NASA CONTRACTOR REPORT

NASA CR-2809

NSEG - A SEGMENTED MISSION ANALYSIS PROGRAM FOR LOW AND HIGH SPEED AIRCRAFT

Volume III - Demonstration Problems

D. S. Hague and H. L. Rozendaal

Prepared by
AEROPHYSICS RESEARCH CORPORATION
Bellevue, Wash. 98009
for Langley Research Center

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION • WASHINGTON, D. C. • SEPTEMBER 1977

1. Report No.	2. Government Accession No.	3. Re
NASA CR-2809		

4. Title and Subtitle	5. Report Date
NSEG - A Segmented Mission Analysis Program for Low and High Speed Aircraft. Volume III - Demonstration Problems	September 1977
	6. Performing Organization Code
7. Author(s)	8. Performing Organization Report No.
D. S. Hague and H. L. Rozendaal	
	10. Work Unit No.
9. Performing Organization Name and Address	
Aerophysics Research Corporation Bellevue, WA 98009	11. Contract or Grant No. NAS1 - 13599
	13. Type of Report and Period Covered
12. Sponsoring Agency Name and Address	Contractor Report
National Aeronautics and Space Administration Washington, D.C.	14. Sponsoring Agency Code

15. Supplementary Notes

Langley Technical Monitor: Walter A. Vahl
Volume III of Final Report

16. Abstract

Program NSEG is a rapid mission analysis code based on the use of approximate flight path equations of motion. Equation form varies with the segment type, for example, accelerations, climbs, cruises, descents, and decelerations. Realistic and detailed vehicle characteristics are specified in tabular form. In addition to its mission performance calculation capabilities, the code also contains extensive flight envelope performance mapping capabilities. For example, rate-of-climb, turn rates, and energy maneuverability parameter values may be mapped in the Mach-altitude plane. Approximate take off and landing analyses are also performed. At high speeds, centrifugal lift effects are accounted for. Extensive turbojet and ramjet engine scaling procedures are incorporated in the code.

17. Key Words (Suggested by Author(s))	18. Distribution Statement
Mission Analysis; Trajectories; Air-breathing Propulsion; Turbojets; Ramjets	Unclassified - Unlimited Subject Category 01

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price*
Unclassified	Unclassified	181	$7.50

*For sale by the National Technical Information Service, Springfield, Virginia 22161

PREFACE

The NSEG program was originally constructed by Mr. L. H. Leet of the United States Air Force Aeronautical Systems Division, Wright-Patterson Air Force Base. The code was subsequently modified and extended by Aerophysics Research Corporation under contract F33615-73-C-3039. The current version of the NSEG (Version III) extends the program applicability to higher speed (hypersonic turbo-ramjet) aircraft. It also includes various improvements generated by Mr. David T. Johnson of the Air Force Flight Dynamics Laboratory. The authors wish to extend their thanks to Mr. Walter Vahl of NASA for his extensive assistance during formulation and checkout of the turbo-ramjet propulsion system model now available in NSEG. The analytic basis of the turbo-ramjet model is due to Mr. Vahl.

Mr. D. S. Hague of Aerophysics Research Corporation served as project leader for the present study. Dr. H. L. Rozendaal provided specialist support in the fields of propulsion system analysis and computer sciences. Mr. R. T. Jones, formerly of Aerophysics Research Corporation, has also made significant contributions to the NSEG code in studies preceding the present one.

Additional details and copies of the program deck can be obtained from NASA Langley Research Center.

This report is Volume III of three volumes. Total program documentation consists of

Volume I.	Theoretical Development
Volume II.	Program User's Manual
Volume III.	Test Problems

TABLE OF CONTENTS

SECTION		PAGE
1.0	INTRODUCTION	1
2.0	PROBLEM NO. 1 - MACH 3, JP FUELLED TURBOJET POWERED VEHICLE RANGE DETERMINATION	2
	2.1 Vehicle Characteristics	2
	2.2 Mission Characteristics	2
	2.3 Propulsion Characteristics	3
	2.4 Trajectory Details	8
	2.5 Aerodynamic Characteristics	9
3.0	PROBLEM NO. 2 - MACH 14 HYDROGEN FUELLED TURBOJET/ SCRAMJET PROPULSION RANGE DETERMINATION	48
	3.1 Vehicle Characteristics	48
	3.2 Mission Characteristics	48
	3.3 Propulsion Characteristics	49
	3.4 Trajectory Details	53
	3.5 Aerodynamic Characteristics	54
4.0	PROBLEM No. 3 - MACH 6 HYDROGEN FUELLED TURBORAMJET WITH ENGINE SCALING	74
	4.1 Vehicle Characteristics	74
	4.2 Mission Characteristics	74
	4.3 Propulsion Characteristics	75
	4.4 Trajectory Details	82
	4.5 Aerodynamic Characteristics	83

NSEG: A SEGMENTED MISSION ANALYSIS PROGRAM FOR LOW AND HIGH SPEED AIRCRAFT

D. S. Hague and H. L. Rozendaal
Aerophysics Research Corporation

1.0 INTRODUCTION

This report considers three representative trajectory design/engine scaling problems capable of solution on the NSEG program. For each problem the document presents an overall description of vehicle and trajectory characteristics, data set-up for the NSEG code, and computer output for the problem considered. The three problems consist of

1. Problem No. 1. Mach 3 JP fuelled turbojet cruise vehicle range determination. Vehicle characteristics are fixed as are all mission segments except the cruise leg. The cruise leg fuel consumption is to be varied to determine overall vehicle range for a total amount of fuel consumed over take-off, climb-acceleration, cruise, descent, and diversion legs.

2. Problem No. 2. Mach 14 turbojet/scramjet hydrogen fuelled propulsion vehicle for sub-orbital missions. Fixed vehicle and mission profile total mission range to be determined for a specified end of cruise weight.

3. Problem No. 3. Mach 6 dual mode turbo-ramjet powered vehicle using hydrogen fuel. Mission profile is fixed and engine sizes to be scaled for transonic margin and thrust margin at cruise. Total range (excluding alternate field) is fixed as is the empty weight. The vehicle initial weight is to be determined subject to these constraints.

It should be noted that the problems selected in no way exhaust all options of the NSEG program. In particular the Rutowski-like trajectory optimization modes are not exercised; neither are the flight performance contour charts used. Within these limitations the three problems studied are considered to be representative of the mission analysis/engine scaling problems which NSEG is designed to solve. The remainder of this report describes in sequence the problem statement and data, deck setup, and solution for Problems 1, 2, and 3. Provisions of NASA Publication NPD-2220.4 have been waived for the listing of computer output. U. S. Customary Units are also employed in problem descriptions since the program will only accept data in these units at the present time.

2.0 PROBLEM NO. 1 - MACH 3, JP FUELLED TURBOJET POWERED VEHICLE RANGE DETERMINATION

2.1 Vehicle Characteristics

Turbojet propulsion, 4 engines, JP fuel (F/A = .0678)

$M_{cruise} = 3$

Gross take-off weight = 75000 pounds

Operating weight empty = 421,780 pounds

Thrust loading = .5

Vehicle reference area = 8983.8 ft^2

Wing semi-thickness angle = $-.7^o$

Inlet initial wedge angle = 6^o

Engine exhaust field pressure (P_N) = underwing pressure (p_1)

Total range to be determined

2.2 Mission Characteristics

(1) Take-off to clear 50 ft. obstacle (using NSEG take-off aerodynamics)

(2) Accelerating climb at max. power along prescribed path until q = 1000 psf reached ($\approx$M = 2.5)

(3) Accelerating climb at max. power along constant q = 1000 psf path to M=2.9 (altitude = 57540 ft.)

(4) Accelerating climb at max. power to M=3, altitude = 65,932 ft. (linear M-h path)

(5) Constant altitude, constant C_L cruise (throttled turbojets)

(6) Descent at max. L/D to M=.8, altitude = 20,000 ft.

(7) Loiter 5 min.

(8) Constant M =.8 climb to 45,000 ft.

(9) Constant altitude cruise for 200 N.M. at M=.8.

(10) Descent at max. L/D to M=.8, h=20,000 ft.

(11) Loiter 5 min.

(12) Descent at max. L/D to M=.6, altitude = 1000 ft.

(13) Go around 360^{o}, 1.8g

(14) Descent to 50 ft. obstacle

(15) Landing (Use NSEG landing aerodynamics)

2.3 Propulsion Characteristics

Inlet capture ratio (A_c/A_i) vs. Inlet flow field Mach number (M_1)

M_1	A_c/A_i
0	1.0
.3	.8707
.54	.7347
.7	.6961
.8	.6168
.9	.5986
1.0	.5941
1.2	.6077
1.6	.6395

2.0	.7347
2.2	.8345
2.4	.8685
2.7	1.0
8.	1.0

Inlet pressure recovery (p_{t_3}/p_{t_1}) vs. Inlet flow field Mach number (M_1)

M_1	p_{t_3}/p_{t_1}
0	1.0
.3	1.0
.4	.9885
.65	.972
.9	.972
1.0	.9707
1.1	.9682
1.2	.9645
1.25	.9604
1.34	.9495
1.45	.9288
1.6	.892
1.61	.92
1.84	.92
2.1	.9169
2.4	.9117
3.	.898

Turbojet corrected airflow ($w\frac{\sqrt{\theta}}{\delta}$) vs. Inlet flow field total temperature (T_{t_1}) for base size engine

T_{t_1} (^{o}R)	$w\frac{\sqrt{\theta}}{\delta}$ (#/sec)
400	615
435	624
500	627
510	626
520	620
540	598
580	554
620	514
670	471
740	421
800	391
900	351
1000	318
1200	258

Turbojet gross thrust per pound of airflow (F_g/w_a) vs. engine pressure ratio ($\log_{10} P_{t3}/P_N$) and inlet flow field total temperature (T_{t_1})

$\text{Log}_{10}\ P_{t3}/P_N$	$T_{t_1} = 390^{\circ}R$	$T_{t_1} = 1200^{\circ}R$
-.0458	99.5	99.5
0.	99.5	99.5
.1139	114.0	114.0
.1761	120.5	120.5
.2553	127.5	127.5
.3010	131.2	131.2
.3979	137.3	137.3
.4771	141.6	141.6
.5441	144.7	144.7
.6532	148.8	148.8
.7404	151.5	151.5
.8451	154.1	154.1
1.0	157.0	157.0
1.301	161.3	161.3
1.6021	164.9	164.9
	$F_g/\dot{w}_a$, (lbs./lb. per second)	

Turbojet fuel-air ratio ($\dot{w}_f/\dot{w}_a$) vs. Inlet flow field total temperature (T_{t_1})

T_{t_1}, ^{o}R	$\dot{w}_f/\dot{w}_a$
400	.0413
440	.0427
480	.04665
508	.0489
520	.04869
560	.04818
600	.04756
760	.04512
1200	.03835

Turbojet throttling table at cruise conditions ($M_\infty = 3$); $(F_N/F_{N_{max}})$ vs. (SFC/SFC_{max})

$(F_N/F_{N_{max}})$	(SFC/SFC_{max})
0	1.0
.3991	.7701
.45	.76
.5	.762
.55	.773
.7	.838
.9	.943
1.0	1.0

2.4 Trajectory Details

Trajectory segment (2) prescribed path follows.

M_∞	Altitude, ft.
M at 50' obstacle	50
.5	3000
.6	5000
.7	11500
.75	16000
.8	21500
.85	24000
.9	27000
.95	29000
1.0	30000
1.1	32700
1.15	33500
1.2	34500
1.3	36500
1.4	38500
1.5	40500
1.6	41500
1.8	44500
2.0	47200
2.2	49000
2.4	51000 (q = 936.4 psf)
2.6	52971 (q = 1000 psf)

2.5 Aerodynamic Characteristics

Linear aerodynamic characteristics are based on these equations:

$$C_D = C_{D_o} + K (C_L - C_{L_o})^2$$

$$C_L = C_{L_\alpha} \alpha + C_{L_{\alpha=0}}$$

where

C_{D_o} = minimum drag coefficient

K = drag due to lift factor

C_{L_o} = C_L at minimum drag coefficient

C_{L_α} = lift curve slope

$C_{L_{\alpha=0}}$ = lift coefficient at $\alpha = 0^o$

M_∞	C_{D_o}	C_{L_o}	$C_{L_{\alpha=0}}$	C_{L_α}	K
0.	.008601	0.	0.	.052	.20
.4	.008601	0.	0.	.05465	.20
.6	.008601	0.	0.	.05460	.20
.8	.008801	0.	0.	.05795	.205
.9	.01102	0.	0.	.06500	.209
.95	.01273	0.	0.	.06460	.212
1.	.01522	0.	0.	.06280	.216
1.1	.01210	0.	0.	.06000	.225
1.2	.01191	0.	0.	.05750	.236
1.3	.01150	0.	0.	.05580	.250
1.4	.01100	0.	0.	.05320	.267
2.0	.009276	0.	0.	.04320	.390
2.5	.008055	0.	0.	.03620	.490
3.0	.007318	0.	0.	.03050	.583
3.5	.005681	0.	0.	.02660	.674

TEST PROBLEM NO. 1
..... TOTAL RANGE TO BE DETERMINED. ITERATE TO FIND WEIGHT AT END OF
..... CRUISE. NO IN-FLIGHT ENGINE SCALING REQUESTED.

```
STCASE/TABSIZ/
          TABLE SIZES FOR EACH TABLE USED IN THIS RUN
ATAB46(60)
ATAB52(50)
CLATAB(60)
   CLZTAB(20)
ETAB03(40)
ETAB04(40)
ETAB05(40)
ETAB06(50)
ETAB07(25)
ETAB08(20)
MTAB01(500)
MTAB02(500)
END
          TOTAL TABLE SIZE FOR THIS RUN IS  1477
```

TEST PROBLEM NO. 1
..... TOTAL RANGE TO BE DETERMINED. ITERATE TO FIND WEIGHT AT END OF
..... CRUISE. NO IN-FLIGHT ENGINE SCALING REQUESTED.

```
      STCASE/DATA1/
...
...
...        DATA FOR PRINT-OUT CONTROL
      IPDICN=1,     $ PRINT DATA BASE DIRECTORY
      IPDICN=0,     $ DO NOT PRINT DATA BASE DIRECTORY
..
...      CONTROLS PRINT OUT OF MISSION SEGMENTS
      IPSEG=1,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,23,0,
...
      IPATMC=1,     $ GENERATE TABULAR LISTING OF ATMOSPHERIC PROPERTIES
      IPATMD=0,     $ DO NOT GENERATE TABULAR LISTING OF ATMOSPHERIC PROPERTIES
      IPTZIN=0,     $ DO NOT PRINT TERM ARRAY AS THE INPUT DATA IS PROCESSED
      IPTZIN=1,     $ PRINT THE TERM ARRAY FROM FILLTZ
     IDBMHP=0,      $DO NOT PRINT DUMPS DURING CLIMB
.                     AS THE INPUT DATA FOR EACH
.          ,        MISSION SEGMENT IS PROCESSED
      IPENDS=0,     $ DO NOT PRINT SCALED ENGINE DATA
      IPENDS=1,     $ PRINT SCALED ENGINE DATA
      IPENDR=0,     $ DO NOT PRINT RAW ENGINE DATA
      IPENDR=1,     $ PRINT RAW ENGINE DATA
      IPTZXX=1,     $ PRINT TERM ARRAY AS EACH MISSION SEGMENT IS STARTED
      IPRGSV=1,     $ PRINT THE RG SAVE ARRAY FROM EACH MISSION SEGMENT
...
...        TAKE-OFF AND LANDING DATA
...
  SREF=4983.8, $ WING REFERENCE AREA (FT**2)
  SPLG  =200.0,$   FLAT PLATE AREA OF GEAR (SF)
  CDPLG =0.5,$     FLAT PLATE DRAG COEF OF GEAR
  AG    =.25,$     GROUND ROLL BODY ANGLE (DEG)
  AMAXG =12.0,$    MAXIMUM GROUND ROTATION ANGLE (DEG)
   WINCID=-.7,  $   WING INCIDENCE  (DEG)
  ARTHEO=9.0,$     THEORETICAL WING ASPECT RATIO (SPAN**2/SREF)
  WSLEFC=37.0,$    WING LEADING EDGE SWEEP ANGLE (DEG)
   CLATOT=.052,  $  TOTAL LIFT CURVE SLOPE  (PER DEGREE)
   CL0=0.0,  $  LIFT COEF AT ZERO ANGLE OF ATTACK
  DFK   =0.189,$   INDUCED DRAG FACTOR
  XMAXG =7500.0,$  MAXIMUM GROUND ROLL (FT) IGNORED, IF ZERO
  BFOBEX=0.66,$    FLAP SPAN TO EXPOSED WING SPAN RATIO
  CFOCAV=.25,$     AVERAGE FLAP CHORD TO WING CHORD RATIO
  SPCHUT=0.0,$     FLAT PLATE AREA OF DRAG CHUTE (SF)
  CDPCHT=0.0,$     FLAT PLATE DRAG COEFF OF CHUTE
  GRNOFT=0.025,$   GROUND ROLL FRICTION COEFFICIENT TAKE-OFF
  FLAPOT=20.0,$    FLAP DEFLECTION (DEG) TAKE-OFF
  GRNOFL=.35,$     GROUND ROLL FRICTION COEFFICIENT LANDING
  FLAPOL=45.0,$    FLAP DEFLECTION (DEG) LANDING
  FNL   =0.0,$     LANDING THRUST (LB)
...   LOW ASPECT RATIO TAKE-OFF VALUES
  ARTHEO=2.0,$     THEORETICAL WING ASPECT RATIO (SPAN**2/SREF)
  AMAXG =20.0,$    MAXIMUM GROUND ROTATION ANGLE (DEG)
  WSLEFC=60.0,$    WING LEADING EDGE SWEEP ANGLE (DEG)
  CFOCAV=.15,$     AVERAGE FLAP CHORD TO WING CHORD RATIO
```

TEST PROBLEM NO. 1
..... TOTAL RANGE TO BE DETERMINED. ITERATE TO FIND WEIGHT AT END OF
..... CRUISE. NO IN-FLIGHT ENGINE SCALING REQUESTED.

```
  CDO   =0.0086, $ DRAG COEFF AT ZERO LIFT
  TRATIO=.20,$      WING TAPER RATIO
   HTO=0.,  $ ALTITUDE AT START OF TAKEOFF ROLL
...
...         GENERAL DATA
      PLWINT=100000.0,
      GLEVEL=1.0,
      AVOID1=0,
      AVOID2=0,
  AMTO=.2,
      PSET=1,
      HI=0.0,
      HF=40000.0,
      AMI=0.2,
      AMF=0.825,
      HO=0.0,
      HE=35000.0,
      AMS=0.29,
      AME=0.767,
...
...
...         AERO DATA
  RCSC=100.0,
    CASE = 1,    $ SINGLE SYSTEM.
    INCAER = 9,
    INDA46 = 1,
    INDA52 = 1,
    INDCLZ = 0,  $ CL AT ZERO ANGLE OF ATTACK IS ZERO.
    INDA58 = 0,  $ CL MIN IS IDENTICALLY ZERO.
    IA46X  = 2,  $ NO. ALT
    IA46Y  = 15, $ NO. M
    ATA946 =  0., 500000.,    $ ALTITUDES FOR LINEAR AERO CDO
              0.,.4,.6,.8,.9,.95,1.,1.1,1.2,1.3,1.4,2.,2.5, $MACHS
              3.,3.5,
              .008601,.008601,.008601,.008601,.008601,.008601,
              .008801,.008801,.01102,.01102,.01273,.01273,
              .01522,.01522,.01210,.01210,.01191,.01191,
              .0115,.0115,.011,.011,.009276,.009276,.008055,.008055,
              .007318,.007318,.005681,.005681,
...  K21 VS MACH
    ATA852 = 15 ,0.,.2,.4,.2,.6,.2,.8,.205,.9,.209,.95,.212,1.,.216,
             1.1,.225,1.2,.236,1.3,.25,1.4,.267,2.,.39,2.5,.49,
             3.,.583,3.5,.674,
...  LIFT CURVE SLOPE VS. ALT AND MACH
    INDCLA = 1,
    ICLAX = 15,    $  NO. MACHS
    ICLAY = 2,     $  NO. ALTS
    CLATA8 = 0.,.4,.6,.8,.9,.95,1.,1.1,1.2,1.3,1.4,2.,2.5,3.,3.5,
             0.,500000.,
...   ALT = 0.
             .052,.05465,.0546,.05795,.065,.0646,.0628,.06,.0575,
             .0558,.0532,.0432,.0362,.0305,.0266,
```

```
                              TEST PROBLEM NO. 1
             ..... TOTAL RANGE TO BE DETERMINED.  ITERATE TO FIND WEIGHT AT END OF
             ..... CRUISE.  NO IN-FLIGHT ENGINE SCALING REQUESTED.


     ...    ALT = 500000.
                 .052,.05465,.0546,.05795,.065,.0646,.0628,.06,.0575,
                 .0558,.0532,.0432,.0362,.0305,.0266,
     ...    ...   ...   ...   ...   ...   ...   ...   ...   ...   ...   ...   ...   ..
     ...
     ...
     ...         ATMOSPHERIC DATA
            INDATM=9,
            INDATM=3,
     ...
     ...                 DATA FOR USER SPECIFIED TEMPERATURE PROFILE
            NHG=11,
            HG=-16404.0, 0.0, 36089.01, 65617.01, 104987.0, 154199.01,
                170604.01, 200131.01, 259186.01, 291160.01, 295276.01,
            TM=577.18, 518.68, 389.98, 389.98, 411.58, 487.18, 487.18,
               454.78, 325.18, 325.18, 379.18,
            PM=3711.0839, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0,
     ...
     ...
     ...         THRUST DATA
        FF=.05,
        FPOL=1.0,
            FFLMIN=0.001,
            SFCFAC=1.05,
            NUMENG=4,
            TSIZEF=1.0,
            THRMIN=0.1,
     ...    ...   ...   ...   ...   ...   ...   ...   ...   ...   ...   ...   ...   ..
     ...                MAX. THRUST  (CASEN = 1)
     ....   CHECK PROBLEM 1
          INDE01 = 0,
          INDE02 = 0,
          INDE03 = 1,
          INDE04 = 1,
          INDE05 = 1,
          INDE06 = 1,
          INDE07 = 1,
          INDE08 = 1,
          INDE09 = 0,
          INDE10 = 0,
          IE03X = 14,
          ETAB03 = 0.,.3,.54,.7,.8,.9,1.,1.2,1.6,2.,2.2,2.4,2.7,8.,
                   1.,.8707,.7347,.6961,.6168,.5986,.5941,.6077,.6395,
                   .7347,.8345,.8685,1.,1.,
          IE04X = 17,
          ETAB04 = 0.,.3,.4,.65,.9,1.,1.1,1.2,1.25,1.34,1.45,1.6,1.61,
                   1.84,2.1,2.4,3.,
                   1.,1.,.9885,.972,.972,.9707,.9682,.9645,.9604,.9495,
                   .9288,.892,.92,.92,.9169,.9117,.898,
          IE05X = 14,
          ETAB05 = 400.,435.,500.,510.,520.,540.,580.,620.,670.,740.,
                   800.,900.,1000.,1200.,
```

```
                              TEST PROBLEM NO. 1
            .....  TOTAL RANGE TO BE DETERMINED.  ITERATE TO FIND WEIGHT AT END OF
            .....  CRUISE.  NO IN-FLIGHT ENGINE SCALING REQUESTED.


                615.,624.,627.,626.,620.,598.,554.,514.,471.,421.,
                391.,351.,318.,258.,
       IE06X = 2,
       IE06Z = 15,
       ETAB06 = 380.,1200., $LOWER LIMIT REDUCED ...3/13/76...HR
                -.0458,0.,.1139,.1761,.2553,.3010,.3979,.4771,.5441,
                .6532,.7404,.8451,1.,1.301,1.6021,
                99.5,99.5,99.5,99.5,114.,114.,120.5,120.5,127.5,127.5,
                131.2,131.2,137.3,137.3,141.5,141.5,144.7,144.7,
                148.8,148.8,151.5,151.5,154.1,154.1,157.,157.,
                161.3,161.3,164.9,164.9,
       IE07X = 9,
       ETAB07 = 400.,440.,480.,508.,520.,560.,600.,760.,1200.,
                .0413,.0427,.04665,.0489,.04869,.04818,.04756,
                .04512,.03935,
       IE08X =  8,
       ETAB08 = 0.,.3991,.45,.5,.55,.7,.9,1.,
                1.,.7701,.76,.762,.773,.838,.943,1.,
...    SPECIAL INPUTS FOR DUAL ENGINE OPTION
     ALPLIM=45.,
       IPDENG=0,      $NULL DIAGNOSTIC PRINT IN ENGINS ROUTINE
     IASCAL=0.,  $DO NOT AUTOMATICALLY SCALE ENGINE IN FLIGHT.
   TMINRJ=1.0,
       TMINTJ= 0.01,    $ MINIMUM TURBOJET THROTTLE SETTING
     SREF=8983.8,
   DELWNG=-0.7,  $WING INCIDENCE ANGLE (DEGREES)
     DELIN =  6.0 ,
     AMAXTJ=4.0,
     PLWINT=0.,
     AMINRJ=5.0,
     AMLIM=3.5,
     QLIM=1200.,
     XQSW=8983.8,
     CLMAX=2.5,
     BASEWT=421780.,
     OWE=421780.,
     WT=421780.,
     W0=750000.,
     WL=421780.,
     WGTO=750000.,
       AINLET = 55.,
     IEOP=1,  $  TURBOJET ENGINE ONLY OPTION
        END
```

TEST PROBLEM NO. 1
..... TOTAL RANGE TO BE DETERMINED. ITERATE TO FIND WEIGHT AT END OF
..... CRUISE. NO IN-FLIGHT ENGINE SCALING REQUESTED.

STCASE/MSEG/
TANK SYSTEM DROP AND RETURN WEIGHT STATEMENT

TANK SYSTEM 1

NUMBER OF TANK PAIRS = 0

POUNDS DROPPED = 0.

POUNDS RETURNED = 0.

TOTAL WEIGHT FOR TANK SYSTEM 1 LESS FUEL = 0.

TANK SYSTEM 2

NUMBER OF TANK PAIRS = 0

POUNDS DROPPED = 0.

POUNDS RETURNED = 0.

TOTAL WEIGHT FOR TANK SYSTEM 2 LESS FUEL = 0.

TANK SYSTEM 3

NUMBER OF TANK PAIRS = 0

POUNDS DROPPED = 0.

POUNDS RETURNED = 0.

TOTAL WEIGHT FOR TANK SYSTEM 0 LESS FUEL =

TOTAL TANK SYSTEM DROP WEIGHT = 0.

TOTAL TANK SYSTEM RETURN WEIGHT = 0.

TOTAL TANK SYSTEM WEIGHT = 0.

TEST PROBLEM NO. 1
..... TOTAL RANGE TO BE DETERMINED. ITERATE TO FIND WEIGHT AT END OF
..... CRUISE. NO IN-FLIGHT ENGINE SCALING REQUESTED.

STORE SYSTEM DROP AND RETURN WEIGHT STATEMENT

STORE SYSTEM 1

NUMBER OF STORE PAIRS = 0

POUNDS DROPPED = 0.

POUNDS RETURNED = 0.

TOTAL WEIGHT FOR STORE SYSTEM 1 LESS FUEL = 0.

STORE SYSTEM 2

NUMBER OF STORE PAIRS = 0

POUNDS DROPPED = 0.

POUNDS RETURNED = 0.

TOTAL WEIGHT FOR STORE SYSTEM 2 LESS FUEL = 0.

STORE SYSTEM 3

NUMBER OF STORE PAIRS = 0

POUNDS DROPPED = 0.

POUNDS RETURNED = 0.

TOTAL WEIGHT FOR STORE SYSTEM 3 LESS FUEL = 0.

TOTAL STORE SYSYEM DROP WEIGHT = 0.

TOTAL STORE SYSTEM RETURN WEIGHT = 0.

TOTAL STORE SYSTEM WEIGHT = 0.

TEST PROBLEM NO. 1
..... TOTAL RANGE TO BE DETERMINED. ITERATE TO FIND WEIGHT AT END OF
..... CRUISE. NO IN-FLIGHT ENGINE SCALING REQUESTED.

```
... NASA TEST PROBLEM 1, NSEG VERSION III.
...
    SEGMENT(2),OPTION(21)
     OUTPUT RUN.
...   ENGINE SCALING OPTION
      PROPULSIVE MODE = DUAL
   SCALE TURBOJET--THRUST=375000.,  (LBS. TOTAL)
  CRUISE MACH=3.0,  CRUISE ALTITUDE=65932..
... TURBOJET IS SCALED AT SEA LEVEL
 EXIT PRESSURE=WING PRESSURE
     AERO OPTION=1,
    END
  2.0000     0.          3.0000      .37500E+06  65932.          51000 0.                21  1.0000      1111112111
...
      SEGMENT(3) ,OPTION(17),
      COMPUTE WARM-UP AND TAKE-OFF FUEL ALLOWANCE
      WARM-UP TIME=5.0,(MIN)
      END
 0.          0.          0.          5.0000      2.0000          51000  2.0000           17 0.          1111112111
...
      SEGMENT(4) ,OPTION(1),
   FLY LINEAR MACH-ALTITUDE PATH
   END MACH NUMBER =0.5,
   END ALTITUDE=3000.,
      PROPULSIVE MODE = DUAL
      THRUST = MAXIMUM AVAILABLE
    END
  .50000      3000.0      0.          4.0000      0.              51100 0.                 1 0.          1111112111
...
      SEGMENT(5) ,OPTION(1),
   FLY LINEAR MACH-ALTITUDE PATH
   END MACH NUMBER =0.6,
   END ALTITUDE=5000.,
      PROPULSIVE MODE = DUAL
      THRUST = MAXIMUM AVAILABLE
    END
  .60000      5000.0      0.          4.0000      0.              51100 0.                 1 0.          1111112111
...
      SEGMENT(6) ,OPTION(1),
   FLY LINEAR MACH-ALTITUDE PATH
   END MACH NUMBER =0.8,
   END ALTITUDE=21500.,
      PROPULSIVE MODE = DUAL
      THRUST = MAXIMUM AVAILABLE
    END
  .80000      21500.      0.          4.0000      0.              51100 0.                 1 0.          1111112111
...
      SEGMENT(7) ,OPTION(1),
   FLY LINEAR MACH-ALTITUDE PATH
   END MACH NUMBER =0.95,
   END ALTITUDE=29000.,
      PROPULSIVE MODE = DUAL
```

TEST PROBLEM NO. 1
..... TOTAL RANGE TO BE DETERMINED. ITERATE TO FIND WEIGHT AT END OF
..... CRUISE. NO IN-FLIGHT ENGINE SCALING REQUESTED.

```
   THRUST = MAXIMUM AVAILABLE
  END
 .95000      29000.     0.          4.0000     0.          51100 0.          1 0.          1111112111
...
   SEGMENT(8) ,OPTION(1),
 FLY LINEAR MACH-ALTITUDE PATH
 END MACH NUMBER =1.5,
 END ALTITUDE=40500.,
   PROPULSIVE MODE = DUAL
   THRUST = MAXIMUM AVAILABLE
  END
 1.5000      40500.     0.          4.0000     0.          51100 0.          1 0.          1111112111
...
   SEGMENT(9) ,OPTION(1),
 FLY LINEAR MACH-ALTITUDE PATH
 END MACH NUMBER =2.6,
 END ALTITUDE=52971.,
   PROPULSIVE MODE = DUAL
   THRUST = MAXIMUM AVAILABLE
  END
 2.6000      52971.     0.          4.0000     0.          51100 0.          1 0.          1111112111
...
   SEGMENT(10), OPTION(1),
 FLY CONSTANT Q PATH
 END MACH NUMBER =2.9,
 END ALTITUDE=57540.,
   PROPULSIVE MODE = DUAL
   THRUST = MAXIMUM AVAILABLE
  END
 2.9000      57540.     0.          5.0000     0.          51100 0.          1 0.          1111112111
...
   SEGMENT(11), OPTION(1),
 FLY LINEAR MACH-ALTITUDE PATH
 END MACH NUMBER =3.0,
 END ALTITUDE=65932.,
   PROPULSIVE MODE = DUAL
   THRUST = MAXIMUM AVAILABLE
  END
 3.0000      65932.     0.          4.0000     0.          51100 0.          1 0.          1111112111
...
   SEGMENT(12),OPTION(6),
   CRUISE AT CONSTANT LIFT COEFFICIENT
    NUMBER OF INTEGRATION STEPS = 10,
..... END OF CRUISE WEIGHT GUESSED = 500000. LBS
   END WEIGHT=500000., LBS
  THRUST = THRUST REQUIRED
  PROPULSIVE MODE = DUAL
  END
 .0.          0.          .50000E+06 0.          0.          51010  1.0000     6 0.          1111112111
...
   SEGMENT(13), OPTION(1),
 USE MAX L/D AS BASIS FOR SELECTION
```

TEST PROBLEM NO. 1
..... TOTAL RANGE TO BE DETERMINED. ITERATE TO FIND WEIGHT AT END OF
..... CRUISE. NO IN-FLIGHT ENGINE SCALING REQUESTED.

```
   SEARCH AT CONSTANT SPECIFIC ENERGY
   END MACH NUMBER =0.8,
   END ALTITUDE=20000.,
      PROPULSIVE MODE = DUAL
      THRUST = MINIMUM ALLOWABLE
     END
  .80000      20000.      3.0000      1.0000      0.              51210 0.              1 0.          1111112111
...
      SEGMENT(14), OPTION(17),
   COMPUTE LOITER FUEL ALLOWANCE
   LOITER TIME=5.0, (MINUTES)
   THRUST=THRUST REQUIRED
     END
 0.           0.           0.           5.0000      1.0000          51010  2.0000          17 0.          1111112111
...
      SEGMENT(15), OPTION(1),
   FLY LINEAR MACH-ALTITUDE PATH
   END MACH NUMBER =0.8,
   END ALTITUDE=45000.,
      PROPULSIVE MODE = DUAL
      THRUST = MAXIMUM AVAILABLE
     END
  .80000      45000.      3.0000      4.0000      0.              51110 0.              1 0.          1111112111
...
      SEGMENT(16), OPTION(7),
   RANGE=200., N.M.
      THRUST = THRUST REQUIRED
     END
 0.           0.           0.           1.0000      200.00          51010 0.              7 0.          1111112111
...
      SEGMENT(17), OPTION(1),
   USE MAX L/D AS BASIS FOR SELECTION
   SEARCH AT CONSTANT SPECIFIC ENERGY
   END MACH NUMBER =0.8,
   END ALTITUDE=20000.,
      PROPULSIVE MODE = DUAL
      THRUST = MINIMUM ALLOWABLE
     END
  .80000      20000.      3.0000      1.0000      0.              51210 0.              1 0.          1111112111
...
      SEGMENT(18), OPTION(17),
   COMPUTE LOITER FUEL ALLOWANCE
   LOITER TIME=5.0, (MINUTES)
   THRUST=THRUST REQUIRED
     END
 0.           0.           0.           5.0000      1.0000          51010  2.0000          17 0.          1111112111
...
      SEGMENT(19), OPTION(1),
   FLY LINEAR MACH-ALTITUDE PATH
   END MACH NUMBER =0.6,
   END ALTITUDE=1000.,
      PROPULSIVE MODE = DUAL
```

TEST PROBLEM NO. 1
..... TOTAL RANGE TO BE DETERMINED. ITERATE TO FIND WEIGHT AT END OF
..... CRUISE. NO IN-FLIGHT ENGINE SCALING REQUESTED.

```
     THRUST = MINIMUM ALLOWABLE
    END
  .60000      1000.0      3.0000      4.0000      0.              51210 0.              1 0.          1111112111
...
     SEGMENT(20), OPTION(17),
   360.0 DEG    1.8 G TURNS
   COMPUTE COMBAT FUEL ALLOWANCE
     THRUST = THRUST REQUIRED
    END
 0.           360.00      1.8000      0.          0.              51010  3.0000         17 0.          1111112111
...
     SEGMENT(21), OPTION(1),
   FLY LINEAR MACH-ALTITUDE PATH
   END MACH NUMBER =0.2,
   END ALTITUDE=50.0,
     PROPULSIVE MODE = DUAL
     THRUST = MINIMUM ALLOWABLE
    END
  .20000      50.000      3.0000      4.0000      0.              51210 0.              1 0.          1111112111
.....
     SEGMENT(22),OPTION(22),
     START LOOP AT BEGINNING OF SEGMENT(12)---WEIGHT IS TO BE VARIED
     FINISH LOOP AT END OF SEGMENT(21)---WEIGHT IS TO BE SATISFIED
     NUMBER OF ITERATIONS=2.,
     DESIRED WEIGHT =421780., LBS
     END
  1.0000      1.0000      .42178E+06  12.000      21.000          51210 0.              22  2.0000    1111112111
     SEGMENT(23),OPTION(17),
    PROPULSIVE MODE=DUAL
    THRUST = MINIMUM ALLOWABLE
    COMPUTE LANDING PERFORMANCE
    END MISSION
 0.           0.          0.          0.          1.0000          51210  4.0000         17 0.          1111112111
```


TEST PROBLEM NO. 1
..... TOTAL RANGE TO BE DETERMINED. ITERATE TO FIND WEIGHT AT END OF
..... CRUISE. NO IN-FLIGHT ENGINE SCALING REQUESTED.

```
                          RUN

END OF NSEGII INPUT FOR CURRENT CASE.  0 INPUT ERRORS DETECTED.
```

TEST PROBLEM NO. 1
..... TOTAL RANGE TO BE DETERMINED. ITERATE TO FIND WEIGHT AT END OF
..... CRUISE. NO IN-FLIGHT ENGINE SCALING REQUESTED.

MISSION SEGMENT TABLE

	.20000	0.	.75000E+06	3.5000	1200.0	.50000E-01	1.0000	100.00		0	
2	2.0000	0.	3.0000	.37500E+06	65932.	51000	0.		21	X	1111112111
3	0.	0.	0.	5.0000	2.0000	51000	2.0000		17	0	1111112111
4	.50000	3000.0	0.	4.0000	0.	51100	0.		1	0	1111112111
5	.60000	5000.0	0.	4.0000	0.	51100	0.		1	0	1111112111
6	.80000	21500.	0.	4.0000	0.	51100	0.		1	0	1111112111
7	.95000	29000.	0.	4.0000	0.	51100	0.		1	0	1111112111
8	1.5000	40500.	0.	4.0000	0.	51100	0.		1	0	1111112111
9	2.6000	52971.	0.	4.0000	0.	51100	0.		1	0	1111112111
10	2.9000	57540.	0.	5.0000	0.	51100	0.		1	0	1111112111
11	3.0000	65932.	0.	4.0000	0.	51100	0.		1	0	1111112111
12	0.	0.	.50000E+06	0.	0.	51010	1.0000		6	0	1111112111
13	.80000	20000.	3.0000	1.0000	0.	51210	0.		1	0	1111112111
14	0.	0.	0.	5.0000	-1.0000	51010	2.0000		17	0	1111112111
15	.80000	45000.	3.0000	4.0000	0.	51110	0.		1	0	1111112111
16	0.	0.	0.	1.0000	200.00	51010	0.		7	0	1111112111
17	.80000	20000.	3.0000	1.0000	0.	51210	0.		1	0	1111112111
18	0.	0.	0.	5.0000	1.0000	51010	2.0000		17	0	1111112111
19	.60000	1000.0	3.0000	4.0000	0.	51210	0.		1	0	1111112111
20	0.	360.00	1.8000	0.	0.	51010	3.0000		17	0	1111112111
21	.20000	50.000	3.0000	4.0000	0.	51210	0.		1	0	1111112111
22	1.0000	1.0000	.42178E+06	12.000	21.000	51210	0.		22	X	1111112111
23	0.	0.	0.	0.	1.0000	51210	4.0000		17	0	1111112111

TURBOJET PERFORMANCE (PER ENGINE) AT SEA LEVEL STATIC CONDITIONS

TURBOJET GROSS THRUST - - - - - - - - - -	93757.0	(LB)
NET THRUST IN FREESTREAM DIRECTION - - -	93750.0	(LB)
AIRFLOW RATE - - - - - - - - - - - - - - -	942.281	(LB/SEC)
FUELFLOW RATE - - - - - - - - - - - - - -	45.9016	(LB/SEC)
SPECIFIC FUEL CONSUMPTION - - - - - - - -	1.76249	((LB FUEL/HR)/LB THRUST)
BASE ENGINE SCALING FACTOR - - - - - - -	1.51786	(NO UNITS)
MAXIMUM AIRFLOW RATE OF BASE ENGINE - - -	620.798	(LB/SEC)
PRESSURE RATIO (PT3/PN) - - - - - - - - -	1.000000	(NO UNITS)
ANGLE OF ATTACK - - - - - - - - - - - - -	0.	(DEGREES)
WING HALF ANGLE- - - - - - - - - - - - - -	-.700000	(DEGREES)
INLET WEDGE ANGLE- - - - - - - - - - - - -	6.00000	(DEGREES)
SCALING THRUST IN FREESTREAM DIRECTION - -	93750.9	(LB)
LIFT COMPONENT OF ENGINE FORCES - - - - -	-1145.43	(LB)
INLET AREA FOR MAX AIRFLOW RFOD AT CRUISE=	34.572	(SQ. FT.)

ENGINE SCALING COMPLETED

2. ****** XCLECT END OPTION 21 ******
WT = .75000E+06 H = 0. AM = .20000

TIME = 0. RANGE = 0. FUEL = 0.

*** ***

CUMULATIVE CPU TIME = 4.4190 CPU TIME USED IN PREVIOUS TASK = 4.4190

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
11	.7500E+06	0.	.2000	0.	0.	0.	1.000	-0.	0.	21

UNPACK 21 51000 5 1 0 0 0. 17

0.	0.	0.	5.0000	2.0000	51000	2.0000	17	0.	1111112111

TEST PROBLEM NO. 1
..... TOTAL RANGE TO BE DETERMINED. ITERATE TO FIND WEIGHT AT END OF
..... CRUISE. NO IN-FLIGHT ENGINE SCALING REQUESTED.

INPUT TO TAKEOFF CALCULATIONS

WING REFERENCE AREA (SF)	SREF =	6983.800
FLAT PLATE AREA OF GEAR (SF)	SPLG =	200.0000
FLAT PLATE DRAG COEFF OF GEAR	CDPLG =	.5000000
GROUND ROLL BODY ANGLE (DEG)	AG =	.2500000
MAXIMUM GROUND ROTATION ANGLE (DEG)	AMAXG =	20.00000
WING INCIDENCE (DEG)	WINCID=	-.7000000
THEORETICAL WING ASPECT RATIO	ARTHEO=	2.000000
WING LEADING EDGE SWEEP ANGLE (DEG)	WSLEFC=	60.00000
TOTAL LIFT LIFT CURVE SLOPE (PER DEG)	CLATOT=	.5200000E-01
LIFT COEF AT ZERO ANGLE OF ATTACK	CL0 =	0.
WING TAPER RATIO	TRATIO=	.2000000
INDUCED DRAG FACTOR	DFK =	.1890000
GROUND ROLL FRICTION COEFFICIENT	GRNDFT=	.2500000E-01
DRAG COEFF AT ZERO LIFT	CD0 =	.8600000E-02
WEIGHT AT START OF TAKE-OFF (LB)	W0 =	749452.4
TAKE-OFF THRUST (LB)	FN0 =	335932.9
FUEL FLOW RATE (LBS/HR)	FFR =	660983.2
SPECIFIC FUEL CONSUMPTION (1.0/HR)	SFC =	1.967605
SPECIFIC IMPULSE AT TAKE-OFF (SEC)	XISO =	1829.635
FLAP SPAN TO EXPOSED WING SPAN RATIO	BFOBEX=	.6600000
FLAPDEFLECTION (DEG)	FLAPDT=	20.00000
AVERAGE FLAP CHORD TO WING CHORD RATIO	CFOCAV=	.1500000

TEST PROBLEM NO. 1
..... TOTAL RANGE TO BE DETERMINED. ITERATE TO FIND WEIGHT AT END OF
..... CRUISE. NO IN-FLIGHT ENGINE SCALING REQUESTED.

OUTPUT FROM TAKEOFF CALCULATIONS

MAXIMUM WING LIFT COEFFICIENT	CLMAX =	1.104521
MAXIMUM WING PLUS FLAP LIFT COEFFICIENT	CLMAXF=	1.285234
FLAP LIFT COEFFICIENT INCREMENT	DELCLF=	.1807133
GROUND ROTATION WING LIFT COEFFICIENT	CLU =	.8808903
GROUND ROTATION WING PLUS FLAP LIFT COEFFICIENT	CLUF =	1.061604
GROUND ROLL LIFT COEFFICIENT	CLG =	-.2335179E-01
LIFT COEFFICIENT AT OBSTACLE	CL50 =	.8768546
GROUND ROLL DRAG COEFFICIENT	CDG =	.2063179E-01
GROUND ROTATION DRAG COEFFICIENT	CDU =	.1964757
DRAG COEFFICIENT AT OBSTACLE	CD50 =	.1351084
GROUND ROTATION BODY ANGLE (DEG)	AU =	19.33206
ANG. OF ATTACK FOR MAXIMUM LIFT COEFF (DEG)	AMMAX =	23.36217
POWER OFF STALL SPEED (KNOTS)	VSTAL =	138.2509
FLIGHT SPEED CORRESPONDING TO CLUF (KNOTS)	VU =	152.1171
FLIGHT SPEED AT OBSTACLE (KNOTS)	V50 =	167.3288
GROUND ROLL DISTANCE (FT)	XG =	2485.358
TAKE-OFF DISTANCE OVER OBSTACLE (FT)	X50 =	3449.222
GROUND ROLL TIME (SEC)	TG =	19.34799
TAKE-OFF TIME (SEC)	T50 =	23.09974
FUEL USED FOR TAKE-OFF (LB)	DELW =	4241.262
WEIGHT AT OBSTACLE (LB)	W50 =	745211.1
RATE OF CLIMB AT OBSTACLE (FPS)	ROC =	83.85104
FLIGHT PATH ANGLE AT OBSTACLE (DEG)	GAM50 =	17.25843

3. ****** XCLECT END OPTION 17 ******
WT = .74521E+06 H = 50.000 AM = .25313

TIME = 0. RANGE = 0. FUEL = 0.

+++ +++

CUMULATIVE CPU TIME = 4.5270 CPU TIME USED IN PREVIOUS TASK = .1088

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION

TEST PROBLEM NO. 1
..... TOTAL RANGE TO BE DETERMINED. ITERATE TO FIND WEIGHT AT END OF
..... CRUISE. NO IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZO	NET THRUST	SFC
0.000	0.	745211.	0.	50.	.253	167.	9.23	347137.6	1.9507
.053	.14936	744613.	597.8	197.	.265	175.	9.36	347595.2	1.9456
.102	.29437	744059.	1152.	345.	.278	183.	9.59	348589.6	1.9378
.148	.43651	743540.	1671.	492.	.290	191.	9.75	349251.9	1.9320
.192	.57682	743049.	2162.	640.	.303	200.	9.84	349522.4	1.9282
.234	.71634	742580.	2631.	788.	.315	208.	9.87	349001.3	1.9267
.274	.85578	742131.	3080.	935.	.327	216.	9.86	348375.9	1.9260
.313	.99558	741698.	3513.	1082.	.340	224.	9.82	347669.3	1.9260
.350	1.1361	741279.	3932.	1230.	.352	232.	9.76	346898.0	1.9264
.387	1.2775	740872.	4339.	1377.	.364	240.	9.69	346117.0	1.9271
.422	1.4202	740476.	4735.	1525.	.377	248.	9.61	345343.5	1.9280
.457	1.5643	740090.	5121.	1672.	.389	256.	9.51	344589.9	1.9289
.491	1.7098	739712.	5499.	1820.	.401	264.	9.41	343901.7	1.9298
.525	1.8569	739343.	5869.	1967.	.414	272.	9.32	343550.6	1.9301
.558	2.0056	738980.	6231.	2115.	.426	280.	9.22	343245.0	1.9304
.590	2.1559	738624.	6587.	2262.	.438	287.	9.12	343005.1	1.9305
.622	2.3080	738275.	6936.	2410.	.451	295.	9.02	342837.7	1.9304
.653	2.4617	737931.	7281.	2557.	.463	303.	8.91	342702.2	1.9300
.684	2.6174	737592.	7619.	2705.	.475	311.	8.81	342610.6	1.9297
.714	2.7749	737257.	7954.	2852.	.488	319.	8.70	342577.5	1.9293
.744	2.9343	736928.	8283.	3000.	.500	327.	8.65	342603.6	1.9287

4. ****** XCLECT END OPTION 1 ******
WT = .73693E+06 H = 3000.0 AM = .50000

TIME = .83333E-01 RANGE = 0. FUEL = 4788.9

+++ +++

CUMULATIVE CPU TIME = 5.6310 CPU TIME USED IN PREVIOUS TASK = 1.1040

PGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
31	.7369E+06	3000.	.5000	.1240E-01	8283.	2.934	1.000	-0.	0.	1

UNPACK 41 51100 5 1 1 0 0. 1

.60000	5000.0	0.	4.0000	0.	51100	0.	1	0.		1111112111

TEST PROBLEM NO. 1
..... TOTAL RANGE TO BE DETERMINED. ITERATE TO FIND WEIGHT AT END OF
..... CRUISE. NO IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZO	NET THRUST	SFC
0.000	0.	736928.	0.	3000.	.500	327.	11.51	342623.7	1.9286
.015	.80803E-01	736762.	165.7	3100.	.505	330.	11.48	342316.8	1.9282
.030	.16200	736597.	330.4	3200.	.510	333.	11.42	342000.6	1.9279
.045	.24359	736434.	494.2	3300.	.515	337.	11.37	341697.6	1.9276
.060	.32558	736271.	657.0	3400.	.520	340.	11.32	341407.5	1.9272
.075	.40796	736109.	818.8	3500.	.525	343.	11.26	341130.2	1.9268
.089	.49074	735948.	979.8	3600.	.530	346.	11.21	340865.6	1.9264
.104	.57391	735788.	1140.	3700.	.535	349.	11.16	340613.7	1.9259
.118	.65748	735628.	1299.	3800.	.540	352.	11.11	340374.5	1.9254
.133	.74144	735470.	1458.	3900.	.545	355.	11.06	340121.7	1.9249
.147	.82582	735313.	1615.	4000.	.550	359.	11.00	339868.0	1.9244
.162	.91059	735156.	1772.	4100.	.555	362.	10.95	339642.7	1.9238
.176	.99577	735000.	1928.	4200.	.560	365.	10.90	339430.1	1.9232
.190	1.0814	734845.	2083.	4300.	.565	368.	10.85	339230.2	1.9226
.205	1.1673	734690.	2238.	4400.	.570	371.	10.80	339043.0	1.9219
.219	1.2537	734536.	2391.	4500.	.575	374.	10.76	338868.3	1.9212
.233	1.3405	734383.	2544.	4600.	.580	377.	10.71	338706.1	1.9204
.247	1.4277	734231.	2696.	4700.	.585	380.	10.66	338556.3	1.9196
.261	1.5152	734080.	2848.	4800.	.590	384.	10.61	338418.9	1.9188
.275	1.6032	733929.	2999.	4900.	.595	387.	10.57	338293.8	1.9179
.289	1.6916	733779.	3149.	5000.	.600	390.	10.54	338180.9	1.9170

5. ****** XCLECT END OPTION 1 ******
WT = .73378E+06 H = 5000.0 AM = .60000
TIME = .957315-01 RANGE = 2.9343 FUEL = 8283.4

+++ +++

CUMULATIVE CPU TIME = 6.6270 CPU TIME USED IN PREVIOUS TASK = .99600

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
41	.7338E+06	5000.	.6000	.4813E-02	3149.	1.692	1.000	-0.	0.	1

UNPACK 51 51100 5 1 1 0 0. 1
.60000 21500. 0. 4.0000 0. 51100 0. 1 0. 1111112111

TEST PROBLEM NO. 1
..... TOTAL RANGE TO BE DETERMINED. ITERATE TO FIND WEIGHT AT END OF
..... CRUISE. NO IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZD	NET THRUST	SFC
0.000	0.	733779.	0.	5000.	.600	390.	17.94	338171.4	1.9170
.067	.41921	733057.	721.4	5825.	.610	395.	17.74	332424.2	1.9154
.135	.84837	732343.	1436.	6650.	.620	400.	17.36	326915.6	1.9135
.204	1.2877	731636.	2143.	7475.	.630	406.	16.98	321306.0	1.9118
.273	1.7374	730935.	2843.	8300.	.640	411.	16.61	315867.4	1.9097
.342	2.1976	730241.	3537.	9125.	.650	416.	16.25	310538.7	1.9074
.413	2.6683	729554.	4224.	9950.	.660	421.	15.91	305485.3	1.9048
.483	3.1498	728873.	4905.	10775.	.670	426.	15.57	300418.3	1.9031
.555	3.6423	728198.	5581.	11600.	.680	431.	15.24	295370.3	1.9014
.627	4.1461	727528.	6250.	12425.	.690	436.	14.90	290353.2	1.8995
.700	4.6622	726864.	6915.	13250.	.700	441.	14.56	284999.6	1.8979
.774	5.1913	726204.	7574.	14075.	.710	446.	14.21	279712.9	1.8962
.849	5.7339	725549.	8229.	14900.	.720	451.	13.88	274568.0	1.8943
.925	6.2901	724899.	8880.	15725.	.730	456.	13.55	269475.0	1.8923
1.001	6.8604	724253.	9526.	16550.	.740	461.	13.22	264486.6	1.8901
1.079	7.4458	723611.	.1017E+05	17375.	.750	465.	12.89	259162.4	1.8880
1.158	8.0473	722973.	.1081E+05	18200.	.760	470.	12.54	253907.3	1.8794
1.239	8.6658	722342.	.1144E+05	19025.	.770	475.	12.21	248744.6	1.8698
1.321	9.3014	721716.	.1206E+05	19850.	.780	479.	11.89	243726.2	1.8600
1.404	9.9548	721095.	.1268E+05	20675.	.790	484.	11.58	238825.4	1.8501
1.488	10.627	720480.	.1330E+05	21500.	.800	488.	11.42	233897.4	1.8403

6. ****** XCLECT END OPTION 1 ******
WT = .72048E+06 H = 21500. AM = .80000

TIME = .10054 RANGE = 4.6258 FUEL = 3149.1

+++ +++

CUMULATIVE CPU TIME = 7.7150 CPU TIME USED IN PREVIOUS TASK = 1.0880

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
51	.7205E+06	.2150E+05	.8000	.2481E-01	.1330E+05	10.63	1.000	-0.	0.	1

UNPACK 61 51100 5 1 1 0 0. 1
.95000 29000. 0. 4.0000 0. 51100 0. 1 0. 1111112111

TEST PROBLEM NO. 1
..... TOTAL RANGE TO BE DETERMINED. ITERATE TO FIND WEIGHT AT END OF
..... CRUISE. NO IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZO	NET THRUST	SFC
0.000	0.	720480.	0.	21500.	.800	488.	9.54	233882.0	1.8404
.046	.36690	720155.	325.3	21875.	.807	492.	9.48	232406.1	1.8362
.091	.73884	719831.	649.7	22250.	.815	496.	9.35	230972.9	1.8324
.137	1.1162	719507.	973.2	22625.	.822	500.	9.22	229241.5	1.8292
.184	1.4992	719184.	1296.	23000.	.830	503.	9.08	227652.0	1.8260
.231	1.8878	718862.	1618.	23375.	.837	507.	8.95	226104.2	1.8228
.278	2.2821	718540.	1940.	23750.	.845	511.	8.82	224515.9	1.8196
.325	2.6824	718219.	2261.	24125.	.852	515.	8.69	222933.2	1.8164
.373	3.0888	717898.	2582.	24500.	.860	518.	8.57	221390.9	1.8131
.421	3.5012	717578.	2903.	24875.	.867	522.	8.44	219894.8	1.8097
.469	3.9199	717258.	3223.	25250.	.875	526.	8.32	218390.3	1.8063
.518	4.3448	716938.	3542.	25625.	.882	529.	8.20	216921.4	1.8029
.567	4.7761	716619.	3862.	26000.	.890	533.	8.08	215491.1	1.7994
.617	5.2139	716300.	4181.	26375.	.897	537.	7.96	214075.9	1.7958
.667	5.6586	715981.	4500.	26750.	.905	540.	7.83	212585.2	1.7924
.717	6.1114	715661.	4819.	27125.	.912	544.	7.69	211121.6	1.7890
.769	6.5725	715341.	5140.	27500.	.920	548.	7.55	209696.3	1.7855
.820	7.0420	715019.	5461.	27875.	.927	551.	7.42	208275.5	1.7820
.873	7.5203	714697.	5783.	28250.	.935	555.	7.28	206851.7	1.7785
.926	8.0076	714374.	6107.	28625.	.942	558.	7.15	205465.1	1.7749
.979	8.5039	714050.	6431.	29000.	.950	562.	7.08	204115.4	1.7712

7. ****** XCLECT END OPTION 1 ******
WT = .71405E+06 H = 29000. AM = .95000

TIME = .12535 RANGE = 15.252 FUEL = 13298.

+++ +++

CUMULATIVE CPU TIME = 8.7230 CPU TIME USED IN PREVIOUS TASK = 1.0080

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
61	.7140E+06	.2900E+05	.9500	.1632E-01	6471.	8.504	1.000	-0.	0.	1

UNPACK 71 51100 5 1 1 0 0. 1
1.5000 40500. 0. 4.0000 0. 51100 0. 1 0. 1111112111

TEST PROBLEM NO. 1
..... TOTAL RANGE TO BE DETERMINED. ITERATE TO FIND WEIGHT AT END OF
..... CRUISE. NO IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZO	NET THRUST	SFC
0.000	0.	714050.	0.	29000.	.950	562.	4.78	204112.1	1.7712
.130	1.2333	713262.	787.9	29575.	.977	577.	4.28	205591.9	1.7697
.264	2.5287	712450.	1690.	30150.	1.005	592.	4.09	205734.2	1.7808
.400	3.8803	711617.	2432.	30725.	1.032	606.	3.93	200203.5	1.8451
.537	5.2827	710768.	3282.	31300.	1.060	621.	3.80	194809.0	1.9121
.676	6.7312	709903.	4147.	31875.	1.087	635.	3.67	189686.5	1.9803
.816	8.2312	709021.	5029.	32450.	1.115	650.	3.70	184648.5	2.0506
.947	9.6575	708193.	5856.	33025.	1.142	664.	3.80	196749.5	1.9405
1.074	11.075	707382.	6668.	33600.	1.170	678.	3.77	195546.6	1.9673
1.201	12.531	706561.	7488.	34175.	1.197	692.	3.66	193674.9	1.9919
1.330	14.029	705733.	8317.	34750.	1.225	706.	3.57	191834.7	2.0145
1.460	15.567	704898.	9152.	35325.	1.252	720.	3.48	190174.9	2.0353
1.590	17.141	704057.	9992.	35900.	1.280	734.	3.29	188727.7	2.0541
1.730	18.867	703156.	.1089E+05	36475.	1.307	749.	3.01	185675.2	2.0770
1.877	20.721	702215.	.1183E+05	37050.	1.335	765.	2.97	181349.5	2.1052
2.016	22.509	701335.	.1271E+05	37625.	1.362	781.	3.05	191748.5	1.9699
2.150	24.270	700496.	.1355E+05	38200.	1.390	797.	3.05	191585.8	1.9508
2.284	26.063	699666.	.1438E+05	38775.	1.417	813.	2.98	190555.1	1.9387
2.419	27.908	698840.	.1521E+05	39350.	1.445	828.	2.89	188964.2	1.9301
2.556	29.811	698014.	.1604E+05	39925.	1.472	844.	2.80	187176.1	1.9234
2.694	31.779	697187.	.1686E+05	40500.	1.500	860.	2.75	185105.3	1.9190

8. ****** XCLECT END OPTION 1 ******
WT = .69719E+06 H = 40500. AM = 1.5000

TIME = .14167 RANGE = 23.756 FUEL = 6430.8

*** ***

CUMULATIVE CPU TIME = 10.175 CPU TIME USED IN PREVIOUS TASK = 1.4520

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
71	.6972E+06	.4050E+05	1.500	.4491E-01	.1686E+05	31.78	1.000	-0.	0.	1

UNPACK 81 51100 5 1 1 0 0. 1
2.6000 52971. 0. 4.0000 0. 51100 0. 1 0. 1111112111

TEST PROBLEM NO. 1
..... TOTAL RANGE TO BE DETERMINED. ITERATE TO FIND WEIGHT AT END OF
..... CRUISE. NO IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMMA	NET THRUST	SFC
0.000	0.	697187.	0.	40500.	1.500	860.	1.68	185148.0	1.9185
.239	3.4877	695775.	1412.	41124.	1.555	891.	1.65	184734.1	1.9129
.480	7.1287	694360.	2827.	41747.	1.610	923.	1.59	184377.0	1.9072
.720	10.874	692951.	4236.	42371.	1.665	954.	1.60	190274.9	1.8891
.943	14.482	691600.	5587.	42994.	1.720	986.	1.62	194329.5	1.8763
1.160	18.113	690269.	6918.	43618.	1.775	1017.	1.61	197434.8	1.8687
1.373	21.770	688956.	8231.	44241.	1.830	1049.	1.60	199942.3	1.8643
1.581	25.462	687657.	9530.	44865.	1.885	1080.	1.58	202144.2	1.8607
1.785	29.187	686372.	.1082E+05	45488.	1.940	1112.	1.57	204483.9	1.8607
1.985	32.937	685099.	.1209E+05	46112.	1.995	1144.	1.56	206669.1	1.8610
2.181	36.721	683837.	.1335E+05	46735.	2.050	1175.	1.54	208598.2	1.8622
2.374	40.555	682581.	.1461E+05	47359.	2.105	1207.	1.52	209667.4	1.8673
2.564	44.432	681331.	.1586E+05	47983.	2.160	1238.	1.51	211939.6	1.8717
2.750	48.316	680093.	.1709E+05	48606.	2.215	1270.	1.51	214557.2	1.8750
2.932	52.206	678867.	.1832E+05	49230.	2.270	1301.	1.51	216849.4	1.8791
3.110	56.110	677651.	.1954E+05	49853.	2.325	1333.	1.51	219085.8	1.8863
3.283	60.011	676445.	.2074E+05	50477.	2.380	1364.	1.51	221737.6	1.8931
3.453	63.909	675250.	.2194E+05	51100.	2.435	1396.	1.51	224012.5	1.9012
3.619	67.810	674065.	.2312E+05	51724.	2.490	1427.	1.50	226105.6	1.9082
3.782	71.724	672887.	.2430E+05	52347.	2.545	1459.	1.50	227836.6	1.9156
3.942	75.660	671715.	.2547E+05	52971.	2.600	1490.	1.49	229930.1	1.9229

9. ****** XCLECT END OPTION 1 ******
WT = .671715E+06 H = 52971. AM = 2.6000

TIME = .18658 RANGE = 55.535 FUEL = 16863.

+++ +++

CUMULATIVE CPU TIME = 12.051 CPU TIME USED IN PREVIOUS TASK = 1.8760

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
81	.6717E+06	.5297E+05	2.600	.6570E-01	.2547E+05	75.66	1.000	-0.	0.	1

UNPACK 91 51100 5 1 1 0 0. 1

2.9000	57540.	0.	5.0000	0.	51100	0.	1	0.		1111112111

TEST PROBLEM NO. 1
..... TOTAL RANGE TO BE DETERMINED. ITERATE TO FIND WEIGHT AT END OF
..... CRUISE. NO IN-FLIGHT ENGINE SCALING REQUESTED.

CONSTANT DYNAMIC PRESSURE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZO	NET THRUST	SFC
0.000	0.	671715.	0.	52971.	2.600	1490.	2.19	229971.9	1.9225
.040	.98377	671423.	291.2	53199.	2.613	1498.	2.08	229538.9	1.9244
.083	2.0763	671102.	612.9	53428.	2.627	1506.	1.96	229308.5	1.9281
.127	3.1793	670779.	936.1	53656.	2.642	1514.	1.94	229166.3	1.9294
.171	4.2921	670454.	1260.	53885.	2.656	1522.	1.92	229041.5	1.9310
.215	5.4154	670129.	1586.	54113.	2.671	1531.	1.91	228849.2	1.9330
.260	6.5493	669802.	1913.	54342.	2.685	1539.	1.89	228640.9	1.9363
.304	7.6943	669473.	2241.	54570.	2.700	1548.	1.87	228413.5	1.9381
.349	8.8507	669143.	2572.	54799.	2.715	1556.	1.85	228106.9	1.9415
.394	10.018	668812.	2903.	55027.	2.730	1565.	1.83	228012.0	1.9419
.439	11.197	668479.	3236.	55255.	2.745	1573.	1.82	227717.3	1.9446
.484	12.388	668144.	3570.	55484.	2.760	1582.	1.80	227372.0	1.9476
.530	13.591	667808.	3906.	55712.	2.775	1591.	1.78	227059.5	1.9506
.575	14.808	667470.	4244.	55941.	2.791	1600.	1.76	226702.7	1.9536
.622	16.038	667131.	4584.	56169.	2.806	1608.	1.74	226353.0	1.9567
.668	17.280	666789.	4925.	56398.	2.821	1617.	1.72	226087.2	1.9598
.714	18.535	666446.	5269.	56626.	2.837	1626.	1.71	225917.5	1.9630
.761	19.803	666101.	5614.	56855.	2.853	1635.	1.69	225558.8	1.9662
.808	21.084	665755.	5960.	57083.	2.869	1644.	1.67	225297.0	1.9695
.855	22.378	665406.	6309.	57312.	2.884	1653.	1.65	224992.3	1.9730
.902	23.685	665056.	6659.	57540.	2.900	1662.	1.65	224662.7	1.9766

10. ****** xCLECT END OPTION 1 ******
WT = .66506E+06 H = 57540. AM = 2.9000

TIME = .25227 RANGE = 131.20 FUEL = 25472.

*** ***

CUMULATIVE CPU TIME = 13.505 CPU TIME USED IN PREVIOUS TASK = 1.4540

RGSAVE

ITZ	WT	H	AM	TAC***	FUEL	PUN***	XNZZ	E10	C11	OPTION
91	.6651E+06	.5754E+05	2.900	.1504E-01	6659.	23.69	1.000	-0.	0.	1

UNPACK 101 51100 5 1 1 0 0. 1

3.0000	65932.	0.	4.0000	0.	51100	0.	1	0.		1111112111

TEST PROBLEM NO. 1
..... TOTAL RANGE TO BE DETERMINED. ITERATE TO FIND WEIGHT AT END OF
..... CRUISE. NO IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZD	NET THRUST	SFC
0.000	0.	665056.	0.	57540.	2.900	1662.	5.57	224661.8	1.9766
.026	.70816	664867.	188.4	57960.	2.905	1665.	5.50	220817.5	1.9780
.052	1.4349	664678.	378.1	58379.	2.910	1668.	5.36	216995.1	1.9801
.079	2.1804	664487.	569.2	58799.	2.915	1671.	5.22	213355.1	1.9799
.106	2.9458	664294.	761.7	59218.	2.920	1674.	5.08	209642.1	1.9819
.135	3.7322	664100.	955.9	59638.	2.925	1677.	4.95	205978.6	1.9839
.164	4.5406	663904.	1152.	60058.	2.930	1679.	4.81	202389.6	1.9859
.193	5.3718	663706.	1350.	60477.	2.935	1682.	4.68	198863.9	1.9880
.224	6.2268	663506.	1549.	60897.	2.940	1685.	4.55	195384.8	1.9901
.255	7.1070	663305.	1751.	61316.	2.945	1688.	4.42	191952.0	1.9922
.288	8.0135	663100.	1955.	61736.	2.950	1691.	4.29	188567.5	1.9944
.321	8.9477	662894.	2162.	62156.	2.955	1694.	4.16	185270.1	1.9965
.355	9.9107	662685.	2371.	62575.	2.960	1697.	4.04	182016.1	1.9988
.390	10.904	662473.	2582.	62995.	2.965	1700.	3.91	178805.2	2.0010
.427	11.930	662259.	2797.	63414.	2.970	1702.	3.79	175636.9	2.0033
.464	12.990	662041.	3014.	63834.	2.975	1705.	3.66	172532.4	2.0056
.503	14.086	661821.	3235.	64254.	2.980	1708.	3.54	169488.1	2.0080
.542	15.219	661597.	3459.	64673.	2.985	1711.	3.42	166483.8	2.0103
.584	16.393	661369.	3687.	65093.	2.990	1714.	3.30	163519.1	2.0128
.626	17.610	661137.	3919.	65512.	2.995	1717.	3.09	160595.4	2.0153
.673	18.959	660884.	4171.	65932.	3.000	1720.	2.93	157688.4	2.0179

11. ****** XCLECT END OPTION 1 ******
WT = .66088E+06 H = 65932. AM = 3.0000

TIME = .26731 RANGE = 154.88 FUEL = 6659.8

+++ +++

CUMULATIVE CPU TIME = 15.383 CPU TIME USED IN PREVIOUS TASK = 1.8780

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
101	.6609E+06	.6593E+05	3.000	.1122E-01	4171.	18.96	1.000	-0.	0.	1

UNPACK 111 51010 5 1 0 10 10. 6
0. 0. .50000E+06 0. 0. 51010 1.0000 6 0. 1111112111

TEST PROBLEM NO. 1
..... TOTAL RANGE TO BE DETERMINED. ITERATE TO FIND WEIGHT AT END OF
..... CRUISE. NO IN-FLIGHT ENGINE SCALING REQUESTED.

SEARCH FOR MACH ALTITUDE POINT ALONG A CONSTANT ENERGY LINE

THE BASIS FOR SELECTION OF EACH MACH ALTITUDE POINT WAS MAXIMUM LIFT/DRAG

CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZD	NET THRUST	SFC
0.000	0.	500000.	0.	65932.	2.609	1496.	4.78	-13091.32	-.18311
.271	6.5773	499990.	9.573	69276.	2.468	1418.	-.35	-11818.71	-.15816
.486	11.610	499984.	16.33	66336.	2.420	1388.	-5.51	-13129.87	-.14905
.704	16.598	499976.	23.94	63397.	2.367	1357.	1.73	-13521.63	-.16034
1.048	23.952	499966.	34.04	70476.	2.150	1236.	2.01	-11651.56	-.11443
1.367	30.431	499958.	41.51	67049.	2.102	1206.	-4.93	-13254.54	-.11232
1.699	37.015	499950.	50.41	63622.	2.050	1175.	-4.91	-13742.23	-.12371
2.038	43.551	499939.	60.71	60196.	1.994	1143.	.13	-14383.08	-.13380
2.447	50.945	499928.	72.05	64283.	1.798	1030.	-.52	-12990.39	-.10789
2.793	56.792	499919.	80.53	60402.	1.743	999.	-6.23	-15109.21	-.10295
3.150	62.637	499909.	90.61	56522.	1.686	966.	-1.98	-16129.08	-.10962
3.646	70.181	499896.	104.3	58339.	1.502	861.	-1.81	-16076.21	-.94535E-01
4.135	77.041	499882.	117.8	54039.	1.445	828.	-2.82	-21268.67	-.84279E-01
4.645	83.652	499868.	132.4	54207.	1.271	729.	-3.25	-21713.61	-.73840E-01
5.195	90.174	499852.	148.3	49521.	1.215	696.	-6.47	-16954.70	-.10944
5.823	97.275	499831.	169.4	44834.	1.156	663.	-2.56	-9443.320	-.22674
6.792	106.72	499802.	198.3	45904.	.895	513.	-1.82	900.1037	1.6261
8.087	117.45	499767.	232.9	40546.	.841	482.	-4.48	1084.707	1.6119
9.616	129.28	499718.	282.3	35187.	.780	449.	-4.67	1315.969	1.6050
11.365	142.48	499643.	357.2	28052.	.774	459.	-4.29	1762.789	1.7231
13.232	156.08	499540.	460.0	23013.	.686	416.	-2.46	1988.303	1.7843
15.794	175.75	496480.	3520.	20000.	.800	491.	-1.44	48121.05	1.6520

13. ****** XCLECT END OPTION 1 ******
WT = .49648E+06 H = 20000. AM = .80000

TIME = 1.5255 RANGE = 2174.4 FUEL = .16068E+06

+++ +++

CUMULATIVE CPU TIME = 21.489 CPU TIME USED IN PREVIOUS TASK = 5.7560

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
121	.4965E+06	.2000E+05	.8000	.2632	3520.	175.8	1.000	-0.	0.	1

UNPACK 131 51010 5 1 0 10 10. 17
0. 0. 0. 5.0000 1.0000 51010 2.0000 17 0. 1111112111

TEST PROBLEM NO. 1
..... TOTAL RANGE TO BE DETERMINED. ITERATE TO FIND WEIGHT AT END OF
..... CRUISE. NO IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZD	NET THRUST	SFC
0.000	0.	489956.	0.	20000.	.800	491.	26.20	247194.9	1.8605
.057	.41786	489530.	425.4	21250.	.800	489.	25.50	236255.2	1.8425
.117	.86268	489105.	850.9	22500.	.800	486.	24.13	225424.3	1.8246
.181	1.3367	488679.	1277.	23750.	.800	484.	22.79	214995.3	1.8068
.249	1.8421	488252.	1704.	25000.	.800	481.	21.50	204836.1	1.7892
.321	2.3815	487824.	2132.	26250.	.800	479.	20.25	195172.3	1.7713
.398	2.9576	487394.	2561.	27500.	.800	476.	19.05	185733.5	1.7504
.480	3.5736	486963.	2992.	28750.	.800	474.	17.89	176794.7	1.7293
.568	4.2330	486530.	3426.	30000.	.800	471.	16.76	168152.8	1.7084
.662	4.9405	486093.	3862.	31250.	.800	469.	15.66	159820.3	1.6876
.763	5.7014	485653.	4303.	32500.	.800	466.	14.59	151831.9	1.6668
.872	6.5219	485207.	4749.	33750.	.800	463.	13.55	144161.3	1.6461
.991	7.4096	484754.	5202.	35000.	.800	461.	12.40	136784.8	1.6255
1.123	8.3979	484281.	5674.	36250.	.800	459.	10.89	129607.8	1.6067
1.277	9.5616	483760.	6195.	37500.	.800	459.	9.54	122037.0	1.6072
1.448	10.851	483218.	6737.	38750.	.800	459.	8.60	114906.4	1.6078
1.638	12.289	482650.	7305.	40000.	.800	459.	7.69	108188.2	1.6084
1.852	13.907	482050.	7906.	41250.	.800	459.	6.81	101858.1	1.6091
2.094	15.747	481408.	8548.	42500.	.800	459.	5.96	95893.42	1.6099
2.373	17.867	480712.	9244.	43750.	.800	459.	5.13	90272.81	1.6108
2.699	20.357	479943.	.1001E+05	45000.	.800	459.	4.72	84976.00	1.6119

15. ****** XCLECT END OPTION 1 ******
WT = .47994E+06 H = 45000. AM = .80000

TIME = 1.8721 RANGE = 2350.1 FUEL = 6524.1

+++ +++

CUMULATIVE CPU TIME = 22.593 CPU TIME USED IN PREVIOUS TASK = 1.0660

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
141	.4799E+06	.4500E+05	.8000	.4499E-01	.1001E+05	20.36	1.000	-0.	0.	1

UNPACK 151 51010 5 1 0 10 10. 7

0.	0.	0.	1.0000	200.00	51010	0.	7	0.	1111112111

TEST PROBLEM NO. 1
..... TOTAL RANGE TO BE DETERMINED. ITERATE TO FIND WEIGHT AT END OF
..... CRUISE. NO IN-FLIGHT ENGINE SCALING REQUESTED.

SEARCH FOR MACH ALTITUDE POINT ALONG A CONSTANT ENERGY LINE

THE BASIS FOR SELECTION OF EACH MACH ALTITUDE POINT WAS MAXIMUM LIFT/DRAG

CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZD	NET THRUST	SFC
0.000	0.	454379.	0.	45000.	.800	459.	-15.13	850.9509	1.6022
.208	1.5979	454374.	5.087	42373.	.860	493.	-9.64	981.5631	1.6129
.470	3.7320	454367.	12.46	41431.	.850	487.	-4.12	1064.262	1.6127
.739	5.8999	454359.	20.29	40488.	.841	482.	-4.06	1102.542	1.6096
1.015	8.1024	454351.	28.61	39546.	.831	476.	-3.99	1142.424	1.6062
1.300	10.341	454342.	37.45	38604.	.821	470.	-3.93	1183.686	1.6029
1.592	12.615	454333.	46.86	37662.	.811	465.	-3.87	1226.131	1.5997
1.894	14.928	454323.	56.87	36719.	.800	459.	-3.80	1269.194	1.5976
2.204	17.280	454312.	67.54	35777.	.789	453.	-3.77	1309.745	1.6013
2.518	19.630	454301.	78.71	34835.	.775	447.	-3.77	1345.125	1.6136
2.838	21.989	454289.	90.47	33893.	.761	441.	-3.75	1380.382	1.6262
3.163	24.357	454277.	102.9	32950.	.748	435.	-3.74	1416.983	1.6384
3.494	26.734	454264.	115.9	32008.	.734	428.	-3.72	1454.606	1.6504
3.831	29.119	454250.	129.6	31066.	.720	422.	-3.71	1492.375	1.6626
4.175	31.512	454235.	144.1	30124.	.706	416.	-3.70	1531.616	1.6744
4.525	33.913	454220.	159.3	29182.	.692	409.	-3.69	1571.529	1.6861
4.882	36.321	454204.	175.3	28239.	.678	402.	-3.68	1611.857	1.6977
5.246	38.736	454187.	192.2	27297.	.664	396.	-3.67	1653.446	1.7092
5.617	41.158	454170.	209.9	26355.	.650	389.	-3.66	1695.306	1.7216
5.996	43.586	454151.	228.7	25413.	.636	382.	-3.65	1739.224	1.7339
6.383	46.021	454131.	248.5	24470.	.621	375.	-2.88	1784.413	1.7460
9.061	65.874	451238.	3141.	20000.	.800	491.	-2.12	44461.12	1.8522

17. ****** XCLECT END OPTION 1 ******
WT = .45124E+06 H = 20000. AM = .80000

TIME = 2.3532 RANGE = 2570.5 FUEL = 25564.

+++ +++

CUMULATIVE CPU TIME = 27.109 CPU TIME USED IN PREVIOUS TASK = 4.2040

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZ7	E10	E11	OPTION
161	.4512E+06	.2000E+05	.8000	.1510	3141.	65.87	1.000	-0.	0.	1

UNPACK 171 51010 5 1 0 10 10. 17
0. 0. 0. 5.0000 1.0000 51010 2.0000 17 0. 1111112111

TEST PROBLEM NO. 1
..... TOTAL RANGE TO BE DETERMINED. ITERATE TO FIND WEIGHT AT END OF
..... CRUISE. NO IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMMA	NET THRUST	SFC
0.000	0.	445340.	0.	20000.	.800	491.	-4.56	2475.204	1.8497
.241	1.9574	445321.	18.68	19050.	.790	487.	-4.58	2537.809	1.8612
.483	3.9049	445302.	37.99	18100.	.780	482.	-4.60	2601.151	1.8669
.726	5.8428	445282.	57.90	17150.	.770	478.	-4.62	2661.657	1.8693
.970	7.7715	445262.	78.37	16200.	.760	474.	-4.64	2722.129	1.8717
1.215	9.6913	445240.	99.44	15250.	.750	469.	-4.66	2783.769	1.8739
1.461	11.603	445219.	121.1	14300.	.740	465.	-4.68	2845.977	1.8761
1.709	13.506	445196.	143.4	13350.	.730	460.	-4.70	2906.636	1.8783
1.959	15.402	445174.	166.4	12400.	.720	455.	-4.72	2965.929	1.8805
2.210	17.291	445150.	190.0	11450.	.710	450.	-4.74	3025.236	1.8829
2.463	19.174	445126.	214.2	10500.	.700	446.	-4.75	3086.292	1.8848
2.718	21.051	445101.	239.2	9550.	.690	441.	-4.76	3148.432	1.8866
2.975	22.923	445075.	264.9	8600.	.680	436.	-4.78	3210.578	1.8885
3.234	24.790	445048.	291.4	7650.	.670	431.	-4.79	3274.035	1.8902
3.496	26.654	445021.	318.7	6700.	.660	426.	-4.80	3339.737	1.8914
3.761	28.515	444993.	346.8	5750.	.650	421.	-4.80	3402.415	1.8942
4.028	30.374	444964.	375.9	4800.	.640	416.	-4.81	3470.488	1.8962
4.299	32.232	444934.	405.8	3850.	.630	411.	-4.81	3539.349	1.8980
4.573	34.090	444903.	436.8	2900.	.620	406.	-4.81	3608.435	1.8999
4.850	35.948	444871.	468.9	1950.	.610	401.	-4.81	3678.557	1.9017
5.131	37.807	444838.	502.0	1000.	.600	395.	-4.80	3751.878	1.9028

19. ****** XCLECT END OPTION 1 ******
WT = .44484E+06 H = 1000.0 AM = .60000

TIME = 2.5876 RANGE = 2636.4 FUEL = 5898.5

+++ +++

CUMULATIVE CPU TIME = 28.089 CPU TIME USED IN PREVIOUS TASK = .94200

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
181	.4448E+06	1000.	.6000	.8552E-01	502.0	37.81	1.000	-0.	0.	1

UNPACK 191 5.010 5 1 0 10 10. 17
0. 360.00 1.8000 0. 0. 51010 3.0000 17 0. 1111112111

TEST PROBLEM NO. 1
..... TOTAL RANGE TO BE DETERMINED. ITERATE TO FIND WEIGHT AT END OF
..... CRUISE. NO IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMMA	NET THRUST	SFC
0.000	0.	442037.	0.	1000.	.600	395.	-.54	3751.885	1.9028
.129	.83484	442021.	15.29	952.	.580	382.	-.53	3724.531	1.9060
.264	1.6807	442006.	31.24	905.	.560	369.	-.53	3700.411	1.9084
.406	2.5356	441989.	47.86	857.	.540	356.	-.52	3677.515	1.9105
.553	3.3967	441972.	65.13	810.	.520	343.	-.52	3656.876	1.9119
.708	4.2607	441954.	83.06	763.	.500	330.	-.52	3638.091	1.9127
.868	5.1231	441935.	101.6	715.	.480	317.	-.52	3620.744	1.9131
1.034	5.9789	441916.	120.7	667.	.460	303.	-.53	3606.421	1.9128
1.204	6.8219	441897.	140.2	620.	.440	290.	-.54	3593.527	1.9120
1.378	7.6454	441877.	160.1	572.	.420	277.	-.55	3582.193	1.9107
1.555	8.4417	441857.	180.3	525.	.400	264.	-.58	3573.680	1.9088
1.732	9.2026	441836.	200.4	477.	.380	251.	-.61	3572.206	1.9053
1.909	9.9202	441816.	220.4	430.	.360	238.	-.65	3572.038	1.9015
2.082	10.587	441797.	240.0	382.	.340	224.	-.70	3573.528	1.8975
2.249	11.195	441778.	258.9	335.	.320	211.	-.78	3576.373	1.8932
2.409	11.740	441760.	276.9	288.	.300	198.	-.88	3579.880	1.8891
2.559	12.218	441743.	293.7	240.	.280	185.	-1.01	3570.410	1.8879
2.697	12.629	441728.	309.2	192.	.260	172.	-1.20	3560.294	1.8876
2.822	12.973	441714.	323.1	145.	.240	159.	-1.45	3551.454	1.8728
2.933	13.254	441701.	335.4	98.	.220	145.	-1.80	3534.820	1.8798
3.029	13.478	441691.	346.1	50.	.200	132.	-2.00	3508.998	1.8920

21. ****** XCLECT END OPTION 1 ******
WT = .44169E+06 H = 50.000 AM = .20000

TIME = 2.6973 RANGE = 2674.2 FUEL = 2801.1

+++ +++

CUMULATIVE CPU TIME = 29.053 CPU IME USED IN PREVIOUS TASK = .92200

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
201	.4417E+06	50.00	.2000	.5049E-01	346.1	13.48	1.000	-0.	0.	1

UNPACK 211 51210 5 1 2 10 10. 22

1.0000	1.0000	.42178E+06	12.000	21.000	51210	0.	22	2.0000	1111112111

TEST PROBLEM NO. 1
..... TOTAL RANGE TO BE DETERMINED. ITERATE TO FIND WEIGHT AT END OF
..... CRUISE. NO IN-FLIGHT ENGINE SCALING REQUESTED.

SEARCH FOR MACH ALTITUDE POINT ALONG A CONSTANT ENERGY LINE

THE BASIS FOR SELECTION OF EACH MACH ALTITUDE POINT WAS MAXIMUM LIFT/DRAG

CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZD	NET THRUST	SFC
0.000	0.	480089.	0.	65932.	2.557	1466.	2.27	-12682.36	-.18127
.296	7.0693	480079.	10.42	67635.	2.441	1401.	-1.51	-11574.06	-.16685
.515	12.135	480072.	17.73	64782.	2.392	1371.	2.46	-12936.64	-.16051
.829	18.905	480063.	26.49	72191.	2.173	1251.	2.68	-11113.29	-.11503
1.142	25.348	480056.	33.35	68865.	2.127	1222.	-4.81	-12615.45	-.11037
1.468	31.898	480048.	41.49	65539.	2.080	1192.	-4.78	-13038.40	-.12194
1.802	38.443	480038.	50.96	62213.	2.027	1162.	.77	-13581.65	-.13226
2.162	45.079	480029.	60.30	66681.	1.830	1049.	.15	-12202.91	-.10788
2.502	50.944	480021.	67.92	62915.	1.778	1019.	-6.03	-14135.73	-.10061
2.853	56.801	480012.	76.96	59148.	1.724	988.	-1.44	-14951.07	-.10947
3.277	63.440	480002.	87.52	61376.	1.540	883.	-1.25	-14351.36	-.95379E-01
3.757	70.357	479990.	99.24	57202.	1.487	852.	-2.43	-18754.93	-.84561E-01
4.271	77.235	479977.	112.1	57793.	1.312	752.	-3.07	-23380.03	-.59668E-01
4.773	83.377	479965.	124.7	53244.	1.260	722.	-6.76	-20593.84	-.79118E-01
5.326	89.873	479948.	141.3	48695.	1.205	691.	-6.31	-16502.84	-.11580
5.956	96.928	479926.	163.0	44146.	1.147	657.	-2.45	-8781.163	-.24995
6.908	106.14	479897.	192.0	45274.	.889	509.	-1.65	921.8345	1.6238
8.245	117.13	479861.	228.5	40073.	.836	479.	-4.27	1110.968	1.6094
9.797	129.08	479810.	279.4	34872.	.776	447.	-4.01	1334.769	1.6109
11.541	141.56	479741.	348.5	29671.	.699	412.	-4.56	1541.657	1.6780
13.287	153.57	479653.	436.1	23013.	.686	416.	-3.33	1942.289	1.7744
15.848	173.23	476664.	3426.	20000.	.800	491.	-1.44	47079.85	1.6565

24. ****** XCLECT END OPTION 1 ******
WT = .47666E+06 H = 20000. AM = .80000

TIME = 1.7123 RANGE = 2451.1 FUEL = .18080E+06

+++ +++

CUMULATIVE CPU TIME = 35.325 CPU TIME USED IN PREVIOUS TASK = 5.7600

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
121	.4767E+06	.2000E+05	.8000	.2641	3426.	173.2	1.000	-0.	0.	1

UNPACK 131 51010 5 1 0 10 10. 17
0. 0. 0. 5.0000 1.0000 51010 2.0000 17 0. 1111112111

TEST PROBLEM NO. 1
..... TOTAL RANGE TO BE DETERMINED. ITERATE TO FIND WEIGHT AT END OF
..... CRUISE. NO IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZD	NET THRUST	SFC
0.000	0.	470262.	0.	20000.	.800	491.	27.54	247204.2	1.8605
.054	.39423	469856.	406.2	21250.	.800	489.	26.81	236264.3	1.8424
.112	.81419	469450.	812.1	22500.	.800	486.	25.37	225434.3	1.8246
.173	1.2619	469044.	1218.	23750.	.800	484.	23.98	215006.2	1.8067
.238	1.7395	468637.	1625.	25000.	.800	481.	22.63	204848.1	1.7891
.306	2.2491	468229.	2032.	26250.	.800	479.	21.33	195185.2	1.7712
.379	2.7934	467821.	2441.	27500.	.800	476.	20.08	185747.6	1.7503
.457	3.3752	467411.	2851.	28750.	.800	474.	18.87	176809.9	1.7292
.541	3.9976	467000.	3262.	30000.	.800	471.	17.70	168169.3	1.7082
.630	4.6648	466586.	3676.	31250.	.800	469.	16.57	159838.2	1.6874
.726	5.3815	466169.	4092.	32500.	.800	466.	15.46	151851.3	1.6666
.829	6.1532	465748.	4514.	33750.	.800	463.	14.39	144182.2	1.6458
.940	6.9866	465322.	4940.	35000.	.800	461.	13.19	136807.4	1.6252
1.064	7.9123	464878.	5384.	36250.	.800	459.	11.61	129632.1	1.6064
1.209	8.9995	464390.	5872.	37500.	.800	459.	10.21	122063.0	1.6069
1.368	10.199	463885.	6377.	38750.	.800	459.	9.25	114934.3	1.6074
1.544	11.532	463358.	6904.	40000.	.800	459.	8.32	108217.9	1.6080
1.741	13.021	462804.	7458.	41250.	.800	459.	7.42	101889.9	1.6086
1.963	14.701	462217.	8045.	42500.	.800	459.	6.55	95927.33	1.6094
2.215	16.619	461587.	8675.	43750.	.800	459.	5.70	90308.92	1.6102
2.507	18.841	460900.	9362.	45000.	.800	459.	5.29	85014.39	1.6111

26. ****** XCLECT END OPTION 1 ******
WT = .46090E+06 H = 45000. AM = .80000

TIME = 2.0598 RANGE = 2624.3 FUEL = 6401.8

+++ +++

CUMULATIVE CPU TIME = 36.433 CPU TIME USED IN PREVIOUS TASK = 1.0640

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	F10	F11	OPTION
141	.4609E+06	.4500E+05	.8000	.4178E-01	9362.	18.84	1.000	-0.	0.	1

UNPACK	151	51010	5	1	0	10	10.	7		
0.	0.	0.	1.0000	200.00	51010	0.		7	0.	1111112111

TEST PROBLEM NO. 1
..... TOTAL RANGE TO BE DETERMINED. ITERATE TO FIND WEIGHT AT END OF
..... CRUISE. NO IN-FLIGHT ENGINE SCALING REQUESTED.

SEARCH FOR MACH ALTITUDE POINT ALONG A CONSTANT ENERGY LINE

THE BASIS FOR SELECTION OF EACH MACH ALTITUDE POINT WAS MAXIMUM LIFT/DRAG

CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZD	NET THRUST	SFC
0.000	0.	437108.	0.	45000.	.800	459.	-14.91	851.2951	1.6016
.211	1.6230	437103.	5.163	42373.	.860	493.	-9.51	981.8295	1.6125
.475	3.7765	437095.	12.60	41431.	.850	487.	-4.09	1064.466	1.6124
.747	5.9633	437087.	20.50	40488.	.841	482.	-4.02	1102.749	1.6093
1.025	8.1841	437079.	28.89	39546.	.831	476.	-3.96	1142.633	1.6059
1.312	10.440	437070.	37.80	38604.	.821	470.	-3.90	1183.899	1.6026
1.607	12.732	437061.	47.28	37662.	.811	465.	-3.84	1226.347	1.5995
1.910	15.062	437050.	57.37	36719.	.800	459.	-3.78	1269.413	1.5973
2.223	17.430	437040.	68.11	35777.	.780	453.	-3.75	1309.965	1.6010
2.539	19.795	437028.	79.35	34835.	.775	447.	-3.74	1345.346	1.6134
2.861	22.169	437017.	91.19	33893.	.761	441.	-3.73	1380.606	1.6259
3.188	24.552	437004.	103.6	32950.	.745	435.	-3.72	1417.211	1.6382
3.521	26.942	436991.	116.7	32008.	.734	428.	-3.70	1454.838	1.6502
3.860	29.340	436977.	130.5	31066.	.720	422.	-3.69	1492.613	1.6623
4.205	31.746	436963.	145.1	30124.	.706	416.	-3.68	1531.860	1.6741
4.557	34.159	436947.	160.4	29182.	.692	409.	-3.67	1571.779	1.6858
4.916	36.580	436931.	176.5	28239.	.678	402.	-3.66	1612.115	1.6975
5.282	39.007	436914.	193.4	27297.	.664	396.	-3.65	1653.713	1.7089
5.655	41.442	436897.	211.3	26355.	.650	389.	-3.64	1695.582	1.7213
6.036	43.884	436878.	230.1	25413.	.636	382.	-3.63	1739.511	1.7336
6.426	46.333	436858.	250.0	24470.	.621	375.	-2.87	1784.712	1.7457
9.102	66.173	434028.	3080.	20000.	.800	491.	-2.12	43575.45	1.6561

28. ****** XCLECT END OPTION 1 ******
WT = .43403E+06 H = 20000. AM = .80000

TIME = 2.5377 RANGE = 2843.1 FUEL = 23793.

+++ +++

CUMULATIVE CPU TIME = 40.987 CPU TIME USED IN PREVIOUS TASK = 4.2420

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
161	.4340E+06	.2000E+05	.8000	.1517	3080.	66.17	1.000	-0.	0.	1

UNPACK 171 51010 5 1 0 10 10. 17
0. 0. 0. 5.0000 1.0000 51010 2.0000 17 0. 1111112111

TEST PROBLEM NO. 1
..... TOTAL RANGE TO BE DETERMINED. ITERATE TO FIND WEIGHT AT END OF
..... CRUISE. NO IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZD	NET THRUST	SFC
0.000	.0.	428223.	0.	20000.	.800	491.	-4.66	2475.273	1.8497
.236	1.9169	428205.	18.29	19050.	.790	487.	-4.67	2537.879	1.8611
.473	3.8233	428186.	37.20	18100.	.780	482.	-4.70	2601.221	1.8669
.711	5.7197	428166.	56.68	17150.	.770	478.	-4.72	2661.727	1.8693
.949	7.6063	428146.	76.72	16200.	.760	474.	-4.75	2722.199	1.8717
1.189	9.4837	428126.	97.32	15250.	.750	469.	-4.77	2783.838	1.8739
1.430	11.352	428104.	118.5	14300.	.740	465.	-4.79	2846.047	1.8761
1.672	13.213	428083.	140.3	13350.	.730	460.	-4.81	2906.706	1.8783
1.916	15.065	428060.	162.8	12400.	.720	455.	-4.83	2965.998	1.8805
2.162	16.910	428037.	185.8	11450.	.710	450.	-4.85	3025.305	1.8828
2.409	18.749	428013.	209.5	10500.	.700	446.	-4.87	3086.361	1.8848
2.658	20.582	427989.	233.9	9550.	.690	441.	-4.88	3148.502	1.8866
2.909	22.409	427964.	259.0	8600.	.680	436.	-4.89	3210.649	1.8885
3.162	24.232	427938.	284.9	7650.	.670	431.	-4.90	3274.106	1.8901
3.417	26.051	427911.	311.5	6700.	.660	426.	-4.91	3339.809	1.8914
3.676	27.867	427884.	339.0	5750.	.650	421.	-4.92	3402.488	1.8942
3.937	29.681	427856.	367.3	4800.	.640	416.	-4.92	3470.562	1.8961
4.201	31.494	427826.	396.5	3850.	.630	411.	-4.93	3539.420	1.8980
4.468	33.306	427796.	426.8	2900.	.620	406.	-4.93	3608.511	1.8999
4.739	35.119	427765.	458.0	1950.	.610	401.	-4.93	3678.635	1.9016
5.013	36.933	427732.	490.4	1000.	.600	395.	-4.92	3751.957	1.9028

30. ****** XCLECT END OPTION 1 ******
WT = .42773E+06 H = 1000.0 AM = .60000

TIME = 2.7728 RANGE = 2909.3 FUEL = 5805.4

+++ +++

CUMULATIVE CPU TIME = 41.965 CPU TIME USED IN PREVIOUS TASK = .94000

RGSAVE

ITZ	WJ	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
181	.4277E+06	1000.	.6000	.8355E-01	490.4	36.93	1.000	-0.	0.	1

UNPACK 191 51010 5 1 0 10 10. 17
0. 360.00 1.8000 0. 0. 51010 3.0000 17 0. 1111112111

TEST PROBLEM NO. 1
..... TOTAL RANGE TO BE DETERMINED. ITERATE TO FIND WEIGHT AT END OF
..... CRUISE. NO IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZD	NET THRUST	SFC
0.000	0.	425009.	0.	1000.	.600	395.	-.55	3751.964	1.9028
.126	.81506	424994.	14.93	952.	.580	382.	-.55	3724.616	1.9060
.258	1.6424	424978.	30.53	905.	.560	369.	-.54	3700.512	1.9084
.397	2.4803	424962.	46.81	857.	.540	356.	-.53	3677.635	1.9104
.542	3.3262	424945.	63.79	810.	.520	343.	-.53	3657.019	1.9118
.694	4.1771	424927.	81.44	763.	.500	330.	-.53	3638.261	1.9126
.852	5.0289	424909.	99.75	715.	.480	317.	-.53	3620.948	1.9130
1.016	5.8769	424890.	118.7	667.	.460	303.	-.53	3606.668	1.9126
1.186	6.7153	424871.	138.1	620.	.440	290.	-.54	3593.826	1.9118
1.360	7.5372	424851.	158.0	572.	.420	277.	-.55	3582.559	1.9105
1.537	8.3353	424831.	178.1	525.	.400	264.	-.57	3574.131	1.9085
1.715	9.1012	424810.	198.4	477.	.380	251.	-.60	3572.771	1.9050
1.894	9.8266	424790.	218.6	430.	.360	238.	-.64	3572.751	1.9011
2.069	10.503	424770.	238.5	382.	.340	224.	-.69	3574.438	1.8970
2.240	11.124	424751.	257.8	335.	.320	211.	-.76	3577.549	1.8926
2.404	11.682	424732.	276.2	288.	.300	198.	-.86	3581.420	1.8883
2.558	12.173	424715.	293.6	240.	.280	185.	-.98	3572.453	1.8868
2.700	12.597	424699.	309.5	192.	.260	172.	-1.16	3563.052	1.8862
2.829	12.953	424685.	323.9	145.	.240	159.	-1.40	3555.260	1.8708
2.944	13.244	424672.	336.6	98.	.220	145.	-1.73	3540.196	1.8769
3.045	13.476	424661.	347.8	50.	.200	132.	-1.93	3516.812	1.8878

32. ****** XCLECT END OPTION 1 ******
WT = .42466E+06 H = 50.000 AM = .20000
TIME = 2.8805 RANGE = 2946.3 FUEL = 2723.8

*** ***

CUMULATIVE CPU TIME = 42.929 CPU TIME USED IN PREVIOUS TASK = .92200

RGSAVE

ITZ	WT	H	AM	TAC***	FUEL	RUN***	XNZZ	E10	E11	OPTION
201	.4247E+06	50.00	.2000	.5074E-01	347.8	13.48	1.000	-0.	0.	1

UNPACK 211 51210 5 1 2 10 10. 22
1.0000 1.0000 .42178E+06 12.000 21.000 51210 0. 22 2.0000 1111112111

TEST PROBLEM NO. 1
..... TOTAL RANGE TO BE DETERMINED. ITERATE TO FIND WEIGHT AT END OF
..... CRUISE. NO IN-FLIGHT ENGINE SCALING REQUESTED.

SEARCH FOR MACH ALTITUDE POINT ALONG A CONSTANT ENERGY LINE

THE BASIS FOR SELECTION OF EACH MACH ALTITUDE POINT WAS MAXIMUM LIFT/DRAG

CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZD	NET THRUST	SFC
0.000	0.	476721.	0.	65932.	2.548	1461.	1.91	-12613.29	-.18106
.295	7.0241	476711.	10.39	67358.	2.437	1398.	-1.70	-11623.93	-.16785
.512	12.037	476703.	17.72	64519.	2.388	1369.	2.37	-12908.46	-.16237
.830	18.881	476694.	26.69	71902.	2.169	1249.	2.62	-11073.74	-.11652
1.144	25.343	476687.	33.66	68593.	2.124	1220.	-4.79	-12574.19	-.11198
1.470	31.872	476679.	41.88	65284.	2.076	1190.	-4.76	-13006.06	-.12351
1.804	38.408	476670.	51.45	61975.	2.023	1159.	.79	-13559.14	-.13370
2.163	45.008	476660.	60.83	66430.	1.826	1048.	.14	-12172.89	-.10918
2.501	50.822	476653.	68.48	62683.	1.775	1018.	-6.03	-14101.39	-.10182
2.852	56.676	476643.	77.61	58936.	1.721	987.	-1.42	-14927.79	-.11058
3.275	63.284	476633.	88.23	61162.	1.538	881.	-1.23	-14334.70	-.96301E-01
3.756	70.202	476621.	100.1	57010.	1.484	851.	-2.41	-18739.12	-.85347E-01
4.268	77.041	476608.	113.0	57606.	1.310	751.	-3.04	-23333.65	-.60229E-01
4.771	83.183	476595.	125.7	53081.	1.258	721.	-6.73	-20539.18	-.79886E-01
5.324	89.672	476579.	142.3	48555.	1.203	690.	-6.29	-16416.62	-.11700
5.954	96.718	476557.	164.1	44030.	1.146	657.	-2.43	-8656.420	-.25462
6.903	105.89	476528.	193.1	45168.	.888	509.	-1.62	925.5566	1.6234
8.247	116.93	476491.	230.0	39993.	.835	479.	-4.23	1115.505	1.6089
9.807	128.91	476440.	281.3	34819.	.775	447.	-3.98	1337.978	1.6119
11.555	141.42	476370.	350.7	29645.	.699	412.	-4.54	1543.947	1.6786
13.301	153.42	476283.	438.4	23013.	.686	416.	-3.32	1944.245	1.7748
15.861	173.09	473305.	3416.	20000.	.800	491.	-1.44	46907.44	1.6572

35. ****** XCLECT END OPTION 1 ******
WT = .47331E+06 H = 20000. AM = .80000

TIME = 1.7448 RANGE = 2498.6 FUEL = .18416E+06

+++ +++

CUMULATIVE CPU TIME = 49.209 CPU TIME USED IN PREVIOUS TASK = 5.7660

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
121	.4733E+06	.2000E+05	.8000	.2644	3416.	173.1	1.000	-0.	0.	1

UNPACK 131 51010 5 1 0 10 10. 17
0. 0. 0. 5.0000 1.0000 51010 2.0000 17 0. 1111112111

TEST PROBLEM NO. 1
..... TOTAL RANGE TO BE DETERMINED. ITERATE TO FIND WEIGHT AT END OF
..... CRUISE. NO IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZD	NET THRUST	SFC
0.000	0.	466923.	0.	20000.	.800	491.	27.78	247205.7	1.8605
.054	.39023	466521.	402.9	21250.	.800	489.	27.05	236265.8	1.8424
.111	.80599	466118.	805.6	22500.	.800	486.	25.60	225435.9	1.8245
.172	1.2493	465715.	1208.	23750.	.800	484.	24.19	215008.0	1.8067
.236	1.7222	465312.	1612.	25000.	.800	481.	22.83	204850.0	1.7891
.304	2.2268	464908.	2016.	26250.	.800	479.	21.52	195187.4	1.7712
.376	2.7658	464503.	2421.	27500.	.800	476.	20.26	185749.9	1.7502
.454	3.3418	464097.	2827.	28750.	.800	474.	19.05	176812.4	1.7291
.536	3.9580	463689.	3235.	30000.	.800	471.	17.87	168172.1	1.7082
.624	4.6185	463279.	3644.	31250.	.800	469.	16.73	159841.2	1.6874
.719	5.3278	462866.	4057.	32500.	.800	466.	15.62	151854.4	1.6665
.821	6.0915	462449.	4474.	33750.	.800	463.	14.54	144185.6	1.6458
.932	6.9159	462027.	4897.	35000.	.800	461.	13.33	136811.1	1.6251
1.054	7.8314	461588.	5336.	36250.	.800	459.	11.74	129636.1	1.6064
1.197	8.9061	461105.	5818.	37500.	.800	459.	10.33	122067.3	1.6068
1.355	10.091	460606.	6318.	38750.	.800	459.	9.36	114938.8	1.6073
1.529	11.406	460086.	6838.	40000.	.800	459.	8.43	108222.9	1.6079
1.723	12.875	459540.	7384.	41250.	.800	459.	7.52	101895.2	1.6085
1.941	14.530	458961.	7962.	42500.	.800	459.	6.65	95932.93	1.6093
2.190	16.417	458341.	8582.	43750.	.800	459.	5.80	90314.88	1.6101
2.476	18.598	457667.	9256.	45000.	.800	459.	5.39	85020.74	1.6110

37. ****** XCLECT END OPTION 1 ******
WT = .45767E+06 H = 45000. AM = .80000

TIME = 2.0925 RANGE = 2671.7 FUEL = 6381.6

+++ +++

CUMULATIVE CPU TIME = 50.319 CPU TIME USED IN PREVIOUS TASK = 1.0720

RGSAVE

ITZ	WT	H	AM	TAC+++	FUFL	RUN+++	XNZZ	E10	E11	OPTION
141	.4577E+06	.4500E+05	.8000	.4127E-01	9256.	18.60	1.000	-0.	0.	1

UNPACK 151 51010 5 1 0 10 10. 7
0. 0. 0. 1.0000 200.00 51010 0. 7 0. 1111112111

TEST PROBLEM NO. 1
..... TOTAL RANGE TO BE DETERMINED. ITERATE TO FIND WEIGHT AT END OF
..... CRUISE. NO IN-FLIGHT ENGINE SCALING REQUESTED.

SEARCH FOR MACH ALTITUDE POINT ALONG A CONSTANT ENERGY LINE

THE BASIS FOR SELECTION OF EACH MACH ALTITUDE POINT WAS MAXIMUM LIFT/DRAG

CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAM7O	NET THRUST	SFC
0.000	0.	434156.	0.	45000.	.800	459.	-14.87	851.3524	1.6015
.211	1.6273	434151.	5.176	42373.	.860	493.	-9.49	981.8740	1.6124
.476	3.7839	434144.	12.62	41431.	.850	487.	-4.08	1064.500	1.6124
.748	5.9736	434136.	20.53	40488.	.841	482.	-4.02	1102.783	1.6092
1.027	8.1973	434127.	28.93	39546.	.831	476.	-3.96	1142.668	1.6059
1.314	10.456	434118.	37.86	38604.	.821	470.	-3.89	1183.934	1.6025
1.609	12.751	434109.	47.35	37662.	.811	465.	-3.83	1226.382	1.5994
1.913	15.083	434099.	57.45	36719.	.800	459.	-3.77	1269.450	1.5973
2.226	17.454	434088.	68.20	35777.	.789	453.	-3.74	1310.001	1.6010
2.542	19.822	434077.	79.45	34835.	.775	447.	-3.74	1345.383	1.6133
2.864	22.198	434065.	91.30	33893.	.761	441.	-3.72	1380.643	1.6259
3.192	24.582	434052.	103.8	32950.	.748	435.	-3.71	1417.249	1.6381
3.525	26.975	434039.	116.9	32008.	.734	428.	-3.70	1454.877	1.6501
3.865	29.375	434025.	130.7	31066.	.720	422.	-3.69	1492.653	1.6623
4.210	31.782	434011.	145.2	30124.	.706	416.	-3.68	1531.900	1.6740
4.562	34.197	433996.	160.5	29182.	.692	409.	-3.67	1571.821	1.6858
4.921	36.620	433979.	176.6	28239.	.678	402.	-3.66	1612.158	1.6974
5.288	39.049	433963.	193.6	27297.	.664	396.	-3.64	1653.757	1.7088
5.661	41.486	433945.	211.5	26355.	.650	389.	-3.63	1695.628	1.7212
6.043	43.930	433926.	230.4	25413.	.636	382.	-3.62	1739.559	1.7335
6.432	46.380	433906.	250.3	24470.	.621	375.	-2.87	1784.762	1.7456
9.108	66.219	431087.	3069.	20000.	.800	491.	-2.12	43427.40	1.6567

39. ****** XCLECT END OPTION 1 ******
WT = .43109E+06 H = 20000. AM = .80000

TIME = 2.5699 RANGE = 2890.3 FUEL = 23511.

+++ +++

CUMULATIVE CPU TIME = 54.875 CPU TIME USED IN PREVIOUS TASK = 4.2420

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	F10	E11	OPTION
161	.4311E+06	.2000E+05	.8000	.1518	3069.	66.22	1.000	-0.	0.	1

UNPACK 171 51010 5 1 0 10 10. 17
0. 0. 0. 5.0000 1.0000 51010 2.0000 17 0. 1111112111

TEST PROBLEM NO. 1
..... TOTAL RANGE TO BE DETERMINED. ITERATE TO FIND WEIGHT AT END OF
..... CRUISE. NO IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZO	NET THRUST	SFC
0.000	0.	425297.	0.	20000.	.800	491.	-4.68	2475.285	1.8497
.235	1.9096	425279.	18.22	19050.	.790	487.	-4.69	2537.891	1.8611
.471	3.8088	425260.	37.06	18100.	.780	482.	-4.72	2601.232	1.8668
.708	5.6978	425241.	56.47	17150.	.770	478.	-4.74	2661.738	1.8693
.946	7.5769	425221.	76.42	16200.	.760	474.	-4.76	2722.210	1.8717
1.184	9.4468	425200.	96.95	15250.	.750	469.	-4.79	2783.849	1.8739
1.425	11.308	425179.	118.1	14300.	.740	465.	-4.81	2846.058	1.8761
1.666	13.160	425157.	139.8	13350.	.730	460.	-4.83	2906.717	1.8782
1.909	15.005	425135.	162.1	12400.	.720	455.	-4.85	2966.010	1.8805
2.153	16.843	425112.	185.1	11450.	.710	450.	-4.87	3025.317	1.8828
2.399	18.674	425088.	208.7	10500.	.700	446.	-4.89	3086.373	1.8848
2.647	20.499	425064.	233.0	9550.	.690	441.	-4.90	3148.514	1.8866
2.897	22.318	425039.	258.0	8600.	.680	436.	-4.91	3210.660	1.8885
3.149	24.133	425013.	283.7	7650.	.670	431.	-4.93	3274.118	1.8901
3.403	25.944	424987.	310.2	6700.	.660	426.	-4.93	3339.821	1.8914
3.661	27.753	424960.	337.6	5750.	.650	421.	-4.94	3402.500	1.8942
3.920	29.559	424931.	365.8	4800.	.640	416.	-4.95	3470.574	1.8961
4.183	31.363	424902.	394.9	3850.	.630	411.	-4.95	3539.432	1.8980
4.449	33.167	424872.	425.0	2900.	.620	406.	-4.95	3608.524	1.8999
4.719	34.972	424841.	456.1	1950.	.610	401.	-4.95	3678.648	1.9016
4.992	36.778	424809.	488.3	1000.	.600	395.	-4.95	3751.970	1.9028

41. ****** XCLECT END OPTION 1 ******
WT = .42481E+06 H = 1000.0 AM = .60000

TIME = 2.8051 RANGE = 2956.5 FUEL = 5789.9

+++ +++

CUMULATIVE CPU TIME = 55.855 CPU TIME USED IN PREVIOUS TASK = .94200

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
181	.4248E+06	1000.	.6000	.8321E-01	488.3	36.78	1.000	-0.	0.	1

UNPACK 191 51010 5 1 0 10 10. 17

0. 360.00 1.8000 0. 0. 51010 3.0000 17 0. 1111112111

TEST PROBLEM NO. 1
..... TOTAL RANGE TO BE DETERMINED. ITERATE TO FIND WEIGHT AT END OF
..... CRUISE. NO IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZD	NET THRUST	SFC
0.000	0.	422098.	0.	1000.	.600	395.	-.55	3751.977	1.9028
.125	.81157	422083.	14.87	952.	.580	382.	-.55	3724.630	1.9060
.257	1.6356	422068.	30.40	905.	.560	369.	-.54	3700.529	1.9084
.395	2.4705	422051.	46.63	857.	.540	356.	-.53	3677.655	1.9104
.540	3.3137	422034.	63.55	810.	.520	343.	-.53	3657.042	1.9118
.691	4.1621	422017.	81.15	763.	.500	330.	-.53	3638.289	1.9126
.849	5.0120	421999.	99.42	715.	.480	317.	-.53	3620.982	1.9130
1.013	5.8586	421980.	118.3	667.	.460	303.	-.53	3606.709	1.9126
1.183	6.6960	421960.	137.7	620.	.440	290.	-.54	3593.876	1.9118
1.356	7.5175	421940.	157.6	572.	.420	277.	-.55	3582.620	1.9105
1.533	8.3157	421920.	177.8	525.	.400	264.	-.57	3574.206	1.9085
1.712	9.0824	421900.	198.1	477.	.380	251.	-.60	3572.865	1.9049
1.891	9.8091	421880.	218.3	430.	.360	238.	-.64	3572.869	1.9011
2.067	10.487	421860.	238.2	382.	.340	224.	-.69	3574.589	1.8969
2.238	11.110	421840.	257.6	335.	.320	211.	-.76	3577.744	1.8925
2.402	11.670	421822.	276.1	288.	.300	198.	-.85	3581.677	1.8881
2.557	12.164	421804.	293.5	240.	.280	185.	-.98	3579.793	1.8867
2.700	12.590	421788.	309.6	192.	.260	172.	-1.15	3563.511	1.8859
2.830	12.948	421774.	324.0	145.	.240	159.	-1.39	3555.894	1.8705
2.946	13.241	421761.	336.8	98.	.220	145.	-1.72	3541.093	1.8764
3.047	13.475	421750.	348.0	50.	.200	132.	-1.91	3518.116	1.8871

43. ****** XCLECT END OPTION 1 ******
WT = .42175E+06 H = 50.000 AM = .20000

TIME = 2.9125 RANGE = 2993.3 FUEL = 2710.9

+++ +++

CUMULATIVE CPU TIME = 56.821 CPU TIME USED IN PREVIOUS TASK = .92400

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	PUN+++	XNZZ	E10	F11	OPTION
201	.4217E+06	50.00	.2000	.5078E-01	348.0	13.47	1.000	-0.	9.	1

UNPACK 211 51210 5 1 2 10 10. 22
1.0000 1.0000 .42178E+06 12.000 21.000 51210 0. 22 2.0000 1111112111

TEST PROBLEM NO. 1
..... TOTAL RANGE TO BE DETERMINED. ITERATE TO FIND WEIGHT AT END OF
..... CRUISE. NO IN-FLIGHT ENGINE SCALING REQUESTED.

INPUT TO LANDING CALCULATIONS

WING REFERENCE AREA (SF)	SREF =	8983.800
FLAT PLATE AREA OF GEAR (SF)	SPLG =	200.0000
FLAT PLATE DRAG COEFF OF GEAR	CDPLG =	.5000000
GROUND ROLL BODY ANGLE (DEG)	AG =	.2500000
MAXIMUM GROUND ROTATION ANGLE (DEG)	AMAXG =	20.00000
WING INCIDENCE (DEG)	WINCID=	-.7000000
THEORETICAL WING ASPECT RATIO	ARTHEO=	2.000000
WING LEADING EDGE SWEEP ANGLE (DEG)	WSLEFC=	60.00000
TOTAL LIFT LIFT CURVE SLOPE (PER DEG)	CLATOT=	.5200000E-01
LIFT COEF AT ZERO ANGLE OF ATTACK	CL0 =	0.
WING TAPER RATIO	TRATIO=	.2000000
INDUCED DRAG FACTOR	DFK =	.1690000
GROUND ROLL FRICTION COEFFICIENT	GRNDFL=	.3500000
DRAG COEFF AT ZERO LIFT	CD0 =	.8600000E-02
WEIGHT AT START OF LANDING (LB)	WL =	421749.9
MAXIMUM GROUND ROLL (FT) IGNORED, IF ZERO	XMAXG =	7500.000
FLAP SPAN TO EXPOSED WING SPAN RATIO	BFOBEX=	.6600000
FLAPDEFLECTION (DEG)	FLAPDL=	45.00000
AVERAGE FLAP CHORD TO WING CHORD RATIO	CFOCAV=	.1500000
FLAT PLATE AREA OF DRAG CHUTE (SF)	SPCHUT=	0.
FLAT PLATE DRAG COEFF OF CHUTE	CDPCHT=	0.
LANDING THRUST (LB)	FNL =	0.

OUTPUT FROM LANDING CALCULATIONS

MAXIMUM WING LIFT COEFFICIENT	CLMAX =	1.104521
MAXIMUM WING PLUS FLAP LIFT COEFFICIENT	CLMAXF=	1.420701
FLAP LIFT COEFFICIENT INCREMENT	DFLCLF=	.3161802
TOUCHDOWN WING PLUS FLAT LIFT COEFFICIENT	CLTOF =	.8573190
TOUCHDOWN BODY ANGLE (DEG)	ATD =	1.173499
TOUCHDOWN WING LIFT COEFFICIENT	CLTD =	18.83350
TOUCHDOWN SPEED (KNOTS)	VTD =	108.5359
SPEED AT OBSTACLE (KNOTS)	V50 =	119.3895
LIFT COEFFICIENT AT OBSTACLE	CL50 =	.9693103
DRAG COEFFICIENT AT OBSTACLE	CD50 =	.1393844
DRAG COEFFICIENT AT TOUCHDOWN	CDTD =	.2098771
DRAG COEFFICIENT OF LANDING GEAR	CDLG =	.1113115E-01
DRAG COEFFICIENT DURING GROUND ROLL	CDG =	.1983421E-01
AIR DISTANCE (FT)	XAIR =	971.8795
RATE OF SINK AT OBSTACLE (FPS)	ROS =	29.01376
FLIGHT PATH ANGLE AT OBSTACLE (DEG)	GAM50 =	8.266815
GROUND ROLL DISTANCE (FT)	XG =	1444.639
POWER OFF STALL SPEED (KNOTS)	VSTAL =	98.64234
GROUND ROLL LIFT COEFFICIENT	CLG =	-.2335179E-01
DRAG COEFFICIENT OF THE CHUTE	CDCHUT=	0.

45. ****** XCLECT END OPTION 17 ******
WT = .42175E+06 H = 50.000 AM = .20000

TIME = 2.9632 RANGE = 3006.8 FUEL = 348.02

+++ +++

CUMULATIVE CPU TIME = 56.925 CPU TIME USED IN PREVIOUS TASK = .60000E-01

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
221	.4217E+06	50.00	.2000	0.	0.	0.	1.000	-0.	0.	17

TEST PROBLEM NO. 1
..... TOTAL RANGE TO BE DETERMINED. ITERATE TO FIND WEIGHT AT END OF
..... CRUISE. NO IN-FLIGHT ENGINE SCALING REQUESTED.

MISSION TIME HISTORY PAYLOAD = 0.

			******INCREMENTAL*******			**********TOTAL**********			
WEIGHT	MACH	ALTITUDE	RANGE	TIME(HRS)	FUEL	RANGE	TIME(HRS)	FUEL	OPTION
750000.	.200	0.	0.00	0.000	0.	0.	0.00	0.	100
745211.	.253	50.	0.00	.083	4789.	0.	.08	4789.	17
736928.	.500	3000.	2.93	.012	8283.	3.	.10	13072.	1
733779.	.600	5000.	1.69	.005	3149.	5.	.10	16221.	1
720480.	.800	21500.	10.63	.025	13298.	15.	.13	29520.	1
714050.	.950	29000.	8.50	.016	6431.	24.	.14	35950.	1
697187.	1.500	40500.	31.78	.045	16863.	56.	.19	52813.	1
671715.	2.600	52971.	75.66	.066	25472.	131.	.25	78285.	1
665056.	2.900	57540.	23.69	.015	6659.	155.	.27	84944.	1
660884.	3.000	65932.	18.96	.011	4171.	174.	.28	89116.	1
476721.	2.548	65932.	2324.78	1.466	184163.	2499.	1.74	273279.	6
473305.	.900	20000.	173.09	.264	3416.	2672.	2.01	276695.	1
466923.	.800	20000.	0.00	.083	6382.	2672.	2.09	283077.	17
457667.	.800	45000.	18.60	.041	9256.	2690.	2.13	292333.	1
434156.	.300	45000.	200.00	.436	23511.	2890.	2.57	315844.	7
431087.	.800	20000.	66.22	.152	3069.	2957.	2.72	318913.	1
425297.	.800	20000.	0.00	.083	5790.	2957.	2.81	324703.	17
424809.	.600	1000.	36.78	.083	488.	2993.	2.89	325191.	1
422098.	.600	1000.	0.00	.024	2711.	2993.	2.91	327902.	17
421750.	.200	50.	13.47	.051	348.	3007.	2.96	328250.	1
421750.	.200	50.	0.00	0.000	0.	3007.	2.96	328250.	17

```
01/11/77  LRC ICOPS INDEPNDT 6600C-131K 01/21/75F
17.56.49. ACCT - RATE IS EXCEEDED
17.56.49.GT74105.
17.56.50.                        LRC COMPUTER COMP3EX
17.56.50.JOB,01,200,110000,5000.          A4916   R
17.56.50.4322      100732        BLDG 1247A  CENT
17.56.50.USER.VAHL, WALTER A                   0009
17.56.50.10600N 37350
17.56.50.FETCH,A4916,,BINARY,,MISSION.
17.57.01.TIME        BG ATTACH
17.57.25.MC 06 FUNCT REJ ADDR  10000000   ST 1215 FN 24
17.57.35.MC 06 FUNCT REJ ADDR  10000000   ST 1215 FN 24
17.57.43.MC 06 FUNCT REJ ADDR  10000000   ST 1215 FN 24
17.58.34.MC 06 FUNCT REJ ADDR  10000000   ST 1215 FN 24
17.58.36.MC 06 FUNCT REJ ADDR  10000000   ST 1215 FN 24
17.58.38.MC 06 FUNCT REJ ADDR  10000000   ST 1215 FN 24
17.58.40.MC 06 FUNCT REJ ADDR  10000000   ST 1215 FN 24
17.59.10.MC 06 FUNCT REJ ADDR  10000000   ST 1215 FN 24
17.59.12.MC 06 FUNCT REJ ADDR  10000000   ST 1215 FN 24
17.59.14.MC 06 FUNCT REJ ADDR  10000000   ST 1215 FN 24
17.59.15.MC 06 FUNCT REJ ADDR  10000000   ST 1215 FN 24
18.00.05.TIME        EO ATTACH
18.00.06.END     FETCH
18.00.07.DROPFIL,DCNS,ZOOKS,ZOUNDS,DAFILE,SCFILE.
18.00.10.MODE1.
18.00.10.MISSION.
18.02.00.STOP 77
18.02.00.REWIND(INPUT)
18.02.02.COPYCR(INPUT,DUMMY)
18.02.04.REWIND(DUMMY)
18.02.06.COPYSBF(DUMMY,OUTPUT)
18.02.08.COPYSBF(INPUT,OUTPUT)
18.02.11.SPPRINT(OUTPUT,3)
18.02.13.      0000341 O/S CALLS
18.02.13.CPU     57.514099 SEC.
18.02.13.PPU    258.727936 SEC.
18.02.14.CRU     10         RESOURCE UNITS
18.02.14.KWH      2.62      KILOWORD HOURS
19.25.07. GT74105.    3405 LINES PRINTED. LR21
```

3.0 PROBLEM NO. 2 - MACH 14 HYDROGEN FUELLED TURBOJET/ SCRAMJET PROPULSION, RANGE DETERMINATION

3.1 Vehicle Characteristics

Turbojet propulsion, 4 engines (M = 0-4)

Scramjet propulsion, 4 engines (M = 4-14)

H_2 fuel (F/A = .0292)

$M_{cruise} = 14$

Gross take-off weight = 7000,000 pounds

Operating weight empty = 200,000 pounds

Turbojet sea level corrected airflow = 1116.46 pounds/sec per engine

Inlet area = 78.26 ft^2 per engine

Vehicle reference area = 10,000 ft^2

Wing semi-thickness angle = 0^o

Inlet initial wedge angle = 6^o

Engine exhaust field pressure (p_n) = free-stream static pressure (p_∞)

Total range to be determined

3.2 Mission Characteristics

(1) Accelerating climb at max. power along prescribed path from M=.3, altitude = 2000 ft. until q = 1500 psf reached (≈M=1.4); no take-off calculation

(2) Accelerating climb at max. power along constant q = 1500 psf path to M=14 (altitude = 116,978 ft)

(3) Constant altitude, constant C_L cruise to operating weight empty = 200,000 #

(4) Descent at max. L/D to M = .3, altitude = 2000 ft.

3.3 Propulsion Characteristics

Inlet capture ratio (A_c/A_i) vs. Inlet flow field Mach number (M_1)

M_1	A_c/A_i
0	.5645
3.99	.5645
4.0	.73
5	.85
6	1.0
14	1.0

Inlet pressure recovery (P_{t_3}/P_{t_1}) vs. Inlet flow field Mach number (M_1)

M_1	P_{t_3}/P_{t_1}
0	.95
1.0	.95
1.3	.944
1.65	.928
2.	.907
2.4	.872
2.75	.837
3.3	.772
3.9	.688
4.55	.590

Turbojet corrected airflow ($w\frac{\sqrt{\theta}}{\delta}$) vs. Inlet flow field total temperature (T_{t_1}) for base size engine

T_{t_1} (^{o}R)	$w\frac{\sqrt{\theta}}{\delta}$ (#/sec)
400	429
508.449	429
557	410
608	390
700	347
800	307
930	266
1000	246
1070	230
1130	219
1250	201
1340	191
1400	185

Turbojet gross thrust per pound of airflow ($F_g/\dot{w}_a$) vs. Engine pressure ratio ($\log_{10} P_{t_3}/P_N$) and inlet flow field total temperature (T_{t_1})

$\text{Log}_{10} P_{t_3}/P_N$	$T_{t_1} = 0^{o}R$	$T_{t_1} = 5000^{o}R$
-.04561	72.7	72.7
-.01728	84.48	84.48

Log 10 P_{t_3}/P_N	T_{t_1} = 0°R	T_{t_1} = 5000°R
.00346	88.45	88.45
.06145	97.22	97.22
.13862	106.15	106.15
.23249	116.38	116.38
.33806	127.95	127.95
.45332	144.34	144.34
.51348	150.0	150.0
.57426	154.02	154.02
.70114	161.47	161.47
.82769	167.69	167.69
1.14675	182.86	182.86
1.45332	198.69	198.69
1.48000	227.0	227.0
1.73957	232.73	232.73
2.00389	238.06	238.06
2.4000	246.0	246.0
	F_g/w_a (lbs/lb per sec)	

Turbojet fuel-air ratio (w_f/w_a) vs. Inlet flow field total temperature (T_{t_1})

T_{t_1}, °R	$\dot{w}_f/\dot{w}_a$
400	.0292
1200	.0292

Scramjet performance (I_{sp}) vs. Free-stream Mach number (M_∞) and inlet flow field total temperature (T_{t_1})

M	T_{t_1} = 0 ^oR	T_{t_1} = 10000 ^oR
4	4030	4030
5	3380	3380
6	2820	2820
8	2340	2340
10	1840	1840
12	1280	1280
14	700	700

Scramjet equivalence ratio (ϕ) vs. Free-stream Mach number (M_∞)

M_∞	ϕ
4	1.0
5	1.0
6	1.0
8	1.0
10	1.0
12	1.0
14	1.0

Scramjet maximum airflow ratio ($\dot{w}_{RJ_{max}}/\dot{w}_{\substack{\text{full capture}\\ \text{inlet}}}$) vs. inlet flow field total temperature (T_{t_1})

T_{t_1}, ^oR	$(\dot{w}_{RJ_{max}}/\dot{w}_{\substack{\text{full capture}\\ \text{inlet}}})$
0	1.0
10000	1.0

Scramjet throttling table at cruise conditions (M=14); $(F_N/F_{N_{max}})$ vs. (SFC/SFC_{max})

$(F_N/F_{N_{max}})$	(SFC/SFC_{max})
0	1.0
.3991	.7701
.45	.76
.5	.762
.55	.773
.7	.838
.9	.943
1.0	1.0

3.4 Trajectory Details

Trajectory segment (1) prescribed path follows:

M_∞	Altitude, ft.
.3	2000
.5	3700
.6	4700
.7	5800
.75	6500
.8	7300
.85	8000
.9	8700
.95	9300
1.0	10000
1.1	11700
1.2	13700
1.3	15800
1.4	18000 (q_∞= 1450.9 psf)
1.5	20518 (q_∞ = 1500 psf)

3.5 Aerodynamic Characteristics

Linear aerodynamics are based on the equations listed below.

$$C_D = C_{D_o} + K (C_L - C_{L_o})^2$$

$$C_L = C_{L_\alpha}\alpha + (C_{L_{\alpha=0}})$$

M_∞	C_{D_o}	C_{L_o}	$C_{L_{\alpha=0}}$	C_{L_α}	K
0	.016	-.020	-.020	.0450	.347
.52	.016	-.020	-.020	.0450	.347
.68	.016	-.018	-.018	.0455	.347
.80	.0173	-.017	-.017	.0462	.347
1.0	.0263	-.015	-.015	.0473	.358
1.04	.0295	-.014	-.014	.0473	.360
1.12	.0298	-.013	-.013	.0472	.365
1.2	.0255	-.011	-.011	.0464	.372
1.32	.0210	-.010	-.010	.0445	.390
1.48	.0192	-.008	-.008	.0415	.413
2.0	.0170	0.	0.	.0350	.517
2.4	.0147	.005	.005	.0303	.590
2.8	.0132	.008	.008	.0275	.652
4.0	.0093	.010	.010	.0218	.808
5.2	.0064	0.	0.	.0182	.932
6.2	.0050	0.	0.	.0162	1.022
8.0	.0045	-.008	-.008	.0143	1.168
9.2	.0045	-.010	-.010	.0136	1.238
10.8	.0045	-.010	-.010	.0135	1.270
15.0	.0045	-.010	-.010	.0135	1.270

```
                LRC TEST PROBLEM NUMBER 2  -----  NSEG III
                TOTAL RANGE TO BE DETERMINED -- NO ITERATION REQUIRED
                IN-FLIGHT ENGINE SCALING REQUESTED

STCASE/TABSIZ/
          TABLE SIZES FOR EACH TABLE USED IN THIS RUN
ATAB46(75)    $ CD0 VS. ALT AND MACH
ATAB52(50)    $ K21 VS. MACH
ATAB58(50)    $ MIN DRAG CL VS MACH
CLATAB(75)    $ LIFT CURVE SLOPE VS. ALT AND MACH
CLZTAB(75)    $ CL AT ZERO ANGLE OF ATTACK VS. ALT AND MACH
ETAB03(15)
ETAB04(25)
ETAB05(30)
ETAB06(75)
ETAB07(10)
ETAB08(20)
ETAB09(30)
ETAB10(10)
MTAB01(500)
MTAB02(500)
END
          TOTAL TABLE SIZE FOR THIS RUN IS  1609
```

```
                    LRC TEST PROBLEM NUMBER 2 .----- NSEG III
                    TOTAL RANGE TO BE DETERMINED -- NO ITERATION REQUIRED
                    IN-FLIGHT ENGINE SCALING REQUESTED

      $TCASE/DATA1/
...
...
...       DATA FOR PRINT-OUT CONTROL
      IPDICN=1,     $ PRINT DATA BASE DIRECTORY
      IPDICN=0,     $ DO NOT PRINT DATA BASE DIRECTORY
..
...     CONTROLS PRINT OUT OF MISSION SEGMENTS
 IPSEG=3,4,5,6,8,9,10,0,
...
      IPATMO=1,     $ GENERATE TABULAR LISTING OF ATMOSPHERIC PROPERTIES
      IPATMO=0,     $ DO NOT GENERATE TABULAR LISTING OF ATMOSPHERIC PROPERTIES
      IPTZIN=0,     $ DO NOT PRINT TERM ARRAY AS THE INPUT DATA IS PROCESSED
      IPTZIN=1,     $ PRINT THE TERM ARRAY FROM FILLTZ
     IDBMHP=0,      $DO NOT PRINT DUMPS DURING CLIMB
.                     AS THE INPUT DATA FOR EACH
.                     MISSION SEGMENT IS PROCESSED
      IPENDS=0,     $ DO NOT PRINT SCALED ENGINE DATA
      IPENDS=1,     $ PRINT SCALED ENGINE DATA
      IPENDR=0,     $ DO NOT PRINT RAW ENGINE DATA
      IPENDR=1,     $ PRINT RAW ENGINE DATA
      IPTZXX=1,     $ PRINT TERM ARRAY AS EACH MISSION SEGMENT IS STARTED
      IPRGSV=1,     $ PRINT THE RG SAVE ARRAY FROM EACH MISSION SEGMENT
...
...       TAKE-OFF AND LANDING DATA
...
  SPLG  =200.0,$    FLAT PLATE AREA OF GEAR (SF)
  CDPLG =0.5,$      FLAT PLATE DRAG COEF OF GEAR
  AG    =.25,$      GROUND ROLL BODY ANGLE (DEG)
  AMAXG =12.0,$     MAXIMUM GROUND ROTATION ANGLE (DEG)
  DFK   =0.189,$    INDUCED DRAG FACTOR
  XMAXG =7500.0,$   MAXIMUM GROUND ROLL (FT) IGNORED, IF ZERO
  BFOBEX=0.66,$     FLAP SPAN TO EXPOSED WING SPAN RATIO
  SPCHUT=0.0,$      FLAT PLATE AREA OF DRAG CHUTE (SF)
  CDPCHT=0.0,$      FLAT PLATE DRAG COEFF OF CHUTE
  GRNDFT=0.025,$    GROUND ROLL FRICTION COEFFICIENT TAKE-OFF
  FLAPDT=20.0,$     FLAP DEFLECTION (DEG) TAKE-OFF
  GRNDFL=.35,$      GROUND ROLL FRICTION COEFFICIENT LANDING
  FLAPDL=45.0,$     FLAP DEFLECTION (DEG) LANDING
  FNL   =0.0,$      LANDING THRUST (LB)
...   LOW ASPECT RATIO TAKE-OFF VALUES
  CLATOT=0.045,   $TOTAL LIFT CURVE SLOPE (PER DEGREE)
  WINCID=-0.7,    $  WING INCIDENCE AT ZERO ANGLE OF ATTACK
   CL0=0.0,   $LIFT COEF AT ZERO ANGLE OF ATTACK
  ARTHEO=2.0,$      THEORETICAL WING ASPECT RATIO (SPAN**2/SREF)
  AMAXG =20.0,$     MAXIMUM GROUND ROTATION ANGLE (DEG)
  WSLEFC=60.0,$     WING LEADING EDGE SWEEP ANGLE (DEG)
  CFOCAV=.15,$      AVERAGE FLAP CHORD TO WING CHORD RATIO
  CD0   =0.0086, $ DRAG COEFF AT ZERO LIFT
  TRATIO=.20,$      WING TAPER RATIO
...
...       GENERAL DATA
```

LRC TEST PROBLEM NUMBER 2 ----- NSEG III
TOTAL RANGE TO BE DETERMINED -- NO ITERATION REQUIRED
IN-FLIGHT ENGINE SCALING REQUESTED

```
      GLEVEL=1.0,
      AVOID1=0,
      AVOID2=0,
  AMTO=.2,
  HTO=50.,
      PSET=1,
      HI=0.0,
      HF=40000.0,
      AMI=0.2,
      AMF=0.825,
      HO=0.0,
      HE=35000.0,
      AMS=0.29,
      AME=0.767,
...
...
...         AERO DATA
    CLMAX=.8,
  RCSC=100.0,
    INDAER = 9,
    CASE = 1,  $SINGLE SYSTEM
    INDA46 = 1,
    INDA52 = 1,
    INDA58 = 1,
    INDCLA = 1,
    INDCLZ = 1,
    IA46X = 2,
    IA46Y = 20,
    ICLZX=20,
    ICLZY = 2 ,
    ICLAX = 20,
    ICLAY = 2,
    ATAB46 = 0.,.500000.,   $ ALTITUDES FOR CDO
             0.,.52,.68,.8,1.,1.04,1.12,1.2,1.32,1.48,2.,2.4,2.8,4., $ MACHS
             5.2,6.2,8.,9.2,10.8,15.,
             .016,.016,.016,.016,.016,.016,.0173,.0173,.0263,.0263,
             .0295,.0295,.0298,.0298,.0255,.0255,.0210,.0210,
             .0192,.0192,.017,.017,.0147,.0147,.0132,.0132,.0093,.0093,
             .0064,.0064,.005,.005,.0045,.0045,.0045,.0045,
             .0045,.0045,.0045,.0045,
....CL FOR MIN DRAG VS. MACH
    ATAB58 = 20 ,0.,-.02,.52,-.02,.68,-.018,.8,-.017,1.,-.015,1.04,
             -.014,1.12,-.013,1.2,-.011,1.32,-.01,1.48,-.008,2.,0.,
             2.4,.005,2.8,.008,4.,.01,5.2,0.,6.2,0.,8.,-.008,9.2,-.01,
             10.8,-.01,15.,-.01,
....K21 VS. MACH
    ATAB52 = 20 ,0.,.347,.52,.347,.68,.347,.8,.347,1.,.358,
                 1.04,.36,1.12,.365,1.2,.372,1.32,.39,1.48,.413,
                 2.,.517,2.4,.59,2.8,.652,4.,.808,5.2,.932,
                 6.2,1.022,8.,1.168,9.2,1.238,10.8,1.27,15.,1.27,
    CLATAB = 0.,.52,.68,.8,1.,1.04,1.12,1.2,1.32,1.48,2.,2.4,   $MACHS
             2.8,4.,5.2,6.2,8.,9.2,10.8,15.,
```

LRC TEST PROBLEM NUMBER 2 ----- NSEG III
TOTAL RANGE TO BE DETERMINED -- NO ITERATION REQUIRED
IN-FLIGHT ENGINE SCALING REQUESTED

```
              0.,500000.,                                $ALTITUDES
...    ALT = 0.
              .045,.045,.0455,.0462,.0473,.0473,.0472,.0464,.0445,
              .0415,.035,.0303,.0275,.0218,.0182,.0162,.0143,
              .0136,.0135,.0135,
....   ALT = 500000.
              .045,.045,.0455,.0462,.0473,.0473,.0472,.0464,.0445,
              .0415,.035,.0303,.0275,.0218,.0182,.0162,.0143,
              .0136,.0135,.0135,
     CLZTAB = 0.,.52,.68,.8,1.,1.04,1.12,1.2,1.32,1.48,2.,2.4,    $MACHS
              2.8,4.,5.2,6.2,8.,9.2,10.8,15.,
              0.,500000.,       $ALTITUDES
...    ALT = 0.
              -.02,-.02,-.018,-.017,-.015,-.014,-.013,-.011,-.01,
              -.008, 0.,.005,.008,.01,0.,0.,-.008,-.01,-.01,-.01,
...    ALT = 500000.
              -.02,-.02,-.018,-.017,-.015,-.014,-.013,-.011,-.01,
              -.008,0.,.005,.008,.01,0.,0.,-.008,-.01,-.01,-.01,
     INDE01 = 0,
     INDE02 = 0,
     INDE03 = 1,
     INDE04 = 1,
     INDE05 = 1,
     INDE06 = 1,
     INDE07 = 1,
     INDE08 = 1,
     INDE09 = 1,
     INDE10 = 1,
     IE03X = 6,
     ETAB03 = 0.,3.99,4.,5.,6.,14.,
              .5645,.5645,.73,.85,1.,1.,
     IE04X = 10,
     ETAB04 = 0.,1.,1.3,1.65,2.,2.4,2.75,3.3,3.9,4.55,
              .95,.95,.944,.928,.907,.872,.837,.772,.688,.59,
     IE05X = 13,
     ETAB05 = 400.,508.449,557.,608.,700.,800.,930.,1000.,1070.,
              1130.,1250.,1340.,1400.,
              429.,429.,410.,390.,347.,307.,266.,246.,230.,219.,
              201.,191.,185.,
     IE06X = 2,
     IE06Z = 18,
     ETAB06 = 0.,5000.,
              -.04561,-.01728,.00346,.06145,.13862,.23249,.33806,
              .45332,.51348,.57426,.70114,.82769,1.14675,1.45332,
              1.48,1.73957,2.00389,2.4,
              72.2,72.2,84.48,84.48,88.45,88.45,97.22,97.22,
              106.15,106.15,116.38,116.38,127.95,127.95,
              144.34,144.34,150.,150.,154.02,154.02,161.47,161.47,
              167.69,167.69,182.86,182.86,198.59,198.69,227.,227.,
              232.73,232.73,238.06,238.06,246.,246.,
     IE07X = 2,
     ETAB07 = 400.,1200.,
```

```
                    LRC TEST PROBLEM NUMBER 2  -----  NSEG III
                    TOTAL RANGE TO BE DETERMINED -- NO ITERATION REQUIRED
                    IN-FLIGHT ENGINE SCALING REQUESTED


              .0292.,.0292.
     IE08X =  8.
     ETAB08 = 0.,.3991.,.45,.5,.55,.7,.9,1.,
              1.,.7701.,.76,.762,.773,.838,.943,1.,
     IE09X =  7
     ETAB09 = 4.,5.,6.,8.,10.,12.,14.,
              4030.,3380.,2820.,2340.,1840.,1280.,700.,
              1.,1.,1.,1.,1.,1.,1.,
     IE10X = 2
     ETAB10 = 0.,10000.,
              1.,1.,
...
...         ATMOSPHERIC DATA
       INDATM=9,
       INDATM=3,
...
...                    DATA FOR USER SPECIFIED TEMPERATURE PROFILE
       NHG=11,
       HG=-16404.0, 0.0, 36089.01, 65617.01, 104987.0, 154199.01,
          170604.01, 200131.01, 259186.01, 291160.01, 295276.01,
       TM=577.18, 518.68, 389.98, 389.98, 411.58, 487.18, 487.18,
          454.78, 325.18, 325.18, 379.18,
       PM=3711.0839, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0,
...
...
...         THRUST DATA
     FF=0.0,     $ FUEL FLOW ADDITIVE FACTOR FOR RESERVES
     FPOL=1.0,
       FFLMIN=0.001,
       SFCFAC=1.05,        $ SFC MULTIPLYER FACTOR
       NUMENG=4,           $ NUMBER OF ENGINES
       TSIZEF=1.0,
       THRMIN=0.1,
...    ...   ...   ...   ...   ...   ...   ...   ...   ...   ...   ...   ...   ...   ..
...              MAX. THRUST  (CASEN = 1)
     INDE01 = 0,
     INDE02 = 0,
...    SPECIAL INPUTS FOR DUAL ENGINE OPTION
      TMINTJ=0.01,
      TMINRJ=0.01,
     DELIN =  6.0 ,
      IPDENG=0,      $NULL DIAGNOSTIC PRINT IN ENGINS ROUTINE
     DELWNG = 0.,
     AMINRJ=3.99,           $ MINIMUM RAMJET OPERATING MACH NUMBER
     AMAXTJ = 4.0,          $ MAXIMUM TURBOJET OPERATING MACH NUMBER
     SREF = 10000.,         $ WING AREA FOR TAKEOFF AND LANDING
     XQSW = 10000.,         $ IN-FLIGHT WING AREA
       BAREWT=327100.0,     $ AIRCRAFT BARE WEIGHT
       OWE=200000.,      $ OVERALL WEIGHT EMPTY
     PLWINT = 0.,    $ INTERNAL PAYLOAD WEIGHT
     AMLIM = 14.5,        $ MAXIMUM MACH NUMBER PLACARD
     QLIM = 2000.,          $ MAXIMUM DYNAMIC PRESSURE PLACARD
```

```
                    LRC TEST PROBLEM NUMBER 2  -----  NSEG III
                    TOTAL RANGE TO BE DETERMINED -- NO ITERATION REQUIRED
                    IN-FLIGHT ENGINE SCALING REQUESTED


 CLMAX=1.0,  $MAX LIFT COEFFICIENT
 CLC=.05,   $CRUISE LIFT COEFFICIENT FOR RAMJET SCALING
 BARENT = 200000.,
 WT = 700000.,
 WGTO = 700000.,
 WL = 200000.,
 WO = 700000.,
 AINLET = 78.26,  $FT**2
  ALPLIM=65.0,     $ MAXIMUM ANGLE OF ATTACK IN DUAL ENGINE OPTION
IEOP=2,  $  COMBINATION ENGINE OPTION--RAMJET AND TURBOJET
  IASCAL=1,  $AUTOMATICALLY SCALE ENGINES DURING CLIMB
   END
```

LRC TEST PROBLEM NUMBER 2 ----- NSEG III
TOTAL RANGE TO BE DETERMINED -- NO ITERATION REQUIRED
IN-FLIGHT ENGINE SCALING REQUESTED

```
....  TEST PROBLEM 2 -- NSEG III
....
    SEGMENT(2),OPTION(21)
...   ENGINE SCALING OPTION
    PROPULSIVE MODE = DUAL
    SCALE TURBOJET -- SEALEVEL CORRECTED AIRFLOW = 1116.46, (LB/SEC)
    CRUISE MACH = 14.,  CRUISE ALTITUDE=116978.,
     AERO OPTION=1,
    END
  1.0000      0.          14.000      1116.5      .11698E+06    51000 0.          21 0.          1111111111
...
....
    SEGMENT(3),OPTION(13)
    NEW MACH = .3,
    NEW ALTITUDE = 2000.,
    END
  .30000      2000.0      0.          0.          0.            51000 0.          13 0.          1111111111
.....
    SEGMENT(4),OPTION(1)
    FLY LINEAR MACH-ALTITUDE PATH
    END MACH NUMBER = .6,
    END ALTITUDE = 4700.,
    PROPULSIVE MODE = DUAL
    THRUST = MAXIMUM AVAILABLE
    END
  .60000      4700.0      0.          4.0000      0.            51100 0.          1 0.           1111111111
....
    SEGMENT(5),OPTION(1)
    FLY LINEAR MACH-ALTITUDE PATH
    END MACH NUMBER = 1.0,
    END ALTITUDE = 10000.,
    PROPULSIVE MODE = DUAL
    THRUST = MAXIMUM AVAILABLE
    END
  1.0000      10000.      0.          4.0000      0.            51100 0.          1 0.           1111111111
....
    SEGMENT(6),OPTION(1)
    FLY LINEAR MACH-ALTITUDE PATH
    END MACH NUMBER = 1.5,
    END ALTITUDE = 20518.,
    THRUST = MAXIMUM AVAILABLE
    PROPULSIVE MODE = DUAL
    END
  1.5000      20518.      0.          4.0000      0.            51100 0.          1 0.           1111111111
     SEGMENT(7),OPTION(22),
..... LOOP BACK TO USE SCALED UP ENGINE
     START LOOP AT BEGINNING OF SEGMENT(3)
     FINISH LOOP AT END OF SEGMENT(6)
     NUMBER OF ITERATIONS=1.,
     END
 0.          0.          0.          3.0000      6.0000        51100 0.          22 1.0000      1111111111
.....
```

LRC TEST PROBLEM NUMBER 2 ----- NSEG III
TOTAL RANGE TO BE DETERMINED -- NO ITERATION REQUIRED
IN-FLIGHT ENGINE SCALING REQUESTED

```
....
    SEGMENT(8),OPTION(1)
    FLY CONSTANT Q PATH
    END MACH NUMBER = 6.256,
    END MACH NUMBER = 8.0,
    END ALTITUDE = 92000.,
    END MACH NUMBER = 14.,
    END ALTITUDE = 116978.,
    THRUST = MAXIMUM AVAILABLE
    PROPULSIVE MODE = DUAL
    END
  14.000      .11698E+06 0.          5.0000     0.          51100 0.          1 0.          1111111111
....
   SEGMENT(9),OPTION(6),
     NUMBER OF INTEGRATION STEPS = 10,
   END WEIGHT =200000., POUNDS
   CRUISE AT CONSTANT LIFT COEFFICIENT
    THRUST = THRUST REQUIRED
    PROPULSIVE MODE = DUAL
    END
 0.          0.          .20000E+06 0.          0.          51010  1.0000     6 0.          1111111111
....
     SEGMENT(10), OPTION(1)
   USE MAX L/D AS BASIS FOR SELECTION
   SEARCH AT CONSTANT SPECIFIC ENERGY
    PROPULSIVE MODE = DUAL
     THRUST = MINIMUM ALLOWABLE
    END MACH = .3,
    END ALTITUDE = 2000.,
      END MISSION
  .30000      2000.0      3.0000      1.0000     0.          51210 0.          1 0.          1111111111
```


LRC TEST PROBLEM NUMBER 2 ----- NSEG III
TOTAL RANGE TO BE DETERMINED -- NO ITERATION REQUIRED
IN-FLIGHT ENGINE SCALING REQUESTED

```
                    RUN

END OF NSEGII INPUT FOR CURRENT CASE,  0 INPUT ERRORS DETECTED.
```

TURBOJET PERFORMANCE (PER ENGINE) AT SEA LEVEL STATIC CONDITIONS

TURBOJET GROSS THRUST - - - - - - - - - -	87305.4	(LB)
NET THRUST IN FREESTREAM DIRECTION - - -	87305.4	(LB)
AIRFLOW RATE - - - - - - - - - - - - - -	1060.64	(LB/SEC)
FUELFLOW RATE - - - - - - - - - - - - - -	30.9706	(LB/SEC)
SPECIFIC FUEL CONSUMPTION - - - - - - - -	1.27706	((LB FUEL/HR)/LB THRUST)
BASE ENGINE SCALING FACTOR - - - - - - -	2.62696	(NO UNITS)
MAXIMUM AIRFLOW RATE OF BASE ENGINE - - -	425.000	(LB/SEC)
PRESSURE RATIO (PT3/PN) - - - - - - - - -	.950000	(NO UNITS)
ANGLE OF ATTACK - - - - - - - - - - - - -	0.	(DEGREES)
WING HALF ANGLE- - - - - - - - - - - - - -	0.	(DEGREES)
INLET WEDGE ANGLE- - - - - - - - - - - - -	6.00000	(DEGREES)
SCALING CORRECTED AIRFLOW RATE - - - - - -	1116.46	(LB/SEC)
LIFT COMPONENT OF ENGINE FORCES - - - - -	0.	(LB)

ENGINE SCALING COMPLETED

2. ****** XCLECT END OPTION 21 ******
WT = .70000E+06 H = 50.000 AM = .20000

TIME = 0. RANGE = 0. FUEL = 0.

+++ +++

CUMULATIVE CPU TIME = 4.2030 CPU TIME USED IN PREVIOUS TASK = 4.2030

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
11	.7000E+06	50.00	.2000	0.	0.	0.	1.000	-0.	0.	21

UNPACK 21 51000 5 1 0 0 0. 13

.30000 2000.0 0. 0. 0. 51000 0. 13 0. 1111111111

LRC TEST PROBLEM NUMBER 2 ----- NSEG III
TOTAL RANGE TO BE DETERMINED -- NO ITERATION REQUIRED
IN-FLIGHT ENGINE SCALING REQUESTED

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZD	NET THRUST	SFC
0.000	0.	700000.	0.	2000.	.300	197.	5.71	319154.6	1.3776
.066	.22225	699513.	486.8	2135.	.315	207.	5.82	319754.4	1.3758
.127	.43592	699066.	933.8	2270.	.330	216.	6.01	320922.4	1.3719
.184	.64399	698650.	1350.	2405.	.345	226.	6.14	321993.7	1.3687
.238	.84853	698257.	1743.	2540.	.360	236.	6.23	322995.2	1.3660
.288	1.0510	697883.	2117.	2675.	.375	246.	6.27	323989.9	1.3637
.337	1.2525	697525.	2475.	2810.	.390	255.	6.29	325015.1	1.3615
.384	1.4538	697181.	2819.	2945.	.405	265.	6.29	326102.2	1.3591
.429	1.6556	696847.	3153.	3080.	.420	275.	6.27	327326.6	1.3567
.472	1.8582	696523.	3477.	3215.	.435	284.	6.23	328655.7	1.3543
.515	2.0620	696207.	3793.	3350.	.450	294.	6.19	330079.8	1.3517
.557	2.2675	695898.	4102.	3485.	.465	304.	6.14	331605.4	1.3490
.597	2.4747	695595.	4405.	3620.	.480	313.	6.09	333237.4	1.3461
.637	2.6840	695298.	4702.	3755.	.495	323.	6.03	334986.9	1.3431
.676	2.8954	695006.	4994.	3890.	.510	333.	5.96	336882.2	1.3398
.714	3.1092	694718.	5282.	4025.	.525	342.	5.90	338858.2	1.3364
.751	3.3255	694433.	5567.	4160.	.540	352.	5.82	340561.9	1.3343
.789	3.5448	694152.	5848.	4295.	.555	361.	5.74	342053.9	1.3332
.825	3.7673	693873.	6127.	4430.	.570	371.	5.66	343698.8	1.3320
.861	3.9930	693596.	6404.	4565.	.585	381.	5.58	345493.3	1.3305
.897	4.2220	693321.	6679.	4700.	.600	390.	5.54	347385.1	1.3288

4. ****** XCLECT END OPTION 1 ******
WT = .69332E+06 H = 4700.0 AM = .60000
TIME = 0. RANGE = 0. FUEL = 0.

+++ +++

CUMULATIVE CPU TIME = 5.3210 CPU TIME USED IN PREVIOUS TASK = 1.0940

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
31	.6933E+06	4700.	.6000	.1495E-01	6679.	4.222	1.000	-0.	0.	1

UNPACK 41 51100 5 1 1 0 0. 1
1.0000 10000. 0. 4.0000 0. 51100 0. 1 0. 1111111111

LRC TEST PROBLEM NUMBER 2 ----- NSEG III
TOTAL RANGE TO BE DETERMINED -- NO ITERATION REQUIRED
IN-FLIGHT ENGINE SCALING REQUESTED

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZD	NET THRUST	SFC
0.000	0.	693321.	0.	4700.	.600	390.	7.11	347410.7	1.3287
.053	.34942	692911.	410.7	4965.	.620	403.	7.04	349199.7	1.3263
.106	.70553	692504.	817.6	5230.	.640	415.	6.91	351299.8	1.3233
.158	1.0683	692100.	1221.	5495.	.660	428.	6.79	353536.9	1.3200
.209	1.4377	691699.	1622.	5760.	.680	441.	6.66	355953.8	1.3165
.260	1.8149	691300.	2021.	6025.	.700	453.	6.52	358621.2	1.3125
.311	2.2009	690901.	2420.	6290.	.720	466.	6.37	361519.7	1.3082
.362	2.5959	690502.	2819.	6555.	.740	478.	6.22	364592.0	1.3037
.412	3.0003	690102.	3220.	6820.	.760	490.	6.08	367741.7	1.2994
.462	3.4144	689700.	3621.	7085.	.780	503.	5.94	370966.8	1.2952
.513	3.8387	689296.	4025.	7350.	.800	515.	5.76	374396.0	1.2907
.563	4.2785	688885.	4436.	7615.	.820	528.	5.52	378105.7	1.2858
.616	4.7407	688461.	4860.	7880.	.840	540.	5.25	381964.1	1.2808
.669	5.2279	688022.	5299.	8145.	.860	552.	4.97	386114.8	1.2754
.725	5.7431	687564.	5757.	8410.	.880	565.	4.70	390367.9	1.2699
.783	6.2901	687086.	6235.	8675.	.900	577.	4.42	394895.5	1.2641
.843	6.8732	686584.	6737.	8940.	.920	589.	4.13	399598.8	1.2582
.906	7.4976	686053.	7268.	9205.	.940	601.	3.85	404558.2	1.2520
.972	8.1700	685489.	7832.	9470.	.960	614.	3.57	409690.9	1.2456
1.043	8.8986	684886.	8435.	9735.	.980	626.	3.28	415103.7	1.2390
1.119	9.6938	684235.	9086.	10000.	1.000	638.	3.14	420716.2	1.2322

5. ****** XCLECT END OPTION 1 ******
WT = .68424E+06 H = 10000. AM = 1.00000

TIME = .14954E-01 RANGE = 4.2220 FUEL = 6678.8

+++ +++

CUMULATIVE CPU TIME = 6.4430 CPU TIME USED IN PREVIOUS TASK = 1.1220

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
41	.6842E+06	.1000E+05	1.0000	.1864E-01	9086.	9.694	1.000	-0.	0.	1

UNPACK 51 51100 5 1 1 0 0. 1
1.5000 20518. 0. 4.0000 0. 51100 0. 1 0. 1111111111

LRC TEST PROBLEM NUMBER 2 ----- NSEG III
TOTAL RANGE TO BE DETERMINED -- NO ITERATION REQUIRED
IN-FLIGHT ENGINE SCALING REQUESTED

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZO	NET THRUST	SFC
0.000	0.	684235.	0.	10000.	1.000	638.	3.41	420720.7	1.2322
.135	1.4513	683065.	1170.	10526.	1.025	653.	2.74	406126.6	1.2819
.353	3.8490	681169.	3066.	11052.	1.050	667.	1.64	391958.1	1.3340
.718	7.9494	677985.	6250.	11578.	1.075	682.	.83	378256.8	1.3883
1.681	19.036	669529.	.1471E+05	12104.	1.100	696.	.57	365002.1	1.4450
2.298	26.279	664088.	.2015E+05	12629.	1.125	711.	.36	373625.3	1.4189
11.826	140.48	579686.	.1045E+06	13155.	1.150	725.	1.27	347883.3	1.5308
11.993	142.46	578115.	.1061E+06	13681.	1.175	739.	1.85	377820.5	1.5573
12.325	146.59	574851.	.1094E+06	14207.	1.200	754.	1.12	364341.2	1.6230
12.704	151.39	571107.	.1131E+06	14733.	1.225	768.	.94	352452.7	1.6864
13.157	157.25	566604.	.1176E+06	15259.	1.250	782.	.78	341529.6	1.7486
13.678	164.10	561403.	.1228E+06	15785.	1.275	796.	.70	332105.0	1.8073
14.227	171.44	555902.	.1283E+06	16311.	1.300	810.	.84	323898.5	1.8627
14.592	176.40	552220.	.1320E+06	16837.	1.325	824.	2.78	411785.5	1.4722
14.671	177.48	551425.	.1328E+06	17363.	1.350	837.	4.97	441832.1	1.3792
14.736	178.40	550756.	.1335E+06	17888.	1.375	851.	5.61	459959.2	1.3311
14.796	179.25	550150.	.1341E+06	18414.	1.400	865.	6.07	473315.1	1.2991
14.850	180.03	549591.	.1346E+06	18940.	1.425	879.	6.48	485685.2	1.2722
14.901	180.77	549071.	.1352E+06	19466.	1.450	892.	6.85	497009.9	1.2489
14.948	181.47	548581.	.1357E+06	19992.	1.475	906.	7.16	506674.8	1.2310
14.993	182.15	548114.	.1361E+06	20518.	1.500	919.	7.29	515090.7	1.2169

6. ****** XCLECT END OPTION 1 ******
WT = .54811E+06 H = 20518. AM = 1.5000

TIME = .33597E-01 RANGE = 13.916 FUEL = 9086.1

+++ +++

CUMULATIVE CPU TIME = 8.1610 CPU TIME USED IN PREVIOUS TASK = 1.7180

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
51	.5481E+06	.2052E+05	1.500	.2499	.1361E+06	182.1	1.000	-0.	0.	1

UNPACK 61 51100 5 1 1 0 0. 22

0. 0. 0. 3.0000 6.0000 51100 0. 22 1.0000 1111111111

LRC TEST PROBLEM NUMBER 2 ----- NSEG III
TOTAL RANGE TO BE DETERMINED -- NO ITERATION REQUIRED
IN-FLIGHT ENGINE SCALING REQUESTED

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMTD	NET THRUST	SFC
0.000	0.	700000.	0.	2000.	.300	197.	6.87	350974.1	1.3776
.055	.18418	699555.	444.7	2135.	.315	207.	6.97	351670.2	1.3757
.108	.36311	699143.	857.2	2270.	.330	216.	7.14	352948.4	1.3718
.154	.53874	698755.	1245.	2405.	.345	226.	7.24	354121.3	1.3686
.200	.71245	698388.	1612.	2540.	.360	236.	7.30	355217.1	1.3660
.243	.88525	698036.	1964.	2675.	.375	246.	7.33	356307.8	1.3636
.285	1.0579	697698.	2302.	2810.	.390	255.	7.32	357432.5	1.3614
.325	1.2309	697372.	2628.	2945.	.405	265.	7.30	358625.7	1.3590
.364	1.4047	697055.	2945.	3080.	.420	275.	7.26	359970.5	1.3567
.402	1.5795	696747.	3253.	3215.	.435	284.	7.21	361430.6	1.3542
.439	1.7558	696446.	3554.	3350.	.450	294.	7.15	362995.5	1.3517
.475	1.9336	696151.	3849.	3485.	.465	304.	7.08	364672.2	1.3490
.510	2.1132	695862.	4138.	3620.	.480	313.	7.01	366466.0	1.3461
.544	2.2947	695578.	4422.	3755.	.495	323.	6.94	368389.3	1.3431
.578	2.4781	695299.	4701.	3890.	.510	333.	6.86	370472.9	1.3398
.612	2.6637	695023.	4977.	4025.	.525	342.	6.78	372645.4	1.3363
.644	2.8514	694752.	5248.	4160.	.540	352.	6.70	374918.5	1.3343
.676	3.0418	694482.	5518.	4295.	.555	361.	6.60	376158.9	1.3332
.708	3.2350	694216.	5784.	4430.	.570	371.	6.51	377967.5	1.3320
.740	3.4309	693951.	6049.	4565.	.585	381.	6.42	379940.6	1.3305
.771	3.6296	693688.	6312.	4700.	.600	390.	6.38	382020.8	1.3288

9. ****** XCLECT END OPTION 1 ******
WT = .69369E+06 H = 4700.0 AM = .60000

TIME = 0. RANGE = 0. FUEL = 0.

+++ +++

CUMULATIVE CPU TIME = 9.3930 CPU TIME USED IN PREVIOUS TASK = 1.1220

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
31	.6937E+06	4700.	.6000	.1285E-01	6312.	3.630	1.000	-0.	0.	1

UNPACK 41 51100 5 1 1 0 0. 1
1.0000 10000. 0. 4.0000 0. 51100 0. 1 0. 1111111111

LRC TEST PROBLEM NUMBER 2 ----- NSEG III
TOTAL RANGE TO BE DETERMINED -- NO ITERATION REQUIRED
IN-FLIGHT ENGINE SCALING REQUESTED

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZD	NET THRUST	SFC
0.000	0.	693688.	0.	4700.	.600	390.	8.19	382046.6	1.3287
.046	.30268	693296.	392.2	4965.	.620	403.	8.12	384017.5	1.3263
.092	.61095	692908.	780.5	5230.	.640	415.	7.98	386326.6	1.3232
.137	.92473	692523.	1165.	5495.	.660	428.	7.84	388786.4	1.3200
.182	1.2440	692141.	1547.	5760.	.680	441.	7.70	391444.0	1.3164
.226	1.5696	691762.	1927.	6025.	.700	453.	7.55	394377.1	1.3125
.269	1.9021	691383.	2306.	6290.	.720	466.	7.39	397564.4	1.3082
.313	2.2418	691004.	2684.	6555.	.740	478.	7.24	400942.8	1.3037
.356	2.5887	690626.	3062.	6820.	.760	490.	7.08	404406.4	1.2994
.399	2.9432	690247.	3441.	7085.	.780	503.	6.93	407952.9	1.2952
.442	3.3055	689867.	3821.	7350.	.800	515.	6.75	411723.8	1.2907
.486	3.6793	689482.	4206.	7615.	.820	528.	6.51	415803.2	1.2858
.530	4.0697	689088.	4600.	7880.	.840	540.	6.23	420046.2	1.2808
.575	4.4780	688682.	5006.	8145.	.860	552.	5.95	424610.6	1.2754
.621	4.9061	688263.	5425.	8410.	.880	565.	5.67	429287.7	1.2699
.669	5.3562	687830.	5858.	8675.	.900	577.	5.39	434266.6	1.2641
.718	5.8306	687380.	6308.	8940.	.920	589.	5.11	439437.8	1.2582
.769	6.3323	686910.	6778.	9205.	.940	601.	4.82	444892.5	1.2520
.821	6.8646	686419.	7269.	9470.	.960	614.	4.54	450536.9	1.2456
.876	7.4316	685902.	7786.	9735.	.980	626.	4.25	456489.2	1.2390
.934	8.0380	685355.	8333.	10000.	1.000	638.	4.11	462661.2	1.2322

10. ****** XCLECT END OPTION 1 ******
WT = .68536E+06 H = 10000. AM = 1.00000

TIME = .12849E-01 RANGE = 3.6296 FUEL = 6311.8

+++ +++

CUMULATIVE CPU TIME = 10.515 CPU TIME USED IN PREVIOUS TASK = 1.1220

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
41	.6854E+06	.1000E+05	1.0000	.1557E-01	8333.	8.038	1.000	-0.	0.	1

UNPACK 51 51100 5 1 1 0 0. 1

1.5000	20518.	0.	4.0000	0.	51100	0.	1	0.		1111111111

LRC TEST PROBLEM NUMBER 2 ----- NSEG III
TOTAL RANGE TO BE DETERMINED -- NO ITERATION REQUIRED
IN-FLIGHT ENGINE SCALING REQUESTED

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZO	NET THRUST	SFC
0.000	0.	685355.	0.	10000.	1.000	638.	4.79	462665.7	1.2322
.096	1.0313	684439.	916.1	10526.	1.025	653.	4.14	449247.1	1.2744
.226	2.4545	683200.	2155.	11052.	1.050	667.	3.06	436248.2	1.3180
.393	4.3289	681597.	3758.	11578.	1.075	682.	2.30	423721.0	1.3629
.614	6.8718	679461.	5895.	12104.	1.100	696.	1.96	411639.0	1.4090
.828	9.3732	677391.	7965.	12629.	1.125	711.	1.73	421432.8	1.3834
1.108	12.730	674658.	.1070E+05	13155.	1.150	725.	1.30	397356.1	1.4739
1.473	17.178	671092.	.1426E+05	13681.	1.175	739.	1.02	379343.1	1.5513
1.901	22.509	666878.	.1848E+05	14207.	1.200	754.	.84	364648.6	1.6219
2.418	29.062	661770.	.2359E+05	14733.	1.225	768.	.67	351804.9	1.6897
3.085	37.671	655150.	.3021E+05	15259.	1.250	782.	.52	340077.6	1.7563
3.914	48.578	646871.	.3848E+05	15785.	1.275	796.	.43	329981.4	1.8191
4.832	60.864	637660.	.4770E+05	16311.	1.300	810.	.51	321233.2	1.8783
5.426	68.930	631676.	.5368E+05	16837.	1.325	824.	2.12	398614.8	1.5210
5.525	70.296	630673.	.5468E+05	17363.	1.350	837.	4.02	435439.3	1.3998
5.605	71.417	629860.	.5550E+05	17888.	1.375	851.	4.64	454700.3	1.3467
5.676	72.431	629132.	.5622E+05	18414.	1.400	865.	5.07	468646.2	1.3124
5.741	73.371	628465.	.5689E+05	18940.	1.425	879.	5.44	481396.6	1.2838
5.801	74.251	627846.	.5751E+05	19466.	1.450	892.	5.77	492994.2	1.2594
5.857	75.083	627266.	.5809E+05	19992.	1.475	906.	6.05	502853.3	1.2406
5.910	75.884	626714.	.5864E+05	20518.	1.500	919.	6.17	511451.2	1.2259

11. ****** XCLECT END OPTION 1 ******
WT = .62671E+06 H = 20518. AM = 1.5000

TIME = .28418E-01 RANGE = 11.668 FUEL = 8332.7

+++ +++

CUMULATIVE CPU TIME = 12.187 CPU TIME USED IN PREVIOUS TASK = 1.6720

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
51	.6267E+06	.2052E+05	1.500	.9850E-01	.5864E+05	75.88	1.000	-0.	0.	1

UNPACK 61 51100 5 1 1 0 0. 22
0. 0. 0. 3.0000 6.0000 51100 0. 22 1.0000 1111111111

LRC TEST PROBLEM NUMBER 2 ----- NSEG III
TOTAL RANGE TO BE DETERMINED -- NO ITERATION REQUIRED
IN-FLIGHT ENGINE SCALING REQUESTED

CONSTANT DYNAMIC PRESSURE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZD	NET THRUST	SFC
0.000	0.	626714.	0.	20518.	1.500	919.	11.83	511468.8	1.2258
.244	3.7866	624203.	2512.	25341.	1.632	980.	11.15	518596.2	1.1694
.501	8.0804	621628.	5087.	30164.	1.818	1070.	10.55	542620.4	1.1114
.731	12.304	619286.	7429.	34987.	2.034	1172.	10.13	576127.3	1.0677
.963	16.987	616893.	9821.	39810.	2.284	1309.	8.91	591175.3	1.0425
1.204	22.484	614415.	.1230E+05	44633.	2.564	1470.	7.80	608696.7	1.0258
1.444	28.604	611952.	.1476E+05	49456.	2.879	1650.	7.69	614970.8	1.0070
1.641	34.248	609876.	.1684E+05	54279.	3.233	1853.	7.95	796868.7	.81076
1.819	39.970	607878.	.1884E+05	59102.	3.630	2081.	7.13	820378.0	.85323
2.014	47.080	605594.	.2112E+05	63925.	4.077	2337.	5.18	533080.8	.93029
2.292	58.433	602779.	.2394E+05	68748.	4.577	2629.	3.53	631467.9	.98844
2.614	73.280	599423.	.2729E+05	73571.	5.136	2960.	2.67	574695.5	1.0897
2.998	93.219	595380.	.3133E+05	78394.	5.758	3330.	2.00	526322.6	1.2065
3.453	119.76	590498.	.3622E+05	83217.	6.451	3743.	1.49	494535.6	1.3164
3.998	155.46	584702.	.4201E+05	88040.	7.222	4204.	1.08	445351.9	1.4090
4.689	206.43	577587.	.4913E+05	92863.	8.078	4718.	.75	399263.0	1.5304
5.591	281.00	568600.	.5811E+05	97686.	9.030	5292.	.50	346351.5	1.6998
6.830	395.89	556771.	.6994E+05	102509.	10.087	5930.	.31	288376.1	1.9359
8.699	590.24	540001.	.8671E+05	107332.	11.260	6641.	.18	224245.2	2.3371
12.023	977.63	512192.	.1145E+06	112155.	12.560	7431.	.07	159551.0	3.0510
22.639	2371.0	430908.	.1958E+06	116978.	14.000	8310.	.03	94551.41	4.6746

13. ****** XCLECT END OPTION 1 ******
WT = .43091E+06 H = .11698E+06 AM = 14.000

TIME = .12692 RANGE = 87.551 FUEL = 58641.

+++ +++

CUMULATIVE CPU TIME = 14.595 CPU TIME USED IN PREVIOUS TASK = 2.3820

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
71	.4309E+06	.1170E+06	14.00	.3773	.1958E+06	2371.	1.000	-0.	0.	1

UNPACK 81 51010 5 1 0 10 10. 6
0. 0. .20000E+06 0. 0. 51010 1.0000 6 0. 1111111111

LRC TEST PROBLEM NUMBER 2 ----- NSEG III
TOTAL RANGE TO BE DETERMINED -- NO ITERATION REQUIRED
IN-FLIGHT ENGINE SCALING REQUESTED

SEARCH FOR MACH ALTITUDE POINT ALONG A CONSTANT ENERGY LINE

THE BASIS FOR SELECTION OF EACH MACH ALTITUDE POINT WAS MAXIMUM LIFT/DRAG

CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMMA	NET THRUST	SFC
0.000	0.	200000.	0.	116978.	9.538	5661.	.52	-22347.67	-.10715
.417	38.771	199984.	15.87	119119.	9.256	5582.	.10	-20370.46	-.10559
.892	81.716	199967.	33.36	117663.	9.002	5345.	-.14	-21172.47	-.10517
1.394	125.79	199948.	51.58	117822.	8.723	5181.	.04	-19829.62	-.10668
1.935	171.69	199930.	70.43	118001.	8.436	5010.	.04	-19081.43	-.10641
2.517	219.47	199910.	89.93	118204.	8.138	4834.	.04	-18376.77	-.10584
3.147	269.23	199890.	110.1	118435.	7.829	4651.	-.17	-17475.79	-.10570
3.810	319.62	199869.	130.9	116401.	7.528	4467.	-.18	-17520.73	-.10863
4.541	372.80	199847.	153.4	116512.	7.193	4268.	.02	-15842.53	-.11159
5.344	428.55	199823.	176.7	116642.	6.842	4060.	.02	-14971.42	-.11123
6.229	486.76	199799.	200.9	116794.	6.471	3841.	.03	-14200.76	-.11004
7.199	546.97	199774.	225.7	116976.	6.078	3608.	.03	-13549.61	-.10773
8.233	606.94	199749.	250.5	117196.	5.658	3359.	-.37	-12966.58	-.10443
9.090	653.53	199729.	270.8	113372.	5.242	3104.	-.41	-13719.39	-.10519
10.285	712.40	199702.	298.3	113038.	4.752	2813.	-.54	-11373.93	-.11248
11.462	764.95	199675.	325.0	107367.	4.260	2512.	-.13	-11753.52	-.11939
12.854	818.99	199654.	346.5	111697.	3.580	2117.	-.49	-10558.03	-.49504E-01
14.460	870.61	199639.	361.0	102214.	2.931	1723.	-1.96	-12320.21	-.42175E-01
16.465	920.22	199623.	377.3	90664.	2.098	1224.	-3.46	-13842.88	-.32989E-01
19.698	966.39	199598.	402.3	67499.	.939	539.	-6.33	382.4950	1.2039
34.222	1043.2	199038.	978.1	2413.	.262	172.	-15.50	3517.457	1.3365
34.313	1043.3	198998.	1002.	2000.	.300	197.	-23.05	34092.77	1.2720

15. ****** XCLECT END OPTION 1 ******
WT = .19900E+06 H = 2000.0 AM = .30000
TIME = 1.6871 RANGE = 10458. FUEL = .23091E+06

+++ +++

CUMULATIVE CPU TIME = 20.621 CPU TIME USED IN PREVIOUS TASK = 5.8020

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
91	.1990E+06	2000.	.3000	.5719	1002.	1043.	1.000	-0.	0.	1

LRC TEST PROBLEM NUMBER 2 ----- NSEG III
TOTAL RANGE TO BE DETERMINED -- NO ITERATION REQUIRED
IN-FLIGHT ENGINE SCALING REQUESTED

MISSION TIME HISTORY PAYLOAD = 0.

			******INCREMENTAL*******			**********TOTAL**********			
WEIGHT	MACH	ALTITUDE	RANGE	TIME(HRS)	FUEL	RANGE	TIME(HRS)	FUEL	OPTION
700000.	.300	2000.	0.00	0.000	0.	0.	0.00	0.	13
693688.	.600	4700.	3.63	.013	6312.	4.	.01	6312.	1
685355.	1.000	10000.	8.04	.016	8333.	12.	.03	14645.	1
626714.	1.500	20518.	75.88	.099	58641.	88.	.13	73286.	1
430908.	14.000	116978.	2370.96	.377	195806.	2459.	.50	269092.	1
200000.	9.538	116978.	7999.84	1.183	230908.	10458.	1.69	500000.	6
198998.	.300	2000.	1043.31	.572	1002.	11502.	2.26	501002.	1

LRC TEST PROBLEM NUMBER 2 ----- NSEG III
TOTAL RANGE TO BE DETERMINED -- NO ITERATION REQUIRED
IN-FLIGHT ENGINE SCALING REQUESTED

END OF FILE READING DATA

```
01/14/77  LRC ICOPS INDEPNDT 6600C-131K 01/21/75F
10.42.58. ACCT - RATE IS EXCEEDED
10.42.59.GT74108.
10.42.59.                        LRC COMPUTER COMP3EX
10.42.59.JOB,01,200,110000,5000.          A4916   R
10.42.59.4322       100732          BLDG 1247A  CENT
10.42.59.USER.VAHL, WALTER A                    0809
10.42.59.10600N 37358
10.42.59.FETCH,A4916,,BINARY,,MISSION.
10.43.06.TIME        BG ATTACH
10.46.28.TIME        ED ATTACH
10.46.29.END    FETCH
10.46.29.DROPFIL,DCNS,ZOOKS,ZOUNDS,DAFILE,SCFILE.
10.46.34.MODE1.
10.46.34.MISSION.
10.47.30.STOP 77
10.47.30.REWIND(INPUT)
10.47.31.COPYCR(INPUT,DUMMY)
10.47.33.REWIND(DUMMY)
10.47.35.COPYSBF(DUMMY,OUTPUT)
10.47.36.COPYSBF(INPUT,OUTPUT)
10.47.39.SPPRINT(OUTPUT,3)
10.47.41.      0000230 O/S CALLS
10.47.41.CPU     20.969674 SEC.
10.47.41.PPU    265.322496 SEC.
10.47.41.CRU      7         RESOURCE UNITS
10.47.41.KWH      1.80      KILOWORD HOURS
11.13.27. GT74108.    1706 LINES PRINTED. LR31
```

4.0 PROBLEM NO. 3 - MACH 6 HYDROGEN FUELLED TURBORAMJET WITH ENGINE SCALING

4.1 Vehicle Characteristics

Turbojet propulsion (M = 0-.8)

Dual mode (turbojet and ramjet) propulsion (M = .8-3)

Ramjet propulsion (M = 3-6)

4 turboramjet engines, H_2 fuel (F/A = .0292)

$M_{cruise} = 6$

Gross take-off weight to be determined

Operating weight empty = 494,960 pounds

Thrust loading = .4

Thrust margin at cruise = .4

Vehicle reference area - 14,724 ft^2

Wing semi-thickness angle = $-.7^o$

Inlet initial wedge angle = 6^o

Engine exhaust field pressure (p_N) = free-stream static pressure (p_∞)

Total range = 7350 N.M. (not counting alternate field range)

4.2 Mission Characteristics

(1) Take-off to clear 50 foot obstacle

(2) Accelerating climb at max. power along prescribed path until q = 1000 psf reached ($\approx$M = 2.5)

(3) Accelerating climb at max. power along constant q = 1000 psf path to M = 5.95 (altitude = 87990 ft.)

(4) Accelerating climb at full power to M = 6, altitude = 99,120 ft.

(5) Constant altitude, constant C_L cruise to weight = OWE + reserve fuel for 200 N.M. alternate field

(6) Descent at max. L/D to M = .8, altitude = 20,000 ft.

(7) Loiter 5 minutes

(8) Constant M = .8 climb to 45,000 ft.

(9) Constant altitude cruise for 200 N.M. at M = .8.

(10) Descent at max. L/D to M = .8, h = 20,000 ft.

(11) Loiter 5 minutes.

(12) Descent at max. L/D to 50 ft. obstacle

(13) Landing

4.3 Propulsion Characteristics

Inlet capture ratio (A_c/A_i) vs. Inlet flow field Mach number (M_1)

M_1	A_c/A_i
0	.8707
.3	.8707
.54	.7347
.7	.6961
.8	.6168
.9	.5986
1.0	.5941
1.2	.6077
1.6	.6395
2.0	.7347
2.2	.8345
2.4	.8685
2.7	1.0
8.0	1.0

Inlet pressure recovery (p_{t_3}/p_{t_1}) vs. Inlet flow field Mach number (M_1)

M_1	p_{t_3}/p_{t_1}
0.0	.938
1.0	.938
1.3	.93
1.65	.91
2.0	.878
2.4	.827
2.75	.771
3.55	.63
4.2	.513
5.0	.384
5.5	.314
6.0	.258
6.35	.224
6.75	.19
7.25	.157
7.75	.13
8.0	.118

Turbojet corrected airflow ($w\frac{\sqrt{\theta}}{\delta}$) vs. Inlet flow field total temperature (T_{t_1}) for base size engine

T_{t_1} (^{o}R)	$w\frac{\sqrt{\theta}}{\delta}$ (#/sec)
400	443
450	439
500	430
570	408.5
750	325.5
830	294.5
900	273
1000	249
1100	231
1200	219
1300	210
1400	199
1500	183
1600	162
1768	127

Turbojet gross thrust per pound of airflow ($F_g/\dot{w}_a$) vs. Engine pressure ratio ($\log_{10} P_{t_3}/P_N$) and inlet flow field total temperature (T_{t_1})

$\log_{10} P_{t_3}/P_N$ \ T_{t_1} =	400	430	450	470	519	700	800	900	1000	1100	1200	1400	1500	1600
-.0458	144	144.5	145	148.7	146.4	130.8	123.0	0	0	0	0	0	0	0
0.	148	148.5	149.2	152.9	150.7	135.3	127.5	119.6	115.7	0	0	0	0	0
.301	167.9	170.8	173.2	177.9	176.3	163.7	157.0	150.0	143.4	0	0	0	0	0
.4771	179.4	181.4	183.9	189.5	188.0	179.0	173.0	166.7	159.9	0	0	0	0	0
.6021	185.3	188.3	190.8	196.5	195.0	188.5	183.0	176.8	170.1	163.2	0	0	0	0
.7782	194.8	196.9	199.3	204.9	204.1	199.7	196.0	193.8	191.7	190.5	186.5	180.7	171.5	144.0
.9031	199.3	202.6	204.8	210.1	210.0	206.4	203.4	200.0	198.8	197.3	194.6	189.9	178.9	151.8
1.0	204.1	206.6	208.9	213.9	214.2	211.2	208.9	206.3	204.2	202.6	200.6	196.5	184.3	157.4
1.301	0	0	0	0	224.8	223.0	219.2	221.0	219.2	213.0	217.6	215.2	200.3	174.3
1.6021	0	0	0	0	234.0	233.1	231.5	232.7	231.6	231.2	231.1	229.1	214.2	188.4
1.7781	0	0	0	0	239.0	238.6	237.8	237.5	237.8	237.8	237.8	235.4	220.9	194.6
1.9031	0	0	0	0	242.3	242.2	242.1	242.3	242.0	242.0	242.0	239.9	225.0	198.1
2.0	0	0	0	0	245.0	245.0	245.0	245.0	245.0	245.0	245.0	243.0	227.8	200.5

Turbojet fuel-air ratio ($\dot{w}_f/\dot{w}_a$) vs. inlet flow field total temperature (T_{t_1})

T_t, ^oR	$\dot{w}_f/\dot{w}_a$
400	.0258
425	.02645
450	.02755
470	.0292
1320	.0292
1380	.0283
1440	.02605
1490	.0239
1530	.0217
1570	.01885
1600	.0160
1768	0.

Ramjet performance (I_{sp}) vs. free-stream Mach number (M_∞) and inlet flow field total temperature (T_{t_1})

M_∞	$T_{t_1} = 0^oR$	$T_{t_2} = 1000^oR$
.8	1675.0	1675.0
.85	1768.4	1768.4
.9	1861.0	1861.0
.95	1957.4	1957.4
1.0	2054.9	2054.9
1.1	2334.9	2334.9
1.15	2404.5	2404.5
1.2	2495.0	2495.0
1.3	2686.0	2686.0
1.4	2853.0	2853.0
1.5	2995.3	2995.3

(Continued)

M_∞	T_{t_1} = 0 °R	T_{t_2} = 1000 °R
1.6	3138.7	3138.7
1.8	3354.0	3354.0
2.0	3515.8	3515.8
2.2	3637.0	3637.0
2.4	3738.7	3738.7
2.6	3821.3	3821.3
2.7	3857.2	3847.2
2.8	3879.8	3879.8
2.95	3902.7	3902.7
3.	3908.0	3908.0
3.2	3928.1	3928.1
3.4	3938.4	3938.4
3.6	3925.0	3925.0
3.8	3903.7	3903.7
4.0	3889.7	3889.7
4.2	3867.6	3867.6
4.4	3822.5	3822.5
4.6	3763.3	3763.3
4.8	3702.5	3702.5
5.	3630.0	3630.0
5.2	3568.0	3568.0
5.4	3510.1	3510.1
5.6	3450.6	3450.6
5.8	3387.5	3387.5
5.95	3342.5	3342.5
6.0	3381.5	3381.5

Ramjet equivalence ratio (ϕ) vs. free stream Mach number (M_∞)

M_∞	ϕ
0	1.0
6.0	1.0

Ramjet maximum airflow ratio ($\dot{w}_{RJ_{max}}/\dot{w}_{\text{full capture inlet}}$) vs. Inlet flow field total temperature (T_{t_1})

T_{t_1}, °R	$(\dot{w}_{RJ_{max}}/\dot{w}_{\text{full capture inlet}})$
440	0
700	.4
900	.745
1035	1.0
6000	1.0

Ramjet throttling table at cruise conditions ($M_\infty = 6$); $F_N/F_{N_{max}}$) vs. (SFC/SFC_{max})

$(F_N/F_{N_{max}})$	(SFC/SFC_{max})
0	2.222
.1	1.215
.2	.995
.3	.903
.4	.873
.5	.868
.6	.875
.7	.889
.8	.912
1.0	1.0

4.4 Trajectory Details

The trajectory segment (2) prescribed path is described below.

M_∞	Altitude, ft.
M_∞ at 50' obstacle	50.
.5	3000
.6	5000
.7	11500
.75	16000
.8	21500
.85	24000
.9	27000
.95	29000
1.0	30000
1.1	32700
1.15	33500
1.2	34500
1.3	36500
1.4	38500
1.5	40500
1.6	41500
1.8	44500
2.0	47200
2.2	49000
2.4	51000 (q = 936.4 psf)
2.6	52971 (q = 1000 psf)

4.5 Aerodynamic Characteristics

Linear aerodynamics are based on the following equations:

$$C_D = C_{D_o} + K (C_L - C_{L_o})^2$$

$$C_L = C_{L_\alpha} \alpha + C_{L_{\alpha=0}}$$

M_∞	C_{D_o}	C_{L_o}	$C_{L_{\alpha=0}}$	C_{L_α}	K
0	.0078	0.	0.	.0465	.280
.3	.0078	0.	0.	.0465	.280
.4	.0078	0.	0.	.0466	.285
.6	.0078	0.	0.	.0475	.292
.8	.0078	0.	0.	.0545	.302
.9	.0120	0.	0.	.0563	.310
.95	.0170	0.	0.	.0561	.312
1.0	.0199	0.	0.	.0556	.316
1.1	.0199	0.	0.	.0540	.323
1.2	.01645	0.	0.	.0526	.330
1.3	.0156	0.	0.	.0515	.338
1.4	.0148	0.	0.	.0504	.342
2.0	.0119	0.	0.	.0439	.398
2.5	.0177	0.	0.	.0368	.464
3.	.00965	0.	0.	.0302	.579
3.5	.00868	0.	0.	.0262	.700
4.	.0078	0.	0.	.0230	.840
4.5	.00705	0.	-.0060	.0206	.970
5.	.00652	0.	-.0058	.0188	1.068
5.5	.0061	0.	-.00565	.0174	1.162
6.	.005887	0.	-.0055	.0164	1.220

```
                LRC TEST PROBLEM NUMBER 3  -----  NSEG III
                ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
                FOR GIVEN FINAL WEIGHT.  IN-FLIGHT ENGINE SCALING REQUESTED.


     STCASE/TABSIZ/
               TABLE SIZES FOR EACH TABLE USED IN THIS RUN
        ETAB03(30)
        ETAB04(40)
        ETAB05(40)
        ETAB06(225)
        ETAB07(30)
        ETAB08(25)
        ETAB09(120)
        ETAB10(15)
     ATAB46(75)
     ATAB52(50)
     ATAB58(50)
     CLZTAB(75)
        CLATAB(100)
     MTAB01(500)
     MTAB02(500)
     END
               TOTAL TABLE SIZE FOR THIS RUN IS  1944
```

```
                    LRC TEST PROBLEM NUMBER 3  -----  NSEG III
                    ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
                    FOR GIVEN FINAL WEIGHT.  IN-FLIGHT ENGINE SCALING REQUESTED.


      STCASE/DATA1/
...
...
...         DATA FOR PRINT-OUT CONTROL
      IPDICN=1,     $ PRINT DATA BASE DIRECTORY
      IPDICN=0,     $ DO NOT PRINT DATA BASE DIRECTORY
..
...       CONTROLS PRINT OUT OF MISSION SEGMENTS
     IPSEG=3,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,22,0
...
      IPATMD=1,     $ GENERATE TABULAR LISTING OF ATMOSPHERIC PROPERTIES
      IPATMD=0,     $ DO NOT GENERATE TABULAR LISTING OF ATMOSPHERIC PROPERTIES
      IPTZIN=0,     $ DO NOT PRINT TERM ARRAY AS THE INPUT DATA IS PROCESSED
      IPTZIN=1,     $ PRINT THE TERM ARRAY FROM FILLTZ
     IOBMHP=0,      $DO NOT PRINT DUMPS DURING CLIMB
.                     AS THE INPUT DATA FOR EACH
.                     MISSION SEGMENT IS PROCESSED
      IPENDS=0,     $ DO NOT PRINT SCALED ENGINE DATA
      IPENDS=1,     $ PRINT SCALED ENGINE DATA
      IPENDR=0,     $ DO NOT PRINT RAW ENGINE DATA
      IPENDR=1,     $ PRINT RAW ENGINE DATA
      IPTZXX=1,     $ PRINT TERM ARRAY AS EACH MISSION SEGMENT IS STARTED
      IPRGSV=1,     $ PRINT THE RG SAVE ARRAY FROM EACH MISSION SEGMENT
...
...         TAKE-OFF AND LANDING DATA
...
  SREF =14724.0,$  WING REFERENCE AREA (SF)
  SPLG  =200.0,$   FLAT PLATE AREA OF GEAR (SF)
  CDPLG =0.5,$     FLAT PLATE DRAG COEF OF GEAR
  AG    =.25,$     GROUND ROLL BODY ANGLE (DEG)
  WSLEFC=37.0,$    WING LEADING EDGE SWEEP ANGLE (DEG)
  DFK   =0.189,$   INDUCED DRAG FACTOR
  XMAXG =7500.0,$  MAXIMUM GROUND ROLL (FT) IGNORED, IF ZERO
  BFOBEX=0.66,$    FLAP SPAN TO EXPOSED WING SPAN RATIO
  CFOCAV=.25,$     AVERAGE FLAP CHORD TO WING CHORD RATIO
  SPCHUT=0.0,$     FLAT PLATE AREA OF DRAG CHUTE (SF)
  CDPCHT=0.0,$     FLAT PLATE DRAG COEFF OF CHUTE
  GRNDFT=0.025,$   GROUND ROLL FRICTION COEFFICIENT TAKE-OFF
  FLAPOT=20.0,$    FLAP DEFLECTION (DEG) TAKE-OFF
  GRNDFL=.35,$     GROUND ROLL FRICTION COEFFICIENT LANDING
  FLAPDL=45.0,$    FLAP DEFLECTION (DEG) LANDING
  FNL   =0.0,$     LANDING THRUST (LB)
...   LOW ASPECT RATIO TAKE-OFF VALUES
  ARTHEO=2.0,$     THEORETICAL WING ASPECT RATIO (SPAN**2/SREF)
  AMAXG =20.0,$    MAXIMUM GROUND ROTATION ANGLE (DEG)
  WSLEFC=60.0,$    WING LEADING EDGE SWEEP ANGLE (DEG)
  CFOCAV=.15,$     AVERAGE FLAP CHORD TO WING CHORD RATIO
  CD0   =0.0086, $ DRAG COEFF AT ZERO LIFT
  TRATIO=.20,$     WING TAPER RATIO
  CLATOT=.05115, $ TOTAL LIFT LIFT CURVE SLOPE (PER DEG)
  WINCID=-0.7,  $  WING INCIDENCE AT ZERO ANGLE OF ATTACK
   CL0=0.0,  $LIFT COEF AT ZERO ANGLE OF ATTACK
```

```
                    LRC TEST PROBLEM NUMBER 3 -----  NSEG III
                    ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
                    FOR GIVEN FINAL WEIGHT.  IN-FLIGHT ENGINE SCALING REQUESTED.


   HTO=0.,  $ ALTITUDE AT START OF TAKEOFF ROLL
...
...         GENERAL DATA
      PLWINT=100000.0,
      GLEVEL=1.0,
      AVOID1=0,
      AVOID2=0,
  AMTO=.2,
      PSET=1,
      HI=0.0,
      HF=40000.0,
      AMI=0.2,
      AMF=0.825,
      H0=0.0,
      HE=35000.0,
      AMS=0.29,
      AME=0.767,
...
...
...         AERO DATA
  RCSC=100.0,
...   LINEAR AERODYNAMICS
    INDAER = 9,     $ TABULAR DATA
    INDA46 =1,      $ COD VS MAND M
    INDA52 =1,      $ K21 VS M
    INDA58 =0,      $ MIN DRAG CL  VS  M  IS IDENTICALLY ZERO
    INDCLZ = 1,     $ CL AT ZERO ALPHA VS M AND ALT
    IA46X = 2,      $ NO. ALT
    IA46Y = 21,     $ NO M
    ICLZX = 21,
    ICLZY = 2,
    ATAB46 = 0.,500000.,      $ ALTITUDES
             0.,.3,.4,.6,.8,.9,.95,1.,1.1,1.2,1.3,1.4,    $ MACHS
             2.,2.5,3.,3.5,4.,4.5,5.,5.5,6.,
             .0078,.0078,.0078,.0078,.0078,.0078,.0078,.0078,
             .0078,.0078,.0120,.0120,.0170,.0170,.0199,.0199,
             .0199,.0199,.01645,.01645,.0156,.0156,.0148,.0148,
             .0119,.0119,.0177,.0177,.00965,.00965,.00868,.00868,
             .0078,.0078,.00705,.00705,.00652,.00652,.0061,.0061,
             .005887,.005887,
....K21 VS. MACH
    ATAB52 = 21 ,0.,.28,.3,.28,.4,.285,.6,.292,.8,.302,
                 .9,.31,.95,.312,1.,.316,1.1,.323,1.2,.33,
                 1.3,.338,1.4,.342,2.,.398,2.5,.464,3.,.579,
                 3.5,.7,4.,.84,4.5,.97,5.,1.068,5.5,1.162,
                 6.,1.22,
    CLZTAB = 0.,.3,.4,.6,.8,.9,.95,1.,1.1,1.2,1.3,1.4,
             2.,2.5,3.,3.5,4.,4.5,5.,5.5,6., 0.,500000.,
...       ALT = 0.
             0.,0.,0.,0.,0.,0.,0.,0.,0.,0.,0.,0.,0.,0.,0.,0.,0.,0.,0.,
             -.006,-.0058,-.00565,-.0055,
...       ALT = 500000.
```

```
                    LRC TEST PROBLEM NUMBER 3  -----  NSEG III
                    ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
                    FOR GIVEN FINAL WEIGHT.  IN-FLIGHT ENGINE SCALING REQUESTED.


              0.,0.,0.,0.,0.,0.,0.,0.,0.,0.,0.,0.,0.,0.,0.,0.,0.,0.,
              -.006,-.0058,-.00565,-.0055,
       INDCLA = 1,
       ICLAX =21 ,
       ICLAY =2,
       CLATAB = 0.,.3,.4,.6,.8,.9,.95,1.,1.1,1.2,1.3,1.4,
              2.,2.5,3.,3.5,4.,4.5,5.,5.5,6.,0.,500000.,
...         ALT = 0.
              .0465,.0465,.0466,.0475,.0545,.0563,.0561,.0556,
              .0540,.0526,.0515,.0504,.0439,.0368,.0302,.0262,
              .0230,.0206,.0188,.0174,.0164,
...         ALT = 500000.
              .0465,.0465,.0466,.0475,.0545,.0563,.0561,.0556,
              .0540,.0526,.0515,.0504,.0439,.0368,.0302,.0262,
              .0230,.0206,.0188,.0174,.0164,
...   ...   ...   ...   ...   ...   ...   ...   ...   ...   ...   ...   ...   ..
...
...
...         ATMOSPHERIC DATA
       INDATM=9,
       INDATM=3,
...
...                 DATA FOR USER SPECIFIED TEMPERATURE PROFILE
       NHG=11,
       HG=-16404.0, 0.0, 36089.01, 65617.01, 104987.0, 154199.01,
          170604.01, 200131.01, 259186.01, 291160.01, 295276.01,
       TM=577.18, 518.68, 389.98, 389.98, 411.58, 487.18, 487.18,
          454.78, 325.18, 325.18, 379.18,
       PM=3711.0839, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0,
...
...
...         THRUST DATA
  FF=.05,
  FPOL=1.0,
       FFLMIN=0.001,
       SFCFAC=1.05,
       NUMENG=4,
       TSIZEF=1.0,
       THRMIN=0.1,
...   ...   ...   ...   ...   ...   ...   ...   ...   ...   ...   ...   ...   ..
....  CHECK PROBLEM 3
    INDEG1 = 0,
    INDEG2 = 0,
    INDEG3 = 1,
    INDEG4 = 1,
    INDEG5 = 1,
    INDEG6 = 1,
    INDEG7 = 1,
    INDEG8 = 1,
    INDEG9 = 1,
    INDEG10 = 1,
    INOCLA = 1,
```

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

```
...   CHECK  PROBLEM  3
    IE03X = 14,
    ETAB03 = 0.,.3,.54,.7,.8,.9,1.,1.2,1.6,2.,2.2,2.4,2.7,8.,
             .8707,.8707,.7347,.6961,.6168,.5986,.5941,.6077,
             .6395,.7347,.8345,.8685,1.,1.,
    IE04X = 17,
    ETAB04= 0.,1.,1.3,1.65,2.,2.4,2.75,3.55,4.2,5.,5.5,6.,6.35,
            6.75,7.25,7.75,8.,
            .938,.938,.93,.91,.878,.827,.771,.63,.513,.384,.314,
            .258,.224,.19,.157,.13,.118,
    IE05X = 15,
    ETAB05 =  400.,450.,500.,570.,750.,830.,900.,1000.,1100.,
              1200.,1300.,1400.,1500.,1600.,1768.,
              443.,439.,430.,408.5,325.5,294.5,273.,249.,231.,
              219.,210.,199.,183.,162.,127.,
    IE06X = 14,
    IE06Z = 13,
    ETAB06 = 400.,430.,450.,470.,519.,700.,800.,900.,1000.,1100.,
             1200.,1400.,1500.,1600.,
             -.0458,0.,.301,.4771,.6021,.7782,.9031,1.0,1.301,
             1.6021,1.7781,1.9031, 2.0,
             144.,144.5,145.,148.7,146.4,130.8,123.,0.,0.,0.,0.,
             0.,0.,0.,
             148.,148.5,149.2,152.9,150.7,135.3,127.5,119.6,
             115.7,0.,0.,0.,0.,0.,
             167.9,170.8,173.2,177.9,176.3,163.7,157.,150.,143.4,
             0.,0.,0.,0.,0.,
             179.4,181.4,183.9,189.5,188.,179.,173.,166.7,159.9,
             0.,0.,0.,0.,0.,
             185.3,188.3,190.8,196.5,195.,188.5,183.,176.8,170.1,
             163.2,0.,0.,0.,0.,
             194.8,196.9,199.3,204.9,204.1,199.7,196.,193.8,191.7,
             190.5,186.5,180.7,171.5,144.0,
             199.3,202.6,204.8,210.1,210.,206.4,203.4,200.,198.8,
             197.3,194.6,189.9,178.9,151.8,
             204.1,206.6,208.9,213.9,214.2,211.2,208.9,206.3,
             204.2,202.6,200.6,196.5,184.3,157.4,
             0.,0.,0.,0.,224.8,223.0,219.2,221.,219.2,213.,
             217.6,215.2,200.3,174.3,
             0.,0.,0.,0.,234.,233.1,231.5,232.7,231.6,231.2,
             231.1,229.1,214.2,188.4,
             0.,0.,0.,0.,239.,238.6,237.8,237.5,237.8,237.8,
             237.8,235.4,220.9,194.6,
             0.,0.,0.,0.,242.3,242.2,242.1,242.3,242.,242.,242.,
             239.9, 225.,198.1,
             0.,0.,0.,0.,245.,245.,245.,245.,245.,245.,245.,
             243.,227.8,200.5,
    IE07X = 12,
    ETAB07= 400.,425.,450.,470.,1320.,1380.,1440.,1490.,1530.,
            1570.,1600.,1768.,
            .0258,.02645,.02755,.0292,.0292,.0283,.02605,.0239,
            .0217,.01885,.0160 ,0.,
```

```
                    LRC TEST PROBLEM NUMBER 3  -----  NSEG III
                    ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
                    FOR GIVEN FINAL WEIGHT.  IN-FLIGHT ENGINE SCALING REQUESTED.


      IEG8X = 10,
      ETAB08= 0.,.1,.2,.3,.4,.5,.6,.7,.8,.9,1.,
              2.222,1.215,.995,.903,.873,.868,.875,.889,.912,1.0,
      IE09X = 37,
      ETAB09 = .8,.85,.9,.95,1.,1.1,1.15,1.2,1.3,1.4,1.5,1.6,1.8,
               2.,2.2,2.4,2.6,2.7,2.8,2.95,3.0,3.2,3.4,3.6,3.8,4.,
               4.2,4.4,4.6,4.8,5.,5.2,5.4,5.6,5.8,5.95,6.,
              1675.,1768.4,1861.,1957.4,2054.9,2334.9,2404.5,
              2495.,2686.,2853.,2995.3,3138.7,3354.,3515.8,3637.,  $ 12/75
              3738.7,3821.3,3857.2,3879.8,3902.7,3908.,3928.1,
              3938.4,3925.,3903.7,3889.7,3867.6,3822.5,3763.3,
              3702.5,3630.,3568.,3510.1,3450.6,3387.5,3342.5,
              3381.5,
              1.,1.,1.,1.,1.,1.,1.,1.,1.,1.,1.,1.,1.,1.,1.,1.,1.,1.,1.,1.,1.,
              1.,1.,1.,1.,1.,1.,1.,1.,1.,1.,1.,1.,1.,1.,1.,1.,1.,1.,1.,
      IE10X = 5,
      ETAB10 = 440.,700.,900.,1035.,6000.,
               0.,.4,.745,1.0,1.0,
...   SPECIAL INPUTS FOR DUAL ENGINE OPTION
      IEOP=0,
      AINLET = 40. ,
      DELWNG = -0.7,     $ WING COMPRESSION SURFACE ANGLE
      DELIN =  6.0 ,
      AMINRJ = 0.8,
      AMAXTJ = 3.0,
       ALPLIM=20.,       $MAX ANGLE OF ATTACK ALLOWABLE FOR DUAL ENG COMP
       IPDENG=0,      $NULL DIAGMOSTIC PRINT IN ENGINS ROUTINE
.....
       IASCAL = 1,  $AUTOMATICALLY SCALE ENGINES DURING CLIMB TO PROVIDE
.....                THRUST REQUIRED.
    PLWINT=0.,
    QLIM=1200.,
     CLC=.05,   $CRUISE LIFT COEFFICIENT FOR RAMJET SCALING
     CLMAX=1.0,  $MAX LIFT COEFFICIENT
      AMLIM=6.01,
    WT=494960.,
   WO=815000.,
   WGTO=815000.,
    WL=494960.,
    OWE=494960.,
    BAREWT=494960.,
      AINLET = 55.,
      TMINTJ=0.01,
      TMINRJ=0.01,
    SREF=14724.,
    XQSW=14724.,
    IEOP=2,  $  COMBINATION ENGINE OPTION
       END
```

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

```
... NASA TEST PROBLEM 3, NSEG VERSION III.
...
    SEGMENT(2),OPTION(21)
...   ENGINE SCALING OPTION
      PROPULSIVE MODE = DUAL
     SCALE TURBOJET--THRUST=326000.,  (LBS. TOTAL)
... TURBOJET IS SCALED AT SEA LEVEL
   SCALE RAMJET      CRUISE THRUST MARGIN=0.4,
     CRUISE MACH=6.0,  CRUISE ALTITUDE=99120.,
     AERO OPTION=1,
    END
  4.0000      .40000      6.0000      .32600E+06  99120.          51000 0.                21 0.          1111111111
...
     SEGMENT(3) ,OPTION(17),
     COMPUTE WARM-UP AND TAKE-OFF FUEL ALLOWANCE
     WARM-UP TIME=5.0,(MIN)
     END
 0.      -    0.          0.          5.0000      2.0000          51000  2.0000           17 0.          1111111111
...
    SEGMENT(4),OPTION(13),
..... START OF WEIGHT ITERATION LOOP.  GUESSED INITIAL WEIGHT
..... IS 800000. LBS.
     NEW WEIGHT=800000., LBS
     END
 0.          0.          .80000E+06 0.          0.          51000 0.                13 0.          1111111111
     SEGMENT(5) ,OPTION(1),
   FLY LINEAR MACH-ALTITUDE PATH
   END MACH NUMBER =0.5,
   END ALTITUDE=3000.,
      PROPULSIVE MODE = DUAL
      THRUST = MAXIMUM AVAILABLE
    END
  .50000      3000.0      0.          4.0000      0.          51100 0.                 1 0.          1111111111
...
     SEGMENT(6) ,OPTION(1),
   FLY LINEAR MACH-ALTITUDE PATH
   END MACH NUMBER =0.6,
   END ALTITUDE=5000.,
      PROPULSIVE MODE = DUAL
      THRUST = MAXIMUM AVAILABLE
    END
  .60000      5000.0      0.          4.0000      0.          51100 0.                 1 0.          1111111111
...
     SEGMENT(7) ,OPTION(1),
   FLY LINEAR MACH-ALTITUDE PATH
   END MACH NUMBER =0.8,
   END ALTITUDE=21500.,
      PROPULSIVE MODE = DUAL
      THRUST = MAXIMUM AVAILABLE
    END
  .80000      21500.      0.          4.0000      0.          51100 0.                 1 0.          1111111111
...
```

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

```
      SEGMENT(8) ,OPTION(1),
   FLY LINEAR MACH-ALTITUDE PATH
   END MACH NUMBER =0.95,
   END ALTITUDE=29000.,
      PROPULSIVE MODE = DUAL
      THRUST = MAXIMUM AVAILABLE
    END
  .95000      29000.     0.          4.0000     0.          51100 0.          1 0.          1111111111
...
      SEGMENT(9) ,OPTION(1),
   FLY LINEAR MACH-ALTITUDE PATH
   END MACH NUMBER =1.5,
   END ALTITUDE=40500.,
      PROPULSIVE MODE = DUAL
      THRUST = MAXIMUM AVAILABLE
    END
  1.5000      40500.     0.          4.0000     0.          51100 0.          1 0.          1111111111
...
      SEGMENT(10),OPTION(1),
   FLY LINEAR MACH-ALTITUDE PATH
   END MACH NUMBER =2.6,
   END ALTITUDE=52971.,
      PROPULSIVE MODE = DUAL
      THRUST = MAXIMUM AVAILABLE
    END
  2.6000      52971.     0.          4.0000     0.          51100 0.          1 0.          1111111111
...
      SEGMENT(11), OPTION(1),
   FLY CONSTANT Q PATH
   END MACH NUMBER =5.95,
   END ALTITUDE=87990.,
      PROPULSIVE MODE = DUAL
      THRUST = MAXIMUM AVAILABLE
    END
  5.9500      87990.     0.          5.0000     0.          51100 0.          1 0.          1111111111
...
      SEGMENT(12), OPTION(1),
   FLY LINEAR MACH-ALTITUDE PATH
   END MACH NUMBER =5.99,
   END ALTITUDE=99120.,
      PROPULSIVE MODE = DUAL
      THRUST = MAXIMUM AVAILABLE
    END
  5.9900      99120.     0.          4.0000     0.          51100 0.          1 0.          1111111111
......SCALE RAMJET AT CRUISE MACH AND ALT BASED ON CURRENT WEIGHT
    SEGMENT(13),OPTION(21),
    PROPULSIVE MODE=DUAL
    SCALE RAMJET---CRUISE THRUST MARGIN=0.4,
    CRUISE MACH=6.0, CRUISE ALTITUDE=99120.,
    COMPUTE ANGLE OF ATTACK FOR SCALING BASED ON CURRENT WEIGHT
    END
  5.0000      .40000     6.0000      0.          -99120.     51100 0.          21 0.         1111111111
```

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

```
..... LOOP BACK ONCE TO START OF CLIMB USING RESCALED ENGINE
    SEGMENT(14),OPTION(22),
    START LOOP AT BEGINNING OF SEGMENT(5)
    FINISH LOOP AT END OF SEGMENT(12)
    NUMBER OF ITERATIONS =1.,
    END
 0.          0.          0.          5.0000      12.000          51100 0.                22  1.0000      1111111111
...
   SEGMENT(15),OPTION(6),
   CRUISE AT CONSTANT LIFT COEFFICIENT
     NUMBER OF INTEGRATION STEPS = 10,
     END WEIGHT=530000.,  POUNDS
    THRUST = THRUST REQUIRED
    PROPULSIVE MODE = DUAL
    END
 0.          0.          .53000E+06 0.          0.          51010  1.0000       6 0.          1111111111
...
     SEGMENT(16), OPTION(1),
   USE MAX L/D AS BASIS FOR SELECTION
   SEARCH AT CONSTANT SPECIFIC ENERGY
   END MACH NUMBER =0.8,
   END ALTITUDE=20000.,
      PROPULSIVE MODE = DUAL
     THRUST=MINIMUM ALLOWABLE
     END
 .80000      20000.      3.0000      1.0000      0.          51210 0.                1 0.          1111111111
...
     SEGMENT(17), OPTION(17),
   COMPUTE LOITER FUEL ALLOWANCE
   LOITER TIME=5.0, (MINUTES)
   THRUST=THRUST REQUIRED
     END
 0.          0.          0.          5.0000      1.0000          51010  2.0000      17 0.          1111111111
...
     SEGMENT(18), OPTION(1),
   FLY LINEAR MACH-ALTITUDE PATH
   END MACH NUMBER =0.8,
   END ALTITUDE=45000.,
      PROPULSIVE MODE = DUAL
      THRUST = MAXIMUM ALLOWABLE
     END
 .80000      45000.      3.0000      4.0000      0.          51110 0.                1 0.          1111111111
...
     SEGMENT(19), OPTION(7),
   RANGE=200., N.M.
      THRUST = THRUST REQUIRED
     END
 0.          0.          0.          1.0000      200.00          51010 0.                7 0.          1111111111
...
     SEGMENT(20), OPTION(1),
   USE MAX L/D AS BASIS FOR SELECTION
   SEARCH AT CONSTANT SPECIFIC ENERGY
```

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

```
   END MACH NUMBER =0.8,
   END ALTITUDE=20000.,
      PROPULSIVE MODE = DUAL
    THRUST=MINIMUM ALLOWABLE
    END
 .80000      20000.     3.0000     1.0000     0.              51210 0.                1 0.          1111111111
...
      SEGMENT(21), OPTION(17),
   COMPUTE LOITER FUEL ALLOWANCE
   LOITER TIME=5.0, (MINUTES)
   THRUST=THRUST REQUIRED
    END
0.           0.         0.         5.0000     1.0000          51010  2.0000           17 0.          1111111111
...
      SEGMENT(22), OPTION(1),
   USE MAX L/D AS BASIS FOR SELECTION
   SEARCH AT CONSTANT SPECIFIC ENERGY
   END MACH NUMBER =0.2,
   END ALTITUDE=50.0,
      PROPULSIVE MODE = DUAL
      THRUST = MINIMUM ALLOWABLE
    END
 .20000      50.000     3.0000     1.0000     0.              51210 0.                1 0.          1111111111
.....
     SEGMENT(23),OPTION(22),
     START LOOP AT BEGINNING OF SEGMENT(4)---WEIGHT IS TO BE VARIED
     FINISH LOOP AT END OF SEGMENT(20)---RANGE IS TO BE SATISFIED
     DESIRED RANGE=7350., NAUT MI
     NUMBER OF ITERATIONS = 2.,
     END
 1.0000      2.0000     7350.0     4.0000     20.000          51210 0.                22  2.0000    1111111111
   SEGMENT(24),OPTION(17),
   PROPULSIVE MODE=DUAL
   THRUST = MINIMUM ALLOWABLE
   COMPUTE LANDING PERFORMANCE
   END MISSION
0.           0.         0.         0.         1.0000          51210  4.0000           17 0.          1111111111
```


LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

```
                    RUN

END OF NSEGII INPUT FOR CURRENT CASE,  0 INPUT ERRORS DETECTED.
```

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

MISSION SEGMENT TABLE

	.20000	0.	.81500E+06	6.0100	1200.0	.50000E-01	1.0000	100.00		0	
2	4.0000	.40000	6.0000	.32600E+06	99120.	51000	0.		21	0	1111111111
3	0.	0.	0.	5.0000	2.0000	51000	2.0000		17	0	1111111111
4	0.	0.	.80000E+06	0.	0.	51000	0.		13	0	1111111111
5	.50000	3000.0	0.	4.0000	0.	51100	0.		1	0	1111111111
6	.60000	5000.0	0.	4.0000	0.	51100	0.		1	0	1111111111
7	.80000	21500.	0.	4.0000	0.	51100	0.		1	0	1111111111
8	.95000	29000.	0.	4.0000	0.	51100	0.		1	0	1111111111
9	1.5000	40500.	0.	4.0000	0.	51100	0.		1	0	1111111111
10	2.6000	52971.	0.	4.0000	0.	51100	0.		1	0	1111111111
11	5.9500	87993.	0.	5.0000	0.	51100	0.		1	0	1111111111
12	5.9900	99120.	0.	4.0000	0.	51100	0.		1	0	1111111111
13	5.0000	.40000	6.0000	0.	-99120.	51100	0.		21	0	1111111111
14	0.	0.	0.	5.0000	12.000	51100	0.		22	X	1111111111
15	0.	0.	.53000E+06	0.	0.	51010	1.0000		6	0	1111111111
16	.80000	20000.	3.0000	1.0000	0.	51210	0.		1	0	1111111111
17	0.	0.	0.	5.0000	1.0000	51010	2.0000		17	0	1111111111
18	.80000	45000.	3.0000	4.0000	0.	51110	0.		1	0	1111111111
19	0.	0.	0.	1.0000	200.00	51010	0.		7	0	1111111111
20	.80000	20000.	3.0000	1.0000	0.	51210	0.		1	0	1111111111
21	0.	0.	0.	5.0000	1.0000	51010	2.0000		17	0	1111111111
22	.20000	50.000	3.0000	1.0000	0.	51210	0.		1	0	1111111111
23	1.0000	2.0000	7350.0	4.0000	20.000	51210	0.		22	X	1111111111
24	0.	0.	0.	0.	1.0000	51210	4.0000		17	0	1111111111

TURBOJET PERFORMANCE (PER ENGINE) AT SEA LEVEL STATIC CONDITIONS

TURBOJET GROSS THRUST	81506.1	(LB)
NET THRUST IN FREESTREAM DIRECTION	81500.0	(LB)
AIRFLOW RATE	550.325	(LB/SEC)
FUELFLOW RATE	16.0695	(LB/SEC)
SPECIFIC FUEL CONSUMPTION	.709765	((LB FUEL/HR)/LB THRUST)
BASE ENGINE SCALING FACTOR	1.38286	(NO UNITS)
MAXIMUM AIRFLOW RATE OF BASE ENGINE	424.266	(LB/SEC)
PRESSURE RATIO (PT3/PN)	.938000	(NO UNITS)
ANGLE OF ATTACK	0.	(DEGREES)
WING HALF ANGLE-	-.700000	(DEGREES)
INLET WEDGE ANGLE-	6.00000	(DEGREES)
SCALING THRUST IN FREESTREAM DIRECTION	81500.0	(LB)
LIFT COMPONENT OF ENGINE FORCES	-995.760	(LB)

RAMJET PERFORMANCE (PER ENGINE) AT SCALING ALTITUDE AND MACH NUMBER

RAMJET GROSS THRUST	27446.4	(LB)
NET THRUST IN FREESTREAM DIRECTION	27404.7	(LB)
AIRFLOW RATE	277.967	(LB/SEC)
FUELFLOW RATE	8.11663	(LB/SEC)
SPECIFIC IMPULSE	3381.50	(SEC)
SCALED FUEL/AIR RATIO (PHI)	1.000	(NO UNITS)
SCALING ALTITUDE	99120.0	(FEET)
SCALING MACH NUMBER	6.000	(NO UNITS)
MAXIMUM AIRFLOW RATE	279.379	(LB/SEC)
ANGLE OF ATTACK	3.37480	(DEGREES)
WING HALF ANGLE-	-.700000	(DEGREES)
INLET WEDGE ANGLE-	6.00000	(DEGREES)
SCALING THRUST IN FREESTREAM DIRECTION	27404.7	(LB)
LIFT COMPONENT OF ENGINE FORCES	1346.03	(LB)
INLET SPILLAGE DRAG	.304498E-10	(LB)
ENGINE INLET AREA	32.412	(SQ. FT)
RAMJET THROTTLE SETTING	.995	(NO UNITS)

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

INPUT TO TAKEOFF CALCULATIONS

WING REFERENCE AREA (SF)	SREF =	14724.00
FLAT PLATE AREA OF GEAR (SF)	SPLG =	200.0000
FLAT PLATE DRAG COEFF OF GEAR	CDPLG =	.5000000
GROUND ROLL BODY ANGLE (DEG)	AG =	.2500000
MAXIMUM GROUND ROTATION ANGLE (DEG)	AMAXG =	20.00000
WING INCIDENCE (DEG)	WINCID=	-.7000000
THEORETICAL WING ASPECT RATIO	ARTHEO=	2.000000
WING LEADING EDGE SWEEP ANGLE (DEG)	WSLEFC=	60.00000
TOTAL LIFT LIFT CURVE SLOPE (PER DEG)	CLATOT=	.5115000E-01
LIFT COEF AT ZERO ANGLE OF ATTACK	CL0 =	0.
WING TAPER RATIO	TRATIO=	.2000000
INDUCED DRAG FACTOR	DFK =	.1890000
GROUND ROLL FRICTION COEFFICIENT	GRNDFT=	.2500000E-01
DRAG COEFF AT ZERO LIFT	CD0 =	.8600000E-02
WEIGHT AT START OF TAKE-OFF (LB)	W0 =	814783.6
TAKE-OFF THRUST (LB)	FN0 =	307702.1
FUEL FLOW RATE (LBS/HR)	FFR =	216359.5
SPECIFIC FUEL CONSUMPTION (1.0/HR)	SFC =	.7031460
SPECIFIC IMPULSE AT TAKE-OFF (SEC)	XISO =	5119.847
FLAP SPAN TO EXPOSED WING SPAN RATIO	BFOBEX=	.6600000
FLAPDEFLECTION (DEG)	FLAPDT=	20.00000
AVERAGE FLAP CHORD TO WING CHORD RATIO	CFOCAV=	.1500000

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

OUTPUT FROM TAKEOFF CALCULATIONS

MAXIMUM WING LIFT COEFFICIENT	CLMAX =	1.104521
MAXIMUM WING PLUS FLAP LIFT COEFFICIENT	CLMAXF=	1.282280
FLAP LIFT COEFFICIENT INCREMENT	DELCLF=	.1777593
GROUND ROTATION WING LIFT COEFFICIENT	CLU =	.8814043
GROUND ROTATION WING PLUS FLAP LIFT COEFFICIENT	CLUF =	1.059164
GROUND ROLL LIFT COEFFICIENT	CLG =	-.2296236E-01
LIFT COEFFICIENT AT OBSTACLE	CL50 =	.8748691
GROUND ROLL DRAG COEFFICIENT	CDG =	.1626274E-01
GROUND ROTATION DRAG COEFFICIENT	CDU =	.1918328
DRAG COEFFICIENT AT OBSTACLE	CD50 =	.1306589
GROUND ROTATION BODY ANGLE (DEG)	AU =	19.34293
ANG. OF ATTACK FOR MAXIMUM LIFT COEFF (DEG)	AWMAX =	23.36217
POWER OFF STALL SPEED (KNOTS)	VSTAL =	112.7286
FLIGHT SPEED CORRESPONDING TO CLUF (KNOTS)	VU =	124.0349
FLIGHT SPEED AT OBSTACLE (KNOTS)	V50 =	136.4384
GROUND ROLL DISTANCE (FT)	XG =	1981.011
TAKE-OFF DISTANCE OVER OBSTACLE (FT)	X50 =	2904.566
GROUND ROLL TIME (SEC)	TG =	18.91333
TAKE-OFF TIME (SEC)	T50 =	23.32207
FUEL USED FOR TAKE-OFF (LB)	DELW =	1401.653
WEIGHT AT OBSTACLE (LB)	W50 =	813381.9
RATE OF CLIMB AT OBSTACLE (FPS)	ROC =	52.75779
FLIGHT PATH ANGLE AT OBSTACLE (DEG)	GAM50 =	13.23409

3. ****** XCLECT END OPTION 17 ******
WT = .81338E+06 H = 50.000 AM = .20640

TIME = 0. RANGE = 0. FUEL = 0.

+++ +++

CUMULATIVE CPU TIME = 5.6070 CPU TIME USED IN PREVIOUS TASK = .11400

RGSAVE
ITZ WT H AM TAC+++ FUEL RUN+++ XNZZ E10 E11 OPTION

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZD	NET THRUST	SFC
0.000	0.	800000.	0.	50.	.206	136.	4.64	304301.0	.72816
.127	.29867	799530.	470.4	197.	.221	146.	5.03	305361.4	.72492
.230	.55478	799152.	847.9	345.	.236	156.	5.68	307528.5	.71927
.317	.78744	798830.	1170.	492.	.250	165.	6.14	308911.4	.71566
.395	1.0061	798544.	1456.	640.	.265	175.	6.46	309783.5	.71342
.466	1.2161	798283.	1717.	788.	.280	184.	6.67	310323.4	.71210
.531	1.4258	798043.	1957.	935.	.294	194.	6.81	310650.0	.71143
.592	1.6225	797817.	2183.	1082.	.309	204.	6.88	310813.7	.71126
.650	1.8229	797603.	2397.	1230.	.324	213.	6.91	310848.8	.71150
.706	2.0231	797398.	2602.	1377.	.339	223.	6.90	310874.0	.71197
.759	2.2239	797201.	2799.	1525.	.353	232.	6.87	310889.2	.71261
.811	2.4260	797010.	2990.	1672.	.368	242.	6.81	310914.4	.71338
.861	2.6299	796826.	3174.	1820.	.383	251.	6.75	310964.1	.71424
.909	2.8360	796645.	3355.	1967.	.397	261.	6.67	311048.6	.71516
.957	3.0446	796469.	3531.	2115.	.412	270.	6.59	311177.3	.71612
1.003	3.2559	796297.	3703.	2262.	.427	280.	6.50	311353.6	.71712
1.049	3.4702	796127.	3873.	2410.	.441	289.	6.41	311581.0	.71813
1.093	3.6878	795961.	4039.	2557.	.456	299.	6.31	311872.9	.71914
1.137	3.9087	795796.	4204.	2705.	.471	308.	6.22	312222.7	.72007
1.181	4.1332	795634.	4366.	2852.	.485	318.	6.12	312627.2	.72107
1.223	4.3613	795473.	4527.	3000.	.500	327.	6.07	313090.5	.72207

5. ****** XCLECT END OPTION 1 ******
WT = .79547E+06 H = 3000.0 AM = .50000
TIME = .83333E-01 RANGE = 0. FUEL = 0.

+++ +++

CUMULATIVE CPU TIME = 6.7530 CPU TIME USED IN PREVIOUS TASK = 1.1220

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
41	.7955E+06	3000.	.5000	.2039E-01	4527.	4.361	1.000	-0.	0.	1

UNPACK 51 51100 5 1 1 0 0. 1
.60000 5000.0 0. 4.0000 0. 51100 0. 1 0. 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAM7D	NET THRUST	SFC
0.000	0.	795473.	0.	3000.	.500	327.	8.99	313110.4	.72202
.019	.10398	795401.	72.39	3100.	.505	330.	8.96	312851.7	.72225
.038	.20855	795329.	144.5	3200.	.510	333.	8.91	312598.4	.72249
.057	.31372	795257.	216.2	3300.	.515	337.	8.86	312354.3	.72273
.076	.41948	795185.	287.7	3400.	.520	340.	8.81	312119.4	.72296
.095	.52584	795114.	358.8	3500.	.525	343.	8.77	311893.6	.72319
.114	.63281	795043.	429.7	3600.	.530	346.	8.72	311676.9	.72341
.133	.74039	794973.	500.3	3700.	.535	349.	8.67	311469.3	.72363
.152	.84858	794903.	570.6	3800.	.540	352.	8.62	311270.8	.72384
.170	.95739	794832.	640.6	3900.	.545	355.	8.57	311062.3	.72406
.189	1.0668	794763.	710.4	4000.	.550	359.	8.52	310853.1	.72428
.208	1.1769	794693.	780.0	4100.	.555	362.	8.47	310664.3	.72450
.226	1.2876	794624.	849.4	4200.	.560	365.	8.43	310484.7	.72470
.244	1.3989	794555.	918.5	4300.	.565	368.	8.38	310314.1	.72490
.263	1.5109	794486.	987.4	4400.	.570	371.	8.33	310152.5	.72510
.281	1.6235	794417.	1056.	4500.	.575	374.	8.29	310000.0	.72529
.299	1.7368	794349.	1125.	4600.	.580	377.	8.24	309856.4	.72548
.318	1.8507	794280.	1193.	4700.	.585	380.	8.19	309721.7	.72567
.336	1.9652	794212.	1261.	4800.	.590	384.	8.15	309595.9	.72585
.354	2.0804	794144.	1329.	4900.	.595	387.	8.10	309479.0	.72602
.372	2.1962	794077.	1397.	5000.	.600	390.	8.08	309370.8	.72619

6. ****** XCLECT END OPTION 1 ******
WT = .79408E+06 H = 5000.0 AM = .60000
TIME = .10372 RANGE = 4.3613 FUEL = 4526.9

+++ +++

CUMULATIVE CPU TIME = 7.8950 CPU TIME USED IN PREVIOUS TASK = 1.1420

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
51	.7941E+06	5000.	.6000	.6200E-02	1397.	2.196	1.000	-0.	0.	1

UNPACK 61 51100 5 1 1 0 0. 1
.80000 21500. 0. 4.0000 0. 51100 0. 1 0. 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZD	NET THRUST	SFC
0.000	0.	794077.	0.	5000.	.600	390.	13.62	309369.3	.72620
.088	.56003	793750.	326.7	5825.	.610	395.	13.44	303675.4	.72526
.177	1.1357	793426.	651.0	6650.	.620	400.	13.09	298195.9	.72426
.268	1.7274	793104.	973.1	7475.	.630	406.	12.74	292665.4	.72332
.359	2.3357	792784.	1293.	8300.	.640	411.	12.41	287280.3	.72231
.452	2.9611	792466.	1611.	9125.	.650	416.	12.08	281996.0	.72128
.546	3.6040	792149.	1927.	9950.	.660	421.	11.76	276734.7	.72025
.642	4.2650	791835.	2242.	10775.	.670	426.	11.45	271652.2	.71915
.739	4.9446	791522.	2554.	11600.	.680	431.	11.14	266605.3	.71805
.837	5.6432	791212.	2865.	12425.	.690	436.	10.84	261661.3	.71691
.937	6.3619	790902.	3175.	13250.	.700	441.	10.54	256665.3	.71602
1.039	7.1015	790594.	3483.	14075.	.710	446.	10.25	251683.1	.71525
1.143	7.8632	790286.	3790.	14900.	.720	451.	9.96	246821.7	.71444
1.248	8.6472	789980.	4097.	15725.	.730	456.	9.68	242012.3	.71361
1.355	9.4547	789674.	4402.	16550.	.740	461.	9.40	237295.4	.71275
1.464	10.287	789370.	4707.	17375.	.750	465.	9.13	232613.6	.71189
1.576	11.144	789066.	5011.	18200.	.760	470.	8.86	228009.8	.71100
1.689	12.027	788762.	5315.	19025.	.770	475.	8.60	223475.7	.71010
1.805	12.938	788459.	5618.	19850.	.780	479.	8.35	219050.3	.70914
1.923	13.877	788156.	5921.	20675.	.790	484.	8.10	214716.2	.70814
2.044	14.845	787853.	6223.	21500.	.800	488.	7.97	210332.2	.70714

7. ****** XCLECT END OPTION 1 ******
WT = .78785E+06 H = 21500. AM = .80000

TIME = .10992 RANGE = 6.5575 FUEL = 1396.5

+++ +++

CUMULATIVE CPU TIME = 9.0730 CPU TIME USED IN PREVIOUS TASK = 1.1780

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
61	.7879E+06	.2150E+05	.8000	.3407E-01	6223.	14.85	1.000	-0.	0.	1

UNPACK 71 51100 5 1 1 0 0. 1
.95000 29000. 0. 4.0000 0. 51100 0. 1 0. 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZD	NET THRUST	SFC
0.000	0.	787853.	0.	21500.	.800	488.	7.30	210328.5	.70715
.059	.48115	787678.	175.4	21875.	.807	492.	7.33	227098.7	.82110
.118	.95866	787497.	356.4	22250.	.815	496.	7.27	225558.2	.81953
.177	1.4489	787314.	539.0	22625.	.822	500.	7.08	224002.2	.81796
.238	1.9523	787130.	723.5	23000.	.830	503.	6.89	222476.1	.81636
.300	2.4697	786943.	910.0	23375.	.837	507.	6.71	220979.8	.81471
.363	3.0015	786755.	1099.	23750.	.845	511.	6.52	219447.2	.81311
.428	3.5489	786564.	1289.	24125.	.852	515.	6.34	217915.2	.81151
.493	4.1125	786371.	1483.	24500.	.860	518.	6.15	216411.4	.80987
.561	4.6931	786175.	1678.	24875.	.867	522.	5.97	214941.5	.80819
.630	5.2915	785976.	1877.	25250.	.875	526.	5.79	213463.3	.80655
.700	5.9089	785775.	2078.	25625.	.882	529.	5.62	212010.6	.80487
.772	6.5462	785570.	2283.	26000.	.890	533.	5.44	210586.1	.80316
.847	7.2044	785362.	2491.	26375.	.897	537.	5.25	209170.6	.80143
.923	7.8895	785149.	2704.	26750.	.905	540.	5.00	207711.0	.79973
1.004	8.6168	784926.	2927.	27125.	.912	544.	4.69	206280.6	.79799
1.090	9.3931	784693.	3161.	27500.	.920	548.	4.39	204877.8	.79622
1.181	10.225	784446.	3407.	27875.	.927	551.	4.09	203476.2	.79445
1.278	11.121	784185.	3668.	28250.	.935	555.	3.79	202070.4	.79271
1.383	12.090	783907.	3947.	28625.	.942	558.	3.49	200691.6	.79093
1.496	13.146	783608.	4245.	29000.	.950	562.	3.34	199339.8	.78912

8. ****** XCLECT END OPTION 1 ******
WT = .78361E+06 H = 29000. AM = .95000

TIME = .14399 RANGE = 21.403 FUEL = 6223.2

+++ +++

CUMULATIVE CPU TIME = 10.259 CPU TIME USED IN PREVIOUS TASK = 1.1860

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
71	.7836E+06	.2900E+05	.9500	.2494E-01	4245.	13.15	1.000	-0.	0.	1

UNPACK 81 51100 5 1 1 0 0. 1

1.5000 40500. 0. 4.0000 0. 51100 0. 1 0. 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMMA	NET THRUST	SFC
0.000	0.	783608.	0.	29000.	.950	562.	1.87	199339.3	.78912
.306	2.8987	782803.	805.4	29575.	.977	577.	1.70	201389.6	.78935
.671	6.4551	781830.	1779.	30150.	1.005	592.	1.42	203073.3	.79135
1.081	10.551	780724.	2884.	30725.	1.032	606.	1.27	202700.1	.80182
1.518	15.018	779533.	4075.	31300.	1.060	621.	1.16	202527.1	.81164
1.983	19.880	778253.	5355.	31875.	1.087	635.	1.13	202570.4	.82067
2.425	24.613	777019.	6589.	32450.	1.115	650.	1.17	205310.4	.82045
2.839	29.142	775851.	7757.	33025.	1.142	664.	1.24	203178.7	.83853
3.218	33.384	774768.	8841.	33600.	1.170	678.	1.33	201984.8	.85335
3.561	37.291	773779.	9829.	34175.	1.197	692.	1.42	201320.1	.86619
3.881	41.024	772842.	.1077E+05	34750.	1.225	706.	1.45	201150.4	.87722
4.197	44.781	771908.	.1170E+05	35325.	1.252	720.	1.44	201272.5	.88690
4.506	48.531	770982.	.1263E+05	35900.	1.280	734.	1.41	201787.0	.89510
4.826	52.484	770012.	.1360E+05	36475.	1.307	749.	1.48	202592.8	.90471
5.097	55.893	769180.	.1443E+05	37050.	1.335	765.	1.70	217881.3	.85559
5.330	58.894	768450.	.1516E+05	37625.	1.362	781.	1.86	222947.8	.84971
5.545	61.722	767765.	.1584E+05	38200.	1.390	797.	1.96	227403.3	.84644
5.746	64.414	767115.	.1649E+05	38775.	1.417	813.	2.05	231571.6	.84444
5.936	67.011	766491.	.1712E+05	39350.	1.445	828.	2.12	235438.8	.84363
6.116	69.523	765889.	.1772E+05	39925.	1.472	844.	2.19	239313.9	.84288
6.288	71.956	765308.	.1830E+05	40500.	1.500	860.	2.23	243231.4	.84206

9. ****** XCLECT END OPTION 1 ******
WT = .76531E+06 H = 40500. AM = 1.5000

TIME = .16893 RANGE = 34.549 FUEL = 4245.1

+++ +++

CUMULATIVE CPU TIME = 11.933 CPU TIME USED IN PREVIOUS TASK = 1.6740

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
81	.7653E+06	.4050E+05	1.500	.1048	.1830E+05	71.96	1.000	-0.	0.	1

UNPACK 91 51100 5 1 1 0 0. 1
2.6000 52971. 0. 4.0000 0. 51100 0. 1 0. 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAM7D	NET THRUST	SFC
0.000	0.	765308.	0.	40500.	1.500	860.	1.51	243243.6	.84197
.268	3.9020	764371.	937.8	41124.	1.555	891.	1.57	256948.4	.84029
.505	7.4875	763495.	1813.	41747.	1.610	923.	1.70	271040.8	.83791
.717	10.806	762672.	2637.	42371.	1.665	954.	1.83	285017.3	.83695
.909	13.899	761893.	3416.	42994.	1.720	986.	1.95	299121.8	.83595
1.085	16.841	761148.	4160.	43618.	1.775	1017.	2.02	308440.8	.83114
1.252	19.710	760429.	4880.	44241.	1.830	1049.	2.07	316624.8	.82631
1.410	22.518	759731.	5577.	44865.	1.885	1080.	2.11	324500.9	.82176
1.561	25.271	759055.	6253.	45488.	1.940	1112.	2.15	331995.1	.81764
1.705	27.976	758399.	6910.	46112.	1.995	1144.	2.16	339091.5	.81397
1.846	30.705	757742.	7566.	46735.	2.050	1175.	2.13	347631.8	.81296
1.987	33.500	757067.	8241.	47359.	2.105	1207.	2.08	359221.6	.81330
2.128	36.357	756373.	8936.	47983.	2.160	1238.	2.03	370450.0	.81371
2.268	39.283	755659.	9650.	48606.	2.215	1270.	1.97	381787.0	.81315
2.410	42.323	754919.	.1039E+05	49230.	2.270	1301.	1.87	387209.4	.81116
2.559	45.590	754137.	.1117E+05	49853.	2.325	1333.	1.73	389626.6	.81084
2.716	49.135	753304.	.1200E+05	50477.	2.380	1364.	1.59	392049.0	.81004
2.884	52.993	752414.	.1289E+05	51100.	2.435	1396.	1.47	395170.3	.80849
3.059	57.113	751471.	.1384E+05	51724.	2.490	1427.	1.43	403432.9	.80827
3.229	61.203	750538.	.1477E+05	52347.	2.545	1459.	1.51	411729.1	.80735
3.381	64.928	749690.	.1562E+05	52971.	2.600	1490.	1.58	419729.0	.80645

10. ****** XCLECT END OPTION 1 ******
WT = .74969E+06 H = 52971. AM = 2.6000

TIME = .27372 RANGE = 106.51 FUEL = 18300.

+++ +++

CUMULATIVE CPU TIME = 14.007 CPU TIME USED IN PREVIOUS TASK = 2.0740

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
91	.7497E+06	.5297E+05	2.600	.5635E-01	.1562E+05	64.93	1.000	-0.	0.	1

UNPACK 101 51100 5 1 1 0 0. 1

5.9500 87990. 0. 5.0000 0. 51100 0. 1 0. 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

CONSTANT DYNAMIC PRESSURE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAM7D	NET THRUST	SFC
0.000	0.	749690.	0.	52971.	2.600	1490.	2.61	419657.7	.80643
.250	6.3117	748282.	1408.	54722.	2.695	1545.	2.53	419054.2	.80591
.507	13.068	746841.	2850.	56473.	2.811	1611.	2.43	411783.1	.80538
.756	19.885	745490.	4200.	58224.	2.932	1681.	2.32	394648.7	.81065
1.016	27.319	744129.	5562.	59975.	3.058	1753.	1.95	335530.4	.91996
1.343	37.084	742475.	7216.	61726.	3.190	1828.	1.59	324754.4	.91689
1.697	48.087	740750.	8940.	63477.	3.327	1907.	1.41	314107.4	.91514
2.079	60.495	738950.	.1074E+05	65228.	3.470	1989.	1.24	303442.6	.91537
2.503	74.877	737018.	.1267E+05	66979.	3.619	2076.	1.07	292249.0	.91790
2.971	91.420	734962.	.1473E+05	68730.	3.774	2168.	.94	281182.6	.92181
3.482	110.29	732791.	.1690E+05	70480.	3.935	2263.	.82	271178.0	.92475
4.038	131.71	730504.	.1919E+05	72231.	4.103	2363.	.73	262348.1	.92861
4.639	155.90	728093.	.2160E+05	73982.	4.278	2467.	.64	254001.6	.93551
5.292	183.32	725537.	.2415E+05	75733.	4.460	2574.	.56	245533.5	.94673
6.008	214.73	722797.	.2689E+05	77484.	4.649	2687.	.49	235361.1	.96102
6.809	251.39	719819.	.2987E+05	79235.	4.845	2804.	.42	225041.9	.97733
7.710	294.43	716560.	.3313E+05	80986.	5.049	2925.	.35	214840.6	.99671
8.729	345.16	712974.	.3672E+05	82737.	5.262	3052.	.30	205440.3	1.0149
9.878	404.91	709029.	.4066E+05	84488.	5.482	3184.	.25	196712.1	1.0337
11.188	475.91	704649.	.4504E+05	86239.	5.712	3321.	.21	187784.4	1.0551
12.702	561.57	699711.	.4998E+05	87990.	5.950	3464.	.19	179245.0	1.0781

11. ****** XCLECT END OPTION 1 ******
WT = .69971E+06 H = 87990. AM = 5.9500

TIME = .33008 RANGE = 171.43 FUEL = 15618.

+++ +++

CUMULATIVE CPU TIME = 15.467 CPU TIME USED IN PREVIOUS TASK = 1.4600

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
101	.6997E+06	.8799E+05	5.950	.2117	.4998E+05	561.6	1.000	-0.	0.	1

UNPACK 111 51100 5 1 1 0 0. 1
5.9900 99120. 0. 4.0000 0. 51100 0. 1 0. 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAM7D	NET THRUST	SFC
0.000	0.	699711.	0.	87990.	5.950	3464.	1.92	179085.0	1.0781
.047	2.7293	699560.	150.6	88546.	5.952	3466.	1.89	175218.8	1.0776
.096	5.5623	699407.	303.9	89103.	5.954	3469.	1.82	172079.2	1.0772
.147	8.5065	699250.	460.3	89659.	5.956	3471.	1.75	169025.3	1.0768
.200	11.570	699091.	619.9	90216.	5.958	3474.	1.68	166054.9	1.0764
.255	14.764	698927.	783.2	90772.	5.960	3476.	1.61	163165.8	1.0759
.313	18.097	698760.	950.6	91329.	5.962	3479.	1.54	160355.8	1.0755
.373	21.583	698588.	1122.	91885.	5.964	3481.	1.47	157622.8	1.0751
.436	25.236	698411.	1299.	92442.	5.966	3484.	1.40	154964.8	1.0747
.502	29.072	698229.	1482.	92998.	5.968	3486.	1.33	152379.8	1.0743
.572	33.111	698041.	1670.	93555.	5.970	3489.	1.26	149865.7	1.0739
.645	37.374	697845.	1866.	94111.	5.972	3491.	1.20	147420.7	1.0735
.723	41.889	697641.	2069.	94668.	5.974	3494.	1.13	145042.9	1.0731
.805	46.688	697429.	2282.	95224.	5.976	3496.	1.06	142730.4	1.0727
.893	51.808	697205.	2505.	95781.	5.978	3499.	.99	140481.3	1.0723
.987	57.298	696970.	2740.	96337.	5.980	3501.	.92	138293.8	1.0720
1.088	63.215	696721.	2990.	96894.	5.982	3503.	.85	136166.1	1.0716
1.198	69.634	696455.	3256.	97450.	5.984	3506.	.78	134096.4	1.0713
1.318	76.650	696169.	3542.	98007.	5.986	3508.	.71	132082.8	1.0709
1.451	84.389	695858.	3853.	98563.	5.988	3511.	.64	130123.5	1.0706
1.598	93.023	695517.	4194.	99120.	5.990	3513.	.61	128216.5	1.0703

12. ****** XCLECT END OPTION 1 ******
WT = .69552E+06 H = 99120. AM = 5.9900

TIME = .54178 RANGE = 733.00 FUEL = 49980.

+++ +++

CUMULATIVE CPU TIME = 17.207 CPU TIME USED IN PREVIOUS TASK = 1.7400

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
111	.6955E+06	.9912E+05	5.990	.2663E-01	4194.	93.02	1.000	-0.	0.	1

UNPACK 121 51100 5 1 1 0 0. 21
5.0000 .40000 6.0000 0. -99120. 51100 0. 21 0. 1111111111

RAMJET PERFORMANCE (PER ENGINE) AT SCALING ALTITUDE AND MACH NUMBER

RAMJET GROSS THRUST	39142.3	(LB)
NET THRUST IN FREESTREAM DIRECTION	39012.2	(LB)
AIRFLOW RATE	396.419	(LB/SEC)
FUELFLOW RATE	11.5754	(LB/SEC)
SPECIFIC IMPULSE	3381.50	(SEC)
SCALED FUEL/AIR RATIO (PHI)	1.000	(NO UNITS)
SCALING ALTITUDE	99120.0	(FEET)
SCALING MACH NUMBER	6.000	(NO UNITS)
MAXIMUM AIRFLOW RATE	397.573	(LB/SEC)
ANGLE OF ATTACK	5.14441	(DEGREES)
WING HALF ANGLE	-.700000	(DEGREES)
INLET WEDGE ANGLE	6.00000	(DEGREES)
SCALING THRUST IN FREESTREAM DIRECTION	39012.2	(LB)
LIFT COMPONENT OF ENGINE FORCES	3087.37	(LB)
INLET SPILLAGE DRAG	.391423E-10	(LB)
ENGINE INLET AREA	39.300	(SQ. FT)
RAMJET THROTTLE SETTING	.997	(NO UNITS)

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

MISSION SEGMENT TABLE

	.20000	0.	.81500E+06	6.0100	1200.0	.50000E-01	1.0000	100.00		0	
2	4.0000	.40000	6.0000	.32600E+06	99120.	51000	0.		21	0	1111111111
3	0.	0.	0.	5.0000	2.0000	51000	2.0000		17	0	1111111111
4	0.	0.	.80000E+06	0.	0.	51000	0.		13	0	1111111111
5	.50000	3000.0	0.	4.0000	0.	51100	0.		1	0	1111111111
6	.60000	5000.0	0.	4.0000	0.	51100	0.		1	0	1111111111
7	.80000	21500.	0.	4.0000	0.	51100	0.		1	0	1111111111
8	.95000	29300.	0.	4.0000	0.	51100	0.		1	0	1111111111
9	1.5000	40500.	0.	4.0000	0.	51100	0.		1	0	1111111111
10	2.6000	52971.	0.	4.0000	0.	51100	0.		1	0	1111111111
11	5.9500	87990.	0.	5.0000	0.	51100	0.		1	0	1111111111
12	5.9900	99120.	0.	4.0000	0.	51100	0.		1	0	1111111111
13	5.0000	.40000	6.0000	0.	-99120.	51100	0.		21	0	1111111111
14	0.	0.	0.	5.0000	12.000	51100	0.		22	X	1111111111
15	0.	0.	.53000E+06	0.	0.	51010	1.0000		6	0	1111111111
16	.80000	20000.	3.0000	1.0000	0.	51210	0.		1	0	1111111111
17	0.	0.	0.	5.0000	1.0000	51010	2.0000		17	0	1111111111
18	.80000	45000.	3.0000	4.0000	0.	51110	0.		1	0	1111111111
19	0.	0.	0.	1.0000	200.00	51010	0.		7	0	1111111111
20	.80000	20000.	3.0000	1.0000	0.	51210	0.		1	0	1111111111
21	0.	0.	0.	5.0000	1.0000	51010	2.0000		17	0	1111111111
22	.20000	50.000	3.0000	1.0000	0.	51210	0.		1	0	1111111111
23	1.0000	2.0000	7350.0	4.0000	20.000	51210	0.		22	X	1111111111
24	0.	0.	0.	0.	1.0000	51210	4.0000		17	0	1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

DUMPRG

SEG	WT	H	AM	TIME	FUEL	RANGE	XNZZ	E10	E11	OPTION
1	.8150E+06	0.	.2000	0.	0.	0.	1.000	0.	0.	X
2	.8150E+06	0.	.2000	0.	0.	0.	1.000	-0.	0.	21
3	.8134E+06	50.00	.2064	.8333E-01	1618.	0.	1.000	-0.	0.	17
4	.8000E+06	50.00	.2064	0.	0.	0.	1.000	-0.	0.	13
5	.7955E+06	3000.	.5000	.2039E-01	4527.	4.361	1.000	-0.	0.	1
6	.7941E+06	5000.	.6000	.6200E-02	1397.	2.196	1.000	-0.	0.	1
7	.7879E+06	.2150E+05	.8000	.3407E-01	6223.	14.85	1.000	-0.	0.	1
8	.7836E+06	.2900E+05	.9500	.2494E-01	4245.	13.15	1.000	-0.	0.	1
9	.7653E+06	.4050E+05	1.500	.1048	.1830E+05	71.96	1.000	-0.	0.	1
10	.7497E+06	.5297E+05	2.600	.5635E-01	.1562E+05	64.93	1.000	-0.	0.	1
11	.6997E+06	.8799E+05	5.950	.2117	.4998E+05	561.6	1.000	-0.	0.	1
12	.6955E+06	.9912E+05	5.990	.2663E-01	4194.	93.02	1.000	-0.	0.	1
13	.6955E+06	.9912E+05	5.990	0.	4194.	0.	1.000	-0.	0.	21
14	-0.	-0.	-0.	-0.	-0.	-0.	-0.	1.	-0.	-0
15	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-0
16	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-0
17	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-0
18	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-0
19	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-0
20	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-0
21	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-0
22	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-0
23	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-0
24	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-0

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAM7D	NET THRUST	SFC
0.000	0.	800000.	0.	50.	.206	136.	4.64	304301.0	.72816
.127	.29867	799530.	470.4	197.	.221	146.	5.03	305361.4	.72492
.230	.55478	799152.	847.9	345.	.236	156.	5.68	307528.5	.71927
.317	.78744	798830.	1170.	492.	.250	165.	6.14	308911.4	.71566
.395	1.0061	798544.	1456.	640.	.265	175.	6.46	309783.5	.71342
.466	1.2161	798283.	1717.	788.	.280	184.	6.67	310323.4	.71210
.531	1.4208	798043.	1957.	935.	.294	194.	6.81	310650.0	.71143
.592	1.6225	797817.	2183.	1082.	.309	204.	6.88	310813.7	.71126
.650	1.8229	797603.	2397.	1230.	.324	213.	6.91	310848.8	.71150
.706	2.0231	797398.	2602.	1377.	.339	223.	6.90	310874.0	.71197
.759	2.2239	797201.	2799.	1525.	.353	232.	6.87	310889.2	.71261
.811	2.4260	797010.	2990.	1672.	.368	242.	6.81	310914.4	.71338
.861	2.6299	796826.	3174.	1820.	.383	251.	6.75	310964.1	.71424
.909	2.8360	796645.	3355.	1967.	.397	261.	6.67	311048.6	.71516
.957	3.0446	796469.	3531.	2115.	.412	270.	6.59	311177.3	.71612
1.003	3.2559	796297.	3703.	2262.	.427	280.	6.50	311353.6	.71712
1.049	3.4702	796127.	3873.	2410.	.441	289.	6.41	311581.0	.71813
1.093	3.6878	795961.	4039.	2557.	.456	299.	6.31	311872.9	.71914
1.137	3.9087	795796.	4204.	2705.	.471	308.	6.22	312222.7	.72007
1.181	4.1332	795634.	4366.	2852.	.485	318.	6.12	312627.2	.72107
1.223	4.3613	795473.	4527.	3000.	.500	327.	6.07	313090.5	.72207

```
15. ****** XCLECT END    OPTION   1 ******
              WT    =  .79547E+06    H      =  3000.0       AM    =  .50000

              TIME  =  .83333E-01    RANGE  =  0.           FUEL  =  4193.7

+++ +++ +++ +++ +++ +++ +++ +++ +++ +++ +++ +++ +++ +++ +++ +++ +++ +++ +++ +++ +++ +++ +++ +++ +++ +++ +++ +++ +++ +++


CUMULATIVE CPU TIME =   18.597        CPU TIME USED IN PREVIOUS TASK =   1.1140

RGSAVE
ITZ      WT           H          AM        TAC+++        FUEL       RUN+++        XNZZ    E10    E11  OPTION
41   .7955E+06   3000.       .5000      .2039E-01    4527.       4.361        1.000        -0.    0.     1


UNPACK        51     51100        5         1         1         0        0.        1
 .60000       5000.0     0.          4.0000      0.                  51100 0.                     1 0.           1111111111
```

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZD	NET THRUST	SFC
0.000	0.	795473.	0.	3000.	.580	327.	8.99	313110.4	.72202
.019	.10398	795401.	72.39	3100.	.585	330.	8.96	312851.7	.72225
.038	.20855	795329.	144.5	3200.	.590	333.	8.91	312598.4	.72249
.057	.31372	795257.	216.2	3300.	.595	337.	8.86	312354.3	.72273
.076	.41948	795185.	287.7	3400.	.520	340.	8.81	312119.4	.72296
.095	.52584	795114.	358.8	3500.	.525	343.	8.77	311893.6	.72319
.114	.63281	795043.	429.7	3600.	.530	346.	8.72	311676.9	.72341
.133	.74039	794973.	500.3	3700.	.535	349.	8.67	311469.3	.72363
.152	.84858	794903.	570.6	3800.	.540	352.	8.62	311270.8	.72384
.170	.95739	794832.	640.6	3900.	.545	355.	8.57	311062.3	.72406
.189	1.0668	794763.	710.4	4000.	.550	359.	8.52	310853.1	.72428
.208	1.1769	794693.	780.0	4100.	.555	362.	8.47	310664.3	.72450
.226	1.2876	794624.	849.4	4200.	.560	365.	8.43	310484.7	.72470
.244	1.3989	794555.	918.5	4300.	.565	368.	8.38	310314.1	.72490
.263	1.5109	794486.	987.4	4400.	.570	371.	8.33	310152.5	.72510
.281	1.6235	794417.	1056.	4500.	.575	374.	8.29	310000.0	.72529
.299	1.7368	794349.	1125.	4600.	.580	377.	8.24	309856.4	.72548
.318	1.8507	794280.	1193.	4700.	.585	380.	8.19	309721.7	.72567
.336	1.9652	794212.	1261.	4800.	.590	384.	8.15	309595.9	.72585
.354	2.0804	794144.	1329.	4900.	.595	387.	8.10	309479.0	.72602
.372	2.1962	794077.	1397.	5000.	.600	390.	8.08	309370.8	.72619

16. ****** XCLECT END OPTION 1 ******
WT = .79408E+06 H = 5000.0 AM = .60000
TIME = .10372 RANGE = 4.3613 FUEL = 4526.9

+++ +++

CUMULATIVE CPU TIME = 19.743 CPU TIME USED IN PREVIOUS TASK = 1.1460

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
51	.7941E+06	5000.	.6000	.6200E-02	1397.	2.196	1.000	-0.	0.	1

UNPACK 61 51100 5 1 1 0 0. 1
.80000 21500. 0. 4.0000 0. 51100 0. 1 0. 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZD	NET THRUST	SFC
0.000	0.	794077.	0.	5000.	.600	390.	13.62	309369.3	.72620
.088	.56003	793750.	326.7	5825.	.610	395.	13.44	303675.4	.72526
.177	1.1357	793426.	651.0	6650.	.620	400.	13.09	298195.9	.72426
.268	1.7274	793104.	973.1	7475.	.630	406.	12.74	292665.4	.72332
.359	2.3357	792784.	1293.	8300.	.640	411.	12.41	287280.3	.72231
.452	2.9611	792466.	1611.	9125.	.650	416.	12.08	281996.0	.72128
.546	3.6040	792149.	1927.	9950.	.660	421.	11.76	276734.7	.72025
.642	4.2650	791835.	2242.	10775.	.670	426.	11.45	271652.2	.71915
.739	4.9446	791522.	2554.	11600.	.680	431.	11.14	266605.3	.71805
.837	5.6432	791212.	2865.	12425.	.690	436.	10.84	261661.3	.71691
.937	6.3619	790902.	3175.	13250.	.700	441.	10.54	256665.3	.71602
1.039	7.1015	790594.	3483.	14075.	.710	446.	10.25	251683.1	.71525
1.143	7.8632	790286.	3790.	14900.	.720	451.	9.96	246821.7	.71444
1.248	8.6472	789980.	4097.	15725.	.730	456.	9.68	242012.3	.71361
1.355	9.4547	789674.	4402.	16550.	.740	461.	9.40	237295.4	.71275
1.464	10.287	789370.	4707.	17375.	.750	465.	9.13	232613.6	.71189
1.576	11.144	789066.	5011.	18200.	.760	470.	8.86	228009.8	.71100
1.689	12.027	788762.	5315.	19025.	.770	475.	8.60	223475.7	.71010
1.805	12.938	788459.	5618.	19850.	.780	479.	8.35	219050.3	.70914
1.923	13.877	788156.	5921.	20675.	.790	484.	8.10	214716.2	.70814
2.044	14.845	787853.	6223.	21500.	.800	488.	7.97	210332.2	.70714

17. ****** XCLECT END OPTION 1 ******
WT = .78785E+06 H = 21500. AM = .80000

TIME = .10992 RANGE = 6.5575 FUEL = 1396.5

+++ +++

CUMULATIVE CPU TIME = 20.919 CPU TIME USED IN PREVIOUS TASK = 1.1760

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
61	.7879E+06	.2150E+05	.8000	.3407E-01	6223.	14.85	1.000	-0.	0.	1

UNPACK 71 51100 5 1 1 0 0. 1
.95000 29000. 0. 4.0000 0. 51100 0. 1 0. 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAM7D	NET THRUST	SFC
0.000	0.	787853.	0.	21500.	.800	488.	7.45	210328.5	.78715
.058	.47175	787675.	177.9	21875.	.807	492.	7.50	230972.2	.84309
.115	.93663	787491.	362.0	22250.	.815	496.	7.46	229414.8	.84130
.173	1.4136	787306.	547.7	22625.	.822	500.	7.27	227840.9	.83952
.232	1.9032	787118.	735.0	23000.	.830	503.	7.09	226296.1	.83770
.292	2.4061	786929.	924.2	23375.	.837	507.	6.90	224780.6	.83583
.354	2.9227	786738.	1115.	23750.	.845	511.	6.71	223228.1	.83402
.416	3.4541	786545.	1309.	24125.	.852	515.	6.53	221675.5	.83220
.480	4.0009	786349.	1504.	24500.	.860	518.	6.34	220150.5	.83034
.546	4.5638	786151.	1702.	24875.	.867	522.	6.16	218658.6	.82845
.612	5.1436	785950.	1903.	25250.	.875	526.	5.98	217158.7	.82659
.681	5.7414	785747.	2107.	25625.	.882	529.	5.80	215683.8	.82470
.751	6.3578	785540.	2313.	26000.	.890	533.	5.63	214236.5	.82278
.822	6.9941	785331.	2523.	26375.	.897	537.	5.43	212797.5	.82084
.896	7.6556	785116.	2737.	26750.	.905	540.	5.18	211314.1	.81892
.974	8.3566	784893.	2961.	27125.	.912	544.	4.88	209859.6	.81696
1.057	9.1032	784659.	3195.	27500.	.920	548.	4.57	208432.3	.81497
1.144	9.9014	784412.	3441.	27875.	.927	551.	4.27	207006.1	.81299
1.237	10.759	784152.	3702.	28250.	.935	555.	3.97	205575.5	.81103
1.337	11.684	783875.	3978.	28625.	.942	558.	3.67	204171.5	.80904
1.445	12.687	783580.	4273.	29000.	.950	562.	3.52	202794.0	.80702

18. ****** XCLECT END OPTION 1 ******
WT = .78358E+06 H = 29000. AM = .95000

TIME = .14399 RANGE = 21.403 FUEL = 6223.2

+++ +++

CUMULATIVE CPU TIME = 22.105 CPU TIME USED IN PREVIOUS TASK = 1.1860

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
71	.7836E+06	.2900E+05	.9500	.2406E-01	4273.	12.69	1.000	-0.	0.	1

UNPACK 81 51100 5 1 1 0 0. 1
1.5000 40500. 0. 4.0000 0. 51100 0. 1 0. 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMMA	NET THRUST	SFC
0.000	0.	783580.	0.	29000.	.950	562.	1.98	202793.5	.80702
.288	2.7310	782790.	790.1	29575.	.977	577.	1.81	205095.6	.80745
.627	6.0277	781850.	1731.	30150.	1.005	592.	1.54	206866.7	.81031
1.006	9.8162	780782.	2798.	30725.	1.032	606.	1.36	205820.9	.82473
1.414	13.986	779621.	3960.	31300.	1.060	621.	1.24	205024.2	.83842
1.852	18.573	778357.	5223.	31875.	1.087	635.	1.20	204493.2	.85120
2.266	23.001	777147.	6433.	32450.	1.115	650.	1.24	207633.7	.85079
2.663	27.344	775972.	7609.	33025.	1.142	664.	1.27	204361.4	.87544
3.036	31.517	774852.	8729.	33600.	1.170	678.	1.34	202269.3	.89599
3.379	35.433	773809.	9771.	34175.	1.197	692.	1.41	200842.1	.91406
3.705	39.229	772806.	.1077E+05	34750.	1.225	706.	1.41	200012.1	.92986
4.030	43.098	771791.	.1179E+05	35325.	1.252	720.	1.39	199556.8	.94395
4.353	47.001	770773.	.1281E+05	35900.	1.280	734.	1.35	199566.6	.95614
4.688	51.147	769698.	.1388E+05	36475.	1.307	749.	1.45	200094.4	.96952
4.956	54.532	768822.	.1476E+05	37050.	1.335	765.	1.74	220253.6	.89799
5.179	57.404	768080.	.1550E+05	37625.	1.362	781.	1.96	226679.7	.88878
5.383	60.075	767391.	.1619E+05	38200.	1.390	797.	2.09	232254.2	.88339
5.571	62.595	766743.	.1684E+05	38775.	1.417	813.	2.20	237432.4	.87980
5.747	65.007	766123.	.1746E+05	39350.	1.445	828.	2.29	242251.1	.87770
5.914	67.324	765528.	.1805E+05	39925.	1.472	844.	2.38	247049.0	.87581
6.071	69.554	764956.	.1862E+05	40500.	1.500	860.	2.43	251871.8	.87395

19. ****** XCLECT END OPTION 1 ******
WT = .76496E+06 H = 40500. AM = 1.5000

TIME = .16807 RANGE = 34.090 FUEL = 4273.0

+++ +++

CUMULATIVE CPU TIME = 23.779 CPU TIME USED IN PREVIOUS TASK = 1.6740

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
81	.7650E+06	.4050E+05	1.500	.1012	.1862E+05	69.55	1.000	-0.	0.	1

UNPACK 91 51100 5 1 1 0 0. 1
2.6000 52971. 0. 4.0000 0. 51100 0. 1 0. 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZD	NET THRUST	SFC
0.000	0.	764956.	0.	40500.	1.500	860.	1.65	251890.2	.87383
.244	3.5524	764037.	919.3	41124.	1.555	891.	1.73	267650.1	.87029
.458	6.7906	763182.	1774.	41747.	1.610	923.	1.89	283888.9	.86615
.649	9.7691	762380.	2575.	42371.	1.665	954.	2.05	299997.1	.86378
.820	12.531	761623.	3333.	42994.	1.720	986.	2.20	316318.9	.86146
.974	15.106	760905.	4051.	43618.	1.775	1017.	2.36	333182.0	.85859
1.114	17.515	760222.	4734.	44241.	1.830	1049.	2.51	350197.4	.85601
1.242	19.781	759569.	5387.	44865.	1.885	1080.	2.67	367434.1	.85358
1.359	21.919	758943.	6013.	45488.	1.940	1112.	2.80	384978.2	.85133
1.468	23.974	758338.	6618.	46112.	1.995	1144.	2.85	395209.8	.84679
1.575	26.034	757736.	7219.	46735.	2.050	1175.	2.83	405782.8	.84445
1.681	28.122	757125.	7831.	47359.	2.105	1207.	2.80	420063.1	.84330
1.784	30.232	756503.	8453.	47983.	2.160	1238.	2.77	433959.5	.84222
1.887	32.366	755871.	9085.	48606.	2.215	1270.	2.72	447913.2	.84038
1.989	34.555	755225.	9731.	49230.	2.270	1301.	2.61	454692.8	.83755
2.094	36.861	754555.	.1040E+05	49853.	2.325	1333.	2.47	458071.7	.83624
2.203	39.308	753858.	.1110E+05	50477.	2.380	1364.	2.33	461420.5	.83452
2.316	41.906	753131.	.1183E+05	51100.	2.435	1396.	2.21	465470.9	.83225
2.431	44.617	752378.	.1258E+05	51724.	2.490	1427.	2.17	475723.7	.83111
2.543	47.308	751633.	.1332E+05	52347.	2.545	1459.	2.26	485969.0	.82939
2.646	49.830	750937.	.1402E+05	52971.	2.600	1490.	2.33	495876.6	.82769

20. ****** XCLECT END OPTION 1 ******
WT = .75094E+06 H = 52971. AM = 2.6000
TIME = .26926 RANGE = 103.64 FUEL = 18625.

+++ +++

CUMULATIVE CPU TIME = 25.853 CPU TIME USED IN PREVIOUS TASK = 2.0740

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
91	.7509E+06	.5297E+05	2.600	.4410E-01	.1402E+05	49.83	1.000	-0.	0.	1

UNPACK 101 51100 5 1 1 0 0. 1
549500 87990. 0. 5.0000 0. 51100 0. 1 0. 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

CONSTANT DYNAMIC PRESSURE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZD	NET THRUST	SFC
0.000	0.	750937.	0.	52971.	2.600	1490.	3.73	495798.9	.82767
.175	4.4138	749742.	1195.	54722.	2.695	1545.	3.55	495854.9	.82584
.361	9.3055	748476.	2462.	56473.	2.811	1611.	3.32	487799.7	.82442
.546	14.359	747261.	3677.	58224.	2.932	1681.	3.12	468340.7	.82836
.739	19.890	746032.	4906.	59975.	3.058	1753.	2.68	406893.5	.91996
.972	26.836	744604.	6333.	61726.	3.190	1828.	2.24	393847.5	.91689
1.223	34.633	743122.	7816.	63477.	3.327	1907.	2.00	380957.6	.91514
1.493	43.391	741580.	9357.	65228.	3.470	1989.	1.76	368048.3	.91537
1.791	53.494	739933.	.1100E+05	66979.	3.619	2076.	1.53	354499.7	.91790
2.118	65.044	738192.	.1275E+05	68730.	3.774	2168.	1.34	341108.1	.92182
2.473	78.144	736363.	.1457E+05	70480.	3.935	2263.	1.19	329008.3	.92475
2.856	92.936	734446.	.1649E+05	72231.	4.103	2363.	1.05	318336.1	.92861
3.270	109.58	732434.	.1850E+05	73982.	4.278	2467.	.94	308253.9	.93552
3.716	128.34	730310.	.2063E+05	75733.	4.460	2574.	.83	298028.9	.94674
4.203	149.69	728050.	.2289E+05	77484.	4.649	2687.	.72	285739.1	.96103
4.742	174.32	725620.	.2532E+05	79235.	4.845	2804.	.62	273277.2	.97734
5.340	202.87	722993.	.2794E+05	80986.	5.049	2925.	.54	260966.1	.99672
6.006	236.05	720144.	.3079E+05	82737.	5.262	3052.	.46	249635.0	1.0149
6.746	274.53	717056.	.3388E+05	84488.	5.482	3184.	.40	239132.9	1.0338
7.574	319.41	713689.	.3725E+05	86239.	5.712	3321.	.34	228396.6	1.0551
8.508	372.25	709982.	.4096E+05	87990.	5.950	3464.	.31	218150.3	1.0782

21. ****** XCLECT END OPTION 1 ******
WT = .70998E+06 H = 87990. AM = 5.9500

TIME = .31336 RANGE = 153.47 FUEL = 14019.

+++ +++

CUMULATIVE CPU TIME = 27.315 CPU TIME USED IN PREVIOUS TASK = 1.4620

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
101	.7100E+06	.8799E+05	5.950	.1418	.4096E+05	372.2	1.000	-0.	0.	1

UNPACK 111 51100 5 1 1 0 0. 1
5.9900 99120. 0. 4.0000 0. 51100 0. 1 0. 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZD	NET THRUST	SFC
0.000	0.	709982.	0.	87990.	5.950	3464.	3.17	218013.0	1.0782
.029	1.6516	709871.	111.0	88546.	5.952	3466.	3.13	213260.3	1.0777
.058	3.3535	709759.	223.3	89103.	5.954	3469.	3.03	209463.3	1.0772
.089	5.1085	709645.	336.8	89659.	5.956	3471.	2.94	205770.3	1.0768
.120	6.9193	709530.	451.8	90216.	5.958	3474.	2.85	202178.7	1.0764
.152	8.7890	709414.	568.4	90772.	5.960	3476.	2.76	198685.8	1.0760
.186	10.721	709295.	686.6	91329.	5.962	3479.	2.67	195289.0	1.0756
.220	12.719	709175.	806.6	91885.	5.964	3481.	2.58	191985.9	1.0751
.256	14.787	709053.	928.6	92442.	5.966	3484.	2.49	188773.8	1.0747
.293	16.929	708929.	1053.	92998.	5.968	3486.	2.40	185650.5	1.0743
.331	19.152	708803.	1179.	93555.	5.970	3489.	2.31	182613.5	1.0739
.371	21.459	708674.	1308.	94111.	5.972	3491.	2.23	179660.7	1.0736
.412	23.858	708542.	1440.	94668.	5.974	3494.	2.14	176789.7	1.0732
.455	26.356	708407.	1575.	95224.	5.976	3496.	2.06	173998.3	1.0728
.499	28.961	708268.	1714.	95781.	5.978	3499.	1.97	171284.4	1.0724
.546	31.681	708126.	1856.	96337.	5.980	3501.	1.88	168645.8	1.0721
.595	34.528	707979.	2003.	96894.	5.982	3503.	1.80	166080.6	1.0717
.646	37.513	707828.	2154.	97450.	5.984	3506.	1.71	163586.6	1.0714
.700	40.650	707672.	2310.	98007.	5.986	3508.	1.63	161161.8	1.0710
.756	43.956	707510.	2472.	98563.	5.988	3511.	1.54	158804.3	1.0707
.816	47.450	707342.	2640.	99120.	5.990	3513.	1.50	156512.2	1.0704

22. ****** XCLECT END OPTION 1 ******
WT = .70734E+06 H = 99120. AM = 5.9900

TIME = .45516 RANGE = 525.72 FUEL = 40955.

+++ +++

CUMULATIVE CPU TIME = 29.059 CPU TIME USED IN PREVIOUS TASK = 1.7440

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
111	.7073E+06	.9912E+05	5.990	.1360E-01	2640.	47.45	1.000	-0.	0.	1

UNPACK 121 51100 5 1 1 0 0. 21
5.0000 .40000 6.0000 0. -99120. 51100 0. 21 0. 1111111111

RAMJET PERFORMANCE (PER ENGINE) AT SCALING ALTITUDE AND MACH NUMBER

RAMJET GROSS THRUST	39864.4	(LB)
NET THRUST IN FREESTREAM DIRECTION	39726.9	(LB)
AIRFLOW RATE	403.732	(LB/SEC)
FUELFLOW RATE	11.7890	(LB/SEC)
SPECIFIC IMPULSE	3361.50	(SEC)
SCALED FUEL/AIR RATIO (PHI)	1.000	(NO UNITS)
SCALING ALTITUDE	99120.0	(FEET)
SCALING MACH NUMBER	6.000	(NO UNITS)
MAXIMUM AIRFLOW RATE	404.951	(LB/SEC)
ANGLE OF ATTACK	5.22573	(DEGREES)
WING HALF ANGLE	-.700000	(DEGREES)
INLET WEDGE ANGLE	6.00000	(DEGREES)
SCALING THRUST IN FREESTREAM DIRECTION	39726.9	(LB)
LIFT COMPONENT OF ENGINE FORCES	3202.81	(LB)
INLET SPILLAGE DRAG	0.	(LB)
ENGINE INLET AREA	39.749	(SQ. FT)
RAMJET THROTTLE SETTING	.997	(NO UNITS)

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

SEARCH FOR MACH ALTITUDE POINT ALONG A CONSTANT ENERGY LINE

THE BASIS FOR SELECTION OF EACH MACH ALTITUDE POINT WAS MAXIMUM LIFT/DRAG

CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMTO	NET THRUST	SFC
0.000	0.	530000.	0.	99120.	5.185	3041.	7.04	-11116.98	-.12043
.393	19.342	529993.	7.102	113645.	4.888	2895.	3.18	-11349.16	-.74978E-01
.752	36.367	529988.	12.27	112413.	4.741	2805.	-8.08	-12009.91	-.71819E-01
1.185	56.038	529977.	22.94	79288.	4.911	2842.	-7.97	-12719.16	-.20208
1.532	72.178	529962.	37.86	78502.	4.753	2749.	6.67	-12475.85	-.20670
1.995	91.953	529951.	49.30	108021.	4.271	2520.	5.12	-9583.414	-.87731E-01
2.420	109.52	529944.	55.85	101387.	4.156	2441.	-3.38	-10321.31	-.96501E-01
2.907	128.98	529935.	64.64	94753.	4.035	2360.	-3.15	-9752.509	-.12085
3.429	149.19	529924.	75.98	88128.	3.909	2276.	-3.14	-9578.303	-.14929
3.955	168.74	529910.	89.99	81486.	3.776	2189.	1.80	-9776.294	-.18131
4.579	190.31	529896.	103.6	97106.	3.370	1974.	1.48	-8246.268	-.11192
5.238	211.49	529885.	115.0	88500.	3.236	1885.	-3.78	-8980.915	-.13064
5.947	233.20	529869.	131.1	79894.	3.093	1791.	-.31	-9204.634	-.16919
6.669	253.65	529848.	152.3	86634.	2.727	1586.	2.08	-7202.207	-.21005
7.444	272.92	529833.	167.3	88799.	2.383	1388.	.07	-6878.470	-.13062
8.423	294.04	529820.	179.8	86747.	2.058	1197.	-3.29	-7961.976	-.80595E-01
9.625	316.95	529805.	195.3	72941.	1.905	1098.	-4.33	-10015.36	-.91891E-01
11.007	340.19	529784.	216.0	65536.	1.592	912.	-4.00	-12528.89	-.68057E-01
12.475	360.45	529763.	236.9	54750.	1.277	732.	-4.34	-28086.65	-.30506E-01
14.805	383.21	529736.	263.8	45455.	.775	444.	-4.42	700.7633	.81106
20.597	422.11	529649.	350.6	24470.	.621	375.	-3.30	1593.395	.83267
24.641	451.42	526833.	3167.	20000.	.800	491.	-1.44	61792.42	.76934

26. ****** XCLECT END OPTION 1 ******
WT = .52683E+06 H = 20000. AM = .80000

TIME = 2.1122 RANGE = 5946.0 FUEL = .17734E+06

+++ +++

CUMULATIVE CPU TIME = 37.675 CPU TIME USED IN PREVIOUS TASK = 8.2460

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
151	.5268E+06	.2000E+05	.8000	.4107	3167.	451.4	1.000	-0.	0.	1

UNPACK 161 51010 5 1 0 10 10. 17
0. 0. 0. 5.0000 1.0000 51010 2.0000 17 0. 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAM7D	NET THRUST	SFC
0.000	0.	522874.	0.	20000.	.800	491.	19.06	221255.2	.70891
.077	.59492	522677.	197.2	21250.	.800	489.	18.60	212221.8	.70724
.158	1.2222	522478.	395.8	22500.	.800	486.	17.69	203170.6	.70561
.244	1.8850	522277.	596.3	23750.	.800	484.	16.78	194422.8	.70397
.335	2.5865	522075.	798.8	25000.	.800	481.	15.90	185878.6	.70240
.432	3.3299	521870.	1004.	26250.	.800	479.	15.03	177695.8	.70077
.534	4.1192	521662.	1211.	27500.	.800	476.	14.18	169691.5	.69924
.643	4.9589	521452.	1422.	28750.	.800	474.	13.30	161963.0	.69737
.761	5.8609	521237.	1636.	30000.	.800	471.	12.36	153208.4	.69206
.888	6.8390	521019.	1855.	31250.	.800	469.	11.40	144821.1	.68669
1.028	7.9036	520795.	2078.	32500.	.800	466.	10.47	136823.4	.68124
1.180	9.0674	520566.	2308.	33750.	.800	463.	9.59	129224.7	.67583
1.348	10.342	520329.	2545.	35000.	.800	461.	8.66	122376.1	.67175
1.537	11.777	520078.	2796.	36250.	.800	459.	7.51	115755.5	.66800
1.762	13.486	519796.	3078.	37500.	.800	459.	6.48	109013.4	.66809
2.016	15.410	519498.	3376.	38750.	.800	459.	5.73	102663.2	.66820
2.303	17.601	519179.	3695.	40000.	.800	459.	5.00	96681.39	.66831
2.636	20.133	518831.	4042.	41250.	.800	459.	4.29	91046.51	.66845
3.027	23.115	518446.	4427.	42500.	.800	459.	3.60	85738.26	.66860
3.500	26.727	518008.	4866.	43750.	.800	459.	2.92	80737.51	.66878
4.096	31.277	517487.	5386.	45000.	.800	459.	2.59	76026.28	.66898

28. ****** XCLECT END OPTION 1 ******
WT = .51749E+06 H = 45000. AM = .80000

TIME = 2.6062 RANGE = 6397.4 FUEL = 3959.3

+++ +++

CUMULATIVE CPU TIME = 38.865 CPU TIME USED IN PREVIOUS TASK = 1.1500

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
171	.5175E+06	.4500E+05	.8000	.6827E-01	5386.	31.28	1.000	-0.	0.	1

UNPACK 181 51010 5 1 0 10 10. 7
0. 0. 0. 1.0000 200.00 51010 0. 7 0. 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

SEARCH FOR MACH ALTITUDE POINT ALONG A CONSTANT ENERGY LINE

THE BASIS FOR SELECTION OF EACH MACH ALTITUDE POINT WAS MAXIMUM LIFT/DRAG

CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMMA	NET THRUST	SFC
0.000	0.	502570.	0.	45000.	.800	459.	-1.90	739.5932	.80121
.245	1.8323	502568.	2.402	44631.	.764	438.	-3.51	729.2391	.79830
.497	3.6531	502565.	4.893	43638.	.756	433.	-5.09	759.0360	.79763
.755	5.4970	502563.	7.547	42646.	.747	428.	-10.09	790.4142	.79668
1.015	7.3848	502560.	10.60	39546.	.831	476.	-9.88	988.6716	.81136
1.258	9.2936	502556.	13.93	38604.	.821	470.	-4.58	1030.582	.80827
1.510	11.254	502553.	17.48	37662.	.811	465.	-4.46	1065.428	.80425
1.773	13.271	502549.	21.28	36719.	.800	459.	-4.35	1101.411	.80013
2.045	15.332	502545.	25.35	35777.	.789	453.	-4.31	1138.687	.80064
2.320	17.388	502541.	29.59	34835.	.775	447.	-4.31	1172.742	.80314
2.599	19.447	502536.	34.05	33893.	.761	441.	-4.30	1206.904	.80573
2.883	21.510	502532.	38.72	32950.	.748	435.	-4.29	1242.250	.80824
3.171	23.577	502527.	43.62	32008.	.734	428.	-4.28	1278.543	.81070
3.464	25.647	502521.	48.76	31066.	.720	422.	-4.28	1315.597	.81337
3.762	27.721	502516.	54.17	30124.	.706	416.	-4.27	1355.676	.81647
4.065	29.799	502510.	59.86	29182.	.692	409.	-4.26	1396.588	.81954
4.374	31.881	502504.	65.84	28239.	.678	402.	-4.25	1438.113	.82258
4.689	33.968	502498.	72.15	27297.	.664	396.	-4.24	1480.934	.82555
5.009	36.058	502491.	78.80	26355.	.650	389.	-4.23	1525.249	.82843
5.337	38.153	502484.	85.80	25413.	.636	382.	-4.23	1570.178	.83129
5.671	40.253	502477.	93.19	24470.	.621	375.	-2.83	1616.374	.83408
9.714	69.559	499698.	2873.	20000.	.800	491.	-1.44	60326.60	.78065

30. ****** XCLECT END OPTION 1 ******
WT = .49970E+06 H = 20000. AM = .80000

TIME = 3.1107 RANGE = 6628.7 FUEL = 14917.

+++ +++

CUMULATIVE CPU TIME = 43.873 CPU TIME USED IN PREVIOUS TASK = 4.7100

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
191	.4997E+06	.2000E+05	.8000	.1619	2873.	69.56	1.000	-0.	0.	1

UNPACK 201 51010 5 1 9 10 10. 17
0. 0. 0. 5.0000 1.0000 51010 2.0000 17 0. 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

SEARCH FOR MACH ALTITUDE POINT ALONG A CONSTANT ENERGY LINE

THE BASIS FOR SELECTION OF EACH MACH ALTITUDE POINT WAS MAXIMUM LIFT/DRAG

CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZD	NET THRUST	SFC
0.000	0.	495777.	0.	20000.	.800	491.	13.83	2149.716	.84889
.309	2.1913	495769.	8.433	23280.	.603	365.	4.82	1718.297	.84049
.755	4.8606	495758.	19.07	22089.	.585	356.	-4.19	1739.287	.84069
1.213	7.5376	495746.	30.44	20898.	.566	346.	-4.18	1795.547	.84142
1.687	10.222	495734.	42.56	19708.	.547	336.	-4.17	1853.176	.84207
2.176	12.913	495721.	55.49	18517.	.528	326.	-4.16	1913.537	.84250
2.682	15.611	495708.	69.32	17326.	.508	315.	-4.15	1975.411	.84283
3.207	18.312	495693.	84.12	16136.	.488	304.	-4.15	2039.268	.84302
3.752	21.013	495677.	99.98	14945.	.467	293.	-5.56	2104.766	.84309
4.292	23.714	495660.	116.6	12935.	.494	312.	-5.43	2272.674	.84764
4.828	26.435	495643.	134.1	11815.	.471	298.	-4.03	2336.300	.84709
5.390	29.168	495624.	152.9	10599.	.452	288.	-4.36	2411.805	.84723
5.971	31.910	495604.	173.1	9275.	.439	281.	-4.60	2501.897	.84787
6.566	34.660	495582.	194.5	7914.	.429	275.	-4.61	2599.757	.84865
7.175	37.418	495560.	217.4	6573.	.417	269.	-4.60	2698.272	.84920
7.800	40.184	495535.	241.7	5209.	.406	264.	-4.63	2802.366	.84991
8.441	42.959	495509.	267.6	3847.	.396	258.	-4.61	2907.805	.85099
9.098	45.743	495482.	295.2	2485.	.385	252.	-4.62	3013.317	.85264
9.771	48.537	495452.	324.6	1105.	.375	247.	-4.10	3125.859	.85436
10.481	51.329	495420.	356.5	50.	.342	226.	-1.78	3198.471	.85234
10.711	51.716	495410.	366.6	50.	.200	132.	0.00	1616.374	.83408

32. ****** XCLECT END OPTION 1 ******
WT = .49541E+06 H = 50.000 AM = .20000

TIME = 3.3559 RANGE = 6698.2 FUEL = 3920.7

+++ +++

CUMULATIVE CPU TIME = 48.769 CPU TIME USED IN PREVIOUS TASK = 4.8580

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
211	.4954E+06	50.00	.2000	.1824	366.6	52.10	1.000	-0.	0.	1

UNPACK 221 51210 5 1 2 10 10. 22
1.0000 2.0000 7350.0 4.0000 20.000 51210 0. 22 2.0000 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

MISSION SEGMENT TABLE

	.20000	0.	.81500E+06	6.0100	1200.0	.50000E-01	1.0000	100.00		0	
2	4.0000	.40000	6.0000	.32600F+06	99120.	51000	0.		21	0	1111111111
3	0.	0.	0.	5.0000	2.0000	51000	2.0000		17	0	1111111111
4	0.	0.	.82998E+06	0.	0.	51000	0.		13	0	1111111111
5	.50000	3000.0	0.	4.0000	0.	51100	0.		1	0	1111111111
6	.60000	5000.0	0.	4.0000	0.	51100	0.		1	0	1111111111
7	.80000	21500.	0.	4.0000	0.	51100	0.		1	0	1111111111
8	.95000	29000.	0.	4.0000	0.	51100	0.		1	0	1111111111
9	1.5000	40500.	0.	4.0000	0.	51100	0.		1	0	1111111111
10	2.6000	52971.	0.	4.0000	0.	51100	0.		1	0	1111111111
11	5.9500	87990.	0.	5.0000	0.	51100	0.		1	0	1111111111
12	5.9900	99120.	0.	4.0000	0.	51100	0.		1	0	1111111111
13	5.0000	.40000	6.0000	0.	-99120.	51100	0.		21	0	1111111111
14	0.	0.	0.	5.0000	12.000	51100	0.		22	X	1111111111
15	0.	0.	.53000E+06	0.	0.	51010	1.0000		6	0	1111111111
16	.80000	20000.	3.0000	1.0000	0.	51210	0.		1	0	1111111111
17	0.	0.	0.	5.0000	1.0000	51010	2.0000		17	0	1111111111
18	.80000	45000.	3.0000	4.0000	0.	51110	0.		1	0	1111111111
19	0.	0.	0.	1.0000	200.00	51010	0.		7	0	1111111111
20	.80000	20000.	3.0000	1.0000	0.	51210	0.		1	0	1111111111
21	0.	0.	0.	5.0000	1.0000	51010	2.0000		17	0	1111111111
22	.20000	50.000	3.0000	1.0000	0.	51210	0.		1	0	1111111111
23	1.0000	2.0000	7350.0	4.0000	20.000	51210	0.		22	X	1111111111
24	0.	0.	0.	0.	1.0000	51210	4.0000		17	0	1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

DUMPRG

SEG	WT	H	AM	TIME	FUEL	RANGE	XNZZ	E10	E11	OPTION
1	.8150E+06	0.	.2000	0.	0.	0.	1.000	0.	0.	X
2	.8150E+06	0.	.2000	0.	0.	0.	1.000	-0.	0.	21
3	.8134E+06	50.00	.2064	.8333E-01	1618.	0.	1.000	-0.	0.	17
4	.8000E+06	50.00	.2064	0.	0.	0.	1.000	-0.	0.	13
5	.7955E+06	3000.	.5000	.2039E-01	4527.	4.361	1.000	-0.	0.	1
6	.7941E+06	5000.	.6000	.6200E-02	1397.	2.196	1.000	-0.	0.	1
7	.7879E+06	.2150E+05	.8000	.3407E-01	6223.	14.85	1.000	-0.	0.	1
8	.7836E+06	.2900E+05	.9500	.2408E-01	4273.	12.69	1.000	-0.	0.	1
9	.7650E+06	.4050E+05	1.500	.1012	.1862E+05	69.55	1.000	-0.	0.	1
10	.7509E+06	.5297E+05	2.600	.4410E-01	.1402E+05	49.83	1.000	-0.	0.	1
11	.7100E+06	.8799E+05	5.950	.1418	.4096E+05	372.2	1.000	-0.	0.	1
12	.7073E+06	.9912E+05	5.990	.1360E-01	2640.	47.45	1.000	-0.	0.	1
13	.7073E+06	.9912E+05	5.990	0.	2640.	0.	1.000	-0.	0.	21
14	.7073E+06	.9912E+05	5.990	0.	2640.	0.	1.000	-0.	0.	22
15	.5300E+06	.9912E+05	5.185	1.643	.1773E+06	5373.	1.000	-0.	0.	6
16	.5268E+06	.2600E+05	.8000	.4107	3167.	451.4	1.000	-0.	0.	1
17	.5229E+06	.2000E+05	.8000	.8333E-01	3959.	0.	1.000	-0.	0.	17
18	.5175E+06	.4500E+05	.8000	.6827E-01	5386.	31.28	1.000	-0.	0.	1
19	.5026E+06	.4500E+05	.8000	.4362	.1492E+05	200.0	1.000	-0.	0.	7
20	.4997E+06	.2000E+05	.8000	.1619	2873.	69.56	1.000	-0.	0.	1
21	.4958E+06	.2000E+05	.8000	.8333E-01	3921.	0.	1.000	-0.	0.	17
22	.4954E+06	50.00	.2000	.1824	366.6	52.10	1.000	-0.	0.	1
23	-0.	-0.	-0.	-0.	-0.	-0.	-0.	1.	-0.	-0
24	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-0

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZD	NET THRUST	SFC
0.000	0.	829983.	0.	50.	.206	136.	3.89	303089.6	.73107
.152	.35647	829422.	560.9	197.	.221	146.	4.31	304287.6	.72748
.269	.64999	828990.	993.3	345.	.236	156.	5.02	306703.1	.72120
.367	.91055	828629.	1354.	492.	.250	165.	5.53	308267.1	.71716
.453	1.1518	828314.	1669.	640.	.265	175.	5.89	309273.6	.71459
.530	1.3812	828030.	1953.	788.	.280	184.	6.14	309914.7	.71304
.600	1.6030	827770.	2214.	935.	.294	194.	6.31	310318.7	.71219
.666	1.8203	827526.	2457.	1082.	.309	204.	6.40	310542.5	.71188
.729	2.0353	827297.	2687.	1230.	.324	213.	6.45	310624.8	.71201
.788	2.2493	827078.	2905.	1377.	.339	223.	6.47	310687.3	.71240
.845	2.4634	826868.	3115.	1525.	.353	232.	6.45	310732.4	.71297
.900	2.6782	826666.	3317.	1672.	.368	242.	6.42	310781.8	.71369
.953	2.8945	826470.	3513.	1820.	.383	251.	6.37	310851.2	.71450
1.004	3.1128	826280.	3704.	1967.	.397	261.	6.31	310951.8	.71538
1.054	3.3333	826094.	3890.	2115.	.412	270.	6.24	311094.1	.71632
1.103	3.5564	825912.	4072.	2262.	.427	280.	6.17	311281.7	.71728
1.151	3.7825	825733.	4250.	2410.	.441	289.	6.08	311518.6	.71827
1.198	4.0117	825557.	4426.	2557.	.456	299.	6.00	311818.6	.71927
1.244	4.2442	825384.	4599.	2705.	.471	308.	5.91	312175.1	.72018
1.290	4.4802	825214.	4770.	2852.	.485	318.	5.82	312585.4	.72117
1.335	4.7199	825045.	4938.	3000.	.500	327.	5.78	313053.6	.72215

35. ****** XCLECT END OPTION 1 ******
WT = .82504E+06 H = 3000.0 AM = .50000

TIME = .83333E-01 RANGE = 0. FUEL = 0.

+++ +++

CUMULATIVE CPU TIME = 50.071 CPU TIME USED IN PREVIOUS TASK = 1.1160

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
41	.8250E+06	3000.	.5000	.2225E-01	4938.	4.720	1.000	-0.	0.	1

UNPACK 51 51100 5 1 1 0 0. 1

.60000	5000.0	0.	4.0000	0.	51100	0.	1	0.		1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAM7D	NET THRUST	SFC
0.000	0.	825045.	0.	3000.	.500	327.	8.56	313075.7	.72210
.020	.10928	824969.	76.00	3100.	.505	330.	8.54	312817.6	.72233
.040	.21916	824893.	151.6	3200.	.510	333.	8.49	312565.6	.72257
.060	.32965	824818.	226.9	3300.	.515	337.	8.44	312322.8	.72280
.080	.44074	824743.	301.9	3400.	.520	340.	8.40	312089.0	.72303
.100	.55244	824668.	376.5	3500.	.525	343.	8.35	311864.3	.72325
.120	.66476	824594.	450.9	3600.	.530	346.	8.31	311648.7	.72348
.140	.77769	824520.	524.9	3700.	.535	349.	8.26	311442.1	.72369
.159	.89126	824446.	598.6	3800.	.540	352.	8.22	311244.5	.72390
.179	1.0054	824373.	672.1	3900.	.545	355.	8.17	311037.0	.72412
.198	1.1203	824300.	745.3	4000.	.550	359.	8.13	310828.7	.72434
.218	1.2358	824227.	818.2	4100.	.555	362.	8.08	310640.8	.72455
.237	1.3519	824154.	890.8	4200.	.560	365.	8.04	310461.9	.72476
.256	1.4687	824082.	963.3	4300.	.565	368.	7.99	310292.1	.72496
.276	1.5861	824009.	1035.	4400.	.570	371.	7.95	310131.3	.72515
.295	1.7042	823938.	1107.	4500.	.575	374.	7.91	309979.5	.72534
.314	1.8229	823866.	1179.	4600.	.580	377.	7.86	309836.6	.72553
.333	1.9423	823794.	1251.	4700.	.585	380.	7.82	309702.5	.72571
.352	2.0624	823723.	1322.	4800.	.590	384.	7.78	309577.4	.72589
.371	2.1831	823652.	1393.	4900.	.595	387.	7.74	309461.0	.72606
.390	2.3045	823581.	1464.	5000.	.600	390.	7.72	309353.4	.72623

36. ****** XCLECT END OPTION 1 ******
WT = .82358E+06 H = 5000.0 AM = .60000
TIME = .10558 RANGE = 4.7199 FUEL = 4938.4

+++ +++

CUMULATIVE CPU TIME = 51.215 CPU TIME USED IN PREVIOUS TASK = 1.1440

RGSAVE
ITZ WT H AM TAC+++ FUEL RUN+++ XNZZ E10 E11 OPTION
51 .8236E+06 5000. .6000 .6500E-02 1464. 2.305 1.000 -0. 0. 1

UNPACK 61 51100 5 1 1 0 0. 1
.80000 21500. 0. 4.0000 0. 51100 0. 1 0. 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMMA	NET THRUST	SFC
0.000	0.	823581.	0.	5000.	.600	390.	13.00	309352.2	.72624
.092	.58792	823239.	342.0	5825.	.610	395.	12.82	303658.9	.72530
.186	1.1923	822899.	681.7	6650.	.620	400.	12.49	298180.1	.72430
.280	1.8136	822562.	1019.	7475.	.630	406.	12.15	292650.2	.72335
.376	2.4525	822227.	1354.	8300.	.640	411.	11.83	287265.7	.72235
.474	3.1094	821893.	1688.	9125.	.650	416.	11.52	281981.9	.72131
.572	3.7848	821562.	2019.	9950.	.660	421.	11.21	276721.1	.72029
.673	4.4794	821232.	2349.	10775.	.670	426.	10.91	271639.0	.71918
.774	5.1936	820904.	2677.	11600.	.680	431.	10.61	266592.4	.71808
.878	5.9281	820578.	3003.	12425.	.690	436.	10.32	261648.8	.71694
.983	6.6839	820253.	3328.	13250.	.700	441.	10.04	256653.1	.71605
1.090	7.4619	819929.	3652.	14075.	.710	446.	9.75	251671.3	.71529
1.198	8.2634	819606.	3975.	14900.	.720	451.	9.47	246810.2	.71447
1.309	9.0888	819284.	4297.	15725.	.730	456.	9.20	242001.1	.71364
1.422	9.9392	818963.	4618.	16550.	.740	461.	8.93	237284.4	.71278
1.537	10.816	818642.	4939.	17375.	.750	465.	8.67	232602.8	.71192
1.654	11.719	818322.	5259.	18200.	.760	470.	8.41	227999.2	.71104
1.774	12.651	818002.	5579.	19025.	.770	475.	8.16	223465.4	.71013
1.896	13.612	817683.	5898.	19850.	.780	479.	7.92	219040.1	.70917
2.021	14.603	817363.	6218.	20675.	.790	484.	7.67	214706.1	.70817
2.148	15.627	817044.	6537.	21500.	.800	488.	7.55	210322.3	.70717

37. ****** XCLECT END OPTION 1 ******
WT = .81704E+06 H = 21500. AM = .80000

TIME = .11208 RANGE = 7.0244 FUEL = 1463.9

+++ +++

CUMULATIVE CPU TIME = 52.385 CPU TIME USED IN PREVIOUS TASK = 1.1700

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
61	.8170E+06	.2150E+05	.8000	.3580E-01	6537.	15.63	1.000	-0.	0.	1

UNPACK 71 51100 5 1 1 0 0. 1

.95000	29000.	0.	4.0000	0.	51100	0.	1	0.		1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZD	NET THRUST	SFC
0.000	0.	817044.	0.	21500.	.800	488.	7.07	210318.5	.78719
.061	.49702	816856.	187.7	21875.	.807	492.	7.13	231214.1	.84454
.121	.98644	816662.	381.9	22250.	.815	496.	7.09	229655.8	.84274
.182	1.4868	816466.	577.8	22625.	.822	500.	6.91	228080.9	.84094
.244	2.0046	816268.	775.5	23000.	.830	503.	6.73	226535.1	.83910
.308	2.5344	816068.	975.3	23375.	.837	507.	6.55	225018.5	.83722
.372	3.0791	815866.	1177.	23750.	.845	511.	6.37	223464.9	.83539
.438	3.6395	815662.	1382.	24125.	.852	515.	6.19	221911.1	.83356
.506	4.2164	815455.	1588.	24500.	.860	518.	6.01	220384.9	.83169
.575	4.8105	815246.	1798.	24875.	.867	522.	5.84	218891.7	.82978
.645	5.4228	815033.	2010.	25250.	.875	526.	5.66	217390.5	.82791
.717	6.0544	814818.	2226.	25625.	.882	529.	5.49	215914.3	.82601
.791	6.7061	814599.	2444.	26000.	.890	533.	5.32	214465.7	.82407
.867	7.3790	814377.	2667.	26375.	.897	537.	5.13	213025.3	.82211
.945	8.0793	814150.	2894.	26750.	.905	540.	4.89	211540.4	.82018
1.028	8.8222	813912.	3132.	27125.	.912	544.	4.60	210084.4	.81821
1.115	9.6146	813663.	3381.	27500.	.920	548.	4.30	208655.5	.81620
1.208	10.463	813401.	3643.	27875.	.927	551.	4.01	207227.8	.81421
1.307	11.376	813123.	3921.	28250.	.935	555.	3.72	205795.6	.81224
1.414	12.363	812827.	4216.	28625.	.942	558.	3.43	204390.0	.81024
1.529	13.436	812511.	4533.	29000.	.950	562.	3.29	203010.9	.80820

38. ****** XCLECT END OPTION 1 ******
WT = .81251E+06 H = 29000. AM = .95000

TIME = .14788 RANGE = 22.651 FUEL = 6537.4

+++ +++

CUMULATIVE CPU TIME = 53.569 CPU TIME USED IN PREVIOUS TASK = 1.1840

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
71	.8125E+06	.2900E+05	.9500	.2548E-01	4533.	13.44	1.000	-0.	0.	1

UNPACK 81 51100 5 1 1 0 0. 1
1.5000 40500. 0. 4.0000 0. 51100 0. 1 0. 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAM7D	NET THRUST	SFC
0.000	0.	812511.	0.	29000.	.950	562.	1.85	203010.4	.80820
.309	2.9306	811661.	849.9	29575.	.977	577.	1.69	205329.0	.80864
.674	6.4867	810644.	1867.	30150.	1.005	592.	1.42	207106.3	.81155
1.086	10.592	809484.	3027.	30725.	1.032	606.	1.26	206017.1	.82624
1.529	15.128	808217.	4294.	31300.	1.060	621.	1.14	205180.1	.84017
2.008	20.136	806833.	5677.	31875.	1.087	635.	1.11	204612.0	.85320
2.450	24.869	805536.	6975.	32450.	1.115	650.	1.15	208368.0	.85052
2.877	29.537	804269.	8242.	33025.	1.142	664.	1.18	204738.6	.87673
3.279	34.038	803056.	9454.	33600.	1.170	678.	1.24	202442.8	.89829
3.649	38.262	801928.	.1058E+05	34175.	1.197	692.	1.30	200864.0	.91718
4.001	42.360	800841.	.1167E+05	34750.	1.225	706.	1.31	199910.6	.93370
4.353	46.545	799739.	.1277E+05	35325.	1.252	720.	1.29	199351.3	.94842
4.702	50.774	798633.	.1388E+05	35900.	1.280	734.	1.24	199271.7	.96119
5.065	55.269	797463.	.1505E+05	36475.	1.307	749.	1.34	199734.2	.97509
5.356	58.936	796510.	.1600E+05	37050.	1.335	765.	1.62	219779.1	.90362
5.594	61.997	795716.	.1680E+05	37625.	1.362	781.	1.84	226520.0	.89326
5.809	64.830	794982.	.1753E+05	38200.	1.390	797.	1.97	232250.1	.88737
6.008	67.493	794293.	.1822E+05	38775.	1.417	813.	2.08	237546.0	.88346
6.194	70.034	793637.	.1887E+05	39350.	1.445	828.	2.18	242466.3	.88113
6.369	72.472	793008.	.1950E+05	39925.	1.472	844.	2.27	247357.1	.87905
6.534	74.814	792405.	.2011E+05	40500.	1.500	860.	2.31	252267.5	.87702

39. ****** XCLECT END OPTICN 1 ******
WT = .79240E+06 H = 40500. AM = 1.5000

TIME = .17336 RANGE = 36.087 FUEL = 4532.7

+++ +++

CUMULATIVE CPU TIME = 55.243 CPU TIME USED IN PREVIOUS TASK = 1.6740

RGSAVE ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
61	.7924E+06	.4050E+05	1.500	.1089	.2011E+05	74.81	1.000	-0.	0.	1

UNPACK 91 51100 5 1 1 0 0. 1
2.6000 52971. 0. 4.0000 0. 51100 0. 1 0. 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZD	NET THRUST	SFC
0.000	0.	792405.	0.	40500.	1.500	860.	1.58	252287.6	.87689
.255	3.7202	791437.	967.7	41124.	1.555	891.	1.66	268227.8	.87307
.479	7.1005	790540.	1865.	41747.	1.610	923.	1.82	284652.1	.86869
.677	10.202	789701.	2704.	42371.	1.665	954.	1.97	300940.5	.86612
.855	13.073	788909.	3496.	42994.	1.720	986.	2.12	317466.0	.86360
1.015	15.744	788159.	4245.	43618.	1.775	1017.	2.28	334519.2	.86058
1.160	18.239	787447.	4958.	44241.	1.830	1049.	2.43	351726.1	.85787
1.293	20.585	786767.	5638.	44865.	1.885	1080.	2.58	369156.2	.85532
1.414	22.796	786115.	6290.	45488.	1.940	1112.	2.72	386898.8	.85296
1.526	24.906	785487.	6918.	46112.	1.995	1144.	2.78	399090.0	.84893
1.636	27.017	784863.	7541.	46735.	2.050	1175.	2.76	409604.6	.84641
1.743	29.156	784229.	8175.	47359.	2.105	1207.	2.73	424104.4	.84515
1.850	31.316	783585.	8820.	47983.	2.160	1238.	2.70	438219.0	.84398
1.954	33.500	782931.	9474.	48606.	2.215	1270.	2.66	452388.9	.84204
2.059	35.734	782263.	.1014E+05	49230.	2.270	1301.	2.56	459604.3	.83924
2.166	38.087	781571.	.1083E+05	49853.	2.325	1333.	2.43	463077.4	.83786
2.277	40.580	780851.	.1155E+05	50477.	2.380	1364.	2.29	466519.3	.83608
2.392	43.224	780102.	.1230E+05	51100.	2.435	1396.	2.17	470392.9	.83370
2.509	45.984	779327.	.1308E+05	51724.	2.490	1427.	2.14	480822.0	.83250
2.623	48.722	778559.	.1385E+05	52347.	2.545	1459.	2.22	491241.9	.83072
2.728	51.289	777842.	.1456E+05	52971.	2.600	1490.	2.29	501322.4	.82896

40. ****** XCLECT END OPTION 1 ******
WT = .77784E+06 H = 52971. AM = 2.6000

TIME = .28227 RANGE = 110.90 FUEL = 20106.

+++ +++

CUMULATIVE CPU TIME = 57.317 CPU TIME USED IN PREVIOUS TASK = 2.0740

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
91	.7778E+06	.5297E+05	2.600	.4546E-01	.1456E+05	51.29	1.000	-0.	0.	1

UNPACK 101 51100 5 1 1 0 0. 1
5.9500 87990. 0. 5.0000 0. 51100 0. 1 0. 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

CONSTANT DYNAMIC PRESSURE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMTD	NET THRUST	SFC
0.000	0.	777842.	0.	52971.	2.600	1490.	3.66	501241.0	.82894
.178	4.4992	776608.	1234.	54722.	2.695	1545.	3.48	501422.8	.82702
.368	9.4845	775300.	2542.	56473.	2.811	1611.	3.25	493927.4	.82561
.556	14.638	774043.	3798.	58224.	2.932	1681.	3.06	474397.8	.82946
.754	20.279	772772.	5070.	59975.	3.058	1753.	2.63	412804.1	.91998
.991	27.351	771297.	6544.	61726.	3.190	1828.	2.20	399669.5	.91691
1.246	35.288	769766.	8076.	63477.	3.327	1907.	1.96	386697.9	.91517
1.521	44.204	768172.	9670.	65228.	3.470	1989.	1.73	373712.1	.91540
1.824	54.489	766470.	.1137E+05	66979.	3.619	2076.	1.50	360072.4	.91793
2.157	66.245	764669.	.1317E+05	68730.	3.774	2168.	1.32	346593.2	.92185
2.518	79.580	762777.	.1506E+05	70480.	3.935	2263.	1.17	334431.2	.92479
2.909	94.637	760793.	.1705E+05	72231.	4.103	2363.	1.03	323712.2	.92865
3.330	111.58	758710.	.1913E+05	73982.	4.278	2467.	.92	313587.8	.93557
3.784	130.67	756510.	.2133E+05	75733.	4.460	2574.	.81	303321.8	.94679
4.280	152.40	754168.	.2367E+05	77484.	4.649	2687.	.71	290947.5	.96108
4.828	177.47	751650.	.2619E+05	79235.	4.845	2804.	.61	278396.1	.97740
5.436	206.53	748926.	.2892E+05	80986.	5.049	2925.	.53	265994.7	.99679
6.114	240.27	745971.	.3187E+05	82737.	5.262	3052.	.46	254579.2	1.0150
6.867	279.40	742767.	.3507E+05	84488.	5.482	3184.	.39	244008.2	1.0339
7.708	325.02	739273.	.3857E+05	86239.	5.712	3321.	.33	233178.7	1.0552
8.657	378.69	735428.	.4241E+05	87990.	5.950	3464.	.31	222844.5	1.0783

41. ****** XCLECT END OPTION 1 ******
WT = .73543E+06 H = 87990. AM = 5.9500

TIME = .32773 RANGE = 162.19 FUEL = 14563.

+++ +++

CUMULATIVE CPU TIME = 58.777 CPU TIME USED IN PREVIOUS TASK = 1.4600

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
101	.7354E+06	.8799E+05	5.950	.1443	.4241E+05	378.7	1.000	-0.	0.	1

UNPACK 111 51100 5 1 1 0 0. 1
5.9900 99120. 0. 4.0000 0. 51100 0. 1 0. 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZD	NET THRUST	SFC
0.000	0.	735428.	0.	87990.	5.950	3464.	3.12	222699.7	1.0783
.029	1.6776	735313.	115.2	88546.	5.952	3466.	3.08	217869.4	1.0778
.059	3.4073	735196.	231.8	89103.	5.954	3469.	2.98	214038.1	1.0774
.090	5.1921	735078.	349.8	89659.	5.956	3471.	2.89	210312.8	1.0769
.122	7.0348	734959.	469.5	90216.	5.958	3474.	2.80	206688.6	1.0765
.155	8.9388	734837.	590.8	90772.	5.960	3476.	2.71	203165.0	1.0761
.189	10.908	734714.	714.1	91329.	5.962	3479.	2.62	199738.6	1.0757
.224	12.946	734589.	839.3	91885.	5.964	3481.	2.53	196406.9	1.0753
.260	15.057	734461.	966.8	92442.	5.966	3484.	2.44	193167.5	1.0749
.298	17.247	734331.	1097.	92998.	5.968	3486.	2.35	190017.7	1.0745
.337	19.521	734199.	1229.	93555.	5.970	3489.	2.26	186955.3	1.0741
.378	21.885	734063.	1365.	94111.	5.972	3491.	2.17	183977.9	1.0737
.420	24.345	733925.	1503.	94668.	5.974	3494.	2.09	181083.3	1.0733
.464	26.911	733782.	1646.	95224.	5.976	3496.	2.00	178269.1	1.0730
.510	29.591	733636.	1792.	95781.	5.978	3499.	1.91	175533.1	1.0726
.558	32.395	733486.	1942.	96337.	5.980	3501.	1.83	172873.3	1.0723
.609	35.335	733331.	2097.	96894.	5.982	3503.	1.74	170287.4	1.0719
.662	38.425	733171.	2257.	97450.	5.984	3506.	1.65	167773.5	1.0716
.717	41.680	733004.	2424.	98007.	5.986	3508.	1.57	165329.3	1.0713
.776	45.120	732831.	2597.	98563.	5.988	3511.	1.48	162952.9	1.0709
.839	48.767	732651.	2777.	99120.	5.990	3513.	1.44	160642.2	1.0706

42. ****** XCLECT END OPTION 1 ******
WT = .73265E+06 H = 99120. AM = 5.9900

TIME = .47201 RANGE = 540.88 FUEL = 42414.

+++ +++

CUMULATIVE CPU TIME = 60.527 CPU TIME USED IN PREVIOUS TASK = 1.7500

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
111	.7327E+06	.9912E+05	5.990	.1398E-01	2777.	48.77	1.000	-0.	0.	1

UNPACK 121 51100 5 1 1 0 0. 21
5.0000 .40000 6.0000 0. -99120. 51100 0. 21 0. 1111111111

RAMJET PERFORMANCE (PER ENGINE) AT SCALING ALTITUDE AND MACH NUMBER

RAMJET GROSS THRUST	41447.8	(LB)
NET THRUST IN FREESTREAM DIRECTION	41293.2	(LB)
AIRFLOW RATE	419.768	(LB/SEC)
FUELFLOW RATE	12.2572	(LB/SEC)
SPECIFIC IMPULSE	3381.50	(SEC)
SCALED FUEL/AIR RATIO (PHI)	1.000	(NO UNITS)
SCALING ALTITUDE	99120.0	(FEET)
SCALING MACH NUMBER	6.000	(NO UNITS)
MAXIMUM AIRFLOW RATE	421.133	(LB/SEC)
ANGLE OF ATTACK	5.39972	(DEGREES)
WING HALF ANGLE	-.700000	(DEGREES)
INLET WEDGE ANGLE	6.00000	(DEGREES)
SCALING THRUST IN FREESTREAM DIRECTION	41293.2	(LB)
LIFT COMPONENT OF ENGINE FORCES	3460.23	(LB)
INLET SPILLAGE DRAG	0.	(LB)
ENGINE INLET AREA	40.726	(SQ. FT)
RAMJET THROTTLE SETTING	.997	(NO UNITS)

LPC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

MISSION SEGMENT TABLE

	.20000	0.	.81500E+06	6.0100	1200.0	.50000E-01	1.0000	100.00		0	
2	4.0000	.40000	6.0000	.32600E+06	99120.	51000	0.		21	0	1111111111
3	0.	0.	0.	5.0000	2.0000	51000	2.0000		17	0	1111111111
4	0.	0.	.82998E+06	0.	0.	51000	0.		13	0	1111111111
5	.50000	3000.0	0.	4.0000	0.	51100	0.		1	0	1111111111
6	.60000	5000.0	0.	4.0000	0.	51100	0.		1	0	1111111111
7	.80000	21500.	0.	4.0000	0.	51100	0.		1	0	1111111111
8	.95000	29000.	0.	4.0000	0.	51100	0.		1	0	1111111111
9	1.5000	40500.	0.	4.0000	0.	51100	0.		1	0	1111111111
10	2.6000	52971.	0.	4.0000	0.	51100	0.		1	0	1111111111
11	5.9500	87990.	0.	5.0000	0.	51100	0.		1	0	1111111111
12	5.9900	99120.	0.	4.0000	0.	51100	0.		1	0	1111111111
13	5.0000	.40000	6.0000	0.	-99120.	51100	0.		21	0	1111111111
14	0.	0.	0.	5.0000	12.000	51100	0.		22	X	1111111111
15	0.	0.	.53000E+06	0.	0.	51010	1.0000		6	0	1111111111
16	.80000	20000.	3.0000	1.0000	0.	51210	0.		1	0	1111111111
17	0.	0.	0.	5.0000	1.0000	51010	2.0000		17	0	1111111111
18	.80000	45000.	3.0000	4.0000	0.	51110	0.		1	0	1111111111
19	0.	0.	0.	1.0000	200.00	51010	0.		7	0	1111111111
20	.80000	20000.	3.0000	1.0000	0.	51210	0.		1	0	1111111111
21	0.	0.	0.	5.0000	1.0000	51010	2.0000		17	0	1111111111
22	.20000	50.000	3.0000	1.0000	0.	51210	0.		1	0	1111111111
23	1.0000	2.0000	7350.0	4.0000	20.000	51210	0.		22	X	1111111111
24	0.	0.	0.	0.	1.0000	51210	4.0000		17	0	1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

DUMPRG

SEG	WT	H	AM	TIME	FUEL	RANGE	XNZZ	E10	E11	OPTION
1	.8150E+06	0.	.2000	0.	0.	0.	1.000	0.	0.	X
2	.8150E+06	0.	.2000	0.	0.	0.	1.000	-0.	0.	21
3	.8134E+06	50.00	.2064	.8333E-01	1618.	0.	1.000	-0.	0.	17
4	.8300E+06	50.00	.2064	0.	0.	0.	1.000	-0.	0.	13
5	.8250E+06	3000.	.5000	.2225E-01	4938.	4.720	1.000	-0.	0.	1
6	.8236E+06	5000.	.6000	.6500E-02	1464.	2.305	1.000	-0.	0.	1
7	.8170E+06	.2150E+05	.8000	.3580E-01	6537.	15.63	1.000	-0.	0.	1
8	.8125E+06	.2900E+05	.9500	.2548E-01	4533.	13.44	1.000	-0.	0.	1
9	.924E+06	.4050E+05	1.500	.1089	.2011E+05	74.81	1.000	-0.	0.	1
10	.7778E+06	.5297E+05	2.600	.4546E-01	.1456E+05	51.29	1.000	-0.	0.	1
11	.7354E+06	.8799E+05	5.950	.1443	.4241E+05	378.7	1.000	-0.	0.	1
12	.7327E+06	.9912E+05	5.990	.1398E-01	2777.	48.77	1.000	-0.	0.	1
13	.7327E+06	.9912E+05	5.990	0.	2777.	0.	1.000	-0.	0.	21
14	.7073E+06	.9912E+05	5.990	0.	2640.	0.	1.000	1.	0.	22
15	.5300E+06	.9912E+05	5.185	1.643	.1773E+06	5373.	1.000	-0.	0.	6
16	.5268E+06	.2000E+05	.8000	.4107	3167.	451.4	1.000	-0.	0.	1
17	.5229E+06	.2000E+05	.8000	.8333E-01	3959.	0.	1.000	-0.	0.	17
18	.5175E+06	.4500E+05	.8000	.6827E-01	5386.	31.28	1.000	-0.	0.	1
19	.5026E+06	.4500E+05	.8000	.4362	.1492E+05	200.0	1.000	-0.	0.	7
20	.4997E+06	.2000E+05	.8000	.1619	2873.	69.56	1.000	-0.	0.	1
21	.4958E+06	.2000E+05	.8000	.8333E-01	3921.	0.	1.000	-0.	0.	17
22	.4954E+06	50.00	.2000	.1824	366.6	52.10	1.000	-0.	0.	1
23	-0.	-0.	-0.	-0.	-0.	-0.	-0.	1.	-0.	-0
24	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-0

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZD	NET THRUST	SFC
0.000	0.	829983.	0.	50.	.206	136.	3.89	303089.6	.73107
.152	.35647	829422.	560.9	197.	.221	146.	4.31	304287.6	.72748
.269	.64999	828990.	993.3	345.	.236	156.	5.02	306703.1	.72120
.367	.91055	828629.	1354.	492.	.250	165.	5.53	308267.1	.71716
.453	1.1518	828314.	1669.	640.	.265	175.	5.89	309273.6	.71459
.530	1.3812	828030.	1953.	788.	.280	184.	6.14	309914.7	.71304
.600	1.6030	827770.	2214.	935.	.294	194.	6.31	310316.7	.71219
.666	1.8203	827526.	2457.	1082.	.309	204.	6.40	310542.5	.71188
.729	2.0353	827297.	2687.	1230.	.324	213.	6.45	310624.8	.71201
.788	2.2493	827078.	2905.	1377.	.339	223.	6.47	310687.3	.71240
.845	2.4634	826868.	3115.	1525.	.353	232.	6.45	310732.4	.71297
.900	2.6782	826666.	3317.	1672.	.368	242.	6.42	310781.8	.71369
.953	2.8945	826470.	3513.	1820.	.383	251.	6.37	310851.2	.71450
1.004	3.1128	826280.	3704.	1967.	.397	261.	6.31	310951.8	.71538
1.054	3.3333	826094.	3890.	2115.	.412	270.	6.24	311094.1	.71632
1.103	3.5564	825912.	4072.	2262.	.427	280.	6.17	311281.7	.71728
1.151	3.7825	825733.	4250.	2410.	.441	289.	6.08	311518.6	.71827
1.198	4.0117	825557.	4426.	2557.	.456	299.	6.00	311818.6	.71927
1.244	4.2442	825384.	4599.	2705.	.471	308.	5.91	312175.1	.72018
1.290	4.4802	825214.	4770.	2852.	.485	318.	5.82	312585.4	.72117
1.335	4.7199	825045.	4938.	3000.	.500	327.	5.78	313053.6	.72215

45. ****** XCLECT END OPTION 1 ******
WT = .82504E+06 H = 3000.0 AM = .50000
TIME = .83333E-01 RANGE = 0. FUEL = 2777.2

+++ +++

CUMULATIVE CPU TIME = 61.923 CPU TIME USED IN PREVIOUS TASK = 1.1180

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
41	.8250E+06	3000.	.5000	.2225E-01	4938.	4.720	1.000	-0.	0.	1

UNPACK 51 51100 5 1 1 0 0. 1

.60000	5000.0	0.	4.0000	0.	51100	0.		1	0.	1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZD	NET THRUST	SFC
0.000	0.	825045.	0.	3000.	.500	327.	8.56	313075.7	.72210
.020	.10928	824969.	76.00	3100.	.505	330.	8.54	312817.6	.72233
.040	.21916	824893.	151.6	3200.	.510	333.	8.49	312565.6	.72257
.060	.32965	824818.	226.9	3300.	.515	337.	8.44	312322.8	.72280
.080	.44074	824743.	301.9	3400.	.520	340.	8.40	312089.0	.72303
.100	.55244	824668.	376.5	3500.	.525	343.	8.35	311864.3	.72325
.120	.66476	824594.	450.9	3600.	.530	346.	8.31	311648.7	.72348
.140	.77769	824520.	524.9	3700.	.535	349.	8.26	311442.1	.72369
.159	.89126	824446.	598.6	3800.	.540	352.	8.22	311244.5	.72390
.179	1.0054	824373.	672.1	3900.	.545	355.	8.17	311037.0	.72412
.198	1.1203	824300.	745.3	4000.	.550	359.	8.13	310828.7	.72434
.218	1.2358	824227.	818.2	4100.	.555	362.	8.08	310640.8	.72455
.237	1.3519	824154.	890.8	4200.	.560	365.	8.04	310461.9	.72476
.256	1.4687	824082.	963.3	4300.	.565	368.	7.99	310292.1	.72496
.276	1.5861	824009.	1035.	4400.	.570	371.	7.95	310131.3	.72515
.295	1.7042	823938.	1107.	4500.	.575	374.	7.91	309979.5	.72534
.314	1.8229	823856.	1179.	4600.	.580	377.	7.86	309836.6	.72553
.333	1.9423	823794.	1251.	4700.	.585	380.	7.82	309702.5	.72571
.352	2.0624	823723.	1322.	4800.	.590	384.	7.78	309577.4	.72589
.371	2.1831	823652.	1393.	4900.	.595	387.	7.74	309461.0	.72606
.390	2.3045	823581.	1464.	5000.	.600	390.	7.72	309353.4	.72623

46. ****** XCLECT END OPTICN 1 ******
WT = .82358E+06 H = 5000.0 AM = .60000

TIME = .10558 RANGE = 4.7199 FUEL = 4938.4

+++ +++

CUMULATIVE CPU TIME = 63.067 CPU TIME USED IN PREVIOUS TASK = 1.1440

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
51	.8236E+06	5000.	.6000	.6500E-02	1464.	2.305	1.000	-0.	0.	1

UNPACK 61 51100 5 1 1 0 0. 1

.80000	21500.	0.	4.0000	0.	51100	0.		1	0.	1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZO	NET THRUST	SFC
0.000	0.	823581.	0.	5000.	.600	390.	13.00	309352.2	.72624
.092	.58792	823239.	342.0	5825.	.610	395.	12.82	303658.9	.72530
.186	1.1923	822899.	681.7	6650.	.620	400.	12.49	298180.1	.72430
.280	1.8136	822562.	1019.	7475.	.630	406.	12.15	292650.2	.72335
.376	2.4525	822227.	1354.	8300.	.640	411.	11.83	287265.7	.72235
.474	3.1094	821893.	1688.	9125.	.650	416.	11.52	281981.9	.72131
.572	3.7848	821562.	2019.	9950.	.660	421.	11.21	276721.1	.72029
.673	4.4794	821232.	2349.	10775.	.670	426.	10.91	271639.0	.71918
.774	5.1936	820904.	2677.	11600.	.680	431.	10.61	266592.4	.71808
.878	5.9281	820578.	3003.	12425.	.690	436.	10.32	261648.8	.71694
.983	6.6839	820253.	3328.	13250.	.700	441.	10.04	256653.1	.71605
1.090	7.4619	819929.	3652.	14075.	.710	446.	9.75	251671.3	.71529
1.198	8.2634	819606.	3975.	14900.	.720	451.	9.47	246810.2	.71447
1.309	9.0888	819284.	4297.	15725.	.730	456.	9.20	242001.1	.71364
1.422	9.9392	818963.	4618.	16550.	.740	461.	8.93	237284.4	.71278
1.537	10.816	818642.	4939.	17375.	.750	465.	8.67	232602.8	.71192
1.654	11.719	818322.	5259.	18200.	.760	470.	8.41	227999.2	.71104
1.774	12.651	818002.	5579.	19025.	.770	475.	8.16	223465.4	.71013
1.896	13.612	817683.	5898.	19850.	.780	479.	7.92	219040.1	.70917
2.021	14.603	817363.	6218.	20675.	.790	484.	7.67	214706.1	.70817
2.148	15.627	817044.	6537.	21500.	.800	488.	7.55	210322.3	.70717

47. ****** XCLECT END OPTION 1 ******
WT = .81704E+06 H = 21500. AM = .80000
TIME = .11208 RANGE = 7.0244 FUEL = 1463.9

+++ +++

CUMULATIVE CPU TIME = 64.237 CPU TIME USED IN PREVIOUS TASK = 1.1700

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
61	.8170E+06	.2150E+05	.8000	.3580E-01	6537.	15.63	1.000	-0.	0.	1

UNPACK 71 51100 5 1 1 0 0. 1
.95000 29000. 0. 4.0000 0. 51100 0. 1 0. 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZD	NET THRUST	SFC
0.000	0.	817044.	0.	21500.	.800	488.	7.09	210318.5	.70719
.061	.49564	816856.	188.1	21875.	.807	492.	7.15	231763.4	.84759
.121	.98320	816661.	382.7	22250.	.815	496.	7.12	230202.7	.84576
.182	1.4836	816465.	579.0	22625.	.822	500.	6.94	228625.3	.84393
.244	1.9973	816266.	777.2	23000.	.830	503.	6.76	227076.9	.84206
.307	2.5251	816066.	977.3	23375.	.837	507.	6.58	225557.5	.84016
.371	3.0675	815864.	1180.	23750.	.845	511.	6.40	224001.1	.83829
.437	3.6256	815659.	1384.	24125.	.852	515.	6.22	222444.4	.83643
.504	4.2000	815452.	1591.	24500.	.860	518.	6.04	220915.1	.83453
.572	4.7915	815242.	1801.	24875.	.867	522.	5.86	219418.9	.83259
.643	5.4011	815030.	2014.	25250.	.875	526.	5.69	217914.6	.83069
.714	6.0298	814814.	2230.	25625.	.882	529.	5.52	216435.2	.82876
.788	6.6784	814595.	2449.	26000.	.890	533.	5.35	214983.4	.82679
.863	7.3482	814373.	2671.	26375.	.897	537.	5.16	213539.6	.82481
.941	8.0450	814145.	2899.	26750.	.905	540.	4.91	212051.4	.82284
1.023	8.7840	813907.	3136.	27125.	.912	544.	4.62	210592.0	.82084
1.110	9.5720	813658.	3385.	27500.	.920	548.	4.33	209159.6	.81881
1.203	10.415	813396.	3648.	27875.	.927	551.	4.04	207728.4	.81678
1.301	11.322	813118.	3925.	28250.	.935	555.	3.75	206292.7	.81478
1.407	12.303	812823.	4220.	28625.	.942	558.	3.46	204883.5	.81275
1.521	13.368	812507.	4536.	29000.	.950	562.	3.31	203500.8	.81068

48. ****** XCLECT END OPTION 1 ******
WT = .81251E+06 H = 29000. AM = .95000

TIME = .14788 RANGE = 22.651 FUEL = 6537.4

+++ +++

CUMULATIVE CPU TIME = 65.423 CPU TIME USED IN PREVIOUS TASK = 1.1860

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
71	.8125E+06	.2900E+05	.9500	.2536E-01	4536.	13.37	1.000	-0.	0.	1

UNPACK 81 51100 5 1 1 0 0. 1
1.5000 40500. 0. 4.0000 0. 51100 0. 1 0. 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZD	NET THRUST	SFC
0.000	0.	812507.	0.	29000.	.950	562.	1.86	203500.3	.81069
.306	2.9059	811660.	847.5	29575.	.977	577.	1.70	205854.6	.81115
.668	6.4241	810648.	1860.	30150.	1.005	592.	1.44	207644.3	.81418
1.075	10.484	809494.	3014.	30725.	1.032	606.	1.27	206459.7	.82942
1.514	14.976	808232.	4276.	31300.	1.060	621.	1.15	205534.2	.84391
1.988	19.942	806851.	5656.	31875.	1.087	635.	1.12	204884.7	.85748
2.426	24.629	805558.	6949.	32450.	1.115	650.	1.16	208717.0	.85467
2.850	29.267	804290.	8217.	33025.	1.142	664.	1.19	204916.1	.88188
3.252	33.757	803073.	9434.	33600.	1.170	678.	1.24	202488.1	.90431
3.622	37.982	801936.	.1057E+05	34175.	1.197	692.	1.30	200797.6	.92398
3.974	42.090	800839.	.1167E+05	34750.	1.225	706.	1.30	199747.7	.94123
4.328	46.293	799724.	.1278E+05	35325.	1.252	720.	1.28	199104.2	.95663
4.679	50.549	798602.	.1391E+05	35900.	1.280	734.	1.23	198951.1	.97001
5.045	55.078	797414.	.1509E+05	36475.	1.307	749.	1.34	199372.5	.98449
5.336	58.743	796455.	.1605E+05	37050.	1.335	765.	1.63	220092.8	.90967
5.572	61.786	795659.	.1685E+05	37625.	1.362	781.	1.85	227033.5	.89876
5.786	64.597	794924.	.1758E+05	38200.	1.390	797.	1.99	232925.1	.89253
5.983	67.235	794236.	.1827E+05	38775.	1.417	813.	2.10	238365.9	.88837
6.167	69.751	793580.	.1893E+05	39350.	1.445	828.	2.20	243422.5	.88583
6.340	72.162	792952.	.1956E+05	39925.	1.472	844.	2.29	248445.1	.88357
6.504	74.477	792350.	.2016E+05	40500.	1.500	860.	2.34	253484.8	.88138

49. ****** XCLECT END OPTION 1 ******
WT = .79235E+06 H = 40500. AM = 1.5000

TIME = .17324 RANGE = 36.019 FUEL = 4536.3

+++ +++

CUMULATIVE CPU TIME = 67.095 CPU TIME USED IN PREVIOUS TASK = 1.6720

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
81	.7924E+06	.4050E+05	1.500	.1084	.2016E+05	74.48	1.000	-0.	0.	1

UNPACK 91 51100 5 1 1 0 0. 1
2.6000 52971. 0. 4.0000 0. 51100 0. 1 0. 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAM7D	NET THRUST	SFC
0.000	0.	792350.	0.	40500.	1.500	860.	1.60	253505.8	.88125
.252	3.6732	791385.	965.1	41124.	1.555	891.	1.68	269738.8	.87714
.473	7.0075	790491.	1859.	41747.	1.610	923.	1.84	286468.7	.87249
.668	10.065	789654.	2696.	42371.	1.665	954.	2.00	303060.5	.86970
.843	12.892	788866.	3484.	42994.	1.720	986.	2.16	319901.6	.86699
1.001	15.522	788119.	4231.	43618.	1.775	1017.	2.31	337282.3	.86378
1.144	17.978	787409.	4941.	44241.	1.830	1049.	2.47	354820.1	.86091
1.274	20.285	786732.	5619.	44865.	1.885	1080.	2.62	372584.6	.85822
1.393	22.459	786082.	6268.	45488.	1.940	1112.	2.77	390673.3	.85572
1.503	24.520	785458.	6892.	46112.	1.995	1144.	2.86	407053.6	.85278
1.609	26.562	784840.	7510.	46735.	2.050	1175.	2.86	417851.7	.85009
1.713	28.627	784213.	8137.	47359.	2.105	1207.	2.83	432734.1	.84865
1.815	30.710	783576.	8774.	47983.	2.160	1238.	2.80	447228.1	.84730
1.916	32.814	782930.	9420.	48606.	2.215	1270.	2.76	461770.1	.84521
2.016	34.964	782272.	.1008E+05	49230.	2.270	1301.	2.66	469186.0	.84230
2.120	37.224	781591.	.1076E+05	49853.	2.325	1333.	2.53	472796.2	.84080
2.226	39.613	780884.	.1147E+05	50477.	2.380	1364.	2.39	476370.1	.83891
2.336	42.142	780150.	.1220E+05	51100.	2.435	1396.	2.28	480369.9	.83644
2.448	44.776	779392.	.1296E+05	51724.	2.490	1427.	2.24	491082.1	.83513
2.557	47.389	778641.	.1371E+05	52347.	2.545	1459.	2.32	501779.4	.83326
2.657	49.845	777938.	.1441E+05	52971.	2.600	1490.	2.39	512131.4	.83141

50. ****** XCLECT END OPTION 1 ******
WT = .77794E+06 H = 52971. AM = 2.6000

TIME = .28163 RANGE = 110.50 FUEL = 20157.

+++ +++

CUMULATIVE CPU TIME = 69.171 CPU TIME USED IN PREVIOUS TASK = 2.0760

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
91	.7779E+06	.5297E+05	2.600	.4428E-01	.1441E+05	49.85	1.000	-0.	0.	1

UNPACK 101 51100 5 1 1 0 0. 1

5.9500 87990. 0. 5.0000 0. 51100 0. 1 0. 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

CONSTANT DYNAMIC PRESSURE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZD	NET THRUST	SFC
0.000	0.	777938.	0.	52971.	2.600	1490.	3.82	512049.3	.83139
.171	4.3174	776725.	1213.	54722.	2.695	1545.	3.62	512325.5	.82931
.354	9.1170	775434.	2504.	56473.	2.811	1611.	3.37	504732.1	.82779
.536	14.090	774192.	3746.	58224.	2.932	1681.	3.17	484874.5	.83149
.726	19.535	772934.	5004.	59975.	3.058	1753.	2.73	422952.4	.91998
.954	26.332	771482.	6456.	61726.	3.190	1828.	2.29	409497.3	.91691
1.199	33.958	769974.	7964.	63477.	3.327	1907.	2.04	396209.1	.91517
1.463	42.522	768406.	9532.	65228.	3.470	1989.	1.80	382906.4	.91540
1.755	52.394	766732.	.1121E+05	66979.	3.619	2076.	1.57	368934.1	.91793
2.074	63.673	764961.	.1298E+05	68730.	3.774	2168.	1.38	355126.4	.92185
2.420	76.460	763102.	.1484E+05	70480.	3.935	2263.	1.22	342668.7	.92479
2.794	90.890	761154.	.1678E+05	72231.	4.103	2363.	1.08	331689.7	.92865
3.197	107.12	759109.	.1883E+05	73982.	4.278	2467.	.96	321320.2	.93557
3.633	125.41	756951.	.2099E+05	75733.	4.460	2574.	.85	310806.2	.94679
4.107	146.20	754655.	.2328E+05	77484.	4.649	2687.	.74	298132.3	.96108
4.631	170.16	752187.	.2575E+05	79235.	4.845	2804.	.64	285277.4	.97740
5.212	197.90	749522.	.2842E+05	80986.	5.049	2925.	.55	272576.9	.99679
5.858	230.08	746635.	.3130E+05	82737.	5.262	3052.	.48	260887.3	1.0150
6.575	267.34	743508.	.3443E+05	84488.	5.482	3184.	.41	250064.2	1.0339
7.375	310.71	740104.	.3783E+05	86239.	5.712	3321.	.35	238976.9	1.0552
8.275	361.63	736365.	.4157E+05	87990.	5.950	3464.	.32	228398.7	1.0783

51. ****** XCLECT END OPTION 1 ******
WT = .73637E+06 H = 87990. AM = 5.9500

TIME = .32591 RANGE = 160.34 FUEL = 14412.

+++ +++

CUMULATIVE CPU TIME = 70.631 CPU TIME USED IN PREVIOUS TASK = 1.4600

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
101	.7364E+06	.8799E+05	5.950	.1379	.4157E+05	361.6	1.000	-0.	0.	1

UNPACK 111 51100 5 1 1 0 0. 1
5.9900 99120. 0. 4.0000 0. 51100 0. 1 0. 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMMA	NET THRUST	SFC
0.000	0.	736365.	0.	87990.	5.950	3464.	3.30	228255.5	1.0783
.028	1.5889	736253.	111.9	88546.	5.952	3466.	3.25	223294.9	1.0778
.056	3.2262	736140.	225.0	89103.	5.954	3469.	3.15	219370.5	1.0774
.085	4.9144	736026.	339.4	89659.	5.956	3471.	3.06	215554.0	1.0769
.115	6.6561	735910.	455.4	90216.	5.958	3474.	2.96	211842.6	1.0765
.146	8.4544	735792.	572.8	90772.	5.960	3476.	2.87	208233.6	1.0761
.178	10.312	735673.	692.0	91329.	5.962	3479.	2.77	204724.2	1.0757
.212	12.234	735552.	813.1	91885.	5.964	3481.	2.68	201311.8	1.0753
.246	14.222	735429.	936.2	92442.	5.966	3484.	2.59	197993.8	1.0749
.281	16.282	735304.	1061.	92998.	5.968	3486.	2.50	194767.9	1.0745
.318	18.418	735176.	1189.	93555.	5.970	3489.	2.41	191631.4	1.0741
.356	20.636	735046.	1319.	94111.	5.972	3491.	2.32	188582.0	1.0737
.396	22.942	734913.	1453.	94668.	5.974	3494.	2.23	185617.4	1.0734
.437	25.343	734776.	1589.	95224.	5.976	3496.	2.14	182735.3	1.0730
.480	27.845	734636.	1729.	95781.	5.978	3499.	2.05	179933.4	1.0726
.525	30.459	734493.	1872.	96337.	5.980	3501.	1.96	177209.5	1.0723
.572	33.193	734345.	2020.	96894.	5.982	3503.	1.87	174561.5	1.0719
.621	36.060	734192.	2173.	97450.	5.984	3506.	1.78	171987.1	1.0716
.673	39.072	734035.	2331.	98007.	5.986	3508.	1.70	169484.3	1.0713
.727	42.246	733871.	2494.	98563.	5.988	3511.	1.61	167051.0	1.0710
.784	45.599	733701.	2664.	99120.	5.990	3513.	1.56	164685.1	1.0706

52. ****** XCLECT END OPTION 1 ******
WT = .7337GE+06 H = 99120. AM = 5.9900

TIME = .46383 RANGE = 521.97 FUEL = 41573.

*** ***

CUMULATIVE CPU TIME = 72.373 CPU TIME USED IN PREVIOUS TASK = 1.7420

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
111	.7337E+06	.9912E+05	5.990	.1307E-01	2664.	45.60	1.000	-0.	0.	1

UNPACK 121 51100 5 1 1 0 0. 21
5.0000 .40000 6.0000 0. -99120. 51100 0. 21 0. 1111111111

RAMJET PERFORMANCE (PER ENGINE) AT SCALING ALTITUDE AND MACH NUMBER

RAMJET GROSS THRUST	41514.9	(LB)
NET THRUST IN FREESTREAM DIRECTION	41359.7	(LB)
AIRFLOW RATE	420.448	(LB/SEC)
FUELFLOW RATE	12.2771	(LB/SEC)
SPECIFIC IMPULSE	3381.50	(SEC)
SCALED FUEL/AIR RATIO (PHI)	1.000	(NO UNITS)
SCALING ALTITUDE	99120.0	(FEET)
SCALING MACH NUMBER	6.000	(NO UNITS)
MAXIMUM AIRFLOW RATE	421.820	(LB/SEC)
ANGLE OF ATTACK	5.40694	(DEGREES)
WING HALF ANGLE	-.700000	(DEGREES)
INLET WEDGE ANGLE	6.00000	(DEGREES)
SCALING THRUST IN FREESTREAM DIRECTION	41359.7	(LB)
LIFT COMPONENT OF ENGINE FORCES	3471.25	(LB)
INLET SPILLAGE DRAG	0.	(LB)
ENGINE INLET AREA	40.767	(SQ. FT)
RAMJET THROTTLE SETTING	.997	(NO UNITS)

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

SEARCH FOR MACH ALTITUDE POINT ALONG A CONSTANT ENERGY LINE

THE BASIS FOR SELECTION OF EACH MACH ALTITUDE POINT WAS MAXIMUM LIFT/DRAG

CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZD	NET THRUST	SFC
0.000	0.	530000.	0.	99120.	5.091	2986.	8.07	-11313.56	-.11932
.378	18.233	529993.	6.815	114833.	4.784	2835.	3.72	-11700.42	-.71311E-01
.715	33.866	529988.	11.54	113784.	4.636	2746.	-.66	-12464.80	-.67167E-01
1.065	49.643	529984.	16.43	112640.	4.484	2654.	-.71	-12120.89	-.68566E-01
1.434	65.666	529978.	21.52	111387.	4.327	2559.	-2.23	-11547.68	-.71014E-01
1.822	81.939	529973.	27.23	104958.	4.218	2484.	-3.49	-11049.76	-.85724E-01
2.276	100.44	529965.	34.94	98528.	4.105	2407.	-3.16	-10267.17	-.10720
2.780	120.32	529955.	45.02	92099.	3.986	2327.	-3.03	-9869.008	-.13271
3.307	140.37	529942.	57.71	85669.	3.861	2244.	-3.11	-9863.282	-.16168
3.823	159.31	529927.	73.01	79240.	3.730	2158.	1.76	-10189.71	-.19399
4.449	180.58	529912.	87.94	94456.	3.330	1947.	1.53	-8373.606	-.12010
5.128	202.11	529899.	101.0	86115.	3.198	1859.	-3.66	-9225.882	-.14187
5.836	223.47	529881.	118.8	77774.	3.056	1767.	-.24	-9596.920	-.18086
6.535	242.98	529859.	141.1	84381.	2.695	1565.	2.14	-7455.810	-.21546
7.290	261.54	529843.	156.9	86547.	2.356	1370.	.13	-7129.587	-.13589
8.308	283.15	529829.	170.7	84622.	2.036	1182.	-3.13	-8234.852	-.83008E-01
9.539	306.32	529812.	187.8	71241.	1.885	1085.	-4.17	-10574.33	-.93674E-01
10.930	329.37	529790.	209.8	64123.	1.574	902.	-3.91	-13423.29	-.66493E-01
12.393	349.27	529768.	231.5	53723.	1.265	725.	-4.15	-27279.44	-.32569E-01
14.861	372.83	529740.	260.4	45237.	.769	441.	-4.32	713.1046	.80102
20.398	409.95	529657.	343.4	24470.	.621	375.	-3.35	1570.794	.83114
24.442	439.26	526840.	3160.	20000.	.800	491.	-1.44	61792.82	.76934

56. ****** XCLECT END OPTION 1 ******
WT = .52684E+06 H = 20000. AM = .80000

TIME = 2.3292 RANGE = 6567.9 FUEL = .20370E+06

+++ +++

CUMULATIVE CPU TIME = 79.699 CPU TIME USED IN PREVIOUS TASK = 6.9560

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
151	.5268E+06	.2000E+05	.8000	.4074	3160.	439.3	1.000	-0.	0.	1

UNPACK 161 51010 5 1 3 10 10. 17
0. 0. 0. 5.0000 1.0000 51010 2.0000 17 0. 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAM7D	NET THRUST	SFC
0.000	0.	522881.	0.	20000.	.800	491.	19.06	221255.2	.70891
.077	.59493	522684.	197.2	21250.	.800	489.	18.60	212221.0	.70724
.158	1.2222	522485.	395.8	22500.	.800	486.	17.69	203170.6	.70561
.244	1.8850	522285.	596.3	23750.	.800	484.	16.78	194422.8	.70397
.335	2.5865	522082.	798.8	25000.	.800	481.	15.90	185878.6	.70240
.432	3.3299	521877.	1004.	26250.	.800	479.	15.03	177695.8	.70077
.534	4.1192	521670.	1211.	27500.	.800	476.	14.18	169691.5	.69924
.643	4.9590	521459.	1422.	28750.	.800	474.	13.30	161963.9	.69737
.761	5.8610	521244.	1637.	30000.	.800	471.	12.36	153208.4	.69206
.888	6.8391	521026.	1855.	31250.	.800	469.	11.40	144821.1	.68669
1.028	7.9038	520803.	2078.	32500.	.800	466.	10.47	136823.4	.68124
1.180	9.0676	520573.	2308.	33750.	.800	463.	9.59	129224.7	.67583
1.348	10.342	520336.	2545.	35000.	.800	461.	8.66	122376.1	.67175
1.537	11.777	520085.	2796.	36250.	.800	459.	7.51	115755.5	.66800
1.762	13.486	519803.	3078.	37500.	.800	459.	6.48	109613.4	.66809
2.016	15.410	519505.	3376.	38750.	.800	459.	5.73	102663.2	.66820
2.304	17.601	519186.	3695.	40000.	.800	459.	5.00	96681.38	.66831
2.636	20.133	518838.	4042.	41250.	.800	459.	4.29	91046.51	.66845
3.027	23.116	518453.	4427.	42500.	.800	459.	3.60	85738.25	.66860
3.500	26.727	518015.	4866.	43750.	.800	459.	2.92	80737.51	.66878
4.097	31.278	517495.	5386.	45000.	.800	459.	2.59	76026.28	.66898

58. ****** XCLECT END OPTION 1 ******
WT = .51749E+06 H = 45000. AM = .80000
TIME = 2.8199 RANGE = 7007.2 FUEL = 3959.3

+++ +++

CUMULATIVE CPU TIME = 80.889 CPU TIME USED IN PREVIOUS TASK = 1.1520

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
171	.5175E+06	.4500E+05	.8000	.6828E-01	5386.	31.28	1.000	-0.	0.	1

UNPACK 181 51010 5 1 0 10 10. 7
0. 0. 0. 1.0000 200.00 51010 0. 7 0. 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

SEARCH FOR MACH ALTITUDE POINT ALONG A CONSTANT ENERGY LINE

THE BASIS FOR SELECTION OF EACH MACH ALTITUDE POINT WAS MAXIMUM LIFT/DRAG

CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZD	NET THRUST	SFC
0.000	0.	502577.	0.	45000.	.800	459.	-1.90	739.5932	.80121
.245	1.8323	502575.	2.402	44631.	.764	438.	-3.51	729.2391	.79830
.497	3.6530	502572.	4.893	43638.	.756	433.	-5.09	759.0359	.79763
.755	5.4970	502569.	7.547	42646.	.747	428.	-10.09	790.4141	.79668
1.015	7.3848	502566.	10.60	39546.	.831	476.	-9.88	988.8437	.81158
1.258	9.2935	502563.	13.93	38604.	.821	470.	-4.58	1030.713	.80843
1.516	11.254	502559.	17.48	37662.	.811	465.	-4.46	1065.495	.80433
1.773	13.271	502556.	21.28	36719.	.800	459.	-4.35	1101.411	.80013
2.045	15.332	502552.	25.35	35777.	.789	453.	-4.31	1138.687	.80064
2.320	17.388	502547.	29.60	34835.	.775	447.	-4.31	1172.742	.80314
2.599	19.447	502543.	34.05	33893.	.761	441.	-4.30	1206.904	.80573
2.883	21.510	502538.	38.72	32950.	.748	435.	-4.29	1242.250	.80824
3.171	23.577	502533.	43.62	32008.	.734	428.	-4.28	1278.543	.81070
3.464	25.647	502528.	48.76	31066.	.720	422.	-4.28	1315.597	.81337
3.762	27.721	502523.	54.17	30124.	.706	416.	-4.27	1355.676	.81647
4.065	29.799	502517.	59.86	29182.	.692	409.	-4.26	1396.588	.81954
4.374	31.881	502511.	65.85	28239.	.678	402.	-4.25	1438.112	.82258
4.689	33.968	502505.	72.15	27297.	.664	396.	-4.24	1480.934	.82555
5.009	36.058	502498.	78.80	26355.	.650	389.	-4.23	1525.249	.82843
5.337	38.153	502491.	85.80	25413.	.636	382.	-4.23	1570.178	.83129
5.671	40.253	502484.	93.19	24470.	.621	375.	-2.83	1616.374	.83408
9.714	69.559	499704.	2873.	20000.	.800	491.	-1.44	60326.95	.78065

60. ****** XCLECT END OPTION 1 ******
WT = .49970E+06 H = 20000. AM = .80000

TIME = 3.3243 RANGE = 7238.4 FUEL = 14918.

+++ +++

CUMULATIVE CPU TIME = 85.899 CPU TIME USED IN PREVIOUS TASK = 4.7120

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
191	.4997E+06	.2000E+05	.8000	.1619	2873.	69.56	1.000	-0.	0.	1

UNPACK 201 51010 5 1 0 10 10. 17
0. 0. 0. 5.0000 1.0000 51010 2.0000 17 0. 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

SEARCH FOR MACH ALTITUDE POINT ALONG A CONSTANT ENERGY LINE

THE BASIS FOR SELECTION OF EACH MACH ALTITUDE POINT WAS MAXIMUM LIFT/DRAG

CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAM7D	NET THRUST	SFC
0.000	0.	495784.	0.	20000.	.800	491.	13.83	2149.716	.84889
.309	2.1913	495775.	8.433	23280.	.603	365.	4.82	1718.297	.84049
.755	4.8606	495765.	19.07	22089.	.585	356.	-4.19	1739.287	.84069
1.213	7.5376	495753.	30.44	20898.	.566	346.	-4.18	1795.547	.84142
1.687	10.222	495741.	42.56	19708.	.547	336.	-4.17	1853.176	.84207
2.176	12.913	495728.	55.49	18517.	.528	326.	-4.16	1913.537	.84250
2.682	15.611	495714.	69.32	17326.	.508	315.	-4.15	1975.411	.84283
3.207	18.312	495700.	84.12	16136.	.488	304.	-4.15	2039.267	.84302
3.752	21.013	495684.	99.98	14945.	.467	293.	-5.56	2104.766	.84309
4.292	23.714	495667.	116.6	12935.	.494	312.	-5.43	2272.673	.84764
4.828	26.435	495650.	134.1	11815.	.471	298.	-4.03	2336.300	.84709
5.390	29.168	495631.	152.9	10598.	.452	288.	-4.36	2411.810	.84723
5.971	31.910	495611.	173.1	9275.	.439	281.	-4.60	2501.902	.84788
6.566	34.660	495589.	194.5	7914.	.429	275.	-4.61	2599.763	.84865
7.175	37.418	495566.	217.4	6573.	.417	269.	-4.60	2698.276	.84920
7.800	40.184	495542.	241.7	5209.	.406	264.	-4.63	2802.371	.84991
8.441	42.959	495516.	267.6	3847.	.396	258.	-4.61	2907.809	.85099
9.098	45.743	495488.	295.2	2485.	.385	252.	-4.62	3013.322	.85264
9.771	48.537	495459.	324.6	1105.	.375	247.	-4.10	3125.864	.85436
10.480	51.329	495427.	356.5	50.	.342	226.	-1.78	3198.471	.85234
10.711	51.716	495417.	366.6	50.	.200	132.	0.00	1616.374	.83408

62. ****** XCLECT END OPTION 1 ******
WT = .49542E+06 H = 50.000 AM = .20000

TIME = 3.5696 RANGE = 7308.0 FUEL = 3920.7

+++ +++

CUMULATIVE CPU TIME = 90.795 CPU TIME USED IN PREVIOUS TASK = 4.8580

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
211	.4954E+06	50.00	.2000	.1824	366.6	52.10	1.000	-0.	0.	1

UNPACK 221 51210 5 1 2 10 10. 22
1.0000 2.0000 7350.0 4.0000 20.000 51210 0. 22 2.0000 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

MISSION SEGMENT TABLE

	.20000	0.	.81500E+06	6.0100	1200.0	.50000E-01	1.0000	100.00		0	
2	4.0000	.40000	6.0000	.32600E+06	99120.	51000	0.		21	0	1111111111
3	0.	0.	0.	5.0000	2.0000	51000	2.0000		17	0	1111111111
4	0.	0.	.82949E+06	0.	0.	51000	0.		13	0	1111111111
5	.50000	3000.0	0.	4.0000	0.	51100	0.		1	0	1111111111
6	.60000	5000.0	0.	4.0000	0.	51100	0.		1	0	1111111111
7	.80000	21500.	0.	4.0000	0.	51100	0.		1	0	1111111111
8	.95000	29000.	0.	4.0000	0.	51100	0.		1	0	1111111111
9	1.5000	40500.	0.	4.0000	0.	51100	0.		1	0	1111111111
10	2.6000	52971.	0.	4.0000	0.	51100	0.		1	0	1111111111
11	5.9500	87990.	0.	5.0000	0.	51100	0.		1	0	1111111111
12	5.9900	99120.	0.	4.0000	0.	51100	0.		1	0	1111111111
13	5.0000	.40000	6.0000	0.	-99120.	51100	0.		21	0	1111111111
14	0.	0.	0.	5.0000	12.000	51100	0.		22	X	1111111111
15	0.	0.	.53000E+06	0.	0.	51010	1.0000		6	0	1111111111
16	.80000	20000.	3.0000	1.0000	0.	51210	0.		1	0	1111111111
17	0.	0.	0.	5.0000	1.0000	51010	2.0000		17	0	1111111111
18	.80000	45000.	3.0000	4.0000	0.	51110	0.		1	0	1111111111
19	0.	0.	0.	1.0000	200.00	51010	0.		7	0	1111111111
20	.80000	20000.	3.0000	1.0000	0.	51210	0.		1	0	1111111111
21	0.	0.	0.	5.0000	1.0000	51010	2.0000		17	0	1111111111
22	.20000	50.000	3.0000	1.0000	0.	51210	0.		1	0	1111111111
23	1.0000	2.0000	7350.0	4.0000	20.000	51210	0.		22	X	1111111111
24	0.	0.	0.	0.	1.0000	51210	4.0000		17	0	1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

DUMPRG

SEG	WT	H	AM	TIME	FUEL	RANGE	XNZZ	E10	E11	OPTION
1	.8150E+06	0.	.2000	0.	0.	0.	1.000	0.	0.	X
2	.8150E+06	0.	.2000	0.	0.	0.	1.000	-0.	0.	21
3	.8134E+06	50.00	.2064	.8333E-01	1618.	0.	1.000	-0.	0.	17
4	.8300E+06	50.00	.2064	0.	0.	0.	1.000	-0.	0.	13
5	.8250E+06	3000.	.5000	.2225E-01	4938.	4.720	1.000	-0.	0.	1
6	.8236E+06	5000.	.6000	.6500E-02	1464.	2.305	1.000	-0.	0.	1
7	.8170E+06	.2150E+05	.8000	.3580E-01	6537.	15.63	1.000	-0.	0.	1
8	.8125E+06	.2900E+05	.9500	.2536E-01	4536.	13.37	1.000	-0.	0.	1
9	.7924E+06	.4050E+05	1.500	.1084	.2016E+05	74.48	1.000	-0.	0.	1
10	.7779E+06	.5297E+05	2.600	.4428E-01	.1441E+05	49.85	1.000	-0.	0.	1
11	.7364E+06	.8799E+05	5.950	.1379	.4157E+05	361.6	1.000	-0.	0.	1
12	.7337E+06	.9912E+05	5.990	.1307E-01	2664.	45.60	1.000	-0.	0.	1
13	.7337E+06	.9912E+05	5.990	0.	2664.	0.	1.000	-0.	0.	21
14	.7337E+06	.9912E+05	5.990	0.	2664.	0.	1.000	-0.	0.	22
15	.5300E+06	.9912E+05	5.091	1.852	.2037E+06	6000.	1.000	-0.	0.	6
16	.5268E+06	.2000E+05	.8000	.4074	3160.	439.3	1.000	-0.	0.	1
17	.5229E+06	.2000E+05	.8000	.8333E-01	3959.	0.	1.000	-0.	0.	17
18	.5175E+06	.4500E+05	.8000	.6828E-01	5386.	31.28	1.000	-0.	0.	1
19	.5026E+06	.4500E+05	.8000	.4362	.1492E+05	200.0	1.000	-0.	0.	7
20	.4997E+06	.2000E+05	.8000	.1619	2973.	69.56	1.000	-0.	0.	1
21	.4958E+06	.2000E+05	.8000	.8333E-01	3921.	0.	1.000	-0.	0.	17
22	.4954E+06	50.00	.2000	.1824	366.6	52.10	1.000	-0.	0.	1
23	-0.	-0.	-0.	-0.	-0.	-0.	-0.	2.	-0.	-0
24	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-0

LRC TEST PROBLEM NUMBER 3, ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZO	NET THRUST	SFC
0.000	0.	829467.	0.	50.	.206	136.	3.91	303110.0	.73103
.151	.35536	828928.	559.2	197.	.221	146.	4.32	304305.7	.72744
.268	.64818	828496.	990.5	345.	.236	156.	5.03	306717.0	.72117
.366	.90825	828136.	1351.	492.	.250	165.	5.54	308278.0	.71713
.452	1.1491	827822.	1665.	640.	.265	175.	5.90	309282.2	.71457
.529	1.3781	827538.	1949.	788.	.280	184.	6.15	309921.6	.71302
.599	1.5997	827278.	2209.	935.	.294	194.	6.31	310324.3	.71217
.665	1.8167	827035.	2452.	1082.	.309	204.	6.41	310547.1	.71187
.727	2.0314	826806.	2681.	1230.	.324	213.	6.46	310628.6	.71201
.787	2.2452	826587.	2900.	1377.	.339	223.	6.47	310690.4	.71239
.843	2.4590	826378.	3109.	1525.	.353	232.	6.46	310735.0	.71297
.898	2.6737	826176.	3311.	1672.	.368	242.	6.43	310784.0	.71368
.951	2.8898	825980.	3507.	1820.	.383	251.	6.38	310853.1	.71449
1.002	3.1078	825790.	3697.	1967.	.397	261.	6.32	310953.4	.71538
1.052	3.3281	825604.	3883.	2115.	.412	270.	6.25	311095.5	.71631
1.101	3.5511	825422.	4065.	2262.	.427	280.	6.17	311282.9	.71728
1.149	3.7769	825243.	4244.	2410.	.441	289.	6.09	311519.7	.71827
1.196	4.0059	825068.	4419.	2557.	.456	299.	6.00	311819.5	.71927
1.242	4.2382	824895.	4592.	2705.	.471	308.	5.92	312175.9	.72018
1.288	4.4741	824724.	4762.	2852.	.485	318.	5.83	312586.1	.72117
1.333	4.7136	824556.	4931.	3000.	.500	327.	5.78	313054.2	.72215

65. ****** XCLECT END OPTICN 1 ******
WT = .82456E+06 H = 3000.0 AM = .50000

TIME = .83333E-01 RANGE = 0. FUEL = 0.

+++ +++

CUMULATIVE CPU TIME = 92.097 CPU TIME USED IN PREVIOUS TASK = 1.1180

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
41	.8246E+06	3000.	.5000	.2221E-01	4931.	4.714	1.000	-0.	0.	1

UNPACK 51 51100 5 1 1 0 0. 1
.60000 5000.0 0. 4.0000 0. 51100 0. 1 0. 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZD	NET THRUST	SFC
0.000	0.	824556.	0.	3000.	.500	327.	8.57	313076.3	.72210
.020	.10919	824480.	75.94	3100.	.505	330.	8.54	312818.2	.72233
.040	.21898	824404.	151.5	3200.	.510	333.	8.50	312566.2	.72257
.060	.32938	824329.	226.8	3300.	.515	337.	8.45	312323.3	.72280
.080	.44038	824254.	301.7	3400.	.520	340.	8.41	312089.5	.72303
.100	.55199	824180.	376.2	3500.	.525	343.	8.36	311864.8	.72325
.120	.66422	824105.	450.5	3600.	.530	346.	8.31	311649.2	.72347
.139	.77707	824031.	524.5	3700.	.535	349.	8.27	311442.6	.72369
.159	.89054	823958.	598.1	3800.	.540	352.	8.22	311245.0	.72390
.179	1.0046	823884.	671.5	3900.	.545	355.	8.18	311037.4	.72412
.198	1.1194	823811.	744.7	4000.	.550	359.	8.13	310829.1	.72434
.217	1.2348	823738.	817.5	4100.	.555	362.	8.09	310641.2	.72455
.237	1.3508	823666.	890.1	4200.	.560	365.	8.05	310462.3	.72475
.256	1.4675	823593.	962.5	4300.	.565	368.	8.00	310292.5	.72495
.275	1.5848	823521.	1035.	4400.	.570	371.	7.96	310131.7	.72515
.295	1.7028	823449.	1107.	4500.	.575	374.	7.91	309979.8	.72534
.314	1.8215	823378.	1178.	4600.	.580	377.	7.87	309836.9	.72553
.333	1.9408	823306.	1250.	4700.	.585	380.	7.83	309702.9	.72571
.352	2.0608	823235.	1321.	4800.	.590	384.	7.79	309577.7	.72589
.371	2.1814	823164.	1392.	4900.	.595	387.	7.74	309461.3	.72606
.390	2.3027	823093.	1463.	5000.	.600	390.	7.72	309353.7	.72623

66. ****** XCLECT END OPTION 1 ******
WT = .82309E+06 H = 5000.0 AM = .60000

TIME = .10555 RANGE = 4.7136 FUEL = 4931.0

+++ +++

CUMULATIVE CPU TIME = 93.239 CPU TIME USED IN PREVIOUS TASK = 1.1420

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
51	.8231E+06	5000.	.6000	.6495E-02	1463.	2.303	1.000	-0.	0.	1

UNPACK 61 51100 5 1 1 0 0. 1

.80000	21500.	0.	4.0000	0.	51100	0.	1	0.	1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZD	NET THRUST	SFC
0.000	0.	823093.	0.	5000.	.600	390.	13.01	309352.5	.72623
.092	.58745	822751.	341.8	5825.	.610	395.	12.83	303659.2	.72530
.186	1.1914	822412.	681.2	6650.	.620	400.	12.50	298180.4	.72430
.280	1.8122	822075.	1018.	7475.	.630	406.	12.16	292650.5	.72335
.376	2.4505	821740.	1353.	8300.	.640	411.	11.84	287265.9	.72235
.473	3.1069	821407.	1687.	9125.	.650	416.	11.52	281982.1	.72131
.572	3.7817	821075.	2018.	9950.	.660	421.	11.22	276721.3	.72028
.672	4.4758	820746.	2347.	10775.	.670	426.	10.91	271639.2	.71918
.774	5.1894	820418.	2675.	11600.	.680	431.	10.62	266592.7	.71808
.877	5.9234	820092.	3001.	12425.	.690	436.	10.33	261649.0	.71694
.982	6.6785	819767.	3326.	13250.	.700	441.	10.04	256653.3	.71605
1.089	7.4559	819444.	3649.	14075.	.710	446.	9.76	251671.5	.71529
1.197	8.2567	819121.	3972.	14900.	.720	451.	9.48	246810.4	.71447
1.308	9.0814	818799.	4294.	15725.	.730	456.	9.21	242001.3	.71364
1.421	9.9311	818478.	4615.	16550.	.740	461.	8.94	237284.6	.71278
1.536	10.807	818158.	4935.	17375.	.750	465.	8.68	232603.0	.71192
1.653	11.709	817838.	5255.	18200.	.760	470.	8.42	227999.4	.71104
1.772	12.640	817519.	5574.	19025.	.770	475.	8.17	223465.6	.71013
1.894	13.601	817199.	5894.	19850.	.780	479.	7.92	219040.3	.70917
2.019	14.591	816880.	6213.	20675.	.790	484.	7.68	214706.3	.70817
2.146	15.614	816561.	6532.	21500.	.800	488.	7.56	210322.5	.70717

67. ****** XCLECT END OPTION 1 ******
WT = .81656E+06 H = 21500. AM = .80000

TIME = .11204 RANGE = 7.0163 FUEL = 1462.8

+++ +++

CUMULATIVE CPU TIME = 94.409 CPU TIME USED IN PREVIOUS TASK = 1.1700

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
61	.8166E+06	.2150E+05	.8000	.3577E-01	6532.	15.61	1.000	-0.	0.	1

UNPACK 71 51100 5 1 1 0 0. 1

.95000	29000.	0.	4.0000	0.	51100	0.	1	0.	1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMMA	NET THRUST	SFC
0.000	0.	816561.	0.	21500.	.800	488.	7.10	210318.7	.70719
.061	.49514	816373.	187.9	21875.	.807	492.	7.16	231786.8	.84772
.121	.98220	816179.	382.4	22250.	.815	496.	7.13	230226.0	.84589
.181	1.4821	815983.	578.5	22625.	.822	500.	6.94	228648.5	.84406
.243	1.9953	815784.	776.5	23000.	.830	503.	6.76	227100.0	.84219
.306	2.5225	815584.	976.6	23375.	.837	507.	6.58	225580.5	.84028
.371	3.0643	815382.	1179.	23750.	.845	511.	6.40	224024.0	.83841
.436	3.6218	815178.	1383.	24125.	.852	515.	6.22	222467.2	.83655
.503	4.1955	814971.	1590.	24500.	.860	518.	6.05	220937.7	.83465
.572	4.7864	814761.	1800.	24875.	.867	522.	5.87	219441.4	.83271
.642	5.3954	814549.	2012.	25250.	.875	526.	5.70	217936.9	.83081
.714	6.0233	814333.	2228.	25625.	.882	529.	5.52	216457.4	.82887
.787	6.6712	814115.	2446.	26000.	.890	533.	5.35	215005.4	.82691
.862	7.3401	813892.	2669.	26375.	.897	537.	5.17	213561.5	.82492
.940	8.0361	813665.	2896.	26750.	.905	540.	4.92	212073.1	.82296
1.022	8.7742	813428.	3133.	27125.	.912	544.	4.63	210613.6	.82095
1.109	9.5612	813179.	3382.	27500.	.920	548.	4.33	209181.1	.81892
1.201	10.404	812917.	3644.	27875.	.927	551.	4.04	207749.7	.81689
1.300	11.309	812639.	3922.	28250.	.935	555.	3.75	206313.9	.81489
1.405	12.288	812344.	4217.	28625.	.942	558.	3.46	204904.5	.81285
1.520	13.352	812029.	4532.	29000.	.950	562.	3.32	203521.6	.81079

68. ****** XCLECT END OPTION 1 ******
WT = .81203E+06 H = 29000. AM = .95000

TIME = .14781 RANGE = 22.630 FUEL = 6532.1

+++ +++

CUMULATIVE CPU TIME = 95.595 CPU TIME USED IN PREVIOUS TASK = 1.1860

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
71	.8120E+06	.2900E+05	.9500	.2533E-01	4532.	13.35	1.000	-0.	0.	1

UNPACK 81 51100 5 1 1 0 0. 1
1.5000 40500. 0. 4.0000 0. 51100 0. 1 0. 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZD	NET THRUST	SFC
0.000	0.	812029.	0.	29000.	.950	562.	1.87	203521.2	.81079
.306	2.9013	811183.	846.4	29575.	.977	577.	1.70	205877.0	.81125
.667	6.4132	810172.	1857.	30150.	1.005	592.	1.44	207667.2	.81429
1.073	10.466	809020.	3069.	30725.	1.032	606.	1.27	206478.5	.82956
1.511	14.949	807760.	4269.	31300.	1.060	621.	1.15	205549.3	.84407
1.985	19.905	806382.	5647.	31875.	1.087	635.	1.13	204896.3	.85766
2.422	24.585	805091.	6938.	32450.	1.115	650.	1.16	208721.2	.85489
2.845	29.216	803824.	8205.	33025.	1.142	664.	1.19	204918.3	.88212
3.246	33.700	802608.	9421.	33600.	1.170	678.	1.25	202487.2	.90457
3.616	37.919	801473.	.1056E+05	34175.	1.197	692.	1.30	200793.7	.92427
3.968	42.023	800376.	.1165E+05	34750.	1.225	706.	1.31	199741.2	.94155
4.321	46.222	799262.	.1277E+05	35325.	1.252	720.	1.28	199095.3	.95697
4.672	50.473	798141.	.1389E+05	35900.	1.280	734.	1.24	198940.1	.97037
5.038	54.997	796954.	.1508E+05	36475.	1.307	749.	1.34	199360.5	.98486
5.328	58.657	795995.	.1603E+05	37050.	1.335	765.	1.63	220117.1	.90987
5.564	61.696	795200.	.1683E+05	37625.	1.362	781.	1.86	227062.2	.89895
5.778	64.503	794467.	.1756E+05	38200.	1.390	797.	1.99	232959.3	.89272
5.974	67.138	793779.	.1825E+05	38775.	1.417	813.	2.11	238405.3	.88855
6.158	69.650	793124.	.1891E+05	39350.	1.445	828.	2.20	243466.9	.88601
6.331	72.058	792496.	.1953E+05	39925.	1.472	844.	2.30	248494.6	.88374
6.494	74.369	791895.	.2013E+05	40500.	1.500	860.	2.34	253539.2	.88154

69. ****** XCLECT END OPTION 1 ******
WT = .79189E+06 H = 40500. AM = 1.5000

TIME = .17314 RANGE = 35.982 FUEL = 4532.0

+++ +++

CUMULATIVE CPU TIME = 97.269 CPU TIME USED IN PREVIOUS TASK = 1.6740

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
81	.7919E+06	.4050E+05	1.500	.1082	.2013E+05	74.37	1.000	-0.	0.	1

UNPACK 91 51100 5 1 1 0 0. 1
2.6000 52971. 0. 4.0000 0. 51100 0. 1 0. 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMMA	NET THRUST	SFC
0.000	0.	791895.	0.	40500.	1.580	860.	1.60	253560.3	.88141
.252	3.6681	790931.	964.2	41124.	1.555	891.	1.68	269804.8	.87730
.472	6.9978	790037.	1858.	41747.	1.610	923.	1.84	286546.9	.87263
.667	10.051	789202.	2693.	42371.	1.665	954.	2.00	303150.9	.86984
.842	12.874	788414.	3481.	42994.	1.720	986.	2.16	320004.3	.86712
1.000	15.500	787668.	4227.	43618.	1.775	1017.	2.32	337398.1	.86390
1.142	17.953	786959.	4936.	44241.	1.830	1049.	2.47	354949.3	.86103
1.272	20.257	786281.	5613.	44865.	1.885	1080.	2.63	372727.3	.85834
1.391	22.428	785633.	6262.	45488.	1.940	1112.	2.78	390829.9	.85583
1.501	24.486	785009.	6886.	46112.	1.995	1144.	2.87	407386.8	.85293
1.606	26.524	784392.	7503.	46735.	2.050	1175.	2.87	418200.1	.85024
1.710	28.584	783765.	8129.	47359.	2.105	1207.	2.84	433097.9	.84879
1.812	30.663	783130.	8765.	47983.	2.160	1238.	2.81	447607.3	.84743
1.913	32.763	782484.	9411.	48606.	2.215	1270.	2.77	462164.2	.84534
2.013	34.908	781826.	.1007E+05	49230.	2.270	1301.	2.67	469582.7	.84242
2.116	37.162	781147.	.1075E+05	49853.	2.325	1333.	2.53	473198.2	.84092
2.222	39.546	780441.	.1145E+05	50477.	2.380	1364.	2.40	476777.1	.83902
2.332	42.068	779708.	.1219E+05	51100.	2.435	1396.	2.28	480786.3	.83655
2.444	44.696	778950.	.1294E+05	51724.	2.490	1427.	2.24	491509.7	.83524
2.552	47.302	778201.	.1369E+05	52347.	2.545	1459.	2.33	502217.9	.83336
2.652	49.752	777499.	.1440E+05	52971.	2.600	1490.	2.40	512580.6	.83150

70. ****** XCLECT END OPTION 1 ******
WT = .77750E+06 H = 52971. AM = 2.6000

TIME = .28137 RANGE = 110.35 FUEL = 20134.

+++ +++

CUMULATIVE CPU TIME = 99.345 CPU TIME USED IN PREVIOUS TASK = 2.0760

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
91	.7775E+06	.5297E+05	2.600	.4420E-01	.1440E+05	49.75	1.000	-0.	0.	1

UNPACK 101 51100 5 1 1 0 0. 1

5.9500	87990.	0.	5.0000	0.	51100	0.	1	0.		1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

CONSTANT DYNAMIC PRESSURE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAM7D	NET THRUST	SFC
0.000	0.	777499.	0.	52971.	2.600	1490.	3.83	512498.5	.83149
.171	4.3073	776287.	1211.	54722.	2.695	1545.	3.63	512777.3	.82940
.353	9.0966	774998.	2500.	56473.	2.811	1611.	3.38	505169.3	.82788
.534	14.059	773757.	3742.	58224.	2.932	1681.	3.18	485296.5	.83157
.724	19.493	772501.	4998.	59975.	3.058	1753.	2.73	423360.5	.91998
.952	26.275	771050.	6448.	61726.	3.190	1828.	2.30	409890.8	.91691
1.197	33.884	769545.	7954.	63477.	3.327	1907.	2.05	396588.1	.91517
1.460	42.428	767978.	9520.	65228.	3.470	1989.	1.80	383270.8	.91540
1.751	52.278	766306.	.1119E+05	66979.	3.619	2076.	1.57	369283.3	.91793
2.069	63.531	764539.	.1296E+05	68730.	3.774	2168.	1.38	355460.6	.92185
2.414	76.287	762682.	.1482E+05	70480.	3.935	2263.	1.22	342989.1	.92479
2.788	90.684	760736.	.1676E+05	72231.	4.103	2363.	1.08	331997.9	.92865
3.190	106.87	758695.	.1880E+05	73982.	4.278	2467.	.96	321616.8	.93557
3.625	125.12	756540.	.2096E+05	75733.	4.460	2574.	.85	311091.0	.94679
4.098	145.86	754247.	.2325E+05	77484.	4.649	2687.	.74	298403.5	.96108
4.620	169.76	751784.	.2572E+05	79235.	4.845	2804.	.64	285534.9	.97740
5.200	197.43	749123.	.2838E+05	80986.	5.049	2925.	.56	272820.9	.99679
5.844	229.52	746241.	.3126E+05	82737.	5.262	3052.	.48	261119.1	1.0150
6.559	266.69	743120.	.3438E+05	84488.	5.482	3184.	.41	250284.5	1.0339
7.357	309.94	739722.	.3778E+05	86239.	5.712	3321.	.35	239185.8	1.0552
8.254	360.71	735990.	.4151E+05	87990.	5.950	3464.	.32	228596.8	1.0783

71. ****** XCLECT END OPTION 1 ******
WT = .73599E+06 H = 87990. AM = 5.9500

TIME = .32558 RANGE = 160.10 FUEL = 14396.

+++ +++

CUMULATIVE CPU TIME = 100.80 CPU TIME USED IN PREVIOUS TASK = 1.4600

RGSAVE

ITZ	WT.	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
101	.7360E+06	.8799E+05	5.950	.1376	.4151E+05	360.7	1.000	-0.	0.	1

UNPACK 111 51100 5 1 1 0 0. 1
5.9900 99120. 0. 4.0000 0. 51100 0. 1 0. 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZD	NET THRUST	SFC
0.000	0.	735990.	0.	87990.	5.950	3464.	3.31	228453.8	1.0783
.027	1.5843	735878.	111.6	88546.	5.952	3466.	3.26	223488.0	1.0778
.056	3.2168	735766.	224.5	89103.	5.954	3469.	3.16	219559.5	1.0774
.085	4.9000	735651.	338.7	89659.	5.956	3471.	3.06	215739.1	1.0769
.115	6.6364	735536.	454.4	90216.	5.958	3474.	2.97	212023.8	1.0765
.146	8.4292	735418.	571.6	90772.	5.960	3476.	2.88	208411.0	1.0761
.178	10.281	735299.	690.6	91329.	5.962	3479.	2.78	204897.9	1.0757
.211	12.197	735179.	811.3	91885.	5.964	3481.	2.69	201481.9	1.0753
.245	14.179	735056.	934.1	92442.	5.966	3484.	2.60	198160.5	1.0749
.281	16.232	734931.	1059.	92998.	5.968	3486.	2.51	194931.2	1.0745
.317	18.361	734804.	1186.	93555.	5.970	3489.	2.42	191791.4	1.0741
.355	20.571	734674.	1316.	94111.	5.972	3491.	2.33	188738.9	1.0737
.395	22.869	734541.	1449.	94668.	5.974	3494.	2.24	185771.2	1.0733
.436	25.260	734405.	1585.	95224.	5.976	3496.	2.15	182886.1	1.0730
.479	27.754	734266.	1725.	95781.	5.978	3499.	2.06	180081.2	1.0726
.523	30.357	734122.	1868.	96337.	5.980	3501.	1.97	177354.5	1.0723
.570	33.080	733975.	2015.	96894.	5.982	3503.	1.88	174703.6	1.0719
.619	35.935	733823.	2167.	97450.	5.984	3506.	1.79	172126.6	1.0716
.670	38.935	733666.	2324.	98007.	5.986	3508.	1.70	169621.2	1.0713
.724	42.094	733503.	2487.	98563.	5.988	3511.	1.62	167185.3	1.0709
.781	45.432	733333.	2657.	99120.	5.990	3513.	1.57	164817.0	1.0706

72. ****** XCLECT END OPTION 1 ******
WT = .73333E+06 H = 99120. AM = 5.9900

TIME = .46315 RANGE = 520.82 FUEL = 41509.

+++ +++

CUMULATIVE CPU TIME = 102.55 CPU TIME USED IN PREVIOUS TASK = 1.7420

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
111	.7333E+06	.9912E+05	5.990	.1302E-01	2657.	45.43	1.000	-0.	0.	1

UNPACK 121 51100 5 1 1 0 0. 21
5.0000 .40000 6.0000 0. -99120. 51100 0. 21 0. 1111111111

RAMJET PERFORMANCE (PER ENGINE) AT SCALING ALTITUDE AND MACH NUMBER

RAMJET GROSS THRUST	41492.6	(LB)
NET THRUST IN FREESTREAM DIRECTION	41336.1	(LB)
AIRFLOW RATE	420.221	(LB/SEC)
FUELFLOW RATE	12.2705	(LB/SEC)
SPECIFIC IMPULSE	3381.50	(SEC)
SCALED FUEL/AIR RATIO (PHI)	1.000	(NO UNITS)
SCALING ALTITUDE	99120.0	(FEET)
SCALING MACH NUMBER	6.000	(NO UNITS)
MAXIMUM AIRFLOW RATE	421.727	(LB/SEC)
ANGLE OF ATTACK	5.40436	(DEGREES)
WING HALF ANGLE	.700000	(DEGREES)
INLET WEDGE ANGLE	6.00000	(DEGREES)
SCALING THRUST IN FREESTREAM DIRECTION	41336.1	(LB)
LIFT COMPONENT OF ENGINE FORCES	3473.85	(LB)
INLET SPILLAGE DRAG	.404232E-10	(LB)
ENGINE INLET AREA	40.767	(SQ. FT)
RAMJET THROTTLE SETTING	.996	(NO UNITS)

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

MISSION SEGMENT TABLE

	.20000	0.	.81500E+06	6.0100	1200.0	.50000E-01	1.0000	100.00		0	
2	4.0000	.40000	6.0000	.32600E+06	99120.	51000	0.		21	0	1111111111
3	0.	0.	0.	5.0000	2.0000	51000	2.0000		17	0	1111111111
4	0.	0.	.82949E+06	0.	0.	51000	0.		13	0	1111111111
5	.50000	3000.0	0.	4.0000	0.	51100	0.		1	0	1111111111
6	.60000	5000.0	0.	4.0000	0.	51100	0.		1	0	1111111111
7	.80000	21500.	0.	4.0000	0.	51100	0.		1	0	1111111111
8	.95000	29000.	0.	4.0000	0.	51100	0.		1	0	1111111111
9	1.5000	40500.	0.	4.0000	0.	51100	0.		1	0	1111111111
10	2.6000	52971.	0.	4.0000	0.	51100	0.		1	0	1111111111
11	5.9500	87990.	0.	5.0000	0.	51100	0.		1	0	1111111111
12	5.9900	99120.	0.	4.0000	0.	51100	0.		1	0	1111111111
13	5.0000	.40000	6.0000	0.	-99120.	51100	0.		21	0	1111111111
14	0.	0.	0.	5.0000	12.000	51100	0.		22	X	1111111111
15	0.	0.	.53000E+06	0.	0.	51010	1.0000		6	0	1111111111
16	.80000	20000.	3.0000	1.0000	0.	51210	0.		1	0	1111111111
17	0.	0.	0.	5.0000	1.0000	51010	2.0000		17	0	1111111111
18	.80000	45000.	3.0000	4.0000	0.	51110	0.		1	0	1111111111
19	0.	0.	0.	1.0000	200.00	51010	0.		7	0	1111111111
20	.80000	20000.	3.0000	1.0000	0.	51210	0.		1	0	1111111111
21	0.	0.	0.	5.0000	1.0000	51010	2.0000		17	0	1111111111
22	.20000	50.000	3.0000	1.0000	0.	51210	0.		1	0	1111111111
23	1.0000	2.0000	7350.0	4.0000	20.000	51210	0.		22	X	1111111111
24	0.	0.	0.	0.	1.0000	51210	4.0000		17	0	1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

DUMPRG

SEG	WT	H	AM	TIME	FUEL	RANGE	XNZZ	E10	E11	OPTION
1	.8150E+06	0.	.2000	0.	0.	0.	1.000	0.	0.	X
2	.8150E+06	0.	.2000	0.	0.	0.	1.000	-0.	0.	21
3	.8134E+06	50.00	.2064	.8333E-01	1618.	0.	1.000	-0.	0.	17
4	.8295E+06	50.00	.2064	0.	0.	0.	1.000	-0.	0.	13
5	.8246E+06	3000.	.5000	.2221E-01	4931.	4.714	1.000	-0.	0.	1
6	.8231E+06	5000.	.6000	.6495E-02	1463.	2.303	1.000	-0.	0.	1
7	.8166E+06	.2150E+05	.8000	.3577E-01	6532.	15.61	1.000	-0.	0.	1
8	.8120E+06	.2900E+05	.9500	.2533E-01	4532.	13.35	1.000	-0.	0.	1
9	.7919E+06	.4050E+05	1.500	.1082	.2013E+05	74.37	1.000	-0.	0.	1
10	.7775E+06	.5297E+05	2.600	.4420E-01	.1440E+05	49.75	1.000	-0.	0.	1
11	.7360E+06	.8799E+05	5.950	.1376	.4151E+05	360.7	1.000	-0.	0.	1
12	.7333E+06	.9912E+05	5.990	.1302E-01	2657.	45.43	1.000	-0.	0.	1
13	.7333E+06	.9912E+05	5.990	0.	2657.	0.	1.000	-0.	0.	21
14	.7337E+06	.9912E+05	5.990	0.	2664.	0.	1.000	1.	0.	22
15	.5300E+06	.9912E+05	5.091	1.852	.2037E+06	6000.	1.000	-0.	0.	6
16	.5268E+06	.2000E+05	.8000	.4074	3160.	439.3	1.000	-0.	0.	1
17	.5229E+06	.2000E+05	.8000	.8333E-01	3959.	0.	1.000	-0.	0.	17
18	.5175E+06	.4500E+05	.8000	.6828E-01	5386.	31.28	1.000	-0.	0.	1
19	.5026E+06	.4500E+05	.8000	.4362	.1492E+05	200.0	1.000	-0.	0.	7
20	.4997E+06	.2000E+05	.8000	.1619	2873.	69.56	1.000	-0.	0.	1
21	.4958E+06	.2000E+05	.8000	.8333E-01	3921.	0.	1.000	-0.	0.	17
22	.4954E+06	50.00	.2000	.1824	366.6	52.10	1.000	-0.	0.	1
23	-0.	-0.	-0.	-0.	-0.	-0.	-0.	2.	-0.	-0
24	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-0

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZD	NET THRUST	SFC
0.000	0.	829487.	0.	50.	.206	136.	3.91	303110.0	.73103
.151	.35536	828928.	559.2	197.	.221	146.	4.32	304305.7	.72744
.268	.64818	828496.	990.5	345.	.236	156.	5.03	306717.0	.72117
.366	.90825	828136.	1351.	492.	.250	165.	5.54	308278.0	.71713
.452	1.1491	827822.	1665.	640.	.265	175.	5.90	309282.2	.71457
.529	1.3781	827538.	1949.	788.	.280	184.	6.15	309921.6	.71302
.599	1.5997	827278.	2209.	935.	.294	194.	6.31	310324.3	.71217
.665	1.8167	827035.	2452.	1082.	.309	204.	6.41	310547.1	.71187
.727	2.0314	826806.	2681.	1230.	.324	213.	6.46	310628.6	.71201
.787	2.2452	826587.	2900.	1377.	.339	223.	6.47	310690.4	.71239
.843	2.4590	826378.	3109.	1525.	.353	232.	6.46	310735.0	.71297
.898	2.6737	826176.	3311.	1672.	.368	242.	6.43	310784.0	.71368
.951	2.8898	825980.	3507.	1820.	.383	251.	6.38	310853.1	.71449
1.002	3.1078	825790.	3697.	1967.	.397	261.	6.32	310953.4	.71538
1.052	3.3281	825604.	3883.	2115.	.412	270.	6.25	311095.5	.71631
1.101	3.5511	825422.	4065.	2262.	.427	280.	6.17	311282.9	.71728
1.149	3.7769	825243.	4244.	2410.	.441	289.	6.09	311519.7	.71827
1.196	4.0059	825068.	4419.	2557.	.456	299.	6.00	311819.5	.71927
1.242	4.2382	824895.	4592.	2705.	.471	308.	5.92	312175.9	.72018
1.288	4.4741	824724.	4762.	2852.	.485	318.	5.83	312586.1	.72117
1.333	4.7136	824556.	4931.	3000.	.500	327.	5.78	313054.2	.72215

75. ****** XCLECT END OPTION 1 ******
WT = .82456E+06 H = 3000.0 AM = .50000

TIME = .83333E-01 RANGE = 0. FUEL = 2657.1

+++ +++

CUMULATIVE CPU TIME = 103.93 - CPU TIME USED IN PREVIOUS TASK = 1.1140

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
41	.8246E+06	3000.	.5000	.2221E-01	4931.	4.714	1.000	-0.	0.	1

UNPACK 51 51100 5 1 1 0 0. 1

.60000	5000.0	0.	4.0000	0.	51100	0.	1	0.	1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMTD	NET THRUST	SFC
0.000	0.	824556.	0.	3000.	.500	327.	8.57	313076.3	.72210
.020	.10919	824480.	75.94	3100.	.505	330.	8.54	312818.2	.72233
.040	.21898	824404.	151.5	3200.	.510	333.	8.50	312566.2	.72257
.060	.32938	824329.	226.8	3300.	.515	337.	8.45	312323.3	.72280
.080	.44038	824254.	301.7	3400.	.520	340.	8.41	312089.5	.72303
.100	.55199	824180.	376.2	3500.	.525	343.	8.36	311864.8	.72325
.120	.66422	824105.	450.5	3600.	.530	346.	8.31	311649.2	.72347
.139	.77707	824031.	524.5	3700.	.535	349.	8.27	311442.6	.72369
.159	.89054	823958.	598.1	3800.	.540	352.	8.22	311245.0	.72390
.179	1.0046	823884.	671.5	3900.	.545	355.	8.18	311037.4	.72412
.198	1.1194	823811.	744.7	4000.	.550	359.	8.13	310829.1	.72434
.217	1.2348	823738.	817.5	4100.	.555	362.	8.09	310641.2	.72455
.237	1.3508	823666.	890.1	4200.	.560	365.	8.05	310462.3	.72475
.256	1.4675	823593.	962.5	4300.	.565	368.	8.00	310292.5	.72495
.275	1.5848	823521.	1035.	4400.	.570	371.	7.96	310131.7	.72515
.295	1.7028	823449.	1107.	4500.	.575	374.	7.91	309979.8	.72534
.314	1.8215	823378.	1178.	4600.	.580	377.	7.87	309836.9	.72553
.333	1.9408	823306.	1250.	4700.	.585	380.	7.83	309702.9	.72571
.352	2.0608	823235.	1321.	4800.	.590	384.	7.79	309577.7	.72589
.371	2.1814	823164.	1392.	4900.	.595	387.	7.74	309461.3	.72606
.390	2.3027	823093.	1463.	5000.	.600	390.	7.72	309353.7	.72623

76. ****** XCLECT END OPTION 1 ******
WT = .82309E+06 H = 5000.0 AM = .60000

TIME = .10555 RANGE = 4.7136 FUEL = 4931.0

+++ +++

CUMULATIVE CPU TIME = 105.07 CPU TIME USED IN PREVIOUS TASK = 1.1440

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
51	.8231E+06	5000.	.6000	.6495E-02	1463.	2.303	1.000	-0.	0.	1

UNPACK 61 51100 5 1 1 0 0. 1
.80000 21500. 0. 4.0000 0. 51100 0. 1 0. 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAM7D	NET THRUST	SFC
0.000	0.	823093.	0.	5000.	.600	390.	13.01	309352.5	.72623
.092	.58745	822751.	341.8	5825.	.610	395.	12.83	303659.2	.72530
.186	1.1914	822412.	681.2	6650.	.620	400.	12.50	298180.4	.72430
.280	1.8122	822075.	1018.	7475.	.630	406.	12.16	292650.5	.72335
.376	2.4505	821740.	1353.	8300.	.640	411.	11.84	287265.9	.72235
.473	3.1069	821407.	1687.	9125.	.650	416.	11.52	281982.1	.72131
.572	3.7817	821075.	2018.	9950.	.660	421.	11.22	276721.3	.72028
.672	4.4758	820746.	2347.	10775.	.670	426.	10.91	271639.2	.71918
.774	5.1894	820418.	2675.	11600.	.680	431.	10.62	266592.7	.71808
.877	5.9234	820092.	3001.	12425.	.690	436.	10.33	261649.0	.71694
.982	6.6785	819767.	3326.	13250.	.700	441.	10.04	256653.3	.71605
1.089	7.4559	819444.	3649.	14075.	.710	446.	9.76	251671.5	.71529
1.197	8.2567	819121.	3972.	14900.	.720	451.	9.48	246810.4	.71447
1.308	9.0814	818799.	4294.	15725.	.730	456.	9.21	242001.3	.71364
1.421	9.9311	818478.	4615.	16550.	.740	461.	8.94	237284.6	.71278
1.536	10.807	818158.	4935.	17375.	.750	465.	8.68	232603.0	.71192
1.653	11.709	817838.	5255.	18200.	.760	470.	8.42	227999.4	.71104
1.772	12.640	817519.	5574.	19025.	.770	475.	8.17	223465.6	.71013
1.894	13.601	817199.	5894.	19850.	.780	479.	7.92	219040.3	.70917
2.019	14.591	816880.	6213.	20675.	.790	484.	7.68	214706.3	.70817
2.146	15.614	816561.	6532.	21500.	.800	488.	7.56	210322.5	.70717

77. ****** XCLECT END OPTION 1 ******
WT = .81656E+06 H = 21500. AM = .80000

TIME = .11204 RANGE = 7.0163 FUEL = 1462.8

+++ +++

CUMULATIVE CPU TIME = 106.24 CPU TIME USED IN PREVIOUS TASK = 1.1700

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
61	.8166E+06	.2150E+05	.8000	.3577E-01	6532.	15.61	1.000	-0.	0.	1

UNPACK 71 51100 5 1 1 0 0. 1
.95000 29000. 0. 4.0000 0. 51100 0. 1 0. 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAM7D	NET THRUST	SFC
0.000	0.	816561.	0.	21500.	.800	488.	7.10	210318.7	.78719
.061	.49514	816373.	187.9	21875.	.807	492.	7.16	231786.8	.84772
.121	.98220	816179.	382.4	22250.	.815	496.	7.13	230226.0	.84589
.181	1.4821	815983.	578.5	22625.	.822	500.	6.94	228648.5	.84406
.243	1.9953	815784.	776.5	23000.	.830	503.	6.76	227100.0	.84219
.306	2.5225	815584.	976.6	23375.	.837	507.	6.58	225580.5	.84028
.371	3.0643	815382.	1179.	23750.	.845	511.	6.40	224024.0	.83841
.436	3.6218	815178.	1383.	24125.	.852	515.	6.22	222467.2	.83655
.503	4.1955	814971.	1590.	24500.	.860	518.	6.05	220937.7	.83465
.572	4.7864	814761.	1800.	24875.	.867	522.	5.87	219441.4	.83271
.642	5.3954	814549.	2012.	25250.	.875	526.	5.70	217936.9	.83081
.714	6.0233	814333.	2228.	25625.	.882	529.	5.52	216457.4	.82887
.787	6.6712	814115.	2446.	26000.	.890	533.	5.35	215005.4	.82691
.862	7.3401	813892.	2669.	26375.	.897	537.	5.17	213561.5	.82492
.940	8.0361	813665.	2896.	26750.	.905	540.	4.92	212073.1	.82296
1.022	8.7742	813428.	3133.	27125.	.912	544.	4.63	210613.6	.82095
1.109	9.5612	813179.	3382.	27500.	.920	548.	4.33	209181.1	.81892
1.201	10.404	812917.	3644.	27875.	.927	551.	4.04	207749.7	.81689
1.300	11.309	812639.	3922.	28250.	.935	555.	3.75	206313.9	.81489
1.405	12.288	812344.	4217.	28625.	.942	558.	3.46	204904.5	.81285
1.520	13.352	812029.	4532.	29000.	.950	562.	3.32	203521.6	.81079

78. ****** XCLECT END OPTION 1 ******
WT = .81203E+06 H = 29000. AM = .95000
TIME = .14781 RANGE = 22.630 FUEL = 6532.1

+++ +++

CUMULATIVE CPU TIME = 107.43 CPU TIME USED IN PREVIOUS TASK = 1.1860

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
71	.8120E+06	.2900E+05	.9500	.2533E-01	4532.	13.35	1.000	-0.	0.	1

UNPACK 81 51100 5 1 1 0 0. 1
1.5000 40500. 0. 4.0000 0. 51100 0. 1 0. 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZD	NET THRUST	SFC
0.000	0.	812029.	0.	29000.	.950	562.	1.87	203521.2	.81879
.306	2.9013	811183.	846.4	29575.	.977	577.	1.70	205877.0	.81125
.667	6.4132	810172.	1857.	30150.	1.005	592.	1.44	207667.2	.81429
1.073	10.466	809020.	3009.	30725.	1.032	606.	1.27	206478.5	.82956
1.511	14.949	807760.	4269.	31300.	1.060	621.	1.15	205549.3	.84407
1.985	19.905	806382.	5647.	31875.	1.087	635.	1.13	204896.3	.85766
2.422	24.585	805091.	6938.	32450.	1.115	650.	1.16	208721.2	.85489
2.845	29.216	803824.	8205.	33025.	1.142	664.	1.19	204918.3	.88212
3.246	33.700	802608.	9421.	33600.	1.170	678.	1.25	202487.2	.90457
3.616	37.919	801473.	.1056E+05	34175.	1.197	692.	1.30	200793.7	.92427
3.968	42.023	800376.	.1165E+05	34750.	1.225	706.	1.31	199741.2	.94155
4.321	46.222	799262.	.1277E+05	35325.	1.252	720.	1.28	199095.3	.95697
4.672	50.473	798141.	.1389E+05	35900.	1.280	734.	1.24	198940.1	.97037
5.038	54.997	796954.	.1508E+05	36475.	1.307	749.	1.34	199360.5	.98486
5.328	58.657	795995.	.1603E+05	37050.	1.335	765.	1.63	220117.1	.90987
5.564	61.696	795200.	.1683E+05	37625.	1.362	781.	1.86	227062.2	.89895
5.778	64.503	794467.	.1756E+05	38200.	1.390	797.	1.99	232959.3	.89272
5.974	67.138	793779.	.1825E+05	38775.	1.417	813.	2.11	238405.3	.88855
6.158	69.650	793124.	.1891E+05	39350.	1.445	828.	2.20	243466.9	.88601
6.331	72.058	792496.	.1953E+05	39925.	1.472	844.	2.30	248494.6	.88374
6.494	74.369	791895.	.2013E+05	40500.	1.500	860.	2.34	253539.2	.88154

79. ****** XCLECT END OPTION 1 ******
WT = .79189E+06 H = 40500. AM = 1.5000

TIME = .17314 RANGE = 35.982 FUEL = 4532.0

+++ +++

CUMULATIVE CPU TIME = 109.10 CPU TIME USED IN PREVIOUS TASK = 1.6760

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
81	.7919E+06	.4050E+05	1.500	.1082	.2013E+05	74.37	1.000	-0.	0.	1

UNPACK 91 51100 5 1 1 0 0. 1
2.6000 52971. 0. 4.0000 0. 51100 0. 1 0. 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZO	NET THRUST	SFC
0.000	0.	791895.	0.	40500.	1.500	860.	1.60	253560.3	.88141
.252	3.6681	790931.	964.2	41124.	1.555	891.	1.68	269804.8	.87730
.472	6.9978	790037.	1858.	41747.	1.610	923.	1.84	286546.9	.87263
.667	10.051	789202.	2693.	42371.	1.665	954.	2.00	303150.9	.86984
.842	12.874	788414.	3481.	42994.	1.720	986.	2.16	320004.3	.86712
1.000	15.500	787668.	4227.	43618.	1.775	1017.	2.32	337398.1	.86390
1.142	17.953	786959.	4936.	44241.	1.830	1049.	2.47	354949.3	.86103
1.272	20.257	786281.	5613.	44865.	1.885	1080.	2.63	372727.3	.85834
1.391	22.428	785633.	6262.	45488.	1.940	1112.	2.78	390829.9	.85583
1.501	24.486	785009.	6886.	46112.	1.995	1144.	2.87	407386.8	.85293
1.606	26.524	784392.	7503.	46735.	2.050	1175.	2.87	418200.1	.85024
1.710	28.584	783765.	8129.	47359.	2.105	1207.	2.84	433097.9	.84879
1.812	30.663	783130.	8765.	47983.	2.160	1238.	2.81	447607.3	.84743
1.913	32.763	782484.	9411.	48606.	2.215	1270.	2.77	462164.2	.84534
2.013	34.908	781826.	.1007E+05	49230.	2.270	1301.	2.67	469582.7	.84242
2.116	37.162	781147.	.1075E+05	49853.	2.325	1333.	2.53	473198.2	.84092
2.222	39.546	780441.	.1145E+05	50477.	2.380	1364.	2.40	476777.1	.83902
2.332	42.068	779708.	.1219E+05	51100.	2.435	1396.	2.28	480786.3	.83655
2.444	44.696	778950.	.1294E+05	51724.	2.490	1427.	2.24	491509.7	.83524
2.552	47.302	778201.	.1369E+05	52347.	2.545	1459.	2.33	502217.9	.83336
2.652	49.752	777499.	.1440E+05	52971.	2.600	1490.	2.40	512580.6	.83150

80. ****** XCLECT END OPTION 1 ******
WT = .77750E+06 H = 52971. AM = 2.6000

TIME = .28137 RANGE = 110.35 FUEL = 20134.

+++ +++

CUMULATIVE CPU TIME = 111.18 CPU TIME USED IN PREVIOUS TASK = 2.0760

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
91	.7775E+06	.5297E+05	2.600	.4420E-01	.1440E+05	49.75	1.000	-0.	0.	1

UNPACK 101 51100 5 1 1 0 0. 1
5.9500 87990. 0. 5.0000 0. 51100 0. 1 0. 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

CONSTANT DYNAMIC PRESSURE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMMA	NET THRUST	SFC
0.000	0.	777499.	0.	52971.	2.600	1490.	3.83	512498.5	.83149
.171	4.3073	776287.	1211.	54722.	2.695	1545.	3.63	512777.3	.82940
.353	9.0966	774998.	2500.	56473.	2.811	1611.	3.38	505169.3	.82788
.534	14.059	773757.	3742.	58224.	2.932	1681.	3.18	485296.5	.83157
.724	19.493	772501.	4998.	59975.	3.058	1753.	2.73	423360.5	.91998
.952	26.275	771050.	6448.	61726.	3.190	1828.	2.30	409890.8	.91691
1.197	33.884	769545.	7954.	63477.	3.327	1907.	2.05	396588.1	.91517
1.460	42.428	767978.	9520.	65228.	3.470	1989.	1.80	383270.8	.91540
1.751	52.278	766306.	.1119E+05	66979.	3.619	2076.	1.57	369283.3	.91793
2.069	63.531	764539.	.1296E+05	68730.	3.774	2168.	1.38	355460.6	.92185
2.414	76.287	762682.	.1482E+05	70480.	3.935	2263.	1.22	342989.1	.92479
2.788	90.684	760736.	.1676E+05	72231.	4.103	2363.	1.08	331997.9	.92865
3.190	106.87	758695.	.1880E+05	73982.	4.278	2467.	.96	321616.8	.93557
3.625	125.12	756540.	.2096E+05	75733.	4.460	2574.	.85	311091.0	.94679
4.098	145.86	754247.	.2325E+05	77484.	4.649	2687.	.74	298403.5	.96108
4.620	169.76	751784.	.2572E+05	79235.	4.845	2804.	.64	285534.9	.97740
5.200	197.43	749123.	.2838E+05	80986.	5.049	2925.	.56	272820.9	.99679
5.844	229.52	746241.	.3126E+05	82737.	5.262	3052.	.48	261119.1	1.0150
6.559	266.69	743120.	.3438E+05	84488.	5.482	3184.	.41	250284.5	1.0339
7.357	309.94	739722.	.3778E+05	86239.	5.712	3321.	.35	239185.8	1.0552
8.254	360.71	735990.	.4151E+05	87990.	5.950	3464.	.32	228596.8	1.0783

81. ****** XCLECT END OPTION 1 ******
WT = .73599E+06 H = 87990. AM = 5.9500

TIME = .32558 RANGE = 160.10 FUEL = 14396.

+++ +++

CUMULATIVE CPU TIME = 112.64 CPU TIME USED IN PREVIOUS TASK = 1.4600

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
101	.7360E+06	.8799E+05	5.950	.1376	.4151E+05	360.7	1.000	-0.	0.	1

UNPACK 111 51100 5 1 1 0 0. 1
5.9900 99120. 0. 4.0000 0. 51100 0. 1 0. 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMTD	NET THRUST	SFC
0.000	0.	735990.	0.	87990.	5.950	3464.	3.31	228453.8	1.0783
.027	1.5843	735878.	111.6	88546.	5.952	3466.	3.26	223488.0	1.0778
.056	3.2168	735766.	224.5	89103.	5.954	3469.	3.16	219559.5	1.0774
.085	4.9000	735651.	338.7	89659.	5.956	3471.	3.06	215739.1	1.0769
.115	6.6364	735536.	454.4	90216.	5.958	3474.	2.97	212023.8	1.0765
.146	8.4292	735418.	571.6	90772.	5.960	3476.	2.88	208411.0	1.0761
.178	10.281	735299.	690.6	91329.	5.962	3479.	2.78	204897.9	1.0757
.211	12.197	735179.	811.3	91885.	5.964	3481.	2.69	201481.9	1.0753
.245	14.179	735056.	934.1	92442.	5.966	3484.	2.60	198160.5	1.0749
.281	16.232	734931.	1059.	92998.	5.968	3486.	2.51	194931.2	1.0745
.317	18.361	734804.	1186.	93555.	5.970	3489.	2.42	191791.4	1.0741
.355	20.571	734674.	1316.	94111.	5.972	3491.	2.33	188738.9	1.0737
.395	22.869	734541.	1449.	94668.	5.974	3494.	2.24	185771.2	1.0733
.436	25.260	734405.	1585.	95224.	5.976	3496.	2.15	182886.1	1.0730
.479	27.754	734266.	1725.	95781.	5.978	3499.	2.06	180081.2	1.0726
.523	30.357	734122.	1868.	96337.	5.980	3501.	1.97	177354.5	1.0723
.570	33.080	733975.	2015.	96894.	5.982	3503.	1.88	174703.6	1.0719
.619	35.935	733823.	2167.	97450.	5.984	3506.	1.79	172126.6	1.0716
.670	38.935	733666.	2324.	98007.	5.986	3508.	1.70	169621.2	1.0713
.724	42.094	733503.	2487.	98563.	5.988	3511.	1.62	167185.3	1.0709
.781	45.432	733333.	2657.	99120.	5.990	3513.	1.57	164817.0	1.0706

82. ****** XCLECT END OPTION 1 ******
WT = .73333E+06 H = 99120. AM = 5.9900

TIME = .46315 RANGE = 520.82 FUEL = 41509.

+++ +++

CUMULATIVE CPU TIME = 114.38 CPU TIME USED IN PREVIOUS TASK = 1.7400

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
111	.7333E+06	.9912E+05	5.990	.1302E-01	2657.	45.43	1.000	-0.	0.	1

UNPACK 121 51100 5 1 1 0 0. 21
5.0000 .40000 6.0000 0. -99120. 51100 0. 21 0. 1111111111

RAMJET PERFORMANCE (PER ENGINE) AT SCALING ALTITUDE AND MACH NUMBER

RAMJET GROSS THRUST	41492.6	(LB)
NET THRUST IN FREESTREAM DIRECTION	41336.1	(LB)
AIRFLOW RATE	420.221	(LB/SEC)
FUELFLOW RATE	12.2705	(LB/SEC)
SPECIFIC IMPULSE	3381.50	(SEC)
SCALED FUEL/AIR RATIO (PHI)	1.000	(NO UNITS)
SCALING ALTITUDE	99120.0	(FEET)
SCALING MACH NUMBER	6.000	(NO UNITS)
MAXIMUM AIRFLOW RATE	421.727	(LB/SEC)
ANGLE OF ATTACK	5.40436	(DEGREES)
WING HALF ANGLE	-.700000	(DEGREES)
INLET WEDGE ANGLE	6.00000	(DEGREES)
SCALING THRUST IN FREESTREAM DIRECTION	41336.1	(LB)
LIFT COMPONENT OF ENGINE FORCES	3473.85	(LB)
INLET SPILLAGE DRAG	.404232E-10	(LB)
ENGINE INLET AREA	40.767	(SQ. FT)
RAMJET THROTTLE SETTING	.996	(NO UNITS)

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

SEARCH FOR MACH ALTITUDE POINT ALONG A CONSTANT ENERGY LINE

THE BASIS FOR SELECTION OF EACH MACH ALTITUDE POINT WAS MAXIMUM LIFT/DRAG

CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAM7D	NET THRUST	SFC
0.000	0.	530000.	0.	99120.	5.092	2987.	8.11	-11314.70	-.11934
.378	18.191	529993.	6.799	114879.	4.785	2836.	3.74	-11701.10	-.71330E-01
.713	33.811	529988.	11.52	113829.	4.637	2746.	-.66	-12475.63	-.67053E-01
1.064	49.576	529984.	16.40	112684.	4.485	2654.	-.71	-12132.19	-.68447E-01
1.432	65.586	529979.	21.48	111431.	4.328	2559.	-2.23	-11557.62	-.70894E-01
1.819	81.842	529973.	27.18	104999.	4.219	2484.	-3.50	-11056.66	-.85590E-01
2.273	100.33	529965.	34.87	98567.	4.105	2407.	-3.16	-10270.87	-.10705
2.777	120.21	529955.	44.93	92134.	3.986	2327.	-3.03	-9870.092	-.13255
3.304	140.26	529942.	57.61	85702.	3.862	2245.	-3.11	-9862.376	-.16151
3.820	159.20	529927.	72.90	79270.	3.730	2159.	1.76	-10187.20	-.19382
4.446	180.48	529912.	87.82	94492.	3.331	1947.	1.53	-8374.485	-.11999
5.125	202.00	529899.	100.9	86147.	3.198	1860.	-3.66	-9225.355	-.14172
5.832	223.37	529881.	118.7	77803.	3.057	1767.	-.24	-9594.547	-.18070
6.532	242.89	529859.	141.0	84411.	2.695	1565.	2.14	-7454.857	-.21536
7.288	261.47	529843.	156.7	86578.	2.356	1370.	.13	-7128.527	-.13580
8.305	283.08	529829.	170.5	84650.	2.036	1182.	-3.13	-8233.805	-.82955E-01
9.536	306.24	529812.	187.6	71264.	1.885	1085.	-4.17	-10570.17	-.93635E-01
10.927	329.29	529790.	209.6	64142.	1.575	903.	-3.91	-13415.25	-.66502E-01
12.390	349.20	529769.	231.3	53737.	1.265	725.	-4.15	-27302.09	-.32530E-01
14.855	372.75	529740.	260.2	45245.	.770	441.	-4.33	712.8747	.80106
20.392	409.87	529657.	343.1	24470.	.621	375.	-3.35	1570.306	.83111
24.436	439.18	526841.	3159.	20000.	.800	491.	-1.44	61792.84	.76934

86. ****** XCLECT END OPTION 1 ******
WT = .52684E+06 H = 20000. AM = .80000

TIME = 2.3255 RANGE = 6557.8 FUEL = .20333E+06

+++ +++

CUMULATIVE CPU TIME = 121.69 CPU TIME USED IN PREVIOUS TASK = 6.9560

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
151	.5268E+06	.2000E+05	.8000	.4073	3159.	439.2	1.000	-0.	0.	1

UNPACK 161 51010 5 1 0 10 10. 17
0. 0. 0. 5.0000 1.0000 51010 2.0000 17 0. 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

LINEAR MACH ALTITUDE CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMZO	NET THRUST	SFC
0.000	0.	522881.	0.	20000.	.800	491.	19.06	221255.2	.70891
.077	.59493	522684.	197.2	21250.	.800	489.	18.60	212221.0	.70724
.158	1.2222	522485.	395.8	22500.	.800	486.	17.69	203170.6	.70561
.244	1.8850	522285.	596.3	23750.	.800	484.	16.78	194422.8	.70397
.335	2.5865	522082.	798.8	25000.	.800	481.	15.90	185878.6	.70240
.432	3.3299	521877.	1004.	26250.	.800	479.	15.03	177695.8	.70077
.534	4.1192	521670.	1211.	27500.	.800	476.	14.18	169691.5	.69924
.643	4.9590	521459.	1422.	28750.	.800	474.	13.30	161963.0	.69737
.761	5.8610	521245.	1637.	30000.	.800	471.	12.36	153208.4	.69206
.888	6.8391	521026.	1855.	31250.	.800	469.	11.40	144821.1	.68669
1.028	7.9038	520803.	2078.	32500.	.800	466.	10.47	136823.4	.68124
1.180	9.0676	520573.	2308.	33750.	.800	463.	9.59	129224.7	.67583
1.348	10.342	520337.	2545.	35000.	.800	461.	8.66	122376.1	.67175
1.537	11.777	520085.	2796.	36250.	.800	459.	7.51	115755.5	.66800
1.762	13.486	519804.	3078.	37500.	.800	459.	6.48	109013.4	.66809
2.016	15.410	519505.	3376.	38750.	.800	459.	5.73	102663.2	.66820
2.304	17.601	519186.	3695.	40000.	.800	459.	5.00	96681.38	.66831
2.636	20.133	518839.	4042.	41250.	.800	459.	4.29	91046.51	.66845
3.027	23.116	518454.	4427.	42500.	.800	459.	3.60	85738.25	.66860
3.500	26.727	518015.	4866.	43750.	.800	459.	2.92	80737.51	.66878
4.097	31.279	517495.	5386.	45000.	.800	459.	2.59	76026.28	.66898

88. ****** XCLECT END OPTION 1 ******
WT = .51749E+06 H = 45000. AM = .80000

TIME = 2.8161 RANGE = 6997.0 FUEL = 3959.3

+++ +++

CUMULATIVE CPU TIME = 122.88 CPU TIME USED IN PREVIOUS TASK = 1.1500

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
171	.5175E+06	.4500E+05	.8000	.6828E-01	5386.	31.28	1.000	-0.	0.	1

UNPACK 181 51010 5 1 0 10 10. 7

0.	0.	0.	1.0000	200.00	51010	0.		7	0.	1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

SEARCH FOR MACH ALTITUDE POINT ALONG A CONSTANT ENERGY LINE

THE BASIS FOR SELECTION OF EACH MACH ALTITUDE POINT WAS MAXIMUM LIFT/DRAG

CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAM7D	NET THRUST	SFC
0.000	0.	502577.	0.	45000.	.800	459.	-1.90	739.5932	.80121
.245	1.8323	502575.	2.402	44631.	.764	438.	-3.51	729.2391	.79830
.497	3.6530	502572.	4.893	43638.	.756	433.	-5.09	759.0359	.79763
.755	5.4970	502570.	7.547	42646.	.747	428.	-10.09	790.4141	.79668
1.015	7.3648	502567.	10.60	39546.	.831	476.	-9.88	988.8437	.81158
1.258	9.2935	502563.	13.93	38604.	.821	470.	-4.58	1030.713	.80843
1.510	11.254	502560.	17.48	37662.	.811	465.	-4.46	1065.495	.80433
1.773	13.271	502556.	21.28	36719.	.800	459.	-4.35	1101.411	.80013
2.045	15.332	502552.	25.35	35777.	.789	453.	-4.31	1138.687	.80064
2.320	17.388	502548.	29.60	34835.	.775	447.	-4.31	1172.742	.80314
2.599	19.447	502543.	34.05	33893.	.761	441.	-4.30	1206.904	.80573
2.883	21.510	502539.	38.72	32950.	.748	435.	-4.29	1242.250	.80824
3.171	23.577	502534.	43.62	32008.	.734	428.	-4.28	1278.543	.81070
3.464	25.647	502528.	48.76	31066.	.720	422.	-4.28	1315.597	.81337
3.762	27.721	502523.	54.17	30124.	.706	416.	-4.27	1355.676	.81647
4.065	29.799	502517.	59.86	29182.	.692	409.	-4.26	1396.588	.81954
4.374	31.881	502511.	65.85	28239.	.678	402.	-4.25	1438.112	.82258
4.689	33.968	502505.	72.15	27297.	.664	396.	-4.24	1480.934	.82555
5.009	36.058	502498.	78.80	26355.	.650	389.	-4.23	1525.249	.82843
5.337	38.153	502491.	85.80	25413.	.636	382.	-4.23	1570.178	.83129
5.671	40.253	502484.	93.19	24470.	.621	375.	-2.83	1616.374	.83408
9.714	69.559	499705.	2873.	20000.	.800	491.	-1.44	60326.96	.78065

90. ****** XCLECT END OPTION 1 ******
WT = .49970E+06 H = 20000. AM = .80000

TIME = 3.3206 RANGE = 7228.3 FUEL = 14918.

+++ +++

CUMULATIVE CPU TIME = 127.91 CPU TIME USED IN PREVIOUS TASK = 4.7360

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
191	.4997E+06	.2000E+05	.8000	.1619	2873.	69.56	1.000	-0.	0.	1

UNPACK 201 51010 5 1 0 10 10. 17
0. 0. 0. 5.0000 1.0000 51010 2.0000 17 0. 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

SEARCH FOR MACH ALTITUDE POINT ALONG A CONSTANT ENERGY LINE

THE BASIS FOR SELECTION OF EACH MACH ALTITUDE POINT WAS MAXIMUM LIFT/DRAG

CLIMB PATH HISTORY

TIME	RANGE	WEIGHT	FUEL	ALTITUDE	MACH NO.	V (KNOTS)	GAMTO	NET THRUST	SFC
0.000	0.	495784.	0.	20000.	.800	491.	13.83	2149.716	.84889
.309	2.1913	495775.	8.433	23280.	.603	365.	4.82	1718.297	.84049
.755	4.8606	495765.	19.07	22089.	.585	356.	-4.19	1739.287	.84069
1.213	7.5376	495753.	30.44	20898.	.566	346.	-4.18	1795.547	.84142
1.687	10.222	495741.	42.56	19708.	.547	336.	-4.17	1853.176	.84207
2.176	12.913	495728.	55.49	18517.	.528	326.	-4.16	1913.537	.84250
2.682	15.611	495715.	69.32	17326.	.508	315.	-4.15	1975.411	.84283
3.207	18.312	495700.	84.12	16136.	.488	304.	-4.15	2039.267	.84302
3.752	21.013	495684.	99.98	14945.	.467	293.	-5.56	2104.766	.84309
4.292	23.714	495662	116.6	12935.	.494	312.	-5.43	2272.673	.84764
4.828	26.435	495650.	134.1	11815.	.471	298.	-4.03	2336.300	.84709
5.390	29.168	495631.	152.9	10598.	.452	288.	-4.36	2411.811	.84723
5.971	31.910	495611.	173.1	9275.	.439	281.	-4.60	2501.902	.84788
6.566	34.660	495589.	194.5	7914.	.429	275.	-4.61	2599.763	.84865
7.175	37.418	495567.	217.4	6573.	.417	269.	-4.60	2698.277	.84920
7.800	40.184	495542.	241.7	5209.	.406	264.	-4.63	2802.371	.84991
8.441	42.959	495516.	267.6	3847.	.396	258.	-4.61	2907.810	.85099
9.098	45.743	495489.	295.2	2485.	.385	252.	-4.62	3013.322	.85264
9.771	48.537	495459.	324.6	1105.	.375	247.	-4.10	3125.864	.85436
10.480	51.329	495427.	356.5	50.	.342	226.	-1.78	3198.471	.85234
10.711	51.716	495417.	366.6	50.	.200	132.	0.00	1616.374	.83408

92. ****** XCLECT END OPTION 1 ******
WT = .49542E+06 H = 50.000 AM = .20000

TIME = 3.5658 RANGE = 7297.8 FUEL = 3920.7

+++ +++

CUMULATIVE CPU TIME = 132.81 CPU TIME USED IN PREVIOUS TASK = 4.8560

RGSAVE

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
211	.4954E+06	50.00	.2000	.1824	366.6	52.10	1.000	-0.	0.	1

UNPACK 221 51210 5 1 2 10 10. 22
1.0000 2.0000 7350.0 4.0000 20.000 51210 0. 22 2.0000 1111111111

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

INPUT TO LANDING CALCULATIONS

WING REFERENCE AREA (SF)	SREF =	14724.00
FLAT PLATE AREA OF GEAR (SF)	SPLG =	200.0000
FLAT PLATE DRAG COEFF OF GEAR	CDPLG =	.5000000
GROUND ROLL BODY ANGLE (DEG)	AG =	.2500000
MAXIMUM GROUND ROTATION ANGLE (DEG)	AMAXG =	20.00000
WING INCIDENCE (DEG)	WINCID=	-.7000000
THEORETICAL WING ASPECT RATIO	ARTHEO=	2.000000
WING LEADING EDGE SWEEP ANGLE (DEG)	WSLEFC=	60.00000
TOTAL LIFT LIFT CURVE SLOPE (PER DEG)	CLATOT=	.5115000E-01
LIFT COEF AT ZERO ANGLE OF ATTACK	CL0 =	0.
WING TAPER RATIO	TRATIO=	.2000000
INDUCED DRAG FACTOR	DFK =	.1890000
GROUND ROLL FRICTION COEFFICIENT	GRNDFL=	.3500000
DRAG COEFF AT ZERO LIFT	CD0 =	.8600000E-02
WEIGHT AT START OF LANDING (LB)	WL =	495417.4
MAXIMUM GROUND ROLL (FT) IGNORED, IF ZERO	XMAXG =	7500.000
FLAP SPAN TO EXPOSED WING SPAN RATIO	BFOBEX=	.6600000
FLAPDEFLECTION (DEG)	FLAPDL=	45.00000
AVERAGE FLAP CHORD TO WING CHORD RATIO	CFOCAV=	.1500000
FLAT PLATE AREA OF DRAG CHUTE (SF)	SPCHUT=	0.
FLAT PLATE DRAG COEFF OF CHUTE	CDPCHT=	0.
LANDING THRUST (LB)	FNL =	0.

OUTPUT FROM LANDING CALCULATIONS

MAXIMUM WING LIFT COEFFICIENT	CLMAX =	1.104521
MAXIMUM WING PLUS FLAP LIFT COEFFICIENT	CLMAXF=	1.415533
FLAP LIFT COEFFICIENT INCREMENT	DELCLF=	.3110118
TOUCHDOWN WING PLUS FLAT LIFT COEFFICIENT	CLTDF =	.8582183
TOUCHDOWN BODY ANGLE (DEG)	ATD =	1.169230
TOUCHDOWN WING LIFT COEFFICIENT	CLTD =	18.85252
TOUCHDOWN SPEED (KNOTS)	VTD =	92.05343
SPEED AT OBSTACLE (KNOTS)	V50 =	101.2588
LIFT COEFFICIENT AT OBSTACLE	CL50 =	.9657841
DRAG COEFFICIENT AT OBSTACLE	CD50 =	.1349093
DRAG COEFFICIENT AT TOUCHDOWN	CDTD =	.2050446
DRAG COEFFICIENT OF LANDING GEAR	CDLG =	.6791633E-02
DRAG COEFFICIENT DURING GROUND ROLL	CDG =	.1549129E-01
AIR DISTANCE (FT)	XAIR =	802.9959
RATE OF SINK AT OBSTACLE (FPS)	ROS =	23.90459
FLIGHT PATH ANGLE AT OBSTACLE (DEG)	GAM50 =	8.029034
GROUND ROLL DISTANCE (FT)	XG =	1044.587
POWER OFF STALL SPEED (KNOTS)	VSTAL =	83.66234
GROUND ROLL LIFT COEFFICIENT	CLG =	-.2296236E-01
DRAG COEFFICIENT OF THE CHUTE	CDCHUT=	0.

94. ****** XCLECT END OPTION 17 ******

WT = .49542E+06 H = 50.000 AM = .20000

TIME = 3.7482 RANGE = 7349.9 FUEL = 366.56

+++ +++

CUMULATIVE CPU TIME = 132.91 CPU TIME USED IN PREVIOUS TASK = .78000E-01

RGSAVE.

ITZ	WT	H	AM	TAC+++	FUEL	RUN+++	XNZZ	E10	E11	OPTION
231	.4954E+06	50.00	.2000	0.	0.	0.	1.000	-0.	0.	17

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

DUMPRG

SEG	WT	H	AM	TIME	FUEL	RANGE	XNZZ	E10	E11	OPTION
1	.8150E+06	0.	.2000	0.	0.	0.	1.000	0.	0.	X
2	.8150E+06	0.	.2000	0.	0.	0.	1.000	-0.	0.	21
3	.8134E+06	50.00	.2064	.8333E-01	1618.	0.	1.000	-0.	0.	17
4	.8295E+06	50.00	.2064	0.	0.	0.	1.000	-0.	0.	13
5	.8246E+06	3000.	.5000	.2221E-01	4931.	4.714	1.000	-0.	0.	1
6	.8231E+06	5000.	.6000	.6495E-02	1463.	2.303	1.000	-0.	0.	1
7	.8166E+06	.2150E+05	.8000	.3577E-01	6532.	15.61	1.000	-0.	0.	1
8	.8120E+06	.2900E+05	.9500	.2533E-01	4532.	13.35	1.000	-0.	0.	1
9	.7919E+06	.4050E+05	1.500	.1082	.2013E+05	74.37	1.000	-0.	0.	1
10	.7775E+06	.5297E+05	2.600	.4420E-01	.1440E+05	49.75	1.000	-0.	0.	1
11	.7360E+06	.8799E+05	5.950	.1376	.4151E+05	360.7	1.000	-0.	0.	1
12	.7333E+06	.9912E+05	5.990	.1302E-01	2657.	45.43	1.000	-0.	0.	1
13	.7333E+06	.9912E+05	5.990	0.	2657.	0.	1.000	-0.	0.	21
14	.7333E+06	.9912E+05	5.990	0.	2657.	0.	1.000	-0.	0.	22
15	.5300E+06	.9912E+05	5.092	1.849	.2033E+06	5992.	1.000	-0.	0.	6
16	.5268E+06	.2000E+05	.8000	.4073	3159.	439.2	1.000	-0.	0.	1
17	.5229E+06	.2000E+05	.8000	.8333E-01	3959.	0.	1.000	-0.	0.	17
18	.5175E+06	.4500E+05	.8000	.6828E-01	5386.	31.28	1.000	-0.	0.	1
19	.5026E+06	.4500E+05	.8000	.4362	.1492E+05	200.0	1.000	-0.	0.	7
20	.4997E+06	.2000E+05	.8000	.1619	2873.	69.56	1.000	-0.	0.	1
21	.4958E+06	.2000E+05	.8000	.8333E-01	3921.	0.	1.000	-0.	0.	17
22	.4954E+06	50.00	.2000	.1824	366.6	52.10	1.000	-0.	0.	1
23	.4954E+06	50.00	.2000	0.	366.6	0.	1.000	-0.	0.	22
24	.4954E+06	50.00	.2000	0.	0.	0.	1.000	-0.	0.	17

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

MISSION TIME HISTORY PAYLOAD = 0.

			******INCREMENTAL******			**********TOTAL**********			
WEIGHT	MACH	ALTITUDE	RANGE	TIME(HRS)	FUEL	RANGE	TIME(HRS)	FUEL	OPTION
813382.	.206	50.	0.00	.083	1618.	0.	.08	1618.	17
824556.	.500	3000.	4.71	.022	4931.	5.	.11	6549.	1
823093.	.600	5000.	2.30	.006	1463.	7.	.11	8012.	1
816561.	.800	21500.	15.61	.036	6532.	23.	.15	14544.	1
812029.	.950	29000.	13.35	.025	4532.	36.	.17	19076.	1
791895.	1.500	40500.	74.37	.108	20134.	110.	.28	39210.	1
777499.	2.600	52971.	49.75	.044	14396.	160.	.33	53606.	1
735990.	5.950	87990.	360.71	.138	41509.	521.	.46	95115.	1
733333.	5.990	99120.	45.43	.013	2657.	566.	.48	97772.	1
733333.	5.990	99120.	0.00	0.000	2657.	566.	.48	100429.	21
733333.	5.990	99120.	0.00	0.000	2657.	566.	.48	103086.	22
530000.	5.092	99120.	5991.56	1.849	203333.	6558.	2.33	306419.	6
526841.	.800	20000.	439.18	.407	3159.	6997.	2.73	309579.	1
522881.	.600	20000.	0.00	.083	3959.	6997.	2.82	313538.	17
517495.	.800	45000.	31.28	.068	5386.	7028.	2.88	318924.	1
502577.	.800	45000.	200.00	.436	14918.	7228.	3.32	333842.	7
499705.	.800	20000.	69.56	.162	2873.	7298.	3.48	336715.	1
495417.	.200	50.	52.10	.182	367.	7350.	3.66	337081.	1

LRC TEST PROBLEM NUMBER 3 ----- NSEG III
ITERATE TO FIND INITIAL WEIGHT TO PROVIDE 7350 NM TOTAL RANGE
FOR GIVEN FINAL WEIGHT. IN-FLIGHT ENGINE SCALING REQUESTED.

END OF FILE READING DATA

```
01/14/77  LRC ICOPS INDEPNDT 66000-131K 01/21/75F
18.19.16. ACCT - RATE IS EXCEEDED
18.19.16.GT83099.
18.19.16.                          LRC COMPUTER COMPLEX
18.19.16.JOB,01,200,110000,5000.          A4916    R
18.19.16.4322       100732          BLDG 1247A   CENT
18.19.16.USER.VAHL, WALTER A                     0009
18.19.16.10600N 37350
18.19.16.FETCH,A4916,,BINARY,,MISSION.
18.19.21.TIME         BG ATTACH
18.20.29.TIME         ED ATTACH
18.20.29.END     FETCH
18.20.30.DROPFIL,DCNS,ZOOKS,ZOUNDS,DAFILE,SCFILE.
18.20.32.MODE1.
18.20.32.MISSION.
18.25.39.STOP 77
18.25.39.REWIND(INPUT)
18.25.40.COPYCR(INPUT,DUMMY)
18.25.41.REWIND(DUMMY)
18.25.43.COPYSBF(DUMMY,OUTPUT)
18.25.44.COPYSBF(INPUT,OUTPUT)
18.25.45.SPPRINT(OUTPUT,3)
18.25.47.      0000476 O/S CALLS
18.25.47.CPU    133.491683 SEC.
18.25.47.PPU    125.886464 SEC.
18.25.47.CRU     17         RESOURCE UNITS
18.25.47.KWH      4.26      KILOWORD HOURS
20.20.40. GT83099.    6239 LINES PRINTED. LR27
```

*U.S. GOVERNMENT PRINTING OFFICE: 1977 - 735-004/35