



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

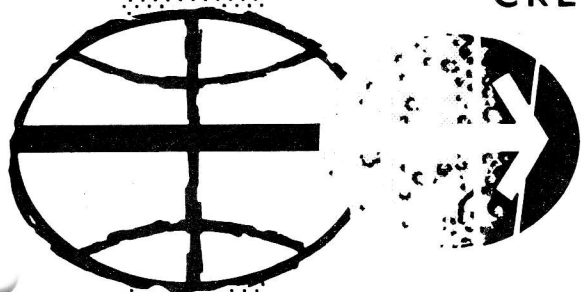
APOLLO 17

ALL LAUNCH DATES

BASIC
LM RENDEZVOUS
CHARTS

PREPARED BY

FLIGHT PROCEDURES BRANCH
CREW PROCEDURES DIVISION



MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SEPTEMBER 18, 1972

APOLLO 17
LM RENDEZVOUS CHARTS

SEPT 18, 1972

PREPARED BY: Jon C. Axford
J. C. AXFORD
BOOK MANAGER

APPROVED BY: Paul C. Kramer
PAUL C. KRAMER, CHIEF
FLIGHT PLANNING BRANCH
CREW PROCEDURES DIVISION

It is requested that any organization having comments, questions, or suggestions concerning this document contact J. C. Axford, Flight Procedures Branch, CG43, Building 4, room 220 telephone 483-5348.

This document is under the configuration control of the Crew Procedures Control Board (CPCB). All proposed changes should be submitted to the Apollo Flight Data File Manager, T. W. Holloway, CG5, Building 4, room 230, telephone 483-4271.

Distribution of this document is controlled by Flight Data File Manager, T. W. Holloway, Flight Planning Branch, Crew Procedures Division.

LM RENDEZVOUS CHARTS

LIST OF EFFECTIVE PAGES

BASIC 9/18/72

PAGE	DATE
i	9/18/72
1	9/18/72
2	9/18/72
3	9/18/72
4	9/18/72
5	9/18/72
6	9/18/72
7	9/18/72
8	9/18/72
9	9/18/72
10	9/18/72
11	9/18/72
12	9/18/72
13	9/18/72
14	9/18/72
15	9/18/72
16	9/18/72
17	9/18/72
18	9/18/72
19	9/18/72
20	9/18/72
21	9/18/72
22	9/18/72

DATE 9/18/72

PAGE 1

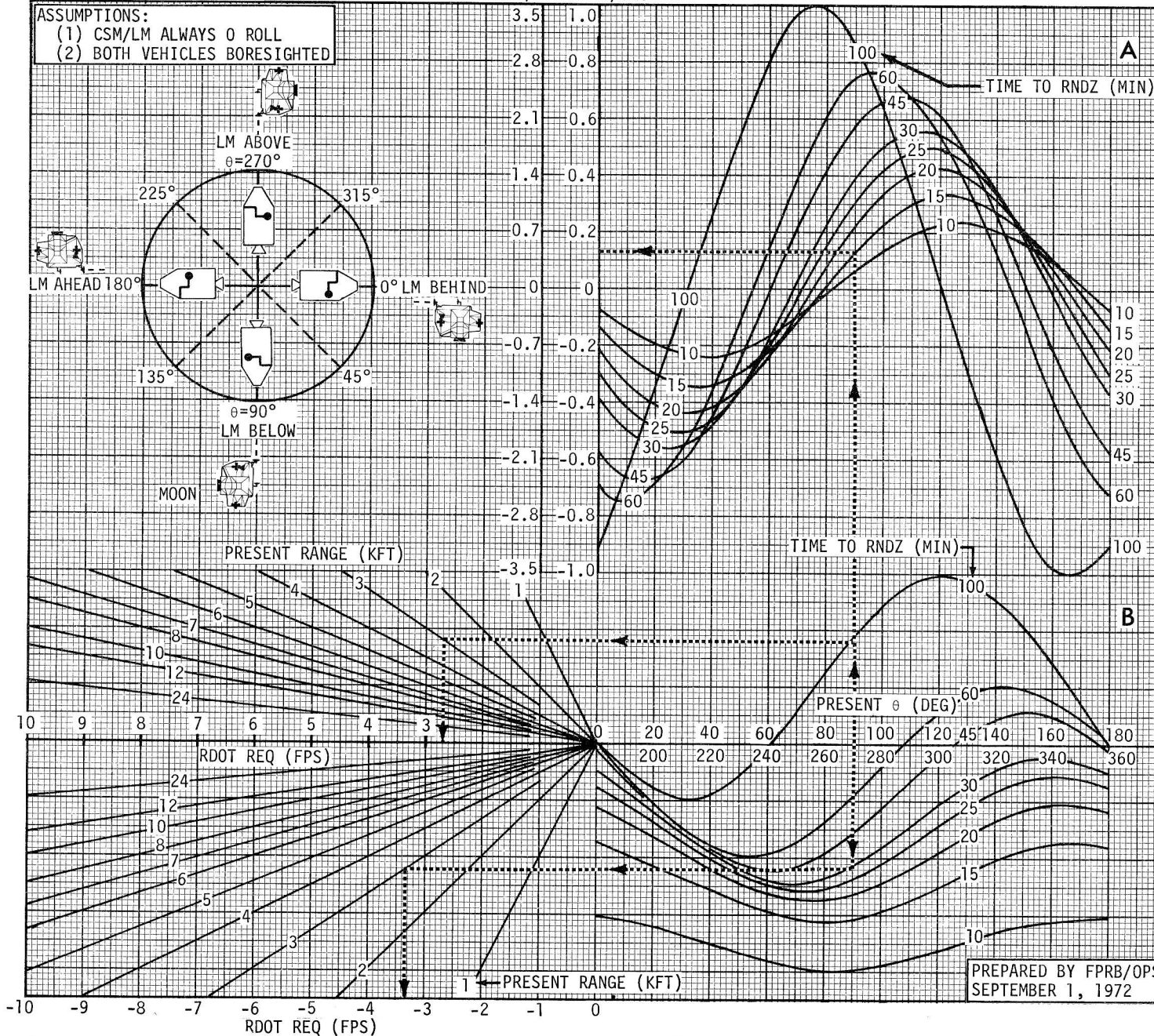
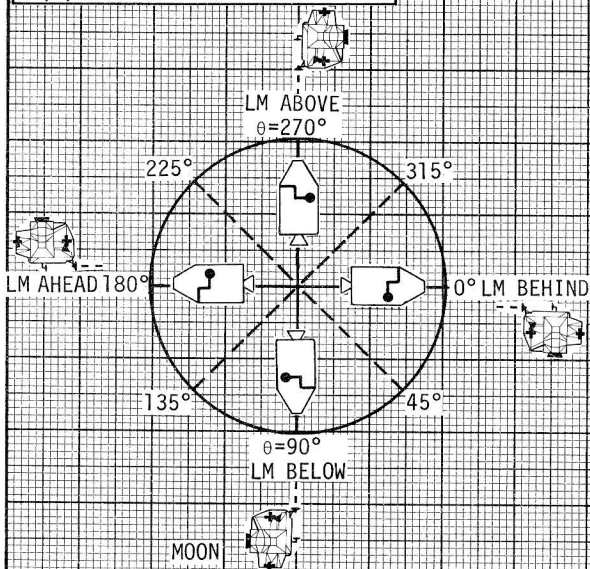
MINI-FOOTBALL
RENDEZVOUS

THIS PAGE INTENTIONALLY BLANK

MINI-FOOTBALL RENDEZVOUS

COAS XPTR
DEG/MIN MRAD/SEC

ASSUMPTIONS:
(1) CSM/LM ALWAYS 0 ROLL
(2) BOTH VEHICLES BORESIGHTED



PREPARED BY FPRB/OPS
SEPTEMBER 1, 1972

NOTE: USE PROPER ALGEBRAIC SIGN IN ALL LOGGING AND COMPUTING DATA

DATE 9/18/72

WITH RR	PRES GET	:	:	:	:	:	:	PRES GET	WITHOUT RR
LOG FROM XPTR	PRES η DOTI (MRAD/SEC)	.	.	.	.	.	.	PRES η DOTI (DEG/MIN)	TIME DRIFT FOR 2 MIN (+ = TGT DRIFTING UP)
LOG FROM FDAI	PRES θ (DEG)							PRES θ (DEG)	LOG FROM FDAI
LOG FROM DSKY/TM	PRES R (FT)							PRES R (FT)	LOG FROM CMC
LOG FROM DSKY/TM	PRES RDOT (FPS)	.	.	.	.	.	.	PRES RDOT (FPS)	LOG FROM CMC
COMPUTE FROM CHART A	REQ η DOTI (MRAD/SEC)	.	.	.	.	.	.	REQ η DOTI (DEG/MIN)	COMPUTE FROM CHART A
COMPUTE FROM CHART B	REQ RDOT (FPS)	.	.	.	.	.	.	REQ RDOT (FPS)	COMPUTE FROM CHART B

*IF LM ACTIVE PERFORM BURN

**IF CSM ACTIVE COMPUTE ΔV BELOW AND READ TO CMP

PRES RDOT - REQ RDOT	ΔV +FWD (FPS) -AFT	.	.	.	.	.	.	ΔV +FWD (FPS) -AFT	PRES RDOT - REQ RDOT
PRES η DOTI - REQ η DOTI	$\Delta \eta$ DOTI (MRAD/SEC)	.	.	.	.	.	.	$\Delta \eta$ DOTI (DEG/MIN)	PRES η DOTI - REQ η DOTI
$\frac{R(FT) \cdot \Delta \eta \text{DOTI (MRAD/SEC)}}{1000}$	ΔV +UP (FPS) -DN	.	.	.	.	.	.	ΔV +UP (FPS) -DN	$\frac{R(FT) \cdot \Delta \eta \text{DOTI (DEG/MIN)}}{3600}$

*LM ACTIVE WITH RR

P47

BURN +FWD/-AFT UNTIL RDOT = RDOT REQ
 BURN +UP/-DN UNTIL HORZ XPTR = η DOTI REQ
 BURN +RT/-LT TO NULL VERT XPTR

**CSM ACTIVE

P47

BURN +FWD/-AFT, +UP/-DN AS ABOVE
 NULL OUT OF PLANE (IF CSM DRIFTING
 RT AS VIEWED FROM LM, CSM BURN LEFT)

LM ACTIVE WITHOUT RR

P47

BURN +FWD/-AFT, +UP/-DN AS ABOVE
 BURN +RT/-LT TO NULL OUT OF PLANE DRIFT

PREPARED BY FPRB/OPS
 SEPTEMBER 1, 1972

PAGE 3

THIS PAGE INTENTIONALLY BLANK

RDOT1	F1	RDOT2	F2	RDOT3	F3	R3	F4
-240.0	47.3	-140.0	45.2	-70.0	-27.6	120.0	-15.2
-241.0	48.4	-141.0	43.4	-71.0	-26.6	121.0	-15.5
-242.0	49.4	-142.0	41.6	-72.0	-25.6	122.0	-15.7
-243.0	50.5	-143.0	39.8	-73.0	-24.5	123.0	-15.9
-244.0	51.5	-144.0	37.9	-74.0	-23.5	124.0	-16.1
-245.0	52.5	-145.0	36.1	-75.0	-22.5	125.0	-16.3
-246.0	53.6	-146.0	34.3	-76.0	-21.4	126.0	-16.5
-247.0	54.6	-147.0	32.4	-77.0	-20.4	127.0	-16.7
-248.0	55.7	-148.0	30.6	-78.0	-19.4	128.0	-16.9
-249.0	56.7	-149.0	28.7	-79.0	-18.3	129.0	-17.1
-250.0	57.8	-150.0	26.9	-80.0	-17.3	130.0	-17.3
-251.0	58.8	-151.0	25.1	-81.0	-16.3	131.0	-17.5
-252.0	59.9	-152.0	23.2	-82.0	-15.2	132.0	-17.7
-253.0	60.9	-153.0	21.4	-83.0	-14.2	133.0	-17.9
-254.0	62.0	-154.0	18.6	-84.0	-13.1	134.0	-18.1
-255.0	63.0	-155.0	17.7	-85.0	-12.1	135.0	-18.4
-256.0	64.1	-156.0	15.9	-86.0	-11.1	136.0	-18.6
-257.0	65.1	-157.0	14.0	-87.0	-10.0	137.0	-18.8
-258.0	66.2	-158.0	12.2	-88.0	-9.0	138.0	-19.0
-259.0	67.2	-159.0	10.3	-89.0	-8.0	139.0	-19.2
-260.0	68.3	-160.0	8.5	-90.0	-6.9	140.0	-19.4
-261.0	69.3	-161.0	6.6	-91.0	-5.9	141.0	-19.6
-262.0	70.4	-162.0	4.8	-92.0	-4.8	142.0	-19.8
-263.0	71.4	-163.0	3.0	-93.0	-3.8	143.0	-20.0
-264.0	72.5	-164.0	1.1	-94.0	-2.8	144.0	-20.2
-265.0	73.5	-165.0	-.7	-95.0	-1.7	145.0	-20.5
-266.0	74.6	-166.0	-2.6	-96.0	-.7	146.0	-20.7
-267.0	75.7	-167.0	-4.4	-97.0	.4	147.0	-20.9
-268.0	76.7	-168.0	-6.3	-98.0	1.4	148.0	-21.1
-269.0	77.8	-169.0	-8.1	-99.0	2.4	149.0	-21.3
-270.0	78.8	-170.0	-10.0	-100.0	3.5	150.0	-21.5
-271.0	79.9	-171.0	-11.9	-101.0	4.5	151.0	-21.7
-272.0	81.0	-172.0	-13.7	-102.0	5.6	152.0	-21.9
-273.0	82.0	-173.0	-15.6	-103.0	6.6	153.0	-22.1
-274.0	83.1	-174.0	-17.4	-104.0	7.7	154.0	-22.4
-275.0	84.2	-175.0	-19.3	-105.0	8.7	155.0	-22.6
-276.0	85.2	-176.0	-21.1	-106.0	9.7	156.0	-22.8
-277.0	86.3	-177.0	-23.0	-107.0	10.8	157.0	-23.0
-278.0	87.4	-178.0	-24.9	-108.0	11.8	158.0	-23.2
-279.0	88.4	-179.0	-26.7	-109.0	12.9	159.0	-23.4
-280.0	89.5	-180.0	-28.6	-110.0	13.9	160.0	-23.6
-281.0	90.6	-181.0	-30.4	-111.0	15.0	161.0	-23.8

CSI BACKUP TABLE NOMINAL ASCENT	
TIME (Min)	NOMINAL
-30 R1	DSKY>TM (-283.3) -1.4
-20 R2	(-173.9) -.9
-10 R3	(- 94.0) -.5
-10 R3	(154.1)
F1	(93.0)
+F2	(-17.3)
	(75.7)
+F3	(-2.8)
	(72.9)
+F4	(- 22.4)
	(50.5)
+ΔΔVCSI	(0.0)
ΔVCSI	(50.5)

PREPARED BY FPRB/OPS
APRIL 19, 1971

RDOT1	F1	RDOT2	F2	RDOT 3	F3	R3	F4
-282.0	91.6	-182.0	-32.3	-112.0	16.0	162.0	-24.0
-283.0	92.7	-183.0	-34.2	-113.0	17.0	163.0	-24.2
-284.0	93.8	-184.0	-36.0	-114.0	18.1	164.0	-24.5
-285.0	94.8	-185.0	-37.9	-115.0	19.1	165.0	-24.7
-286.0	95.9	-186.0	-39.8	-116.0	20.2	166.0	-24.9
-287.0	97.0	-187.0	-41.6	-117.0	21.2	167.0	-25.1
-288.0	98.1	-188.0	-43.5	-118.0	22.3	168.0	-25.3
-289.0	99.2	-189.0	-45.4	-119.0	23.3	169.0	-25.5
-290.0	100.2	-190.0	-47.2	-120.0	24.4	170.0	-25.7
-291.0	101.3	-191.0	-49.1	-121.0	25.4	171.0	-25.9
-292.0	102.4	-192.0	-51.0	-122.0	26.5	172.0	-26.1
-293.0	103.5	-193.0	-52.9	-123.0	27.5	173.0	-26.3
-294.0	104.6	-194.0	-54.7	-124.0	28.6	174.0	-26.5
-295.0	105.6	-195.0	-56.6	-125.0	29.6	175.0	-26.7
-296.0	106.7	-196.0	-58.5	-126.0	30.7	176.0	-26.9
-297.0	107.8	-197.0	-60.4	-127.0	31.7	177.0	-27.1
-298.0	108.9	-198.0	-62.2	-128.0	32.8	178.0	-27.3
-299.0	110.0	-199.0	-64.1	-129.0	33.8	179.0	-27.5
-300.0	111.1	-200.0	-66.0	-130.0	34.9	180.0	-27.7
-301.0	112.2	-201.0	-67.9	-131.0	35.9	181.0	-27.9
-302.0	113.2	-202.0	-69.8	-132.0	37.0	182.0	-28.1
-303.0	114.3	-203.0	-71.6	-133.0	38.0	183.0	-28.3
-304.0	115.4	-204.0	-73.5	-134.0	39.1	184.0	-28.5
-305.0	116.5	-205.0	-75.4	-135.0	40.1	185.0	-28.7
-306.0	117.6	-206.0	-77.3	-136.0	41.2	186.0	-28.9
-307.0	118.7	-207.0	-79.2	-137.0	42.2	187.0	-29.1
-308.0	119.8	-208.0	-81.1	-138.0	43.3	188.0	-29.3
-309.0	120.9	-209.0	-83.0	-139.0	44.3	189.0	-29.5
-310.0	122.0	-210.0	-84.9	-140.0	45.4	190.0	-29.7
-311.0	123.1	-211.0	-86.8	-141.0	46.4	191.0	-29.9
-312.0	124.2	-212.0	-88.7	-142.0	47.5	192.0	-30.1
-313.0	125.3	-213.0	-90.5	-143.0	48.5	193.0	-30.3
-314.0	126.4	-214.0	-92.4	-144.0	49.6	194.0	-30.5
-315.0	127.5	-215.0	-94.3	-145.0	50.7	195.0	-30.7
-316.0	128.6	-216.0	-96.2	-146.0	51.7	196.0	-30.9
-317.0	129.7	-217.0	-98.1	-147.0	52.8	197.0	-31.0
-318.0	130.8	-218.0	-100.0	-148.0	53.8	198.0	-31.2
-319.0	131.9	-219.0	-101.9	-149.0	54.9	199.0	-31.4
-320.0	133.0	-220.0	-103.8	-150.0	55.9	200.0	-31.6
-321.0	134.1	-221.0	-105.7	-151.0	57.0	201.0	-31.8
-322.0	135.3	-222.0	-107.7	-152.0	58.1	202.0	-32.0
-323.0	136.4	-223.0	-109.6	-153.0	59.1	203.0	-32.2

CSI BACKUP TABLE
NOMINAL ASCENT

TIG TPI : : :
 - TIG CSI : : :
 ΔT : : :
 - NOM ΔT : 1: 36: 58
 ΔΔT : : :
 ΔΔVCSI :

PREPARED BY FPRB/OPS
APRIL 19, 1971

RDOT	X1	Z1	X2	Z2	X3	Z3	CDH BACKUP TABLE NOMINAL ASCENT
-50.0	67.3	254.8	-17.2	-193.9	-50.2	-60.7	
-51.0	67.6	253.9	-17.5	-191.8	-50.3	-62.0	
-52.0	68.0	253.0	-17.8	-189.6	-50.3	-63.2	
-53.0	68.3	252.0	-18.2	-187.5	-50.3	-64.4	
-54.0	68.7	251.1	-18.5	-185.4	-50.3	-65.6	
-55.0	69.0	250.2	-18.9	-183.2	-50.3	-66.8	
-56.0	69.4	249.3	-19.2	-181.1	-50.3	-68.0	
-57.0	69.7	248.3	-19.5	-179.0	-50.3	-69.2	
-58.0	70.1	247.4	-19.9	-176.8	-50.3	-70.5	
-59.0	70.4	246.5	-20.2	-174.7	-50.3	-71.7	
-60.0	70.8	245.6	-20.5	-172.5	-50.4	-72.9	
-61.0	71.1	244.6	-20.9	-170.4	-50.4	-74.1	
-62.0	71.5	243.7	-21.2	-168.3	-50.4	-75.3	
-63.0	71.8	242.8	-21.6	-166.1	-50.4	-76.5	
-64.0	72.2	241.9	-21.9	-164.0	-50.4	-77.7	
-65.0	72.5	240.9	-22.2	-161.8	-50.4	-78.9	
-66.0	72.9	240.0	-22.6	-159.7	-50.4	-80.2	
-67.0	73.2	239.1	-22.9	-157.5	-50.5	-81.4	
-68.0	73.6	238.1	-23.2	-155.4	-50.5	-82.6	
-69.0	73.9	237.2	-23.6	-153.2	-50.5	-83.8	
-70.0	74.3	236.3	-23.9	-151.1	-50.5	-85.0	
-71.0	74.6	235.3	-24.3	-149.0	-50.5	-86.2	
-72.0	75.0	234.4	-24.6	-146.8	-50.5	-87.4	
-73.0	75.3	233.5	-24.9	-144.7	-50.6	-88.6	
-74.0	75.7	232.5	-25.3	-142.5	-50.6	-89.8	
-75.0	76.0	231.6	-25.6	-140.4	-50.6	-91.1	
-76.0	76.4	230.6	-25.9	-138.2	-50.6	-92.3	
-77.0	76.7	229.7	-26.3	-136.1	-50.6	-93.5	
-78.0	77.1	228.8	-26.6	-133.9	-50.6	-94.7	
-79.0	77.4	227.8	-26.9	-131.8	-50.7	-95.9	
-80.0	77.8	226.9	-27.3	-129.6	-50.7	-97.1	
-81.0	78.1	225.9	-27.6	-127.5	-50.7	-98.3	
-82.0	78.5	225.0	-27.9	-125.3	-50.7	-99.5	
-83.0	78.8	224.1	-28.3	-123.2	-50.7	-100.7	
-84.0	79.2	223.1	-28.6	-121.0	-50.8	-102.0	
-85.0	79.5	222.2	-28.9	-118.9	-50.8	-103.2	
-86.0	79.9	221.2	-29.3	-116.7	-50.8	-104.4	
-87.0	80.2	220.3	-29.6	-114.6	-50.8	-105.6	
-88.0	80.6	219.3	-29.9	-112.4	-50.8	-106.8	
-89.0	80.9	218.4	-30.3	-110.2	-50.9	-108.0	
-90.0	81.3	217.4	-30.6	-108.1	-50.9	-109.2	
-91.0	81.6	216.5	-30.9	-105.9	-50.9	-110.4	
-92.0	82.0	215.5	-31.3	-103.8	-50.9	-111.6	
-93.0	82.3	214.6	-31.6	-101.6	-50.9	-112.9	

PREPARED BY FPRB/OPS
APRIL 19, 1971

CDH BACKUP
NOMINAL ASCENT

CDH BACKUP
NOMINAL ASCENT

RDOT	X1	Z1	X2	Z2	X3	Z3
-93.0	82.3	214.6	-31.6	-101.6	-50.9	-112.9
-94.0	82.7	213.6	-31.9	-99.5	-51.0	-114.1
-95.0	83.0	212.7	-32.3	-97.3	-51.0	-115.3
-96.0	83.4	211.7	-32.6	-95.1	-51.0	-116.5
-97.0	83.7	210.8	-32.9	-93.0	-51.0	-117.7
-98.0	84.1	209.8	-33.3	-90.8	-51.0	-118.9
-99.0	84.5	208.9	-33.6	-88.7	-51.1	-120.1
-100.0	84.8	207.9	-33.9	-86.5	-51.1	-121.3
-101.0	85.2	207.0	-34.2	-84.3	-51.1	-122.5
-102.0	85.5	206.0	-34.6	-82.2	-51.1	-123.7
-103.0	85.9	205.1	-34.9	-80.0	-51.2	-125.0
-104.0	86.2	204.1	-35.2	-77.8	-51.2	-126.2
-105.0	86.6	203.1	-35.6	-75.7	-51.2	-127.4
-106.0	86.9	202.2	-35.9	-73.5	-51.2	-128.6
-107.0	87.3	201.2	-36.2	-71.4	-51.3	-129.8
-108.0	87.6	200.3	-36.6	-69.2	-51.3	-131.0
-109.0	88.0	199.3	-36.9	-67.0	-51.3	-132.2
-110.0	88.3	198.3	-37.2	-64.9	-51.3	-133.4
-111.0	88.7	197.4	-37.5	-62.7	-51.4	-134.6
-112.0	89.1	196.4	-37.9	-60.5	-51.4	-135.8
-113.0	89.4	195.5	-38.2	-58.4	-51.4	-137.0
-114.0	89.8	194.5	-38.5	-56.2	-51.4	-138.3
-115.0	90.1	193.5	-38.9	-54.0	-51.5	-139.5
-116.0	90.5	192.6	-39.2	-51.8	-51.5	-140.7
-117.0	90.8	191.6	-39.5	-49.7	-51.5	-141.9
-118.0	91.2	190.6	-39.8	-47.5	-51.6	-143.1
-119.0	91.5	189.7	-40.2	-45.3	-51.6	-144.3
-120.0	91.9	188.7	-40.5	-43.2	-51.6	-145.5
-121.0	92.2	187.7	-40.8	-41.0	-51.6	-146.7
-122.0	92.6	186.8	-41.2	-38.8	-51.7	-147.9
-123.0	93.0	185.8	-41.5	-36.6	-51.7	-149.1
-124.0	93.3	184.8	-41.8	-34.5	-51.7	-150.3
-125.0	93.7	183.8	-42.1	-32.3	-51.7	-151.5
-126.0	94.0	182.9	-42.5	-30.1	-51.8	-152.8
-127.0	94.4	181.9	-42.8	-27.9	-51.8	-154.0
-128.0	94.7	180.9	-43.1	-25.8	-51.8	-155.2
-129.0	95.1	180.0	-43.4	-23.6	-51.9	-156.4
-130.0	95.4	179.0	-43.8	-21.4	-51.9	-157.6
-131.0	95.8	178.0	-44.1	-19.2	-51.9	-158.8
-132.0	96.2	177.0	-44.4	-17.1	-52.0	-160.0
-133.0	96.5	176.0	-44.7	-14.9	-52.0	-161.2
-134.0	96.9	175.1	-45.1	-12.7	-52.0	-162.4
-135.0	97.2	174.1	-45.4	-10.5	-52.1	-163.6
-136.0	97.6	173.1	-45.7	-8.3	-52.1	-164.8

CDH BACKUP TABLE NOMINAL ASCENT		
TIME (MIN)	NOMINAL	DSKY>TM
-36 R1	_____ (-118.0)	-.6
-23 R2	_____ (-118.0)	-.6
-10 R3	_____ (-118.0)	-.6
ΔV_X : X1	_____ (91.2)	
+X2	_____ (- 39.8)	
	_____ (51.4)	
+X3	_____ (- 51.6)	
$\Delta V_X(LV)$	<input type="text"/> (- 0.2)	
ΔV_Z : Z1	_____ (190.6)	
+Z2	_____ (- 47.5)	
	_____ (143.1)	
+Z3	_____ (-143.1)	
$\Delta V_Z(LV)$	<input type="text"/> (0.0)	

PREPARED BY FPRB/OPS
APRIL 19, 1971

RDOT	X1	Z1	X2	Z2	X3	Z3
-136.0	97.6	173.1	-45.7	-8.3	-52.1	-164.8
-137.0	97.9	172.1	-46.0	-6.2	-52.1	-166.0
-138.0	98.3	171.2	-46.4	-4.0	-52.2	-167.2
-139.0	98.7	170.2	-46.7	-1.8	-52.2	-168.4
-140.0	99.0	169.2	-47.0	.4	-52.2	-169.7
-141.0	99.4	168.2	-47.3	2.6	-52.2	-170.9
-142.0	99.7	167.2	-47.7	4.8	-52.3	-172.1
-143.0	100.1	166.2	-48.0	6.9	-52.3	-173.3
-144.0	100.4	165.3	-48.3	9.1	-52.4	-174.5
-145.0	100.8	164.3	-48.6	11.3	-52.4	-175.7
-146.0	101.2	163.3	-49.0	13.5	-52.4	-176.9
-147.0	101.5	162.3	-49.3	15.7	-52.5	-178.1
-148.0	101.9	161.3	-49.6	17.9	-52.5	-179.3
-149.0	102.2	160.3	-49.9	20.1	-52.5	-180.5
-150.0	102.6	159.3	-50.3	22.2	-52.6	-181.7
-151.0	103.0	158.4	-50.6	24.4	-52.6	-182.9
-152.0	103.3	157.4	-50.9	26.6	-52.6	-184.1
-153.0	103.7	156.4	-51.2	28.8	-52.7	-185.3
-154.0	104.0	155.4	-51.5	31.0	-52.7	-186.5
-155.0	104.4	154.4	-51.9	33.2	-52.7	-187.7
-156.0	104.7	153.4	-52.2	35.4	-52.8	-189.0
-157.0	105.1	152.4	-52.5	37.6	-52.8	-190.2
-158.0	105.5	151.4	-52.8	39.8	-52.8	-191.4
-159.0	105.8	150.4	-53.1	42.0	-52.9	-192.6
-160.0	106.2	149.4	-53.5	44.2	-52.9	-193.8
-161.0	106.5	148.4	-53.8	46.3	-53.0	-195.0
-162.0	106.9	147.4	-54.1	48.5	-53.0	-196.2
-163.0	107.3	146.4	-54.4	50.7	-53.0	-197.4
-164.0	107.6	145.4	-54.8	52.9	-53.1	-198.6
-165.0	108.0	144.4	-55.1	55.1	-53.1	-199.8
-166.0	108.3	143.4	-55.4	57.3	-53.2	-201.0
-167.0	108.7	142.4	-55.7	59.5	-53.2	-202.2
-168.0	109.1	141.4	-56.0	61.7	-53.2	-203.4
-169.0	109.4	140.4	-56.4	63.9	-53.3	-204.6
-170.0	109.8	139.4	-56.7	66.1	-53.3	-205.8
-171.0	110.1	138.4	-57.0	68.3	-53.4	-207.0
-172.0	110.5	137.4	-57.3	70.5	-53.4	-208.2
-173.0	110.9	136.4	-57.6	72.7	-53.4	-209.4
-174.0	111.2	135.4	-57.9	74.9	-53.5	-210.6
-175.0	111.6	134.4	-58.3	77.1	-53.5	-211.9
-176.0	111.9	133.4	-58.6	79.3	-53.6	-213.1
-177.0	112.3	132.4	-58.9	81.5	-53.6	-214.3
-178.0	112.7	131.4	-59.2	83.7	-53.6	-215.5
-179.0	113.0	130.4	-59.5	85.9	-53.7	-216.7

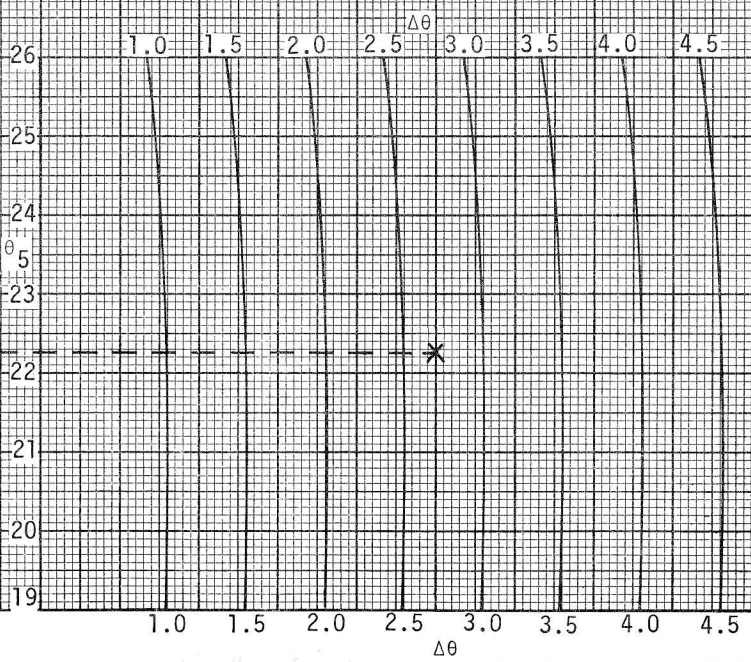
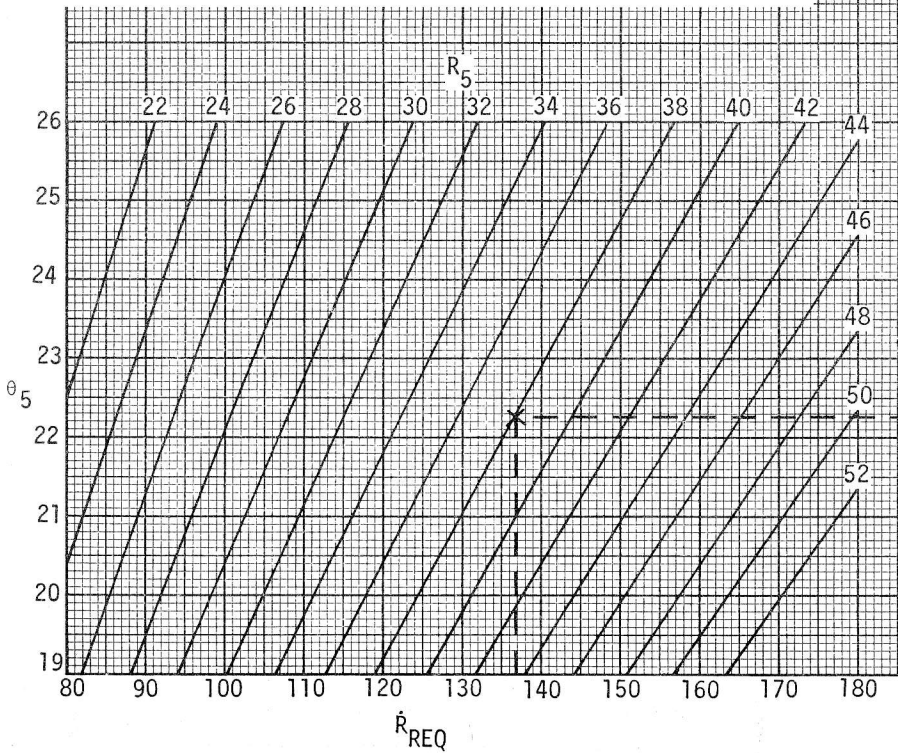
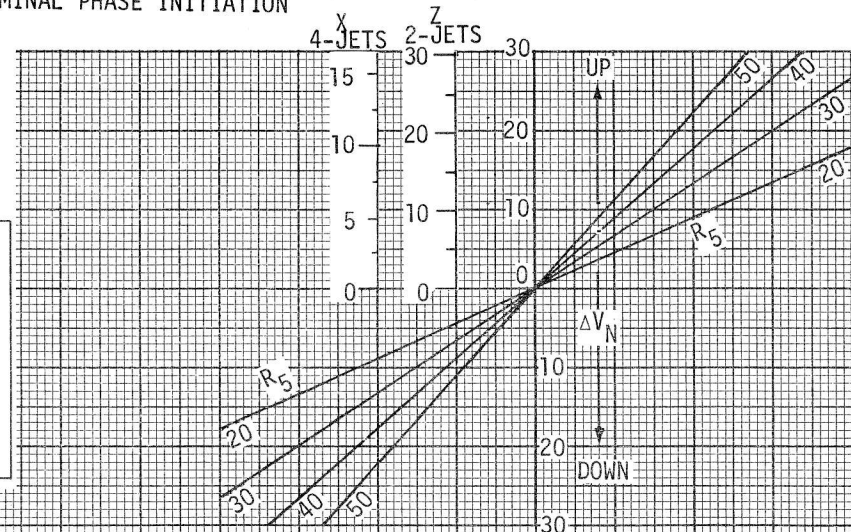
CDH BACKUP TABLE
NOMINAL ASCENTPREPARED BY FPRB/OPS
APRIL 19, 1971

TPI BACKUP
NOMINAL ASCENT

H-3 MISSION TERMINAL PHASE INITIATION

\dot{R}_{REQ} _____ 136.9
 R_5 _____ 38.18 \dot{R}_5 _____ 112.3 θ_5 _____ 22.24
 ΔR _____ 24.6 θ_9 _____ 19.54
 $\Delta\theta$ _____ 2.70

	PNGS (N59)	CSM (N59)	CHARTS	ΔT
\dot{F}/A	_____	_____	_____	_____
\dot{R}/L	_____	_____	_____	_____
\dot{D}/U	_____	_____	_____	_____



PREPARED BY FPRB/OPS
NOVEMBER 23, 1970

DIRECT ASCENT TPI BACKUP TABLE TWEAK

R1	V1	R1	V1	R1	V2	R1	V2	R1	V2	CSM A+P	V3
40.	834.1	90.	851.5	-412.	-82.0	-362.	-117.8	-312.	-164.1	95.	-467.0
41.	835.3	91.	851.4	-411.	-82.7	-361.	-118.6	-311.	-165.2	96.	-469.7
42.	836.4	92.	851.3	-410.	-83.3	-360.	-119.4	-310.	-166.3	97.	-472.1
43.	837.4	93.	851.1	-409.	-84.0	-359.	-120.2	-309.	-167.4	98.	-474.4
44.	838.4	94.	851.0	-408.	-84.7	-358.	-121.0	-308.	-168.5	99.	-476.5
45.	839.4	95.	850.9	-407.	-85.3	-357.	-121.8	-307.	-169.7	100.	-478.4
46.	840.4	96.	850.7	-406.	-86.0	-356.	-122.6	-306.	-170.8	101.	-480.2
47.	841.2	97.	850.6	-405.	-86.7	-355.	-123.4	-305.	-171.9	102.	-481.8
48.	842.1	98.	850.4	-404.	-87.3	-354.	-124.3	-304.	-173.1	103.	-483.3
49.	842.9	99.	850.3	-403.	-88.0	-353.	-125.1	-303.	-174.2	104.	-484.6
50.	843.7	100.	850.2	-402.	-88.7	-352.	-125.9	-302.	-175.4	105.	-485.7
51.	844.4	101.	850.0	-401.	-89.4	-351.	-126.8	-301.	-176.6	106.	-486.8
52.	845.1	102.	849.9	-400.	-90.0	-350.	-127.6	-300.	-177.7	107.	-487.7
53.	845.7	103.	849.8	-399.	-90.7	-349.	-128.5	-299.	-178.9	108.	-488.5
54.	846.4	104.	849.7	-398.	-91.4	-348.	-129.3	-298.	-180.1	109.	-489.2
55.	846.9	105.	849.6	-397.	-92.1	-347.	-130.2	-297.	-181.3	110.	-489.7
56.	847.5	106.	849.5	-396.	-92.8	-346.	-131.1	-296.	-182.5	111.	-490.2
57.	848.0	107.	849.4	-395.	-93.5	-345.	-131.9	-295.	-183.7	112.	-490.6
58.	848.5	108.	849.3	-394.	-94.2	-344.	-132.8	-294.	-185.0	113.	-490.9
59.	848.9	109.	849.3	-393.	-94.9	-343.	-133.7	-293.	-186.2	114.	-491.0
60.	849.3	110.	849.2	-392.	-95.6	-342.	-134.6	-292.	-187.5	115.	-491.2
61.	849.7	111.	849.2	-391.	-96.3	-341.	-135.5	-291.	-188.7	116.	-491.2
62.	850.1	112.	849.1	-390.	-97.0	-340.	-136.4	-290.	-190.0	117.	-491.2
63.	850.4	113.	849.1	-389.	-97.7	-339.	-137.3	-289.	-191.3	118.	-491.1
64.	850.7	114.	849.1	-388.	-98.4	-338.	-138.2	-288.	-192.5	119.	-490.9
65.	851.0	115.	849.1	-387.	-99.1	-337.	-139.1	-287.	-193.8	120.	-490.7
66.	851.2	116.	849.2	-386.	-99.8	-336.	-140.0	-286.	-195.1	121.	-490.5
67.	851.5	117.	849.2	-385.	-100.5	-335.	-141.0	-285.	-196.4	122.	-490.2
68.	851.7	118.	849.3	-384.	-101.2	-334.	-141.9	-284.	-197.8	123.	-489.9
69.	851.8	119.	849.4	-383.	-101.9	-333.	-142.8	-283.	-199.1	124.	-489.6
70.	852.0	120.	849.5	-382.	-102.6	-332.	-143.8	-282.	-200.4	125.	-489.2
71.	852.1	121.	849.6	-381.	-103.4	-331.	-144.7	-281.	-201.8	126.	-488.8
72.	852.2	122.	849.8	-380.	-104.1	-330.	-145.7	-280.	-203.1	127.	-488.4
73.	852.3	123.	850.0	-379.	-104.8	-329.	-146.7	-279.	-204.5	128.	-488.1
74.	852.4	124.	850.2	-378.	-105.6	-328.	-147.6	-278.	-205.9	129.	-487.7
75.	852.4	125.	850.4	-377.	-106.3	-327.	-148.6	-277.	-207.3	130.	-487.3
76.	852.4	126.	850.6	-376.	-107.0	-326.	-149.6	-276.	-208.6	131.	-486.9
77.	852.5	127.	850.9	-375.	-107.8	-325.	-150.6	-275.	-210.1	132.	-486.6
78.	852.5	128.	851.2	-374.	-108.5	-324.	-151.6	-274.	-211.5	133.	-486.3
79.	852.4	129.	851.5	-373.	-109.3	-323.	-152.6	-273.	-212.9	134.	-486.0
80.	852.4	130.	851.9	-372.	-110.0	-322.	-153.6	-272.	-214.3	135.	-485.8
81.	852.4	131.	852.3	-371.	-110.8	-321.	-154.6	-271.	-215.8	136.	-485.6
82.	852.3	132.	852.7	-370.	-111.5	-320.	-155.7	-270.	-217.2	137.	-485.5
83.	852.3	133.	853.2	-369.	-112.3	-319.	-156.7	-269.	-218.7	138.	-485.4
84.	852.2	134.	853.6	-368.	-113.1	-318.	-157.7	-268.	-220.2	139.	-485.4
85.	852.1	135.	854.2	-367.	-113.8	-317.	-158.8	-267.	-221.7	140.	-485.4
86.	852.0	136.	854.7	-366.	-114.6	-316.	-159.8	-266.	-223.2	141.	-485.5
87.	851.9	137.	855.3	-365.	-115.4	-315.	-160.9	-265.	-224.7	142.	-485.7
88.	851.8	138.	855.9	-364.	-116.2	-314.	-162.0	-264.	-226.2	143.	-486.0
89.	851.7	139.	856.6	-363.	-117.0	-313.	-163.0	-263.	-227.7	144.	-486.4

TPI LOGGING		
TIME	TM DATA	NOMINAL
TPI - 30:00	R1 _____	(91.6)
	R1 _____	(-353.8)
	CSM A+P _____	(124.7)
TPI - 10:00	R2 _____	(42.8)
	R2 _____	(-143.4)
	θ2 _____	(26.8)
	N81	
	F+/A-	D+/U-
H1 _____	(183.7)	V1 _____ (851.3)
H2 _____	(-108.1)	V2 _____ (-124.4)
ΔVX _____	(75.6)	_____ (726.9)

		V3 _____ (-489.3)
		_____ (237.6)

		V4 _____ (-66.8)
		_____ (170.8)

		V5 _____ (-47.5)
		_____ (123.3)

		V6 _____ (-110.4)

		ΔVZ _____ (12.9)

PREPARED BY FPRB/OPS
JULY 18, 1972

DATE 9/18/72

PAGE 11

TPI BU
DIR ASC TWEAK

DIRECT ASCENT TPI BACKUP TABLE TWEAK

R2	V4	R2	V5	H1	R2	V5	H1	Ø2	V6	H2	Ø2	V6	H2
13.	-41.6	-230.	-20.0	175.1	-130.	-49.6	184.4	14.00	-18.8	-90.1	26.50	-108.1	-107.9
14.	-43.8	-228.	-21.1	175.4	-128.	-49.9	184.4	14.25	-20.2	-90.8	26.75	-109.9	-108.1
15.	-45.8	-226.	-22.1	175.7	-126.	-50.2	184.5	14.50	-21.6	-91.5	27.00	-111.7	-108.3
16.	-47.7	-224.	-23.1	176.0	-124.	-50.5	184.6	14.75	-23.0	-92.2	27.25	-113.5	-108.5
17.	-49.5	-222.	-24.1	176.3	-122.	-50.8	184.7	15.00	-24.5	-92.8	27.50	-115.3	-108.6
18.	-51.2	-220.	-25.1	176.6	-120.	-51.2	184.8	15.25	-26.0	-93.5	27.75	-117.1	-108.8
19.	-52.8	-218.	-26.1	176.9	-118.	-51.5	184.8	15.50	-27.5	-94.1	28.00	-118.8	-109.0
20.	-54.2	-216.	-27.0	177.2	-116.	-51.8	184.9	15.75	-29.0	-94.7	28.25	-120.5	-109.2
21.	-55.6	-214.	-27.9	177.5	-114.	-52.1	185.0	16.00	-30.6	-95.2	28.50	-122.2	-109.4
22.	-56.8	-212.	-28.7	177.8	-112.	-52.4	185.1	16.25	-32.2	-95.8	28.75	-123.9	-109.6
23.	-58.0	-210.	-29.6	178.0	-110.	-52.7	185.1	16.50	-33.8	-96.3	29.00	-125.6	-109.8
24.	-59.1	-208.	-30.4	178.3	-108.	-53.0	185.2	16.75	-35.5	-96.8	29.25	-127.2	-110.1
25.	-60.0	-206.	-31.2	178.5	-106.	-53.3	185.3	17.00	-37.2	-97.3	29.50	-128.8	-110.3
26.	-60.9	-204.	-32.0	178.8	-104.	-53.7	185.3	17.25	-38.9	-97.8	29.75	-130.4	-110.5
27.	-61.7	-202.	-32.7	179.0	-102.	-54.0	185.4	17.50	-40.6	-98.3	30.00	-132.0	-110.7
28.	-62.5	-200.	-33.5	179.2	-100.	-54.3	185.5	17.75	-42.3	-98.7	30.25	-133.5	-111.0
29.	-63.1	-198.	-34.2	179.5	-98.	-54.7	185.5	18.00	-44.0	-99.1	30.50	-135.1	-111.2
30.	-63.7	-196.	-34.9	179.7	-96.	-55.0	185.6	18.25	-45.8	-99.6	30.75	-136.5	-111.5
31.	-64.2	-194.	-35.6	179.9	-94.	-55.4	185.7	18.50	-47.6	-100.0	31.00	-138.0	-111.8
32.	-64.7	-192.	-36.2	180.1	-92.	-55.7	185.7	18.75	-49.4	-100.4	31.25	-139.4	-112.0
33.	-65.1	-190.	-36.8	180.3	-90.	-56.1	185.8	19.00	-51.2	-100.7	31.50	-140.8	-112.3
34.	-65.4	-188.	-37.4	180.5	-88.	-56.5	185.9	19.25	-53.0	-101.1	31.75	-142.2	-112.6
35.	-65.8	-186.	-38.0	180.7	-86.	-56.9	185.9	19.50	-54.9	-101.4	32.00	-143.5	-112.9
36.	-66.0	-184.	-38.6	180.9	-84.	-57.3	186.0	19.75	-56.7	-101.8	32.25	-144.8	-113.2
37.	-66.2	-182.	-39.2	181.1	-82.	-57.7	186.1	20.00	-58.6	-102.1	32.50	-146.1	-113.6
38.	-66.4	-180.	-39.7	181.2	-80.	-58.1	186.1	20.25	-60.5	-102.4	32.75	-147.3	-113.9
39.	-66.5	-178.	-40.3	181.4	-78.	-58.5	186.2	20.50	-62.4	-102.7	33.00	-148.5	-114.3
40.	-66.6	-176.	-40.8	181.6	-76.	-59.0	186.3	20.75	-64.3	-103.0	33.25	-149.7	-114.6
41.	-66.7	-174.	-41.3	181.7	-74.	-59.4	186.3	21.00	-66.2	-103.3	33.50	-150.8	-115.0
42.	-66.8	-172.	-41.7	181.9	-72.	-59.9	186.4	21.25	-68.1	-103.6	33.75	-151.9	-115.4
43.	-66.8	-170.	-42.2	182.1	-70.	-60.4	186.5	21.50	-70.0	-103.8	34.00	-152.9	-115.8
44.	-66.8	-168.	-42.7	182.2	-68.	-60.9	186.5	21.75	-71.9	-104.1	34.25	-153.9	-116.3
45.	-66.9	-166.	-43.1	182.4	-66.	-61.4	186.6	22.00	-73.8	-104.3	34.50	-154.8	-116.7
46.	-66.9	-164.	-43.6	182.5	-64.	-61.9	186.7	22.25	-75.8	-104.6	34.75	-155.8	-117.2
47.	-66.9	-162.	-44.0	182.6	-62.	-62.5	186.8	22.50	-77.7	-104.8	35.00	-156.6	-117.6
48.	-66.9	-160.	-44.4	182.8	-60.	-63.0	186.8	22.75	-79.6	-105.0	35.25	-157.4	-118.1
49.	-66.9	-158.	-44.8	182.9	-58.	-63.6	186.9	23.00	-81.6	-105.2	35.50	-158.2	-118.6
50.	-66.9	-156.	-45.2	183.0	-56.	-64.2	187.0	23.25	-83.5	-105.4	35.75	-159.0	-119.2
51.	-66.9	-154.	-45.6	183.1	-54.	-64.8	187.1	23.50	-85.4	-105.7	36.00	-159.6	-119.7
52.	-67.0	-152.	-45.9	183.3	-52.	-65.4	187.2	23.75	-87.3	-105.9	36.25	-160.3	-120.3
53.	-67.0	-150.	-46.3	183.4	-50.	-66.1	187.2	24.00	-89.3	-106.1	36.50	-160.9	-120.8
54.	-67.1	-148.	-46.7	183.5	-48.	-66.7	187.3	24.25	-91.2	-106.3	36.75	-161.4	-121.4
55.	-67.2	-146.	-47.0	183.6	-46.	-67.4	187.4	24.50	-93.1	-106.4	37.00	-161.9	-122.1
56.	-67.4	-144.	-47.3	183.7	-44.	-68.1	187.5	24.75	-95.0	-106.6	37.25	-162.3	-122.7
57.	-67.6	-142.	-47.7	183.8	-42.	-68.9	187.6	25.00	-96.9	-106.8	37.50	-162.7	-123.4
58.	-67.8	-140.	-48.0	183.9	-40.	-69.6	187.7	25.25	-98.8	-107.0	37.75	-163.0	-124.1
59.	-68.1	-138.	-48.3	184.0	-38.	-70.4	187.8	25.50	-100.7	-107.2	38.00	-163.3	-124.8
60.	-68.4	-136.	-48.7	184.1	-36.	-71.2	187.9	25.75	-102.5	-107.4	38.25	-163.5	-125.5
61.	-68.7	-134.	-49.0	184.2	-34.	-72.0	188.0	26.00	-104.4	-107.5	38.50	-163.7	-126.2
62.	-69.2	-132.	-49.3	184.3	-32.	-72.8	188.1	26.25	-106.3	-107.7	38.75	-163.8	-127.0

DIRECT ASCENT TPI BACKUP TABLE

R1	V1	R1	V1	R1	V2	R1	V2	R1	V2
40.	2121.0	90.	2090.9	-410.	-9.3	-360.	-99.3	-310.	-148.5
41.	2119.6	91.	2090.9	-409.	-11.9	-359.	-100.5	-309.	-149.5
42.	2118.2	92.	2090.9	-408.	-14.4	-358.	-101.6	-308.	-150.4
43.	2116.8	93.	2090.9	-407.	-16.9	-357.	-102.8	-307.	-151.4
44.	2115.5	94.	2091.0	-406.	-19.4	-356.	-103.9	-306.	-152.4
45.	2114.2	95.	2091.0	-405.	-21.8	-355.	-105.1	-305.	-153.4
46.	2113.0	96.	2091.0	-404.	-24.2	-354.	-106.2	-304.	-154.4
47.	2111.8	97.	2091.1	-403.	-26.5	-353.	-107.3	-303.	-155.5
48.	2110.7	98.	2091.2	-402.	-28.8	-352.	-108.4	-302.	-156.5
49.	2109.6	99.	2091.2	-401.	-31.1	-351.	-109.5	-301.	-157.5
50.	2108.5	100.	2091.3	-400.	-33.3	-350.	-110.5	-300.	-158.6
51.	2107.5	101.	2091.4	-399.	-35.6	-349.	-111.6	-299.	-159.7
52.	2106.5	102.	2091.5	-398.	-37.7	-348.	-112.6	-298.	-160.7
53.	2105.6	103.	2091.6	-397.	-39.9	-347.	-113.6	-297.	-161.8
54.	2104.6	104.	2091.7	-396.	-42.0	-346.	-114.7	-296.	-162.9
55.	2103.8	105.	2091.8	-395.	-44.0	-345.	-115.7	-295.	-164.0
56.	2102.9	106.	2091.9	-394.	-46.1	-344.	-116.7	-294.	-165.2
57.	2102.1	107.	2092.0	-393.	-48.1	-343.	-117.7	-293.	-166.3
58.	2101.4	108.	2092.1	-392.	-50.1	-342.	-118.6	-292.	-167.5
59.	2100.6	109.	2092.2	-391.	-52.0	-341.	-119.6	-291.	-168.6
60.	2099.9	110.	2092.3	-390.	-53.9	-340.	-120.6	-290.	-169.8
61.	2099.2	111.	2092.4	-389.	-55.8	-339.	-121.6	-289.	-171.0
62.	2098.6	112.	2092.5	-388.	-57.6	-338.	-122.5	-288.	-172.3
63.	2098.0	113.	2092.6	-387.	-59.5	-337.	-123.5	-287.	-173.5
64.	2097.4	114.	2092.7	-386.	-61.3	-336.	-124.4	-286.	-174.8
65.	2096.9	115.	2092.8	-385.	-63.0	-335.	-125.3	-285.	-176.0
66.	2096.4	116.	2092.9	-384.	-64.8	-334.	-126.3	-284.	-177.3
67.	2095.9	117.	2093.0	-383.	-66.5	-333.	-127.2	-283.	-178.7
68.	2095.4	118.	2093.1	-382.	-68.2	-332.	-128.1	-282.	-180.0
69.	2095.0	119.	2093.1	-381.	-69.8	-331.	-129.1	-281.	-181.3
70.	2094.6	120.	2093.2	-380.	-71.4	-330.	-130.0	-280.	-182.7
71.	2094.2	121.	2093.3	-379.	-73.0	-329.	-130.9	-279.	-184.1
72.	2093.8	122.	2093.3	-378.	-74.6	-328.	-131.8	-278.	-185.5
73.	2093.5	123.	2093.4	-377.	-76.2	-327.	-132.7	-277.	-187.0
74.	2093.2	124.	2093.4	-376.	-77.7	-326.	-133.6	-276.	-188.4
75.	2092.9	125.	2093.4	-375.	-79.2	-325.	-134.5	-275.	-189.9
76.	2092.6	126.	2093.4	-374.	-80.7	-324.	-135.5	-274.	-191.4
77.	2092.4	127.	2093.5	-373.	-82.2	-323.	-136.4	-273.	-193.0
78.	2092.2	128.	2093.4	-372.	-83.6	-322.	-137.3	-272.	-194.5
79.	2092.0	129.	2093.4	-371.	-85.0	-321.	-138.2	-271.	-196.1
80.	2091.8	130.	2093.4	-370.	-86.4	-320.	-139.1	-270.	-197.7
81.	2091.6	131.	2093.3	-369.	-87.8	-319.	-140.0	-269.	-199.3
82.	2091.5	132.	2093.3	-368.	-89.1	-318.	-141.0	-268.	-201.0
83.	2091.4	133.	2093.2	-367.	-90.5	-317.	-141.9	-267.	-202.7
84.	2091.2	134.	2093.1	-366.	-91.8	-316.	-142.8	-266.	-204.4
85.	2091.2	135.	2093.0	-365.	-93.1	-315.	-143.8	-265.	-206.1
86.	2091.1	136.	2092.9	-374.	-94.4	-314.	-144.7	-264.	-207.9
87.	2091.0	137.	2092.7	-363.	-95.6	-313.	-145.6	-263.	-209.7
88.	2091.0	138.	2092.6	-362.	-96.8	-312.	-146.6	-262.	-211.5
89.	2090.9	139.	2092.4	-361.	-98.1	-311.	-147.5	-261.	-213.4

TPI LOGGING			
TIME	TM DATA	NOMINAL	
TPI - 30:00	R1 _____	(91.6)	
	R1 _____	(-353.8)	
	CSM A+P _____	(124.7)	
TPI - 10:00	R2 _____	(42.8)	
	R2 _____	(-143.4)	
	θ2 _____	(26.8)	
<u>F+/A-</u>	<u>D+/U-</u>		
H1 _____	(234.8)	V1 _____	(2090.9)
H2 _____	(159.3)	V2 _____	(-106.4)
ΔVX _____	(75.5)	_____	(1984.5)
_____	_____	_____	_____
_____	_____	V3 _____	(-523.2)
_____	_____	_____	(1461.3)
_____	_____	V4 _____	(-48.6)
_____	_____	_____	(1412.7)
_____	_____	V5 _____	(-60.1)
_____	_____	_____	(1352.6)
_____	_____	V6 _____	(1339.8)
_____	_____	ΔVZ _____	(12.8)

PREPARED BY FPRB/OPS
SEPTEMBER 18, 1972

DIRECT ASCENT TPI BACKUP TABLE

CSM A+P	V3	R2	V4	R2	V4	R2	V5	H1	R2	V5	H1	R2	V5	H1
95.	-290.9	1.	-21.2	51.	-48.8	-303.	-96.3	159.6	-203.	-25.0	223.6	-103.	-109.2	235.0
96.	-298.7	2.	-22.3	52.	-48.7	-301.	-93.0	161.6	-201.	-25.4	224.2	-101.	-112.1	234.9
97.	-306.5	3.	-23.4	53.	-48.6	-299.	-89.8	163.6	-199.	-25.8	224.9	-99.	-115.0	234.8
98.	-314.4	4.	-24.5	54.	-48.4	-297.	-86.6	165.5	-197.	-26.3	225.5	-97.	-118.0	234.6
99.	-322.2	5.	-25.6	55.	-48.2	-295.	-83.6	167.4	-195.	-26.8	226.0	-95.	-121.0	234.5
100.	-330.0	6.	-26.6	56.	-48.0	-293.	-80.6	169.2	-193.	-27.4	226.6	-93.	-124.0	234.4
101.	-337.8	7.	-27.7	57.	-47.8	-291.	-77.7	171.1	-191.	-28.0	227.1	-91.	-127.1	234.2
102.	-345.7	8.	-28.7	58.	-47.5	-289.	-74.9	172.9	-189.	-28.7	227.7	-89.	-130.2	234.1
103.	-353.5	9.	-29.7	59.	-47.2	-287.	-72.2	174.6	-187.	-29.5	228.2	-87.	-133.4	233.9
104.	-361.3	10.	-30.6	60.	-46.9	-285.	-69.5	176.4	-185.	-30.3	228.6	-85.	-136.6	233.8
105.	-369.2	11.	-31.5	61.	-46.6	-283.	-67.0	178.1	-183.	-31.2	229.1	-83.	-139.8	233.6
106.	-377.0	12.	-32.5	62.	-46.2	-281.	-64.5	179.7	-181.	-32.1	229.6	-81.	-143.1	233.4
107.	-384.8	13.	-33.3	63.	-45.8	-279.	-62.1	181.4	-179.	-33.1	230.0	-79.	-146.4	233.2
108.	-392.7	14.	-34.2	64.	-45.3	-277.	-59.7	183.0	-177.	-34.2	230.4	-77.	-149.7	233.0
109.	-400.5	15.	-35.1	65.	-44.9	-275.	-57.5	184.6	-175.	-35.3	230.8	-75.	-153.1	232.8
110.	-408.3	16.	-35.9	66.	-44.4	-273.	-55.3	186.1	-173.	-36.5	231.2	-73.	-156.5	232.6
111.	-416.2	17.	-36.7	67.	-43.9	-271.	-53.2	187.6	-171.	-37.7	231.5	-71.	-159.9	232.4
112.	-424.0	18.	-37.4	68.	-43.3	-269.	-51.2	189.1	-169.	-39.0	231.9	-69.	-163.4	232.2
113.	-431.8	19.	-38.2	69.	-42.7	-267.	-49.3	190.6	-167.	-40.3	232.2	-67.	-166.9	232.0
114.	-439.6	20.	-38.9	70.	-42.1	-265.	-47.4	192.0	-165.	-41.7	232.5	-65.	-170.4	231.8
115.	-447.5	21.	-39.6	71.	-41.5	-263.	-45.6	193.4	-163.	-43.2	232.8	-63.	-174.0	231.5
116.	-455.3	22.	-40.3	72.	-40.8	-261.	-43.9	194.8	-161.	-44.6	233.0	-61.	-177.6	231.3
117.	-463.1	23.	-40.9	73.	-40.1	-259.	-42.3	196.2	-159.	-46.2	233.3	-59.	-181.2	231.1
118.	-470.9	24.	-41.5	74.	-39.4	-257.	-40.7	197.5	-157.	-47.8	233.5	-57.	-184.9	230.8
119.	-478.7	25.	-42.1	75.	-38.7	-255.	-39.2	198.8	-155.	-49.4	233.8	-55.	-188.6	230.6
120.	-486.6	26.	-42.7	76.	-37.9	-253.	-37.8	200.1	-153.	-51.2	234.0	-53.	-192.3	230.3
121.	-494.4	27.	-43.3	77.	-37.1	-251.	-36.4	201.3	-151.	-52.9	234.2	-51.	-196.0	230.1
122.	-502.2	28.	-43.8	78.	-36.2	-249.	-35.2	202.5	-149.	-54.7	234.4	-49.	-199.8	229.8
123.	-510.0	29.	-44.3	79.	-35.4	-247.	-34.0	203.7	-147.	-56.6	234.5	-47.	-203.6	229.6
124.	-517.8	30.	-44.8	80.	-34.5	-245.	-32.8	204.9	-145.	-58.5	234.7	-45.	-207.5	229.3
125.	-525.6	31.	-45.2	81.	-33.5	-243.	-31.8	206.0	-143.	-60.4	234.8	-43.	-211.3	229.1
126.	-533.3	32.	-45.6	82.	-32.6	-241.	-30.8	207.1	-141.	-62.4	234.9	-41.	-215.2	228.8
127.	-541.1	33.	-46.0	83.	-31.6	-239.	-29.9	208.2	-139.	-64.5	235.0	-39.	-219.1	228.5
128.	-548.9	34.	-46.4	84.	-30.6	-237.	-29.1	209.2	-137.	-66.6	235.1	-37.	-223.0	228.3
129.	-556.7	35.	-46.8	85.	-29.5	-235.	-28.3	210.3	-135.	-68.7	235.2	-35.	-227.0	228.0
130.	-564.4	36.	-47.1	86.	-28.4	-233.	-27.6	211.3	-133.	-70.9	235.3	-33.	-231.0	227.7
131.	-572.2	37.	-47.4	87.	-27.3	-231.	-26.9	212.3	-131.	-73.2	235.4	-31.	-235.0	227.5
132.	-579.9	38.	-47.7	88.	-26.2	-229.	-26.4	213.2	-129.	-75.5	235.4	-29.	-239.0	227.2
133.	-587.7	39.	-47.9	89.	-25.0	-227.	-25.9	214.2	-127.	-77.8	235.4	-27.	-243.1	226.9
134.	-595.4	40.	-48.1	90.	-23.8	-225.	-25.5	215.1	-125.	-80.2	235.5	-25.	-247.2	226.7
135.	-603.2	41.	-48.3	91.	-22.6	-223.	-25.1	216.0	-123.	-82.6	235.5	-23.	-251.3	226.4
136.	-610.9	42.	-48.5	92.	-21.3	-221.	-24.8	216.8	-121.	-85.1	235.5	-21.	-255.4	226.1
137.	-618.6	43.	-48.6	93.	-20.0	-219.	-24.6	217.7	-119.	-87.6	235.5	-19.	-259.6	225.9
138.	-626.3	44.	-48.7	94.	-18.7	-217.	-24.4	218.5	-117.	-90.1	235.4	-17.	-263.7	225.6
139.	-634.0	45.	-48.8	95.	-17.3	-215.	-24.3	219.3	-115.	-92.7	235.4	-15.	-267.9	225.3
140.	-641.7	46.	-48.9	96.	-16.0	-213.	-24.3	220.1	-113.	-95.4	235.3	-13.	-272.1	225.1
141.	-649.4	47.	-48.9	97.	-14.5	-211.	-24.3	220.8	-111.	-98.1	235.3	-11.	-276.4	224.8
142.	-657.0	48.	-48.9	98.	-13.1	-209.	-24.4	221.5	-109.	-100.8	235.2	-9.	-280.6	224.6
143.	-664.7	49.	-48.9	99.	-11.6	-207.	-24.5	222.2	-107.	-103.5	235.2	-7.	-284.9	224.3
144.	-672.4	50.	-48.9	100.	-10.1	-205.	-24.8	222.9	-105.	-106.4	235.1	-5.	-289.2	224.0

MCC1 CHART LOGGING					
\dot{R}_{REQ} _____ 103.0 R_{13} _____ 16.92 \dot{R}_{13^-} _____ 103.0 θ_{13} _____ 43.87 $\Delta \dot{R}$ _____ 0.0 θ_{9^-} _____ 37.97 $\Delta \theta$ _____ 5.90					
MCC1	PGNS (N59)	CMC (N59)	AGS	PGNS (N85)	CHART
ΔVX	_____.	_____.	_____.	_____.	_____.
ΔVY	_____.	_____.	_____.	_____.	_____.
ΔVZ	_____.	_____.	_____.	_____.	_____.

MCC2 CHART LOGGING					
\dot{R}_{REQ} _____ 50.2 R_{28} _____ 33.1 kFT \dot{R}_{28^-} _____ 50.2 θ_{28} _____ 78.09 $\Delta \dot{R}$ _____ 0.0 θ_{24^-} _____ 66.79 $\Delta \theta$ _____ 11.30					
MCC2	PGNS (N59)	CMC (N59)	AGS	PGNS (N85)	CHART
ΔVX	_____.	_____.	_____.	_____.	_____.
ΔVY	_____.	_____.	_____.	_____.	_____.
ΔVZ	_____.	_____.	_____.	_____.	_____.

DATE 9/18/72

PAGE 17

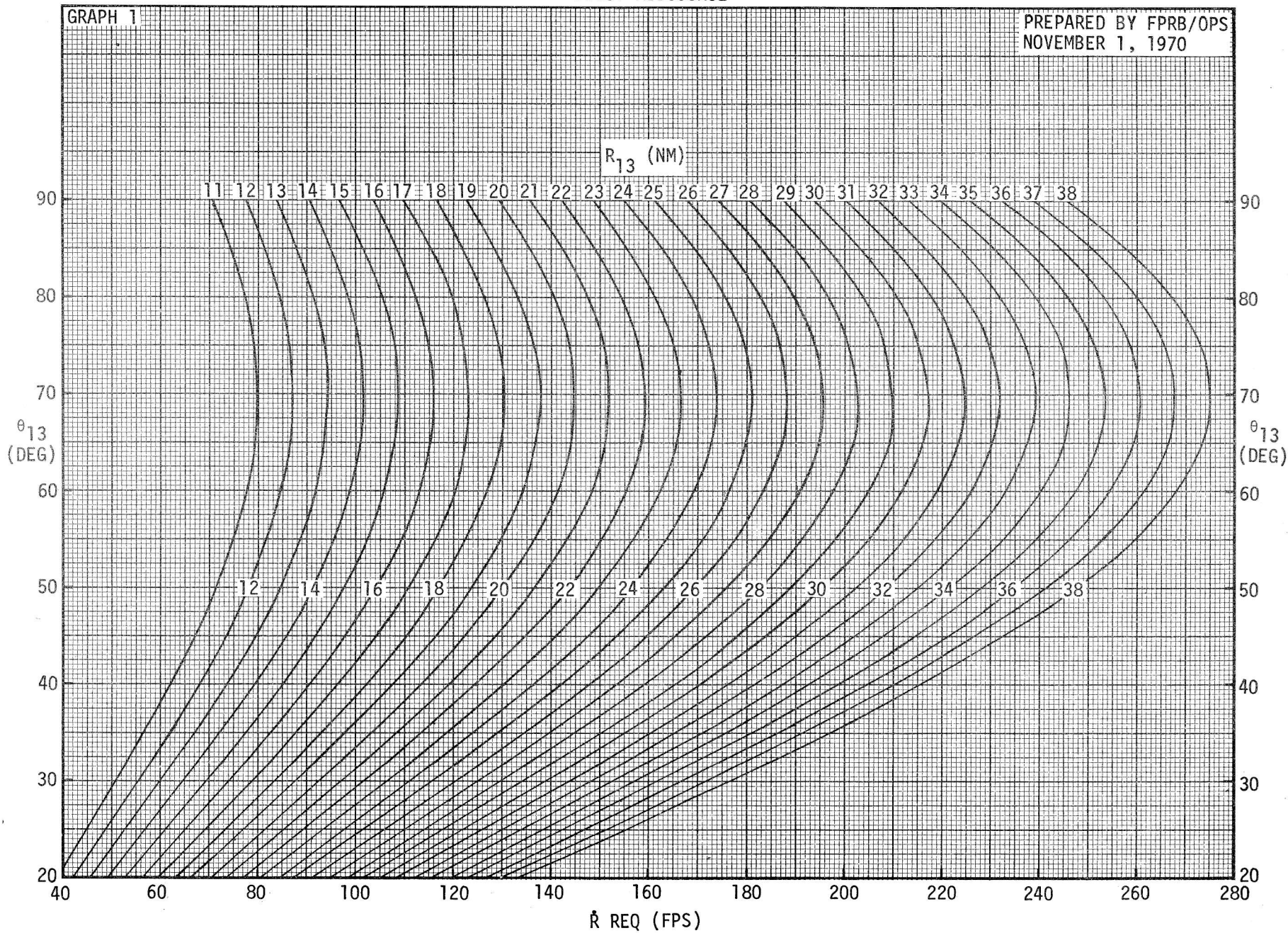
FIRST
MIDCOURSE

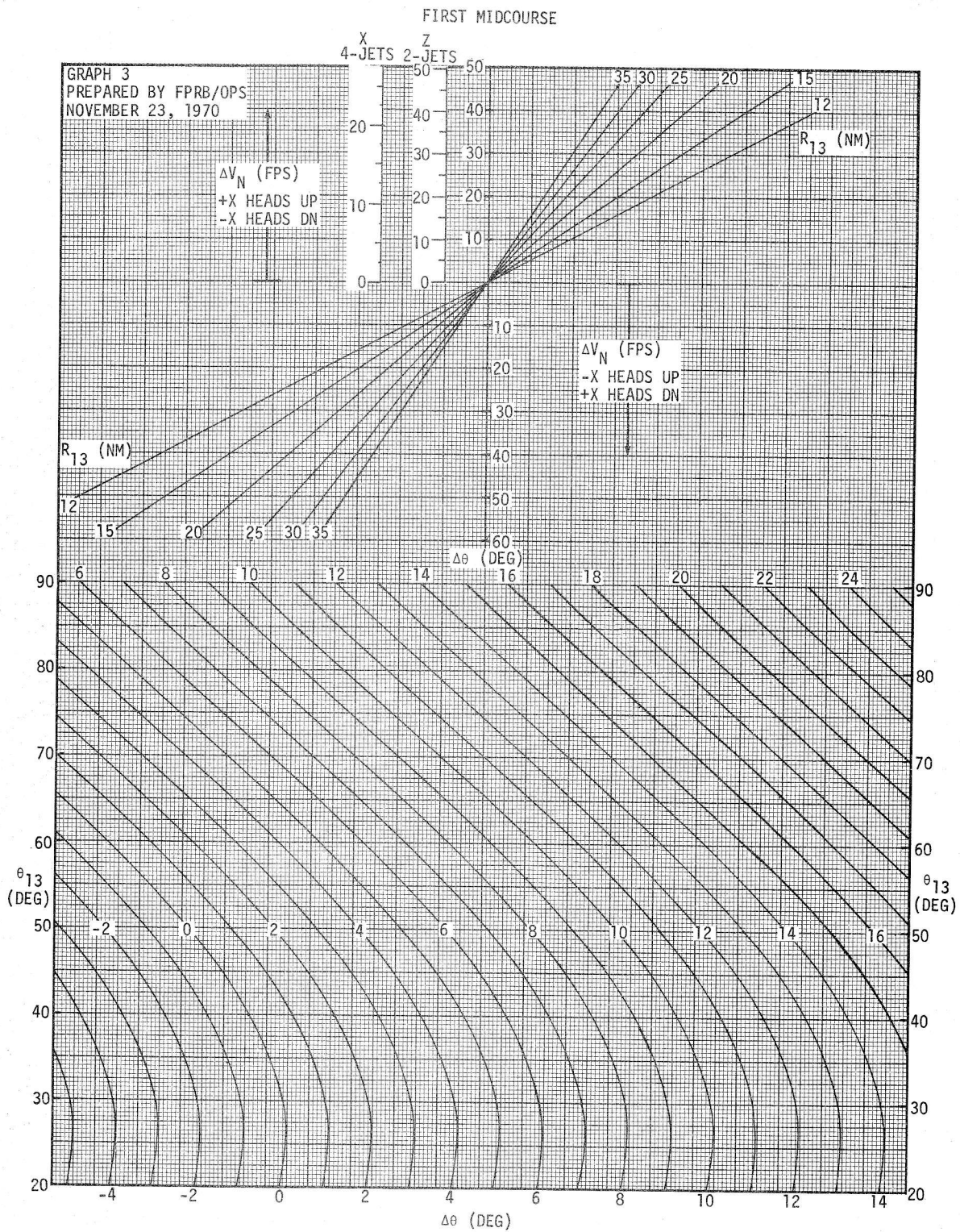
THIS PAGE INTENTIONALLY BLANK

FIRST MIDCOURSE

GRAPH 1

PREPARED BY FPRB/OPS
NOVEMBER 1, 1970



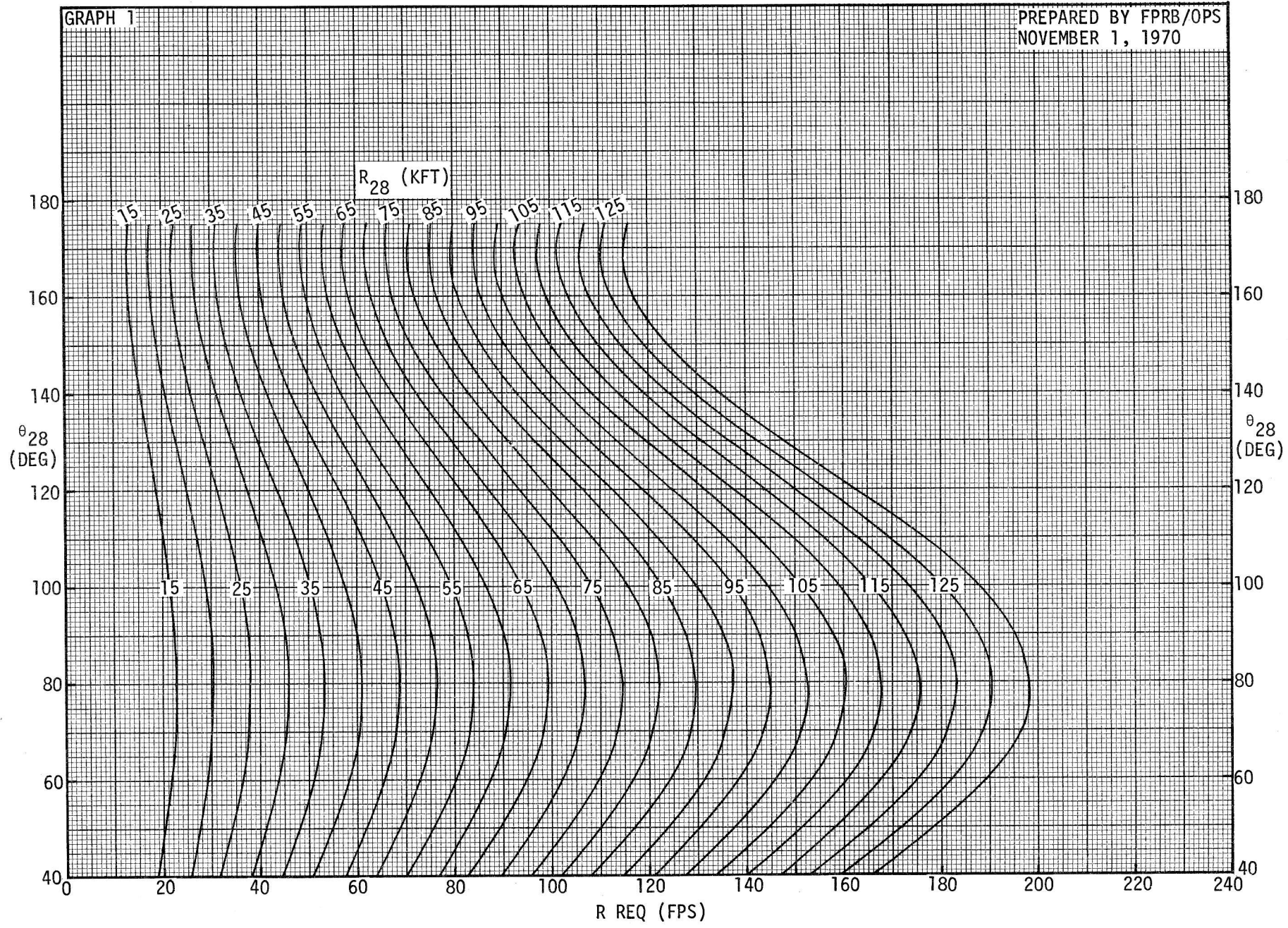


FIRST
MIDCOURSE

SECOND MIDCOURSE

GRAPH 1

PREPARED BY FPRB/OPS
NOVEMBER 1, 1970



SECOND MIDCOURSE

GRAPH 3
PREPARED BY FPRB/OPS
NOVEMBER 23, 1970

ΔV_N (FPS)
+X HEADS UP
-X HEADS DN

X
4-JETS
Z
2-JETS

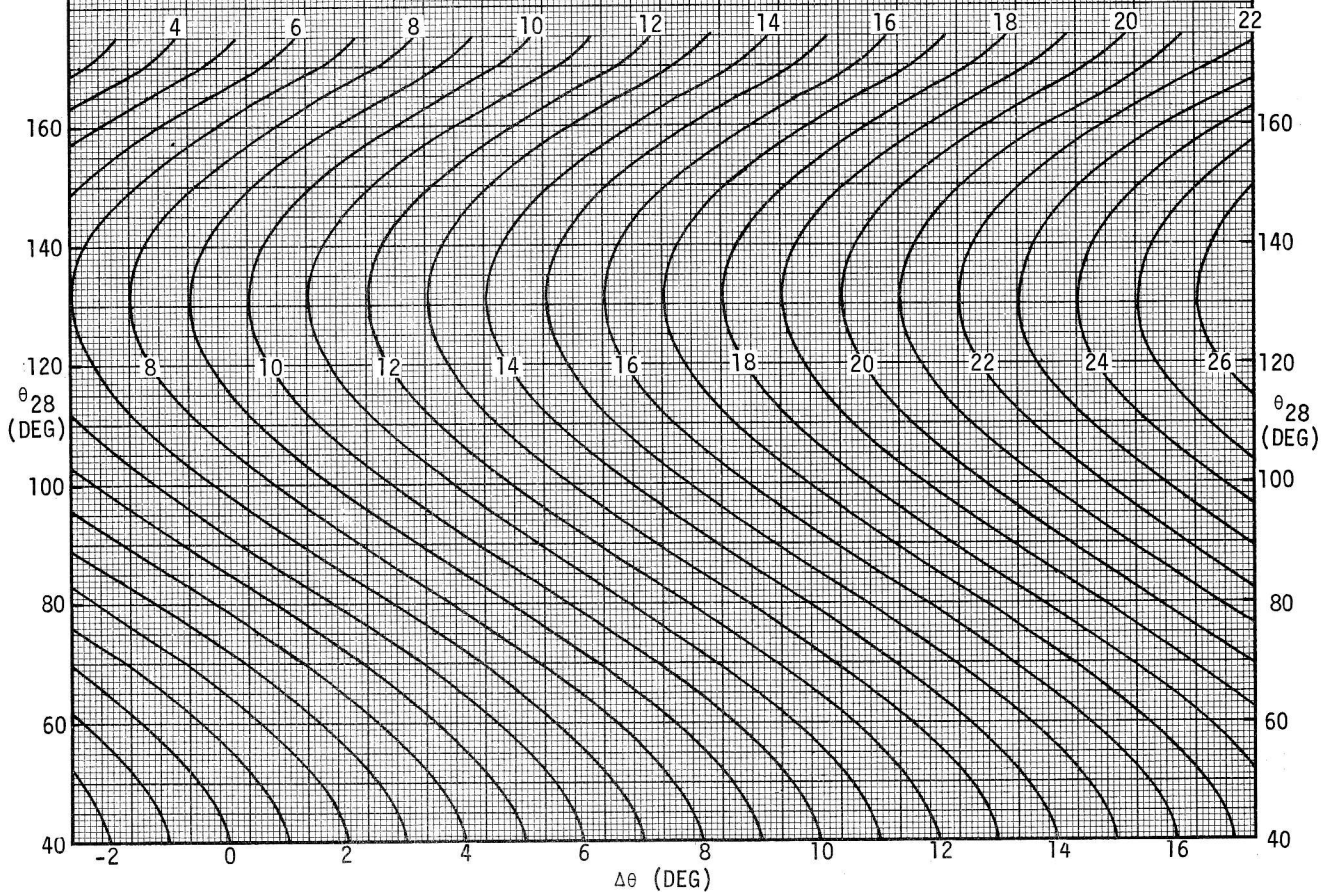
R_{28} (KFT)

ΔV_N (FPS)
-X HEADS UP
+X HEADS DN

R_{28} (KFT)

$\Delta\theta$ (DEG)

GRAPH 2



SECOND
MIDCOURSE

SECOND
MIDCOURSE

THIS PAGE INTENTIONALLY BLANK