ND-1021036

SUPPLEMENT
REVISION B
INITIAL TDRR 11133
TYPE 1
APPROVED BY NASA

APOLLO

COMMAND MODULE

GUIDANCE AND NAVIGATION SYSTEM

BLOCK I

GUIDANCE and NAVIGATION SYSTEM

CHECKOUT, MAINTENANCE, AND REPAIR MANUAL

THIS PUBLICATION SUPPLEMENTS ND 1021036 DATED 1 JULY 1964. IT CONTAINS CLASSIFIED JDC DATA SHEETS.

PREPARED FOR

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

MANNED SPACECRAFT CENTER

INTEGRATED BY

AC SPARK PLUG

THE ELECTRONICS DIVISION OF GENERAL MOTORS CORPORATION

MILWAUKEE, WISCONSIN 53201

PARTICIPATING CONTRACTOR WITH MIT/IL FOR NASA CONTRACT NAS 9-497

1 JULY 1964

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(P65-7878

[redacted] JDC 10079-* REV. ____ PAGE 1 OF 7

JOB PIPA SCALE FACTOR AND BIAS TEST | INITIAL TDRR 16919 D.S. PGS 9

SUBSYSTEM G&N SYSTEM | ASSY.

DESCRIPTION The stable member is erected to six orientations so that each PIPA IA will be parallel to local gravity. The average scale factor is calculated by using the plus and minus g input scale factors. Comparison of local g to g calculated by AGC program is used to calculate average scale factor.

Rev. Let.	Date	TDRR NO.	PAGES REVISED JDC	PAGES REVISED D.S.	APPROVAL MIT	APPROVAL NASA

REFERENCES See Below.

IMPORTANT See Below.

INTERVAL

TOOLS AND MATERIAL Per Paragraph 3-2 of ATP 1025500

REFERENCES: Paragraphs 3-3.5.1, 3-3.11.2.32 thru 3-3.11.2.41, 3-3.11.2.45 thru 3-3.11.2.51, 3-3.11.2.70 thru 3-3.11.2.75, 3-3.11.3.29 thru 3-3.11.3.31

IMPORTANT:

1. Proceed with this JDC if JDC 10063 has been completed and system operation has not been interrupted. If system operation has been interrupted, perform JDC 10061, Part III before proceeding with this JDC.

2. Those signals listed on the Data Sheets which are starred (**) must be corrected by the multiplication factor found on the signal identification drawings 1901554-001 or 1901554-002 to obtain the true value.

1. Insure that G&N MOUNTING FIXTURE is tilted to 32.5 (±0.5) degrees.

2. Set TRANSFER switch on the IMU CONTROL panel to COMPUTER.

3. Enter (and verify) VERB 40, NOUN 20 (ZERO ENCODE) into G&N AGC DSKY. Press ENTER pushbutton.

4. Enter (and verify) VERB 41, NOUN 20 (COARSE ALIGN) into G&N AGC DSKY. Press ENTER pushbutton. The VERB-NOUN display shall flash and indicate 21-22.

5. Enter (and verify) +00000 into G&N AGC DSKY. Press ENTER pushbutton.

6. Enter (and verify) - 01250 into G&N AGC DSKY. Press ENTER pushbutton.

7. Enter (and verify) +03825 into G&N AGC DSKY. Press ENTER pushbutton.

VERIFICATION WITH SIDL REQUIRED BEFORE USE DATE _____

The VERB-NOUN display shall stop flashing and indicate 41-22.

8. Measure and record the voltages of the following signals on the DVM by setting CROSSBAR CONTROL on PRIMARY SIGNAL SELECTOR panel to positions indicated:

a. X PIPA error at 56P9 pins 33 (high) and 32 (low) with CROSSBAR CONTROL set to 251.

b. Y PIPA error at 56P9 pins 43 (high) and 32 (low) with CROSSBAR CONTROL set to 152.

c. Z PIPA error at 56P9 pins 44 (high) and 32 (low) with CROSSBAR CONTROL set to 252.

9. Measure and record the voltage of the following signals on the DVM by setting CROSSBAR CONTROL on PRIMARY SIGNAL SELECTOR panel to 199:

a. X PIPA AC amp. at 45A3J1 pins 2 (high) and 1 (low).

b. Y PIPA AC amp. at 45A3J1 pins 3 (high) and 1 (low).

c. Z PIPA AC amp. at 45A4J1 pins 2 (high) and 1 (low).

10. Set GALVANOMETER RANGE switch to 1 VOLTS.

11. Set CURRENT SOURCE MONITOR VOLTAGE RANGE switch to TEMP READ and SELECTOR to MEASURE.

12. Adjust GALVANOMETER RANGE switch to obtain minimum meter null. The ratio transformer must indicate 50000 (±01250) before proceeding to step 13. Set RANGE switch to 1 VOLTS.

13. Set the PULSE TORQUE ELECTRONICS TEST SWITCH on PSA Front Panel Adapter to each position listed in column 2 of table 1. At each position measure and record the corresponding signal as follows:

a. Set the CURRENT SOURCE MONITOR SELECTOR to ZERO and the VOLTAGE RANGE switch to 5-6.

b. Adjust the GALVANOMETER RANGE switch and ZERO control to obtain minimum null on meter. Return RANGE switch to 1 VOLTS.

c. Set the CURRENT SOURCE MONITOR SELECTOR to STANDARDIZE.

d. Adjust GALVANOMETER RANGE switch and STANDARDIZE pot to obtain minimum null. Set RANGE switch to 1 VOLTS.

e. Set the CURRENT SOURCE MONITOR SELECTOR to MEASURE and adjust GALVANOMETER RANGE switch and VOLTAGE ratio transformer to obtain minimum null with RANGE switch set to .3 MILLIVOLTS.

NOTE: If null cannot be obtained on 5-6 voltage range, set voltage range to 6-7 and repeat b through e above.

f. Set RANGE switch to 1 VOLTS. Record VOLTAGE ratio transformer

indication.

14. Set CURRENT SOURCE MONITOR SELECTOR to ZERO and the VOLTAGE RANGE to 1.0-1.1.

15. Adjust the GALVANOMETER RANGE switch and ZERO control to obtain minimum null on meter. Return RANGE switch to 1 VOLTS.

16. Set CURRENT SOURCE MONITOR SELECTOR to STANDARDIZE.

17. Adjust GALVANOMETER RANGE switch and STANDARDIZE pot to obtain minimum null. Set RANGE switch to 1 VOLTS.

18. Measure and record each signal listed in table 2 as follows:

a. Set the PULSE TORQUE ELECTRONICS TEST SWITCH on PSA Front Panel Adapter to position listed in column 2 of table 2.

b. Set CURRENT SOURCE MONITOR SELECTOR to MEASURE and adjust RANGE switch and VOLTAGE ratio transformer to obtain minimum null with RANGE switch set to .3 MILLIVOLTS.

c. Set RANGE switch to 1 VOLTS. Record VOLTAGE ratio transformer indication.

TABLE 1

COLUMN 1	LOCATION	COLUMN 2
a. X PIPA PVR	45A3J1 pins 20 (high) and 21 (low)	1
b. X PIPA SF	45A3J1 pins 17 (high) and 21 (low)	3
c. Y PIPA PVR	45A3J1 pins 27 (high) and 28 (low)	4
d. Y PIPA SF	45A3J1 pins 18 (high) and 28 (low)	6
e. Z PIPA PVR	45A4J1 pins 20 (high) and 21 (low)	7
f. Z PIPA SF	45A4J1 pins 17 (high) and 21 (low)	9

TABLE 2

COLUMN 1	LOCATION	COLUMN 2
a. X PIPA TCM	45A3J1 pins 9 (high) and 17 (low)	2
b. Y PIPA TCM	45A3J1 pins 10 (high) and 18 (low)	5
c. Z PIPA TCM	45A4J1 pins 9 (high) and 17 (low)	8

19. Set PULSE TORQUE ELECTRONICS TEST SWITCH to OFF. Set SCOPE 'A' INPUT SIGNAL switch on PRIMARY SIGNAL SELECTOR panel to AUX COAX.

20. Connect cable in COAXIAL DISTRIBUTION PANEL from jack 14 to jack 27 and using pulse probes, measure and record peak-to-peak amplitude of following signals on the OSCILLOSCOPE:

a. X PIPA 'p' pulse at 45A3J1 pins 23 (high) and 1 (low).

b. X PIPA 'n' pulse at 45A3J1 pins 31 (high) and 1 (low).

c. X PIPA + Δ V at 45A5J1 pins 2 (high) and 1 (low).

d. Y PIPA 'p' pulse at 45A3J1 pins 24 (high) and 1 (low).

e. Y PIPA 'n' pulse at 45A3J1 pins 32 (high) and 1 (low).

f. Y PIPA + Δ V at 45A5J1 pins 3 (high) and 1 (low).

g. Z PIPA 'p' pulse at 45A4J1 pins 23 (high) and 1 (low).

h. Z PIPA 'n' pulse at 45A4J1 pins 31 (high) and 1 (low).

i. Z PIPA + Δ V at 45A5J1 pins 4 (high) and 1 (low).

21. Enter (and verify) VERB 25 NOUN 22 into G&N AGC DSKY. Press ENTER pushbutton.

22. Enter (and verify) +00000 into G&N AGC DSKY. Press ENTER pushbutton.

23. Enter (and verify) +16750 into G&N AGC DSKY. Press ENTER pushbutton.

24. Enter (and verify) -03825 into G&N AGC DSKY. Press ENTER pushbutton.

25. Measure and record peak-to-peak amplitude of the following signals on the OSCILLOSCOPE:

a. X PIPA - Δ V at 45A5J1 pins 10 (high) and 1 (low).

b. Y PIPA - Δ V at 45A5J1 pins 11 (high) and 1 (low).

c. Z PIPA - Δ V at 45A5J1 pins 12 (high) and 1 (low).

26. Disconnect cable from J27 and J14 in COAXIAL DISTRIBUTION PANEL.

27. Enter (and verify) VERB 71 into G&N AGC DSKY. Press ENTER pushbutton. The VERB-NOUN display will indicate 51-XX.

NOTE: If Noun XX is written in procedure, disregard Noun Indication. Look only for requested indications on AGC DSKY including R1, R2 and R3.

28. Set Optics HOLD switch to OFF, CONTROLLER MODE switch to DIRECT, Optics Mode switch to MANUAL, and CONTROLLER SPEED switch to MED.

29. Set Optics Mode switch to ZERO OPTICS. Wait until ZERO ENCODER lamp on Map and Data Viewer goes out. Set Optics Mode switch to MANUAL.

30. Using the Control Stick and CDU

thumbwheels, drive SHAFT ANGLE CDU to 180.0° and 2X TRUNNION CDU to 065.0°.

31. Sight through SXT eyepiece and using the Control Stick and CDU thumbwheels of the 2X TRUNNION CDU and SHAFT ANGLE CDU, position the StLOS until the center of the SXT reticle is coincident with the reticle dot of target No. 1. Set Optics HOLD switch to ON.

32. Press MARK pushbutton when satisfied with optical alignment.

33. Enter VERB 52 into G&N AGC DSKY. Press ENTER pushbutton.

34. Set Optics HOLD switch to OFF and Optics Mode switch to ZERO OPTICS. Wait until ZERO ENCODER lamp on Map and Data Viewer goes out. Set Optics Mode switch to MANUAL.

35. Using the Control Stick and CDU thumbwheel drive SHAFT ANGLE CDU to 241.0° and 2X TRUNNION CDU to 107.0°.

36. Sight through SXT eyepiece, use CDU thumbwheels to position the StLOS until the center of the SXT reticle is coincident with the reticle dot of target No. 4. Set Optics HOLD switch to ON. Press MARK pushbutton when satisfied with optics alignment.

37. Enter VERB 52 into G&N AGC DSKY. Press ENTER pushbutton.

38. The AGC now zeroes the IMU CDU's. The ENCODER ZEROING lamp on Map and Data Viewer shall light and VERB 06, NOUN 66 will appear on G&N AGC DSKY. Verb Noun display. The CDU FAIL lamp on Map and Data Viewer may light and the ZERO ENCODER lamp on Map and Data Viewer shall light and remain lighted. Wait 90 seconds before proceeding.

NOTE: If test is performed at MIT/IL-7 proceed to step 43.

39. Enter VERB 24 NOUN 01 into G&N AGC DSKY. Press ENTER pushbutton.

40. Enter address 00763_8 into G&N AGC DSKY. Press ENTER pushbutton.

41. Enter LATITUDE 1 (Table 3) for appropriate location into G&N AGC DSKY. Press ENTER pushbutton.

42. Enter LATITUDE 2 (Table 3) for appropriate location into G&N AGC DSKY.

TABLE 3

TEST LOCATION	LATITUDE 1	LATITUDE 2
ACSP	+11916	+45195
NAA	+09422	+81021
MSC	+08210	+14662
AMR LAB	to be defined	

DATE _____

Press ENTER pushbutton.

43. Register R3 of the G&N AGC DSKY shall be 00001, which corresponds to position 1 in Table 4.

TABLE 4

COLUMN 1 POSITION INDICATED IN R3 OF DSKY	COLUMN 2 PIPA TO BE TESTED AND SENSE
00001	X PIPA +
00002	X PIPA -
00003	Y PIPA +
00004	Y PIPA -
00005	Z PIPA +
00006	Z PIPA -

NOTE: Register R3 on the G&N AGC DSKY shall increment by 1 from its previous reading until all 6 positions as shown by Table 4 are completed.

44. Enter VERB 33 into G&N AGC DSKY. Press ENTER pushbutton.

NOTE: The AGC will cause IMU mode changes through COARS ALIGN to FINE ALIGN. This routine takes approximately 10 minutes to complete.

45. When VERB 06, NOUN 66 appears, record the indications on R1 and R2 of G&N AGC DSKY on calculation sheet for the tested position.

46. Enter VERB 33 into G&N AGC DSKY. Press ENTER pushbutton.

47. Repeat steps 38 through 46 until all of the desired PIPA Scale Factor tests are completed.

48. Enter VERB 34 into G&N AGC DSKY. Press ENTER pushbutton. System is now free for other testing.

49. Set the TRANSFER switch to MANUAL and press the COARS ALIGN pushbutton.

50. Measure accel. ind. bridge at 45A7J1 pin 25 (high with respect to pin 26 if temperature error is positive) by setting MONITOR METER SELECT switch on TEMPERATURE MONITOR CONTROL panel to ACCEL. Record °F. indication of MONITOR meter.

51. Perform calculations (ag), (am) thru

(au), (ax) thru (be) and (bh) thru (bs) on data sheets.

52. Transfer data from data sheets 1 thru 8 onto PIPA DATA SUMMARY SHEET (9). Complete PIPA DATA SUMMARY SHEET every time this JDC is run and send copy of all data sheets immediately to:

Inertial Subsystem Development Division
Mail Station #63
Instrumentation Laboratory
75 Cambridge Parkway
Cambridge, Mass. 02142

TABLE 5

TEST LOCATION	LOCAL 'g'
ACSP	980.3246
NAA	979.55
MSC	to be defined
AMR	to be defined

DATE _____

APOLLO G&N
EQUIPMENT TEST
DATA SHEET 1 OF 9

JDC
NO. 10079
REV. _____
INITIAL TDRR 16919

JOB PIPA SCALE FACTOR AND BIAS TEST

ASSEMBLY UNDER TEST

TITLE _____

SER. NO. _____ DWG _____ REV. ____

TEST HISTORY

DATE _____ (START) _____ (END) _____ (SITE / LOCATION)

TIME _____ (START) _____ (END) _____ (TOTAL ELAPSED)

MAJOR GROUND SUPPORT EQUIPMENT

NAME _____ SER. NO. _____ _____ (CAL DATE)

NAME _____ SER. NO. _____ _____ (CAL DATE)

CONDUCTED BY _____ (NAME/AFFILIATION) APPROVED BY _____ (NAME/AFFILIATION)

JDC ITEM NO.	PARAMETER	UNITS	MIN VALUE	RECORDED VALUES 1st	RECORDED VALUES 2nd*	RECORDED VALUES 3rd*	MAX VALUE	REJ	ACC	
8a	X PIPA error	volts rms	0				1.0			(a)
8b	Y PIPA error	volts rms	0				1.0			(b)
8c	Z PIPA error	volts rms	0				1.0			(c)
9a	X PIPA AC amp	volts rms	0				1.0			(d)
9b	Y PIPA AC amp	volts rms	0				1.0			(e)
9c	Z PIPA AC amp	volts rms	0				1.0			(f)
13a	X PIPA PVR	volts, dc	5.94				6.06			(g)
13b	X PIPA scale Factor	volts, dc	5.94				6.06			(h)

* TO BE USED AS REQUIRED OR DESIRED

DATE _____

APOLLO G & N
EQUIPMENT TEST
DATA SHEET 2 OF 9

JDC
NO. 10079
REV. _____

JOB PIPA SCALE FACTOR AND BIAS TEST

JDC ITEM NO.	PARAMETER	UNITS	MIN VALUE	RECORDED VALUES			MAX VALUE	REJ	ACC	
				1st	2nd*	3rd*				
13c	Y PIPA PVR	volts, dc	5.94				6.06			(k)
13d	Y PIPA Scale Factor	volts, dc	5.94				6.06			(m)
13e	Z PIPA PVR	volts, dc	5.94				6.06			(n)
13f	Z PIPA Scale Factor	volts, dc	5.94				6.06			(p)
18a	X PIPA TCM	volts, dc	0.98				1.08			(q)
18b	Y PIPA TCM	volts, dc	0.98				1.08			(r)
18c	Z PIPA TCM	volts, dc	0.98				1.08			(s)
20a	X PIPA "p" pulse **	volts, p-p	14				22			(t)
20b	X PIPA "n" pulse **	volts, p-p	14				22			(u)
20c	X PIPA + Δ V	volts, p-p	4				10			(v)
20d	Y PIPA "p" pulse **	volts, p-p	14				22			(w)
20e	Y PIPA "n" pulse **	volts, p-p	14				22			(x)
20f	Y PIPA + Δ V	volts, p-p	4				10			(y)
20g	Z PIPA "p" pulse **	volts, p-p	14				22			(z)

* TO BE USED AS REQUIRED OR DESIRED

** Correct this measurement using the "Mult by" factor as specified on drawings 1901554-001 or 1901554-002 to obtain the true value.

DATE _____

APOLLO G & N
EQUIPMENT TEST
DATA SHEET 3 OF 9

JDC
NO. 10079
REV. _____

JOB PIPA SCALE FACTOR AND BIAS TEST

JDC ITEM NO.	PARAMETER	UNITS	MIN VALUE	RECORDED VALUES			MAX VALUE	REJ	ACC	
				1st	2nd*	3rd*				
20h	Z PIPA "n" pulse **	volts, p-p	14				22			(aa)
20i	Z PIPA + ΔV	volts, p-p	4				10			(ab)
25a	X PIPA - ΔV	volts, p-p	4				10			(ac)
25b	Y PIPA - ΔV	volts, p-p	4				10			(ad)
25c	Z PIPA - ΔV	volts, p-p	4				10			(ae)
50	PIPA bridge	°F								(af)
	Calculate: 130° F + Line (af)	°F								(ag)

* TO BE USED AS REQUIRED OR DESIRED

** Correct this measurement using the "Mult by" factor as specified on drawings 1901554-001 or 1901554-002 to obtain the true value.

DATE _____

APOLLO G & N
EQUIPMENT TEST
DATA SHEET 4 OF 9

JDC NO. 10079
REV. _____

JOB PIPA SCALE FACTOR AND BIAS TEST

JDC ITEM NO.	PARAMETER	UNITS	MIN VALUE	RECORDED VALUE	MAX VALUE	REJ	ACC	
45	Record DSKY Rdg. PIPA Position 01001 (+) X	cm / sec^2		R_1 _____.00000 R_2 00000._____				(ah)
45	Record DSKY Rdg. PIPA Position 01002 (-) X	cm / sec^2		R_1 _____.00000 R_2 00000._____				(ak)
51	Sum Lines (ah) and (ak)			_____._____				(am)
51	Divide Line (am) by 2. Average Calculated g for X-PIPA	cm / sec^2		_____._____				(an)
51	Calculate: 5.85 x (Local g) from Table 5			5.85 (_____) _____._____				(ap)
51	Divide Line (ap) by Line (an). Average Calculated SF for X-PIPA	cm/sec / pulse	5.848830	—._____	5.851170			(aq)
51	Subtract 5.85000 from Line (aq) and divide result by 5.85×10^{-6}	PPM		$\frac{(\quad) - 5.85000}{5.85 \times 10^{-6}}$ = ( )_____				(ar)

DATE

APOLLO G & N
EQUIPMENT TEST
DATA SHEET 5 OF 9

JDC NO. 10079
REV. _____

JOB PIPA SCALE FACTOR AND BIAS TEST

JDC ITEM NO.	PARAMETER	UNITS	MIN VALUE	RECORDED VALUE	MAX VALUE	REJ	ACC	
51	Record PIPA BIAS from most recent previous test.	$\frac{cm}{sec^2}$		( )_._____				(as)
51	Calculate: Line (ah) — Line (an). BIAS: X-PIPA	$\frac{cm}{sec^2}$		( )_._____				(at)
51	Calculate: Line (as) — Line (at). BIAS DEV: X-PIPA	$\frac{cm}{sec^2}$	-0.2	( )_._____	+0.2			(au)
45	Record DSKY Rdg. PIPA Position 01003 (+) Y	$\frac{cm}{sec^2}$		R_1 _____,00000 R_2 00000,_____				(av)
45	Record DSKY Rdg. PIPA Position 01004 (-) Y	$\frac{cm}{sec^2}$		R_1 _____,00000 R_2 00000,_____				(aw)
51	Sum Lines (av) and (aw)			_____._____				(ax)
51	Divide Line (ax) by 2. Average Calculated g for Y-PIPA	$\frac{cm}{sec^2}$		_____._____				(ay)

[redacted]

DATE _____

APOLLO G & N
EQUIPMENT TEST
DATA SHEET 6 OF 9

JDC NO. 10079
REV. _____

JOB PIPA SCALE FACTOR AND BIAS TEST

JDC ITEM NO.	PARAMETER	UNITS	MIN VALUE	RECORDED VALUE	MAX VALUE	REJ	ACC	
51	Transcribe result from Line (ap)			----.------				(az)
51	Divide Line (az) by Line (ay). Average Calculated SF for Y-PIPA	cm/sec / pulse	5.848830	-.------	5.851170			(ba)
51	Subtract 5.85000 from Line (ba) and divide result by 5.85×10^{-6}	PPM		$\frac{(\quad) - 5.85000}{5.85 \times 10^{-6}}$ = ( ) _____				(bb)
51	Record PIPA BIAS from most recent previous test	$\frac{cm}{sec^2}$		( ) —.------				(bc)
51	Calculate: Line (av) — Line (ay). BIAS: Y-PIPA	$\frac{cm}{sec^2}$		( ) —.------				(bd)
51	Calculate: Line (bc) — Line (bd). BIAS DEV: Y-PIPA	$\frac{cm}{sec^2}$	-0.2	( ) —.------	+0.2			(be)

DATE _____

APOLLO G & N
EQUIPMENT TEST
DATA SHEET 7 OF 9

[redacted]

JDC NO. 10079
REV. _____

JOB PIPA SCALE FACTOR AND BIAS TEST

JDC ITEM NO.	PARAMETER	UNITS	MIN VALUE	RECORDED VALUE	MAX VALUE	REJ	ACC	
45	Record DSKY Rdg. PIPA Position 01005 (+) Z	cm/sec²		R_1 _____.00000 R_2 00000._____				(bf)
45	Record DSKY Rdg. PIPA Position 01006 (-) Z	cm/sec²		R_1 _____.00000 R_2 00000._____				(bg)
51	Sum Lines (bf) and (bg)			_____._____				(bh)
51	Divide Line (bh) by 2. Average Calculated g for Z-PIPA	cm/sec²		_____._____				(bk)
51	Transcribe result from Line (ap)			____._____				(bm)
51	Divide Line (bm) by Line (bk). Average Calculated SF for Z-PIPA	cm/sec pulse	5.848830	-._____	5.851170			(bn)
51	Subtract 5.85000 from Line (bn) and divide result by 5.85×10^{-6}	PPM		$\frac{(\quad) - 5.85000}{5.85 \times 10^{-6}}$ = ( )_____				(bp)

[redacted]

DATE _____

[redacted]

by law.

APOLLO G & N
EQUIPMENT TEST
DATA SHEET 8 OF 9

JDC
NO. 10079
REV. _____

JOB PIPA SCALE FACTOR AND BIAS TEST

JDC ITEM NO.	PARAMETER	UNITS	MIN VALUE	RECORDED VALUE	MAX VALUE	REJ	ACC	
51	Record PIPA BIAS from most recent previous test	$\frac{cm}{sec^2}$		( ) —.——				(bq)
51	Calculate: Line (bf) — Line (bk). BIAS: Z-PIPA	$\frac{cm}{sec^2}$		( ) —.——				(br)
51	Calculate: Line (bq) — Line (br). BIAS DEV: Z-PIPA	$\frac{cm}{sec^2}$	-0.2	( ) —.——	+0.2			(bs)

DATE _____

APOLLO G & N
EQUIPMENT TEST
DATA SHEET 9 OF 9

[redacted]
(When Filled In)

JDC
NO. 10079
REV. _____

JOB PIPA SCALE FACTOR AND BIAS TEST

PIPA DATA SUMMARY SHEET			
	X PIPA	Y PIPA	Z PIPA
Serial #			
a_B	Line (at)	Line (bd)	Line (br)
Average SF (A)	Line (aq)	Line (ba)	Line (bn)
PVR	Line (g)	Line (k)	Line (n)
I_{TM}	Line (q)	Line (r)	Line (s)
Temperature	Line (ag)		
G & N Serial #			
Date Tested			
Tested by			
Tested at			
Checked by			

Failure or Remarks: _____

(When Filled In)

DATE _____

[redacted]

JDC 10080 REV. ____ PAGE 1 OF 4

JOB IRIG COEFFICIENT DETERMINATION TEST

INITIAL TDRR 16919 D.S. PGS 12

SUBSYSTEM G AND N SYSTEM

ASSY.

DESCRIPTION IRIG drift due to acceleration along input axis, IRIG drift due to acceleration along spin reference axis, and IRIG bias drift are determined.

Rev. Let.	Date	TDRR NO.	PAGES REVISED JDC	PAGES REVISED D.S.	APPROVAL MIT	APPROVAL NASA

REFERENCES Paragraphs 3-3.6.2.1 thru 3-3.6.2.3 of ATP 1025500

IMPORTANT See below

INTERVAL

TOOLS AND MATERIAL Per Paragraph 3-2 of ATP 1025500

IMPORTANT: Proceed with this JDC if JDC 10063 has been completed and system operation has not been interrupted. If system operation has been interrupted, perform JDC 10061, Part III before proceeding with this JDC.

1. Insure that G and N MOUNTING FIXTURE is tilted to 32.5 (±0.5) degrees.
2. Read and record WHEEL time from the POWER SUPPLY and LOAD PANEL.
3. Set TRANSFER switch on the IMU CONTROL panel to COMPUTER.
4. Enter (and verify) VERB 70 into G and N AGC DSKY. Press ENTER pushbutton.
5. The AGC now initiates the ZERO ENCODER mode.
6. VERB 06, NOUN 66 will appear on G and N AGC DSKY VERB-NOUN display.

NOTE: If test is performed at MIT/IL-7, proceed to step 11.

7. Enter VERB 24 NOUN 01 into G and N AGC DSKY. Press ENTER pushbutton.
8. Enter address 00763 into G and N AGC DSKY. Press ENTER pushbutton.
9. Enter LATITUDE (Table 1) for appropriate location into G and N AGC DSKY. Press ENTER pushbutton.
10. Enter LATITUDE +1 (Table 1) for appropriate location into G and N AGC DSKY. Press ENTER pushbutton.
11. Compare R3 indication on G and N AGC DSKY with appropriate number in Table 2. If indication agrees with coefficient to be tested, proceed to step 15.

VERIFICATION WITH SIDL REQUIRED BEFORE USE DATE _____

[redacted]

12. Enter VERB 21, NOUN 02 into G and N AGC DSKY. Press ENTER pushbutton.
13. Enter address 01205_8 into G and N AGC DSKY. Press ENTER pushbutton.
14. Enter desired position from Column 1 of Table 2 into G and N AGC DSKY. Press ENTER pushbutton.

TABLE 1

TEST LOCATION	LATITUDE	LATITUDE +1	DISPLAY	DISPLAY +1
ACSP	+11916	+45195	+01952	+45197
MIT	+11767	+04048	+01928	+04047 *
MSC	+08210	+14662	+01345	+14661
NAA	+09422	+81021	+01544	+81018

* ONLY IF INSERTED

TABLE 2

COLUMN 1 POSITION INDICATION IN R3 OF DSKY	COLUMN 2 IRIG COEFFICIENT(S) TO BE TESTED
+00001	$+NBD_y$
+00002	$+NBD_z$
+00003	$+ADSRA_z + NBD_z$
+00004	$+ADSRA_x + NBD_x$
+00005	$+NBD_x$
+00006	$+ADSRA_y + NBD_y$
+00007	$+1/2\ ADIA\ (Z-Y) + 1/2\ ADSRA\ (Z+Y) + \frac{\sqrt{2}}{2} NBD\ (Z-Y)$
+00008	$+1/2\ ADIA\ (X-Z) + \frac{\sqrt{2}}{2} NBD\ (X-Z)$
+00009	$+1/2\ ADIA\ (-X+Y) + 1/2\ (ADSRAX) + \frac{\sqrt{2}}{2} NBD\ (-X+Y)$

DATE _____

15. Record desired position number as displayed in R3 of G and N AGC DSKY on data sheet identified for desired position.
16. When ZERO ENCODER condition lamp goes out, enter VERB 33 into G and N AGC DSKY. Press ENTER pushbutton.
17. VERB-NOUN display will flash 51 XX on the G and N AGC DSKY.
18. Insure Optics HOLD switch is set to OFF, CONTROLLER MODE switch to DIRECT, Optics Mode switch to ZERO OPTICS and CONTROLLER SPEED switch to MED. When ZERO ENCODER light goes out, set Optics Mode Switch to MANUAL.
19. Using the Control Stick and CDU thumbwheels of 2X TRUNNION and SHAFT CDU's position the 2X TRUNNION and SHAFT CDU's to 065.00 and 180.00 respectively.
20. Sighting through SXT eyepiece and using the CDU thumbwheels of the 2X TRUNNION and SHAFT CDU's, position the StLOS until the center of the SXT reticle is coincident with the reticle dot of target #1. Set Optics HOLD switch to ON.
21. Press MARK pushbutton when satisfied with optical alignment.
22. Enter VERB 52 into G and N AGC DSKY. Press ENTER pushbutton.
23. Set Optics HOLD switch to OFF and using the Control Stick and CDU thumbwheels of 2X TRUNNION and SHAFT CDU's position the 2X TRUNNION and SHAFT CDU's to 107.00 and 241.00 respectively.
24. Repeat steps 20 and 21 for target #4.
25. Enter VERB 52 into G and N AGC DSKY. Press ENTER pushbutton.
26. The AGC will cause the IMU mode changes through COARSE ALIGN to FINE ALIGN. GIMBAL LOCK lamp may light.
27. When G and N AGC DSKY VERB-NOUN display flashes VERB 06 NOUN 66 (after approximately 16 minutes), record the indications in R1 and R2 of G and N AGC DSKY on data sheet identified for tested position.
28. Enter VERB 33 into G and N AGC DSKY. Press ENTER pushbutton.
29. Record data R1 and R3 of G and N AGC DSKY on data sheet identified for the tested position.
30. Enter VERB 33 into G and N AGC DSKY. Press ENTER pushbutton.
31. Record data in R1 and R3 of G and N AGC DSKY on data sheet identified for the tested position.
32. Enter VERB 33 into G and N AGC DSKY. Press ENTER pushbutton.
33. Record data in R1 and R2 of G and N AGC DSKY on data sheet identified for the tested position.
34. Enter VERB 33 into G and N AGC DSKY. Press ENTER pushbutton.
35. Record data in R1 and R3 of G and N AGC DSKY on data sheet identified for the tested position.

DATE _____

36. Enter VERB 33 into G and N AGC DSKY. Press ENTER pushbutton.

37. Record data in R1 and R3 of G and N AGC DSKY on data sheet identified for the tested position.

38. Enter VERB 33 into G and N AGC DSKY. Press ENTER pushbutton.

39. Repeat steps 11 through 38 until all of the desired IRIG coefficients are tested.

NOTE: If the coefficients of each IRIG are to be determined, repeat steps 11 through 38 for all positions listed in Column 1 of Table 2.

40. Enter VERB 34 into G and N AGC DSKY. Press ENTER pushbutton. System is now free for other testing.

41. Perform indicated operations a, b, c, d, e, f, and g on data sheet.

42. Perform indicated calculations on the data sheets identified for appropriate tested position.

43. Perform all indicated operations and calculations on remaining data sheets.

44. Upon completion of the data sheets every time this JDC is run, make duplicates and forward them immediately to:

Inertial Subsystem Development Division
MS #63
Instrumentation Laboratory
75 Cambridge Parkway
Cambridge, Mass. 02142

TABLE 3

TEST LOCATION	LOCAL $g\left(\frac{cm}{sec^2}\right)$	We Cos λ (meru)
ACSP	980.32	732.54
NAA	979.55	829.77
MIT	980.402	738.87
MSC	to be defined	869.87
AMR	to be defined	to be defined

TABLE 4

POSITION NUMBER	PIPA SCALE FACTOR
1	Z PIPA
2	Y PIPA
3	X PIPA
4	Z PIPA
5	Y PIPA
6	X PIPA
7	X PIPA
8	Y PIPA
9	Z PIPA

DATE _____

APOLLO G&N
EQUIPMENT TEST
DATA SHEET 1 OF 12

[redacted] (When filled in)

JDC
NO. 10080
REV. ____
INITIAL TDRR 16919

JOB _____

ASSEMBLY UNDER TEST

TITLE _____

SER. NO. _____ DWG _____ REV. ____

TEST HISTORY

DATE _____ START _____ END _____ SITE / LOCATION

TIME _____ START _____ END _____ TOTAL ELAPSED

MAJOR GROUND SUPPORT EQUIPMENT

NAME _____ SER. NO. _____ _____ CAL DATE

NAME _____ SER. NO. _____ _____ CAL DATE

CONDUCTED BY _____ NAME/AFFILIATION

APPROVED BY _____ NAME/AFFILIATION

JDC ITEM NO.	PARAMETER	UNITS	MIN VALUE	RECORDED VALUE	MAX VALUE	REJ	ACC	
2	Wheel Time			(Hours)				
41	Multiply 7.29209 x 10-8 by Local g of Table 3			(+)_____				(a)
41	Transfer SF(A)X from JDC 10079 Item 54, line aq			( )_____				(b)
41	Transfer SF(A)Y from JDC 10079 Item 54, line ba			( )_____				(c)
41	Transfer SF(A) Z from JDC 10079 Item 54, line bn			( )_____				(d)
41	Divide line (b) by line (a)			( )_____				(e)
41	Divide line (c) by line (a)			( )_____				(f)
41	Divide line (d) by line (a)			( )_____				(g)

[redacted] (When filled in)

DATE _____

APOLLO G & N
EQUIPMENT TEST
DATA SHEET 2 OF 12

CONFIDENTIAL

(When filled in)

JDC NO. 10080
REV. ____

JOB IRIG COEFFICIENT DETERMINATION TEST - POSITION 1

LINE	JDC ITEM NO.	PARAMETER	RECORDED VALUE	
(h)	15	Record DSKY POSITION NUMBER	R3	— — — — —
(k)	27	Record DSKY Time 1	R1	— — — — — . 0 0 0 0 0
(m)	27	Record DSKY Time 1	R2	0 0 0 0 0 . — — — — —
(n)	42	Sum lines (k) and (m)		— — — — — . — — X X X
(p)	29	Record DSKY East PIP 1	R1	( ) — — — — —
(q)	29	Record DSKY Identification	R3	0 1 0 0 —
(r)	31	Record DSKY South PIP 1	R1	( ) — — — — —
(s)	31	Record DSKY Identification	R3	0 1 0 0 —
(t)	33	Record DSKY Time 2	R1	— — — — — . 0 0 0 0 0
(u)	33	Record DSKY Time 2	R2	0 0 0 0 0 . — — — — —
(v)	42	Sum lines (t) and (u)		— — — — — . — — X X X
(w)	35	Record DSKY East PIP 2	R1	( ) — — — — —
(x)	35	Record DSKY Identification	R3	0 1 0 0 —
(y)	37	Record DSKY South PIP 2	R1	( ) — — — — —
(z)	37	Record DSKY Identification	R3	0 1 0 0 —
(aa)	42	Subtract line (p) from line (w)		( ) — — — — —
(ab)	42	Square line (v)		(+) _____
(ac)	42	Divide line (aa) by line (ab)		( ) _____
(ad)	42	Multiply line (g) by line (ac)		( ) _____
(ae)	42	Subtract appropriate We Cos λ of Table 3 from line (ad)		NBD_y = ( ) _____ in MERU

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(When filled in)

DATE _____

APOLLO G & N
EQUIPMENT TEST
DATA SHEET 3 OF 12

[redacted]

(When filled in)

JDC
NO. 10080
REV. ____

JOB IRIG COEFFICIENT DETERMINATION TEST - POSITION 2

LINE	JDC ITEM NO.	PARAMETER	RECORDED VALUE	
(af)	15	Record DSKY POSITION NUMBER	R3	— — — — —
(ag)	27	Record DSKY Time 1	R1	——————.00000
(ah)	27	Record DSKY Time 1	R2	00000.——————
(ak)	42	Sum lines (ag) and (ah)		——————.——XXX
(am)	29	Record DSKY East PIP 1	R1	( )— — — — —
(an)	29	Record DSKY Identification	R3	0 1 0 0 —
(ap)	31	Record DSKY South PIP 1	R1	( )— — — — —
(aq)	31	Record DSKY Identification	R3	0 1 0 0 —
(ar)	33	Record DSKY Time 2	R1	——————.00000
(as)	33	Record DSKY Time 2	R2	00000.——————
(at)	42	Sum lines (ar) and (as)		——————.——XXX
(au)	35	Record DSKY East PIP 2	R1	( ) — — — — —
(av)	35	Record DSKY Identification	R3	0 1 0 0 —
(aw)	37	Record DSKY South PIP 2	R1	( ) — — — — —
(ax)	37	Record DSKY Identification	R3	0 1 0 0 —
(ay)	42	Subtract line (am) from line (au)		( ) — — — — —
(az)	42	Square line (at)		(+) _____
(ba)	42	Divide line (ay) by line (az)		( ) _____
(bb)	42	Multiply line (f) by line (ba)		( ) _____
(bc)	42	Subtract appropriate We Cos λ of Table 3 from line (bb)		NBD_z = ( ) _____ in MERU

[redacted]

(When filled in)

DATE _____

JOB IRIG COEFFICIENT DETERMINATION TEST - POSITION 3

LINE	JDC ITEM NO.	PARAMETER	RECORDED VALUE	
(bd)	15	Record DSKY POSITION NUMBER	R3	— — — — —
(be)	27	Record DSKY Time 1	R1	——————.00000
(bf)	27	Record DSKY Time 1	R2	00000.——————
(bg)	42	Sum lines (be) and (bf)		——————.——XXX
(bh)	29	Record DSKY East PIP 1	R1	( )— — — — —
(bk)	29	Record DSKY Identification	R3	0 1 0 0 —
(bm)	31	Record DSKY South PIP 1	R1	( )— — — — —
(bn)	31	Record DSKY Identification	R3	0 1 0 0 —
(bp)	33	Record DSKY Time 2	R1	——————.00000
(bq)	33	Record DSKY Time 2	R2	00000.——————
(br)	42	Sum line (bp) and (bq)		——————.——XXX
(bs)	35	Record DSKY East PIP 2	R1	( )— — — — —
(bt)	35	Record DSKY Identification	R3	0 1 0 0 —
(bu)	37	Record DSKY South PIP 2	R1	( )— — — — —
(bv)	37	Record DSKY Identification	R3	0 1 0 0 —
(bw)	42	Subtract line (bh) from line (bs)		( ) — — — — —
(bx)	42	Square line (br)		(+) _____
(by)	42	Divide line (bw) by line (bx)		( ) _____
(bz)	42	Multiply line (e) by line (by)		( ) _____
(ca)	42	Subtract appropriate We Cos λ of Table 3 from line (bz)		( ) _____ in MERU

APOLLO G & N
EQUIPMENT TEST
DATA SHEET 5 OF 12

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(When filled in)

JDC
NO. 10080
REV. _____

JOB IRIG COEFFICIENT DETERMINATION TEST - POSITION 4

LINE	JDC ITEM NO.	PARAMETER	RECORDED VALUE	
(cb)	15	Record DSKY POSITION NUMBER	R3	— — — — —
(cc)	27	Record DSKY Time 1	R1	——————.00000
(cd)	27	Record DSKY Time 1	R2	00000.——————
(ce)	42	Sum lines (cc) and (cd)		——————.——XXX
(cf)	29	Record DSKY East PIP 1	R1	( )— — — — —
(cg)	29	Record DSKY Identification	R3	0 1 0 0 —
(ch)	31	Record DSKY South PIP 1	R1	( )— — — — —
(ck)	31	Record DSKY Identification	R3	0 1 0 0 —
(cm)	33	Record DSKY Time 2	R1	——————.00000
(cn)	33	Record DSKY Time 2	R2	00000.——————
(cp)	42	Sum lines (cm) and (cn)		——————.——XXX
(cq)	35	Record DSKY East PIP 2	R1	( ) — — — — —
(cr)	35	Record DSKY Identification	R3	0 1 0 0 —
(cs)	37	Record DSKY South PIP 2	R1	( ) — — — — —
(ct)	37	Record DSKY Identification	R3	0 1 0 0 —
(cu)	42	Subtract line (cf) from line (cq)		( ) — — — — —
(cv)	42	Square line (cp)		(+) _____
(cw)	42	Divide line (cu) by line (cv)		( ) _____
(cx)	42	Multiply line (g) by line (cw)		( ) _____
(cy)	42	Subtract appropriate We Cos λ of Table 3 from line (cx)		( ) _____ in MERU

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(When filled in)

DATE _____

APOLLO G & N
EQUIPMENT TEST
DATA SHEET 6 OF 12

CONFIDENTIAL
(When filled in)

JDC
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JOB IRIG COEFFICIENT DETERMINATION TEST - POSITION 5

LINE	JDC ITEM NO.	PARAMETER	RECORDED VALUE	
(cz)	15	Record DSKY POSITION NUMBER	R3	— — — — —
(da)	27	Record DSKY Time 1	R1	— — — — — . 0 0 0 0 0
(db)	27	Record DSKY Time 1	R2	0 0 0 0 0 . — — — — —
(dc)	42	Sum lines (da) and (db)		— — — — — . — — XXX
(dd)	29	Record DSKY East PIP 1	R1	( ) — — — — —
(de)	29	Record DSKY Identification	R3	0 1 0 0 —
(df)	31	Record DSKY South PIP 1	R1	( ) — — — — —
(dg)	31	Record DSKY Identification	R3	0 1 0 0 —
(dh)	33	Record DSKY Time 2	R1	— — — — — . 0 0 0 0 0
(dk)	33	Record DSKY Time 2	R2	0 0 0 0 0 . — — — — —
(dm)	42	Sum lines (dh) and (dk)		— — — — — . — — XXX
(dn)	35	Record DSKY East PIP 2	R1	( ) — — — — —
(dp)	35	Record DSKY Identification	R3	0 1 0 0 —
(dq)	37	Record DSKY South PIP 2	R1	( ) — — — — —
(dr)	37	Record DSKY Identification	R3	0 1 0 0 —
(ds)	42	Subtract line (dd) from line (dn)		( ) — — — — —
(dt)	42	Square line (dm)		(+) _____
(du)	42	Divide line (ds) by line (dt)		( ) _____
(dv)	42	Multiply line (f) by line (du)		( ) _____
(dw)	42	Subtract appropriate We Cos λ of Table 3 from line (dv)		NBD_x = ( ) _____ in MERU

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APOLLO G & N
EQUIPMENT TEST
DATA SHEET 7 OF 12

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JDC
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JOB IRIG COEFFICIENT DETERMINATION TEST - POSITION 6

LINE	JDC ITEM NO.	PARAMETER	RECORDED VALUE	
(dx)	15	Record DSKY POSITION NUMBER	R3	— — — — —
(dy)	27	Record DSKY Time 1	R1	— — — — — . 0 0 0 0 0
(dz)	27	Record DSKY Time 1	R2	0 0 0 0 0 . — — — — —
(ea)	42	Sum lines (dy) and (dz)		— — — — — . — — X X X
(eb)	29	Record DSKY East PIP 1	R1	( ) — — — — — —
(ec)	29	Record DSKY Identification	R3	0 1 0 0 —
(ed)	31	Record DSKY South PIP 1	R1	( ) — — — — — —
(ee)	31	Record DSKY Identification	R3	0 1 0 0 —
(ef)	33	Record DSKY Time 2	R1	— — — — — . 0 0 0 0 0
(eg)	33	Record DSKY Time 2	R2	0 0 0 0 0 . — — — — —
(eh)	42	Sum lines (ef) and (eg)		— — — — — . — — X X X
(ek)	35	Record DSKY East PIP 2	R1	( ) — — — — — —
(em)	35	Record DSKY Identification	R3	0 1 0 0 —
(en)	37	Record DSKY South PIP 2	R1	( ) — — — — — —
(ep)	37	Record DSKY Identification	R3	0 1 0 0 —
(eq)	42	Subtract line (eb) from line (ek)		( ) — — — — —
(er)	42	Square line (eh)		(+) _____
(es)	42	Divide line (eq) by line (er)		( ) _____
(et)	42	Multiply line (e) by line (es)		( ) _____
(eu)	42	Subtract appropriate We Cos λ of Table 3 from line (et)		( ) _____ in MERU

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DATE _____

APOLLO G & N
EQUIPMENT TEST
DATA SHEET 8 OF 12

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(When filled in)

JDC NO. 10080 REV. ____

JOB IRIG COEFFICIENT DETERMINATION TEST - POSITION 7

LINE	JDC ITEM NO.	PARAMETER	RECORDED VALUE	
(ev)	15	Record DSKY POSITION NUMBER	R3	— — — — —
(ew)	27	Record DSKY Time 1	R1	——————.00000
(ex)	27	Record DSKY Time 1	R2	00000.——————
(ey)	42	Sum lines (ew) and ex)		——————.——XXX
(ez)	29	Record DSKY East PIP 1	R1	( )— — — — —
(fa)	29	Record DSKY Identification	R3	0 1 0 0 —
(fb)	31	Record DSKY South PIP 1	R1	( )— — — — —
(fc)	31	Record DSKY Identification	R3	0 1 0 0 —
(fd)	33	Record DSKY Time 2	R1	——————.00000
(fe)	33	Record DSKY Time 2	R2	00000.——————
(ff)	42	Sum lines (fd) and (fe)		——————.——XXX
(fg)	35	Record DSKY East PIP 2	R1	( )— — — — —
(fh)	35	Record DSKY Identification	R3	0 1 0 0 —
(fk)	37	Record DSKY South PIP 2	R1	( )— — — — —
(fm)	37	Record DSKY Identification	R3	0 1 0 0 —
(fn)	42	Subtract line (ez) from line (fg)		( ) — — — — —
(fp)	42	Square line (ff)		(+) _____
(fq)	42	Divide line (fn) by line (fp)		( ) _____
(fr)	42	Multiply line (e) by line (fq)		( ) _____
(fs)	42	Subtract appropriate We Cos λ of Table 3 from line (fr)		( ) _____ in MERU

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APOLLO G & N
EQUIPMENT TEST
DATA SHEET 9 OF 12

CONFIDENTIAL
(When filled in)

JDC
NO. 10080
REV. ____

JOB IRIG COEFFICIENT DETERMINATION TEST - POSITION 8

LINE	JDC ITEM NO.	PARAMETER	RECORDED VALUE	
(ft)	15	Record DSKY POSITION NUMBER	R3	— — — — —
(fu)	27	Record DSKY Time 1	R1	——————.00000
(fv)	27	Record DSKY Time 1	R2	00000.——————
(fw)	42	Sum lines (fu) and (fv)		——————.——XXX
(fx)	29	Record DSKY East PIP 1	R1	( )— — — — —
(fy)	29	Record DSKY Identification	R3	0 1 0 0 —
(fz)	31	Record DSKY South PIP 1	R1	( )— — — — —
(ga)	31	Record DSKY Identification	R3	0 1 0 0 —
(gb)	33	Record DSKY Time 2	R1	——————.00000
(gc)	33	Record DSKY Time 2	R2	00000.——————
(gd)	42	Sum lines (gb) and (gc)		——————.——XXX
(ge)	35	Record DSKY East PIP 2	R1	( ) — — — — —
(gf)	35	Record DSKY Identification	R3	0 1 0 0 —
(gg)	37	Record DSKY South PIP 2	R1	( ) — — — — —
(gh)	37	Record DSKY Identification	R3	0 1 0 0 —
(gk)	42	Subtract line (fx) from line (ge)		( ) — — — — —
(gm)	42	Square line (gd)		(+) _____
(gn)	42	Divide line (gk) by line (gm)		( ) _____
(gp)	42	Multiply line (f) by line (gn)		( ) _____
(gq)	42	Subtract appropriate We Cos λ of Table 3 from line (gp)		( ) _____ in MERU

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(When filled in)

DATE _____

APOLLO G & N
EQUIPMENT TEST
DATA SHEET 10 OF 12

CONFIDENTIAL
(When filled in)

JDC
NO. 10080
REV. _____

JOB IRIG COEFFICIENT DETERMINATION TEST - POSITION 9

LINE	JDC ITEM NO.	PARAMETER	RECORDED VALUE	
(gr)	15	Record DSKY POSITION NUMBER	R3	— — — — —
(gs)	27	Record DSKY Time 1	R1	——————.00000
(gt)	27	Record DSKY Time 1	R2	00000.——————
(gu)	42	Sum lines (gs) and (gt)		——————.——XXX
(gv)	29	Record DSKY East PIP 1	R1	( )— — — — —
(gw)	29	Record DSKY Identification	R3	0 1 0 0 —
(gx)	31	Record DSKY South PIP 1	R1	( )— — — — —
(gy)	31	Record DSKY Identification	R3	0 1 0 0 —
(gz)	33	Record DSKY Time 2	R1	——————.00000
(ha)	33	Record DSKY Time 2	R2	00000.——————
(hb)	42	Sum lines (gz) and (ha)		——————.——XXX
(hc)	35	Record DSKY East PIP 2	R1	( ) — — — — —
(hd)	35	Record DSKY Identification	R3	0 1 0 0 —
(he)	37	Record DSKY South PIP 2	R1	( ) — — — — —
(hf)	37	Record DSKY Identification	R3	0 1 0 0 —
(hg)	42	Subtract line (gv) from line (hc)		( ) — — — — —
(hh)	42	Square line (hb)		(+) _____
(hk)	42	Divide line (hg) by line (hh)		( ) _____
(hm)	42	Multiply line (g) by line (hk)		( ) _____
(hn)	42	Subtract appropriate We Cos λ of Table 3 from line (hm)		( ) _____ in MERU

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APOLLO G & N
EQUIPMENT TEST
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[redacted]
(When filled in)

JDC
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JOB IRIG COEFFICIENT DETERMINATION TEST

JDC ITEM NO.	PARAMETER	UNITS	MIN VALUE	RECORDED VALUE	MAX VALUE	REJ	ACC	
43	Subtract line (dw) from line (cy)	MERU/$_g$		ADSRA$_x$ = ( )_____				(hp)
43	Subtract line (ae) from line (eu)	MERU/$_g$		ADSRA$_y$ = ( )_____				(hq)
43	Subtract line (bc) from line (ca)	MERU/$_g$		ADSRA$_z$ = ( )_____				(hr)
43	Subtract line (bc) from line (ae)			( )_____				(hs)
43	Multiply line (hs) by 1.4142			( )_____				(ht)
43	Subtract line (ae) from line (dw)			( )_____				(hu)
43	Multiply line (hu) by 1.4142			( )_____				(hv)
43	Subtract line (dw) from line (bc)			( )_____				(hw)
43	Multiply line (hw) by 1.4142			( )_____				(hx)
43	Sum lines (hr) and (hq)			( )_____				(hy)
43	Subtract line (hy) from line (ht)			( )_____				(hz)
43	Multiply line (fs) by 2			( )_____				(ka)
43	Sum lines (hz) and (ka)	MERU/$_g$		ADIA$_z$ - ADIA$_y$ = ( )_____				(kb)
43	Multiply line (gq) by 2			( )_____				(kc)

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(When filled in)

DATE _____

APOLLO G & N
EQUIPMENT TEST
DATA SHEET 12 OF 12

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JDC NO. 10080
REV. _____

JOB IRIG COEFFICIENT DETERMINATION TEST

JDC ITEM NO.	PARAMETER	UNITS	MIN VALUE	RECORDED VALUE	MAX VALUE	REJ	ACC	
43	Sum lines (kc) and (hx)	MERU/g		$ADIA_x - ADIA_z = (\ )$_____				(kd)
43	Subtract line (hp) from line (hv)			(\ )_____				(ke)
43	Multiply line (hn) by 2			(\ )_____				(kf)
43	Sum lines (ke) and (kf)	MERU/g		$ADIA_y - ADIA_x = (\ )$_____				(kg)
43	Transfer $ADSRA_x$ from JDC 00236			(\ )_____				(kh)
43	Subtract line (hp) from line (kh)	MERU/g	-5	$\Delta ADSRA_x = (\ )$_____	+5			(kk)
43	Transfer $ADSRA_y$ from JDC 00239			(\ )_____				(km)
43	Subtract line (hq) from line (km)	MERU/g	-5	$\Delta ADSRA_y = (\ )$_____	+5			(kn)
43	Transfer $ADSRA_z$ from JDC 00242			(\ )_____				(kp)
43	Subtract line (hr) from line (kp)	MERU/g	-5	$\Delta ADSRA_z = (\ )$_____	+5			(kq)
43	Transfer NBD_x from JDC 00236			(\ )_____				(kr)
43	Subtract line (dw) from line (kr)	MERU	-5	$\Delta NBD_x = (\ )$_____	+5			(ks)
43	Transfer NBD_y from JDC 00239			(\ )_____				(kt)
43	Subtract line (ae) from line (kt)	MERU	-5	$\Delta NBD_y = (\ )$_____	+5			(ku)
43	Transfer NBD_z from JDC 00242			(\ )_____				(kv)
43	Subtract line (bc) from line (kv)	MERU	-5	$\Delta NBD_z = (\ )$_____	+5			(kw)

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