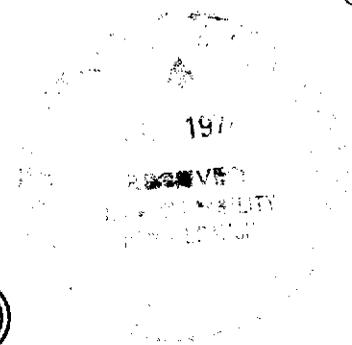


(NASA-CR-120398-APP-1-2) ROLE OF MAN IN
 FLIGHT EXPERIMENT PAYLOADS, PHASE 1,
 APPENDICES 1 AND 2 (Essex Corp.) 212 p
 HC 3 CSCL 05E
 63/05 Unclas
 46913
 N74-31579



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ROLE OF MAN IN FLIGHT EXPERIMENT
PAYLOADS - PHASE 1

(Appendices I and II)

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Under Contract NAS8-29917

July 5, 1974

APPENDIX I

TIME LINE REALIZATION

For the present analysis it will be assumed that some experimental observation requires the completion of N functions in a fixed sequence and that the total time available to perform all N functions is constrained. This could involve acquiring a stellar source, calibrating and recording with each of several sensors and completing these operations within the period of available viewing time determined by the orbit. Each of the N component functions will be regarded as having a completion time distribution with mean M_i and variance V_i . The index i denotes the function and runs from 1 to N . The total time for completion of all N functions may be related to the individual function durations assuming that the process does not branch. It will be assumed that the N functions are performed in sequence, the i -1th being a predecessor to the i th. It is also convenient to denote the standard deviation of the i th function duration as S_i where:

$$S_i = \sqrt{V_i} \quad 1.$$

The mean of the total time distribution will be denoted as M_T . The variance and standard deviation of the distribution will be denoted as V_T and S_T respectively. Then:

$$M_T = \sum_{i=1}^N M_i \quad 2.$$

and assuming that the individual function durations are statistically independent:

$$V_T = \sum_{i=1}^N V_i \quad 3.$$

The N tasks are represented by the parameters M_i , V_i , and S_i . These values are assumed to be population parameters in the present context. Several statistics defined on the set of tasks will prove to be of use. These include:

- \bar{M} The mean of the M_i
- \bar{V} The mean of the V_i
- V_s The variance of the S_i
- \bar{S} The mean of the S_i
- S_s The standard deviation of the S_i

The defining equations for these statistics are given below:

$$\bar{M} = \frac{1}{N} \sum_{i=1}^N M_i \quad 4.$$

$$\bar{V} = \frac{1}{N} \sum_{i=1}^N V_i \quad 5.$$

$$V_s = \frac{1}{N} \left[\sum_{i=1}^N S_i^2 - \frac{(\sum_{i=1}^N S_i)^2}{N} \right] \quad 6.$$

$$\bar{S} = \frac{1}{N} \sum_{i=1}^N S_i \quad 7.$$

$$S_s = \sqrt{V_s} \quad 8.$$

Substituting eq. (4) in eq. (2):

$$M_T = N\bar{M} \quad 9.$$

Substituting eq. (5) in eq. (3):

$$V_T = N\bar{V} \quad 10.$$

Then, by the definitions of S_T and V_T :

$$S_T = \sqrt{N\bar{V}} \quad 11.$$

Substituting eq. (7) in eq. (6) and rearranging:

$$V_S = \frac{1}{N} \sum_{i=1}^N S_i^2 - \bar{S}^2 \quad 12.$$

Substituting eq. (1) in eq. (12):

$$V_S = \frac{1}{N} \sum_{i=1}^N V_i - \bar{S}^2 \quad 13.$$

Substituting eq. (5) in eq. (13):

$$V_S = \bar{V} - \bar{S}^2 \quad 14.$$

Rearranging eq. (14):

$$\bar{V} = V_S + \bar{S}^2 \quad 15.$$

Substituting eq. (8) in eq. (15):

$$\bar{V} = S_S^2 + \bar{S}^2 \quad 16.$$

Substituting eq. (16) in eq. (11):

$$S_T = \sqrt{N} \cdot \sqrt{S_s^2 + \bar{S}^2} \quad 17.$$

Equation 17 expresses the standard deviation of the total task time in terms of the number of tasks in the sequence, and the mean and standard deviation of the individual task duration standard deviations.

The probability of timeline realization may be defined as the probability that the total sequence time is less than or equal to the time available. If the time available is devoted as T_A , and the sequence completion total time as T_R , then the probability of timeline realization is:

$$P (T_R \leq T_A) \quad 18.$$

The distribution of T_R has been shown to have parameters:

$$M_T = N\bar{M}$$
$$S_T = \sqrt{N} \cdot \sqrt{S_s^2 + \bar{S}^2}$$

If the distribution of T_R is denoted by $f(T)$, then:

$$P (T_R \leq T_A) = \int_0^{T_A} f(T) dT \quad 19.$$

Evaluation of this integral requires that the functional form of $f(T)$ be known. Strictly speaking, the distribution form for $f(T)$ depends on the functional forms of the individual function duration distributions. To simplify the discussion, however, it will be assumed that the number of tasks is sufficiently large that the central limit theorem applies. This theorem asserts, in the present context, that as N increases, the functional

form of $f(T)$ approaches the normal or gaussian regardless of the forms of the individual function duration distributions. Under this assumption the distribution of the total sequence time may be considered to be normal with the stated parameters. The time line realization probability may then be calculated via the standard variate:

$$Z_{TA} = \frac{T_A - M_T}{S_T} \quad 20.$$

Substituting eqs. (9) and (17) in eq. (20):

$$Z_{TA} = \frac{T_A - N\bar{M}}{\sqrt{N} \sqrt{S_s^2 + \bar{S}^2}} \quad 21.$$

If T_P denotes the time required for the function sequence to be completed with probability P :

$$T_P = N\bar{M} + Z_P \sqrt{N} \sqrt{S_s^2 + \bar{S}^2} \quad 22.$$

Where Z_P is the normal deviate associated with the desired probability level P . Equation (22) shows that problems are encountered in any approach involving simple summation of function duration times to estimate total sequence times. This approach would obviously yield correct results if the individual function durations were deterministic or fixed quantities. In such a case S_s and \bar{S} would equal zero and the time required would equal N times the average of the fixed durations. The impact of applying a process of additive function durations to obtain sequence time estimates depends on the nature of the component function duration measure. Since this single function time will

generally be a random variable, it can be measured only by some statistic of its distribution. An obvious candidate is the mean of the single function duration distribution, M_i . The rule for estimating the time necessary to complete the functional sequence is then to sum the individual means yielding a sequence completion time T_p where:

$$T_p^i = \sum_{i=1}^N M_i = N\bar{M} \quad 23.$$

Substituting eq. (23) in eq. (21) and evaluating the resulting normal deviate results in the conclusion that a sequence completion probability of .50 is obtained regardless of the value of N , S_s^2 , or \bar{S}^2 .

The rule expressed in eq. (23) is a special case of the use of standardized single function durations. The statistic:

$$T_{pi} = M_i + Z S_i \quad 24.$$

yields a required completion time for the i th function whose value depends on the value of the normal deviate chosen. If the individual function completion duration is normally distributed, eq. (24) would reduce to eq. (23) when summed over functions. If Z in eq. (24) were set to, say 2.33 or 3.20, the resulting value of T_{pi} would permit completion of the i th function with probability .990 or .999 respectively. Summing the T_{pi} over the N functions would then appear to yield a sequence completion time estimate with completion probability corresponding to the value of Z used in eq. (24). This method yields a sequence completion time estimate T_p :

$$T_p^1 = \sum_{i=1}^N (M_i + Z S_i) \quad 25.$$

Assuming that the Z value used is constant for all i and distributing the summation:

$$T_p^1 = N\bar{M} + ZN\bar{S}$$

26.

Equation (26) provides an estimated sequence completion time based on summation of single function duration measures. If Z is selected to be in the vicinity of 3.0, this may be regarded as summing maximum times. If Z is reduced to zero, eq. (26) results in summing mean times. The effects on timeline realization of this procedure depend on whether the estimates of the single function completion times approximate means, maxima, or some intermediate value.

For example, the Spacelab payload data for payload AS-01-S-1.5 M. IR Telescope discussed in Section 4.0 show a timeline for one repetitive cycle. This timeline includes transducer selection and calibration tasks, sensor pointing, etc. the function completion times shown are based on the estimates of scientific personnel who are familiar with these operations in ground based laboratories. The question pointed out by the present analysis is whether these estimates represent mean times, maximum times, intermediate values, or even minimum values.

The impact of the use of the general methodology expressed in eq. (26) may be assessed by comparison with eq. (22). Both expressions involve the sequence time mean plus an additive component. The mean would suffice if the single function durations were deterministic. The need for the additive component is due to the statistical nature of the single function durations which dictates an increase in time required to complete the sequence in order to raise the success probability from .50 to some desired value. The additive

components of eqs. (22) and (26) are given by:

$$T_P - \overline{NM} = Z_P \sqrt{N} \sqrt{S_s^2 + \overline{S}^2} \quad 27.$$

and

$$T_P^1 - \overline{NM} = ZNS$$

For equal values of Z in the two equations, the ratio of the additive components is:

$$\frac{T_P^1 - \overline{NM}}{T_P - \overline{NM}} = \frac{ZNS}{Z \sqrt{N} \sqrt{S_s^2 + \overline{S}^2}} \quad 29.$$

To simplify eq. (29), define a derived statistic D where:

$$D = \frac{S_s^2}{\overline{S}^2} = \left(\frac{S_s}{\overline{S}} \right)^2 \quad 30.$$

D is then the square of the ratio of the standard deviation of the single function duration standard deviations to their mean. Substituting eq. (30) in eq. (29):

$$\frac{T_P^1 - \overline{NM}}{T_P - \overline{NM}} = \frac{ZNS}{Z \sqrt{N} \sqrt{D + 1} \overline{S}} \quad 31.$$

Cancelling terms:

$$\frac{T_P^1 - \overline{NM}}{T_P - \overline{NM}} = \frac{N}{D + 1} \frac{N}{D + 1} \quad 32.$$

The method of summing deviates of the individual function duration distributions thus yields an additive component which differs from the correct additive component. The variation is as follows:

$$\left\{ \begin{array}{cc} T_P^1 & T_P \\ T_P^1 & T_P \\ T_P^1 & T_P \end{array} \right\} \text{ IF } \left\{ \begin{array}{cc} N & D + 1 \\ N & D + 1 \\ N & D + 1 \end{array} \right\} \quad 33.$$

Which of these cases obtains in a particular estimation problem depends on the value of D obtained since N must be a positive integer. The value of D depends on the form of the distribution of the S_i . Since S_i is a standard deviation, it must be greater than or equal to zero but is unbounded above. This implies that the distribution will be positively skewed as illustrated in Figure I-1.

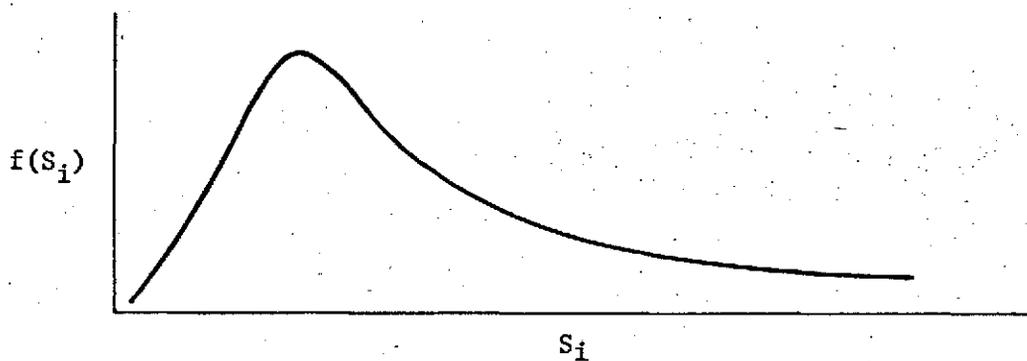


FIGURE I-1

If, despite the argument for skewness, the distribution is taken to be normal, then the distribution parameters must be constrained so that the minimum value exceeds zero. This requires that:

$$0 \approx \bar{S} - 3S_s \quad 34.$$

Which implies:

$$\bar{S} \approx 3S_s \quad 35.$$

In which case:

$$D \approx \frac{S_s^2}{9S_s^2} = \frac{1}{9} \quad 36.$$

This implies that D cannot exceed 1/9 in the case of normally distributed standard deviations. If the S_i distribution takes on positive skew, a more appropriate distribution model would be the gamma distribution which has the form:

$$f(S) = \frac{\lambda}{\Gamma(n)} (\lambda S)^{n-1} e^{-\lambda S} \quad 37.$$

If the S_i are gamma distributed, then:

$$\bar{S} = \frac{n}{\lambda} \quad 38.$$

and

$$S_s = \frac{\sqrt{n}}{\lambda} \quad 39.$$

Therefore, substituting eqs. (38) and (39) in eq. (30):

$$D = \frac{h/\lambda^2}{h^2/\lambda^2} = \frac{1}{h} \quad 40.$$

The parameter n of the gamma distribution must be positive so that for gamma distributed S_i , D will generally be less than unity. The extreme form of the gamma distribution is the exponential distribution which obtains when $n = 1$.

The implication of the above analysis is that the value of D will approach unity as the skewness of the distribution of S_i increases. As the skewness decreases, the value of D will decrease toward zero. Therefore, it will generally be true that:

$$0 < D < 1 \quad 41.$$

With respect to eq. (33),

$$1 < D + 1 < 2 \quad 42.$$

and eq. (33) may be seen to be constrained so that it will generally be true that:

$$\left\{ \begin{array}{l} T_P^1 = T_P \\ T_P^1 & T_P \end{array} \right\} \text{ IF } \left\{ \begin{array}{l} N = 1, 2 \\ N \quad 2 \end{array} \right\} \quad 43.$$

Since task sequences would generally be thought of as consisting of more than two tasks, the conclusion is warranted that the additive method expressed in eq. (25) will yield an overestimate of the time required for a desired probability of sequence completion. Depending on the number of tasks in the sequence, the overestimate may be many times the correct estimate. To illustrate this effect, eq. (31) was varied parametrically for values of N ranging from 1 to 100 and values of D from 0 to 1.0. The results are shown in Figure I-2 with number of tasks as the independent variable, D as the curve parameter, and the ratio of the additive component based on eq. (26) to that based on eq. (27). Figure I-2 shows that the former method of estimating required time will overestimate the correct value by as much as a factor of 10 depending on

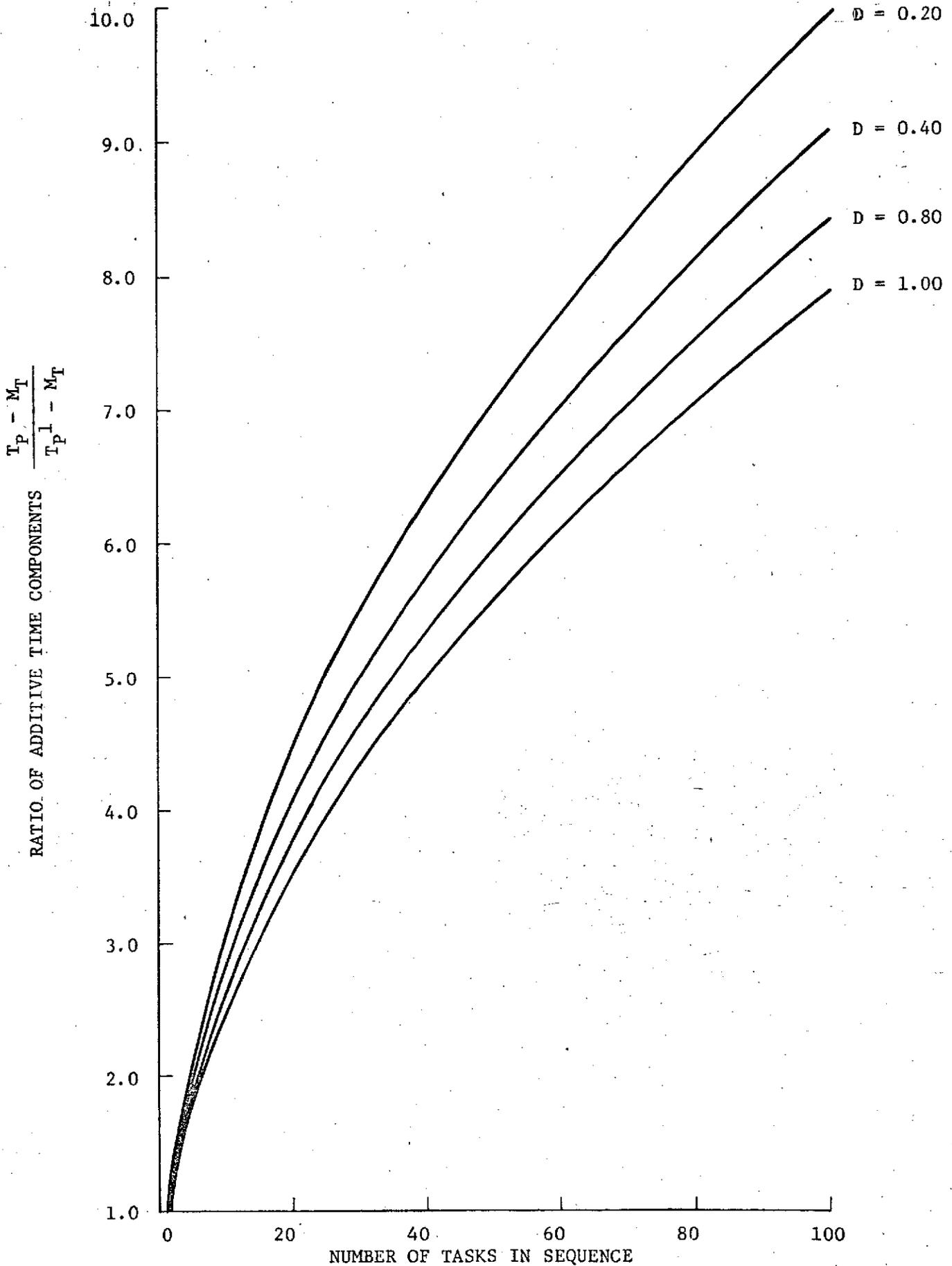


FIGURE I-2. RATIO OF ALLOWED ADDITIVE COMPONENT TO REQUIRED ADDITIVE COMPONENT FOR TASK DURATION SUMMATION APPROACH

values of N and D within the range of these variables studied.

The result is that considerably more time is allowed by eq. (26) to reach a desired sequence success probability than is actually necessary. This gives rise to the concept of excess time. If T_P time units are allowed for sequence completion and T_P time units are actually required for the stated success probability, then the proportion P_E represents the proportion of total allowed time in excess of what is necessary:

$$P_E = \frac{T_P - T_P}{T_P^1} \quad 44.$$

To investigate the behavior of this proportion in terms of variables previously defined, let:

$$K = \frac{T_P^1}{M_T} \quad 45.$$

K is the ratio of allowed time via eq. (26) to total sequence mean time. By eq. (31):

$$\frac{T_P - T_P}{T_P^1 - M_T} = \frac{Z\bar{N}S - Z N D + 1 \bar{S}}{SNS} \quad 46.$$

Cancelling terms in eq. (39):

$$\frac{T_P^1 - T_P}{T_P^1 - M_T} = 1 - \frac{D + 1}{N} \quad 47.$$

For convenience, let:

$$R = \sqrt{\frac{N}{D + 1}} \quad 48.$$

Then, substituting eq. (41) in eq. (48):

$$\frac{T_P^1 - T_P}{T_P^1 - M_T} = 1 - \frac{1}{R} \quad 49.$$

Substituting eq. (38) in eq. (49):

$$\frac{T_P^1 - T_P}{\frac{T_P^1 - T_P^1}{K}} = \frac{1}{R} \quad 50.$$

Rearranging eq. (50):

$$P_E = \frac{T_P^1 - T_P}{T_P^1} = \left[1 - \frac{1}{R} \right] \left[1 - \frac{1}{K} \right] \quad 51.$$

Thus, eq. (51) gives the proportion of total allowed time which is in excess of that required due to the use of eq. (26) to estimate required sequence time. The results of a parametric analysis of eq. (51) are shown in Figure I-3 which shows the ratio K as the independent variable ranging from 1 to 10 and the ratio $\frac{1}{R}$ as the curve parameter varying from 1.5 to 10. The ratio $\frac{1}{R}$ expresses the ratio between additive components based on eq. (31). For the range of values studied, the dependent variable P_E ranges from 0 to 81% excess time.

It is also true that eq. (51) yields a minimum estimate of the proportion of excess time. This is due to the fact that T_P and T_P are basically deviates of probability distribution selected based on Z values which provide stated success probabilities. The expectation in any single performance of the task sequence is that the total completion time would be less than T_P . The mean

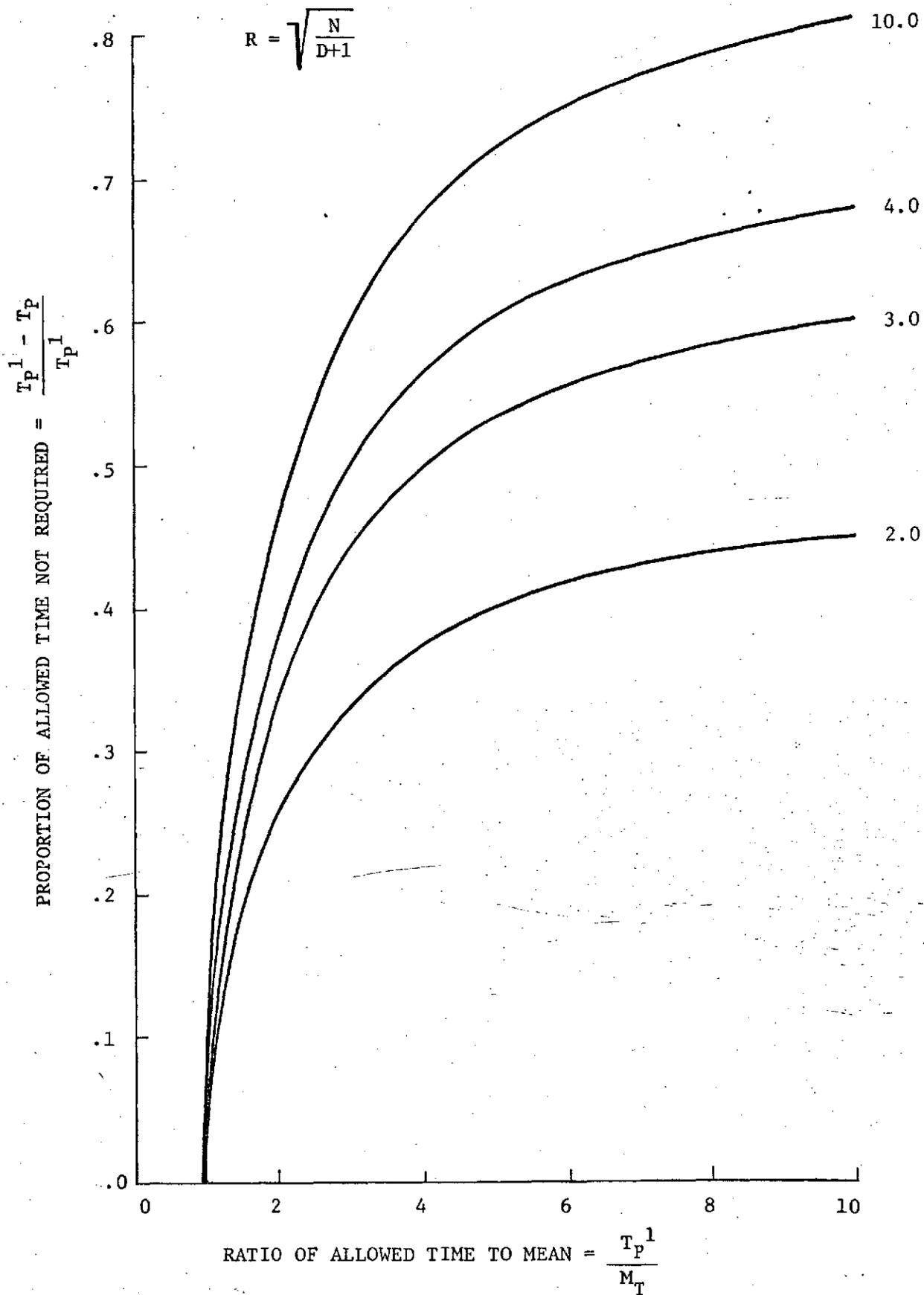


FIGURE I-3. PROPORTION OF ALLOWED SEQUENCE TIME NOT REQUIRED FOR SEQUENCE COMPLETION

and variance of the sequence time are given by:

$$M_T = N\bar{M} \quad 52.$$

$$V_T = N(D+1)\bar{S}^2 \quad 53.$$

By expectation algebra and eq. (37):

$$M_{P_E} = 1 - \frac{M_T}{T_P^1} \quad 54.$$

By eq. (38):

$$V_{P_E} = \left(\frac{1}{T_P^1} \right)^2 V_T \quad 55.$$

Substituting eq. (52) in eq. (54):

$$M_{P_E} = 1 - \frac{\bar{M}}{\bar{M} + Z\bar{S}} \quad 56.$$

Substituting eq. (53) in eq. (55):

$$V_{P_E} = \left[\frac{1}{\bar{M} + Z\bar{S}} \right]^2 D + 1 \bar{S}^2 \quad 57.$$

The standard deviation of P_E is then:

$$S_{P_E} = \frac{\sqrt{D+1}\bar{S}}{\bar{M} + Z\bar{S}} \quad 58.$$

APPENDIX II

FUNCTIONAL REQUIREMENTS DATA COLLECTION

The functional requirements data collection technique developed in the present study was designed to accommodate the data requirements identified in Sections 3.0 and 4.0. The point of departure for the data collection approach is the generalized experiment functional flow diagram shown in Figures 4-2 to 4-8. The data sheets to be used are included in Appendix II. At present one sheet is included for each function in the generalized flow model.

The function description sheets provide space for the descriptor variables discussed in Section 5.0. The function numbers from Figures 4-2 to 4-8 are incremented by ten to provide for incorporation of additional functions. The function description provides space to provide details on the function when the function name does not clarify this. The start criteria section lists the requirements for beginning the function as enumerated in Section 5.0. The completion criteria describe the requirements for considering the function to be completed. The system elements section provides space to describe the specific hardware and software such as sensors, transducers, etc. Crew skills are also included in the system element section. The crew skill/role terminology of Ref. 2 is employed and the spaces in the crew skills section refer to technician, experimenter, and investigator. This information is completed where a strong requirement for a particular skill can be established.

The next function logic section provides data on branching following completion of the current function. The function number to be performed next is indicated along with the conditions for proceeding to this function. The crew performance estimates include both time to complete the function and a listing of potential crew errors.

Additional information refers to any data not accommodated by the above specific items. Items to be included are: --

- Strong requirements for simultaneous performance of another function with this function
- Man loading estimates if different from unity
- A necessity to iterate this function until some condition is obtained
- Data on crew practice or fatigue effects associated with this function
- Modification of function data if the function is performed more than once in the experiment

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 1-10

FUNCTION NAME MONITOR ENVIRONMENT

FUNCTION DESCRIPTION Performed to obtain information on the availability of a

CRITICALITY

phenomenon of opportunity for observation.¹

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH
MUST BE COMPLETED (NUMBER)

Initial Set-up 3-90

Expt. operation - none (or) 1-190 (or) 7-190

EXTERNAL CONDITIONS WHICH
MUST BE SATISFIED

INFORMATION REQUIRED

Appropriate pictorial or quantitative information.

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

Sensors, transducers, displays

CREW SKILLS

PT

PE

PI

T

E

I

TA

EA

IA

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

1-10

IF

IF

IF

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM

MEAN

MAXIMUM

ERROR MODES

ADDITIONAL INFORMATION

CREW SKILLS

PT

PE

PI

T

E

I

TA

EA

IA

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

1-20 IF _____

_____ IF _____

_____ IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM _____

MEAN _____

MAXIMUM _____

ERROR MODES

ADDITIONAL INFORMATION

¹ If a phenomenon of opportunity will take precedence over the planned sequence of activities, indicate a separate sequence to be carried out when the phenomenon is available.

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 1-20

FUNCTION NAME Detect Phenomenon of Interest

FUNCTION DESCRIPTION Decide that observational effort will be devoted to an
CRITICALITY unplanned observation due to availability of a phenomenon
of opportunity or that the phenomenon is not available.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH 2-10
MUST BE COMPLETED (NUMBER) _____

EXTERNAL CONDITIONS WHICH _____
MUST BE SATISFIED _____

INFORMATION REQUIRED _____

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES Phenomenon of opportunity is or is not available.

DECISION REQUIREMENTS Phenomenon of opportunity is or is not available.

ACTION REQUIREMENTS _____

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE _____

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 1-30

FUNCTION NAME Determine Next Experiment

FUNCTION DESCRIPTION Select the experiment to be performed next based on the
CRITICALITY flight plan or contingency planning in the case of phenomena
of opportunity.¹

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 1-20 if phenomena of opportunity are considered

3-90 if initial setup

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED

1-10 for scheduled experiments

INFORMATION REQUIRED

Flight plans

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

Selection of next experiment from schedule or
schedule revision.

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT
T
TA

PE
E
EA

PI
I
IA

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

1-40 IF _____
_____ IF _____
_____ IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM _____
MEAN _____
MAXIMUM _____

ERROR MODES

ADDITIONAL INFORMATION

¹ If the experiment is strictly scheduled with no modifications to be considered, function 1-30 may begin the sequence.

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 1-40

FUNCTION NAME REVIEW EXPERIMENTAL PLAN

FUNCTION DESCRIPTION Retrieve data on experiment planning from flight plan or

CRITICALITY ground crew.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 1-30

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED

INFORMATION REQUIRED Flight plan

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT	<input type="checkbox"/>	PE	<input type="checkbox"/>	PI	<input type="checkbox"/>
T	<input type="checkbox"/>	E	<input type="checkbox"/>	I	<input type="checkbox"/>
TA	<input type="checkbox"/>	EA	<input type="checkbox"/>	IA	<input type="checkbox"/>

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

1-50 IF _____
_____ IF _____
_____ IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM	_____	_____
MEAN	_____	_____
MAXIMUM	_____	_____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 1-50

FUNCTION NAME COMPARE DATA AND EXPERIMENT PLAN

FUNCTION DESCRIPTION Perform a comparison of the experiment start criteria
CRITICALITY including required or expected conditions with existing
conditions.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH
MUST BE COMPLETED (NUMBER)

1-40

EXTERNAL CONDITIONS WHICH
MUST BE SATISFIED

INFORMATION REQUIRED

Experiment plan, current conditions

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT	<input type="checkbox"/>	PE	<input type="checkbox"/>	PI	<input type="checkbox"/>
T	<input type="checkbox"/>	E	<input type="checkbox"/>	I	<input type="checkbox"/>
TA	<input type="checkbox"/>	EA	<input type="checkbox"/>	IA	<input type="checkbox"/>

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

1-60	IF	_____
_____	IF	_____
_____	IF	_____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME	UNITS
MINIMUM	_____
MEAN	_____
MAXIMUM	_____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 1-60

FUNCTION NAME DECIDE IF EXPERIMENT MODIFICATION REQUIRED

FUNCTION DESCRIPTION Based on the comparison of the experimental plan and existing
CRITICALITY conditions decide if the experiment plan is adequate or if
mods must be made.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 1-50 (or) 2-120 (or) 3-120 (or) 4-120 (or) 5-90
(or) 6-110 (or) 7-130

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS Modify experiment - yes or no

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT

PE

PI

T

E

I

TA

EA

IA

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

1-70 IF Modification is required

1-200 IF Modification is not required

IF

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM

MEAN

MAXIMUM

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 1-70

FUNCTION NAME DECIDE TO POSTPONE, TERMINATE, OR CONTINUE

FUNCTION DESCRIPTION Major choice point requiring a decision to postpone, terminate, or continue the present experiment based on the
CRITICALITY output of 1-60.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 1-60 (or) 1-160 (or) 1-200

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED _____

INFORMATION REQUIRED General nature of deviations of obtained conditions from those required for the experiment.

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES _____

DECISION REQUIREMENTS Decision based on utilities of continuing in on-off nominal mode.

ACTION REQUIREMENTS _____

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE _____

CREW SKILLS

PT	<input type="checkbox"/>	PE	<input type="checkbox"/>	PI	<input type="checkbox"/>
T	<input type="checkbox"/>	E	<input type="checkbox"/>	I	<input type="checkbox"/>
TA	<input type="checkbox"/>	EA	<input type="checkbox"/>	IA	<input type="checkbox"/>

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER		
<u>1-80</u>	IF	<u>Postpone decision</u>
<u>1-100</u>	IF	<u>Continue with modification</u>
<u>1-110</u>	IF	<u>Terminate decision</u>

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME	UNITS
MINIMUM _____	_____
MEAN _____	_____
MAXIMUM _____	_____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 1-80

FUNCTION NAME DECIDE TO EVALUATE MOD OFFLINE

FUNCTION DESCRIPTION Postponement of the experiment is carried out to permit
CRITICALITY other on-board activities while extensive modification
analyses are conducted.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 1-70

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS Alternative approaches to experiment mod.

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT	<input type="checkbox"/>	PE	<input type="checkbox"/>	PI	<input type="checkbox"/>
T	<input type="checkbox"/>	E	<input type="checkbox"/>	I	<input type="checkbox"/>
TA	<input type="checkbox"/>	EA	<input type="checkbox"/>	IA	<input type="checkbox"/>

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

<u>1-90</u>	IF	_____
_____	IF	_____
_____	IF	_____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME	UNITS
MINIMUM _____	_____
MEAN _____	_____
MAXIMUM _____	_____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 1-90

FUNCTION NAME INITIATE OFFLINE ACTIVITY

FUNCTION DESCRIPTION Request offline analysis and transmit details to ground.

CRITICALITY

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 1-80

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

Transmit information

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 1-100

FUNCTION NAME DETERMINE MODIFICATION REQUIREMENTS

FUNCTION DESCRIPTION Determine the hardware, software, and procedural modifications
CRITICALITY necessary to continue the experiment in an off-nominal mode.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 1-70 (or) 1-130

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED _____

INFORMATION REQUIRED _____

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES _____

DECISION REQUIREMENTS Select alternative modification plans

ACTION REQUIREMENTS _____

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE _____

CREW SKILLS

PT	<input type="checkbox"/>	PE	<input type="checkbox"/>	PI	<input type="checkbox"/>
T	<input type="checkbox"/>	E	<input type="checkbox"/>	I	<input type="checkbox"/>
TA	<input type="checkbox"/>	EA	<input type="checkbox"/>	IA	<input type="checkbox"/>

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

<u>1-110</u>	IF	_____
_____	IF	_____
_____	IF	_____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM	_____	_____
MEAN	_____	_____
MAXIMUM	_____	_____

ERROR MODES

ADDITIONAL INFORMATION

CREW SKILLS

PT	<input type="checkbox"/>	PE	<input type="checkbox"/>	PI	<input type="checkbox"/>
T	<input type="checkbox"/>	E	<input type="checkbox"/>	I	<input type="checkbox"/>
TA	<input type="checkbox"/>	EA	<input type="checkbox"/>	IA	<input type="checkbox"/>

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

1-120 IF _____
_____ IF _____
_____ IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME	UNITS
MINIMUM	_____
MEAN	_____
MAXIMUM	_____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 1-110

FUNCTION NAME UPDATE FLIGHT PLAN

FUNCTION DESCRIPTION Modify flight plan to reflect postponement or cancellation

CRITICALITY of experiment.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH
MUST BE COMPLETED (NUMBER)

1-70 (or) 1-90

EXTERNAL CONDITIONS WHICH
MUST BE SATISFIED

INFORMATION REQUIRED

Flight plan impact

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT	<input type="checkbox"/>	PE	<input type="checkbox"/>	PI	<input type="checkbox"/>
T	<input type="checkbox"/>	E	<input type="checkbox"/>	I	<input type="checkbox"/>
TA	<input type="checkbox"/>	EA	<input type="checkbox"/>	IA	<input type="checkbox"/>

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

1-190 IF _____

_____ IF _____

_____ IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME	UNITS
MINIMUM _____	_____
MEAN _____	_____
MAXIMUM _____	_____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 1-120

FUNCTION NAME DETERMINE HARDWARE IMPACTS

FUNCTION DESCRIPTION For proposed modification approaches, determine impacts
CRITICALITY on hardware operation and impacts of hardware constraints
on experiment objectives.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 1-100

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED

INFORMATION REQUIRED Hardware availability, modes, procedural requirements.

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT

PE

PI

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NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

1-130

IF

IF

IF

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM

MEAN

MAXIMUM

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 1-130

FUNCTION NAME DETERMINE FEASIBILITY OF MODIFICATION

FUNCTION DESCRIPTION Based on output from functions 1-100 and 1-120, determine

CRITICALITY the feasibility of proposed modification approaches in
terms of experiment objectives

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH
MUST BE COMPLETED (NUMBER)

1-120

EXTERNAL CONDITIONS WHICH
MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

Feasible - not feasible per approach

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT

PE

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NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

1-100 IF Approach not feasible

1-140 IF Approach feasible

_____ IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM _____

MEAN _____

MAXIMUM _____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 1-140

FUNCTION NAME DETERMINE MODIFICATION IMPACTS

FUNCTION DESCRIPTION For a feasible modification approach, determine impacts on
CRITICALITY experiment procedures and data objectives.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH
MUST BE COMPLETED (NUMBER)

EXTERNAL CONDITIONS WHICH
MUST BE SATISFIED

INFORMATION REQUIRED

Modifications to procedures

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT

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NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

1-150 IF _____
_____ IF _____
_____ IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM _____
MEAN _____
MAXIMUM _____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 1-150

FUNCTION NAME DETERMINE CHANGES IN FLIGHT PLAN

FUNCTION DESCRIPTION Determine updates in the flight plan necessary to incor-
CRITICALITY porate the modification.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH 1-140
MUST BE COMPLETED (NUMBER) _____

EXTERNAL CONDITIONS WHICH
MUST BE SATISFIED _____

INFORMATION REQUIRED _____

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES _____

DECISION REQUIREMENTS Flight plan impacts

ACTION REQUIREMENTS _____

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE _____

CREW SKILLS

PT

PE

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NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

1-160

IF

IF

IF

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM

MEAN

MAXIMUM

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 1-160

FUNCTION NAME DECIDE TO IMPLEMENT MODIFICATION

FUNCTION DESCRIPTION Final decision whether to continue experiment with the
CRITICALITY modification being evaluated or to iterate.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH 1-150
MUST BE COMPLETED (NUMBER) _____

EXTERNAL CONDITIONS WHICH
MUST BE SATISFIED _____

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS Decide to implement or not implement mod. in
question.

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT

PE

PI

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NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

1- 70 IF No implementation

1-170 IF Implementation

IF

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM

MEAN

MAXIMUM

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 1-170

FUNCTION NAME DETERMINE MODIFICATION PROCEDURES

FUNCTION DESCRIPTION Update the experimental plan to incorporate unique procedures
CRITICALITY due to modification approach.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 1-160

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS Plan modified experiment

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT

PE

PI

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NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

1-180 IF _____
_____ IF _____
_____ IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM _____
MEAN _____
MAXIMUM _____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 1-180

FUNCTION NAME UPDATE FLIGHT PLAN

FUNCTION DESCRIPTION Transfer data, equipment, procedural information to flight

CRITICALITY plans based on modifications and continuation of experiment.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH
MUST BE COMPLETED (NUMBER)

1-170

EXTERNAL CONDITIONS WHICH
MUST BE SATISFIED

INFORMATION REQUIRED

Revised experimental plan

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT

PE

PI

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NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

1-200 IF _____

IF _____

IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM _____

MEAN _____

MAXIMUM _____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 1-190

FUNCTION NAME DECIDE IF TERMINATE SEQUENCE REQUIRED

FUNCTION DESCRIPTION In the case of termination of the experiment, decide if

CRITICALITY previously deployed and evaluated equipment must be
retrieved or stowed.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH
MUST BE COMPLETED (NUMBER)

1-110

EXTERNAL CONDITIONS WHICH
MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

Termination sequence required or not required

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 1-200

FUNCTION NAME DECIDE GO/NO GO FOR EXPERIMENT

FUNCTION DESCRIPTION Final decision to proceed with experiment. May represent

CRITICALITY sign-off by P.I.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH
MUST BE COMPLETED (NUMBER)

1-180 (or) 1-60

EXTERNAL CONDITIONS WHICH
MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT	<input type="checkbox"/>	PE	<input type="checkbox"/>	PI	<input type="checkbox"/>
T	<input type="checkbox"/>	E	<input type="checkbox"/>	I	<input type="checkbox"/>
TA	<input type="checkbox"/>	EA	<input type="checkbox"/>	IA	<input type="checkbox"/>

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

<u>2-10</u>	IF	Go
<u>1-70</u>	IF	No Go
_____	IF	_____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME	UNITS
MINIMUM _____	_____
MEAN _____	_____
MAXIMUM _____	_____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 2-10

FUNCTION NAME CONSULT EXPERIMENT PLAN FOR REQUIRED CONDITIONS

FUNCTION DESCRIPTION Consult the current experimental plan to determine conditions,
CRITICALITY criteria, independent variable levels etc. to indicate
experiment.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 1-200 - yes

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED Independent variables

INFORMATION REQUIRED Experiment start criteria

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES _____

DECISION REQUIREMENTS _____

ACTION REQUIREMENTS _____

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE _____

CREW SKILLS

PT
T
TA

PE
E
EA

PI
I
IA

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

2-20 IF _____
_____ IF _____
_____ IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM _____
MEAN _____
MAXIMUM _____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 2-20

FUNCTION NAME CONSULT EXPERIMENTAL PLAN FOR RQD. EXPERIMENTAL METHOD

FUNCTION DESCRIPTION Determine experimental method based on previous planning.

CRITICALITY

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 2-20

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED

INFORMATION REQUIRED
Procedures for experiment
Experimental apparatus

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS
Select apparatus, sensors, transducers, recording equipment, supplies, materials

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT
T
TA

PE
E
EA

PI
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IA

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER
2-30

____ IF _____
____ IF _____
____ IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM _____
MEAN _____
MAXIMUM _____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 2-30

FUNCTION NAME DEPLOY EXPERIMENTAL APPARATUS

FUNCTION DESCRIPTION Place, extend, or otherwise situate apparatus components

CRITICALITY including materials or experimental units.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 2-20

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED

INFORMATION REQUIRED Apparatus/Materials procedures

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS Translocating, placing apparatus

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE Apparatus, materials, experimental units

CREW SKILLS

PT
T
TA

PE
E
EA

PI
I
IA

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER
2-40

____ IF _____
____ IF _____
____ IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM _____
MEAN _____
MAXIMUM _____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 2-40

FUNCTION NAME SELECT APPARATUS MODE

FUNCTION DESCRIPTION Based on the experimental procedures, select the proper

CRITICALITY functional mode for the apparatus.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH
MUST BE COMPLETED (NUMBER)

2-30

EXTERNAL CONDITIONS WHICH
MUST BE SATISFIED

INFORMATION REQUIRED

Experimental plan

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

Mode selection

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

Apparatus support subsystems

CREW SKILLS

PT
T
TA

PE
E
EA

PI
I
IA

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

2-50 IF _____
_____ IF _____
_____ IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM _____
MEAN _____
MAXIMUM _____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 2-50

FUNCTION NAME ENABLE APPARATUS

FUNCTION DESCRIPTION Enable apparatus function

CRITICALITY

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH
MUST BE COMPLETED (NUMBER)

2-40

EXTERNAL CONDITIONS WHICH
MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

Enable - power on, switch closure, etc.

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT	<input type="checkbox"/>	PE	<input type="checkbox"/>	PI	<input type="checkbox"/>
T	<input type="checkbox"/>	E	<input type="checkbox"/>	I	<input type="checkbox"/>
TA	<input type="checkbox"/>	EA	<input type="checkbox"/>	IA	<input type="checkbox"/>

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

<u>2-60</u>	IF	_____
_____	IF	_____
_____	IF	_____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM	_____	_____
MEAN	_____	_____
MAXIMUM	_____	_____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 2-60

FUNCTION NAME Monitor Apparatus

FUNCTION DESCRIPTION Receive information on apparatus functioning including

CRITICALITY values of independent variables influenced by apparatus
support systems.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 2-50 (or) 2-90 (or) 2-130

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED _____

INFORMATION REQUIRED Apparatus functions

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES _____

DECISION REQUIREMENTS _____

ACTION REQUIREMENTS _____

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE _____

CREW SKILLS

PT

PE

PI

T

E

I

TA

EA

IA

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

2-70 IF _____
_____ IF _____
_____ IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM _____
MEAN _____
MAXIMUM _____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 2-70

FUNCTION NAME ADJUST/CALIBRATE APPARATUS

FUNCTION DESCRIPTION Operate apparatus controls to produce required conditions

CRITICALITY for experiment.¹

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 2-60

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS Control action

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE Controls for apparatus

CREW SKILLS

PT	<input type="checkbox"/>	PE	<input type="checkbox"/>	PI	<input type="checkbox"/>
T	<input type="checkbox"/>	E	<input type="checkbox"/>	I	<input type="checkbox"/>
TA	<input type="checkbox"/>	EA	<input type="checkbox"/>	IA	<input type="checkbox"/>

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER	
2-80	IF _____
_____	IF _____
_____	IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME	UNITS
MINIMUM	_____
MEAN	_____
MAXIMUM	_____

ERROR MODES

ADDITIONAL INFORMATION

¹ Probably performed as a closed loop operation with function 2-60.

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 2-80

FUNCTION NAME DECIDE APPARATUS GO-NO GO

FUNCTION DESCRIPTION Decide if conditions and independent variables controlled
CRITICALITY by apparatus meet required conditions.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 2-70

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS Decide go or no go

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT	<input type="checkbox"/>	PE	<input type="checkbox"/>	PI	<input type="checkbox"/>
T	<input type="checkbox"/>	E	<input type="checkbox"/>	I	<input type="checkbox"/>
TA	<input type="checkbox"/>	EA	<input type="checkbox"/>	IA	<input type="checkbox"/>

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER		
3-10	IF	Apparatus go
2-90	IF	Apparatus no go
	IF	

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME	UNITS
MINIMUM	_____
MEAN	_____
MAXIMUM	_____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 2-90

FUNCTION NAME DECIDE IF APPARATUS PROBLEM EXISTS

FUNCTION DESCRIPTION Decide if deviations from required conditions indicate

CRITICALITY apparatus fault or further adjustment.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 2-80

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED

INFORMATION REQUIRED Apparatus fault modes

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 2-100

FUNCTION NAME CHECK-OUT/DIAGNOSE APPARATUS

FUNCTION DESCRIPTION Perform diagnostic procedure for experimental apparatus

CRITICALITY sub-systems.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 2-90

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED

INFORMATION REQUIRED Subsystem data, checklists

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT

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NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

2-110 IF _____

_____ IF _____

_____ IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM _____

MEAN _____

MAXIMUM _____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 2-110

FUNCTION NAME IDENTIFY APPARATUS FAULT

FUNCTION DESCRIPTION Identify fault based on information received from function

CRITICALITY 2-100.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 2-100

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

Apparatus diagnostics

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT	<input type="checkbox"/>	PE	<input type="checkbox"/>	PI	<input type="checkbox"/>
T	<input type="checkbox"/>	E	<input type="checkbox"/>	I	<input type="checkbox"/>
TA	<input type="checkbox"/>	EA	<input type="checkbox"/>	IA	<input type="checkbox"/>

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

<u>2-120</u>	IF	_____
_____	IF	_____
_____	IF	_____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME	UNITS
MINIMUM	_____
MEAN	_____
MAXIMUM	_____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 2-120

FUNCTION NAME DECIDE REPAIR APPARATUS OR RECYCLE

FUNCTION DESCRIPTION Decision to hold experiment procedure for repair or to

CRITICALITY mod evaluation functions.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 2-110

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 2-130

FUNCTION NAME REPAIR APPARATUS

FUNCTION DESCRIPTION Based on fault diagnosis, carry out maintenance activities.

CRITICALITY

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 2-120 (repair)

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS May require a sequence of sub-tasks involving securing apparatus, etc.

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

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SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 3-10

FUNCTION NAME CONSULT EXPERIMENTAL PLAN FOR REQUIRED SENSOR/TRANSDUCER

FUNCTION DESCRIPTION Determine from the current experimental plan the sensors
CRITICALITY and transducers necessary.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH
MUST BE COMPLETED (NUMBER)

2-80

EXTERNAL CONDITIONS WHICH
MUST BE SATISFIED

INFORMATION REQUIRED

data requirements from experimental plan

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT	<input type="checkbox"/>	PE	<input type="checkbox"/>	PI	<input type="checkbox"/>
T	<input type="checkbox"/>	E	<input type="checkbox"/>	I	<input type="checkbox"/>
TA	<input type="checkbox"/>	EA	<input type="checkbox"/>	IA	<input type="checkbox"/>

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

3-20	IF	_____
_____	IF	_____
_____	IF	_____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME	UNITS
MINIMUM	_____
MEAN	_____
MAXIMUM	_____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 3-20

FUNCTION NAME PLACE/ORIENT SENSOR/TRANSDUCER

FUNCTION DESCRIPTION Deploy sensor and/or transducer, translocate as required by
CRITICALITY experiment plans. Perform gross and/or fine orientation
printing.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 3-10

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED Source of observation data available.

INFORMATION REQUIRED _____

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES _____

DECISION REQUIREMENTS _____

ACTION REQUIREMENTS Translocate, maneuver, place, point sensor
transducer

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE _____

CREW SKILLS

PT

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NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

3-30 IF _____
_____ IF _____
_____ IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM _____
MEAN _____
MAXIMUM _____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 3-30

FUNCTION NAME SELECT SENSOR/TRANSDUCER MODE

FUNCTION DESCRIPTION Choose between alternative states of sensor transducer
CRITICALITY functioning.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 3-20

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED

INFORMATION REQUIRED Experimental plan

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS Operational mode

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT

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NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER
3-40

____ IF _____
____ IF _____
____ IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM _____
MEAN _____
MAXIMUM _____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 3-40

FUNCTION NAME ENABLE SENSOR/TRANSDUCER

FUNCTION DESCRIPTION Perform activities which initiate sensor/transducer
CRITICALITY functioning.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH
MUST BE COMPLETED (NUMBER)

3-30

EXTERNAL CONDITIONS WHICH
MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

Control actions

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT

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NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

3-50 IF _____
_____ IF _____
_____ IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM _____
MEAN _____
MAXIMUM _____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 3-50

FUNCTION NAME MONITOR DATA RECEPTION

FUNCTION DESCRIPTION Observe data return from sensor/transducer

CRITICALITY

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH
MUST BE COMPLETED (NUMBER)

3-40 (or) 3-90 (or) 3-130

EXTERNAL CONDITIONS WHICH
MUST BE SATISFIED

INFORMATION REQUIRED

Data displays

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

Display adjustments

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT

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NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

3-60 IF _____
_____ IF _____
_____ IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM _____
MEAN _____
MAXIMUM _____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 3-60

FUNCTION NAME PERFORM TEST INPUT EVALUATION

FUNCTION DESCRIPTION Conduct routines involving known inputs for purposes of

CRITICALITY verifying sensor performance.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 3-50

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED

INFORMATION REQUIRED Data displays

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS Initiate test inputs

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT

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NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

3-70

IF

IF

IF

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM

MEAN

MAXIMUM

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 3-70

FUNCTION NAME ADJUST/CALIBRATE SENSOR/TRANSDUCER

FUNCTION DESCRIPTION Initiate adjustments which control sensor/transducer
CRITICALITY functioning.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 3-60

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED _____

INFORMATION REQUIRED Data displays

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES _____

DECISION REQUIREMENTS _____

ACTION REQUIREMENTS Control actions - sensor/transducer subsystems

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE _____

CREW SKILLS

PT

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NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

3-80 IF _____
_____ IF _____
_____ IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM _____
MEAN _____
MAXIMUM _____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 3-80

FUNCTION NAME DECIDE DATA GO/NO GO

FUNCTION DESCRIPTION Perform comparison of observed sensor/transducer functioning
CRITICALITY with experimental data requirements and decide if require-
ments are met.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 3-70

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED

INFORMATION REQUIRED Data displays, data requirements, comparison
criteria

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS Requirements are or are not met

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT	<input type="checkbox"/>	PE	<input type="checkbox"/>	PI	<input type="checkbox"/>
T	<input type="checkbox"/>	E	<input type="checkbox"/>	I	<input type="checkbox"/>
TA	<input type="checkbox"/>	EA	<input type="checkbox"/>	IA	<input type="checkbox"/>

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER		
<u>4-10</u>	IF	<u>Data reception go</u>
<u>3-90</u>	IF	<u>Data reception no go</u>
<u> </u>	IF	<u> </u>

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME	UNITS
MINIMUM	<u> </u>
MEAN	<u> </u>
MAXIMUM	<u> </u>

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 3-90

FUNCTION NAME DECIDE IF DATA RECEPTION PROBLEM EXISTS

FUNCTION DESCRIPTION Decide between further calibration attempts and fault

CRITICALITY diagnosis.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 3-80

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS Data reception problem - yes or no

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 3-100

FUNCTION NAME CHECK-OUT/DIAGNOSE SENSOR/TRANSDUCER

FUNCTION DESCRIPTION Perform fault diagnosis routines

CRITICALITY

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 3-90

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED

INFORMATION REQUIRED Diagnosis procedures

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT

PE

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NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

3-120 IF _____
_____ IF _____
_____ IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM _____
MEAN _____
MAXIMUM _____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 3-120

FUNCTION NAME DECIDE TO REPAIR OR RECYCLE

FUNCTION DESCRIPTION Decision to hold for sensor/transducer repair or recycle

CRITICALITY to evaluate mod.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH
MUST BE COMPLETED (NUMBER)

3-110

EXTERNAL CONDITIONS WHICH
MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

repair or recycle

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT	<input type="checkbox"/>	PE	<input type="checkbox"/>	PI	<input type="checkbox"/>
T	<input type="checkbox"/>	E	<input type="checkbox"/>	I	<input type="checkbox"/>
TA	<input type="checkbox"/>	EA	<input type="checkbox"/>	IA	<input type="checkbox"/>

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

3-130	IF	Repair	_____
1-60	IF	Recycle	_____
_____	IF	_____	_____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME	UNITS
MINIMUM _____	_____
MEAN _____	_____
MAXIMUM _____	_____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 3-130

FUNCTION NAME REPAIR SENSOR/TRANSDUCER

FUNCTION DESCRIPTION Carry out corrective action for sensor/transducer fault.

CRITICALITY

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 3-120

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS Sensor/transducer access, corrective action

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE Sensors/transducers

CREW SKILLS

PT

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NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

3-50

IF

IF

IF

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM

MEAN

MAXIMUM

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 4-10

FUNCTION NAME CONSULT EXPERIMENTAL PLAN FOR RECORDING REQUIREMENTS

FUNCTION DESCRIPTION Based on experimental plan determine data types - film,
CRITICALITY analog, digital, etc. and parameters - channels, sampling
rates, etc.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 3-80

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED

INFORMATION REQUIRED Experimental plan

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT	<input type="checkbox"/>	PE	<input type="checkbox"/>	PI	<input type="checkbox"/>
T	<input type="checkbox"/>	E	<input type="checkbox"/>	I	<input type="checkbox"/>
TA	<input type="checkbox"/>	EA	<input type="checkbox"/>	IA	<input type="checkbox"/>

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

<u>4-20</u>	IF	_____
_____	IF	_____
_____	IF	_____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME	UNITS
MINIMUM	_____
MEAN	_____
MAXIMUM	_____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 4-20

FUNCTION NAME DEPLOY RECORDING DEVICE

FUNCTION DESCRIPTION Translocate and place recording devices such as film packs.

CRITICALITY

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH
MUST BE COMPLETED (NUMBER)

4-10

EXTERNAL CONDITIONS WHICH
MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

Translocation & placement

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT	<input type="checkbox"/>	PE	<input type="checkbox"/>	PI	<input type="checkbox"/>
T	<input type="checkbox"/>	E	<input type="checkbox"/>	I	<input type="checkbox"/>
TA	<input type="checkbox"/>	EA	<input type="checkbox"/>	IA	<input type="checkbox"/>

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

4-30	IF	_____
_____	IF	_____
_____	IF	_____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME	UNITS
MINIMUM	_____
MEAN	_____
MAXIMUM	_____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 4-30

FUNCTION NAME ENABLE RECORDING DEVICE

FUNCTION DESCRIPTION Initiate functioning

CRITICALITY

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 4-20

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS Enable

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT	<input type="checkbox"/>	PE	<input type="checkbox"/>	PI	<input type="checkbox"/>
T	<input type="checkbox"/>	E	<input type="checkbox"/>	I	<input type="checkbox"/>
TA	<input type="checkbox"/>	EA	<input type="checkbox"/>	IA	<input type="checkbox"/>

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER
4-40 IF _____
_____ IF _____
_____ IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME	UNITS
MINIMUM	_____
MEAN	_____
MAXIMUM	_____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 4-40

FUNCTION NAME SELECT RECORDING MODE

FUNCTION DESCRIPTION Determine recording mode from data recording requirements.

CRITICALITY

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH
MUST BE COMPLETED (NUMBER)

4-30

EXTERNAL CONDITIONS WHICH
MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT

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NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

4-50 IF _____
_____ IF _____
_____ IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM _____
MEAN _____
MAXIMUM _____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 4-50

FUNCTION NAME RECORD TEST DATA INPUT

FUNCTION DESCRIPTION Record known data sample as check on recording device
CRITICALITY performance.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 4-40 (or) 4-90 (or) 4-130

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED _____

INFORMATION REQUIRED _____

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES _____

DECISION REQUIREMENTS _____

ACTION REQUIREMENTS _____

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE _____

CREW SKILLS

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NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

4-60 IF _____
_____ IF _____
_____ IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM _____
MEAN _____
MAXIMUM _____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 4-60

FUNCTION NAME EVALUATE ECHO CHECK

FUNCTION DESCRIPTION Compare recorded test input data with known parameters of
CRITICALITY input.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 4-50

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED

INFORMATION REQUIRED Data displays

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT

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NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

4-70

IF

IF

IF

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM

MEAN

MAXIMUM

ERROR MODES

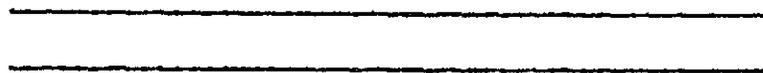
ADDITIONAL INFORMATION

CREW SKILLS

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NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

4-70 IF _____
_____ IF _____
_____ IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM _____
MEAN _____
MAXIMUM _____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 4-70

FUNCTION NAME ADJUST/CALIBRATE RECORDING DEVICE

FUNCTION DESCRIPTION Perform adjustments of recorder functioning.

CRITICALITY

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 4-60

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS Control action

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT	<input type="checkbox"/>	PE	<input type="checkbox"/>	PI	<input type="checkbox"/>
T	<input type="checkbox"/>	E	<input type="checkbox"/>	I	<input type="checkbox"/>
TA	<input type="checkbox"/>	EA	<input type="checkbox"/>	IA	<input type="checkbox"/>

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER		
4-80	IF	_____
_____	IF	_____
_____	IF	_____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME	UNITS
MINIMUM	_____
MEAN	_____
MAXIMUM	_____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 4-80

FUNCTION NAME DECODE DATA RECPRDMG GO/NO GO

FUNCTION DESCRIPTION Decide if data recording suitable to proceed.

CRITICALITY

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 4-70

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS Go or no go

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT	<input type="checkbox"/>	PE	<input type="checkbox"/>	PI	<input type="checkbox"/>
T	<input type="checkbox"/>	E	<input type="checkbox"/>	I	<input type="checkbox"/>
TA	<input type="checkbox"/>	EA	<input type="checkbox"/>	IA	<input type="checkbox"/>

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER		
5-10	IF	Recording go
4-90	IF	Recording no go
	IF	

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME	UNITS
MINIMUM	_____
MEAN	_____
MAXIMUM	_____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 4-90

FUNCTION NAME DECIDE IF DATA RECORDING PROBLEM EXISTS

FUNCTION DESCRIPTION Decide between further calibration and fault diagnosis

CRITICALITY procedures.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 4-80

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS Calibrate vs. diagnose

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT	<input type="checkbox"/>	PE	<input type="checkbox"/>	PI	<input type="checkbox"/>
T	<input type="checkbox"/>	E	<input type="checkbox"/>	I	<input type="checkbox"/>
TA	<input type="checkbox"/>	EA	<input type="checkbox"/>	IA	<input type="checkbox"/>

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER		
4-50	IF	No recorder problem
4-100	IF	Recorder problem
	IF	

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME	UNITS
MINIMUM	
MEAN	
MAXIMUM	

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 4-100

FUNCTION NAME CHECK-OUT/DIAGNOSE RECORDING DEVICE

FUNCTION DESCRIPTION _____

CRITICALITY

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH
MUST BE COMPLETED (NUMBER)

4-90

EXTERNAL CONDITIONS WHICH
MUST BE SATISFIED

INFORMATION REQUIRED

Diagnosis procedures.

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT	<input type="checkbox"/>	PE	<input type="checkbox"/>	PI	<input type="checkbox"/>
T	<input type="checkbox"/>	E	<input type="checkbox"/>	I	<input type="checkbox"/>
TA	<input type="checkbox"/>	EA	<input type="checkbox"/>	IA	<input type="checkbox"/>

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

4-110 IF _____
_____ IF _____
_____ IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM	_____	_____
MEAN	_____	_____
MAXIMUM	_____	_____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 4-110

FUNCTION NAME IDENTIFY RECORDER FAULT

FUNCTION DESCRIPTION Determine cause of problem and required corrective action.

CRITICALITY

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH
MUST BE COMPLETED (NUMBER)

4-100

EXTERNAL CONDITIONS WHICH
MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT

PE

PI

T

E

I

TA

EA

IA

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

4-120 IF _____

_____ IF _____

_____ IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM _____

MEAN _____

MAXIMUM _____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 4-120

FUNCTION NAME DECIDE TO REPAIR/RECYCLE

FUNCTION DESCRIPTION Decide between repairing apparatus and recycling to evaluate

CRITICALITY

modification.

CRITERIA TO BEGIN FUNCTION

4-110

PREDECESSOR FUNCTIONS WHICH
MUST BE COMPLETED (NUMBER)

EXTERNAL CONDITIONS WHICH
MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 4-130

FUNCTION NAME REPAIR RECORDING DEVICE

FUNCTION DESCRIPTION Carry out corrective procedures.

CRITICALITY

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH
MUST BE COMPLETED (NUMBER)

EXTERNAL CONDITIONS WHICH
MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

Access to recorder

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT

PE

PI

T

E

I

TA

EA

IA

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

4-50 IF _____
_____ IF _____
_____ IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM _____
MEAN _____
MAXIMUM _____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 5-10

FUNCTION NAME CONSULT EXPERIMENTAL PLAN FOR START/STOP CRITERIA

FUNCTION DESCRIPTION Consult experimental plan for the criteria to start and to
CRITICALITY terminate a run of the experiment.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 4-80

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED

INFORMATION REQUIRED Experimental plan

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT

PE

PI

T

E

I

TA

EA

IA

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

5-20

IF

IF

IF

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM

MEAN

MAXIMUM

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 5-20

FUNCTION NAME CONSULT EXPERIMENTAL PLAN FOR REAL TIME DISPLAY REQUIREMENTS

FUNCTION DESCRIPTION Determine variables/discrete states etc. which must be

CRITICALITY

monitored during experiment operation.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH
MUST BE COMPLETED (NUMBER)

5-10

EXTERNAL CONDITIONS WHICH
MUST BE SATISFIED

INFORMATION REQUIRED

Dependent variables of experiment

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT

PE

PI

T

E

I

TA

EA

IA

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

5-30	IF	
	IF	
	IF	

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM		
---------	--	--

MEAN		
------	--	--

MAXIMUM		
---------	--	--

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 5-30

FUNCTION NAME SELECT DISPLAY MODE

FUNCTION DESCRIPTION Select mode of display of real time variables.

CRITICALITY

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 5-20

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS Mode control actions

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT	<input type="checkbox"/>	PE	<input type="checkbox"/>	PI	<input type="checkbox"/>
T	<input type="checkbox"/>	E	<input type="checkbox"/>	I	<input type="checkbox"/>
TA	<input type="checkbox"/>	EA	<input type="checkbox"/>	IA	<input type="checkbox"/>

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

<u>5-40</u>	IF	_____
_____	IF	_____
_____	IF	_____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME	UNITS
MINIMUM	_____
MEAN	_____
MAXIMUM	_____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 5-40

FUNCTION NAME ENABLE REAL TIME DISPLAY OF VARIABLES

FUNCTION DESCRIPTION Initiate display of variables for real time monitoring.

CRITICALITY

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH
MUST BE COMPLETED (NUMBER)

5-30

EXTERNAL CONDITIONS WHICH
MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT	<input type="checkbox"/>	PE	<input type="checkbox"/>	PI	<input type="checkbox"/>
T	<input type="checkbox"/>	E	<input type="checkbox"/>	I	<input type="checkbox"/>
TA	<input type="checkbox"/>	EA	<input type="checkbox"/>	IA	<input type="checkbox"/>

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

5-50	IF	_____
_____	IF	_____
_____	IF	_____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME	UNITS
MINIMUM	_____
MEAN	_____
MAXIMUM	_____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 5-50

FUNCTION NAME MONITOR VARIABLES ACCORDING TO EXPERIMENTAL PLAN

FUNCTION DESCRIPTION _____

CRITICALITY

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 5-40

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED _____

INFORMATION REQUIRED _____

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES _____

DECISION REQUIREMENTS _____

ACTION REQUIREMENTS _____

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE _____

CREW SKILLS

PT	<input type="checkbox"/>	PE	<input type="checkbox"/>	PI	<input type="checkbox"/>
T	<input type="checkbox"/>	E	<input type="checkbox"/>	I	<input type="checkbox"/>
TA	<input type="checkbox"/>	EA	<input type="checkbox"/>	IA	<input type="checkbox"/>

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

5-60	IF	_____
_____	IF	_____
_____	IF	_____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME	UNITS
MINIMUM	_____
MEAN	_____
MAXIMUM	_____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 5-60

FUNCTION NAME RECORD RQD. CONDITIONS/INDEX DATA

FUNCTION DESCRIPTION Record required conditions so as to permit proper pairing
CRITICALITY of independent/dependent variables - tape channels, log
entries, etc.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 5-50

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT

PE

PI

T

E

I

TA

EA

IA

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

5-70

IF

IF

IF

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM

MEAN

MAXIMUM

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 5-70

FUNCTION NAME DECIDE IF REQUIRED CONDITIONS ACHIEVED

FUNCTION DESCRIPTION Decide if all experimental apparatus functions, etc. required
CRITICALITY by the experimental plans are acceptable.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH
MUST BE COMPLETED (NUMBER)

EXTERNAL CONDITIONS WHICH
MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 5-80

FUNCTION NAME VERIFY START CONDITIONS SATISFIED

FUNCTION DESCRIPTION Check data displays against experiment start criteria and
CRITICALITY decide if start criteria are satisfied.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) _____

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED _____

INFORMATION REQUIRED _____

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES _____

DECISION REQUIREMENTS Start criteria satisfied or not satisfied.

ACTION REQUIREMENTS _____

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE _____

CREW SKILLS

PT

PE

PI

T

E

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TA

EA

IA

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

5-90 IF Start criteria not satisfied

6-10 IF Start criteria satisfied

IF

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM _____

MEAN _____

MAXIMUM _____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 5-90

FUNCTION NAME DECIDE RECYCLE OR CONTINUE

FUNCTION DESCRIPTION Decide between continuing with data collection or recycling
CRITICALITY to evaluate modification.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 5-80

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT	<input type="checkbox"/>	PE	<input type="checkbox"/>	PI	<input type="checkbox"/>
T	<input type="checkbox"/>	E	<input type="checkbox"/>	I	<input type="checkbox"/>
TA	<input type="checkbox"/>	EA	<input type="checkbox"/>	IA	<input type="checkbox"/>

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER		
6-10	IF	Continue
1-60	IF	Recycle
	IF	

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME	UNITS
MINIMUM	
MEAN	
MAXIMUM	

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 6-10

FUNCTION NAME INITIATE DATA RECORDING

FUNCTION DESCRIPTION Perform action to start recording - initiate experiment

CRITICALITY operation.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 5-80

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 6-20

FUNCTION NAME MONITOR APPARATUS

FUNCTION DESCRIPTION Process information on current status of apparatus hardware,
CRITICALITY materials, etc.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 6-10 (or) 6-80 (or) 6-100

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED _____

INFORMATION REQUIRED Apparatus support & subsystems

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES _____

DECISION REQUIREMENTS _____

ACTION REQUIREMENTS _____

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE _____

CREW SKILLS

PT

PE

PI

T

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TA

EA

IA

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

6-30 IF _____
_____ IF _____
_____ IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM _____
MEAN _____
MAXIMUM _____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 6-30

FUNCTION NAME MONITOR SENSOR/TRANSDUCER

FUNCTION DESCRIPTION Process information on current sensor/transducer hardware.

CRITICALITY

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH
MUST BE COMPLETED (NUMBER)

6-20

EXTERNAL CONDITIONS WHICH
MUST BE SATISFIED

INFORMATION REQUIRED

Sensor/transducer support & subsystems

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT

PE

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NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

<u>6-40</u>	IF	_____
_____	IF	_____
_____	IF	_____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM	_____	_____
MEAN	_____	_____
MAXIMUM	_____	_____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 6-40

FUNCTION NAME MONITOR DATA RECEPTION

FUNCTION DESCRIPTION Process information on primary experiment data.

CRITICALITY _____

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 6-30

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT
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NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

6-50 IF _____
_____ IF _____
_____ IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM _____
MEAN _____
MAXIMUM _____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 6-50

FUNCTION NAME MONITOR DATA RECORDING

FUNCTION DESCRIPTION Process information on recorder operation.

CRITICALITY _____

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 6-40

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED

INFORMATION REQUIRED Recorded data feedback

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT
T
TA

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IA

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

6-60 IF _____
_____ IF _____
_____ IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM _____
MEAN _____
MAXIMUM _____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 6-60

FUNCTION NAME DECIDE IF STOP CRITERIA ARE SATISFIED

FUNCTION DESCRIPTION Decide if the nominal criteria for ending the experimental
CRITICALITY run have been met.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 6-50

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT

PE

PI

T

E

I

TA

EA

IA

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

6-110 IF Stop criteria satisfied

6- 70 IF Stop criteria not satisfied

IF

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM

MEAN

MAXIMUM

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 6-70

FUNCTION NAME DECIDE IF PROBLEM EXISTS

FUNCTION DESCRIPTION Detect off nominal functioning of apparatus, sensors/
CRITICALITY transducers, recorder.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 6-60

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 6-80

FUNCTION NAME DECIDE IF CHANGE REQUIRED IN OPERATION OF EXPERIMENT

FUNCTION DESCRIPTION Decide if control action is required to alter present

CRITICALITY

experiment operation status.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 6-70

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT
T
TA

PE
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EA

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IA

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

6-20 IF No change required
6-90 IF Change required
IF

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM _____
MEAN _____
MAXIMUM _____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 6-90

FUNCTION NAME DETERMINE REQUIRED CONTROL ACTION

FUNCTION DESCRIPTION Determine control action to achieve change in experiment
CRITICALITY operation.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 6-80

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT

PE

PI

T

E

I

TA

EA

IA

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

6-100 IF _____

_____ IF _____

_____ IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM _____

MEAN _____

MAXIMUM _____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 6-100

FUNCTION NAME PERFORM REQUIRED CONTROL ACTION

FUNCTION DESCRIPTION Carry out change in experiment operation.

CRITICALITY _____

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 6-90

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

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NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

6-20 IF _____
_____ IF _____
_____ IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM	_____	_____
MEAN	_____	_____
MAXIMUM	_____	_____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 6-110

FUNCTION NAME DECIDE RECYCLE OR TERMINATE

FUNCTION DESCRIPTION Decide between termination of experiment operation and

CRITICALITY

recycling to evaluate modifications.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH
MUST BE COMPLETED (NUMBER)

6-60 (or) 6-70

EXTERNAL CONDITIONS WHICH
MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

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NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

<u>7-10</u>	IF	Terminate
<u>1-60</u>	IF	Recycle
<u> </u>	IF	_____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM	_____	_____
MEAN	_____	_____
MAXIMUM	_____	_____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 7-10

FUNCTION NAME CONSULT EXPERIMENT PLAN FOR TERMINATION SEQUENCE

FUNCTION DESCRIPTION _____

CRITICALITY

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 1-190 (or) 6-110

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED _____

INFORMATION REQUIRED _____

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES _____

DECISION REQUIREMENTS _____

ACTION REQUIREMENTS _____

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE _____

CREW SKILLS

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NEXT FUNCTION LOGIC -- UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

7-20 IF _____
_____ IF _____
_____ IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME	UNITS
MINIMUM _____	_____
MEAN _____	_____
MAXIMUM _____	_____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 7-20

FUNCTION NAME DECIDE IF MODIFIED SEQUENCE RQD.

FUNCTION DESCRIPTION Decision whether to carry out planned sequence or to modify

CRITICALITY it.

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH
MUST BE COMPLETED (NUMBER)

7-10

EXTERNAL CONDITIONS WHICH
MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

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NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

7-30	IF	Modified sequence
7-40	IF	Nominal sequence
	IF	

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM	_____	_____
MEAN	_____	_____
MAXIMUM	_____	_____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 7-30

FUNCTION NAME DETERMINE TERMINATION SEQUENCE MODIFICATIONS

FUNCTION DESCRIPTION _____
CRITICALITY _____

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH 7-20
MUST BE COMPLETED (NUMBER) _____

EXTERNAL CONDITIONS WHICH
MUST BE SATISFIED _____

INFORMATION REQUIRED _____

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES _____

DECISION REQUIREMENTS _____

ACTION REQUIREMENTS _____

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE _____

CREW SKILLS

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NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

7-40 IF _____
_____ IF _____
_____ IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM _____
MEAN _____
MAXIMUM _____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 7-40

FUNCTION NAME DECIDE DEACTIVATE/SECURE APPARATUS

FUNCTION DESCRIPTION _____

CRITICALITY

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 7-30

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED _____

INFORMATION REQUIRED _____

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES _____

DECISION REQUIREMENTS _____

ACTION REQUIREMENTS _____

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE _____

CREW SKILLS

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NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

7-50 IF _____
_____ IF _____
_____ IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM _____
MEAN _____
MAXIMUM _____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 7-50

FUNCTION NAME DECIDE DEACTIVATE/SECURE SENSOR/TRANSDUCER

FUNCTION DESCRIPTION _____

CRITICALITY

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 7-40

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED _____

INFORMATION REQUIRED _____

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES _____

DECISION REQUIREMENTS _____

ACTION REQUIREMENTS _____

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE _____

CREW SKILLS

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NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

7-60 IF _____
_____ IF _____
_____ IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME	UNITS
MINIMUM	_____
MEAN	_____
MAXIMUM	_____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 7-60

FUNCTION NAME DECIDE DEACTIVATE/SECURE RECORDING DEVICE

FUNCTION DESCRIPTION _____

CRITICALITY

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH
MUST BE COMPLETED (NUMBER)

7-50

EXTERNAL CONDITIONS WHICH
MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

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NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

7-70 IF _____
_____ IF _____
_____ IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM _____
MEAN _____
MAXIMUM _____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 7-70

FUNCTION NAME DEACTIVATE APPARATUS

FUNCTION DESCRIPTION _____

CRITICALITY

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 7-60

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

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NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

7-80 IF _____
_____ IF _____
_____ IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM _____
MEAN _____
MAXIMUM _____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 7-80

FUNCTION NAME DEACTIVATE SENSOR/TRANSDUCER

FUNCTION DESCRIPTION _____

CRITICALITY

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 7-70

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED _____

INFORMATION REQUIRED _____

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES _____

DECISION REQUIREMENTS _____

ACTION REQUIREMENTS _____

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE _____

CREW SKILLS

PT	<input type="checkbox"/>	PE	<input type="checkbox"/>	PI	<input type="checkbox"/>
T	<input type="checkbox"/>	E	<input type="checkbox"/>	I	<input type="checkbox"/>
TA	<input type="checkbox"/>	EA	<input type="checkbox"/>	IA	<input type="checkbox"/>

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

7-90	IF	_____
_____	IF	_____
_____	IF	_____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME	UNITS
MINIMUM	_____
MEAN	_____
MAXIMUM	_____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 7-90

FUNCTION NAME DEACTIVATE RECORDER

FUNCTION DESCRIPTION _____

CRITICALITY

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH
MUST BE COMPLETED (NUMBER)

7-80

EXTERNAL CONDITIONS WHICH
MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT

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NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

7-100

IF

IF

IF

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM

MEAN

MAXIMUM

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 7-100

FUNCTION NAME SECURE APPARATUS

FUNCTION DESCRIPTION _____

CRITICALITY

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 7-90

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED _____

INFORMATION REQUIRED _____

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES _____

DECISION REQUIREMENTS _____

ACTION REQUIREMENTS _____

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE _____

CREW SKILLS

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NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

7-110 IF _____
_____ IF _____
_____ IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM _____
MEAN _____
MAXIMUM _____

ERROR MODES

ADDITIONAL INFORMATION

CREW SKILLS

PT

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NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

7-120 IF _____

_____ IF _____

_____ IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM _____

MEAN _____

MAXIMUM _____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 7-120

FUNCTION NAME SECURE RECORDER

FUNCTION DESCRIPTION _____

CRITICALITY

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 7-110

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED _____

INFORMATION REQUIRED _____

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES _____

DECISION REQUIREMENTS _____

ACTION REQUIREMENTS _____

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE _____

CREW SKILLS

PT

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NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

7-130 IF _____

_____ IF _____

_____ IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM _____

MEAN _____

MAXIMUM _____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 7-130

FUNCTION NAME VERIFY TERMINATION SEQUENCE CORRECTLY COMPLETED

FUNCTION DESCRIPTION _____

CRITICALITY

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 7-120

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED _____

INFORMATION REQUIRED _____

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES _____

DECISION REQUIREMENTS _____

ACTION REQUIREMENTS _____

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE _____

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 7-140

FUNCTION NAME RETRIEVE DATA

FUNCTION DESCRIPTION _____

CRITICALITY

CRITERIA TO BEGIN FUNCTION

7-130

PREDECESSOR FUNCTIONS WHICH
MUST BE COMPLETED (NUMBER)

EXTERNAL CONDITIONS WHICH
MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT

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NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

7-150

IF

IF

IF

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM

MEAN

MAXIMUM

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 7-150

FUNCTION NAME DETERMINE DATA ANALYSIS RQTS.

FUNCTION DESCRIPTION _____

CRITICALITY

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH
MUST BE COMPLETED (NUMBER)

7-140

EXTERNAL CONDITIONS WHICH
MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

PT	<input type="checkbox"/>	PE	<input type="checkbox"/>	PI	<input type="checkbox"/>
T	<input type="checkbox"/>	E	<input type="checkbox"/>	I	<input type="checkbox"/>
TA	<input type="checkbox"/>	EA	<input type="checkbox"/>	IA	<input type="checkbox"/>

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER	
7-160	IF _____
_____	IF _____
_____	IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME	UNITS
MINIMUM	_____
MEAN	_____
MAXIMUM	_____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 7-160

FUNCTION NAME DECIDE ANALYZE/STORE DATA

FUNCTION DESCRIPTION _____

CRITICALITY

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 7-150

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED _____

INFORMATION REQUIRED _____

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES _____

DECISION REQUIREMENTS _____

ACTION REQUIREMENTS _____

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE _____

CREW SKILLS

PT

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NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

7-170

IF

Analysis

7-180

IF

No Analysis - sort data

IF

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM

MEAN

MAXIMUM

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 7-170

FUNCTION NAME CONDUCT DATA ANALYSIS

FUNCTION DESCRIPTION _____

CRITICALITY

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 7-160

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED _____

INFORMATION REQUIRED _____

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES _____

DECISION REQUIREMENTS _____

ACTION REQUIREMENTS _____

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE _____

CREW SKILLS

PT	<input type="checkbox"/>	PE	<input type="checkbox"/>	PI	<input type="checkbox"/>
T	<input type="checkbox"/>	E	<input type="checkbox"/>	I	<input type="checkbox"/>
TA	<input type="checkbox"/>	EA	<input type="checkbox"/>	IA	<input type="checkbox"/>

NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

7-150 IF _____
_____ IF _____
_____ IF _____

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM	_____	_____
MEAN	_____	_____
MAXIMUM	_____	_____

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 7-180

FUNCTION NAME _____ CODE/DESCRIBE DATA _____

FUNCTION DESCRIPTION _____

CRITICALITY

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH
MUST BE COMPLETED (NUMBER)

1-160

EXTERNAL CONDITIONS WHICH
MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

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NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

7-190

IF

IF

IF

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM

MEAN

MAXIMUM

ERROR MODES

ADDITIONAL INFORMATION

SPACELAB EXPERIMENT FUNCTIONAL REQUIREMENTS

DISCIPLINE NAME _____ EXPERIMENT NUMBER _____ FUNCTION NUMBER 7-190

FUNCTION NAME STORE DATA

FUNCTION DESCRIPTION _____

CRITICALITY

CRITERIA TO BEGIN FUNCTION

PREDECESSOR FUNCTIONS WHICH MUST BE COMPLETED (NUMBER) 7-180

EXTERNAL CONDITIONS WHICH MUST BE SATISFIED

INFORMATION REQUIRED

CRITERIA FOR FUNCTION COMPLETION

POSSIBLE OUTCOME STATES

DECISION REQUIREMENTS

ACTION REQUIREMENTS

SYSTEM ELEMENTS INVOLVED

HARDWARE/SOFTWARE

CREW SKILLS

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NEXT FUNCTION LOGIC - UPON COMPLETION OF THIS FUNCTION, THE NEXT FUNCTION TO BE COMPLETED IS:

NUMBER

1-10

IF

IF

IF

CREW PERFORMANCE ESTIMATES

FUNCTION COMPLETION TIME

UNITS

MINIMUM

MEAN

MAXIMUM

ERROR MODES

ADDITIONAL INFORMATION
