350	92	1	A	2	T	3	4531
6126360	92	1	A	2	T	9	4242
6126360	74	0	A	3	T	12	3651
6126360	74	1	L	3	T	25	4361
6126360	74	1	A	3	T	6	3731
6126360	74	1	A	3	T	12	4064
6126360	75	1	A	4	T	25	4216
6126360	75	1	A	4	T	12	3651
6126360	75	1	A	1	T	25	4216
6126360	75	1	A	1	T	12	3651
6126360	75	0	L	1	T	19	4216
6126360	75	0	L	1	T	25	3651
6126360	75	0	A	2	T	6	4361
6126360	89	0	A	1	T	9	3651
6126360	89	0	A	1	T	12	3731
6126360	90	1	A	1	T	25	4064
6126360	91	1	A	2	T	6	4216
6126360	91	1	A	2	T	12	3651
6126360	91	0	L	1	T	6	4361
6126360	91	0	A	4	T	19	3651
6126360	92	1	A	4	T	37	4216
6126360	92	1	A	2	T	50	3651
6126370	74	1	A	2	P	6	4604
6126370	74	1	A	3	P	25	4064
6126370	75	1	A	3	P	12	4216
6126370	75	1	A	3	P	25	3651
6126370	75	1	L	3	P	6	3957
	75		L			9	3957
			F			15	4004
			A			19	4127

1	2	3	4	5	6	7	8
6109680	90	0	A	2	P	3	4792
6109680	90	0	A	2	P	19	4926
6109680	91	1	A	1	P	12	4630
6109680	91	1	A	1	P	25	4792
6109690	75	1	A	1	P	25	4111
6109690	75	1	A	1	P	50	4415
6109690	91	1	A	1	P	75	4111
6109690	91	1	A	2	P	87	4415
6109690	91	1	L	2	P	75	4111
6109690	91	1	L	3	P	87	4415
6109690	91	0	L	3	P	6	4111
6109690	91	0	L	2	T	12	4415
6109710	73	0	A	1	T	12	3750
6109710	74	0	A	1	T	50	4439
6109710	74	0	L	1	T	12	3750
6109710	74	0	F	1	T	25	4294
6109710	74	0	A	2	T	50	4439
6109710	74	1	A	2	T	100	5321
6109710	75	0	L	1	T	12	3750
6109710	75	0	A	1	T	75	4918
6109710	76	3	A	1	T	6	3750
6109710	76	0	A	1	T	12	4163
6109710	90	0	A	1	T	6	3750
6109710	90	1	A	1	T	12	4595
6109710	91	1	A	2	T	12	3750
6109710	91	1	A	2	T	50	4294
6109710	91	1	A	2	T	75	5321
6109710	92	0	A	1	T	87	3750
6109710	92	0	A	4	T	6	4163
6109710	92	0	A	4	T	12	4294
6109710	92	0	A	1	T	25	3750
6109710	92	0	A	1	T	6	4163
6126340	92	1	A	1	P	12	4294
6126340	74	1	A	1	P	50	5321
6126340	74	1	A	1	P	94	4148
6126340	74	1	A	2	P	12	4492
6126340	74	1	A	1	P	19	4367
6126340	75	0	A	4	P	19	4634
6126340	75	0	A	1	P	19	4148
6126340	76	0	A	1	P	25	4367
6126340	76	0	L	1	P	28	4492
6126340	90	0	L	1	P	3	4148
6126340	90	0	A	1	P	12	4367
			A			6	4367
						12	4492

Table (upper block)

8	7	6	5	4	3	2	1
7321	9	P	2	A	1	76	6217900
7576	25	P	2	A	1	76	6217900
6822	6	P	1	A	1	90	6217900
7321	19	P	1	A	1	90	6217900
6822	3	P	2	A	0	90	6217900
6980	12	P	2	A	0	90	6217900
7214	19	P	2	A	0	90	6217900
7469	25	P	2	A	0	90	6217900
6822	3	P	3	A	0	90	6217900
7321	6	P	3	F	0	90	6217900
7469	12	P	3	F	0	90	6217900
6531	3	P	1	F	0	91	6217900
6822	19	P	5	A	1	91	6217900
7321	6	P	5	A	0	91	6217900
7469	12	P	1	A	0	91	6217900
6531	3	T	1	A	0	92	6217900
6822	19	P	2	A	0	92	6217900
7469	25	P	2	A	0	92	6217900
6531	3	P	3	A	0	92	6217900
7321	6	P	3	A	0	92	6217900
7576	12	T	1	A	1	92	6217900
6822	19	P	1	A	1	89	6217920
6980	19	P	2	A	1	89	6217920
7751	25	T	2	F	1	73	6217930
8058	6	T	1	F	1	73	6217930
6710	12	T	1	A	0	73	6217930
7174	6	T	1	A	0	73	6217930
6710	12	T	1	A	0	74	6217930
7174	12	T	1	A	0	74	6217930
6710	19	T	1	A	0	75	6217930
6952	6	T	1	A	1	75	6217930
7174	12	T	1	A	0	75	6217930
6608	19	T	3	F	0	75	6217930
7174	19	T	1	A	1	76	6217930
6710	25	T	1	F	0	76	6217930
7174	6	T	1	A	0	90	6217930
6710	12	T	1	A	1	90	6217930
7174	19	T	2	A	1	90	6217930
6463	50	T	2	A	0	91	6217930
6710	6	T	1	A	1	91	6217930
6710	12	T	1	A	1	91	6217930
6952	6	T	1	A	1	91	6217930
6132	12	T	1	A	1	91	6217930
6710	25	T	1	A	1	91	6217930
6952	37	T	1	A	1	91	6217930
7176							

Table (middle block)

8	7	6	5	4	3	2	1
6659	6	P	3	F	1	73	6217850
6845	19	P	3	F	1	73	6217850
6094	9	P	1	A	1	75	6217850
6230	12	T	1	F	1	75	6217850
6094	3	P	3	F	1	89	6217850
6659	9	P	3	F	1	89	6217850
6094	12	P	1	F	1	89	6217850
6376	3	P	1	F	0	90	6217850
6094	6	P	1	A	0	90	6217850
6659	6	P	4	A	0	90	6217850
6659	9	P	4	A	1	90	6217850
6845	12	P	2	A	1	90	6217850
6094	19	P	2	F	1	91	6217850
6845	6	P	3	F	0	91	6217850
6094	12	P	1	A	0	91	6217850
6845	6	P	1	F	0	91	6217850
6994	12	P	1	F	1	73	6217860
7165	19	T	1	F	1	73	6217860
6373	6	T	1	A	1	75	6217860
6684	19	P	1	F	0	75	6217860
6848	6	P	1	A	0	76	6217860
6994	12	P	1	A	0	89	6217860
7318	19	P	1	A	0	89	6217860
6994	25	P	1	A	0	90	6217860
7165	15	P	1	F	0	90	6217860
6373	19	P	1	A	0	91	6217860
6994	6	P	1	A	1	91	6217860
7626	19	P	1	F	1	74	6217870
7699	3	P	1	F	1	74	6217870
7348	6	P	4	F	1	75	6217870
8164	12	P	4	A	0	75	6217870
8164	25	P	1	F	0	89	6217870
8657	6	P	3	F	1	89	6217870
7626	12	P	3	A	1	90	6217870
8003	6	P	2	F	1	90	6217870
8164	6	P	2	F	1	90	6217870
8249	25	P	3	F	0	92	6217870
8003	31	P	1	A	0	92	6217870
8164	6	P	1	F	1	92	6217870
8003	12	P	1	F	1	74	6217900
8657	12	P	1	F	1	74	6217900
7321	6	P	1	F	1	75	6217900
7469	25	P	1	F	1	75	6217900
7321	6	P	1	F	1		
7576	25	P	1	F	1		

Table (lower block)

8	7	6	5	4	3	2	1
4400	12	P	1	A	0	73	6126430
4206	6	P	1	A	0	75	6126430
4400	19	P	1	A	0	75	6126430
4526	25	P	2	A	0	75	6126430
4400	25	P	2	A	1	75	6126430
4526	31	P	2	A	1	75	6126430
4400	6	P	3	A	1	76	6126430
4526	9	P	3	F	0	76	6126430
4400	6	P	1	F	0	76	6126430
4676	9	P	1	A	1	76	6126430
4206	6	P	2	A	1	90	6126430
4400	12	P	1	A	0	90	6126430
4206	6	P	2	A	0	90	6126430
4400	12	P	1	F	1	90	6126430
4206	50	P	1	F	1	91	6126430
4400	87	P	2	A	1	91	6126430
4206	50	P	2	A	1	91	6126430
4400	87	P	2	A	1	91	6126430
4206	6	P	4	A	0	92	6126430
4526	9	P	4	F	0	92	6126430
4311	12	P	5	F	0	89	6344870
4518	6	P	5	A	0	89	6344870
4311	12	P	1	A	0	89	6344870
4518	6	P	1	F	1	89	6344870
4518	12	P	5	F	0	90	6344870
4624	6	P	5	F	0	90	6344870
4518	3	P	1	F	1	90	6344870
4624	6	P	1	A	1	90	6344870
4518	9	P	1	F	0	90	6344870
4624	25	P	1	F	0	91	6344870
4311	19	P	5	F	1	91	6344870
4518	37	P	5	F	1	91	6344870
4518	50	P	1	F	1	92	6344870
4624	25	T	1	A	0	89	6235590
4811	50	P	1	F	0	91	6235590
5054	6	P	1	F	1	91	6235670
8564	12	T	1	F	1	75	6236670
8865	12	P	1	F	0	75	6123720
5900	19	T	1	F	0	73	6123720
6413	12	P	1	F	0	73	6217840
6566	19	T	1	F	0	74	6217840
6719	6	P	1	F	0	74	6217840
6867	25	T	1	O	0	90	6217840
6189						90	6217840
6867							

1	2	3	4	5	6	7	8
6217930	92	0	F	2	T	19	6132
6217930	92	0	F	2	T	25	6608
6217930	92	0	F	2	T	31	6952
6217930	92	0	F	3	T	37	7176
6217930	92	1	F	3	T	31	6463
6217930	92	1	F	3	T	44	6608
6217930	92	1	F	1	T	50	6710
6217940	73	0	F	1	P	12	5927
6217940	73	0	F	1	P	50	6294
6217940	76	1	F	4	P	9	6294
6217950	76	1	F	4	P	12	6607
6217950	73	1	F	4	P	6	8738
6217950	73	1	F	2	P	9	10317
6217950	73	0	F	2	P	12	11219
6217950	73	0	F	2	P	9	8738
6217950	73	0	F	2	P	25	10317
6217950	74	0	F	2	P	6	8738
6217950	74	1	F	1	P	9	9379
6217950	75	0	F	1	P	12	9554
6217950	75	0	A	1	P	6	8738
6217950	75	0	A	1	P	19	9379
6217950	75	1	F	1	P	6	8738
6217950	76	1	F	1	P	12	9149
6217950	76	1	F	1	P	19	10317
6217950	76	0	F	3	P	6	8738
6217950	90	0	F	3	P	9	9830
6217950	90	0	A	1	P	9	9554
6217950	90	0	A	1	P	3	10469
6217950	90	0	A	2	P	6	9554
6217950	91	1	A	2	P	12	10317
6217950	91	1	A	1	P	19	8738
6217950	91	1	A	1	P	3	9830
6217970	91	1	F	2	P	6	10317
6217970	92	0	F	2	P	9	9149
6217970	92	0	A	1	P	19	9379
6217970	73	1	F	1	P	12	10317
6217970	73	0	F	2	A	19	8738
6217970	74	1	A	1	P	12	9149
6217970	74	1	A	1	P	25	7357
6217970	74	0	F	2	P	12	7357

1	2	3	4	5	6	7	8
6217970	74	0	F	2	P	19	7681
6217970	75	1	A	2	P	19	7357
6217970	75	1	A	2	P	25	8055
6217970	75	1	A	3	P	50	8472
6217970	75	0	A	1	P	6	7852
6217970	75	0	F	1	P	9	8055
6217970	76	1	F	1	P	12	7357
6217970	76	0	F	3	P	9	7527
6217970	89	0	F	3	P	19	7357
6217970	89	1	F	1	P	6	8055
6217970	89	1	F	3	P	12	8055
6217970	89	1	F	1	P	19	8270
6217970	90	0	F	1	P	25	7852
6217970	90	1	F	1	P	9	8055
6217970	91	0	A	2	P	12	7357
6217970	91	1	F	2	P	6	8055
6217980	91	1	A	1	P	19	8113
6217980	91	1	F	1	P	25	8254
6217980	75	1	A	1	T	15	8113
6217980	75	1	F	1	P	9	8254
6217980	75	1	F	1	P	12	7530
6217980	76	1	A	2	P	6	8254
6217980	76	1	A	1	T	19	8254
6218000	91	1	F	1	P	6	8393
6218000	91	1	A	1	T	12	7182
6218000	91	1	A	2	P	19	7809
6218000	76	1	A	2	P	6	7947
6218000	76	0	A	1	P	19	8269
6218000	74	0	A	1	P	6	7809
6218010	74	1	F	2	P	12	9071
6218010	75	1	F	2	P	6	7809
6218040	76	1	A	1	T	12	9071
6218040	76	1	A	2	T	12	4089
6218040	74	0	A	1	T	19	4247
6218040	74	0	A	2	P	12	4203
6218040	75	0	A	1	P	19	5512
6218040	76	0	F	1	P	3	4644
6218040	90	0	F	2	P	6	5395
6218040	90	0	A	1	P	6	4958
6218040	92	0	F	2	P	12	5512
6218040	92	0	F	1	P	9	4768

1	2	3	4	5	6	7	8
6218040	92	0	A	1	P	12	5395
6218060	74	0	F	1	T	6	8327
6218060	74	0	F	1	P	9	8880
6218060	76	1	F	1	P	9	7940
6218070	76	0	A	1	P	15	8880
6218070	74	0	A	1	P	6	8892
6218070	74	0	F	1	P	9	8050
6218070	75	1	A	1	P	6	8892
6218070	75	1	F	2	P	19	8050
6218070	75	1	F	4	P	6	8892
6218070	75	0	A	1	P	25	8050
6218070	75	0	A	3	P	9	8441
6218070	76	1	F	3	P	6	8050
6218070	76	1	F	2	P	19	8441
6218070	76	0	F	3	P	6	8050
6218070	89	0	A	1	P	15	8441
6218070	89	0	F	2	P	12	8050
6218070	89	0	F	2	P	19	8441
6218070	90	1	F	1	P	3	9028
6218070	90	1	A	1	P	9	8050
6218070	90	0	F	1	P	9	8441
6218070	90	0	F	4	P	12	8441
6218070	91	1	A	4	P	6	8731
6218070	91	1	F	1	P	9	8050
6218070	92	1	F	1	P	19	8441
6218070	92	0	A	4	P	19	8050
6218070	92	0	F	4	P	25	8441
6218080	92	0	F	1	P	6	8050
6218080	89	1	A	1	P	9	8441
6218080	90	1	F	1	P	12	8731
6218080	90	1	F	6	P	6	8892
6218140	92	0	A	1	P	12	4326
6218140	92	0	F	1	T	6	4404
6218140	76	1	F	1	T	3	4106
6218140	89	1	A	2	T	12	4326
6218140	89	1	A	2	P	25	4106
6218140	91	1	F	2	P	9	4404
6218140	91	1	F	2	P	12	7884
6218140	91	1	F	2	P	9	8477
6218140	92	1	F	3	P	15	7884

Block 1

8	7	6	5	4	3	2	1
6346	9	P	1	F	0	92	6218320
3996	6	T	1	F	0	92	6218330
4203	12	T	1	F	0	92	6218330
4395	19	T	1	A	1	75	6218340
4395	25	T	1	A	0	75	6218340
4841	19	P	2	A	0	90	6218340
4395	25	P	2	A	0	90	6218340
4841	6	P	1	A	1	91	6218340
4395	12	P	3	A	1	91	6218340
4841	6	P	3	A	0	91	6218340
4395	9	P	1	A	1	91	6218340
4841	6	P	1	A	0	92	6218340
4915	12	P	1	A	0	92	6218350
4616	12	P	1	F	0	73	6218350
4778	25	P	1	F	0	73	6218350
3932	15	P	1	F	0	89	6218350
4253	25	P	2	A	0	89	6218350
3932	9	P	1	A	0	90	6218350
4100	12	P	1	A	1	90	6218350
4616	6	P	1	A	1	91	6218350
4778	12	P	1	A	1	91	6218350
3487	3	P	1	A	1	92	6218350
4100	6	P	1	A	1	92	6218360
4465	6	T	2	A	1	73	6218360
6386	3	P	2	A	1	75	6218360
5018	9	P	1	A	1	75	6218370
5999	6	P	2	A	0	90	6218370
5745	25	P	2	A	0	90	6218370
5947	12	T	1	A	0	92	6218370
5497	19	T	1	A	0	76	6218380
5745	6	T	1	F	0	76	6218380
5931	12	T	1	F	1	90	6218380
6136	25	T	2	F	0	90	6218380
6311	37	T	2	F	0	90	6218380
6919	50	T	2	F	0	73	6218410
4299	6	P	1	F	0	73	6218410
4544	6	P	1	F	0	73	6218410
4299	9	P	1	A	0	73	6218410
4544	6	P	1	F	1	74	6218410
4299	12	P	1	F	1	74	6218410
5124	6	P	1	F	0	75	6218410
4299	9	P	1	F	0	75	6218410
4544	6	P	1	F	1	76	6218410

Block 2

8	7	6	5	4	3	2	1
5531	31	T	3	F	0	75	6218240
5302	15	P	1	F	1	76	6218240
5451	19	T	3	F	0	76	6218240
4495	9	P	3	A	0	76	6218240
5451	12	P	2	F	0	89	6218240
4495	9	P	2	L	1	89	6218240
5918	12	P	1	A	1	90	6218240
4495	31	P	1	A	1	90	6218240
5451	6	T	1	F	0	91	6218240
5451	9	P	1	F	0	91	6218250
6846	6	P	1	A	0	74	6218250
7200	12	T	1	F	1	91	6218250
6846	6	T	1	A	1	91	6218250
7200	12	T	1	A	1	75	6218250
3736	25	T	1	A	0	75	6218260
3850	6	T	1	A	0	75	6218260
4771	9	P	1	A	1	90	6218260
3736	19	P	2	A	1	91	6218260
3809	25	T	2	A	0	91	6218260
3850	31	T	2	A	0	91	6218260
4467	9	T	1	A	0	91	6218260
4771	12	T	1	A	0	91	6218260
3850	37	T	1	A	0	91	6218260
4467	25	T	1	A	0	92	6218260
4771	9	T	1	A	0	92	6218260
3850	15	T	1	A	0	92	6218260
4467	19	T	1	A	1	89	6218300
4771	6	T	2	F	0	89	6218300
7359	12	T	2	F	1	89	6218300
7700	6	T	1	F	0	89	6218300
7359	12	P	1	A	0	91	6218300
7700	6	P	2	F	0	91	6218310
7359	12	P	2	F	0	73	6218310
7700	6	P	1	F	0	73	6218310
4339	19	P	1	F	1	89	6218310
4762	12	P	1	F	0	89	6218310
4339	19	P	2	A	0	90	6218310
4762	12	P	2	F	0	91	6218310
4339	25	P	1	F	0	91	6218320
4762	31	P	2	A	0	76	6218320
5417	6	P	2	A	0	76	6218320
6346	12	P	1	F	0	91	6218320
5417	9	P	1	F	0	91	6218320
6946	12	P	1	A	0	91	6218320
5417	3	P	1	F	0	92	6218320

Block 3

8	7	6	5	4	3	2	1
8477	19	P	3	F	1	92	6218140
7884	9	P	6	F	0	92	6218140
8477	12	P	6	F	0	92	6218170
4967	12	P	3	F	0	73	6218170
5135	15	P	3	F	0	73	6218170
4967	6	P	3	A	1	74	6218170
5135	12	P	3	A	1	74	6218170
4967	9	P	1	A	0	74	6218170
5135	12	P	3	A	1	74	6218170
4967	3	P	5	A	0	89	6218170
5413	12	P	5	F	0	89	6218170
4967	9	P	3	F	1	89	6218170
5413	15	P	3	A	0	90	6218170
5135	9	P	1	A	0	90	6218170
5413	12	P	1	A	0	90	6218170
5135	12	P	1	A	0	90	6218170
5413	15	P	3	A	0	91	6218170
4521	9	P	3	A	0	91	6218170
4967	12	P	1	A	0	91	6218170
5265	15	P	1	A	0	91	6218170
4967	12	P	1	A	0	91	6218170
5135	15	P	2	A	0	92	6218170
4521	12	P	2	A	0	92	6218170
4967	25	P	1	A	1	92	6218170
4967	6	P	1	A	1	92	6218190
5646	9	P	1	A	1	92	6218190
5610	6	P	1	A	0	92	6218190
5676	12	T	1	F	0	75	6218200
6866	15	P	3	A	0	75	6218200
8306	6	P	1	F	1	89	6218200
8054	9	P	1	F	0	89	6218200
8884	9	P	1	A	0	91	6218200
6866	12	P	1	A	0	91	6218200
7215	19	P	1	A	0	91	6218210
8587	3	T	3	A	0	91	6218210
8306	6	P	3	A	0	91	6218240
9070	56	T	1	A	0	74	6218240
5782	19	P	1	A	1	74	6218240
5921	25	P	2	A	0	75	6218240
4495	6	P	2	A	0	75	6218240
5451	12	P	1	A	0	75	6218240
4742	15	T	3	A	0	75	6218240
5045	12	P	2	F	1	75	6218240
5302	15	P	3	F	0	75	6218240
5302	12	...	...	...	...	...	...
5451	15	...	...	...	...	75	6218240

Table 1

1	2	3	4	5	6	7	8
6218510	75	1	A	2	T	12	6120
6218510	76	1	F	1	T	6	6087
6218510	76	1	F	1	T	19	6218
6218510	89	1	F	2	T	3	5970
6218510	89	1	A	2	T	6	6087
6218510	90	0	A	2	T	6	6087
6218510	90	0	A	1	T	12	6120
6218510	91	1	A	1	T	3	5970
6218510	91	1	F	2	T	12	5713
6218510	92	0	F	2	T	6	5713
6218510	92	0	A	3	T	12	5970
6218510	92	1	A	3	T	6	6087
6218510	92	0	A	1	T	12	6120
6218520	74	0	A	1	P	12	4230
6218520	75	1	A	2	T	19	4727
6218530	75	0	A	2	P	6	5504
6218530	91	0	A	1	T	12	5628
6218530	91	1	A	1	P	9	4447
6218530	91	1	A	1	P	12	5068
6218530	91	1	A	2	T	15	5504
6218530	91	1	A	2	P	19	5628
6218530	92	0	A	1	P	6	4447
6218530	92	0	F	1	P	9	5504
6218540	73	0	F	1	P	9	4447
6218540	73	0	F	3	P	12	5628
6218540	75	0	A	3	P	9	4134
6218540	75	0	A	1	P	19	4444
6218540	75	1	A	1	P	12	4134
6218540	76	0	A	1	P	15	4764
6218540	76	0	F	2	P	9	4134
6218540	89	1	F	2	P	9	4444
6218540	89	1	F	1	P	12	4134
6218540	91	1	F	1	P	19	4444
6218540	91	0	A	1	P	12	4444
6218540	91	0	A	3	P	25	4764
6218540	91	1	A	3	P	31	4134
6218540	92	1	F	1	P	9	4444
6218550	73	0	F	1	P	12	4764
6218550	73	0	F	1	P	6	4134
6218550	73	1	F	2	P	19	4392
6218550	73	0	F	2	P	9	5081
6218550		0	F		P	19	4392
6218550			F		P	6	5081
						12	

Table 2

1	2	3	4	5	6	7	8
6218470	90	0	F	2	P	6	7019
6218470	90	1	A	3	P	3	6989
6218470	90	1	A	3	P	6	7019
6218470	90	1	F	4	P	3	6989
6218470	90	1	A	1	P	6	7019
6218470	91	1	A	3	P	25	6454
6218470	91	0	F	3	P	3	7019
6218470	91	0	F	1	P	6	6989
6218470	91	1	A	1	P	9	7019
6218470	92	1	A	1	P	9	6454
6218480	92	1	A	1	P	25	6989
6218480	91	1	A	2	P	9	6404
6218490	91	1	F	2	P	12	6675
6218490	73	1	A	2	P	19	6658
6218490	73	1	A	1	P	22	6959
6218490	73	0	A	3	P	25	6959
6218490	73	0	A	3	P	9	7193
6218490	75	1	A	1	P	12	7350
6218490	75	1	A	1	P	19	6353
6218490	75	0	A	1	P	6	7699
6218490	75	0	A	1	P	12	7760
6218490	76	1	A	6	P	9	6658
6218490	76	1	F	6	P	12	7193
6218490	76	0	F	1	P	12	6353
6218490	89	0	F	2	P	19	6658
6218490	89	1	F	2	P	3	7350
6218490	89	1	F	3	P	6	6353
6218490	89	1	F	3	P	3	6658
6218490	90	1	F	4	P	19	7193
6218490	90	1	A	4	P	22	7350
6218490	90	1	A	1	P	25	6353
6218490	90	1	F	1	P	12	6658
6218490	90	1	F	1	P	6	6353
6218500	90	0	A	1	T	12	7350
6218500	91	0	A	1	T	3	6658
6218510	91	1	F	2	T	6	6959
6218510	89	0	A	1	T	12	6658
6218510	74	0	F	2	T	6	7760
6218510	75	0	A	2	T	12	6353
		1	A			6	7193
							7567
							6850
							7251
							5713
							6087
							5970

Table 3

1	2	3	4	5	6	7	8
6218410	76	0	F	2	P	12	5124
6218410	89	1	F	3	P	3	4299
6218410	89	1	F	3	P	9	5124
6218410	89	0	F	6	P	12	4299
6218410	89	0	F	6	P	19	4544
6218410	89	0	A	1	P	25	4774
6218410	90	1	A	1	P	9	4299
6218410	90	1	A	2	P	19	4544
6218410	90	0	A	1	P	12	4299
6218410	90	0	A	1	P	19	4544
6218410	90	1	A	3	P	37	4299
6218410	91	1	A	3	P	50	4544
6218410	91	0	A	1	P	6	4299
6218410	91	1	A	4	P	15	4774
6218410	91	0	F	4	P	12	4299
6218410	92	1	A	3	P	15	4997
6218410	92	0	A	1	T	12	4299
6218410	92	0	A	1	T	15	4774
6218410	92	0	F	2	T	12	3954
6218420	75	0	A	2	T	3	4633
6218420	76	1	A	1	T	6	3954
6218420	76	0	A	3	T	3	4234
6218420	76	0	A	3	P	6	3954
6218420	92	0	A	5	P	3	4234
6218420	92	1	F	5	P	6	3954
6218440	74	0	A	1	P	12	4234
6218440	76	0	A	2	P	25	4788
6218440	76	1	F	1	P	15	5292
6218440	76	1	A	1	P	19	4788
6218440	76	1	A	1	P	3	5036
6218440	76	0	A	1	P	12	4788
6218440	90	0	A	1	P	3	5292
6218440	90	0	F	1	P	6	4788
6218440	91	1	A	1	P	3	5036
6218440	91	1	F	1	P	25	4788
6218440	92	1	A	1	P	37	5292
6218460	92	0	F	2	P	6	4070
6218470	73	0	F	2	P	12	4788
6218470	73	0	F	2	P	25	5292
6218470	89	0	F	1	P	6	6454
6218470	89	0	F	1	P	9	6989
6218470	90	0	F	1	P	9	6989
					P	12	7019
					P	3	6454

48

8	7	6	5	4	3	2	1
4444	6	T	2	A	0	90	62186660
4748	12	T	1	A	0	90	62186660
3940	6	T	1	F	1	92	62186660
4444	12	T	2	F	1	92	62186660
3142	3	P	2	F	1	89	63776650
3861	6	T	3	F	1	89	63776650
3142	9	P	3	A	0	89	63776650
3861	3	T	1	A	0	89	63776650
3142	6	P	1	A	0	91	63776650
3861	3	T	2	A	0	91	63776650
3602	9	P	1	F	1	74	63776660
4156	12	T	1	A	0	74	63776660
3602	9	T	1	F	1	76	63776660
4156	12	T	1	F	1	76	63776660
3169	12	T	1	F	1	91	63776670
3830	25	T	2	A	0	91	63776690
3036	12	T	1	F	1	74	63776690
3861	19	T	1	F	1	74	63776690
3327	12	T	1	F	1	75	63776690
3831	25	T	1	F	1	75	63776690
3036	12	T	1	A	0	91	63776690
3831	19	T	1	A	0	91	63776690
3533	12	T	1	F	1	76	63776700
4300	6	T	1	A	0	76	63776700
4001	12	T	1	A	0	76	63776700
4300	6	T	1	A	0	89	63776750
3793	19	T	1	A	0	89	63776750
3954	3	T	1	A	0	76	63776750
3954	6	T	1	A	0	76	63776750
4790	6	T	1	A	0	90	63776780
3443	12	T	2	A	0	90	63776780
3901	25	T	1	F	1	89	63776780
3016	12	T	1	F	1	89	63776780
3443	31	T	1	F	1	91	63776780
3622	75	T	1	A	0	91	63776800
3459	12	T	1	A	0	91	63776800
4345	19	T	1	A	0	89	63776800
3459	12	T	1	F	1	91	63776810
3859	19	T	1	F	1	91	63776810
3406	12	T	1	F	1	92	63776810
3627	19	T	1	A	0	92	63776900
7465	6	T	1	A	0	74	63776900
7590	12	T	1	A	0	75	63776900
7120	12	T	1	A	0	75	63776900
7465	19	T	1	A	0	91	63776930
7350	25	T	2	A	1	91	63776930

8	7	6	5	4	3	2	1
4659	6	T	1	A	1	91	62186600
5673	25	P	1	A	1	91	62186600
3653	12	P	1	A	0	75	62186610
4249	25	P	1	A	0	75	62186610
3877	9	P	1	A	0	76	62186610
4355	19	P	1	A	0	76	62186610
3877	3	P	1	A	1	90	62186610
4249	6	P	2	A	1	90	62186610
3653	19	P	2	A	1	91	62186610
4249	22	P	2	F	0	91	62186610
3653	6	P	1	F	0	91	62186610
4863	9	P	2	A	0	92	62186610
5500	3	P	2	A	0	92	62186630
4343	6	P	2	A	1	74	62186630
4646	9	P	4	A	1	74	62186630
4863	19	P	5	F	0	75	62186630
4863	25	P	5	F	0	75	62186630
5390	3	P	1	A	1	75	62186630
4863	6	P	2	A	1	75	62186630
5390	3	P	2	F	0	75	62186630
4343	9	P	1	F	0	76	62186630
5186	19	P	2	A	1	76	62186630
4646	6	P	2	A	0	76	62186630
5500	19	P	2	A	0	89	62186630
4646	9	P	2	A	1	89	62186630
5390	9	P	1	A	0	89	62186630
4646	9	P	2	F	0	91	62186630
5390	6	P	2	A	1	91	62186630
4646	9	P	2	F	0	91	62186630
4863	6	P	1	F	0	91	62186630
4646	9	P	1	F	0	89	62186640
4863	6	P	2	A	0	89	62186640
3551	15	T	1	A	0	89	62186640
4250	19	T	2	F	1	91	62186640
4826	6	T	2	F	0	91	62186640
4606	12	T	2	A	1	76	62186660
4826	19	T	2	A	1	76	62186660
3615	31	T	1	F	1	76	62186660
3823	50	T	1	F	0	89	62186660
3940	62	T	2	F	0	89	62186660
4444	9	T	3	F	1	89	62186660
3940	12	T	3	F	0	91	62186660
4748	12	T	2	F	0	91	62186660

8	7	6	5	4	3	2	1
4392	9	P	2	A	1	74	62185550
5081	12	P	2	A	1	74	62185550
4392	12	P	1	A	1	75	62185550
5081	19	P	1	A	0	75	62185550
4392	9	P	1	A	0	92	62185550
5081	12	T	1	A	0	92	62185550
3806	3	T	4	A	0	73	62185560
4242	12	T	2	A	0	92	62185560
3806	9	T	1	A	1	73	62185560
4242	19	T	1	A	0	75	62185560
3806	6	T	1	A	0	75	62185560
4321	19	T	1	A	0	75	62185560
3806	15	T	2	A	0	91	62185560
4242	19	T	2	A	0	91	62185560
3976	6	T	2	F	0	92	62185560
4128	12	T	2	F	0	92	62185560
3780	3	T	3	A	1	74	62185570
3988	6	P	3	A	1	74	62185570
7531	25	P	1	F	1	74	62185570
4552	6	P	1	F	1	75	62185570
4988	9	P	1	F	0	76	62185570
3780	12	P	1	A	0	76	62185570
4988	12	P	4	A	0	91	62185570
3780	25	P	4	F	0	91	62185570
3988	6	P	4	F	0	91	62185570
3780	9	P	1	L	1	91	62185570
3988	19	P	1	L	0	92	62185570
7531	12	P	1	F	0	92	62185570
3780	12	T	1	F	0	89	62185580
3988	15	T	1	F	0	89	62185580
3905	12	P	2	F	0	73	62185580
4197	19	P	2	A	1	73	62185590
4420	6	P	1	A	0	74	62185590
4834	9	P	1	A	0	75	62185590
4420	25	P	2	A	0	75	62185590
4834	31	P	2	A	1	75	62185590
4420	6	P	1	A	0	75	62185590
4834	9	P	1	A	0	76	62185590
4420	12	P	2	A	0	76	62185590
4834	19	P	2	F	0	76	62185590
4420	9	P	1	F	0	91	62185590
4834	12	P	1	F	1	91	62185590
3		P	2		0		
6			2				

Table (left block):

1	2	3	4	5	6	7	8
6377930	91	I	A	2	T	50	7673
6377950	92	I	A	1	T	6	3364
6377950	92	I	A	1	T	12	3465
6377950	92	O	A	2	T	3	3364
6377950	92	O	F	2	P	6	3465
6377960	73	I	F	5	P	12	4484
6377960	73	I	F	5	P	6	4659
6377960	73	O	F	5	P	12	4902
6377960	74	O	A	1	P	15	4484
6377960	74	O	A	1	P	6	4659
6377960	75	O	F	1	P	9	4484
6377960	75	O	F	1	P	6	4946
6377960	76	O	F	1	P	12	4283
6377960	76	O	F	2	P	9	4484
6377960	89	O	A	1	P	12	4051
6377960	89	O	F	3	P	6	4484
6377960	89	O	F	3	P	9	4051
6377960	91	O	A	1	P	9	4946
6377960	91	O	F	3	P	9	4283
6377960	91	O	F	3	P	19	4902
6377960	91	O	F	3	P	6	4051
6377960	92	O	A	1	P	15	4902
6377960	92	O	A	1	P	6	4484
6377960	92	O	A	2	P	12	4902
6377960	92	O	A	2	P	9	4946
6377960	74	O	F	1	P	19	4035
6377980	74	O	F	1	P	3	4326
6377980	89	O	F	2	P	6	3815
6377980	89	O	F	2	P	12	4326
6377980	92	O	A	1	P	6	4035
6377980	74	O	A	1	T	9	4326
6378030	74	O	A	2	T	6	4168
6378030	89	O	A	2	T	12	4942
6378030	89	O	A	2	T	9	3296
6378030	89	O	A	1	T	12	4036
6378030	75	O	A	1	T	6	3296
6378100	75	O	A	2	T	12	4168
6378100	90	I	A	2	T	50	7575
6378100	90	I	A	2	T	3	8360
6378100	91	I	A	1	T	6	7306
6378100	91	I	A	1	T	12	8302
6378100	91	I	A	1	T	19	7575
						50	8360

Table (middle block):

1	2	3	4	5	6	7	8
6378130	91	O	A	1	T	6	6391
6378130	91	O	A	1	T	12	6769
6378190	91	O	A	1	P	3	3931
6378190	91	O	A	4	P	12	4224
6378190	91	I	F	4	P	12	4363
6378190	91	O	A	2	P	15	4535
6378220	73	O	A	2	P	9	3192
6378220	73	I	F	2	P	19	3774
6378220	91	O	A	1	P	12	3192
6378220	91	I	F	1	P	25	3774
6378230	73	O	A	1	P	25	4373
6378230	73	O	A	1	P	44	4722
6378230	75	I	F	4	P	12	3915
6378230	75	I	F	4	P	19	4506
6378230	76	I	F	1	P	6	3579
6378230	76	I	F	1	P	19	4373
6378230	76	O	A	1	P	6	4506
6378230	76	O	A	1	P	12	4722
6378230	89	O	A	2	P	12	3915
6378230	89	O	A	1	P	50	4373
6378230	90	O	A	1	P	3	3915
6378230	90	O	A	2	P	6	4722
6378230	91	I	F	1	P	19	3915
6378250	91	I	F	1	P	25	4506
6378250	92	O	A	1	P	6	4373
6378250	75	O	A	2	P	19	4506
6378250	75	O	A	1	P	6	4123
6378250	75	O	A	1	P	9	4514
6378250	75	O	A	2	P	25	4969
6378250	75	I	F	1	P	25	4514
6378250	89	I	F	2	P	9	4969
6378250	89	I	F	1	P	19	4123
6378250	89	O	A	3	P	9	4830
6378250	89	O	A	3	P	12	4123
6378250	89	O	A	3	P	9	4830
6378250	91	O	A	2	P	15	4123
6378250	91	O	A	3	P	19	4514
6378250	92	I	F	2	P	6	4969
6378250	92	O	A	3	P	12	4123
6378250	92	O	A	2	P	19	4514
6378250	92	O	A	3	P	12	4123
					P	15	4514

Table (right block):

1	2	3	4	5	6	7	8
6378350	89	O	A	1	T	3	5503
6378350	89	O	A	1	T	19	6496
6378350	90	O	A	1	T	3	5769
6378350	90	O	A	3	T	6	6770
6378380	91	I	A	3	T	6	3727
6378380	91	I	A	1	T	12	4017
6378400	74	I	A	1	T	9	3094
6378400	74	O	A	1	T	12	3232
6378400	76	O	A	1	T	3	3094
6378410	76	I	F	3	T	6	3247
6378410	74	I	A	3	T	3	3374
6378410	75	I	A	1	T	12	3972
6378410	75	I	A	1	T	12	3374
6378410	76	I	F	1	T	19	3560
6378410	76	I	F	1	T	12	3196
6378410	92	I	F	3	T	19	3323
6378410	92	I	A	4	T	6	3374
6378420	73	I	A	1	T	12	3560
6378420	73	I	A	3	T	15	2744
6378420	75	I	F	3	T	3	2781
6378420	75	I	F	1	T	19	3009
6378420	76	I	F	1	T	3	3617
6378420	76	I	A	3	T	6	3009
6378420	89	I	A	3	T	6	3617
6378420	89	I	A	1	T	12	2744
6378420	89	I	A	1	T	3	2781
6378420	91	I	F	3	T	12	3009
6378420	91	I	F	4	T	9	3617
6378420	92	I	A	1	T	12	3009
6378420	92	I	A	1	T	6	3617
6378420	92	I	A	1	T	12	6040
6378420	92	I	A	1	T	6	6926
6378420	92	O	A	1	T	19	6040
6378420	75	O	A	1	T	6	6926
6378490	75	O	A	1	P	25	6052
6378490	91	O	A	1	T	6	6372
6378490	91	I	F	1	T	25	3056
6378530	91	I	F	1	T	3	3577
6378530	91	I	F	1	T	6	3440
6378570	75	I	F	1	T	19	
6378570	76	I	F	1	T		

Table (columns 1–8), block 1:

1	2	3	4	5	6	7	8
63788770	92	0	F	2	P	9	4502
63788770	92	0	F	2	P	12	4724
63788770	92	0	F	2	P	19	5058
63788800	75	1	A	1	T	6	2880
63788800	75	1	A	1	P	12	3086
63788810	75	1	A	1	P	12	3775
63788810	75	1	A	2	P	19	4090
63788810	75	1	F	2	P	12	3775
63788810	75	1	F	3	P	19	4277
63788810	76	0	A	3	P	3	4090
63788810	76	0	A	1	P	6	4277
63788810	89	1	F	1	P	12	3775
63788810	89	1	F	2	P	19	4090
63788810	91	1	F	1	P	19	3775
63788810	91	1	F	1	P	25	4277
63788810	92	0	F	2	P	6	3775
63788810	92	0	F	2	P	12	4090
63788810	92	1	F	1	P	3	4090
63788810	76	1	F	1	P	6	4277
63788810	76	1	F	2	P	9	2327
63788840	92	1	F	2	T	9	2384
63788840	92	1	F	2	T	6	2327
63788840	75	0	A	1	T	12	2833
63788840	75	0	A	1	P	6	3982
63788870	75	1	A	1	P	9	4123
63788870	76	1	F	3	T	12	4715
63788870	76	1	F	3	P	3	3982
63788870	89	1	F	4	P	6	4384
63788870	89	0	A	4	T	9	3982
63788870	89	0	A	4	P	12	4123
63788870	89	0	F	1	P	6	4715
63788870	89	0	F	1	T	6	3982
63788870	89	0	F	3	P	9	4123
63788870	91	0	A	3	P	12	3982
63788870	91	1	A	2	T	12	4687
63788870	91	1	F	2	P	25	4715
63788870	91	0	F	3	P	31	3665
63788870	92	0	F	3	T	6	3982
63788870	92	0	F	2	P	12	4384
63788950	73	0	F	2	T	19	3982

Table (columns 1–8), block 2:

1	2	3	4	5	6	7	8
63788760	89	0	F	1	T	28	3144
63788760	89	0	F	1	T	50	3785
63788760	91	1	A	1	T	3	3144
63788760	91	1	A	2	T	6	3947
63788760	91	1	A	2	T	3	3144
63788760	91	1	A	3	T	6	3947
63788760	91	0	F	1	T	3	3144
63788760	91	0	F	1	P	6	3340
63788760	92	1	F	2	P	3	3144
63788760	92	1	F	2	P	6	3947
63788770	73	1	A	1	P	9	3927
63788770	73	0	F	1	P	19	5058
63788770	73	0	F	1	P	12	3927
63788770	73	0	A	1	P	25	4136
63788770	74	0	A	1	P	31	5211
63788770	74	0	A	2	P	12	3927
63788770	75	0	A	2	P	19	4136
63788770	75	1	A	4	P	25	5211
63788770	75	1	A	4	P	6	3927
63788770	75	0	A	1	P	25	4136
63788770	76	0	A	2	P	31	5211
63788770	76	0	A	1	P	3	4724
63788770	76	1	F	1	P	12	5211
63788770	89	1	A	2	P	25	3927
63788770	89	1	A	1	P	12	4502
63788770	89	0	A	2	P	19	3927
63788770	90	0	A	2	P	6	4136
63788770	90	1	F	1	P	12	3927
63788770	90	1	A	4	P	6	4136
63788770	91	1	A	4	P	12	3927
63788770	91	1	A	1	P	6	5211
63788770	92	0	F	2	P	19	3927
63788770	92	0	F	1	P	12	4724
63788770	92	1	F	1	P	19	3927
63788770	92	0	F	2	P	25	5058

Table (columns 1–8), block 3:

1	2	3	4	5	6	7	8
63788570	76	1	F	1	T	25	3577
63788570	91	1	F	2	T	19	2922
63788570	91	1	F	2	T	31	3056
63788570	91	1	F	1	P	44	3202
63788590	90	0	A	1	T	6	3136
63788590	90	0	A	1	T	12	3273
63788590	73	0	F	1	T	3	2340
63788640	73	0	F	1	T	6	2651
63788640	91	0	A	1	T	12	2289
63788640	91	1	A	1	P	15	2340
63788640	91	1	A	1	T	50	3088
63788640	74	1	A	1	P	3	4699
63788680	74	0	A	2	P	6	5210
63788680	74	0	A	2	P	12	5484
63788680	75	1	F	3	P	9	4221
63788680	75	1	A	3	P	12	4899
63788680	75	1	A	5	P	19	5210
63788680	75	1	A	5	P	9	4221
63788680	76	0	A	1	P	19	4899
63788680	76	0	A	3	P	3	4899
63788680	76	1	A	3	P	6	5380
63788680	89	1	A	1	P	9	4221
63788680	89	0	A	5	P	12	5210
63788680	89	0	A	5	P	3	4899
63788680	90	1	A	3	P	6	5720
63788680	90	1	A	3	P	6	4221
63788680	90	0	A	3	P	12	4899
63788680	90	0	A	5	P	12	5210
63788680	91	1	A	5	P	25	5380
63788680	91	0	A	1	P	6	4221
63788680	91	0	A	2	P	37	4899
63788680	92	0	A	2	P	50	4221
63788680	92	1	A	3	T	37	6017
63788680	92	0	A	2	P	9	4699
63788680	92	0	F	2	P	19	4899
63788680	92	0	F	3	P	12	4899
63788760	76	0	A	3	T	15	5210
63788760	76	0	F	2	T	12	5210
63788760	89	0	F	1	T	19	3144
						3	3947
						6	2966

1	2	3	4	5	6	7	8
6378950	73	0	F	2	P	19	4488
6378950	73	I	F	3	P	3	4808
6378950	73	I	F	3	P	6	4978
6378950	73	I	A	4	P	3	4808
6378950	73	I	A	4	P	6	4978
6378950	74	I	F	2	P	3	4808
6378950	74	I	F	2	P	6	5833
6378950	74	0	A	1	P	3	4808
6378950	74	0	A	1	P	6	5126
6378950	75	I	A	3	T	12	3915
6378950	75	I	A	3	P	19	4488
6378950	75	I	A	3	P	25	4808
6378950	75	0	A	1	T	6	3915
6378950	75	0	A	1	P	9	4488
6378950	75	0	A	1	P	15	4808
6378950	75	0	F	2	T	6	3915
6378950	75	0	F	2	P	9	4488
6378950	75	0	F	2	P	15	4808
6378950	76	I	F	2	T	9	3915
6378950	76	I	F	2	P	12	4808
6378950	76	0	A	1	T	6	3915
6378950	76	0	A	1	P	9	5730
6378950	89	0	F	1	T	9	3915
6378950	89	0	F	1	P	12	4808
6378950	90	0	A	1	P	3	4488
6378950	90	0	A	1	P	6	4693
6378950	90	I	A	3	P	3	4808
6378950	90	I	A	3	P	6	5730
6378950	91	I	A	1	T	6	3915
6378950	91	I	A	1	P	9	4488
6378950	91	I	A	1	P	15	4693
6378950	91	I	A	1	P	19	5276
6378950	91	0	A	3	P	9	4693
6378950	91	0	A	3	P	15	5436
6378950	92	I	F	1	P	3	4808
6378950	92	I	F	1	P	6	5436
6378960	75	0	A	1	T	3	2900
6378960	75	0	A	1	T	6	3692
6378960	90	I	A	2	T	3	2900
6378960	90	I	A	2	T	9	3918
6378960	90	0	A	3	T	3	2900
6378960	90	0	A	3	T	6	3918
6378970	73	0	F	1	P	9	3860
6378970	73	0	F	1	P	15	4592
6378970	73	0	F	1	P	19	5580
6378970	73	I	F	2	P	3	4730
6378970	73	I	F	2	P	19	4957
6378970	74	I	A	1	P	9	3860
6378970	74	I	A	1	P	15	4730
6378970	74	0	F	2	P	3	4592
6378970	74	0	F	2	P	15	5123
6378970	74	0	F	2	P	25	5279
6378970	75	I	A	4	P	6	4135
6378970	75	I	A	4	P	12	4311
6378970	75	I	A	4	P	25	5123
6378970	75	0	A	1	P	3	4135
6378970	75	0	A	1	P	6	4311
6378970	75	0	A	1	P	15	4592
6378970	75	0	F	2	P	3	4135
6378970	75	0	F	2	P	6	4311
6378970	75	0	F	2	P	9	5123
6378970	75	0	F	2	P	15	5580
6378970	76	I	F	1	P	6	4730
6378970	76	I	F	1	P	25	5123
6378970	89	I	F	2	P	9	4135
6378970	89	I	F	2	P	12	4311
6378970	89	I	F	2	P	15	4730
6378970	89	0	F	6	P	9	4135
6378970	89	0	F	6	P	12	4592
6378970	90	I	A	1	P	3	4311
6378970	90	I	A	1	P	6	5123
6378970	90	I	A	1	P	9	5279
6378970	90	0	A	2	P	3	4311
6378970	90	0	A	2	P	25	5279
6378970	91	I	A	3	P	15	4135
6378970	91	I	A	3	P	50	6382
6378970	91	0	A	1	P	9	4135
6378970	91	0	A	1	P	15	4592
6378970	91	0	A	1	P	25	4957
6378970	91	0	A	1	P	50	6382
6378970	92	I	F	2	P	12	4135
6378970	92	I	F	2	P	15	4592
6378970	92	I	F	2	P	19	5404
6378970	92	0	A	5	P	3	4135
6378970	92	0	A	5	P	25	5279
6378980	73	0	F	1	T	6	4387
6378980	73	0	F	1	T	12	4679
6378980	75	I	A	3	T	3	4276
6378980	75	I	A	3	T	6	4387
6378980	75	0	A	2	T	6	4276
6378980	75	0	A	2	T	12	4582
6378980	76	I	A	1	T	3	3825
6378980	76	I	A	1	T	6	4387
6378980	76	0	A	2	T	6	4387
6378980	76	0	A	2	T	9	4679
6378990	74	I	A	1	T	3	2788
6378990	74	I	A	1	T	6	3360
6378990	89	0	F	1	T	19	2788
6378990	89	0	F	1	T	44	3125
6378990	89	0	F	1	T	50	3360
6378990	91	I	A	2	T	12	2788
6378990	91	I	A	2	T	44	3125
6378990	91	I	A	2	T	50	3360
6398100	76	I	A	1	T	3	3934
6398100	76	I	A	1	T	6	4386
6398100	89	0	F	2	T	12	3535
6398100	89	0	F	2	T	25	3934
6398100	90	0	A	2	T	3	3410
6398100	90	0	A	2	T	12	4386
6398100	92	0	A	1	T	3	3535
6398100	92	0	A	1	T	6	4386
6398100	92	I	F	2	T	6	3934
6398100	92	I	F	2	T	12	4175
6398110	73	I	F	2	P	6	3568
6398110	73	I	F	2	P	9	4058
6398110	73	I	F	2	P	12	4651
6398110	73	I	F	3	P	6	3568
6398110	73	I	F	3	P	12	4058
6398110	73	0	F	1	P	6	3568
6398110	73	0	F	1	P	12	3920
6398110	73	0	F	1	P	15	4058
6398110	73	0	F	1	P	19	4651
6398110	75	I	A	3	P	12	3568
6398110	75	I	A	3	P	22	3920
6398110	75	I	A	3	T	25	4382
6398110	75	0	A	1	P	9	3568
6398110	75	0	A	1	P	12	3724
6398110	75	0	A	1	P	15	3920
6398110	76	I	F	2	P	6	3568
6398110	76	I	F	2	T	9	4382
6398110	76	0	F	1	P	9	3568
6398110	76	0	F	1	P	12	3920
6398110	89	0	F	1	P	9	3568
6398110	89	0	F	1	P	12	3724
6398110	89	0	F	1	P	15	3920
6398110	89	0	F	1	P	19	4216
6398110	89	0	F	1	P	25	4966
6398110	90	I	A	1	P	3	3920

Panel 1

8	7	6	5	4	3	2	1
4259	3	P	3	F	0	92	64404970
4408	6	P	3	F	0	92	64404970
5463	25	P	3	F	0	92	64404970
3114	3	I	1	F	0	73	64404980
3736	25	I	1	F	0	73	64404980
3114	3	I	1	F	1	92	64404980
3736	6	I	1	F	0	92	64404980
3773	12	I	1	F	0	73	64404990
4126	19	I	1	F	1	73	64404990
3922	6	I	3	A	1	73	64404990
4200	12	I	1	A	1	74	64404990
3497	3	I	1	A	1	74	64404990
3773	6	I	1	A	1	75	64404990
3239	6	I	1	A	1	75	64404990
3389	9	I	1	A	1	75	64404990
3497	12	I	1	F	1	89	64404990
4200	19	I	2	F	0	89	64404990
3389	3	I	2	A	0	89	64405000
3773	6	I	1	A	1	91	64405000
3922	19	I	3	A	1	91	64405000
3239	44	I	3	F	0	92	64405000
3636	50	I	3	F	0	92	64405000
3239	12	I	1	A	1	73	64405000
3389	15	I	2	F	1	73	64405000
3922	19	I	2	A	1	73	64405000
4126	25	P	3	A	1	74	64405000
4048	6	P	3	A	1	75	64405000
4306	9	P	1	A	1	75	64405000
4629	6	P	1	A	1	75	64405000
5060	12	P	2	A	1	75	64405000
4756	6	P	2	A	0	75	64405000
5402	12	P	2	A	0	75	64405000
3620	9	P	3	A	1	75	64405000
4465	12	P	3	F	1	75	64405000
5402	19	P	3	F	1	75	64405000
5737	25	P	1	F	1	75	64405000
3620	9	P	1	A	0	75	64405000
4048	12	P	2	A	0	75	64405000
4465	15	P	2	A	1	75	64405000
4629	25	P	2	A	1	75	64405000
5737	75	P	3	A	1	75	64405000
3620	19	P	1	A	0	75	64405000
5737	25	P	3	F	1	76	64405000
3620	12	P	3	F	1	76	64405000
5402	19	P	3	F	0	76	64405000

Panel 2

8	7	6	5	4	3	2	1
3961	12	I	2	F	0	89	64404960
4242	6	I	2	A	1	90	64404960
4700	12	I	2	A	1	90	64404960
3473	6	I	1	A	1	91	64404960
3961	12	I	1	A	1	91	64404960
4242	19	I	1	A	1	91	64404960
3540	3	I	1	A	1	92	64404960
4105	6	I	1	A	1	92	64404960
4700	19	I	1	A	1	91	64404960
4799	25	I	2	F	0	92	64404960
4242	6	P	2	F	0	92	64404960
4799	12	P	1	A	0	73	64404960
4259	6	P	1	A	0	73	64404970
4845	12	P	1	A	0	74	64404970
4259	6	P	3	A	0	74	64404970
3148	12	P	3	A	0	75	64404970
4297	12	P	3	F	1	75	64404970
5646	15	P	1	F	1	75	64404970
4259	31	P	1	F	0	75	64404970
4408	12	P	1	A	0	75	64404970
5615	15	P	1	A	0	75	64404970
4259	19	P	4	A	0	76	64404970
4408	25	P	4	A	1	76	64404970
4634	19	P	2	A	0	76	64404970
5463	25	P	3	F	0	76	64404970
4259	6	P	3	F	0	89	64404970
4408	25	P	3	F	0	89	64404970
5615	6	P	3	F	0	89	64404970
5878	12	P	1	A	1	90	64404970
4259	6	P	1	A	1	90	64404970
5278	19	P	1	A	1	91	64404970
5046	3	P	1	A	1	91	64404970
5463	6	P	4	F	1	91	64404970
4408	25	P	1	F	1	91	64404970
5615	50	P	1	F	0	91	64404970
4259	3	P	1	F	0	91	64404970
5905	6	P	1	A	0	91	64404970
4259	19	P	2	A	0	91	64404970
5046	25	P	2	F	0	92	64404970
5463	6	P	1	F	1	92	64404970
5878	12	P	1	F	1	92	64404970

Panel 3

8	7	6	5	4	3	2	1
4058	6	P	1	A	1	90	63981110
4058	3	P	2	A	0	90	63981110
4216	6	P	2	A	0	90	63981110
4058	3	P	3	F	0	90	63981110
5110	6	P	3	A	0	90	63981110
3724	12	P	1	A	1	91	63981110
4651	19	P	4	A	0	91	63981110
4058	6	P	4	A	0	91	63981110
4966	12	P	1	F	0	91	63981110
3920	3	P	1	F	0	92	63981110
4216	6	I	2	A	1	92	63981110
3907	25	I	2	A	1	89	63981160
4420	37	I	1	F	0	89	63981160
4597	50	I	2	F	0	89	63981160
3148	12	I	1	A	0	91	63981160
4297	50	I	2	A	1	91	63981160
3907	50	I	2	A	0	91	63981160
4078	62	I	1	A	0	91	63981160
4597	125	I	1	A	0	92	63981160
3582	12	I	1	A	1	89	63981170
3907	15	I	1	A	1	89	63981170
3959	19	P	4	F	0	91	63981170
5113	19	P	4	A	0	91	63981170
3959	31	P	1	F	0	91	63981170
4438	9	P	3	A	1	92	63981170
3959	12	P	3	A	1	92	63981170
5423	9	P	4	F	0	92	63981170
4438	12	P	4	F	0	75	63981170
4981	3	P	1	A	0	75	63981170
4438	12	P	1	F	0	75	63981170
4981	9	I	2	F	1	75	64404950
3044	12	I	1	F	1	75	64404960
3448	19	I	1	F	1	75	64404960
3961	12	I	1	F	0	76	64404960
4559	6	I	2	F	0	76	64404960
3961	12	I	1	F	1	76	64404960
4799	6	I	1	F	1	76	64404960
3540	12	I	1	F	0	89	64404960
4242	3	I	2	F	1	89	64404960
3540	12	I	1	F	1	89	64404960
4559	6	I	1	F	0	89	64404960
3473	25	I	2	F	0	—	—
4799	3	I	—	F	—	—	—
3650	—	—	—	—	—	—	—

Block 1

8	7	6	5	4	3	2	1
3620	6	P	1	F	0	76	64050000
5737	12	P	1	F	0	76	64050000
3620	6	P	1	A	1	89	64050000
4163	12	P	2	A	1	89	64050000
3620	6	P	2	F	0	89	64050000
4048	9	P	2	F	0	89	64050000
5060	25	P	2	A	0	89	64050000
3620	6	P	2	A	0	90	64050000
4306	9	P	1	A	0	90	64050000
5060	12	P	1	A	0	90	64050000
3620	19	P	1	A	1	91	64050000
4048	25	P	1	A	1	91	64050000
4756	31	P	3	A	1	91	64050000
5060	50	P	3	A	1	91	64050000
5263	75	P	3	A	1	91	64050000
3620	12	P	1	A	1	91	64050000
4629	19	P	3	A	1	91	64050000
4898	31	P	3	A	1	91	64050000
3620	12	P	4	A	0	92	64050000
4048	31	P	4	A	0	92	64050000
3620	6	P	4	A	0	92	64050000
4629	9	P	1	A	0	92	64050020
5060	12	P	1	A	0	92	64050020
3620	6	P	2	A	1	92	64050030
4465	12	P	2	A	1	92	64050030
4898	25	P	2	A	1	91	64050030
6384	3	T	1	A	0	91	64050030
6719	6	T	1	A	0	73	64050030
5495	12	T	1	F	0	73	64050030
5622	6	P	1	F	0	74	64050030
5346	25	P	1	A	1	74	64050030
7045	50	T	1	A	1	74	64050030
7513	12	T	1	A	1	74	64050030
5346	19	T	1	F	0	74	64050030
5495	37	T	3	F	0	74	64050030
6013	44	T	3	A	0	75	64050030
6135	12	P	1	A	1	75	64050030
5495	19	T	2	F	1	75	64050030
5622	50	T	2	F	1	76	64050030
7513	12	T	2	F	0	76	64050030
5495	19	P	1	F	0	76	64050030
6135	6	P	1	F	0	76	64050030
6013	19	P	1	F	0	76	64050030
6750	25	P	1	F	0	76	64050030
7513	50	P	1	F	0	76	64050030

Block 2

8	7	6	5	4	3	2	1
5495	6	T	1	F	0	89	64050030
6320	75	T	1	F	0	89	64050030
6013	3	T	3	A	0	89	64050030
6496	6	T	3	A	1	89	64050030
5495	3	T	1	A	1	90	64050030
6013	6	T	3	A	0	90	64050030
5495	25	T	3	A	0	91	64050030
6320	50	T	5	A	1	91	64050030
6013	12	T	5	A	1	91	64050030
6135	19	T	5	A	0	91	64050030
6320	25	T	1	A	0	91	64050030
6013	3	T	1	A	0	92	64050040
6135	6	T	1	A	1	92	64050040
3837	3	T	1	A	1	73	64050040
4376	12	T	1	A	1	73	64050040
3837	6	T	2	A	0	74	64050040
4060	12	T	3	A	0	74	64050040
4376	19	T	3	A	0	74	64050040
3837	6	T	1	F	0	74	64050040
4060	12	T	1	F	0	74	64050040
3837	3	T	1	A	1	75	64050040
4060	6	T	4	A	0	75	64050040
3837	6	T	4	A	1	75	64050040
4376	12	T	4	F	0	76	64050040
3837	3	T	2	F	0	76	64050040
4060	6	T	2	A	1	76	64050040
3837	12	T	2	A	1	76	64050040
4060	25	T	3	A	0	91	64050040
3837	3	P	3	A	0	91	64050050
4376	12	P	1	A	1	91	64050050
3837	6	P	2	A	1	92	64050050
4964	12	P	2	A	1	92	64050050
3837	3	P	3	A	0	92	64050050
4060	6	P	1	A	0	74	64050050
3791	6	P	1	F	0	74	64050050
2877	9	P	1	F	0	74	64050050
4818	12	P	1	A	0	75	64050050
2877	3	T	1	A	0	74	64050050
3890	6	P	1	A	1	74	64050050
4114	9	F	1	A	1	75	64050050
3025	12	F	1	F	1	75	64050050
3454	3	F	1	F	0	76	64050050
4114	12	P	1	F	1	76	64050050

Block 3

8	7	6	5	4	3	2	1
3589	12	P	2	F	0	76	64050050
4324	19	P	2	F	0	76	64050050
3295	6	P	1	F	1	89	64050050
3890	15	P	1	F	1	89	64050050
3791	6	P	3	A	0	89	64050050
3890	12	P	3	A	0	89	64050050
3295	6	P	1	A	0	90	64050050
4324	12	P	1	A	0	90	64050050
4114	6	P	4	A	0	90	64050050
4180	9	P	4	A	1	90	64050050
3025	6	P	1	A	1	91	64050050
3454	9	P	1	A	1	91	64050050
3890	12	P	1	A	1	91	64050050
3025	19	P	2	A	1	91	64050050
4481	3	P	1	A	1	91	64050050
3025	9	P	1	A	1	92	64050050
3454	6	T	1	A	0	92	64050050
3890	19	T	1	A	0	92	64050050
3454	6	T	1	A	1	73	64050080
4180	12	T	2	A	1	74	64050080
3454	6	T	2	A	1	74	64050080
3791	12	T	1	F	0	75	64050080
3695	6	T	1	F	0	75	64050080
3982	12	T	1	F	0	75	64050080
3695	6	T	1	F	0	75	64050080
3982	9	T	1	A	0	89	64050080
3695	12	P	2	A	0	89	64050080
3982	19	P	2	A	0	90	64050080
3695	12	P	1	A	1	90	64050080
3982	15	P	1	A	1	90	64050080
3695	9	P	1	A	1	90	64050080
3982	12	P	1	A	0	91	64050080
3695	3	P	2	A	0	75	64050090
3982	6	P	2	A	0	75	64050090
3695	12	P	1	A	0	75	64050090
3982	15	P	1	F	0	76	64050090
3407	25	P	1	F	0	76	64050090
3602	12	T	1	A	0	76	64050090
3916	19	T	1	A	1	76	64050090
3407	12	T	1	A	1	89	64050090
3916	15	T	5	F	1	89	64050090
3756	12	T	5	F	0	89	64050090
3602	6	T	2	F	0	89	64050090
3756	9	T	2	F	1	89	64050090

Data table (page content printed in landscape orientation). Three stacked panels, each with columns numbered 1–8.

Panel 1

1	2	3	4	5	6	7	8
6405150	73	0	A	6	P	19	5235
6405150	74	0	F	2	P	9	4724
6405150	74	0	F	2	P	12	5101
6405150	75	1	A	2	P	19	4361
6405150	75	1	A	1	P	25	5101
6405150	75	0	A	1	P	19	4361
6405150	75	0	F	2	P	25	5920
6405150	76	1	F	2	P	6	4361
6405150	76	1	F	2	P	12	5101
6405150	76	1	F	4	P	19	5920
6405150	76	0	A	2	P	3	4578
6405150	90	0	A	4	P	6	5101
6405150	90	1	F	1	P	3	4361
6405150	90	0	A	1	P	9	5101
6405150	91	0	A	3	P	12	4361
6405150	91	0	A	3	P	25	5920
6405150	91	1	A	1	P	12	4361
6405150	91	1	F	1	P	15	4724
6405150	92	1	F	1	P	25	5920
6405150	92	1	F	1	P	3	4578
6405160	73	0	F	2	T	12	5920
6405160	73	0	A	3	T	6	4361
6405160	73	0	A	1	T	12	5101
6405160	73	0	A	1	T	6	3657
6405160	73	0	A	1	T	12	3719
6405160	74	0	F	2	T	19	4755
6405160	74	0	F	3	T	19	4038
6405160	75	1	F	1	T	31	4178
6405160	75	1	F	1	T	19	4038
6405160	76	1	A	1	T	31	4178
6405160	76	1	A	1	T	6	3657
6405160	76	0	F	2	T	12	4755
6405160	76	0	A	3	T	25	3657
6405160	89	1	A	1	T	37	4178
6405160	89	1	A	1	T	12	3657
6405160	90	0	F	1	T	19	4755
6405160	90	0	F	2	T	6	4038
6405160	91	1	F	2	T	12	4178
6405160	91	1	A	1	T	6	4038
6405160	91	1	F	1	T	12	4755
6405160	91	1	F	2	T	6	4038
6405160	91	1	A	2	T	12	4755
6405160	91	1	A	2	T	6	4038
6405160	91	1	A	2	T	9	4178

Panel 2

1	2	3	4	5	6	7	8
6405140	73	0	A	1	P	9	4339
6405140	73	0	A	3	P	12	4999
6405140	73	0	F	1	P	6	3717
6405140	73	0	A	1	P	19	4725
6405140	74	0	A	3	P	6	4339
6405140	74	0	A	3	P	12	5459
6405140	74	1	A	3	P	6	4725
6405140	74	1	A	1	P	19	5320
6405140	75	1	A	1	P	19	3717
6405140	75	0	A	2	P	25	4170
6405140	75	0	F	2	P	6	3717
6405140	75	0	F	1	P	19	4170
6405140	75	1	A	1	P	6	3717
6405140	76	1	A	1	P	12	4170
6405140	76	1	A	2	P	6	3717
6405140	76	0	F	2	P	9	4999
6405140	76	0	F	3	P	25	5596
6405140	76	0	A	3	P	3	4170
6405140	89	1	A	1	P	6	4498
6405140	89	1	A	1	P	12	5320
6405140	89	1	F	2	P	3	4170
6405140	89	1	F	2	P	25	5459
6405140	89	1	F	2	P	6	3717
6405140	89	1	F	3	P	12	4999
6405140	89	0	A	3	P	25	5459
6405140	89	0	A	1	P	31	3717
6405140	89	0	A	1	P	50	4170
6405140	90	1	A	2	P	6	4725
6405140	90	1	F	2	P	9	5320
6405140	91	0	F	2	P	12	3717
6405140	91	0	F	3	P	25	4170
6405140	91	0	F	3	P	12	5320
6405140	91	0	F	1	P	25	5596
6405140	91	0	F	1	P	31	4170
6405140	91	0	A	1	P	50	4845
6405140	91	1	A	3	P	9	3717
6405150	73	1	F	3	P	12	4170
6405150	73	1	F	3	P	25	4725
6405150	73	0	F	1	P	12	3717
6405150	73	0	F	1	P	15	4170
6405150		0	A	6	P	19	4339
						12	4725
							4361
							4578
							4724
							4892

Panel 3

1	2	3	4	5	6	7	8
6405090	89	0	F	1	T	6	3602
6405090	89	0	F	1	T	12	3756
6405090	89	0	F	1	T	19	3916
6405090	90	0	A	1	T	6	3407
6405090	90	0	A	2	T	12	3602
6405090	91	1	A	1	T	31	3602
6405090	91	1	A	1	T	37	3756
6405090	92	1	A	2	T	6	3407
6405090	92	0	A	2	T	12	3916
6405100	73	0	F	1	T	6	3609
6405100	73	0	F	2	T	9	3898
6405100	73	0	A	2	T	6	3609
6405100	73	0	A	2	T	12	3711
6405100	73	1	A	3	T	6	3411
6405100	75	1	A	3	T	12	3609
6405100	75	1	A	3	T	25	3711
6405100	75	1	A	1	T	6	3411
6405100	75	0	F	3	T	12	3711
6405100	75	0	F	3	T	25	3898
6405100	75	0	F	2	T	6	3411
6405100	76	1	F	2	T	12	3898
6405100	76	1	F	1	T	19	3411
6405100	76	1	F	2	T	6	3711
6405100	76	0	F	2	T	19	3411
6405100	89	0	F	2	T	12	3711
6405100	89	1	F	1	T	19	3898
6405100	91	1	A	3	T	12	3996
6405100	92	1	A	1	T	12	3898
6405120	92	1	A	1	T	25	3996
6405120	75	0	F	3	T	12	3411
6405120	75	0	F	3	T	25	3898
6405120	75	0	F	2	T	3	3815
6405120	91	1	A	1	T	12	3940
6405120	91	1	F	3	T	31	3940
6405120	91	1	F	1	T	37	3815
6405120	92	1	F	3	T	3	3940
6405120	76	0	F	3	T	12	4279
6405120	76	0	A	3	T	9	3940
6405130	76	1	F	1	T	12	4279
6405130	76	1	F	2	T	3	3197
6405130	76	0	A	2	T	6	3359
6405140	73	0	A	1	P	6	3197
							3359
							3717

8	7	6	5	4	3	2	1
4062	37	T	1	A	1	91	6405210
4533	56	T	1	A	1	91	6405210
4643	75	T	1	A	1	91	6405210
3898	19	T	2	A	0	91	6405210
4205	25	T	2	A	0	91	6405210
3319	3	.	1	F	1	92	6405210
4205	6	P	1	A	1	92	6405210
3815	6	P	1	A	1	76	6405220
4353	9	P	1	A	1	91	6405220
3815	12	P	1	A	1	91	6405220
4073	19	P	3	A	0	91	6405220
3815	6	P	3	A	0	91	6405220
4353	12	P	1	A	1	92	6405220
4073	3	P	2	A	0	92	6405220
4353	9	P	2	F	0	89	6405230
1507	12	P	2	F	0	89	6405230
1590	15	P	4	F	0	89	6405230
1747	19	P	4	A	1	89	6405230
1747	3	P	1	A	0	91	6405230
1873	6	P	2	A	0	91	6405230
1507	12	P	2	F	1	75	6405230
1747	6	T	2	F	0	75	6405240
4192	12	T	1	F	0	76	6405240
4562	3	T	3	A	1	76	6405240
3869	6	T	3	A	0	91	6405240
4192	9	T	1	F	0	91	6405240
3453	19	T	1	F	1	92	6405240
3869	6	T	2	A	1	92	6405240
3869	12	T	1	A	0	76	6405250
4562	12	T	1	A	0	76	6405250
3279	25	T	2	A	1	76	6405250
4123	12	T	2	F	0	89	6405250
3279	25	T	2	A	1	89	6405250
4123	19	T	2	A	1	91	6405250
3700	31	T	1	A	0	91	6405250
3773	37	T	1	A	0	91	6405250
3589	62	T	1	A	1	91	6405250
3700	100	T	1	A	1	91	6405250
4123	19	T	2	A	0	91	6405250
3589	75	T	2	F	0	92	6405250
3773	12	T	2	F	0	92	6405250
3279	19	T	2	F	0	92	6405250
3700	37	T	3	F	1	92	6405250
4123	12	T	3	F	1	92	6405250
3589	25	T	3	F	0	92	6405250

8	7	6	5	4	3	2	1
5040	19	P	1	A	0	75	6405200
4515	9	P	2	A	1	75	6405200
4681	12	P	2	A	1	75	6405200
5040	25	P	2	A	1	75	6405200
5774	37	P	2	F	1	75	6405200
4515	9	P	1	F	1	76	6405200
5040	12	P	2	F	0	76	6405200
4515	6	P	1	F	0	76	6405200
5040	19	P	1	A	0	76	6405200
3742	19	P	3	F	0	89	6405200
4812	25	T	1	F	1	89	6405200
4515	9	P	3	F	1	89	6405200
4681	12	P	3	A	1	89	6405200
5195	19	P	1	A	0	90	6405200
4331	6	P	2	A	0	90	6405200
4681	9	P	2	F	1	90	6405200
4681	6	P	2	A	1	90	6405200
5357	12	P	1	A	1	91	6405200
5644	19	P	3	A	1	91	6405200
3742	9	P	3	F	0	91	6405200
5644	6	P	3	F	0	91	6405200
4331	12	P	3	F	0	91	6405200
4515	15	P	1	F	0	91	6405200
4681	19	T	1	A	1	91	6405200
4812	25	P	3	F	1	92	6405200
5644	6	P	3	F	1	92	6405200
4331	9	P	1	A	0	92	6405200
4515	19	P	1	F	0	92	6405200
5040	6	P	1	F	0	73	6405210
4515	9	P	2	F	0	73	6405210
6123	12	P	2	F	1	75	6405210
3466	25	T	2	F	1	75	6405210
4205	25	T	2	A	1	76	6405210
3466	31	T	2	F	0	76	6405210
3898	12	T	4	F	0	75	6405210
3544	25	T	4	A	0	75	6405210
4062	25	T	1	F	1	76	6405210
3734	37	T	1	F	0	76	6405210
3898	75	T	1	F	0	89	6405210
4643	6	T	1	F	0	89	6405210
4385	12	T	1	F	1	89	6405210
4643	12	T	1	F	0	89	6405210
3734	25	T	1	A	0	90	6405210
4062	31	T	1	A	0	90	6405210
4643	25	T	1	A	0	90	6405210
3898	25	T	1	A	1	91	6405210

8	7	6	5	4	3	2	1
4755	12	T	2	A	1	91	6405160
4028	9	T	6	A	1	73	6405170
4327	12	T	6	A	1	73	6405170
3586	6	T	1	A	1	74	6405170
4028	12	T	1	F	1	74	6405170
3586	6	T	2	F	1	74	6405170
4028	19	T	2	F	1	74	6405170
4327	25	T	4	F	1	74	6405170
3586	3	T	4	F	0	75	6405170
3864	6	T	1	A	0	75	6405170
3586	3	T	1	A	0	75	6405170
4028	12	T	1	F	0	75	6405170
4327	19	T	1	F	0	76	6405170
3586	3	T	1	A	0	76	6405170
3864	9	T	1	A	0	89	6405170
3446	6	T	2	A	1	89	6405170
3864	9	T	2	A	1	91	6405170
3298	12	T	1	A	0	91	6405170
3586	19	T	1	A	0	91	6405170
3728	25	T	3	A	1	91	6405170
3446	3	T	2	F	1	91	6405170
3586	12	T	2	A	1	91	6405170
4028	19	T	2	F	1	92	6405170
3586	6	T	3	F	0	92	6405170
3864	9	T	3	F	0	92	6405170
4028	6	T	1	F	1	92	6405170
3586	19	T	2	F	1	92	6405170
4327	6	T	2	F	1	92	6405180
3214	12	T	5	F	0	75	6405180
3394	62	T	5	F	0	75	6405180
3573	75	T	1	F	1	91	6405190
3736	6	T	2	A	0	91	6405190
3272	12	T	2	A	0	92	6405190
3573	3	P	1	A	0	92	6405190
4681	6	P		A		73	6405200
5357	9	P		A		73	6405200
5357	15	P		A		73	6405200
5489	6	P		A		73	6405200
4515	12	P		A		74	6405200
6123	15	P		A		74	6405200
4681	3	P		A		74	6405200
5040	6	P		A		74	6405200
4331	6	P		A		75	6405200
4515	12	P		A		75	6405200

1	2	3	4	5	6	7	8
6405260	73	0	A	1	T	3	4201
6405260	73	0	A	1	T	6	4456
6405260	74	0	F	1	T	3	4456
6405260	74	0	F	1	T	6	4791
6405260	75	0	A	1	T	6	3680
6405260	75	0	A	3	T	19	4642
6405260	75	1	A	1	T	12	4201
6405260	75	1	A	1	T	31	4201
6405260	76	1	F	1	T	9	4456
6405260	76	1	L	3	T	12	4642
6405260	76	1	F	3	T	25	4456
6405260	76	0	A	3	T	3	4456
6405260	76	0	A	5	T	6	4642
6405280	89	0	F	5	T	12	3880
6405260	89	0	A	1	T	9	4456
6405260	89	1	F	3	T	25	4201
6405260	89	1	A	4	T	6	4456
6405260	90	0	A	2	T	19	3680
6405260	90	0	A	2	T	12	4456
6405263	90	0	A	3	T	25	4201
6405260	90	1	L	2	T	12	4456
6405260	91	1	A	4	T	19	4201
6405260	91	1	A	4	T	3	4642
6405260	91	0	A	4	T	12	4201
6405260	91	0	A	2	T	3	4642
6405260	91	0	A	3	T	12	3680
6405260	92	0	A	3	T	6	4456
6405263	92	0	A	3	T	25	4201
6405270	92	1	F	3	T	3	4456
6405270	73	1	L	3	T	12	3882
6405270	73	0	A	3	T	12	4445
6405270	73	0	A	3	T	19	3882
6405270	73	0	A	2	T	12	4580
6405270	73	0	A	2	T	25	3882
6405270	75	0	F	2	T	37	4057
6405270	75	1	F	2	T	50	3550
6405270	75	1	F	3	T	100	3696
6405270	75	0	A	3	T	6	4187
6405270	76	1	L	2	T	6	3550
6405270	76	0	F	2	T	6	4700
6405270	76	0	F	3	T	19	3550
6405270	76	1	L	3	T	6	4580
6405270	76	0	A	3	T	12	3882
6405270	76	0	A	3	T	12	4445

1	2	3	4	5	6	7	8
6405270	89	0	F	2	T	37	3550
6405270	89	0	F	1	T	50	3696
6405270	90	0	A	1	T	100	3550
6405270	90	0	F	2	T	6	4187
6405270	90	0	F	2	T	12	3550
6405270	90	0	A	3	T	3	3696
6405270	90	1	A	1	T	37	4057
6405270	90	1	A	1	T	50	4445
6405270	91	1	F	1	T	6	3550
6405270	91	1	F	1	T	12	3696
6405270	92	1	F	4	T	50	3550
6405270	92	1	A	1	T	6	4057
6405280	92	0	A	1	T	12	4187
6405280	75	0	F	3	T	3	3985
6405280	75	0	F	2	T	31	4440
6405280	89	1	L	4	T	6	3418
6405280	89	1	F	4	T	12	3570
6405280	89	0	A	4	T	9	3862
6405280	89	0	A	1	T	6	4440
6405280	90	1	F	1	T	12	3418
6405283	90	1	F	3	T	25	3862
6405280	90	1	F	2	T	50	3418
6405280	90	0	A	2	T	75	3985
6405280	90	0	A	3	T	6	4308
6405280	91	1	F	3	T	3	3208
6405280	91	1	A	2	T	6	3668
6405280	91	0	A	3	T	3	3418
6405280	91	0	F	3	T	6	3985
6405280	92	1	F	1	T	9	3570
6405280	92	1	A	1	T	6	3985
6405280	92	1	A	4	T	9	3570
6405290	92	0	A	4	T	19	3668
6405290	74	0	A	4	T	6	3862
6405290	74	0	A	1	T	9	3442
6405290	75	0	F	1	T	19	3867
6405290	75	1	F	1	T	12	4343
6405290	75	1	A	1	T	15	3706
6405290	75	1	F	1	T	25	3867
6405290	75	1	F	1	T	60	4022
6405290	76	0	L	1	T	12	4496
6405290	76	0	L	1	T	31	3442
6405290	76	0	A	1	T	37	4022
6405290	89	0	A	3	T	3	4496
6405290	89	0	A	3	T	6	4192
6405290	89	0	A	1	T	12	4496

1	2	3	4	5	6	7	8
6405290	91	1	A	1	T	3	4022
6405290	91	1	A	1	T	6	4192
6405290	91	1	F	1	T	50	5502
6405290	92	1	F	3	T	3	4022
6405290	92	1	F	3	T	6	4343
6405290	92	0	F	1	T	50	5502
6405300	74	0	A	1	T	6	3746
6405300	74	1	A	2	T	19	3876
6405300	74	1	F	2	T	6	3876
6405300	76	1	F	1	T	12	3996
6405300	76	0	F	1	T	6	3876
6405300	90	1	A	2	T	19	3996
6405300	90	0	A	2	T	12	3876
6405310	73	0	A	1	T	19	4480
6405310	73	0	A	1	T	6	3966
6405310	73	0	A	1	T	9	3966
6405310	75	0	A	2	T	12	4098
6405310	75	1	F	2	T	19	4233
6405310	89	1	F	1	T	6	4388
6405310	89	1	F	1	T	12	3546
6405310	89	0	F	1	T	12	3966
6405310	90	0	A	1	T	19	3546
6405310	90	1	A	2	T	12	3966
6405310	90	0	F	2	T	31	3966
6405310	90	1	F	1	T	3	4098
6405310	91	0	F	1	T	6	3966
6405310	92	0	A	2	T	12	4098
6405310	92	1	A	2	T	12	4098
6405320	73	0	F	1	T	25	4388
6405320	73	1	F	1	T	9	3546
6405320	73	1	F	1	T	19	4098
6405320	75	1	A	2	T	12	4548
6405320	75	1	A	2	T	19	3725
6405320	75	1	A	1	T	12	4175
6405320	76	0	A	3	T	19	4175
6405320	76	1	A	3	T	3	4326
6405320	76	1	A	1	T	12	4022
6405320	76	0	F	1	T	6	4175
6405320	76	1	F	3	T	19	4326
6405320	76	1	F	3	T	25	3398
6405330	75	1	F	1	T	3	3725
						12	4022
						12	3725
							4326
							4036

Columns are labeled 1–8.

Block 1

1	2	3	4	5	6	7	8
6405330	75	1	F	1	T	19	4196
6405330	76	1	A	1	T	9	3876
6405330	76	1	A	3	T	12	4339
6405330	76	0	F	3	T	19	4472
6405330	76	0	F	1	T	25	4625
6405330	91	1	A	1	P	12	3876
6405330	91	1	A	1	P	3	4196
6405340	90	1	A	2	P	6	3916
6405340	90	0	A	2	P	6	4186
6405340	90	0	A	1	P	12	3916
6405340	90	1	A	1	P	9	3651
6405340	91	1	F	1	P	19	3916
6405340	91	1	F	2	P	25	4186
6405340	91	1	F	2	P	50	5825
6405340	91	1	A	2	P	9	3651
6405340	91	0	A	3	P	25	3916
6405340	91	0	A	3	P	31	3651
6405340	91	0	F	4	P	75	3916
6405340	91	0	F	4	P	9	3740
6405340	91	0	F	4	P	19	3916
6405340	91	0	A	1	P	25	4444
6405350	91	1	A	1	T	6	3740
6405350	73	1	A	2	T	19	4182
6405350	73	0	F	2	T	6	4345
6405350	73	0	A	3	T	19	4444
6405350	75	1	A	1	T	6	3585
6405350	75	0	A	2	T	19	4050
6405350	75	1	F	5	T	100	4182
6405350	75	0	F	5	T	6	4444
6405350	76	0	A	1	T	19	4345
6405350	89	1	A	1	T	3	4444
6405350	89	1	F	2	T	6	3740
6405350	89	0	A	2	T	22	4182
6405350	89	0	F	5	T	3	4345
6405350	91	1	A	5	T	12	4444
6405350	91	1	A	1	T	6	3585
6405350	91	0	A	2	T	19	4444
6405350	92	0	A	2	T	6	3740
6405350	92	1	A	1	T	19	4444
6405350	92	1	A	1	T	12	3585
6405350	92	0	A	2	T	19	4182
6405350	92	0	A	2	T	12	3585
6405350	92	0	A	2	T	15	4182
6405350	92	0	A	2	T	19	4444

Block 2

1	2	3	4	5	6	7	8
6405360	73	0	A	2	P	9	3169
6405360	73	0	A	2	P	12	4079
6405360	73	0	A	3	P	15	4371
6405360	73	1	A	3	P	6	3456
6405360	73	1	A	1	P	25	3748
6405360	74	1	A	1	P	3	3169
6405360	74	0	A	3	P	15	4371
6405360	74	0	A	3	P	6	3169
6405360	74	1	A	2	P	9	3748
6405360	75	1	A	1	P	6	3929
6405360	75	0	A	1	P	9	4371
6405360	75	1	A	1	P	3	3929
6405360	89	1	L	1	P	9	4079
6405360	89	0	L	2	P	12	3169
6405360	89	0	L	2	P	3	3456
6405360	89	0	L	1	P	12	3169
6405360	90	1	A	2	P	25	3748
6405360	90	0	A	2	P	6	4371
6405360	90	0	A	1	P	15	3169
6405360	90	1	A	2	P	6	3456
6405360	91	0	A	2	P	25	3169
6405360	91	0	A	2	P	12	3456
6405360	91	0	A	2	P	25	3456
6405360	92	1	A	2	P	6	3169
6405360	92	1	A	3	P	9	3456
6405360	92	1	A	1	P	9	3456
6405370	92	0	F	1	T	12	4079
6405370	76	0	F	2	T	9	3791
6405370	76	1	F	1	T	25	3966
6405370	76	1	A	1	T	3	3791
6405370	76	0	A	2	T	6	4113
6405370	89	0	A	2	T	12	4442
6405370	89	1	F	2	T	6	3232
6405370	89	0	F	5	T	12	4113
6405370	90	0	A	5	T	6	3232
6405370	90	0	A	1	T	6	4113
6405370	91	0	A	2	T	19	3849
6405370	91	1	F	2	T	6	3966
6405370	91	0	F	2	T	25	3232
6405370	91	0	F	1	T	37	3791
6405370	91	0	F	2	T	6	3232
6405370	91	0	F	2	T	12	3849

Block 3

1	2	3	4	5	6	7	8
6405370	91	0	A	3	T	6	3232
6405370	91	0	A	3	T	19	3791
6405370	92	0	F	3	T	12	4113
6405370	92	0	F	3	T	50	5009
6405380	75	1	F	1	T	6	3579
6405380	91	1	A	1	T	19	4184
6405380	91	0	A	1	T	6	2951
6405380	91	0	A	1	T	19	3864
6405380	91	0	A	1	T	9	3579
6405390	73	1	A	2	T	12	4033
6405390	73	0	A	2	T	6	3545
6405390	74	1	F	2	T	15	3709
6405390	74	0	A	3	T	3	4035
6405390	74	0	A	4	T	6	4201
6405390	74	0	F	4	T	3	4035
6405390	76	1	F	2	T	6	4201
6405390	76	1	F	2	T	3	3413
6405390	76	1	A	2	T	12	3545
6405390	89	0	A	1	T	31	4035
6405390	89	0	A	1	T	37	4035
6405390	91	0	A	2	T	50	3413
6405390	91	0	A	2	T	75	3545
6405390	91	0	A	2	T	6	3709
6405390	91	1	A	1	T	15	3545
6405390	91	1	A	1	T	3	3709
6405390	92	1	A	2	T	6	4343
6405390	92	1	A	2	T	12	3880
6405390	92	1	A	2	T	6	4486
6405390	92	0	A	3	T	9	3545
6405390	76	0	A	3	T	12	3709
6405400	73	1	A	3	T	6	3709
6405400	73	1	A	1	T	9	4343
6405400	73	0	A	1	T	12	3551
6405400	73	0	A	1	T	6	3551
6405400	73	1	A	2	T	9	3986
6405400	73	1	A	2	T	12	4286
6405400	73	1	A	5	T	6	3551
6405400	74	0	A	5	T	9	3843
6405400	74	0	A	1	T	19	4615
6405400	74	1	A	2	T	12	3843
6405400	74	1	F	2	T	19	4494
6405400	74	0	F	5	T	15	3843
6405400	75	1	A	1	T	25	3986
6405400	75	0	A	1	T	12	3551

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Table (columns 1–8), three stacked blocks.

Block 1

1	2	3	4	5	6	7	8
6405440	75	1	A	1	T	6	3725
6405440	75	1	A	1	T	9	3873
6405440	76	1	A	2	T	3	3725
6405440	76	1	F	2	T	6	4278
6405440	89	0	F	4	T	25	3725
6405440	89	0	F	2	T	9	3873
6405440	91	0	A	2	T	34	3725
6405440	91	0	A	2	T	3	3873
6405440	92	1	A	2	T	9	3725
6405480	92	1	A	2	T	3	3873
6405480	91	1	A	2	P	9	3714
6405490	91	1	A	1	P	3	3519
6405490	91	1	A	3	T	6	3520
6405500	91	1	A	3	T	3	3746
6405500	73	1	A	2	T	6	3907
6405500	73	0	A	3	T	12	3746
6405500	74	0	A	1	T	19	3907
6405500	74	0	A	1	T	50	3746
6405500	75	1	F	4	T	6	3907
6405500	75	1	F	1	T	12	3374
6405500	89	1	A	1	T	19	3746
6405500	89	1	A	1	T	3	3907
6405500	89	1	A	1	T	6	3746
6405500	89	0	A	1	T	12	3907
6405500	91	0	F	1	P	6	3374
6405500	91	1	F	1	P	12	3907
6405500	92	1	A	1	P	25	3110
6405500	92	1	F	1	P	12	3728
6405560	75	1	A	3	P	25	3110
6405560	89	1	F	3	P	12	3982
6405560	89	1	A	1	P	15	3110
6405560	91	1	F	1	P	3	3982
6405560	91	1	A	1	P	6	3110
6405560	92	1	F	1	P	9	3982
6405570	92	0	A	1	P	15	3497
6405570	73	1	F	3	P	9	3859
6405570	75	1	A	3	P	12	3497
6405570	75	1	F	1	P	6	3859
6405570	76	1	F	3	P	12	3497
6405570	76	1	F	3	P	9	3859

Block 2

1	2	3	4	5	6	7	8
6405410	89	1	F	2	T	19	3579
6405410	90	0	A	1	T	12	3720
6405410	90	0	A	3	T	25	4554
6405410	91	1	A	3	T	19	3579
6405410	91	0	A	1	T	25	3720
6405410	91	0	A	2	T	6	3579
6405410	91	0	A	1	T	12	3720
6405410	91	0	A	2	T	9	3579
6405410	92	1	F	1	T	6	4007
6405410	73	1	F	3	T	19	3263
6405420	73	0	A	3	T	12	4554
6405420	74	0	A	1	T	12	3742
6405420	74	0	A	4	T	15	4007
6405420	74	1	A	4	T	6	3428
6405420	74	1	F	2	T	12	3585
6405420	75	0	A	1	T	15	3742
6405420	75	0	A	2	T	12	4007
6405420	75	0	A	2	T	25	3428
6405420	75	0	F	3	T	12	3742
6405420	89	1	A	3	T	25	3428
6405420	89	1	A	2	T	12	3742
6405420	89	1	A	2	T	25	3585
6405420	91	1	F	2	T	31	3742
6405420	91	1	A	1	T	6	4007
6405420	91	1	A	2	T	12	3585
6405420	92	1	F	2	T	19	3742
6405420	92	0	A	2	T	6	4213
6405420	92	1	A	2	T	12	3585
6405430	74	1	A	1	T	3	3742
6405430	74	1	F	2	T	12	3876
6405430	75	1	A	2	T	6	4222
6405430	75	1	F	2	T	25	3876
6405430	76	1	A	2	T	25	4546
6405430	76	1	F	1	T	75	3710
6405430	91	1	A	1	T	31	4066
6405430	91	1	A	1	T	56	4223
6405430	91	1	F	1	T	75	3710
6405430	91	1	F	2	T	12	3876
6405430	92	1	F	3	T	19	4223
6405430	92	1	F	3	T	25	3710
—	—	—	—	—	—	12	4546
—	—	—	—	—	—	3	4222
—	—	—	—	—	—	6	4223

Block 3

1	2	3	4	5	6	7	8
6405400	75	1	A	1	T	15	3843
6405400	75	1	A	1	T	31	3986
6405400	75	0	A	4	T	3	3843
6405400	75	0	F	4	T	6	4338
6405400	75	0	F	6	T	3	3843
6405400	75	0	F	6	T	6	4286
6405400	75	0	F	7	T	3	3843
6405403	75	1	F	7	T	9	3986
6405400	76	1	F	2	T	19	3551
6405400	76	0	F	2	T	6	3843
6405400	76	0	F	2	T	12	3986
6405400	76	0	F	1	T	19	3551
6405400	89	0	F	1	T	12	3986
6405400	89	0	F	5	T	25	3494
6405400	89	0	F	5	T	6	3986
6405400	90	1	A	5	T	19	3843
6405403	90	1	A	2	T	19	4615
6405400	91	0	A	2	T	25	3986
6405400	91	0	A	1	T	6	4286
6405400	91	0	A	1	T	12	3494
6405400	91	0	A	1	T	12	3551
6405400	91	1	F	2	T	19	3986
6405400	91	1	A	4	T	31	3494
6405400	92	1	A	4	T	19	3986
6405400	92	1	F	1	T	6	3494
6405400	92	1	F	1	T	12	4494
6405400	73	0	F	2	T	3	3843
6405410	73	0	A	2	T	6	4286
6405410	74	0	A	1	T	3	3843
6405410	74	1	F	3	T	12	4494
6405410	74	1	F	3	T	3	3720
6405410	74	1	A	1	T	12	4470
6405410	75	0	A	1	T	6	3579
6405410	75	0	A	1	T	12	3913
6405410	75	1	A	2	T	6	3720
6405410	76	1	F	1	T	9	4007
6405410	89	1	F	1	T	12	4176
6405410	89	0	F	2	T	6	3579
6405410	89	1	A	—	—	12	3720

Top table

1	2	3	4	5	6	7	8
6417681	74	1	A	2	T	6	3578
6417681	74	1	A	2	T	12	5059
6417681	74	0	A	1	T	6	3578
6417681	74	0	A	1	T	19	3905
6417681	74	1	A	1	T	25	4748
6417681	75	1	A	2	T	25	3578
6417681	75	1	A	2	T	37	3905
6417681	75	1	A	2	T	75	4917
6417681	76	1	A	2	T	12	3578
6417681	76	0	F	1	T	56	4748
6417681	76	0	F	1	T	12	3578
6417681	76	0	F	1	T	19	3738
6417681	76	0	F	1	T	25	5059
6417681	89	0	F	1	T	12	3738
6417681	89	0	F	1	T	25	4917

Middle table

1	2	3	4	5	6	7	8
6405680	91	1	A	1	P	19	2161
6405680	92	1	F	2	P	6	1423
6405680	92	1	F	2	P	12	1519
6405680	92	1	F	2	P	15	2161
6405690	73	1	A	2	T	3	4637
6405690	73	1	F	1	T	6	5292
6405690	76	1	F	1	T	12	4637
6405690	76	0	A	1	T	12	4966
6405690	90	0	A	2	T	22	4344
6405690	90	1	A	4	T	12	4637
6405690	91	1	A	4	T	15	4344
6405690	91	1	A	1	T	6	4805
6405690	92	1	A	3	T	12	4637
6405690	92	1	F	3	T	6	4966
6405690	92	0	F	5	T	12	4637
6405690	92	0	F	5	T	6	4966
6405690	92	0	A	3	T	12	4351
6405700	73	1	A	4	T	3	4895
6405700	73	1	F	4	T	12	4895
6405700	73	1	F	1	T	19	5340
6405703	75	1	A	2	T	12	4351
6405703	75	1	A	2	T	50	5340
6405700	75	1	F	1	T	12	4351
6405700	75	0	F	1	T	87	5340
6405700	75	0	A	2	T	6	4351
6405700	75	1	A	1	T	12	5340
6405700	89	0	A	1	T	3	4351
6405700	89	0	A	1	T	12	5340
6405703	89	1	A	1	T	9	4351
6405700	90	0	F	3	T	25	4895
6405700	90	0	F	3	T	3	4351
6405700	90	1	F	1	T	12	4895
6405700	90	0	F	3	T	3	4351
6405700	91	0	A	3	T	12	4701
6405700	91	1	A	1	T	6	4351
6405700	91	0	F	1	T	12	4701
6405700	92	0	F	3	T	3	4351
6405700	92	1	A	3	T	12	4895
6405700	92	0	A	1	T	6	4895
6405710	92	0	F	1	T	25	5340
6405710	74	0	A	1	T	6	4890
6417681	74	0	F	1	T	9	5030
6417681	73	0	F	1	T	19	3578
6417681	73	0	F	1	T	25	3905

Bottom table

1	2	3	4	5	6	7	8
6405570	76	0	F	2	P	6	3497
6405570	76	0	F	2	P	19	3859
6405570	89	0	F	2	P	9	3497
6405570	89	0	F	2	P	25	3859
6405570	91	1	A	1	P	6	3497
6405570	91	1	F	2	P	25	3859
6405570	91	1	F	3	P	6	3497
6405570	91	0	A	3	P	19	3859
6405570	91	0	F	1	P	12	3497
6405570	91	1	A	1	P	25	3859
6405570	92	0	F	2	P	9	3497
6405570	92	0	F	2	P	12	3859
6405570	92	1	F	1	P	9	3497
6405570	92	1	A	1	P	12	3859
6405620	91	0	A	1	P	9	1540
6405623	91	0	A	3	P	12	1696
6405670	73	0	A	3	P	3	1827
6405670	73	0	F	3	P	12	2058
6405670	74	1	F	2	P	15	2058
6405670	74	1	A	2	P	19	2218
6405670	75	0	F	1	P	9	1827
6405670	75	0	F	1	P	12	2058
6405670	75	1	F	1	P	12	1827
6405670	76	1	A	4	P	19	2218
6405670	76	1	A	4	P	12	1827
6405670	76	0	A	1	P	19	2058
6405670	76	0	A	1	P	25	2218
6405670	76	1	A	2	P	6	1827
6405670	91	1	F	2	P	9	2058
6405670	91	0	F	2	P	3	1695
6405670	91	0	A	2	P	9	1827
6405670	91	1	F	5	P	19	2218
6405670	91	1	F	5	P	3	1827
6405680	92	0	F	1	P	9	2218
6405680	92	0	A	1	P	12	1695
6405680	92	1	A	2	P	25	2058
6405680	92	0	A	1	P	6	2218
6405680	92	0	A	1	P	9	1827
6405680	73	0	F	1	P	12	2058
6405680	73	1	F	1	P	6	1519
6405680	76	1	F	1	P	9	2161
6405680	76	0	F	1	P	3	1519
6405680	76	0	F	1	A	6	2161
6405680	91	1	A	1	P	12	1519

TABLE 3

Crack Propagation Parameters for Constant n^*

Location			mean value of $\overline{n^*}$	$\overline{C^*}$	$\overline{t_i}$ hrs.	$\overline{a_0}$ in.	coefficient of variation of n^*	C^*	t_i	a_0	No. of Data Pts.
76	92	TAC	1.500	0.00537	3385.	0.00527	0.0	0.508	0.329	0.750	130
76	92	PACAF	1.500	0.00788	4178.	0.00240	0.0	0.655	0.291	0.596	188
75	91	TAC	1.500	0.00623	3383.	0.00457	0.0	0.640	0.352	0.934	167
75	91	PACAF	1.500	0.00525	3750	0.00498	0.0	0.623	0.387	0.650	268
74	90	TAC	1.500	0.00469	3637.	0.00550	0.0	0.614	0.338	0.433	75
74	90	PACAF	1.500	0.00660	4394.	0.00273	0.0	0.330	0.296	0.405	151
73	89	TAC	1.500	0.00562	3446.	0.00483	0.0	0.774	0.336	0.606	101
73	89	PACAF	1.500	0.00486	3930.	0.00489	0.0	0.671	0.331	0.506	176

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TABLE 4

Statistical Parameters for Time to Crack Initiation
Two Parameter Weibull and Johnson S_B Distributions

Location		Two Parameter Weibull Distribution		Johnson S_B Distribution					
		α	β	β_1	β_2	ϵ	λ	η	γ
76	TAC	3.796	3760.	0.643	5.043	0.0	91,000.	2.980	9.821
76	PACAF	4.125	4602.	1.105	5.702	0.0	51,080.	4.007	9.879
75	TAC	3.545	3770.	0.917	4.450	0.0	82,950.	3.033	9.803
75	PACAF	3.098	4194.	1.348	4.876	0.0	45,210.	2.140	5.336
74	TAC	3.553	4039.	1.408	4.298	0.0	108,500.	2.514	10.160
74	PACAF	4.044	4844.	2.054	5.567	0.0	89,620.	3.086	9.413
73	TAC	3.571	3826.	1.243	4.705	0.0	66,150.	2.841	8.534
73	PACAF	3.629	4359.	1.136	4.971	0.0	29,460.	2.120	4.147

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TABLE 5

Statistical Parameters for Fitting Time to Crack Initiation
Three Parameter Weibull Distribution and Convolution

Location		Three Parameter Weibull Distribution			Convolution			
		α	β	x_0	α	β	x_0	λ
76	92 TAC	9.5	3500	-2000	9.5	3900	-2000	.003
76	92 PACAF	10.5	4250	-1900	10.5	5000	-1900	.003
75	91 TAC	9.5	3400	-2000	9.5	3500	-2000	.016
75	91 PACAF	6.5	3750	- 800	6.5	4000	- 800	.014
74	90 TAC	9.5	3500	-1000	9.5	3550	-1000	.014
74	90 PACAF	10.5	4300	-1500	10.5	4500	-1500	.014
73	89 TAC	9.5	3250	-1000	9.5	3450	-1000	.012
73	89 PACAF	6.5	3950	- 500	6.5	4200	- 500	.012

TABLE 6

Statistical Parameters for Initial Flaw Sizes, a_o, in.

Location		Mean	Standard Deviation	Johnson S_B Distribution					
				β_1	β_2	ϵ	λ in.	η	γ
76	TAC	0.00527	0.00396	20.2	33.8	0.0	0.03	2.364	4.048
76	PACAF	0.00240	0.00143	12.0	18.0	0.0	0.03	2.473	6.579
75	TAC	0.00457	0.00428	2.8	7.6	0.0	0.03	2.010	3.894
75	PACAF	0.00498	0.00323	8.8	16.6	0.0	0.03	1.767	3.314
74	TAC	0.00550	0.00238	5.5	14.6	0.0	0.03	2.034	3.382
74	PACAF	0.00273	0.00110	10.0	26.6	0.0	0.03	2.046	5.167
73	TAC	0.00483	0.00293	21.8	32.4	0.0	0.03	2.013	3.781
73	PACAF	0.00489	0.00248	8.8	16.7	0.0	0.03	2.056	3.672
Over all		0.00431	0.00001	37.9	71.7	0.0	0.03	1.500	2.900

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TABLE 7

Normalizing Constants and Percentage of Detected and
Undetected Crack Initiation Times

Inspection Time t hours	k_3	% Detected	k_4	% Undetected
2500	16.60	6.02	1.06	93.98
4000	1.60	62.56	2.67	37.44
5000	1.01	98.56	69.34	1.44
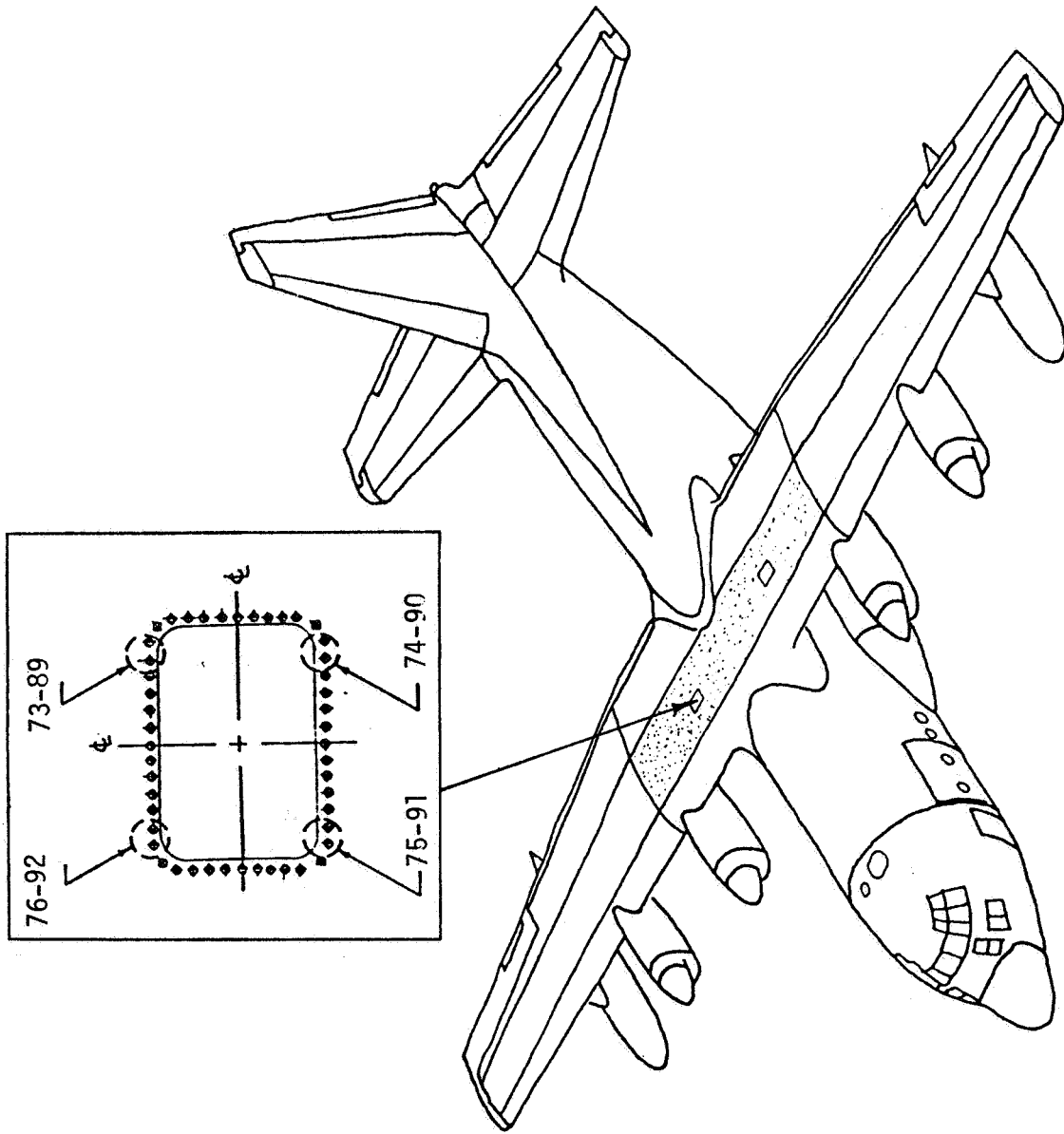
Fig. 1. Location of Investigated Cracks on C-130 Aircraft.
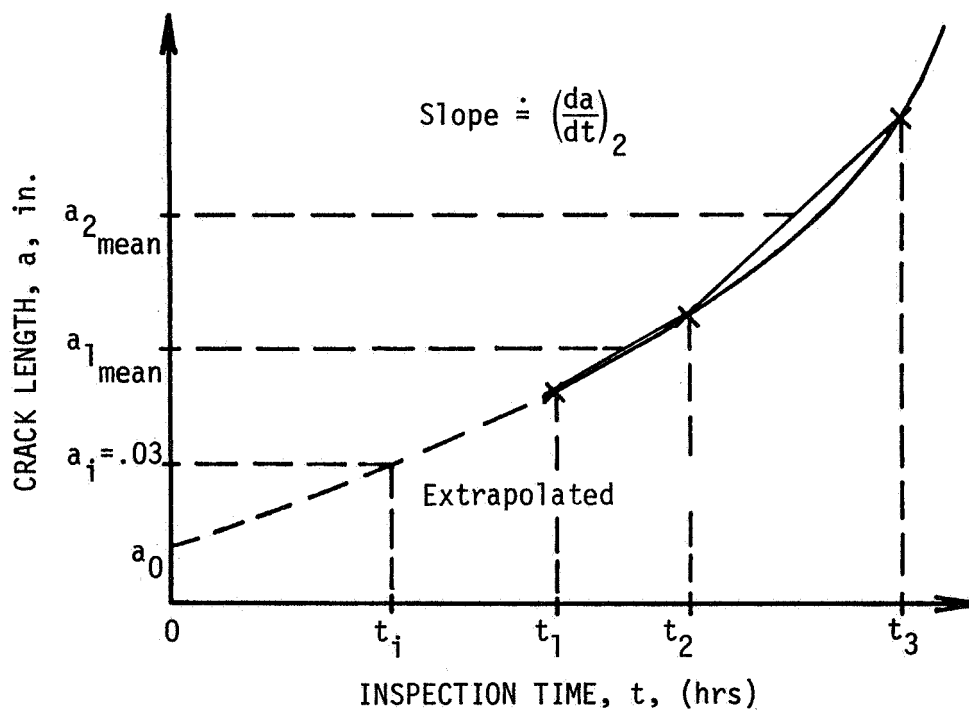
Fig. 2. Extrapolation of Inspection Data.
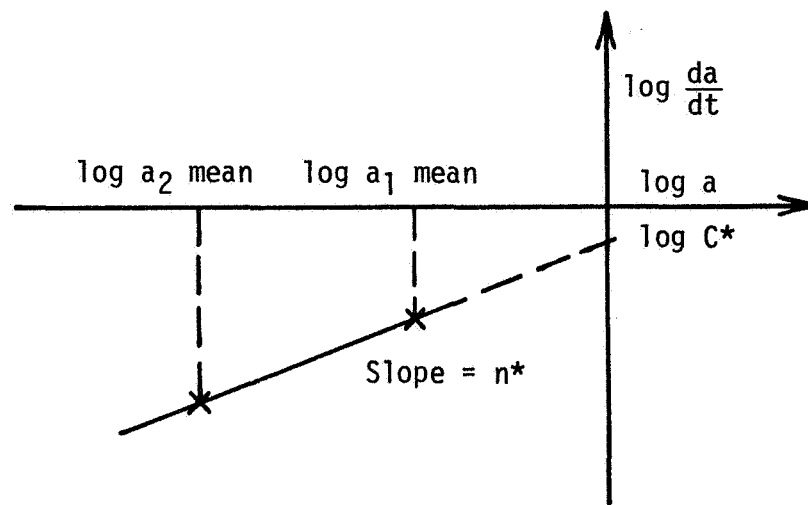
Fig. 3. Determination of Crack Growth Parameters.
Variable n* Method.
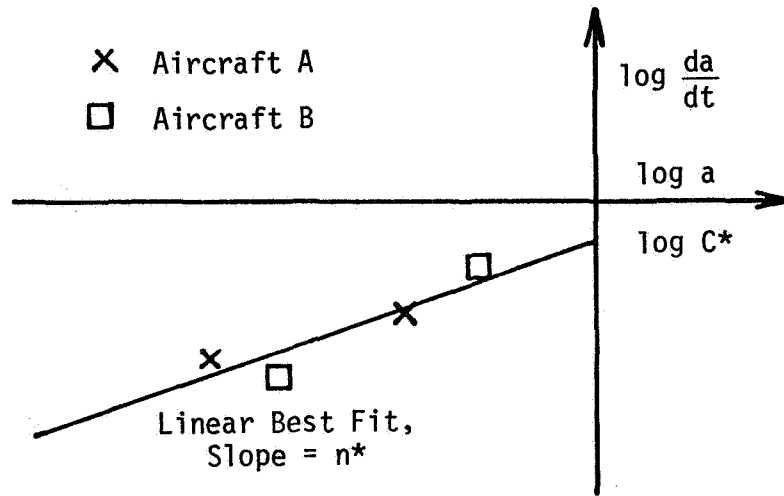
Fig. 4. Determination of Crack Growth Parameters.
Linear Regression Method.
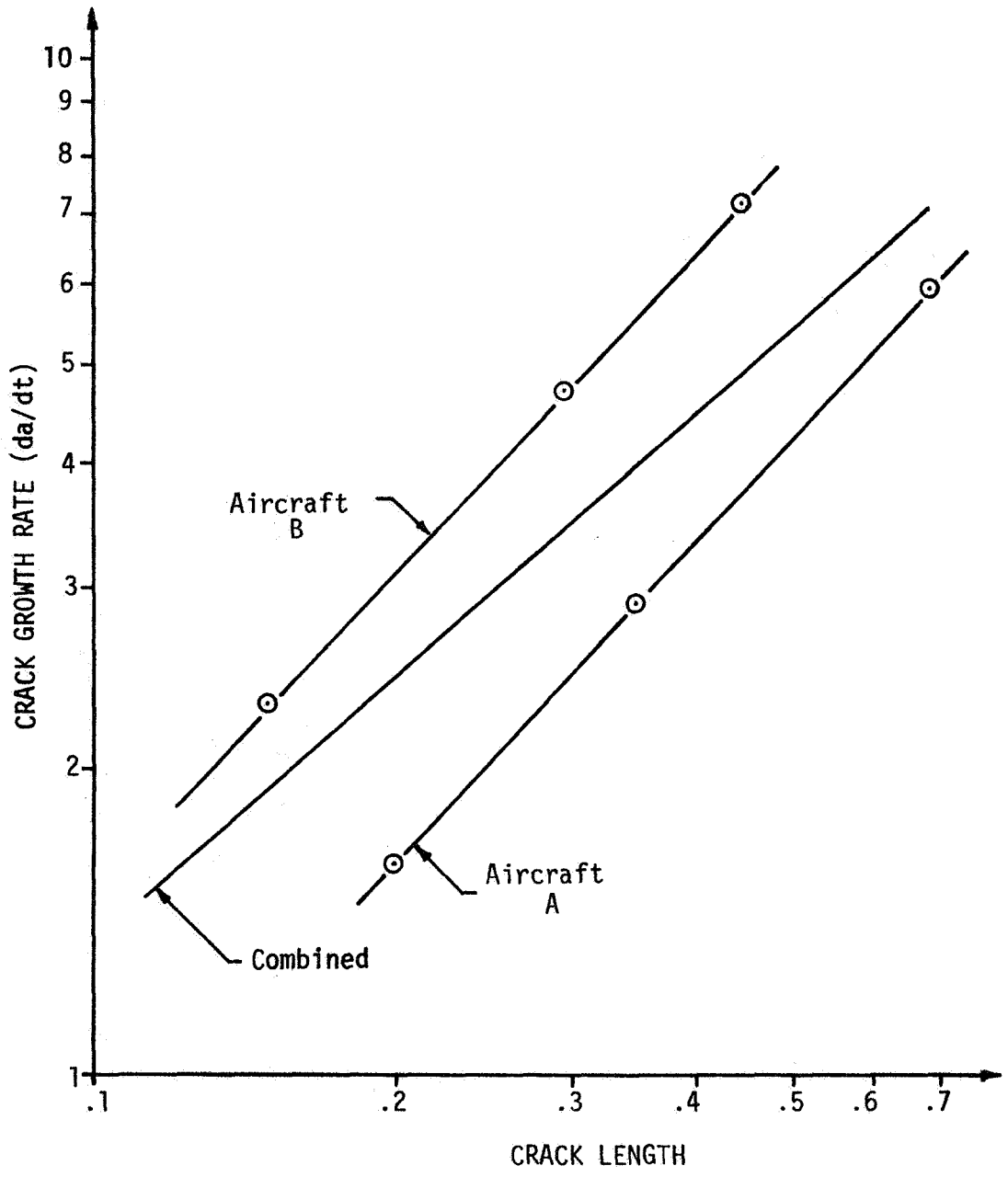
Fig. 5.   Two Ideally Growing Cracks.
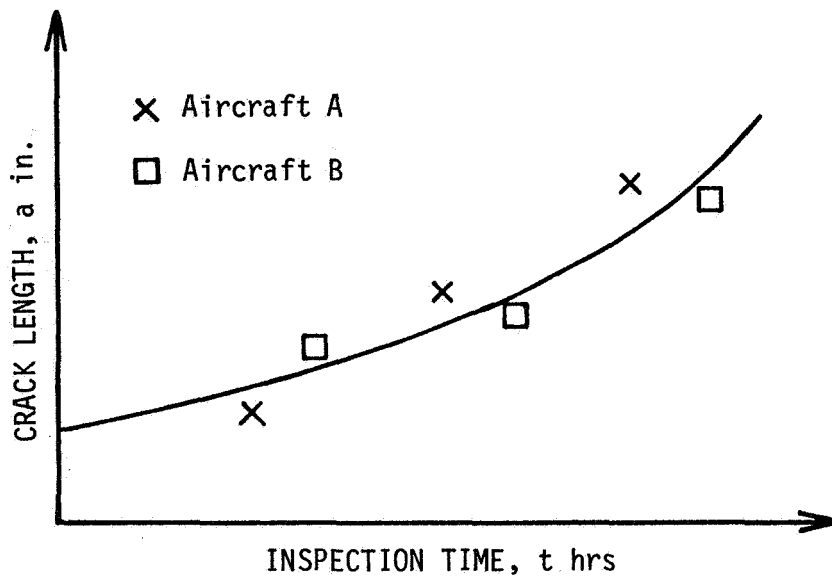
Fig. 6.   Determination of Crack Growth Parameters.
Nonlinear Regression Method.
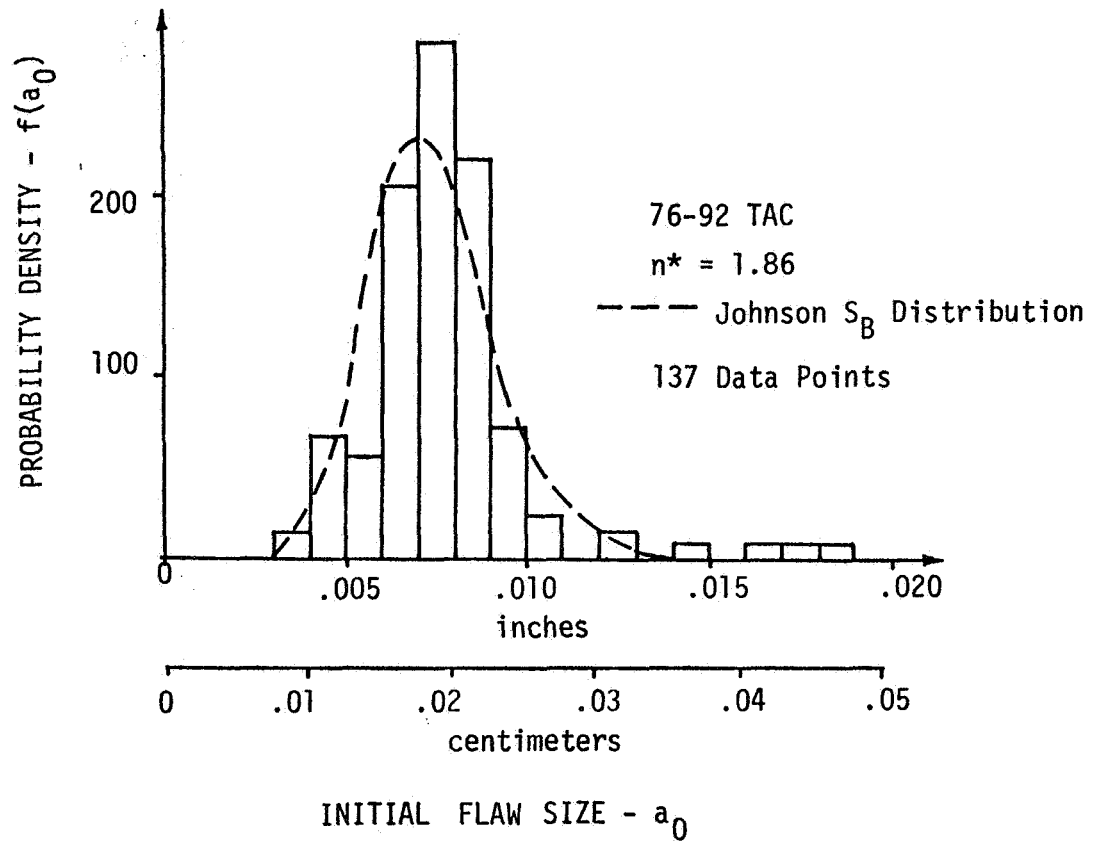
Fig. 7. Histogram of Initial Flaw Size Using a Larger $\overline{n}^*$.
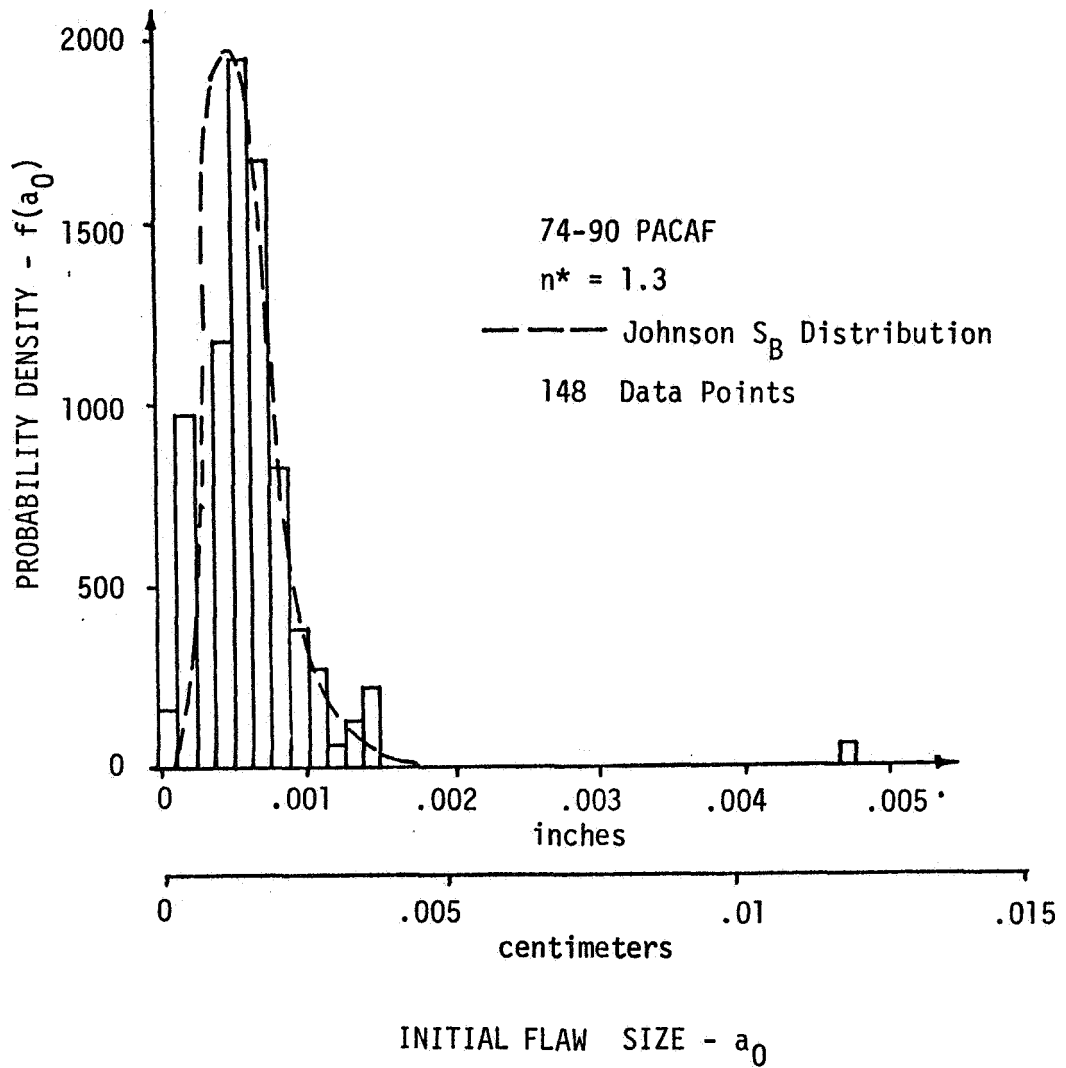
Fig. 8. Histogram of Initial Flaw Size Using a Smaller n^*.
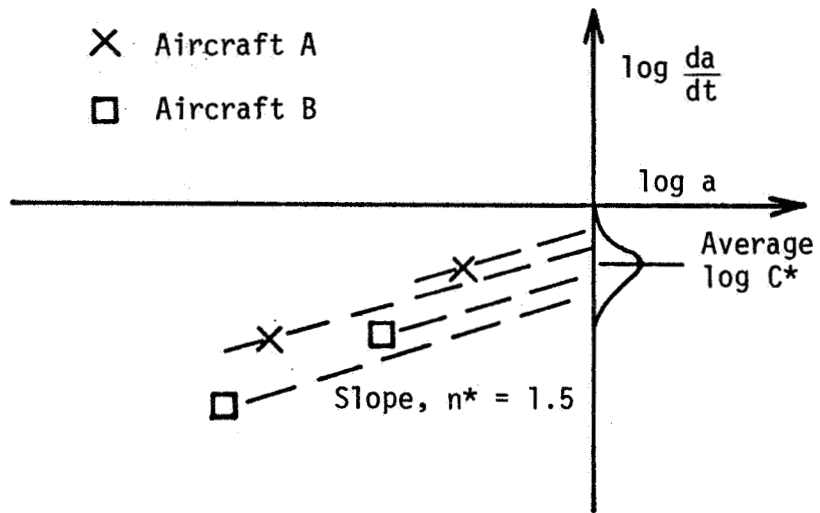
Fig. 9. Determination of Crack Growth Parameters.
         Constant n* Method.
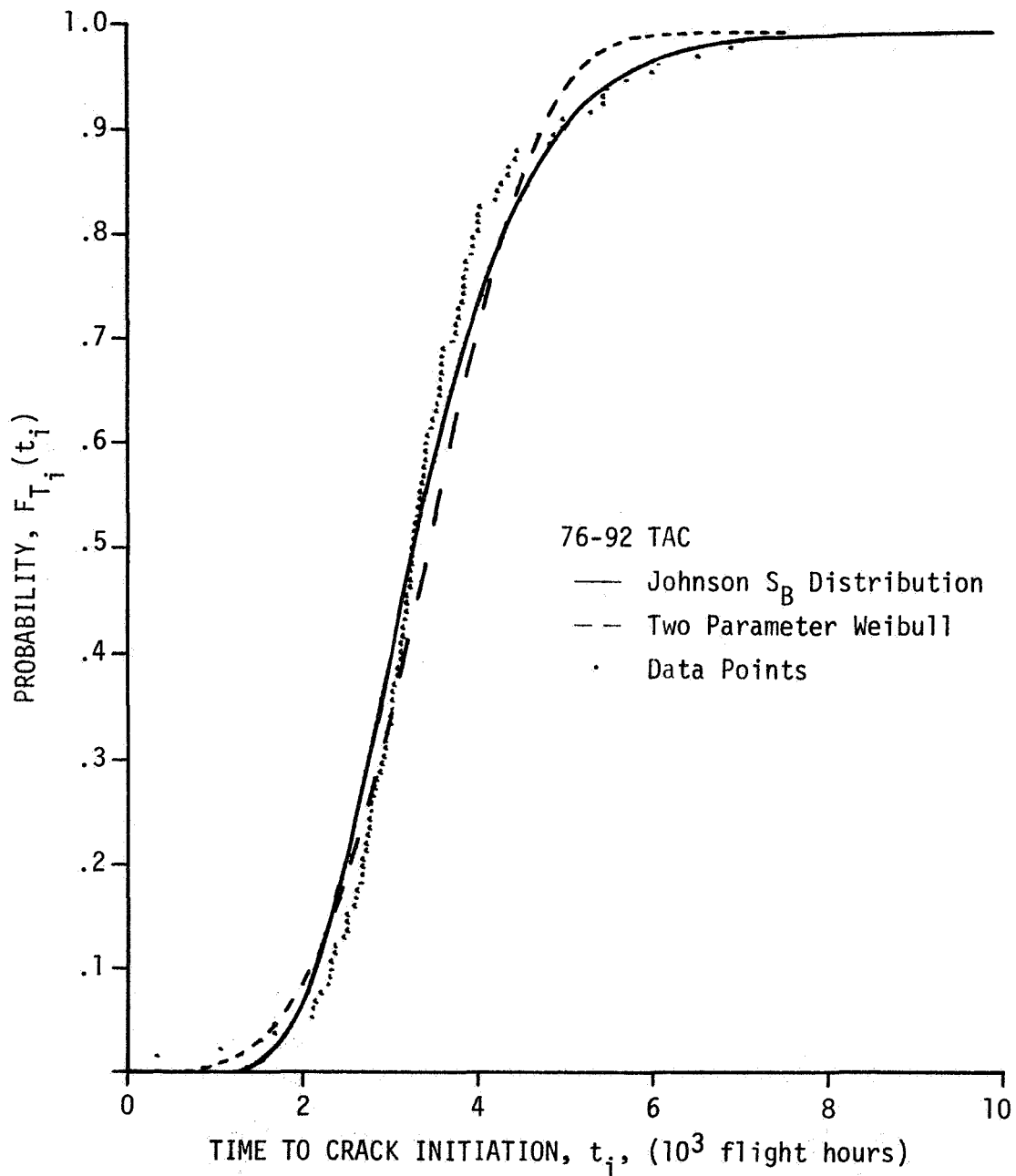
Fig. 10. Distribution of Crack Initiation Times. Two Parameter
Weibull and Johnson S_B Distributions.
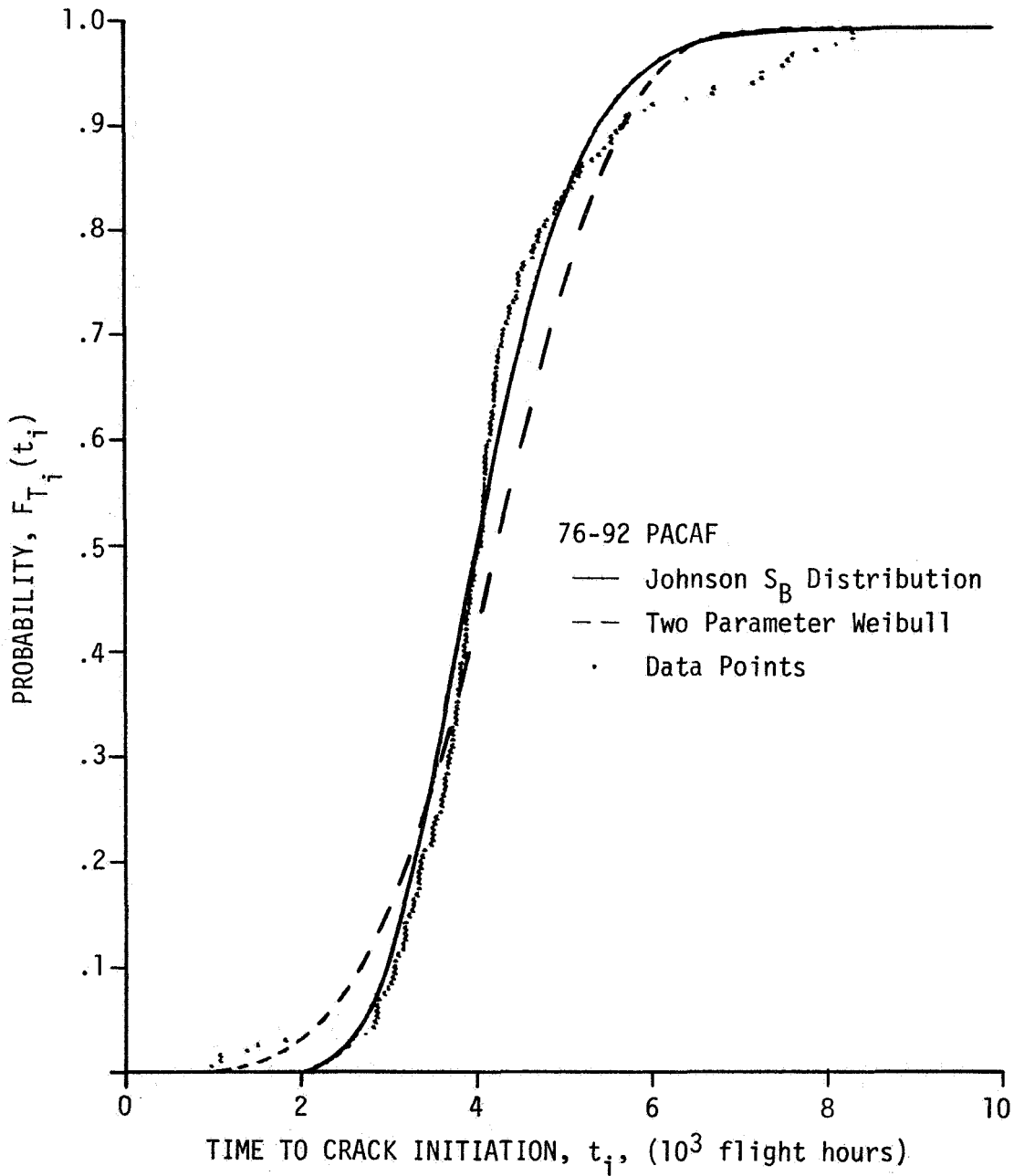
Fig. 11. Distribution of Crack Initiation Times. Two Parameter
Weibull and Johnson S_B Distributions.
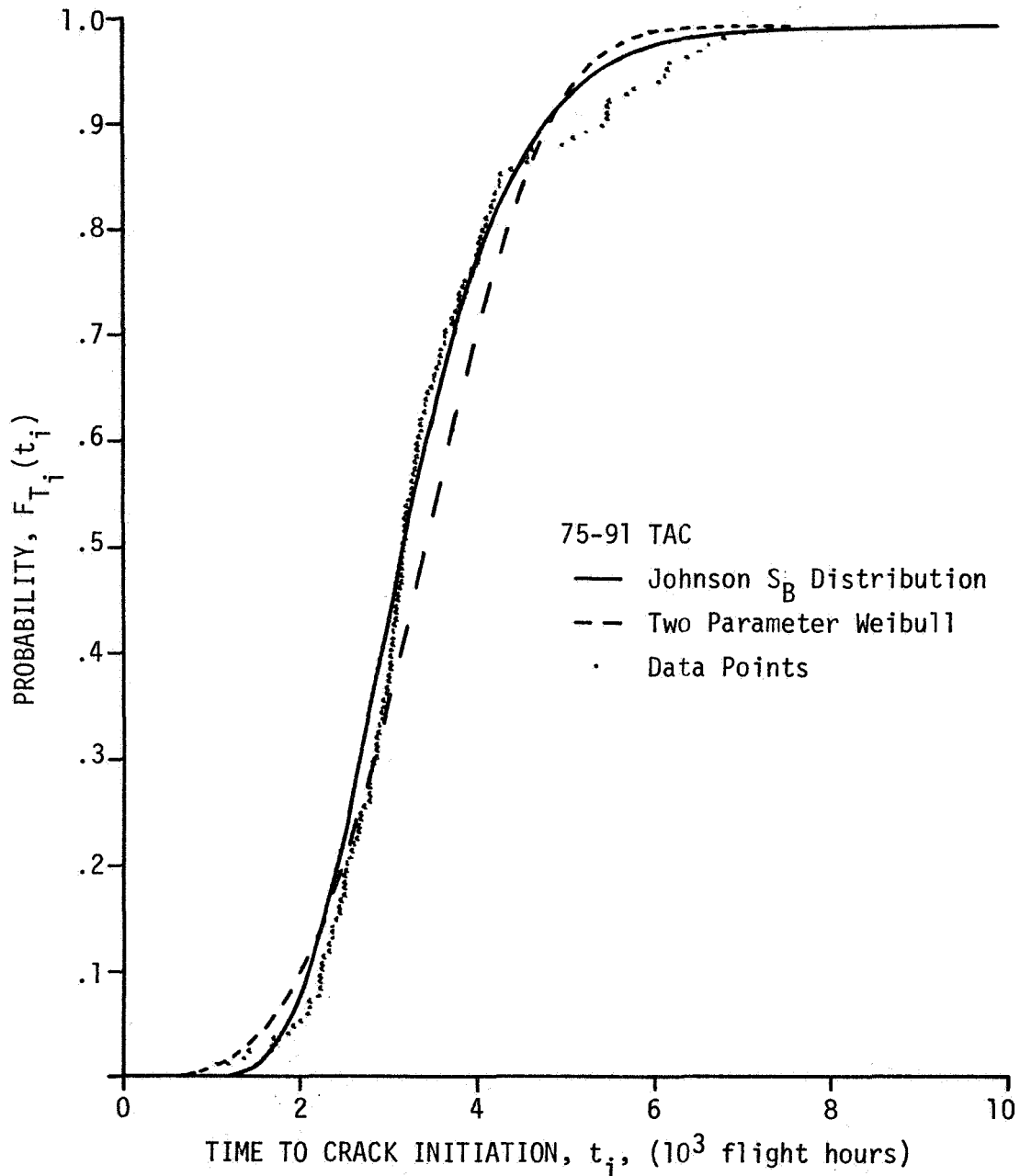
Fig. 12.   Distribution of Crack Initiation Times. Two Parameter
Weibull and Johnson S_B Distributions.
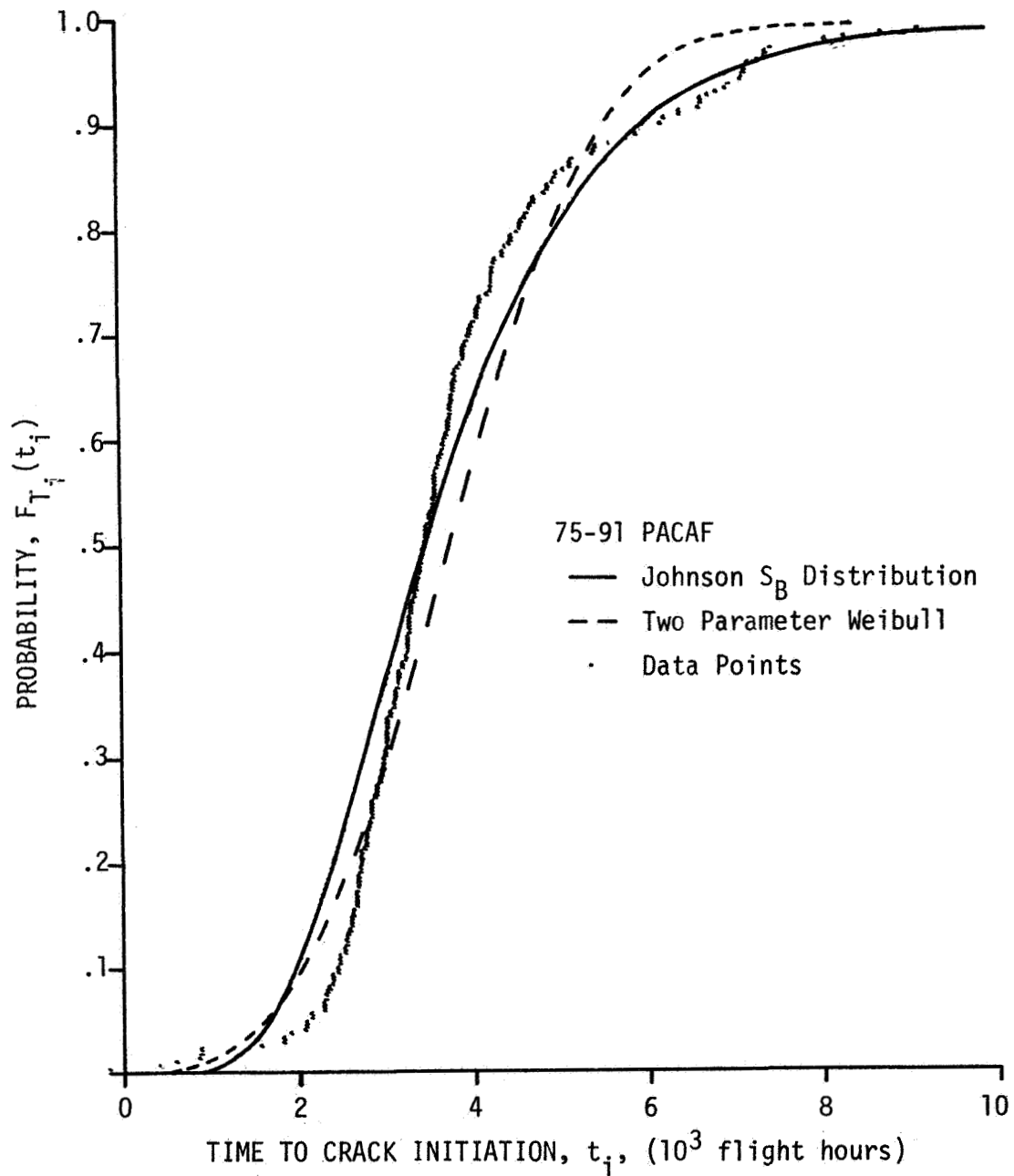
Fig. 13.   Distribution of Crack Initiation Times.   Two Parameter
Weibull and Johnson S_B Distributions.
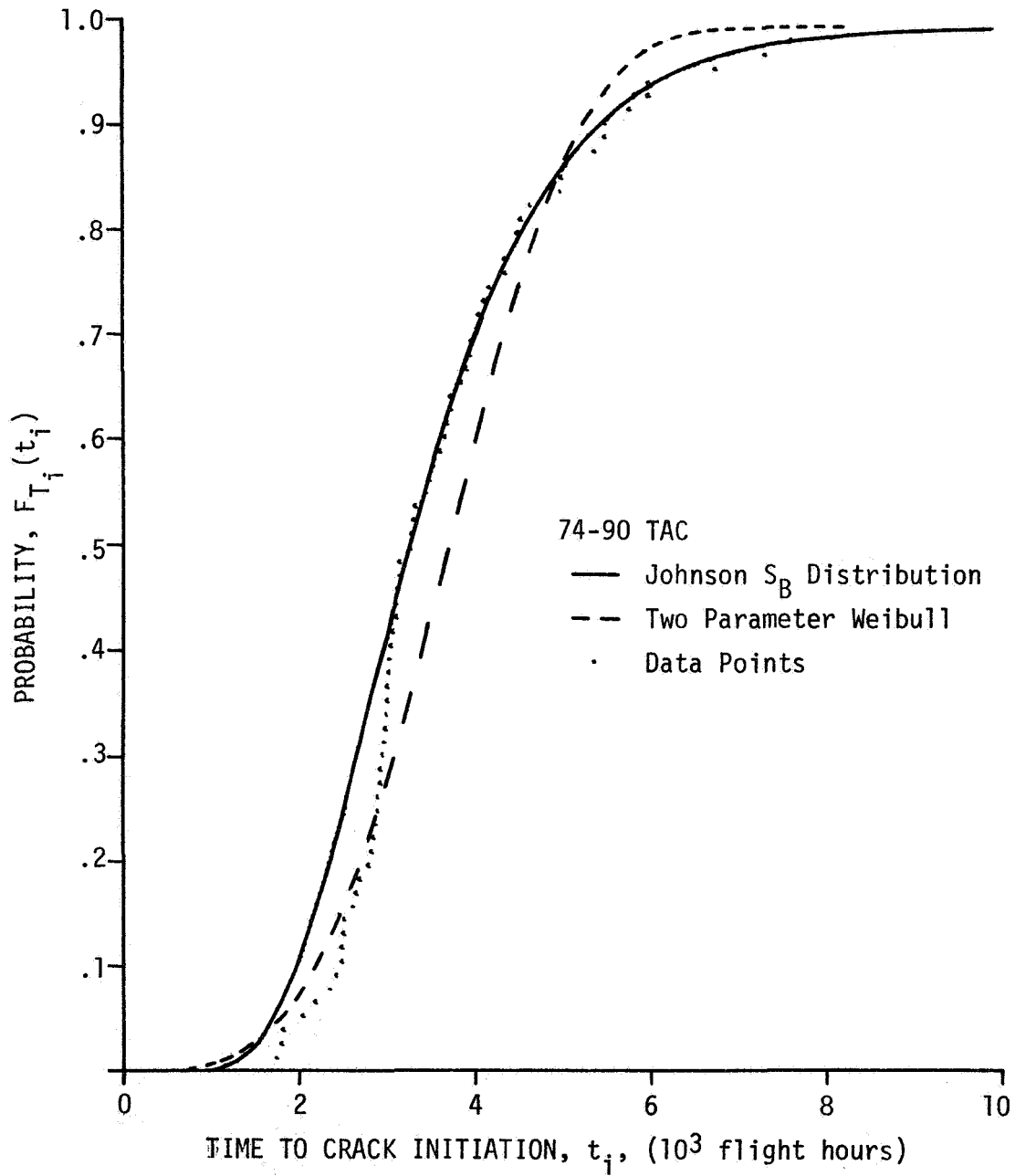
Fig. 14. Distribution of Crack Initiation Times. Two Parameter Weibull and Johnson S_B Distributions.
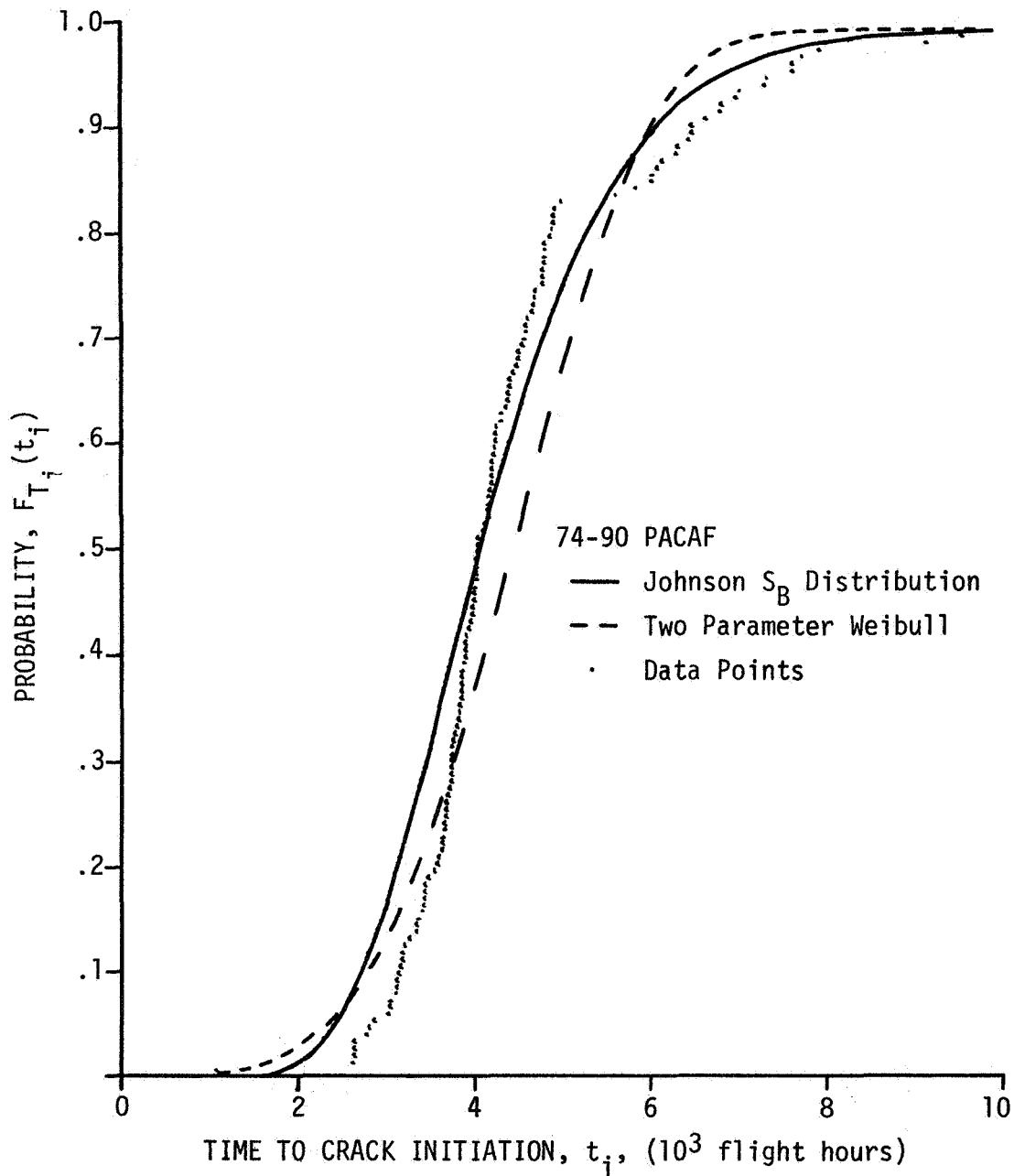
Fig. 15. Distribution of Crack Initiation Times. Two Parameter
Weibull and Johnson S_B Distributions.
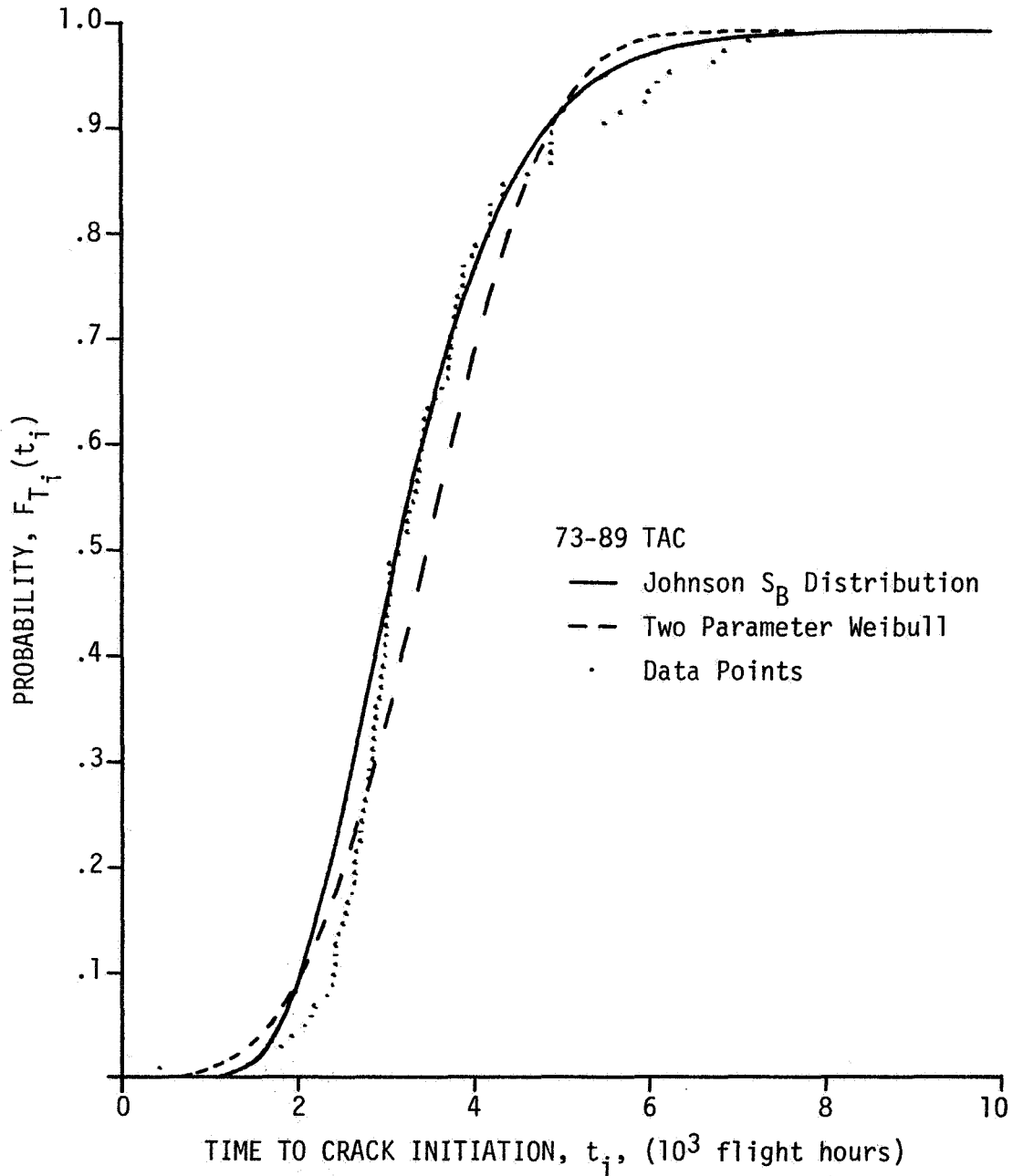
Fig. 16. Distribution of Crack Initiation Times. Two Parameter
Weibull and Johnson S_B Distributions.

Fig. 17. Distribution of Time to Crack Initiation. Two Parameter Weibull and Johnson S_B Distributions.

$$\text{Area} = 1 - e^{-\left(\frac{-x_0}{\beta-x_0}\right)^{\alpha}}$$

$$f_{t_i}(x) = \frac{\alpha}{\beta-x_0}\left(\frac{x-x_0}{\beta-x_0}\right)^{\alpha-1} e^{-\left(\frac{x-x_0}{\beta-x_0}\right)^{\alpha}}$$
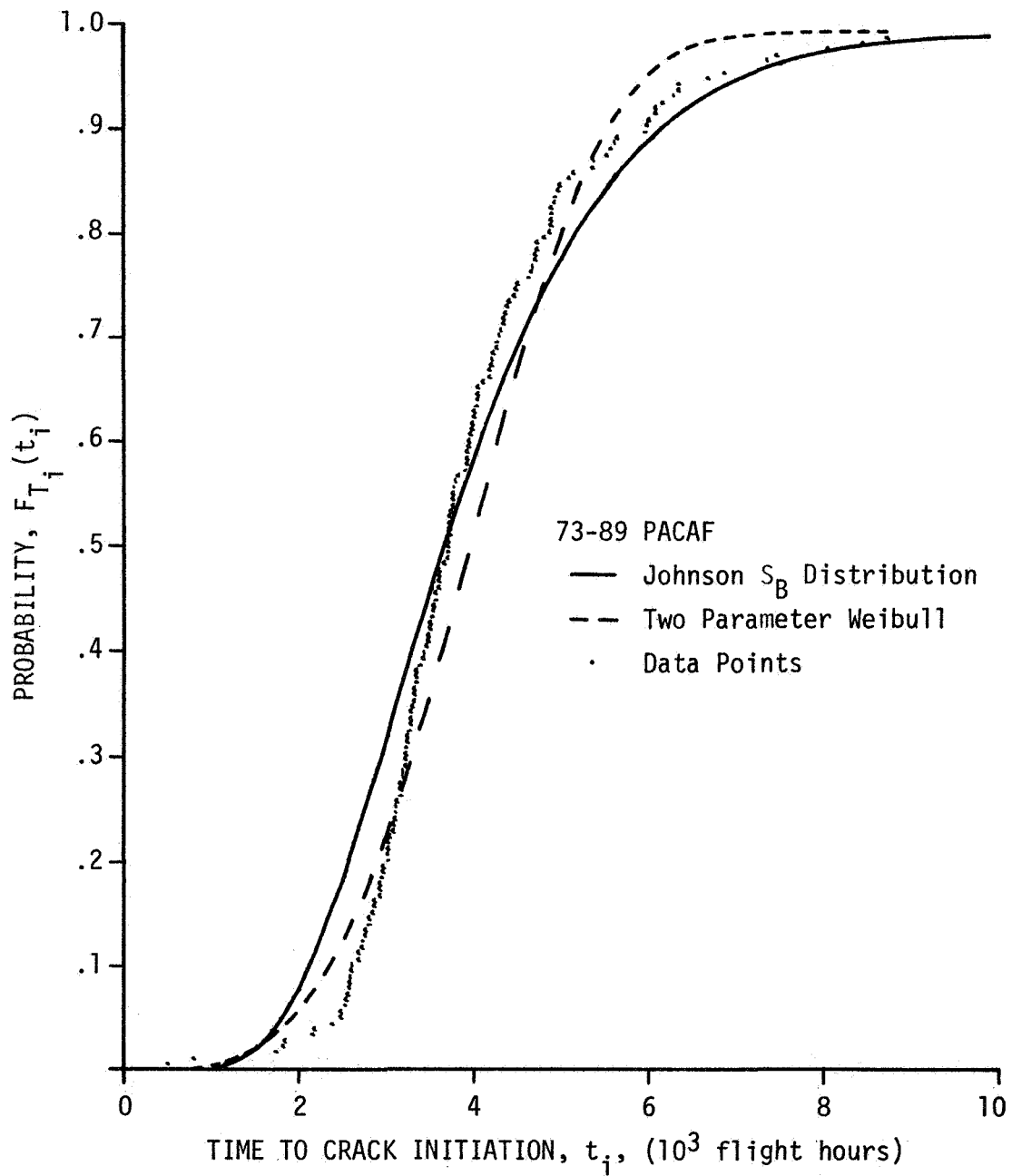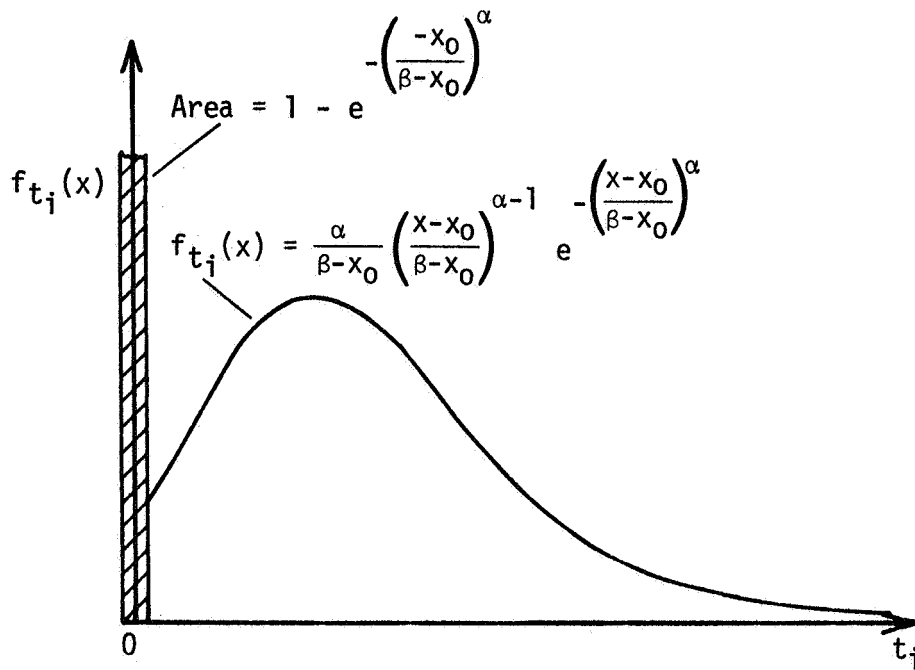
Fig. 18. Three Parameter Weibull Density Function of Crack Initiation Times.

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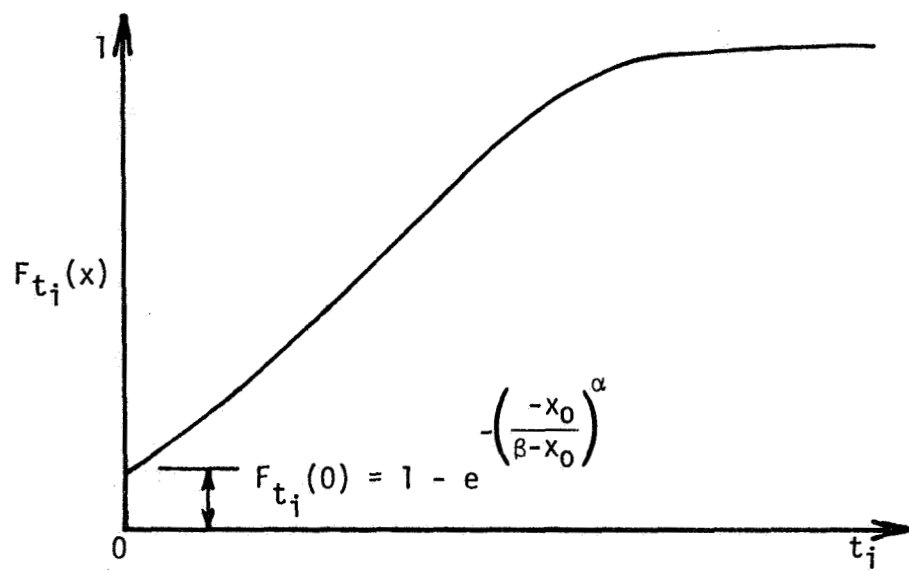
Fig. 19. Three Parameter Weibull Distribution
Function of Crack Initiation Times.
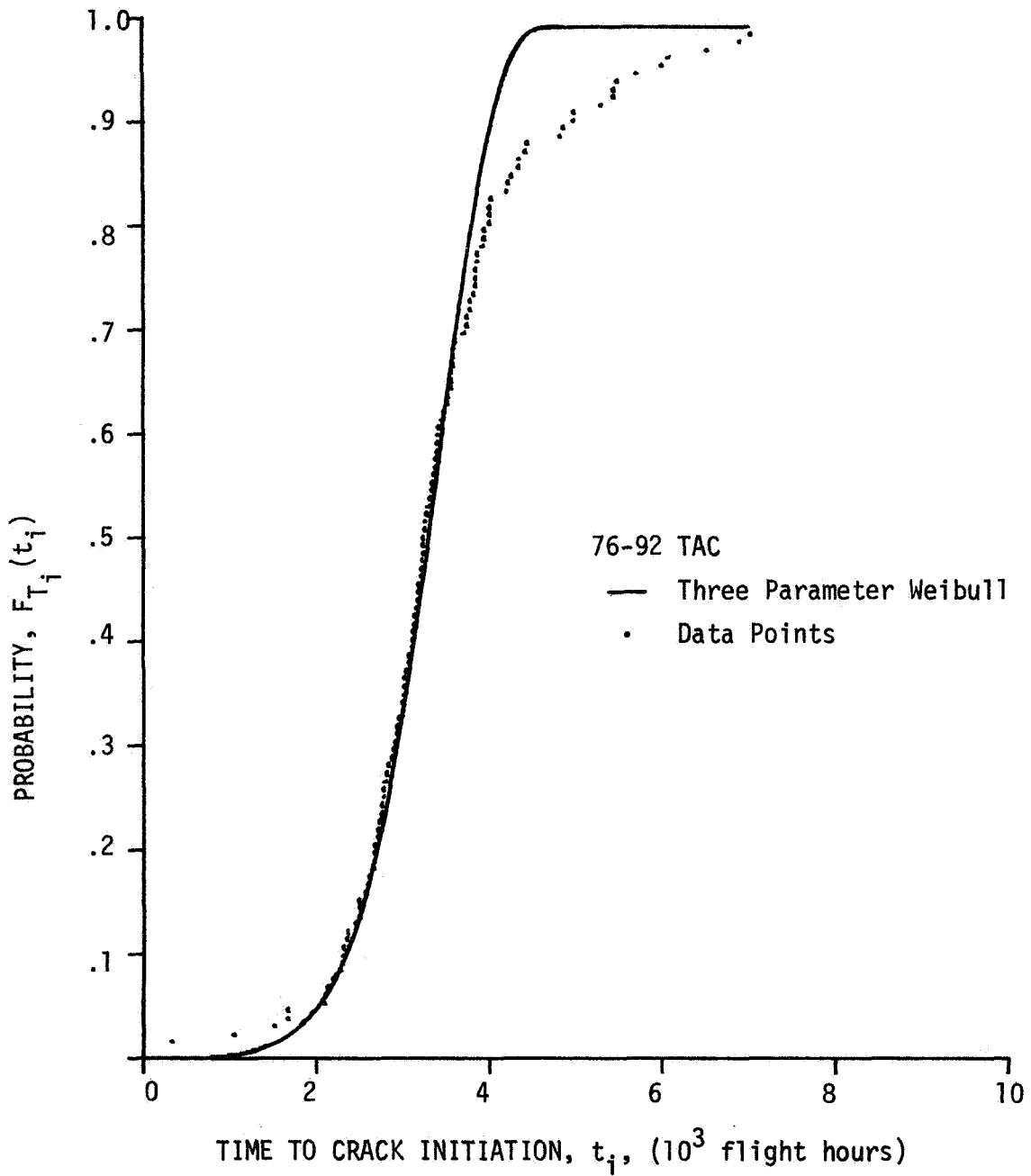
Fig. 20. Distribution of Crack Initiation Times.
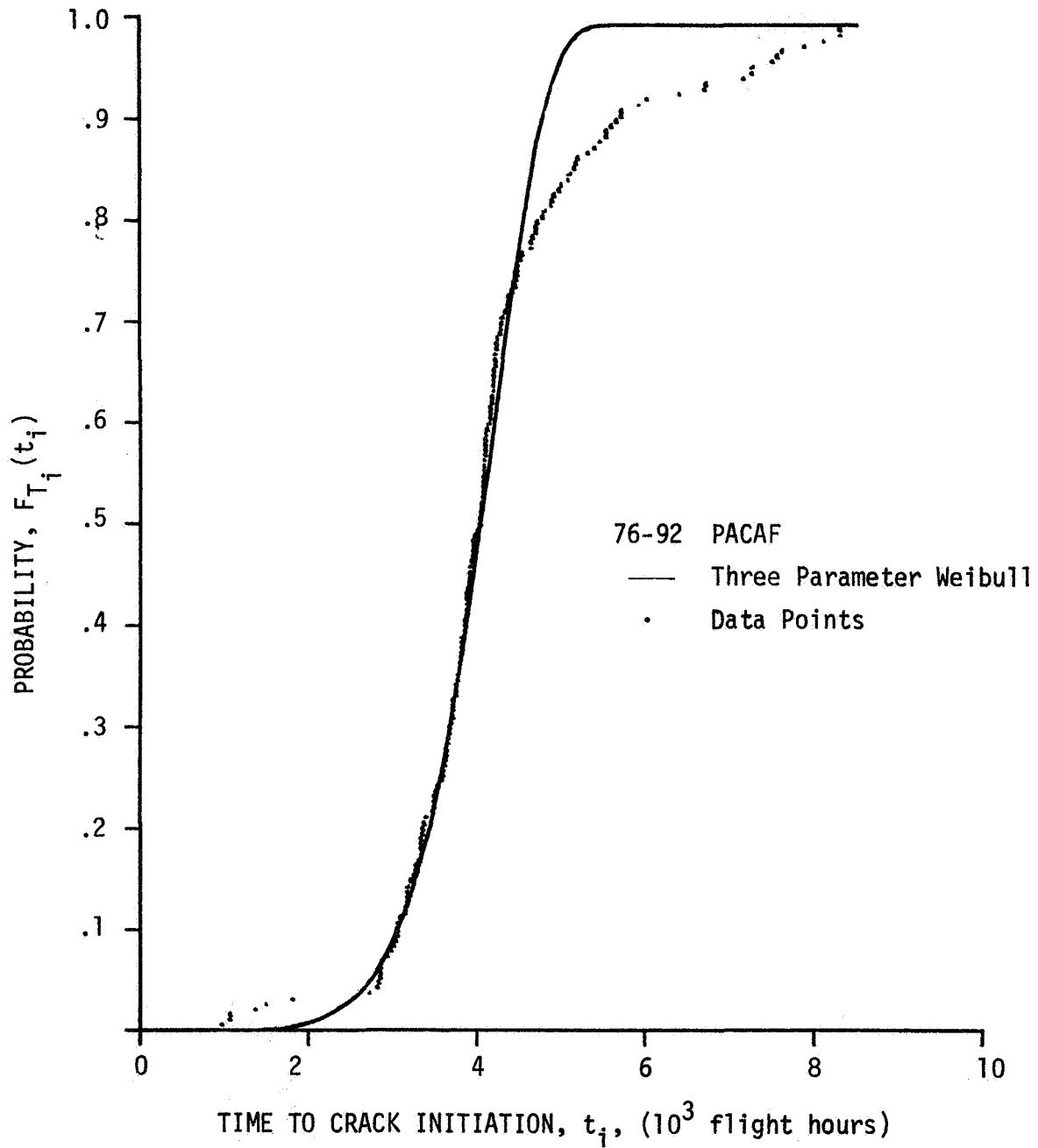
Fig. 21. Distribution of Crack Initiation Time.
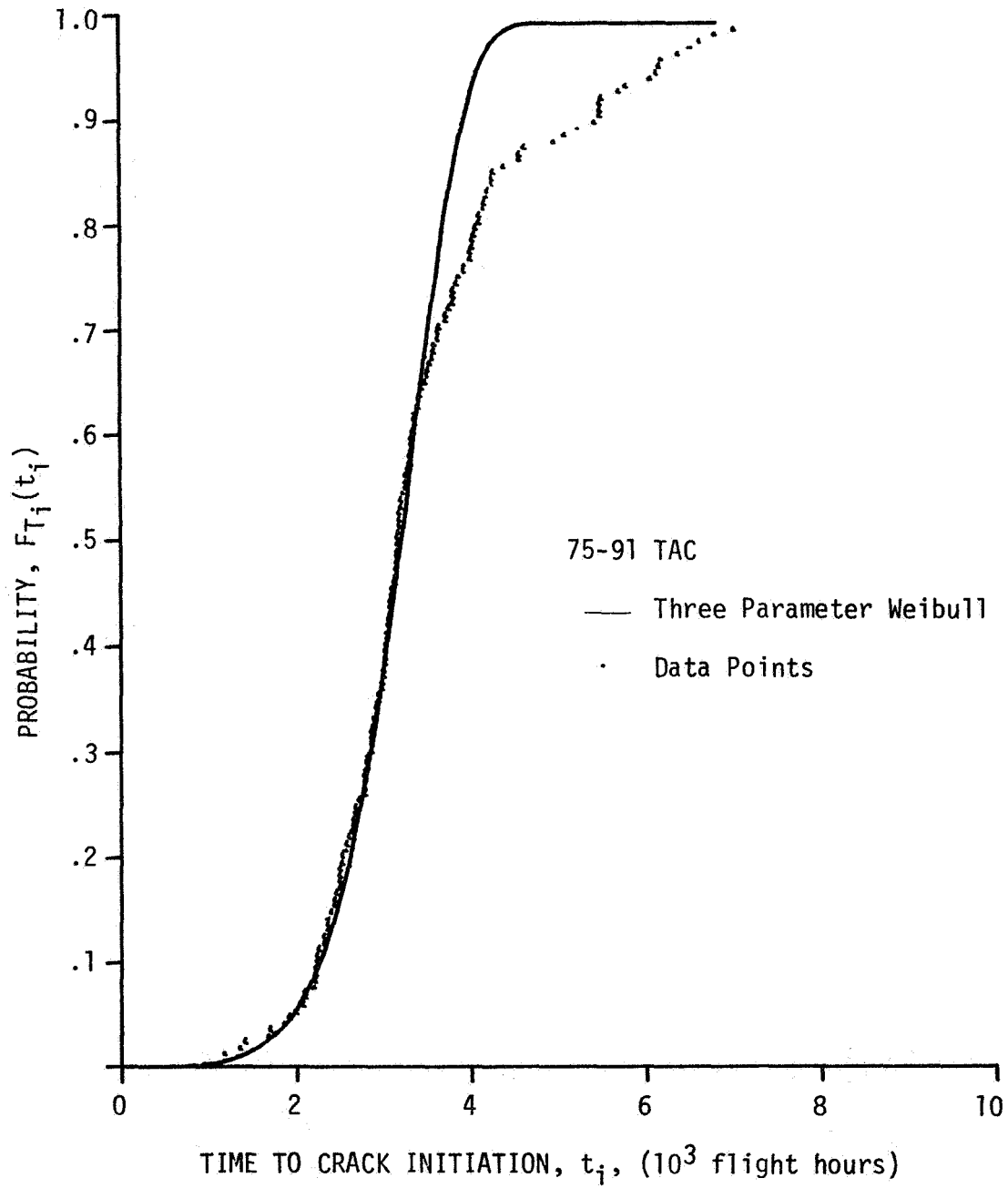
Fig. 22. Distribution of Crack Initiation Times.
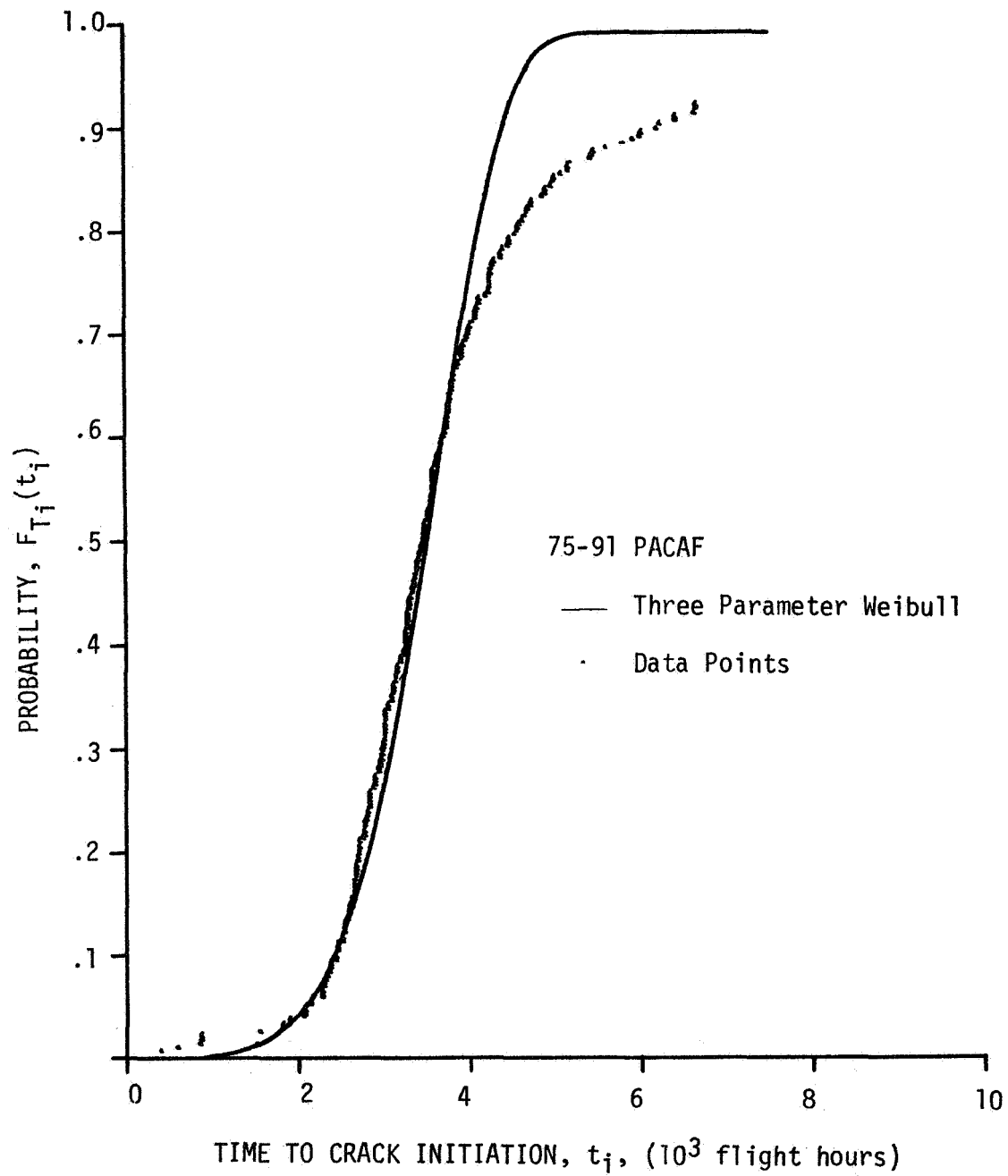
Fig. 23. Distribution of Crack Initiation Times.
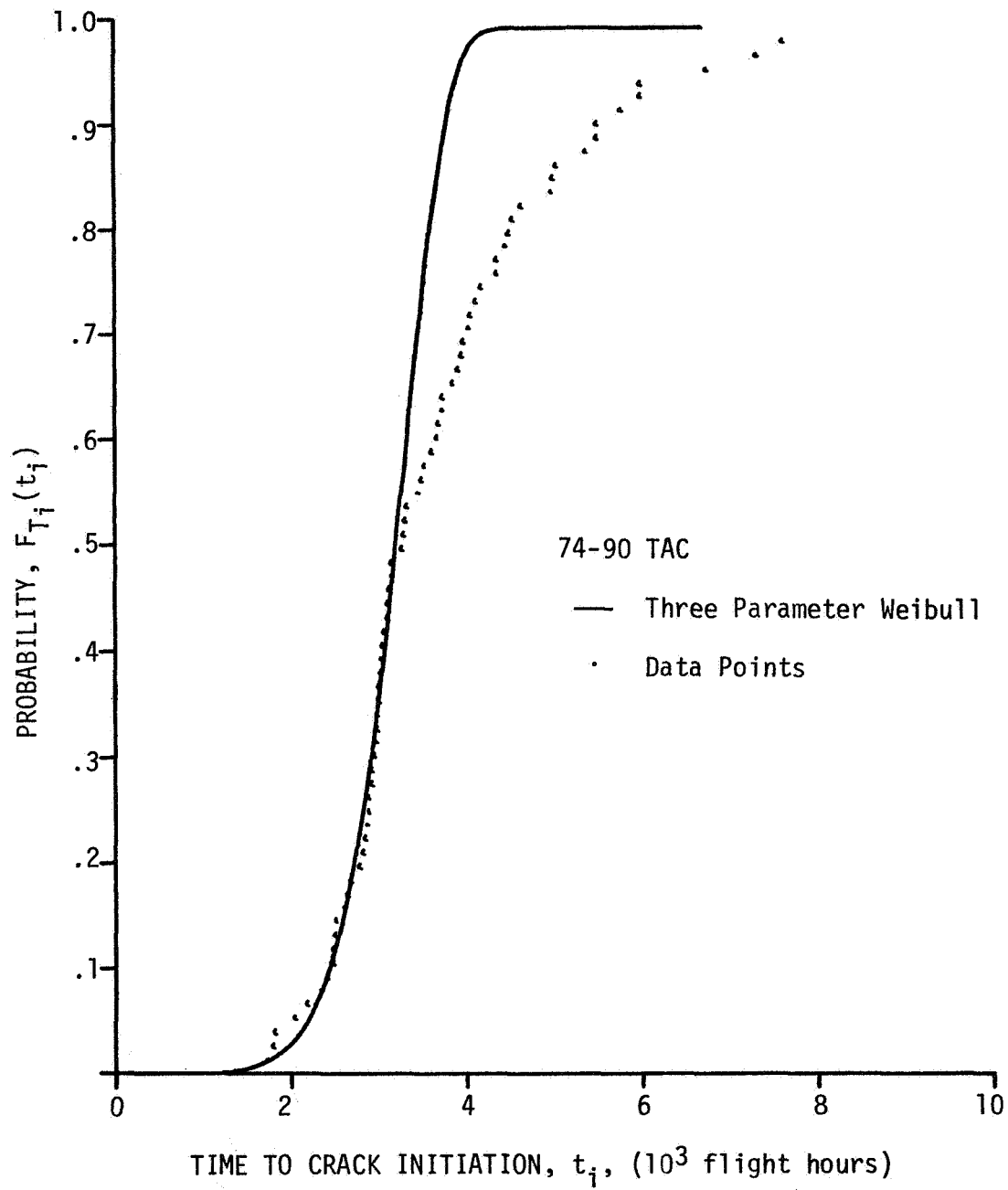
Fig. 24. Distribution of Crack Initiation Times.
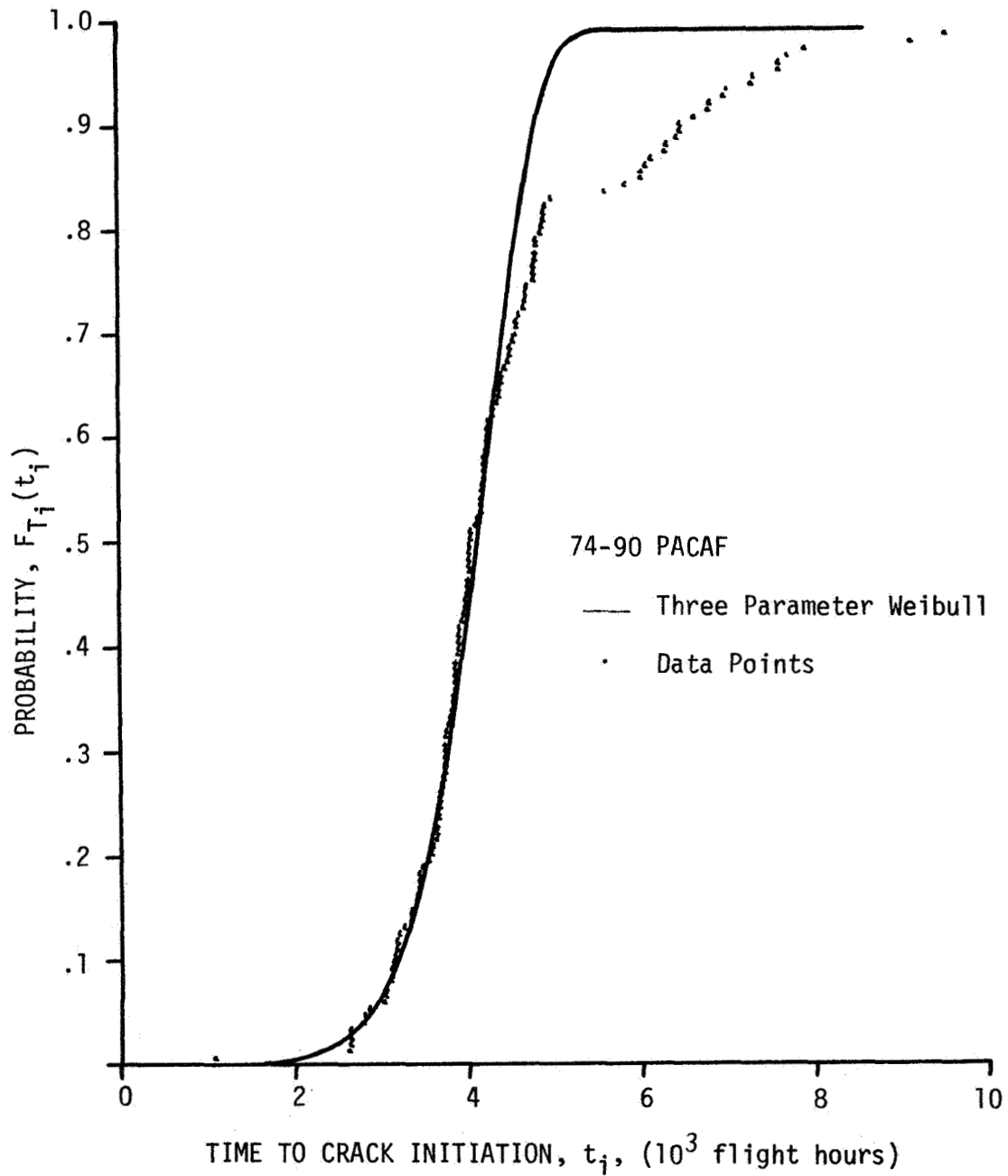
Fig. 25. Distribution of Crack Initiation Times.
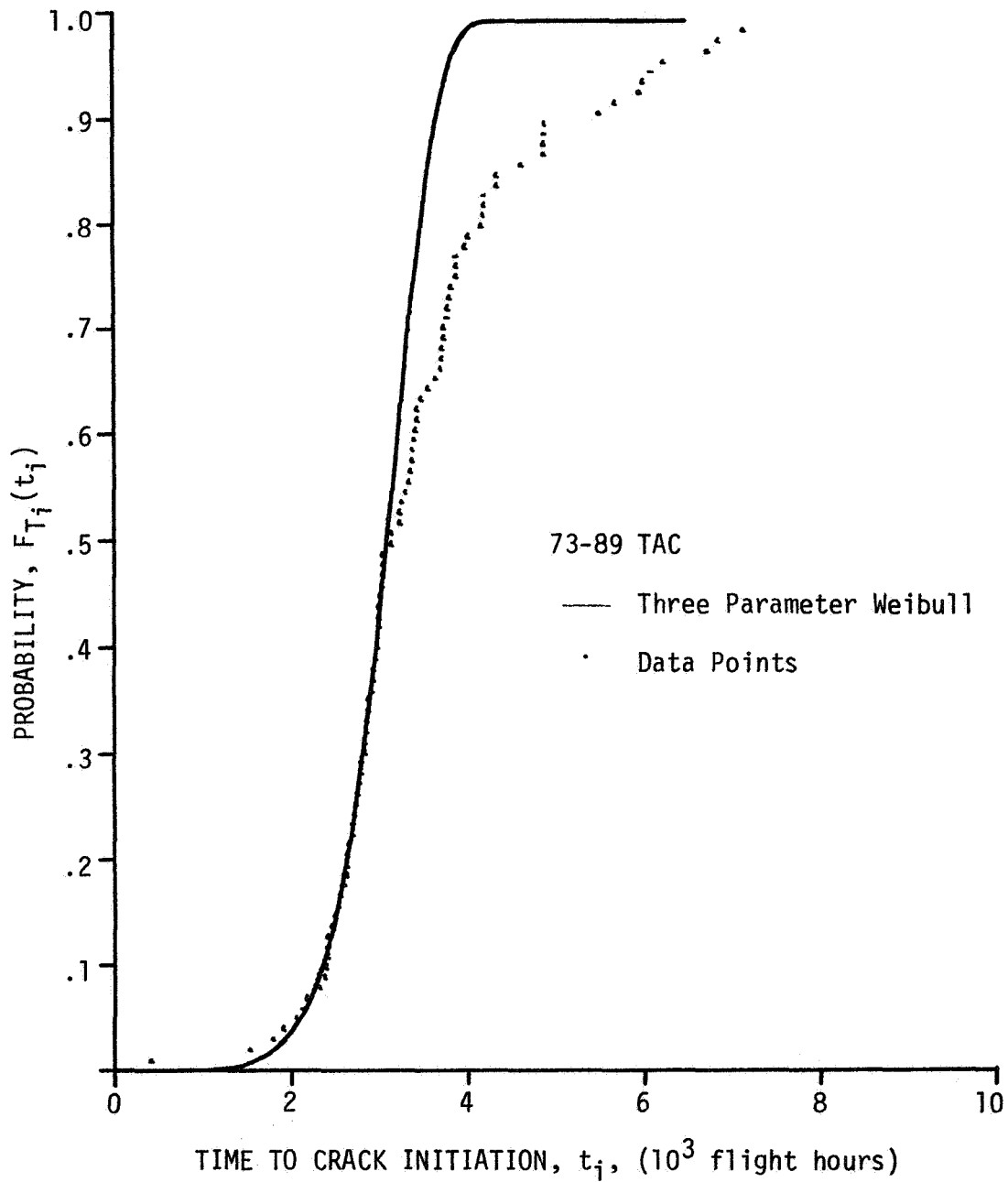
Fig. 26. Distribution of Crack Initiation Times.
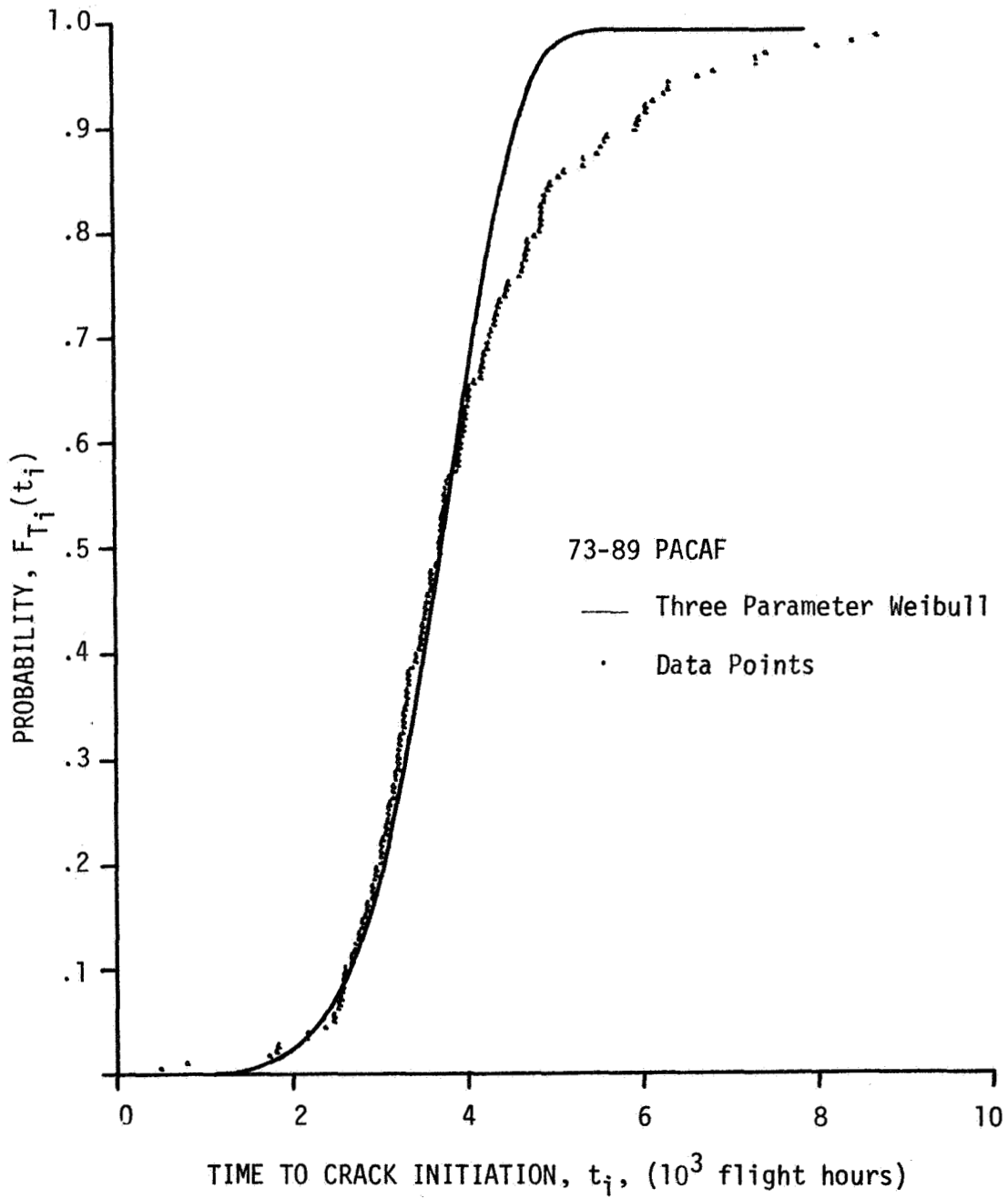
Fig. 27. Distribution of Crack Initiation Times.
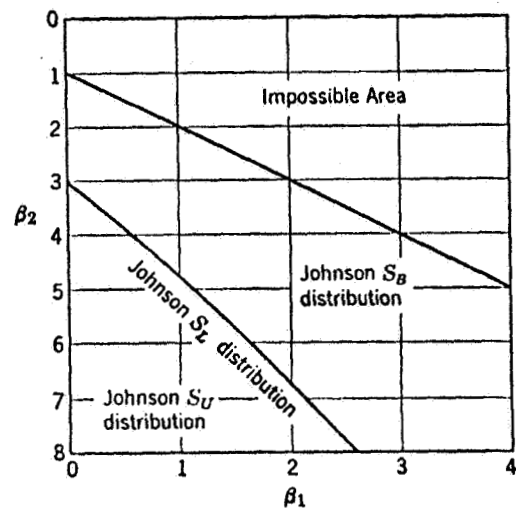
Fig. 28. Johnson Distribution
          Applicability Chart.
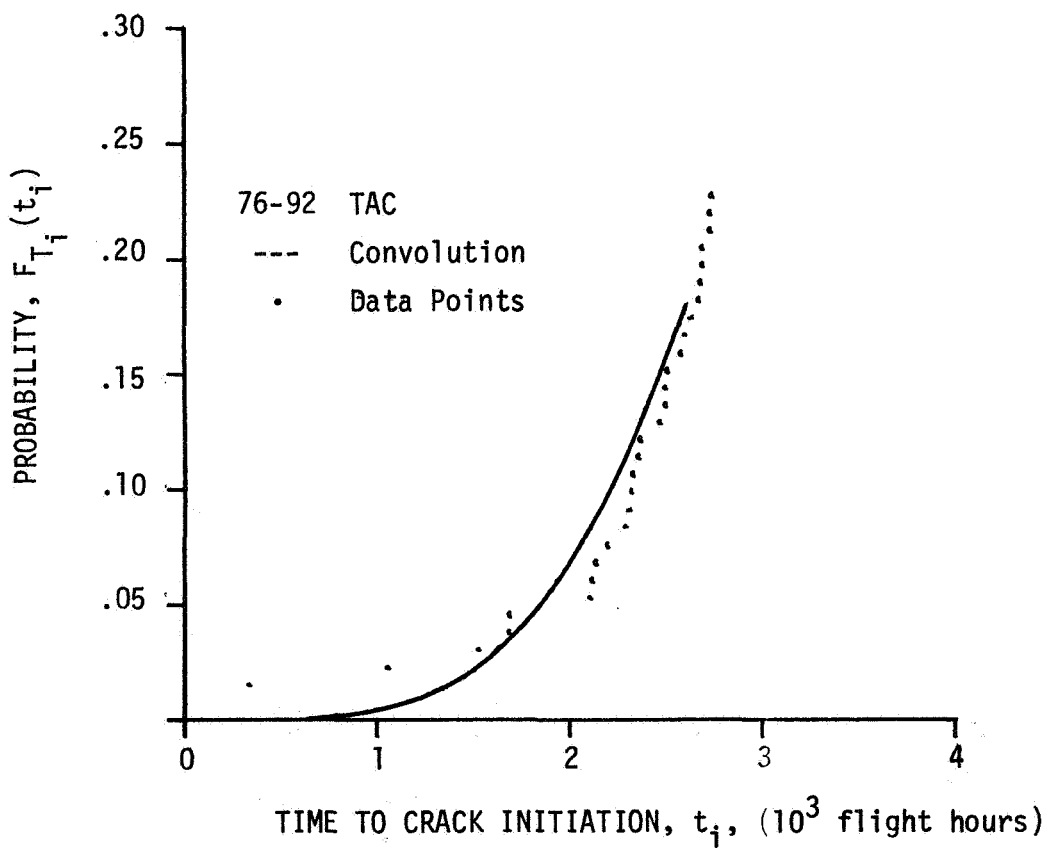
Fig. 29. Lower Tail of Crack Initiation Time Distribution
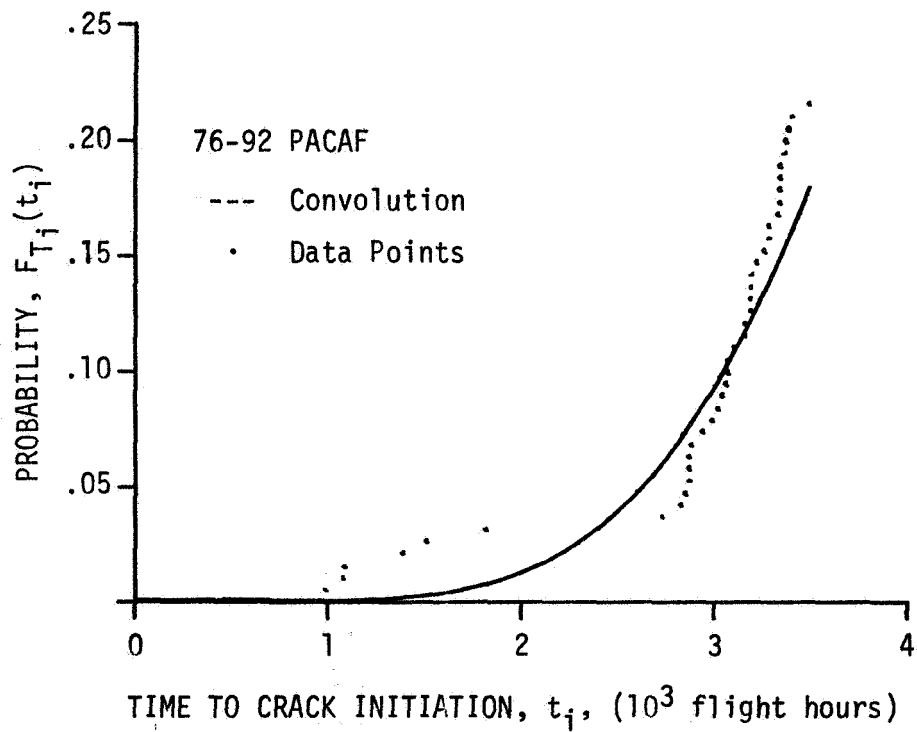
Fig. 30. Lower Tail of Crack Initiation Time Distribution.
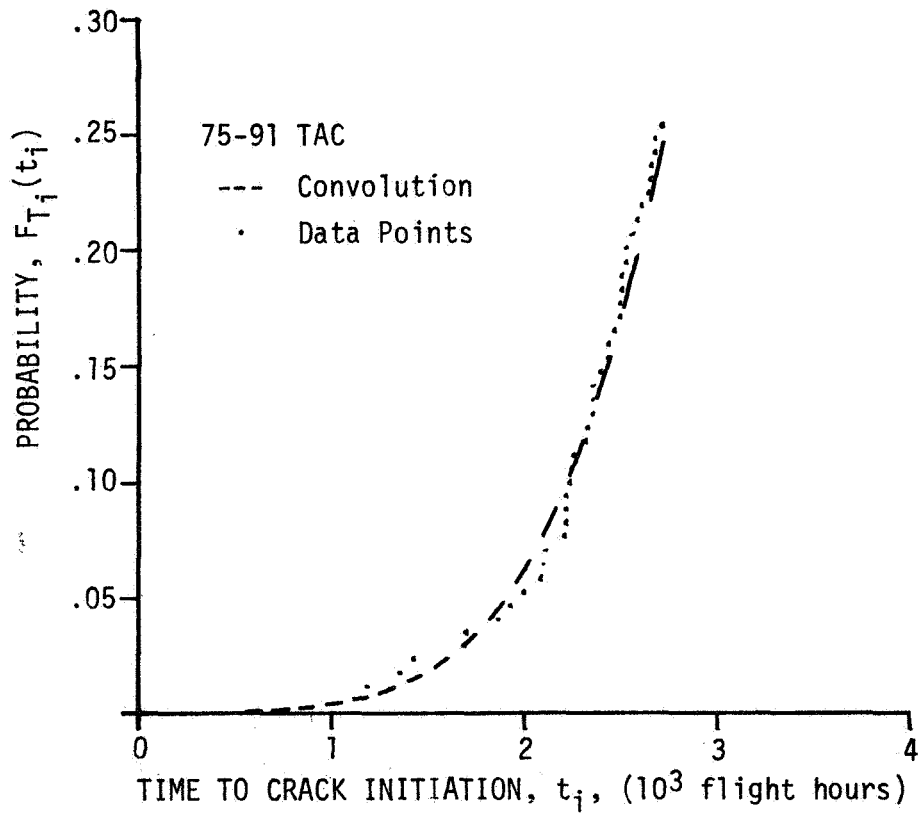
Fig. 31. Lower Tail of Crack Initiation Time Distribution.
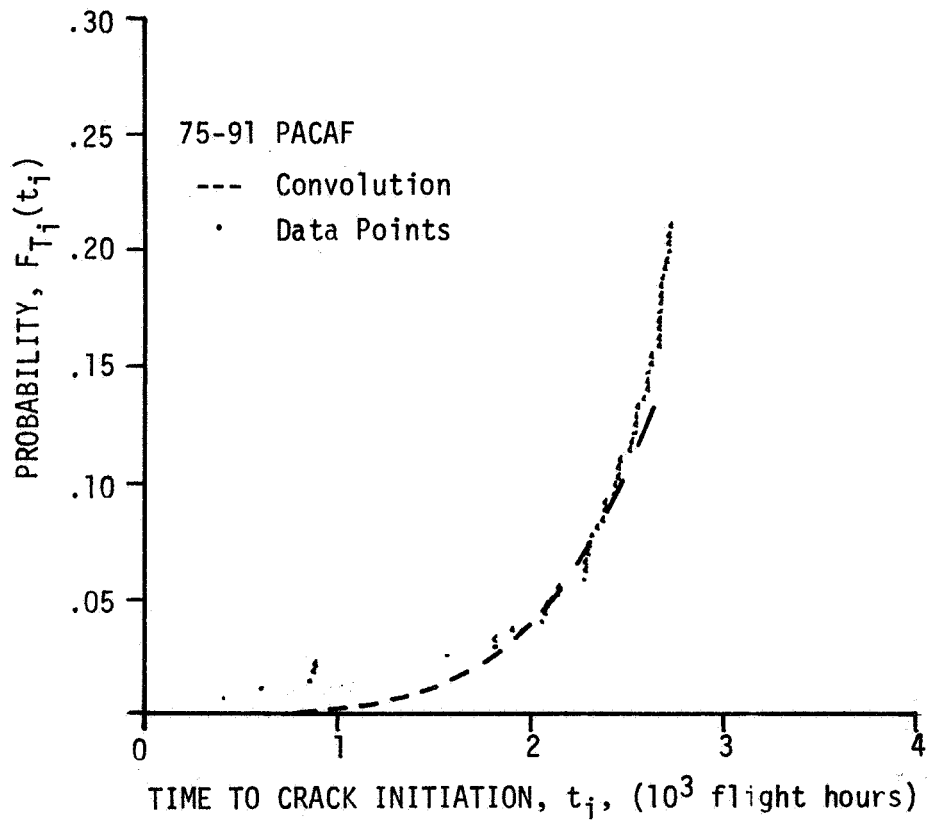
Fig. 32.   Lower Tail of Crack Initiation Time Distribution.
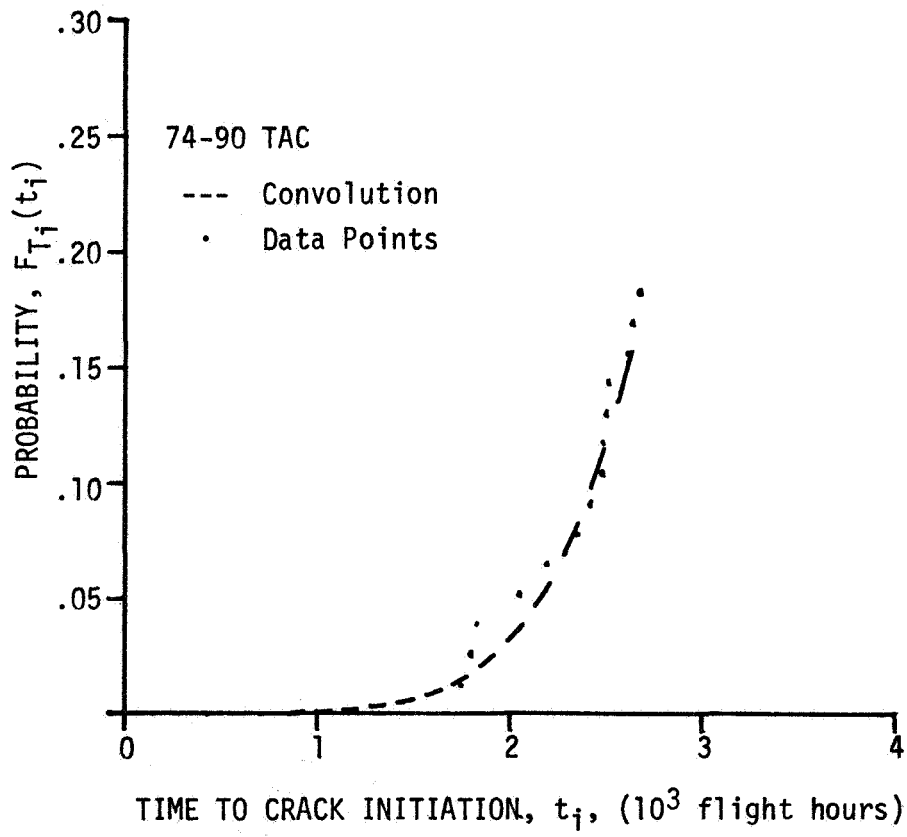
Fig. 33. Lower Tail of Crack Initiation Time Distribution.
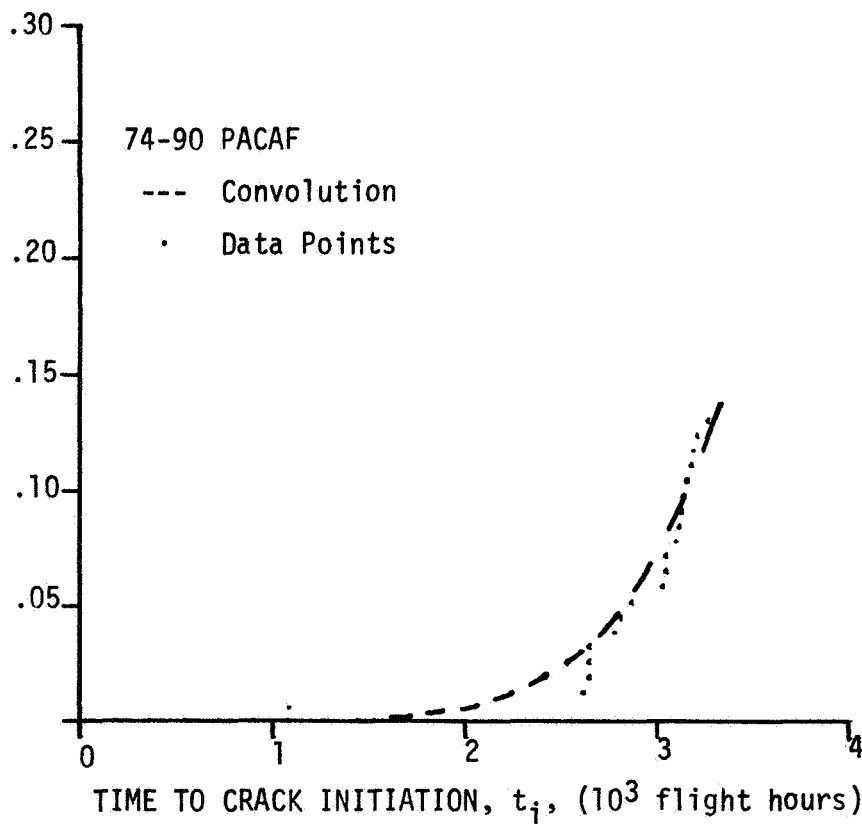
Fig. 34. Lower Tail of Crack Initiation Time Distribution.
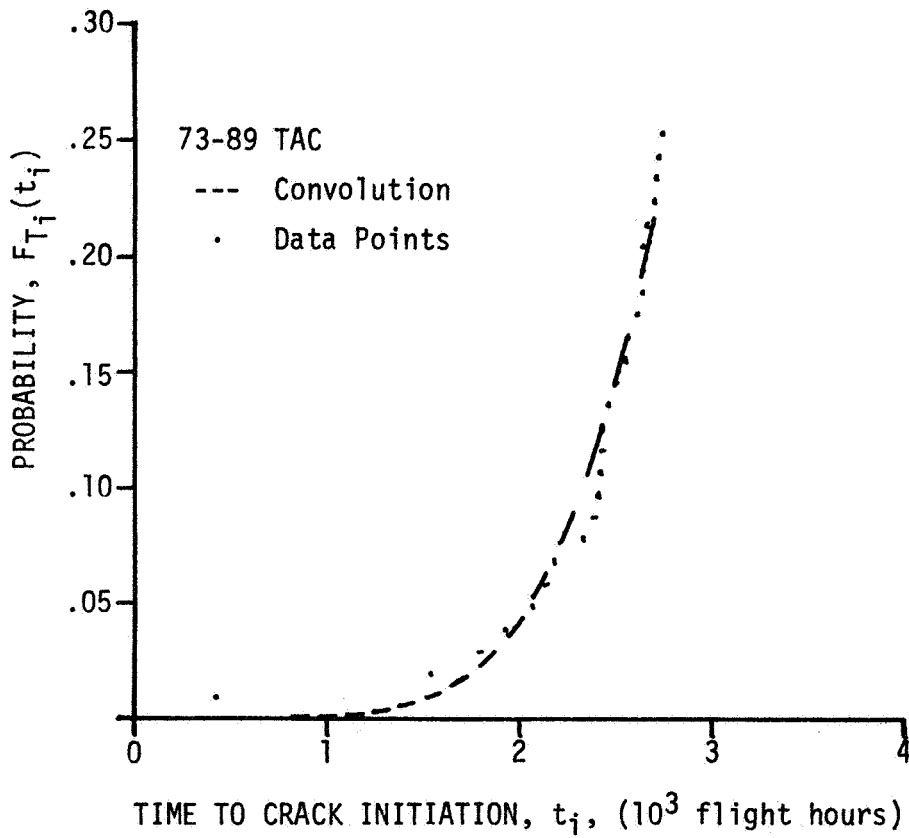
Fig. 35. Lower Tail of Crack Initiation Time Distribution.
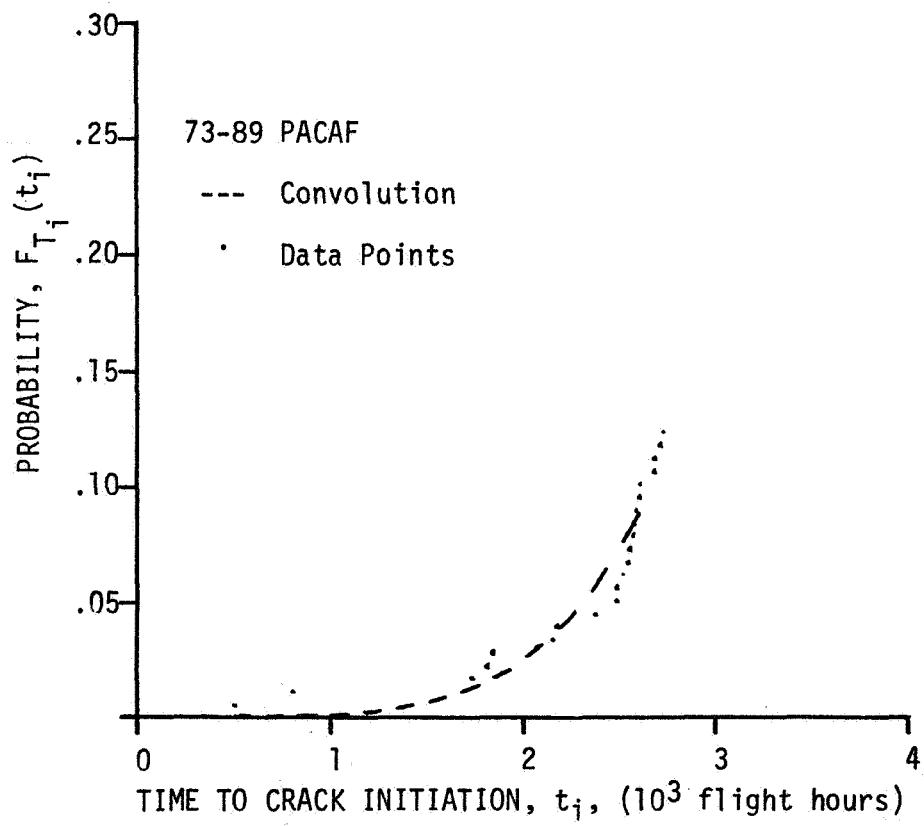
Fig. 36. Lower Tail of Crack Initiation Time Distribution.
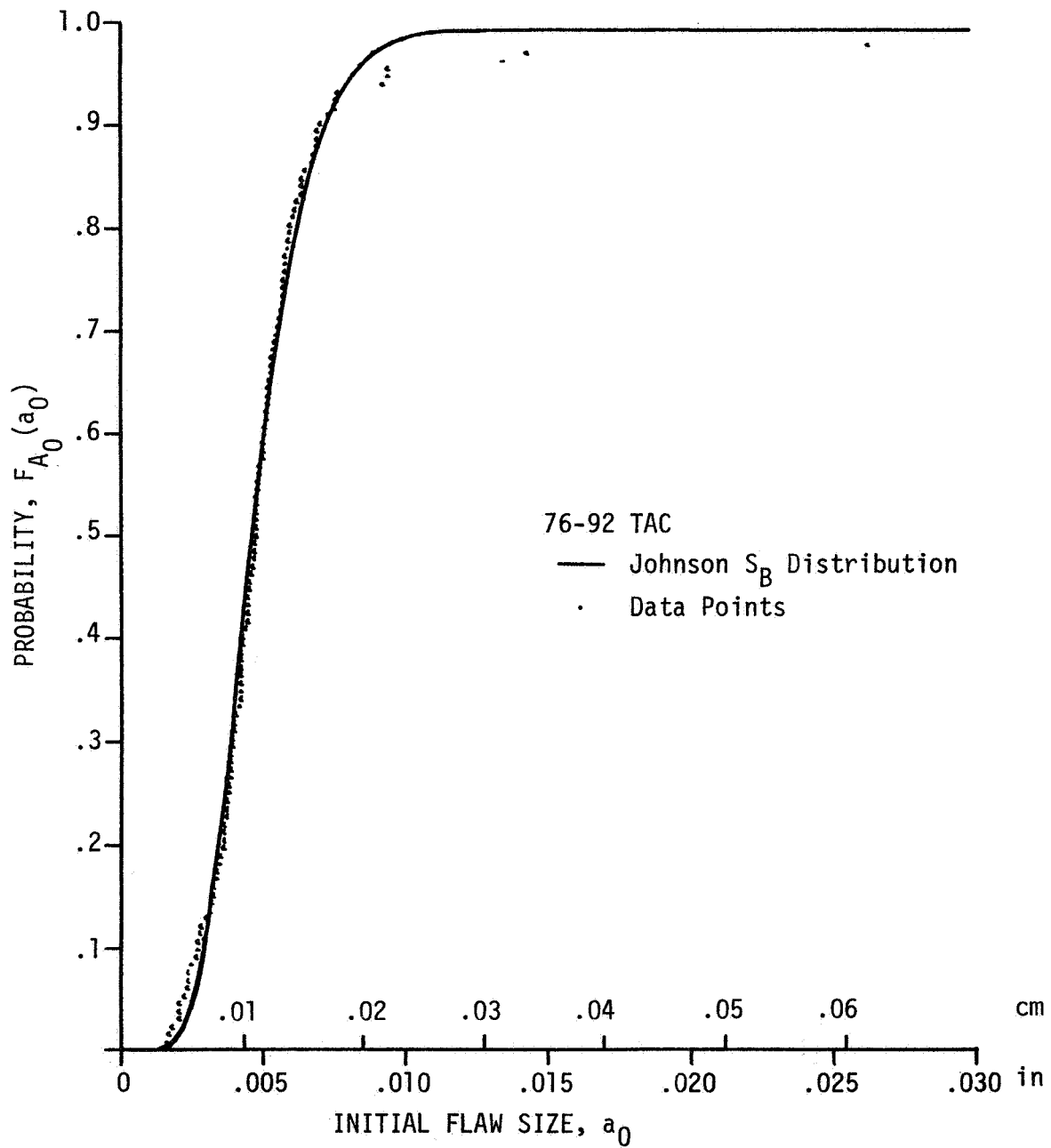
Fig. 37. Distribution of Initial Flaw Sizes.
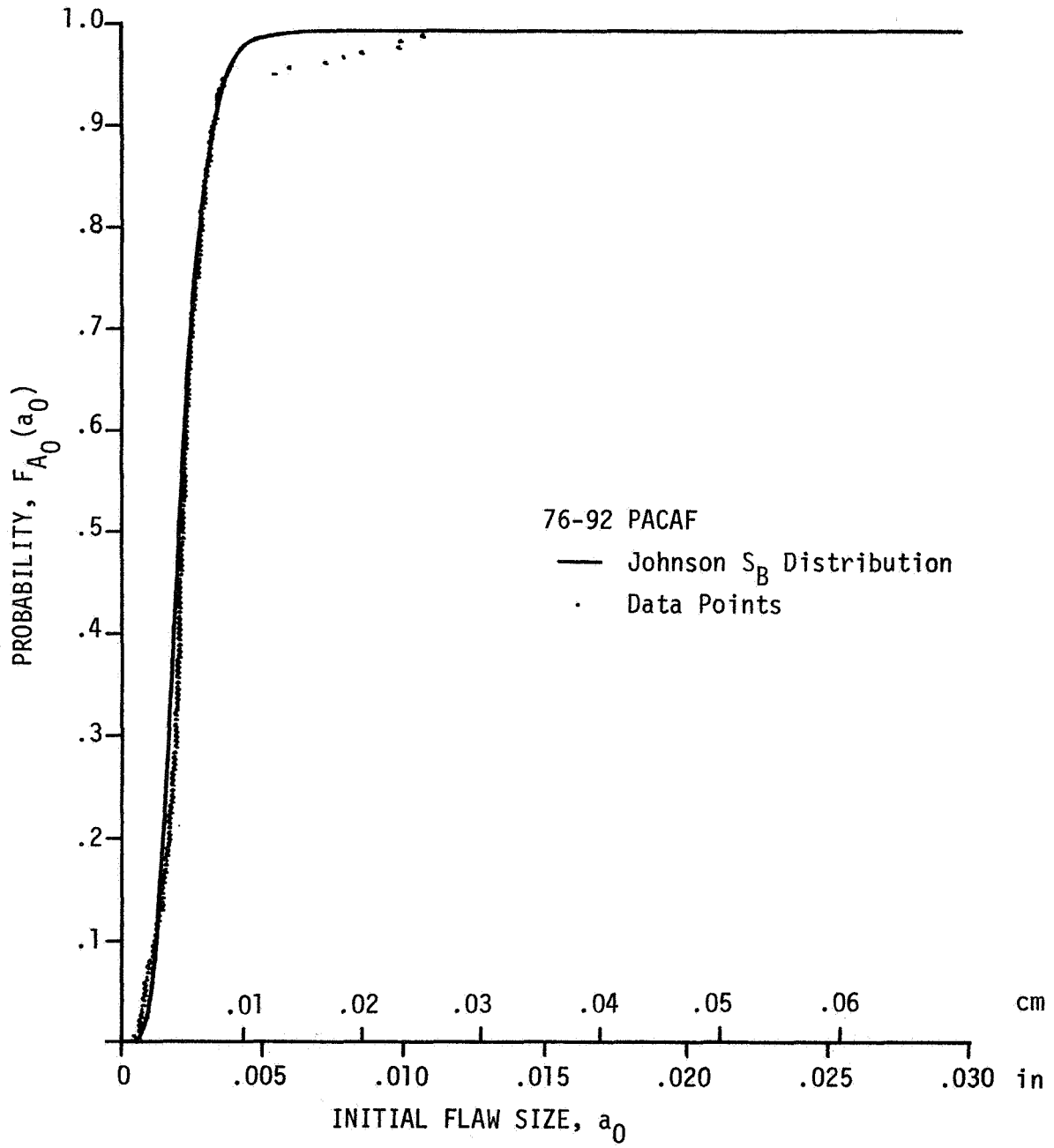
Fig. 38. Distribution of Initial Flaw Sizes .
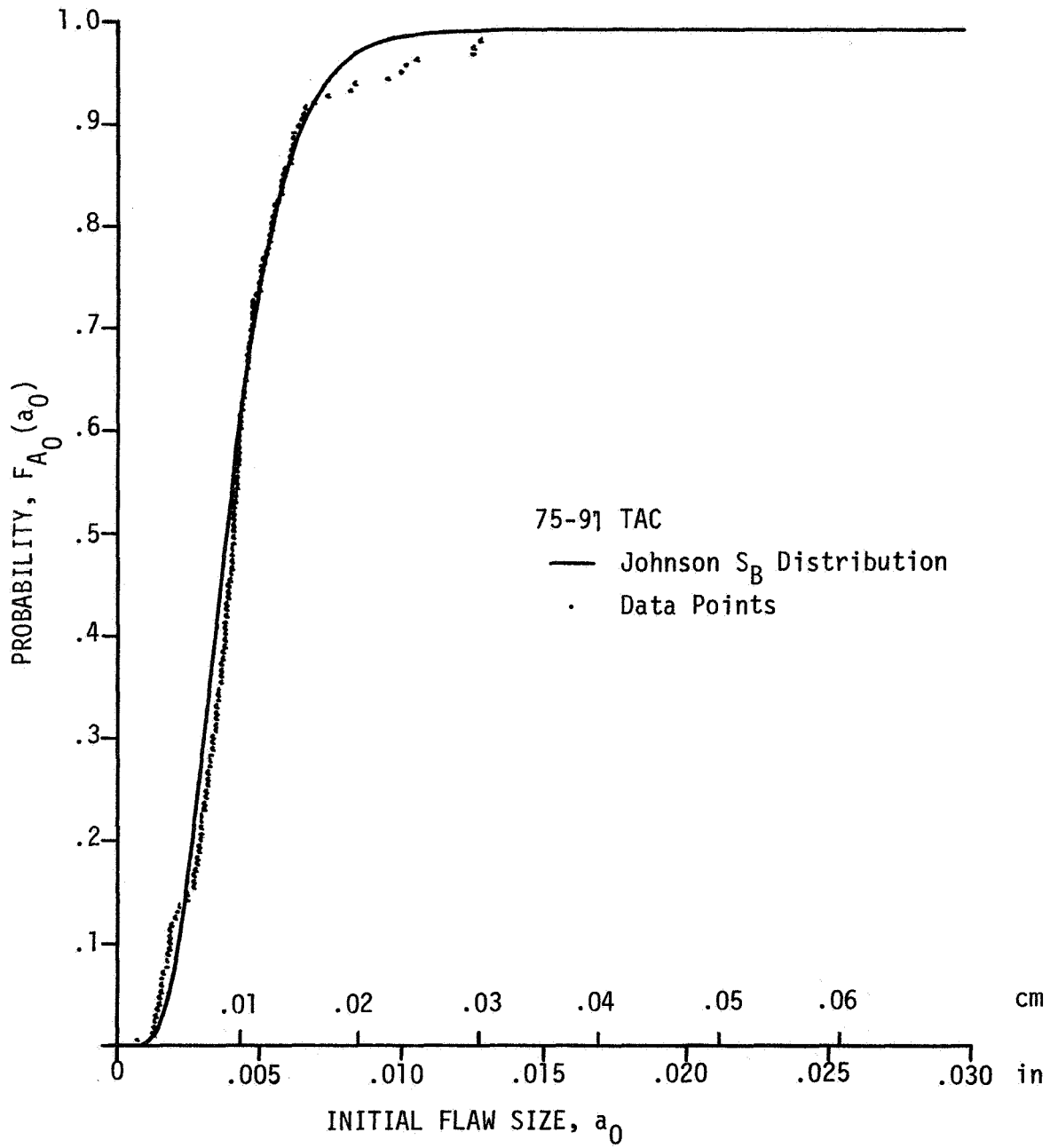
Fig. 39. Distribution of Initial Flaw Sizes.

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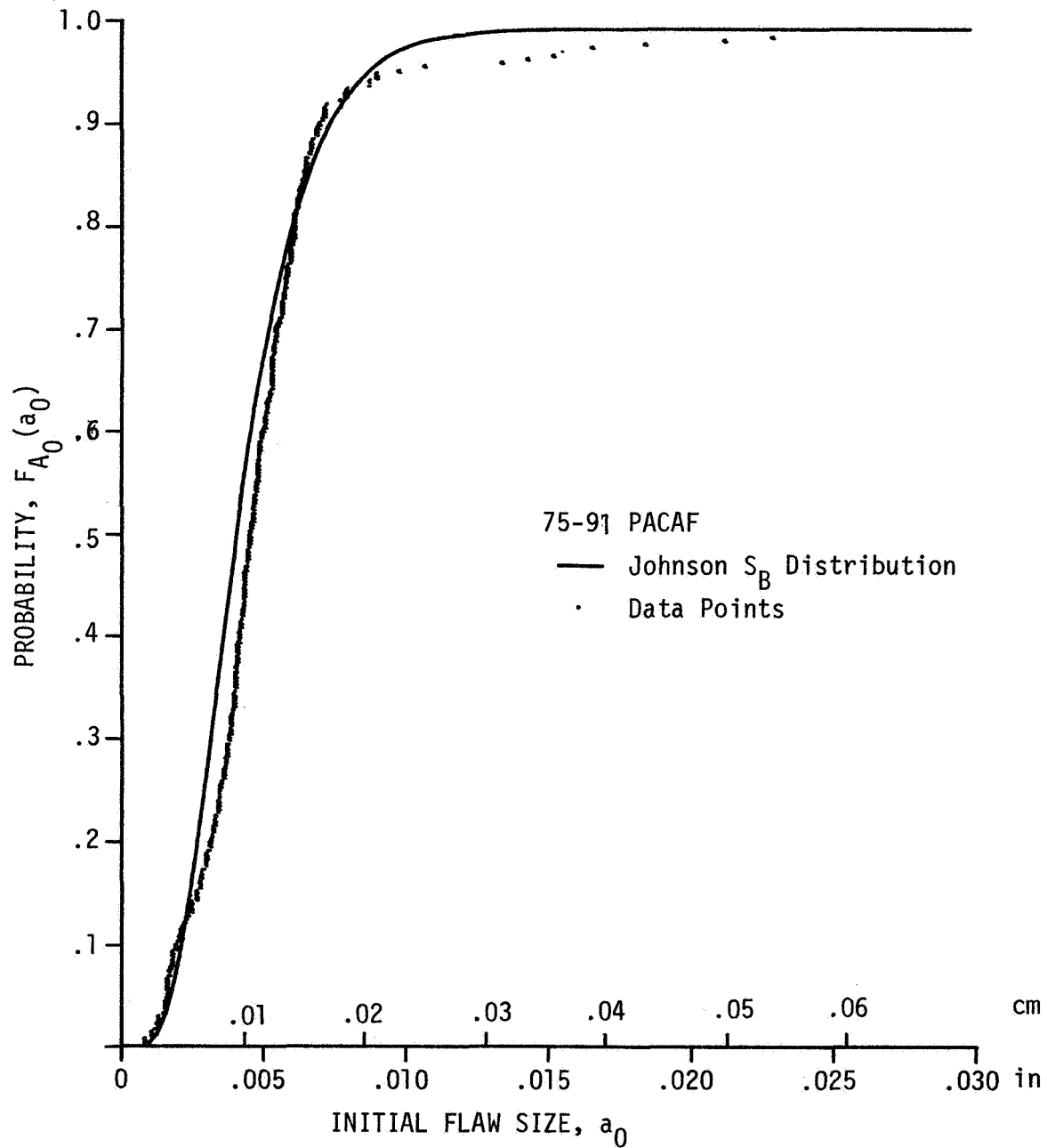
Fig. 40. Distribution of Initial Flaw Sizes.
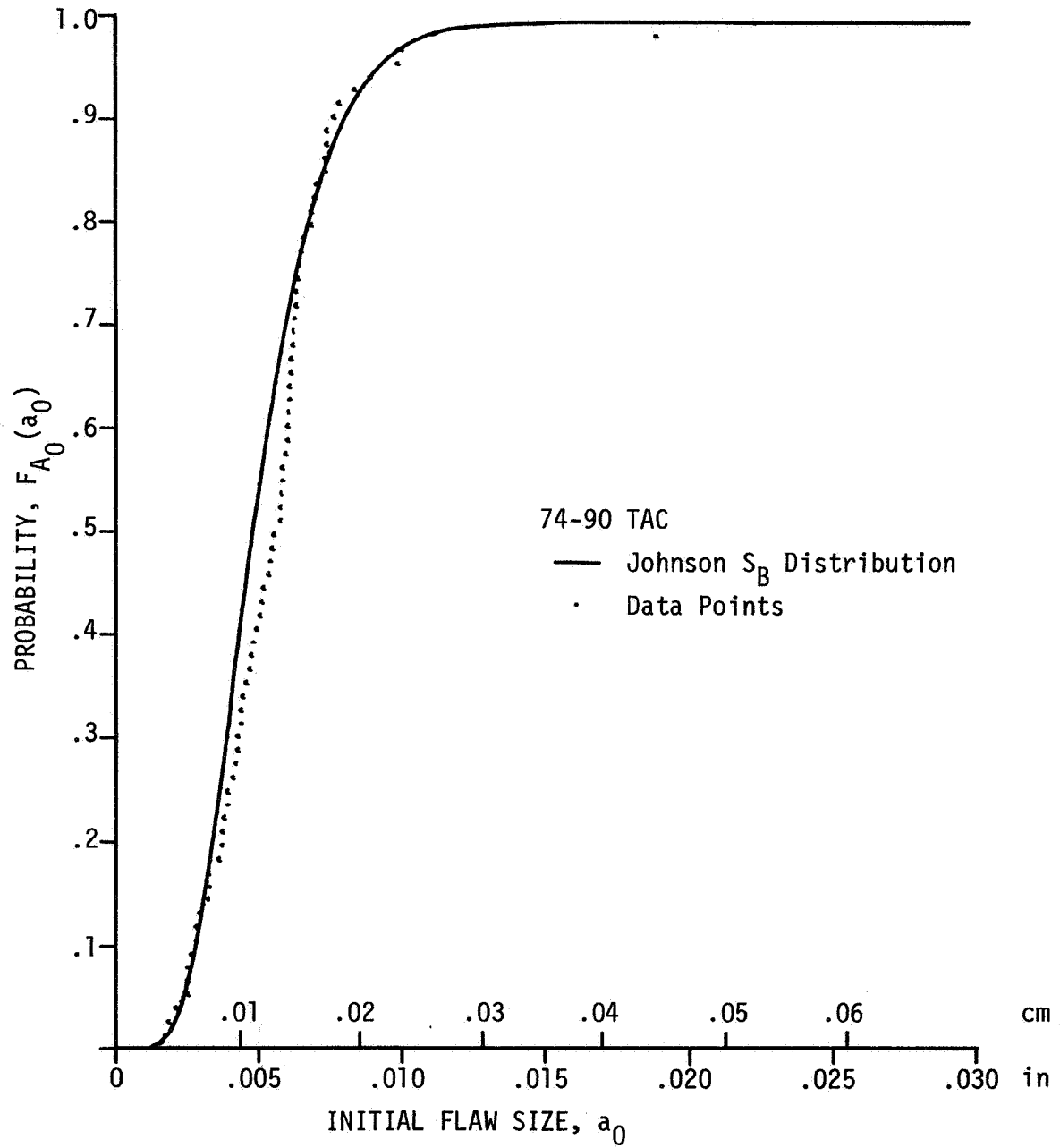
Fig. 41. Distribution of Initial Flaw Sizes.
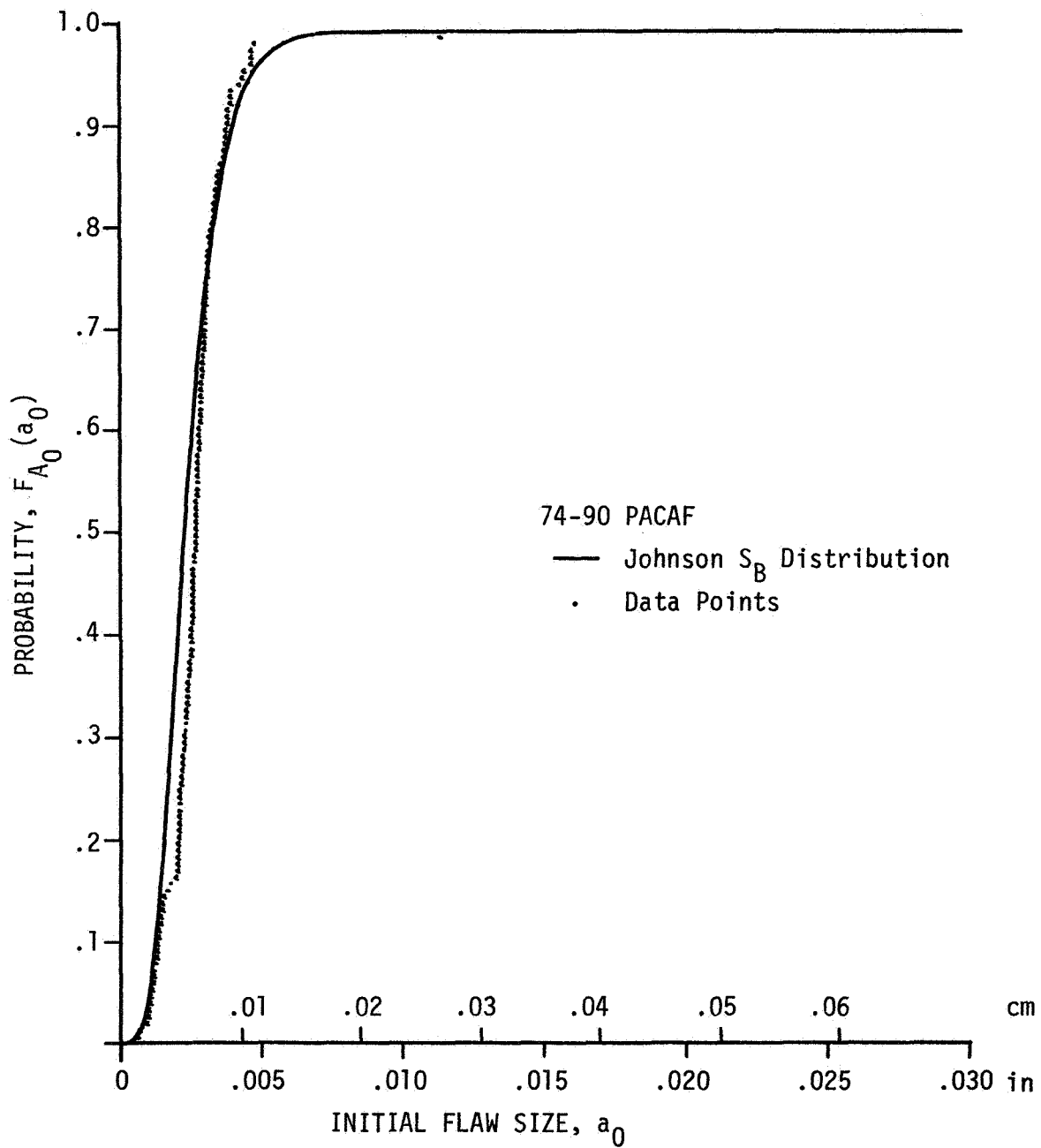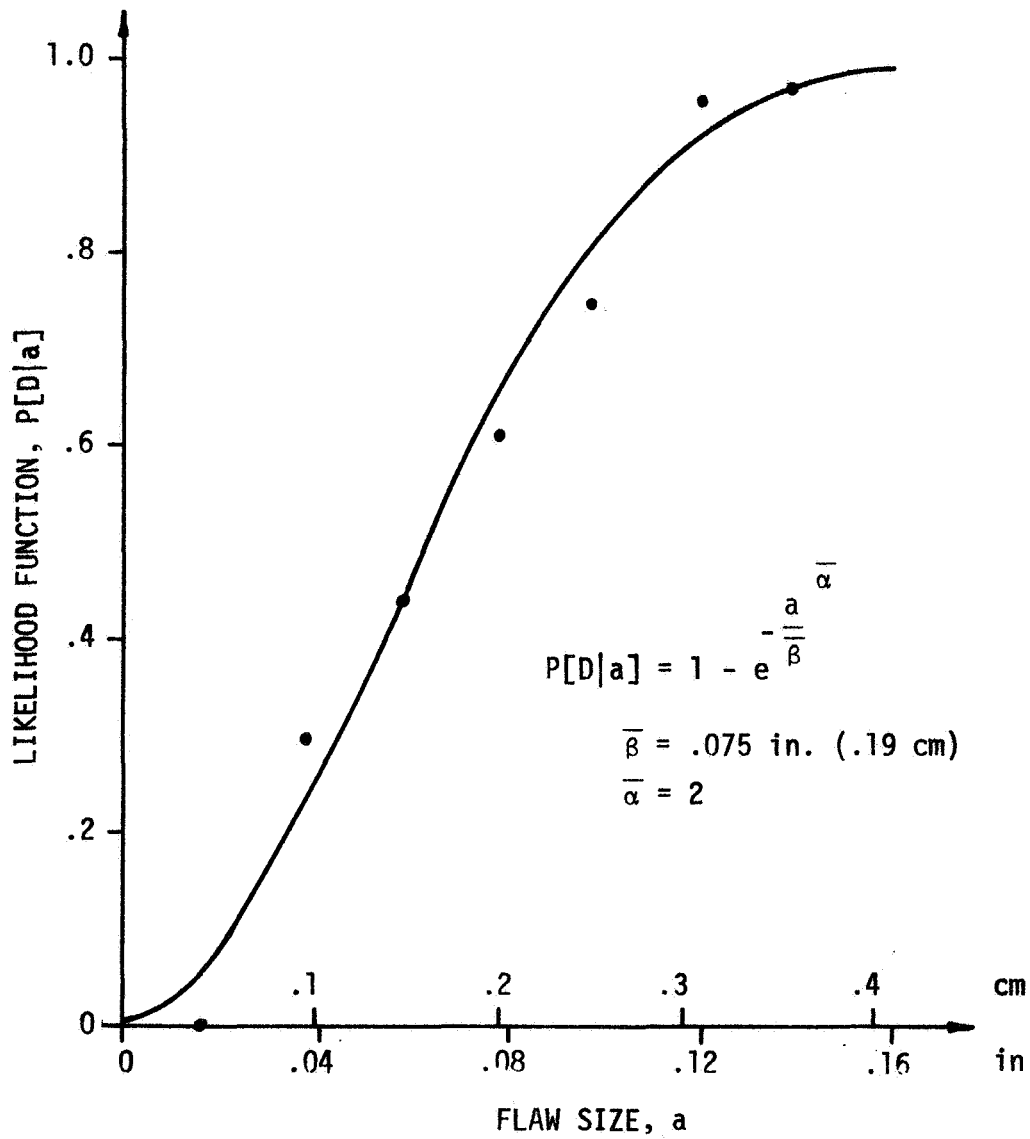
Fig. 42. Distribution of Initial Flaw Sizes.
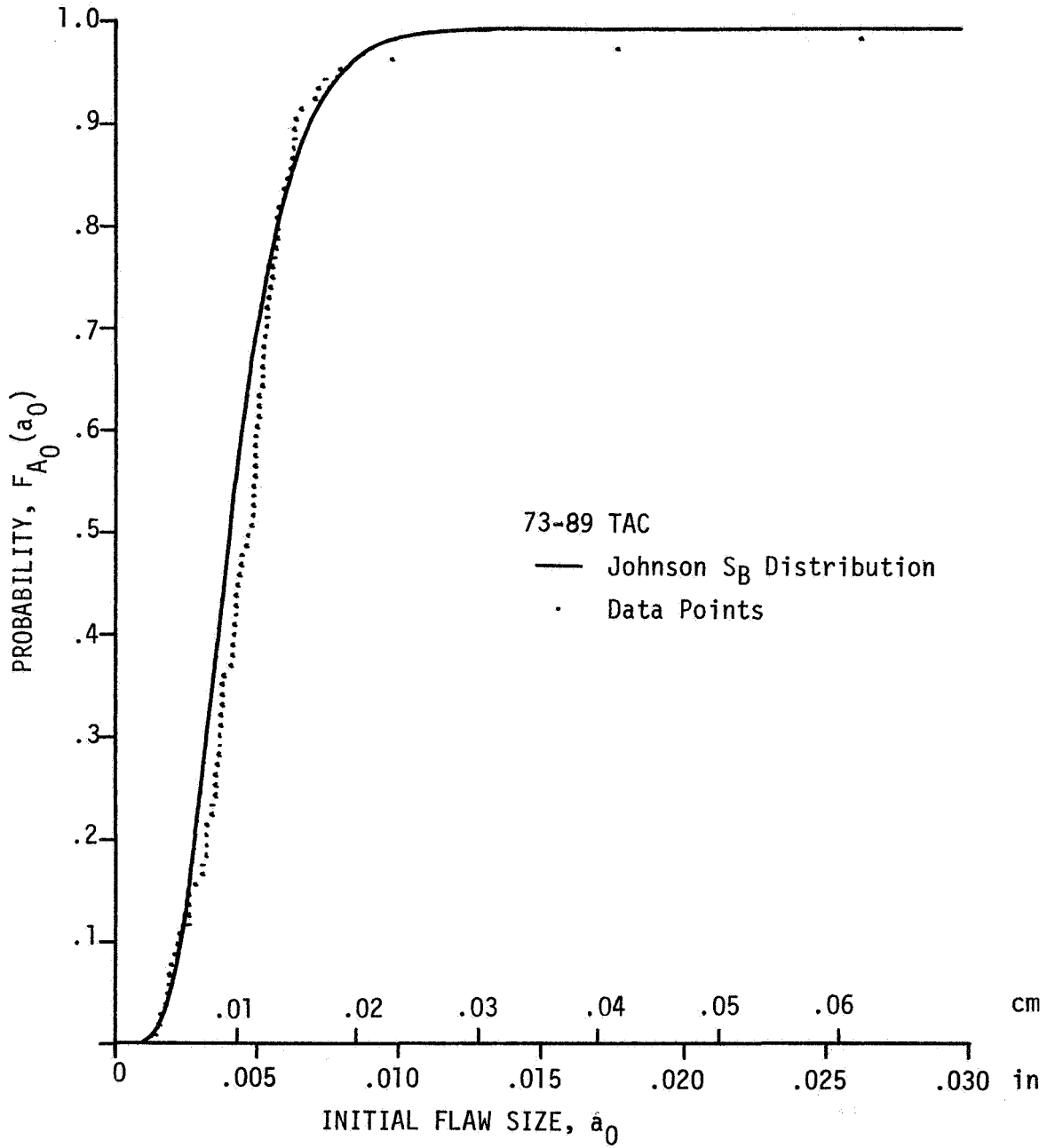
Fig. 43. Distribution of Initial Flaw Sizes.
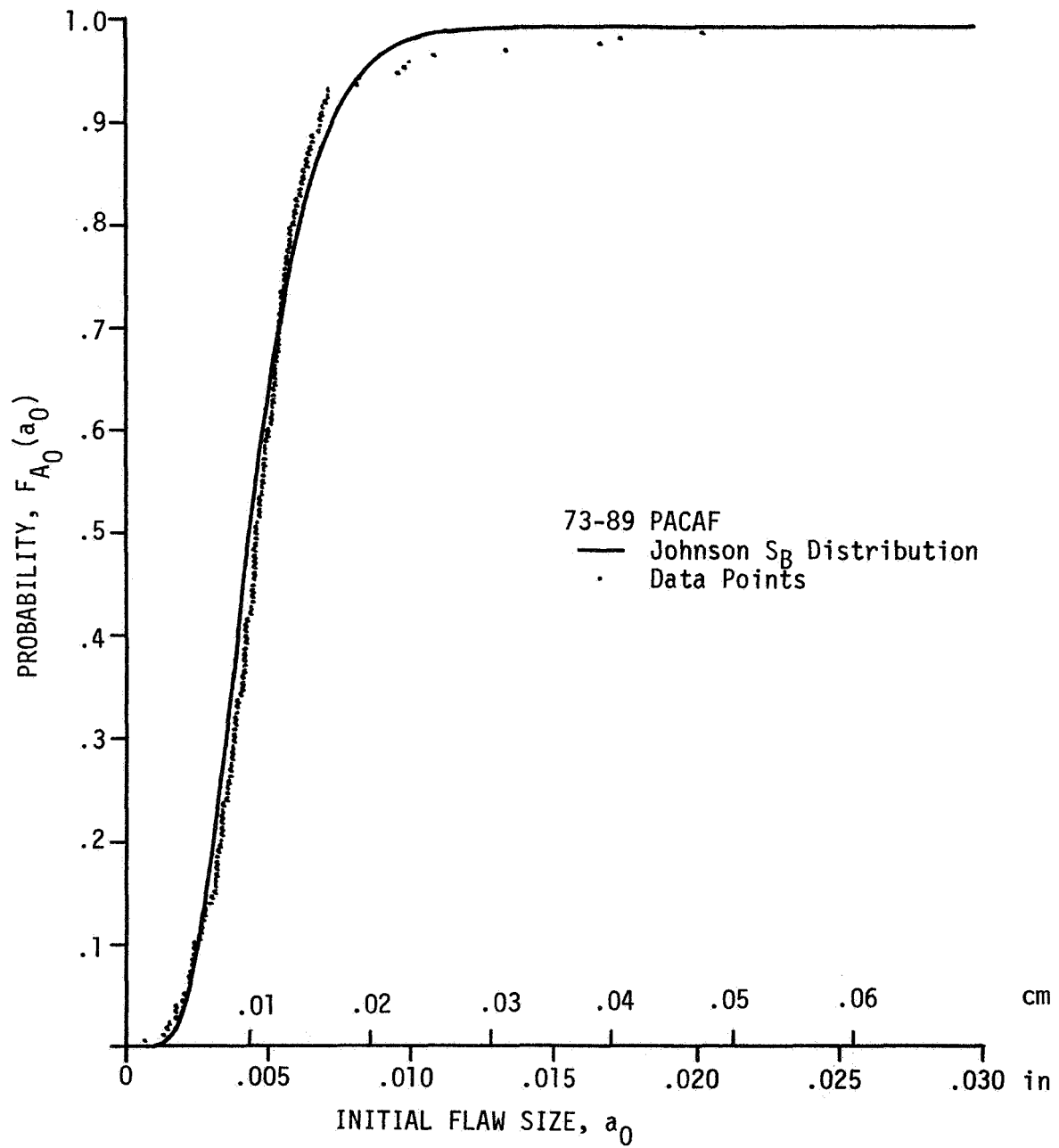
Fig. 44. Distribution of Initial Flaw Sizes.
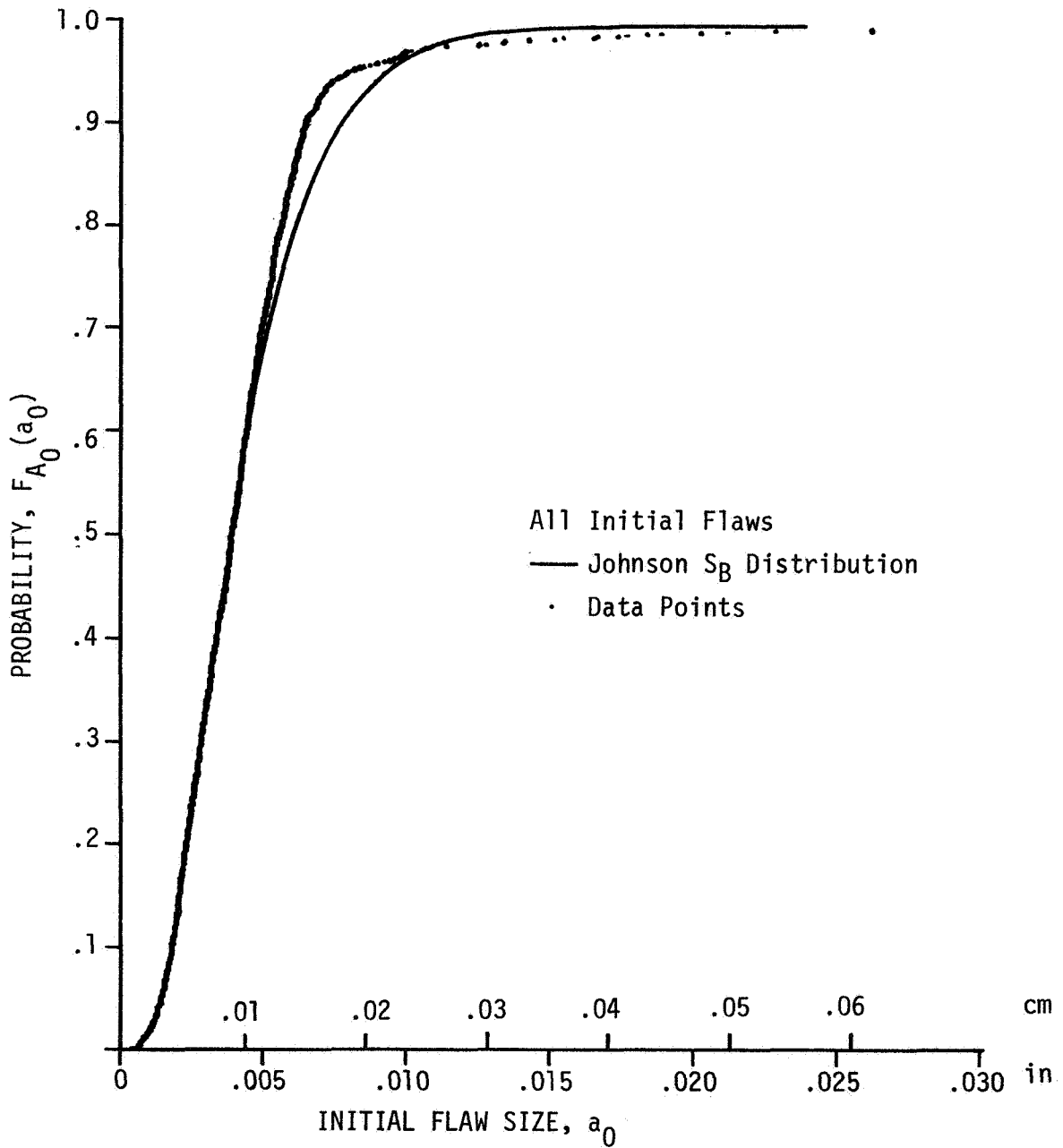
Fig. 45. Distribution of Initial Flaw Sizes for all 1256
Growing Cracks .

The equation shown on the figure:

$$P[D|a] = 1 - e^{-\frac{a}{\bar{\beta}}^{\bar{\alpha}}}$$

$$\bar{\beta} = .075 \text{ in. } (.19 \text{ cm})$$

$$\bar{\alpha} = 2$$

Axis labels: LIKELIHOOD FUNCTION, P[D|a]; FLAW SIZE, a

Fig. 46. Probability of Detection, "Likelihood Function".

Data From Ref. 26.

PROBABILITY DENSITY - $f(t_i)$

.00085

.00068

.00051

.00034

.00017

Inspection time t = 2500 hours

$f(t_i)$

$f(t_i|\overline{D})$

$f(t_i|D)$

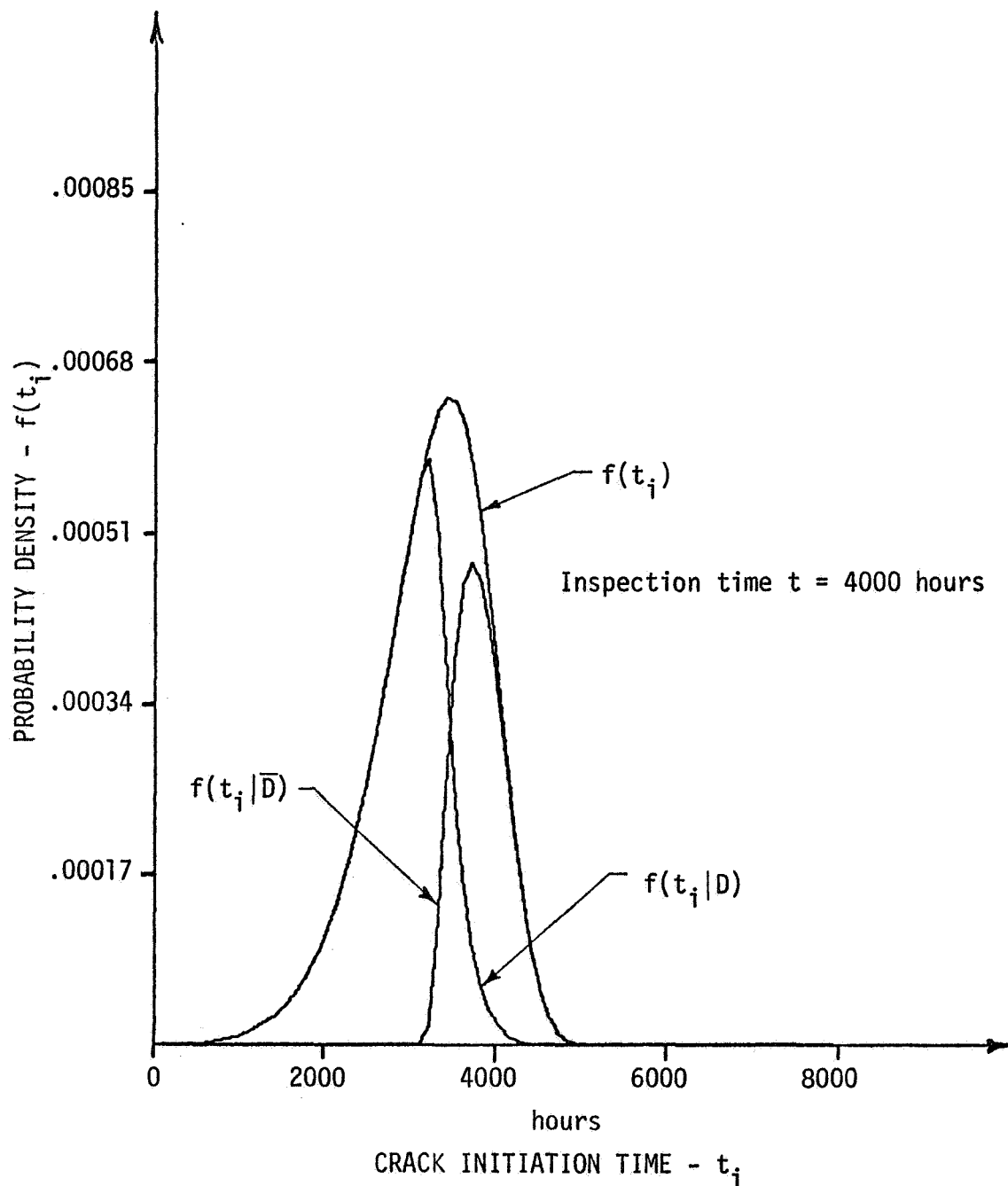0   2000   4000   6000   8000

hours

CRACK INITIATION TIME - t_i
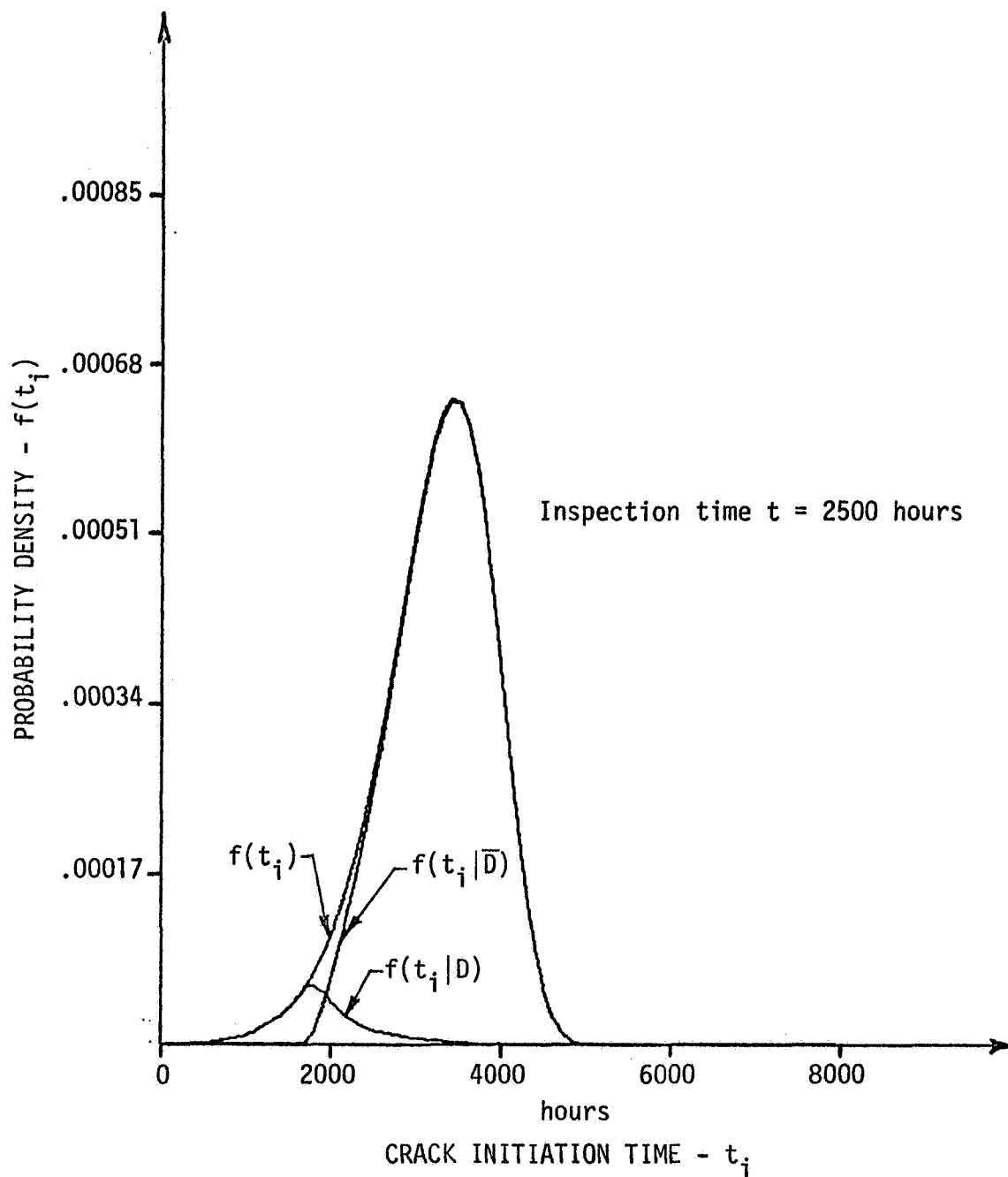
Fig. 47. Distributions of Crack Initiation Times for a
Typical Wing Location for an Early Inspection.

Fig. 48. Distributions of Crack Initiation Times for a
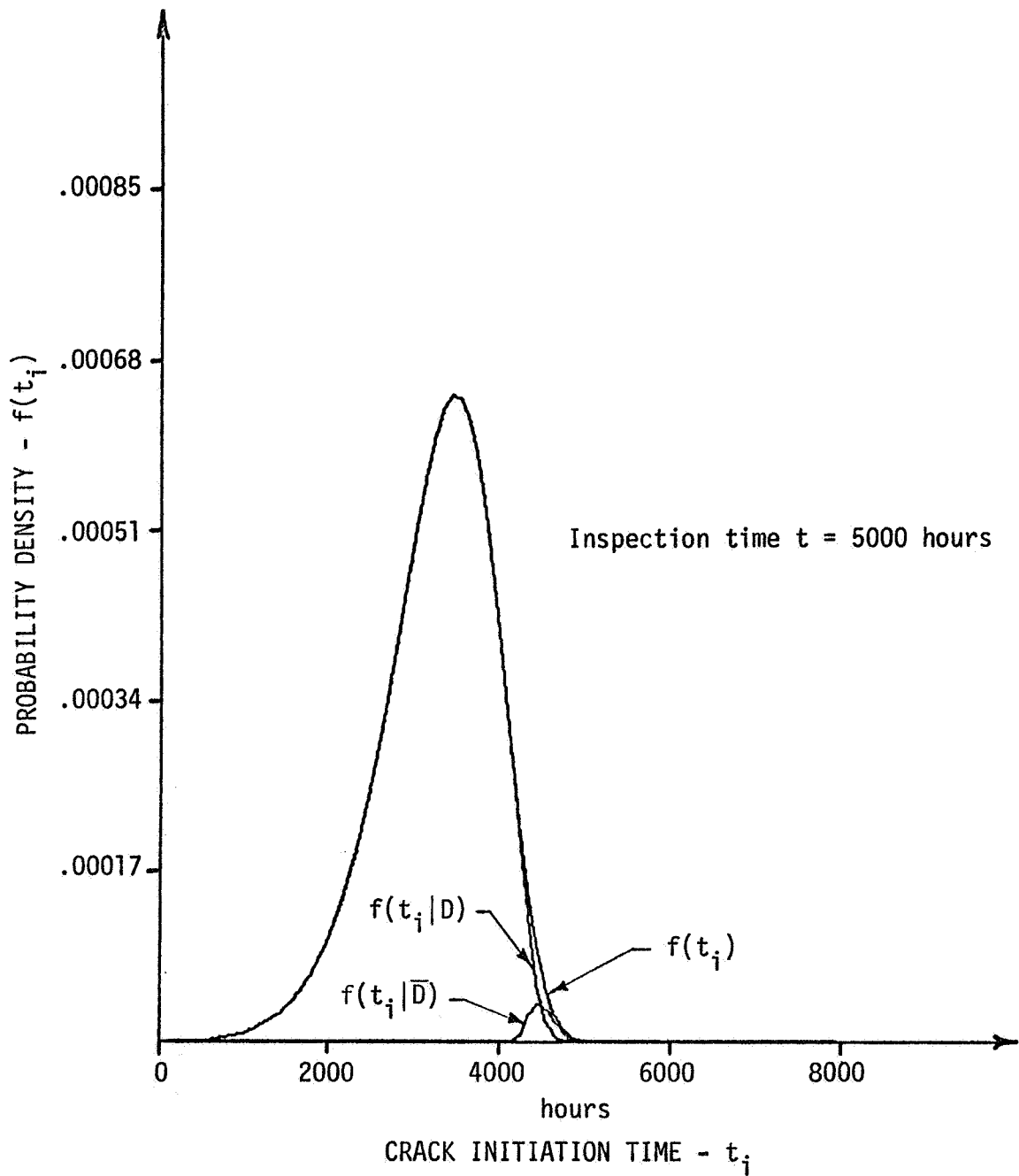Typical Wing Location for an Intermediate Inspection.

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Fig. 49. Distributions of Crack Initiation Times for a
Typical Wing Location for a Late Inspection.

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