

JOB: FIXED MEMORY TEST

INITIAL TDRR 36476 D.S. PGS.

SUBSYSTEM: Apollo Guidance Computer

ASSY: Fixed Memory Module

DESCRIPTION:

This document provides procedures whereby Fixed Memory Modules can be tested. The preferred Procedures A, D and G apply to Test Station 3000 (ART) and should be used whenever possible. The alternate Procedures Band H apply to Test Station 2004 and Procedure E applies to Test Station 2304.

Rev. Let.	Date	TDRR NO.	PAGES REVISED		APPROVAL		REFERENCES: PS 2016036 PS 2016042
			JDC	D.S.	MIT	NASA	
A	36872	All	All				
B	37761	All	All				
C	38172	1,6,24	8				
D	38453	Retyped	all Pages				
IMPORTANT:							
INTERVAL:							
TOOLS AND MATERIAL:							
Test Stations							
2004 2304							
3000 (ART)							

FIRST AMBIENT TEST (OPERATION 145)

NOTE: Perform either Procedure A or B
but not both.

A. PROCEDURE (ART)

1. Setup oven controls as follows:
 - a. Set the COOL Switch to ON.
 - b. Set the HEAT Switch to ON.
 - c. Set the MODE Switch to PROGRAM.
 - d. Set the POWER Switch to ON.
2. Setup the ART Console as follows:
 - a. Assure that power supply (A8, A9, A10 & A16) Power Switches are turned ON.
 - b. Assure that STATION POWER Switch is ON (illuminated)
 - c. Setup the A/D Converter controls as follows:
 1. Set the MODE Switch to COMMAND.
 2. Set the CODE Switch to BINARY.
 3. Set the POWER Switch to ON.

DATE _____

SUBSYSTEM: Apollo Guidance ComputerASSY: Fixed Memory Module

A. PROCEDURE (CON'T)

- d. Set the Digitec Thermometer controls as follows:
 1. Set the ON/FATE control fully clockwise (FCW).
 2. Set the ZERO/OPERATE/CAL Switch to OPERATE.
- e. Set the Digital Multimeter POWER Switch to ON (Digital displays illuminated).
- f. Set the DVM Monitor Switch to OFF.
- g. Depress the DC POWER Pushbutton and assure that the DC POWER OFF INTERLOCK CLOSED indicator is illuminated.

3. Set up the RC 703 Computer as follows:

- a. Depress and Hold the RESET pushbutton on the Central Processor Panel and press the POWER ON pushbutton.
- b. Set the SENSE Switches 0 thru 3, on the Central Processor Panel, to the down position.
- c. Set the DISPLAY SELECTOR Switch, on the Central Processor Panel, to the MB position.
- d. Set the Tape Reader Switches as follows:
 1. Set POWER to ON.
 2. Set the Reel Switch to OFF.
 3. Set the DIRECTION Switch to the mid position.
 4. On the Reader Head, press the LOAD/RUN indicator to LOAD (down).

4. Set up the Teletype Switches as follows:

- a. Set the POWER Switch to the ON LINE position.
- b. Set the READER Switch to the FREE position.
- c. Set the MODE Switch, on the keyboard, to the PRINT position.
- d. On the ART Station, press the DC POWER ON Pushbutton.

5. Load the Executive Program, if necessary, as follows:

*NOTE: Executive Program reloading is not necessary once the program has been loaded and proper turn-on/turn-off procedures are used.

- a. Load the BOOTSTRAP Program listed below into Memory Locations 0 thru A in hexidecimal format as follows:
 1. Press the RESET pushbutton, on the RC 703 Central Processor Panel.

SUBSYSTEM: Apollo Guidance Computer

ASSY: Fixed Memory Module

A. PROCEDURE (CON'T)

2. Key the Location 0 data into the SELECTED DISPLAY Register and press ENTER.
3. Press CLEAR (Selected Display).
4. Load remaining data by repeating Steps 2 & 3 for each location.

BOOTSTRAP PROGRAM LISTING

<u>Location</u>	<u>Content</u>
0	0020
1	8004
2	03D9
3	1003
4	02DD
5	0800
6	0401
7	0010
8	0638
9	300A
A	0010

5. Press the RESET Pushbutton.
 6. Repetitiously press the DISPLAY Pushbutton and verify that Memory Locations 0-A contain the correct data.
- b. Mount the Fixed Memory Executive Program Tape (Tape Control # 576433-2) on the RC 703 Tape Reader and set the LOAD/RUN slide to the RUN position.
- c. Set the Reel Switch to ON.
- d. Press the Central Processor RESET pushbutton.
- e. Set the DISPLAY SELECTOR Switch, on the Central Processor Panel, to the IX position.
- f. Key hexadecimal 0034 into the SELECTED DISPLAY Register.
- g. Press the RUN Pushbutton, on the Central Processor Panel.

CAUTION

Do not turn on any test equipment during the program loading sequence.

- h. Press the HALT pushbutton, on the Central Processor Panel, when the Executive Tape has completed loading.
- i. Set the LOAD/RUN slide to LOAD.

A. PROCEDURE (CON'T)

- j. Set the Reel ON/OFF Switch to OFF.
- k. Remove the tape from the Reader.
- l. On the ART Power Control Panel, press the DC POWER OFF pushbutton.
6. Inspect the module to insure that there are no bent or dirty pins.
7. Inspect the Test Fixture to insure that there are no damaged pins.
8. Insert the module to be tested into the test fixture and connect the fixture to the connector in the oven.
9. Secure the oven door.
10. On the ART Station Power Control Panel, press the DC POWER ON pushbutton.
11. On the RC 703 Central Processor Panel, press the RESET pushbutton.
12. Key hexadecimal 0020 into the Program Counter Register.
13. Press the RUN pushbutton.
14. The Executive Program will now control the test. When necessary, the operator will be asked to supply information by means of the teletype.

NOTE: In all cases, when responding to queries from the computer, the operator shall use the format
: XXXXXX - - - X: (Colon-Message-Colon).

15. Answer the question "UNIT NAME" by typing: ROPE B _:
i.e. B1, B2, B6.

16. Answer the following queries, as suitable*-

Part Number	:	XXXXXXXX	:	DASH	:	XXX:
Serial Number	:	XXX:				
Operation Number	:	145:		TEST LEVEL	:	XX:
Testman	:	XXX:		DATE	:	XX-XX-XX:

* Information shall be taken from Flow Card.

JOB: FIXED MEMORY TEST

JDC: 04255 RCV: D PAGE 5 OF 29

SUBSYSTEM: Apollo Guidance Computer

ASSY: Fixed Memory Module

A. PROCEDURE (CON'T)

17. Answer the query "Previous Operation Complete?" by typing :Y: if the Flow Card has been properly stamped.

NOTE: This question and the several following must be answered :Y: or the program will identify the :N: as an "illegal answer" and keep on asking the same question until the expectant answer is obtained.

18. Answer the query "Cal dates In Limits?" by typing in :Y: if true.

19. Answer the query "Cal Rope In Spec Today?" by typing in :Y: if a dated data sheet is available.

20. Answer the query "Paper Tape OK?" by typing in :Y: if true.

21. Answer the query "Parity and Checksum OK?" by typing in :Y: if an ND 1002378 verification form (certified) is in the package.

22. Answer the query "Tester Tape Verified?" by typing in :Y: if ND 1002378 verification form (certified) is in the package.

23. a. Mount appropriate tester tape on RC 703 Tape Reader.
b. Answer the query "Condensed Tape?" by typing in :Y: or :N: depending on the tape available - use condensed format tape if available.

NOTE: Explanation of replies :Y: = Condensed tape being used, :N: = Non-condensed tape being used, answer query "Mount Tape, Push Run?" by pressing Run Button on 703 Central Processor Panel.

24. The Program will now complete the Ambient Electrical Test No. 1.

25. Verify that the Teletype has printed out test results that are essentially the same as the following example and verify that there are no ERROR messages on the printout.

DATE _____

JOB: FIXED MEMORY TEST

JDC: 04255 REV: D PAGE 6 OF 29

SUBSYSTEM: Apollo Guidance Computer

ASSY: Fixed Memory Module

A. PROCEDURE (CON'T)

FIXED MEMORY MODULE TEST

UNIT NAME :ROPE B3:

PART NUMBER :2010802: DASH :211:

SERIAL NUMBER :414:

OPERATION NUMBER :145: TEST LEVEL :03:

TESTMAN :T-ABC: DATE :3-25-71:

PREVIOUS OPERATION COMPLETED? :Y:

CAL DATES IN LIMITS ? :Y:

CAL ROPE IN SPEC TODAY? :Y:

PAPER TAPE OK ? :Y:

PARITY AND CHECKSUM OK? :Y:

TESTER TAPE VERIFIED? :Y:

NO ZEROS ON MT LINE

VP MAX = 226 VN MAX = 236

VO MAX = 006

VO MAX NMT 25 MV

VO MAX ABORT = 006MV

MTL DATA IN SPEC

VP MIN. = 174M.V. CA = 0703

VN MIN. = 172 CA 0126

CONDENSED TAPE ? :Y:

MODULE CONTENT COMPARES OK

QUAL CHECKS IN SPEC. STRANDS 1-12

STRGAT VO MAX NMT 5 MV

NO OUTPUTS OVER 5 MV STRANDS 1-12

STRAND DATA IN SPEC

V1 MIN = 071 MV CA = 0470

STRAND 011 SENSE LINE 014

AMBIENT TEST COMPLETE FOR 512 CORES

END OF TEST

26. Verify A procedure complete and insert teletype printout in data package.

EXAMPLE

DATE _____

JOB: FIXED MEMORY TEST

JDC: 04255 REV: D PAGE 7 OF 29

SUBSYSTEM: Apollo Guidance Computer

ASSY: Fixed Memory Module

FIRST AMBIENT TEST (OPERATION 145)

NOTE: Perform either procedure A or B but not both.

B. PROCEDURE (STATION 2004)

1. Verify that CHECKSUM & PARITY CHECK have been performed on the core rope tester tape per ND1002378 (Copy of certification in the Data package) & verify that the correct tester tape is used for the corresponding Dash No. for the module under test.
2. Assure that the test equipment calibration is not overdue.
3. Assure that the DVM ground strap is disconnected.
4. Perform Scope Adjustment.
5. Verify that Station Calibration standard measurements have been performed at start of shift.
6. Verify that Station Calibration standard means are within limits at the last reading.
7. Assure TAPE READER is turned OFF.
8. Assure STATION POWER Switch is ON.
9. Press RESET button.
10. Turn the DVM POLARITY knob on the Digital Voltmeter (DVM) to NORM position.
11. With DVM SELECT Switch in the 1 position, measure 20.0 ± 2.0 VDC with the DVM. If necessary adjust R1.
12. With DVM SELECT Switch in the 2 position, measure 14.0 ± 0.5 VDC with the DVM. If necessary adjust R2.
13. With DVM SELECT Switch in the 3 position, measure 12.0 ± 0.36 VDC with the DVM. If necessary adjust R3.
14. With DVM SELECT Switch in the 4 position, measure 6.8 ± 0.2 VDC with the DVM. If necessary adjust R4.
15. Turn DVM POLARITY knob to OFF position.

DATE _____

JOB: FIXED MEMORY TEST

JDC: 04255 REV: D PAGE 8 OF 29

SUBSYSTEM: Apollo Guidance Computer

ASSY: Fixed Memory Module

B. PROCEDURE (CON'T)

16. Set the switches on the control panel as follows:
 - a. ADDRESS COUNTER MODIFICATION switches all to down position (9 switches).
 - b. CURRENT PULSE CONTROL switches all to down (OFF) position (6 switches).
 - c. INHIBIT LINE POLARITY SELECT switches all to up (ON) position (16 switches).
 - d. SYNC SELECT to RPRT.
 - e. SENSE LINE SELECT to any position.
 - f. TEST SELECT to MAN 1.
 - g. MANUAL CORE SELECT switches to any positions.
 - h. Assure ERROR BYPASS switch light glows. Depress if necessary.
 - i. Assure STOP CODE OVERRIDE switch light glows. Depress if necessary.
 - j. DRIVE in the RIGHT position.
 - k. Assure STRAND SELECTION lights are OFF. Depress RESTART button if necessary.
 - l. Assure STBE INHIBIT switch light glows. Depress if necessary.
17. Set Tape Spooler Power Switch to OFF.
18. Assure that outputs CAL 1 and CAL 2 on panel are connected to + Input and - Input respectively on the Differential Amplifier of the Oscilloscope.
19. Assure the oscilloscope external trigger is connected to the SYNC Connection on the control panel.
20. Assure that TEMP. SIM. switch is in ambient position.
21. Inhibit and Drive Wiring - Preparation
 - 21.1. Inspect the module to be sure there are no bent pins.
 - 21.2. Press RESET button.
 - 21.3. Plug test fixture into J-8 of station (left side of keyboard).
 - 21.4. Insert module into test fixture.
 - 21.5. Set CURRENT PULSE CONTROL switches all to up (ON) position (6 switches).
 - 21.6. Set scope INPUT switches to AC.
 - 21.7. Press RESET button.
 - 21.8. Press EXECUTE button.

DATE _____

JOB: FIXED MEMORY TEST

JDC: 04255 REV: D PAGE 9 OF 29

SUBSYSTEM: Apollo Guidance Computer

ASSY: Fixed Memory Module

B. PROCEDURE (CON'T)

22. INHIBIT AND DRIVE WIRING - TEST

22.1 Before measuring the trace characteristics the time base reference should be checked as follows:

- a. Set SENSE LINE SELECT switch to L-Ref.
- b. Make sure that SYNC SELECT switch is on RPRT.
- c. All time base measurements should be made from the 50% point on the rise time of this pulse.

NOTE: Once the time base reference is established as above, neither the time scale nor sync adjustments should be touched.

- d. Return sense line select switch to MT.

22.2 Measure the oscilloscope trace characteristics (See Figure 1). Verify there are no "ZERO" outputs.

22.3 Measure the oscilloscope trace envelop characteristics (Ref. Figure 2). Record V_p Max and V_n Max.

22.4 Record V_p Min and V_n Min and respective CORE ADDRESSES. (Ref. Figure 2).

22.5 Set switches P and \bar{P} to REV position (be sure there are no "ONE" outputs).

22.6 Measure oscilloscope trace envelop characteristics (See Figure 1). Record V₀ Max.

22.7 Set switches P and \bar{P} back to the up (ON) position.

22.8 Press CYCLE button so the ABORT light glows.

22.9 Set SYNC SELECT to CLEAR.

22.10 Monitor oscilloscope trace and assure there are no "ZERO" outputs.

22.11 Set SYNC SELECT to RRCT.

22.12 Set SENSE LINE SELECT switch to L-Ref.

22.13 Set the time base reference to the 50% point on the rise time of this pulse.

DATE _____

B. PROCEDURE (CON'T)

- 22.14 Set SENSE LINE SELECT Switch back to MT.
22.15 Measure the oscilloscope trace and make sure there are no outputs over 25 mv from $1.1 \mu\text{s}$ to $2.3 \mu\text{s}$ after the start of the RRCT pulse (See Figure 2). Record

NOTE: When B Procedure Step 22.15 is repeated from -10°C Environmental Test H Procedure Step 9, there shall be no output over 30 mv during the specified interval.

Allow 4 minutes from pressing ABORT button for driver warm up before making reading.

- 22.16 Press CYCLE button so that NORMAL light glows.
22.17 Repeat Steps 22.1 (a) - 22.1 (d) to reestablish time base reference to RPRT pulse.
22.18 Press CLEAR button.
22.19 Press RESET button.

23. SENSE LINE PROGRAM TEST - PREPARATION

- 23.1 Set switches on control panel as follows:
- a. ADDRESS COUNTER MODIFICATION Switches all in the down position (9 Switches).
 - b. CURRENT PULSE CONTROL Switches all in the ON (up) position (6 Switches).
 - c. INHIBIT LINE POLARITY SELECT Switches all in the ON (up) position (16 Switches).
 - d. SYNC SELECT to RPRT.
 - e. SENSE LINE SELECT to any position.
 - f. TEST SELECT to AUTO.
 - g. MANUAL CORE SELECT switches to any position.
 - h. Assure ERROR BYPASS switch light glows. Depress if necessary.
 - i. Assure STOP CODE OVERRIDE switch light out. Depress if necessary.
 - j. DRIVE in DRIVE RIGHT position.
 - k. Press RESTART button.
 - l. Assure STBE INHIBIT switch light out. Depress if necessary.
 - m. DRIVE in CONT. position.
- 23.2 Set Tape Spooler POWER switch to OFF.

B. PROCEDURE (CON'T)

- 23.3 Set Tape Reader LOAD-RUN switch to LOAD position.
 - 23.4 Thread tape from left side spool through Tape Reader and attach to right side spool (See Figure 3).
NOTE: Insert tape into reader with edge closest to sprocket holes nearest to the test station.
 - 23.5 Place TEMP SIM switch in ambient position.
 - 23.6 Press RESET button.
 - 23.7 Set Tape Reader controls as follows:
 - a. Tape Spooler POWER switch to ON.
 - b. Tape Reader POWER switch to ON.
 - c. Tape Reader LOAD-RUN switch to RUN position.
 - 23.8 Position tape to first stop code in the following manner:
 - a. Set DRIVE switch to either DRIVE RIGHT or DRIVE LEFT, which ever is needed.
 - b. Assure STOP CODE OVERRIDE switch lamp is out. Depress if necessary.
 - c. Press RESET button.
 - d. Press EXECUTE button, tape should move to nearest stop code.
 - e. Repeat (c) and (d) until first stop code of tape is under reader sensor.
 - 23.9 Assure DRIVE switch is in the DRIVE RIGHT position.
 - 23.10 Depress STOP CODE OVERRIDE switch (lamp glows).
 - 23.11 Depress ERROR BYPASS switch (lamp out).
24. SENSE LINE PROGRAM TEST (AUTOMATIC)
- 24.1 Press RESET button.
 - 24.2 Press EXECUTE button.
 - 24.3 Record if tape program goes through its complete sequence without indication of error. All indicated errors must be verified. (Tape may stop on leader or English characters. See Step 24.5 This is not considered an error.)

B. PROCEDURE (CON'T)

24.4 If tape program stops before program is completed (designated by disagreement between TAPE BIT and CORE BIT lamps) the error must be verified before module is rejected.

To verify error:

- a. Press STOP CODE OVERRIDE switch (lamp out).
- b. Press ERROR BYPASS switch (lamp glows).
- c. Set DRIVE to DRIVE LEFT.
- d. Press RESET button.
- e. Press EXECUTE button. Tape will move back to previous stop code.
- f. Set DRIVE to DRIVE RIGHT.
- g. Press STOP CODE OVERRIDE switch (lamp glows).
- h. Press ERROR BYPASS switch (lamp out).
- i. Press RESET button.
- j. Press EXECUTE button. If tape stops again indicating the same error, the error is valid and the module is a reject. Record all valid errors on a ROPE ERROR REPORT sheet. If the tape does not stop again indicating the same error, the error is not valid and the tape program will continue. Initial if all indicated errors have been verified as not valid and module is acceptable.

24.5 Test tapes contain leader and English characters in the center of the tape as well as on both ends of the tape. When English characters or leader are encountered which cause the tape to stop, they should be bypassed in the following manner:

- a. Observe the portion of the tape stopped over the reader head and assure that the tape has stopped on an English character or leader and not on a portion of the program.
- b. Press STOP CODE OVERRIDE switch (lamp out).
- c. Assure DRIVE switch is in DRIVE RIGHT position.

B. PROCEDURE (CON'T)

- d. Press RESET button.
 - e. Press EXECUTE button. Tape will proceed to next stop code, located at the beginning of the next portion of program.
 - f. Press STOP CODE OVERRIDE switch (lamp glows).
 - g. Press ERROR BYPASS switch (lamp out).
 - h. Proceed with test from Step 24.3.
- 24.6 If module is not acceptable discontinue testing, otherwise continue as follows:

25. QUALITY CHECK - PREPARATION

- 25.1 Press RESET button.
- 25.2 Set TEST SELECT to MAN 1.
- 25.3 Assure all ADDRESS COUNTER MODIFICATION switches are in the down position.
- 25.4 Press STBE INHIBIT switch (lamp glows).
- 25.5 Press RESET button.
- 25.6 Press EXECUTE button.

26. QUALITY CHECK - TEST

- 26.1 Press RESTART button.
- 26.2 Pull out 1 MC BANDWIDTH button on oscilloscope.
- 26.3 Check oscilloscope trace for SENSE LINE SELECT switch positions P through S. Be sure there are no outputs over 5 mv from 1.1 to 2.3 μ s after start of RESET pulse (See Figure 1).
- 26.4 Press RESET button.
- 26.5 Press EXECUTE button.
- 26.6 Press MODULE SELECT INHIBIT button (light glows).
- 26.7 Press STRAND 1 button (STRAND 1 ON 2, 4, 8 OFF).

B. PROCEDURE (CON'T)

- 26.8 Check oscilloscope trace for SENSE LINE SELECT switch positions P through S. Be sure there are no outputs over 5 mv from 1.1 to 2.3 μ s after start of RESET pulse (See Figure 1).
- 26.9 Repeat Step 26.8 for strands 2 through 12.
NOTE: To select certain strands it will be necessary to press the RESTART button.
- 26.10 Press 1 MC BANDWIDTH button on oscilloscope back in and press MODULE SELECT INHIBIT button (light out).
- 26.11 Press RESET button.
- 26.12 Press EXECUTE button.
- 26.13 Assure STRAND SELECTION BIT 1 is ON and BIT 2, 4, 8 are all OUT (Strand 1).
- 26.14 Monitor oscilloscope and assure that the envelope characteristics as defined in Figure 2 for SENSE LINE SELECT switch positions P through S are within the specified limits.
- 26.15 Record all out of spec zero failures on a ROPE ERROR REPORT Data Sheet. Repeat Step B26.14 for the following sets of STRAND SELECTION BIT lamps ON:
(STRAND SELECTION BIT lamps may be turned OFF by pressing RESTART switch).
- a. BIT 2 ON; BIT 1, 4, 8 OFF (STRAND 2)
 - b. BIT 1, 2 ON; BIT 4, 8 OFF (STRAND 3)
 - c. BIT 4 ON; BIT 1, 2, 8 OFF (STRAND 4)
 - d. BIT 1, 4 ON; BIT 2, 8 OFF (STRAND 5)
 - e. BIT 2, 4 ON; BIT 1, 8 OFF (STRAND 6)
 - f. BIT 1, 2, 4 ON; BIT 8 OFF (STRAND 7)
 - g. BIT 8 ON; BIT 1, 2, 4 OFF (STRAND 8)
 - h. BIT 1, 8 ON; BIT 2, 4 OFF (STRAND 9)
 - i. BIT 2, 8, ON; BIT 1,4 OFF (STRAND 10)
 - j. BIT 1, 2, 8 ON; BIT 4 OFF (STRAND 11)
 - k. BIT 4, 8 ON; BIT 1, 2 OFF (STRAND 12)

JOB: FIXED MEMORY TEST

JDC: 04255 REV: D PAGE 15 OF

SUBSYSTEM: Apollo Guidance Computer

ASSY: Fixed Memory Module

B. PROCEDURE (CON'T)

- 26.16 Press CLEAR button.
- 26.17 Press RESET button.
- 26.18 Verify B Procedure Complete.

THERMAL CONDITIONING (OPERATION 147)

C. PROCEDURE

1. The module shall be subjected to two (2) complete thermal cycles as indicated below:

From 25°C down to -10°C \pm 3°C in NLT 20 minutes, held at -10°C \pm 3°C for NLT 30 minutes, raised to +70°C \pm 3°C in NLT 40 minutes, held at +70°C \pm 3°C for NLT 30 minutes, lowered to 25°C in NLT 30 minutes.

The above defines one (1) complete thermal cycle only. This must be repeated for the second thermal cycle. Verify completion.

VIBRATION (OPERATION 149)

NOTE: Perform either Procedure D or E but not both.

D. PROCEDURE (ART)

1. Assure that test equipment calibration is not overdue.
2. Assure that DC Power OFF Indicator is illuminated.
3. Assure that the vibration cables are connected in Test Station 3000 and the VIB Buffer. Connect vibration fixture to the VIB Buffer.
4. Inspect Module and Fixture Pins, mount the module under test on the Vibration fixture in XCM axis (See Figure 4).
5. Repeat A Procedure Steps 2 thru 5k.
6. Repeat A Procedure Steps 10 thru 14.

DATE _____

JOB: FIXED MEMORY TEST

JDC: 04255 REV: D PAGE 16 OF 29

SUBSYSTEM: Apollo Guidance Computer

ASSY: Fixed Memory Module

D. PROCEDURE (CON'T)

7. Answer the queries on the teletype as suitable.*
8. Insure that program is running and that the Vib Interlock Lamp is illuminated.
9. Vibrate per Procedure E Step 8.
10. Upon completion of vibration profile insure that no content errors are printed by the teletype.
11. Remove the vibration fixture from the XCM axis and mount it on the YCM axis (See figure 4).
12. Vibrate per Procedure E Step 8.
13. Upon completion of vibration profile insure that no content errors are printed by the teletype.
14. Remove the vibration fixture from the YCM axis and mount it on the ZCM axis (See Figure 4).
15. Vibrate per Procedure E Step 8.
16. Upon completion of vibration profile insure that no content errors are printed by the teletype.
17. Press HALT on RC 702 Central Processor Panel.
18. Depress DC Power OFF Pushbutton.
19. Remove module under test from the vibration fixture and inspect pins.
20. Verify Procedure D complete and insert teletype printout in data package.

VIBRATION (OPERATION 149)

NOTE: Perform either Procedure D or E but not both.

E. PROCEDURE (STATION 2304)

1. Assure that test equipment calibration is not overdue, and on the FIXED MEMORY AND ROPE MEMORY MODULE panel, set switches as follows:
 - a. CURRENT DRIVERS ON/OFF Switch to OFF.
 - b. SECTION Switch to SIDE A.
 - c. TEST-MANUAL Switch to TEST.
 - d. Both OPEN LOCATION Switches to position 1.
2. Connect Block II Rope Cable to the appropriate connectors on the Test Panel. Connect end cable between station 2304 and vibration block.

* Information shall be taken from Flow Card.

DATE _____

SUBSYSTEM: Apollo Guidance ComputerASSY: Fixed Memory Module

E. PROCEDURE (CON'T)

3. Mount the module under test on the vibration fixture in the YCM axis (See Figure 4).
4. Set Module POWER switch to ON.
5. Place DVM leads into +14V jacks and adjust supply to $+14.00 \pm 0.01V$.
6. Depress LAMP TEST pushbutton. Assure all lamps on the FIXED MEMORY AND ROPE MEMORY MODULE panel are ON.
7. Release LAMP TEST pushbutton. Assure all lamps on the FIXED MEMORY AND ROPE MEMORY MODULE panel are OFF.

NOTE: Vibration for the module shall have one control accelerometer.

8. Vibrate per Ling 35/70 or 5101-1 Random Station Operation Test Procedure.

The following items define conditions to be applied to the Random Procedure.

Item 1 Torque (Speciment to Fixture) 15-17 inch-lb
 Torque (Fixture to Block) 19-21 foot-lb
 Torque (Block to Table) 19-21 foot-lb

Item 2 Accelerometer (Location and Mounting)
 Instructions (See Figure 4)

Item 3 GRMS - Approx = 13
 B + K Voltmeter setting approx = 0.13 volts.

Item 4 Duration of run; NLT 2 minutes and NMT 6 minutes.

JOB: FIXED MEMORY TEST

JDC: 04255 REV: D PAGE 18 OF 29

SUBSYSTEM: Apollo Guidance Computer

ASSY: Fixed Memory Module

E. PROCEDURE (Cont'd)

VIBRATION (Continued)

Item 5 AAL - 101 Controls (Tripot levels)
 X10-X100 control - X10
 Helipot - 3.0

Item 6 Meter Range Selectors. See Table I.

Item 7 PSD Spectrum level control settings. See Table I.

TABLE I
 SPECTRUM LEVEL CONTROL SETTINGS
 ROPE MEMORY MODULE

CHNL	HERTZ	(Item #6) RANGE SELECTOR	(Item #7) SPECTRUM LEVEL CONTROL SETTING	G ² /HZ	CHNL	HERTZ	(Item #6) RANGE SELECTOR	(Item #7) SPECTRUM LEVEL CONTROL SETTING	G ² /HZ
1	15	.1	.26	.026	36	1575	.1	.32	.032
2	25		.42	.042	37	1625		.31	.031
3	37		.64	.064	38	1675		.30	.030
4	50	.1	.86	.086	39	1725		.29	.029
5	63	1	.110	.110	40	1775		.28	.028
6	85		.120	.120	41	1825		.27	.027
7	125		.120	.120	42	1875		.27	.027
8	175		.120	.120	43	1925		.26	.026
9	225		.120	.120	44	1975		.26	.026
10	275		.120	.120	45	2025	.1	.25	.025
11	325		.120	.120					
12	375		.120	.120					
13	425		.118	.118					
14	475	1	.105	.105					
15	525	.1	.97	.097					
16	575		.87	.087					
17	625		.80	.080					
18	675		.74	.074					
19	725		.70	.070					
20	775		.65	.065					
21	825		.61	.061					
22	875	.1	.58	.058					

DATE _____

SUBSYSTEM: Apollo Guidance Computer

ASSY: Fixed Memory Module

E. PROCEDURE (Cont'd)

TABLE I (Continued)

CHNL	HERTZ	(Item #6) RANGE SELECTOR	(Item #7) SPECTRUM LEVEL CONTROL SETTING	G ^{2/HZ}	CHNL	HERTZ	(Item #6) RANGE SELECTOR	(Item #7) SPECTRUM LEVEL CONTROL SETTING	G ^{2/HZ}
23	925	.1	.55	.055					
24	975		.52	.052					
25	1025		.49	.049					
26	1075		.47	.047					
27	1125		.45	.045					
28	1175		.43	.043					
29	1225		.41	.041					
30	1275		.39	.039					
31	1325		.38	.038					
32	1375		.36	.036					
33	1425		.35	.035					
34	1475		.34	.034					
35	1525	.1	.33	.033					

9. Assure that all lamps on the FIXED MEMORY AND ROPE MEMORY MODULE panel remain OFF through the vibration cycle.
10. Set SECTION switch to SIDE B.
11. Depress and release the LAMP TEST switch.
12. Repeat Step 8.
13. Assure that all lamps on the FIXED MEMORY AND ROPE MEMORY MODULE panel remain OFF through the vibration cycle.

JOB: FIXED MEMORY TEST

JDC: 04255 REV. D PAGE 20 OF 29

SUBSYSTEM: Apollo Guidance Computer

ASSY: Fixed Memory Module

E. PROCEDURE (Cont'd)

VIBRATION (Continued)

14. Remove the vibration fixture from the XCM axis and mount it in the YCM axis (See Figure 4).

15. Depress and release the LAMP TEST switch.

16. Repeat Step 8.

17. Assure that all lamps on the FIXED MEMORY AND ROPE MEMORY MODULE panel remain OFF through the vibration cycle.

18. Set SECTION switch to SIDE A.

19. Depress and release the LAMP TEST switch.

20. Repeat Step 8.

21. Assure that all lamps on the FIXED MEMORY AND ROPE MEMORY MODULE panel remain OFF through the vibration cycle.

22. Remove the vibration fixture from the YCM axis and mount it in the ZCM axis (See Figure 4).

23. Depress and release the LAMP TEST switch.

24. Repeat Step 8.

25. Assure that all lamps on the FIXED MEMORY AND ROPE MEMORY MODULE panel remain OFF through the vibration cycle.

26. Set SECTION switch to SIDE B.

DATE _____

JOB: FIXED MEMORY TEST

JDC:04255 REV: D PAGE 21 OF 29

SUBSYSTEM: Apollo Guidance Computer

ASSY: Fixed Memory Module

E. PROCEDURE (CON'T)

27. Depress and release the LAMP TEST Switch.
28. Repeat Step 8.
29. Assure that all lamps on the FIXED MEMORY AND ROPE MEMORY MODULE Panel remain OFF through the vibration cycle.
30. Set MODULE POWER Switch OFF.
31. Remove the module under test from the vibration fixture.
32. Verify Procedure E complete.

CONTINUITY, RESISTANCE, INSULATION, and ISOLATION TESTS
(OPERATIONS 151 and 153)

F. PROCEDURE

1. Assure that test equipment calibration is not overdue.
2. Perform the Continuity and Resistance Tests required by PS 2016036. Verify that the module passes.
3. Perform the Isolation and Insulation Tests required by PS 2016036. Verify that the module passes.

NOTE: These tests may be performed after the Thermal Tests but shall be performed prior to the Final Ambient Test.

ENVIRONMENTAL TEST THERMAL CYCLE (OPERATION 155)

NOTE: Perform either Procedure G or H but not both.

G. PROCEDURE (ART)

1. Perform Thermal Extremes Electrical/Ambient Electrical No. 2 Tests by reperforming Procedure A Steps 1 thru 14 taking care to type in the proper operation number from the Flow Card.
NOTE: During temperature transition if oven does not reach specified temperature in allotted amount of time, the program will type out a message indicating the condition. When desired temp. is reached press RUN button on the RC 703 Central Processor Panel.
2. Verify that the teletype has printed out test results and verify there are no ERROR messages on the printout. Insert printout in data package. (See example of teletype printout).
3. Subtract the Vp min (Amb. Test #1, Ref. Proc. A25 Printout) from the Vp min (Amb. Test #2, Ref. Proc. G2 Printout). Record on data sheet.
4. Subtract the Vn min (Ambient Test #1, Ref. Proc. A25 Printout) from the Vn min (Amb. Test #2 Ref. Proc. G2 Printout). Record on data sheet.

DATE _____

JCB: FIXED MEMORY TEST

JDC: 04255 REV: D PAGE 22 OF 29

SUBSYSTEM: Apollo Guidance Computer

ASSY: Fixed Memory Module

FIXED MEMORY MODULE TEST

UNIT NAME :ROPE B3:
PART NUMBER :2010802: DASH :211:
SERIAL NUMBER :414:
OPERATION NUMBER :155: TEST LEVEL :03:
TESTMAN :RA:DATE :4-13-71:

PREVIOUS OPERATION COMPLETED? :Y:

CAL DATES IN LIMITS ? :Y:

CAL ROPE IN SPEC TODAY? :Y:

PAPER TAPE OK ? :Y:

CONDENSED TAPE ? :Y:

TEMP IS TOO HI FOR-10

TEMP= -10 C

MTL DATA IN SPEC

VP MIN. = 188 M.V. CA=0703

VN MIN = 196 CA 0126

NO ZEROS ON MT LINE

VP MAX = 252 VN MAX = 258

VO MAX = 004

VO MAX NMT 25 MV

VO MAX ABORT = 006MV

MODULE CONTENT COMPARES OK

QUAL CHECKS IN SPEC. STRANDS 1-12

STRGAT VO MAX NMT 5 MV

NO OUTPUTS OVER 5 MV STRANDS 1-12

STRAND DATA IN SPEC

V1 MIN = 053 MV CA=0657

STRAND 006SENSE LINE 014

LOWTEMP TEST COMPLETE FOR 512 CORES

TEMP IS TOO LO FOR 70

TEMP= +70 C.

E X A M P L E

DATE _____

SUBSYSTEM: Apollo Guidance ComputerASSY: Fixed Memory Module

MTL DATA IN SPEC

VP MIN. = 126 M.V. CA= 0703

VN MIN = 132 CA 0126

NO ZEROS ON MT LINE

VP MAX = 188 VN MAX = 196

VO MAX = 006

VO MAX NMT 25 MV

VO MAX ABORT = 010MV

MODULE CONTENT COMPARES OK

QUAL CHECKS IN SPEC. STRANDS 1-12

STRGAT VO MAX NMT 5 MV

NO OUTPUTS OVER 5 MV STRANDS 1-12

STRAND DATA IN SPEC

V1 MIN = 056 MV CA = 0460

STRAND 005SENSE LINE 010

HI-TEMP TEST COMPLETE FOR 512 CORES

TEMP = +25

MTL DATA IN SPEC

VP MIN. = 166 M.V. CA= 0703

VN MIN = 170 CA 0126

NO ZEROS ON MT LINE

VP MAX = 220 VN MAX = 228

VO MAX = 006

VO MAX NMT 25 MV

VO MAX ABORT = 004MV

MODULE CONTENT COMPARES OK

QUAL CHECKS IN SPEC. STRANDS 1-12

STRGAT VO MAX NMT 5 MV

NO OUTPUTS OVER 5 MV STRANDS 1-12

STRAND DATA IN SPEC

V1 MIN = 070 MV CA= 0470

STRAND 011SENSE LINE 014

AMBIENT TEST COMPLETE FOR 512 CORES

END OF TEST

E X A M P L E

JOB FIXED MEMORY TEST

JDC 04255 REV D PAGE 24 OF 29

SUBSYSTEM Apollo Guidance Computer

ASSY Fixed Memory Module

H. PROCEDURE (STATION 2004)

1. Repeat Procedure B Steps 2 thru 15.
2. Place Rope Module in the temperature chamber and connect to station via Rope ADAPTER inter-connection cable.
EXERCISE EXTREME CARE NOT TO DAMAGE THE MODULE MALCO PINS WHEN MAKING CONNECTIONS.
3. Decrease oven temperature to -10°C $+0^{\circ}\text{C}$
 -2.8°C .
4. Assure oven temperature reaches -10°C $+0^{\circ}\text{C}$ -2.8°C and allow 20 minutes for module Temp. to stabilize.
5. Repeat Steps B23.1 thru B25.4. If module is acceptable initial data box. If module is unacceptable write reject in data box.
6. Place TEMP. SIM. switch in low position.
7. Repeat Procedure B Steps 22.1 and 22.2.
8. Repeat Procedure B Steps 25.5 to 26.17.
9. Repeat Procedure B Steps 22.4 to 22.19.
10. Place TEMP. SIM. switch in ambient position.
11. Increase oven temperature to 70°C $+2.8^{\circ}\text{C}$
 -0°C .
12. Assure oven chamber attains 70°C $+2.8^{\circ}\text{C}$ and allow 20 minutes for module temperature to
 -0°C stabilize.
13. Repeat Procedure B Steps 23.1 to 25.4. If module is acceptable initial data box. If module is unacceptable write reject in data box.
14. Place TEMP. SIM. Switch to high position.
15. Repeat Procedure B Steps 22.1 and 22.2.
16. Repeat Procedure B Steps 25.5 to 26.17.

DATE _____

JOB: FIXED MEMORY TEST

JDC: 04255 REV: D PAGE 25 OF 29

SUBSYSTEM: Apollo Guidance Computer

ASSY: Fixed Memory Module

H. PROCEDURE (CON'T)

17. Place SENSE LINE SELECT switch to MT and repeat Steps B22.4-B22.19
18. Turn OFF oven and remove rope module under test.
19. Repeat Procedure B Steps 2 to 26.17.
20. Subtract reading of Data Box 19 - Ref Step B23.4 (Vp min) from Data Box 22.4 (Vp min).
21. Subtract reading of Data Box 121 - Ref Step B22.4 (Vn min) from Data Box 22.4 (Vn min).
22. Verify Procedure H complete.

MECHANICAL INSPECTION

I. PROCEDURE

1. Assure that the module has no obvious nicks, scratches, dents and burrs not consistent with the standards of good workmanship.
2. Assure that the connector pins are not misaligned or contaminated, consistent with the standards of good workmanship.
3. Verify that the quantity of hardware is proper per the applicable assembly drawing.
4. Verify that the nomenclature, drawing number, serial number, and other markings are correct and legible.
5. Weigh and record the weight of the module to the nearest 0.01 lbs.
6. Verify mechanical inspection steps I.1 - I.5 have been performed.

DATE _____

JOB: FIXED MEMORY TEST

JDC: 04255 REV. D PAGE 26 OF 29

SUBSYSTEM: Apollo Guidance Computer

ASSY: Fixed Memory Module

ZEROS OUTPUT

WAVEFORM CHARACTERISTICS

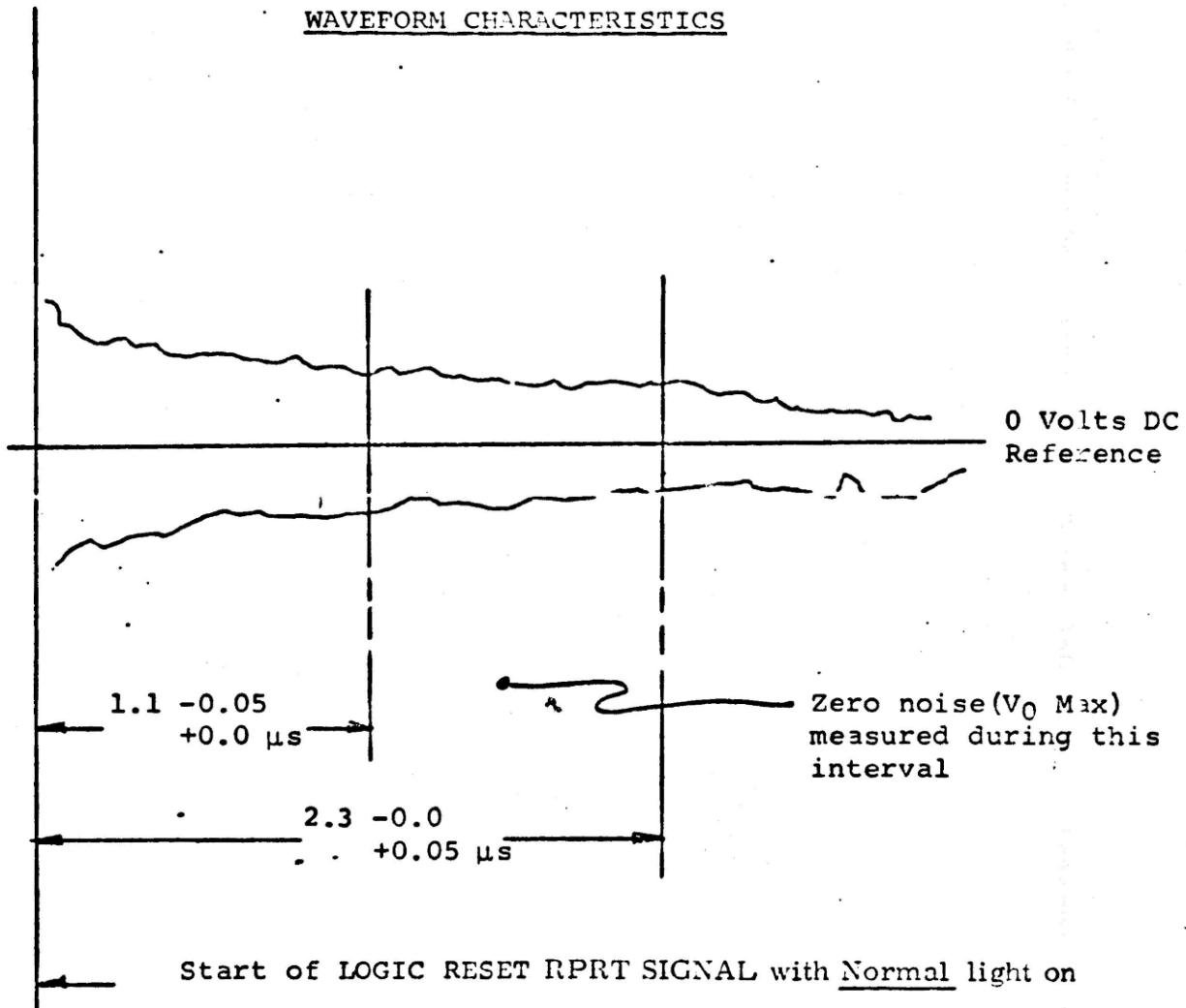


FIGURE 1

DATE _____

SUBSYSTEM: Apollo Guidance Computer

ASSY: Fixed Memory Module

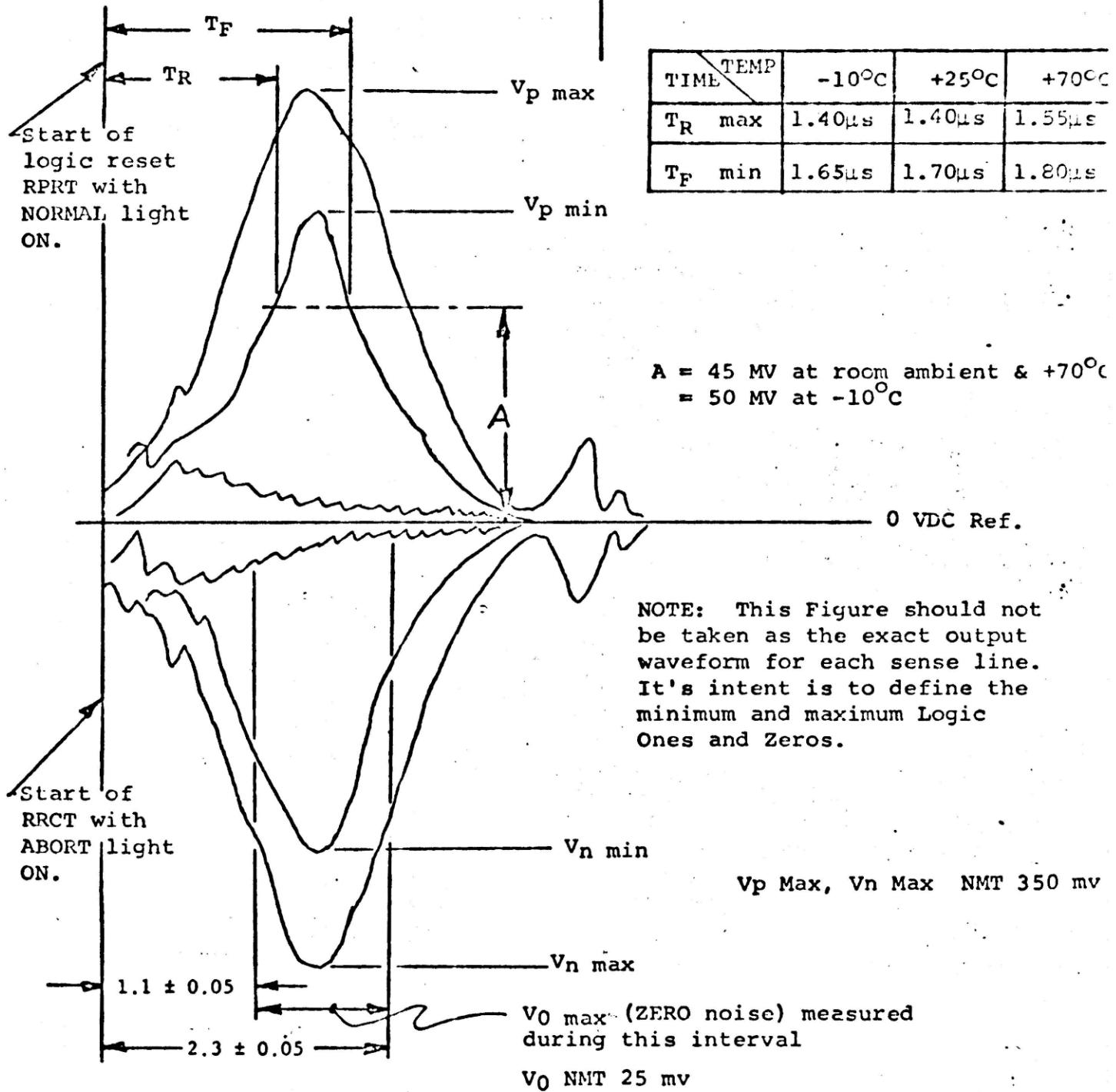


FIGURE 2. - SENSE AND MFT OUTPUTS

DATE _____

JOB: FIXED MEMORY TEST

JDC: 04255 REV: D PAGE 28 OF 29

SUBSYSTEM: Apollo Guidance Computer

ASSY: Fixed memory module

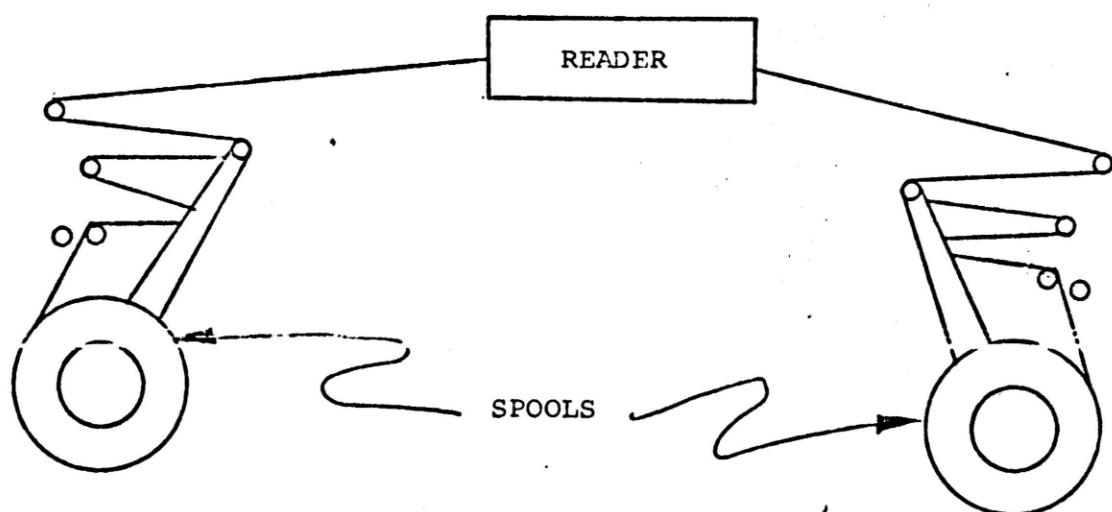


FIGURE 3

TAPE LOADING DIAGRAM

DATE _____

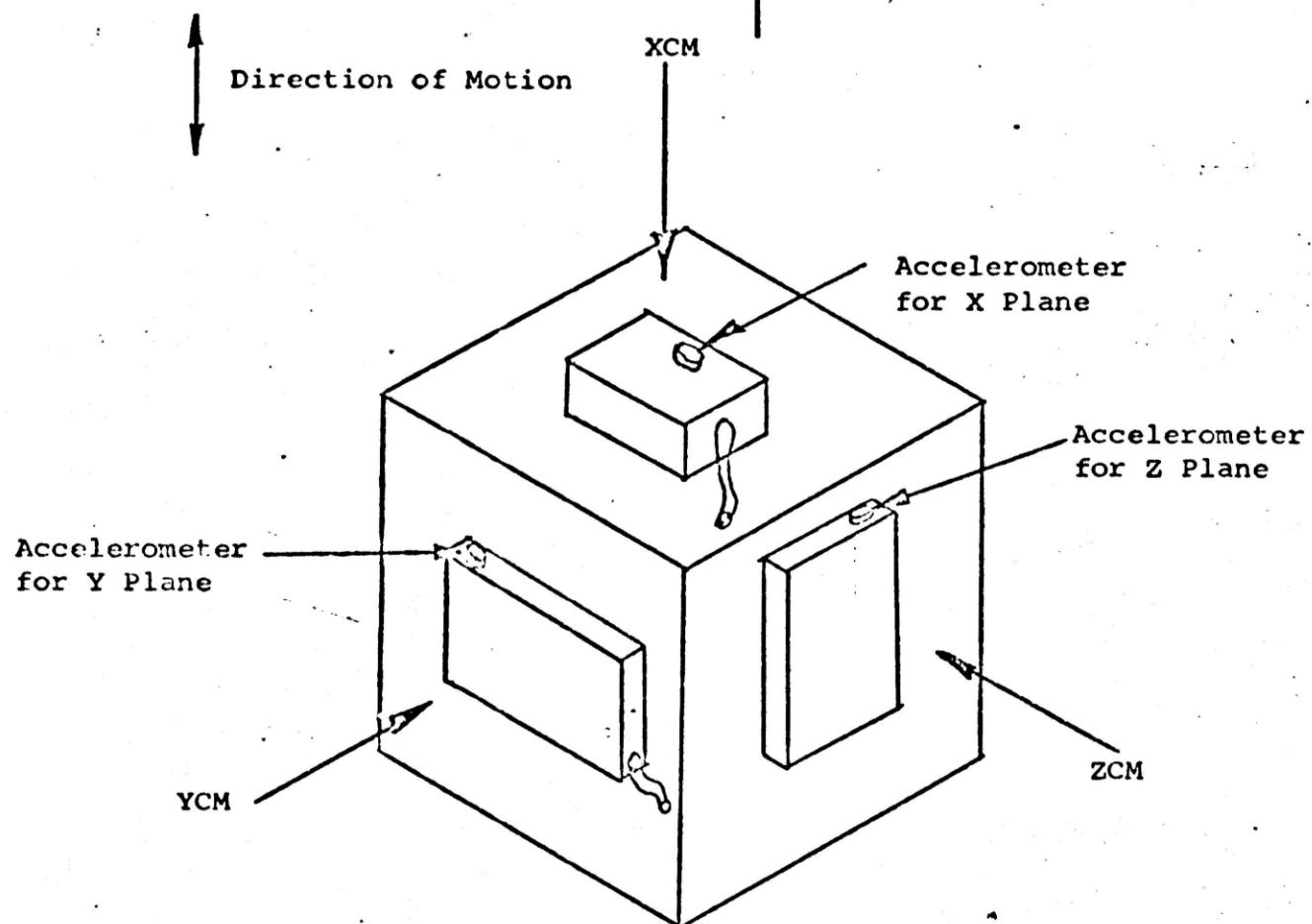


FIGURE 4

NOTE: Mount Accelerometer using cement and cementing studs unless tapped mounting holes are available.

APOLLO G&N
EQUIPMENT TEST
DATA SHEET 1 OF 12

JDC
NO. 04255
REV. D
INITIAL TDRR 364.76

JOB: FIXED MEMORY TEST

<u>ASSEMBLY UNDER TEST</u>		<u>TEST HISTORY</u>			
TITLE	SER. NO.	DATE	START	END	SITE/LOCATION
DWG.	REV.	TIME	START	END	TOTAL ELAPSED
<u>MAJOR GROUND SUPPORT EQUIPMENT</u>					
NAME		SER. NO.		CAL DATE	
NAME		SER. NO.		CAL DATE	
CONDUCTED BY	NAME/AFFILIATION	APPROVED BY	NAME/AFFILIATION		

NOTE: Complete test of Fixed Memory Module
is defined as accumulation of data from
the following procedures; A or B, C, D or
E, F, G or H, and I.

- | | <u>Results</u> | <u>Limits</u> |
|---|----------------|-----------------|
| A. PROCEDURE (ART) | | |
| 25. Ambient Electrical Test No. 1
successfully perform and data
sheet(s) (teletype printout)
attached. | _____ | Testmans' Stamp |
| 26. A Procedure complete and teletype
printout in data package. | _____ | Testmans' Stamp |
| B. PROCEDURE (STATION 2004) | | |
| 1. ND 1002378 Verification Form has
been certified (Attach copy to
this Data Sheet) and Test tape
has been verified. | _____ | Testmans' Stamp |
| 2. Test equipment calibrated. | _____ | Testmans' Stamp |
| 3. DVM ground strap disconnected. | _____ | Testmans' Stamp |
| 4. Scope Adjusted. | _____ | Testmans' Stamp |
| 5. Station Calibration Standard Mea-
surements made. | _____ | Testmans' Stamp |

DATE _____

APOLLO G&N
EQUIPMENT TEST
DATA SHEET 2 OF 12

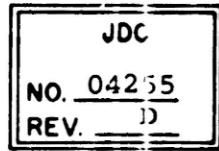
JDC
NO. 04255
REV. D

JOB: FIXED MEMORY TEST

	<u>Results</u>	<u>Limits</u>
6. Station Calibration Standard Measurements within limits.	_____	Testman's Stamp
20. Temp. Switch in Amb. Pos.	_____	Testman's Stamp
NOTE: All out-of-spec readings must be recorded in lieu of Testman's Stamp.		
22.2 No ZERO outputs	_____	Testman's Stamp
22.3 Vp max	_____	NMT 350 MV
Vn max	_____	NMT 350 MV
22.4 Value and Core Address Vp min	_____	Record
Core Address	_____	Record
Vn min	_____	Record
Core Address	_____	Record
22.6 Vo max	_____	NMT 25 MV
22.15 V0 max ABORT mode	_____	NMT 25 MV
24.3 Tape Program Successful (No indication of error)	_____	Testman's Stamp/NO
24.4 If Step B24.3 is NO, initial if all indicated errors have been verified as not valid. Record N/A if Step B24.3 is initialed.	_____	Testman's Stamp/ REV/N/A
26.3 No outputs over 5 MV	_____	Testman's Stamp
26.8 STRAND 1 No outputs over 5 MV	_____	Testman's Stamp
26.9 STRAND 2 No outputs over 5 MV	_____	Testman's Stamp
STRAND 3 No outputs over 5 MV	_____	Testman's Stamp
STRAND 4 No outputs over 5 MV	_____	Testman's Stamp
STRAND 5 No outputs over 5 MV	_____	Testman's Stamp

DATE _____

**APOLLO G&N
EQUIPMENT TEST
DATA SHEET 3 OF 12**



JOB: FIXED MEMORY TEST

		<u>Results</u>	<u>Limits</u>
26.9	STRAND 6 No outputs over 5 MV	_____	Testman's Stamp
	STRAND 7 No outputs over 5 MV	_____	Testman's Stamp
	STRAND 8 No outputs over 5 MV	_____	Testman's Stamp
	STRAND 9 No outputs over 5 MV	_____	Testman's Stamp
	STRAND 10 No outputs over 5 MV	_____	Testman's Stamp
	STRAND 11 No outputs over 5 MV	_____	Testman's Stamp
	STRAND 12 No outputs over 5 MV	_____	Testman's Stamp
26.14	STRAND 1 Wave form within limits	_____	Testman's Stamp
26.15	a. STRAND 2 within limits	_____	Testman's Stamp
	b. STRAND 3 within limits	_____	Testman's Stamp
	c. STRAND 4 within limits	_____	Testman's Stamp
	d. STRAND 5 within limits	_____	Testman's Stamp
	e. STRAND 6 within limits	_____	Testman's Stamp
	f. STRAND 7 within limits	_____	Testman's Stamp
	g. STRAND 8 within limits	_____	Testman's Stamp
	h. STRAND 9 within limits	_____	Testman's Stamp
	i. STRAND 10 within limits	_____	Testman's Stamp
	j. STRAND 11 within limits	_____	Testman's Stamp
	k. STRAND 12 within limits	_____	Testman's Stamp
26.18	Verify B Procedure Complete	_____	Testman's Stamp

THERMAL CONDITIONING

C. PROCEDURE

1. Thermal Conditioning Complete _____ Testman's Stamp

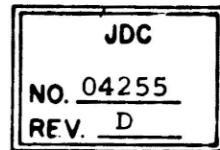
VIBRATION

D. PROCEDURE (ART)

1. Calibration not overdue _____ Testman's Stamp

DATE _____

**APOLLO G&N
EQUIPMENT TEST
DATA SHEET 4 OF 12**



JOB: FIXED MEMORY TEST

	<u>Results</u>	<u>Limits</u>
10. Verify no ERROR message on printout	_____	Testmans' Stamp
13. Verify no ERROR message on printout	_____	Testmans' Stamp
16. Verify no ERROR message on printout	_____	Testmans' Stamp
20. Verify no ERROR message on printout	_____	Testmans' Stamp

VIBRATION

E. PROCEDURE (STATION 2304)

1. Calibration Not Overdue	_____	Testmans' Stamp
6. All lamps ON	_____	Testmans' Stamp
7. All lamps OFF	_____	Testmans' Stamp
9. All lamps remain OFF	_____	Testmans' Stamp
12. All lamps OFF	_____	Testmans' Stamp
13. All lamps remain OFF	_____	Testmans' Stamp
16. All lamps OFF	_____	Testmans' Stamp
17. All lamps remain OFF	_____	Testmans' Stamp
20. All lamps OFF	_____	Testmans' Stamp
21. All lamps remain OFF	_____	Testmans' Stamp
24. All lamps OFF	_____	Testmans' Stamp
25. All lamps remain OFF	_____	Testmans' Stamp
28. All lamps OFF	_____	Testmans' Stamp
29. All lamps remain OFF	_____	Testmans' Stamp
32. Verify E Procedure complete	_____	Testmans' Stamp

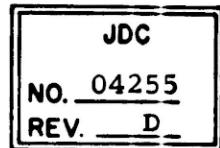
CONTINUITY, RESISTANCE, INSULATION AND ISOLATION

F. PROCEDURE

1. Calibration Not Overdue	_____	Testmans' Stamp
2. Continuity and Resistance Okay	_____	Testmans' Stamp
3. Isolation and Insulation Okay	_____	Testmans' Stamp

DATE _____

**APOLLO G&N
EQUIPMENT TEST
DATA SHEET 5 OF 12**



JOB: FIXED MEMORY TEST

Results Limits

ENVIRONMENTAL TESTS

G. PROCEDURE (ART)

- | | | | |
|----|---|-------|----------------------------|
| 2. | Verify teletype printout has no
ERROR message(s) and is in Data
package | _____ | Testman's Stamp |
| 3. | Original Vp min - Final Vp min | _____ | NLT -25MV and
NMT +25MV |
| 4. | Original Vn min - Final Vn min | _____ | NLT -25MV and
NMT +25MV |

ENVIRONMENTAL TESTS

H. PROCEDURE (STATION 2004)

- | | | | | |
|----|--|---|--------------------|-----------------|
| 1. | REF STEP B2 | Test Equipment
Calibrated | _____ | Testman's Stamp |
| | REF STEP B3 | DVM Ground Strap
Disconnected | _____ | Testman's Stamp |
| | REF STEP B4 | Scope Adjusted | _____ | Testman's Stamp |
| | REF STEP B5 | Station CAL Stan-
dard Measurements
made | _____ | Testman's Stamp |
| | REF STEP B6 | Station CAL Stan-
dard Measurements
Within Limits | _____ | Testman's Stamp |
| 4. | Chamber Temperature at -10°C +0°C | -2.8°C | _____ | Testman's Stamp |
| 5. | Tape Program Successful (REF
STEP B24.3) Indicated errors
verified not valid (REF STEP
B24.4) | _____ | Testman's Stamp/NO | |
| 6. | Temperature Switch in Low Position | _____ | Testman's Stamp | |
| 7. | REF STEP B22.2 No zero outputs | _____ | Testman's Stamp | |
| 8. | Repeat Steps B25.5 - B26.17 | _____ | Testman's Stamp | |
| | REF STEP B26.3 No outputs over
5 MV | _____ | Testman's Stamp | |
| | REF STEP B26.8 STRAND 1 No
outputs over 5 MV | _____ | Testman's Stamp | |

DATE _____

APOLEO G&N
EQUIPMENT TEST
DATA SHEET 6 OF 12

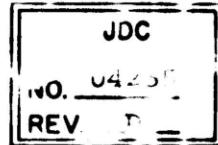
JDC
NO. 04255
REV. D

JOB: FIXED MEMORY TEST

		<u>Results</u>	<u>Limits</u>
8.	REF STEP B26.9	STRAND 2 No outputs over 5 MV	_____ Testman's Stamp
		STRAND 3 No outputs over 5 MV	_____ Testman's Stamp
		STRAND 4 No outputs over 5 MV	_____ Testman's Stamp
		STRAND 5 No outputs over 5 MV	_____ Testman's Stamp
		STRAND 6 No outputs over 5 MV	_____ Testman's Stamp
		STRAND 7 No outputs over 5 MV	_____ Testman's Stamp
		STRAND 8 No outputs over 5 MV	_____ Testman's Stamp
		STRAND 9 No outputs over 5 MV	_____ Testman's Stamp
		STRAND 10 No outputs over 5 MV	_____ Testman's Stamp
		STRAND 11 No outputs over 5 MV	_____ Testman's Stamp
		STRAND 12 No outputs over 5 MV	_____ Testman's Stamp
	REF STEP B26.14	STRAND 1 Waveform within limits	_____ Testman's Stamp
	REF STEP B26.15	a. STRAND 2 within limits	_____ Testman's Stamp
		b. STRAND 3 within limits	_____ Testman's Stamp
		c. STRAND 4 within limits	_____ Testman's Stamp
		d. STRAND 5 within limits	_____ Testman's Stamp

DATE _____

APOLLO G&N
EQUIPMENT TEST
DATA SHEET 7 OF 12



JOB: FIXED MEMORY TEST

		<u>Results</u>	<u>Limits</u>
REF STEP B26.15 (Con't)	e. STRAND 6 within limits	_____	Testman's Stamp
	f. STRAND 7 within limits	_____	Testman's Stamp
	g. STRAND 8 within limits	_____	Testman's Stamp
	h. STRAND 9 within limits	_____	Testman's Stamp
	i. STRAND 10 within limits	_____	Testman's Stamp
	j. STRAND 11 within limits	_____	Testman's Stamp
	k. STRAND 12 within limits	_____	Testman's Stamp
9.	Repeat Steps B22.4 - B22.19		
REF STEP B22.4	Value and Core Address		
	Vp min	_____	Record
	Core Address	_____	Record
	Vn min	_____	Record
	Core Address	_____	Record
REF STEP B22.5	V0 max	_____	NMT 25 MV
REF STEP B22.15	V0 max ABORT mode	_____	NMT 30 MV
10.	Temp Switch in Ambient Pos.	_____	Testman's Stamp
12.	Chamber Temperature at +70°C +2.8°C -0°C	_____	Testman's Stamp
13.	Type Program successful (REF STEP B 24.3)	_____	Testman's Stamp
	Indicated errors verified not valid (REF STEP B 24.4)	_____	Testman's Stamp/ REJ/NA
14.	Temp. Switch in high position	_____	Testman's Stamp
15.	REF STEP B22.2 No zero outputs	_____	Testman's Stamp

DATE _____

APOLLO G&N
EQUIPMENT TEST
DATA SHEET 8 OF 12

JDC
NO. 04255
REV. D

JOB: FIXED MEMORY TEST

		<u>Results</u>	<u>Limits</u>
16.	Repeat Steps B25.5 - B26.17		
	REF STEP B26.3 No outputs over 5 MV	_____	Testman's Stamp
	REF STEP B26.8 STRAND 1 No outputs over 5 MV	_____	Testman's Stamp
	REF STEP B26.9 STRAND 2 No outputs over 5 MV	_____	Testman's Stamp
	STRAND 3 No outputs over 5 MV	_____	Testman's Stamp
	STRAND 4 No outputs over 5 MV	_____	Testman's Stamp
	STRAND 5 No outputs over 5 MV	_____	Testman's Stamp
	STRAND 6 No outputs over 5 MV	_____	Testman's Stamp
	STRAND 7 No outputs over 5 MV	_____	Testman's Stamp
	STRAND 8 No outputs over 5 MV	_____	Testman's Stamp
	STRAND 9 No outputs over 5 MV	_____	Testman's Stamp
	STRAND 10 No outputs over 5 MV	_____	Testman's Stamp
	STRAND 11 No outputs over 5 MV	_____	Testman's Stamp
	STRAND 12 No outputs over 5 MV	_____	Testman's Stamp
	REF STEP B26.14 STRAND 1 Waveform within limits	_____	Testman's Stamp
	REF STEP B26.15 a. STRAND 2 within limits	_____	Testman's Stamp
	b. STRAND 3 within limits	_____	Testman's Stamp
	c. STRAND 4 within limits	_____	Testman's Stamp
	d. STRAND 5 within limits	_____	Testman's Stamp

DATE _____

APOLLO G&N
EQUIPMENT TEST
DATA SHEET 9 OF 12

JDC
NO. <u>04255</u>
REV. D

JOB: FIXED MEMORY TEST

		<u>Results</u>	<u>Limits</u>
REF STEP 26.15	e. STRAND 6 (Con't)	_____	Testman's Stamp
	within limits	_____	Testman's Stamp
	f. STRAND 7 within limits	_____	Testman's Stamp
	g. STRAND 8 within limits	_____	Testman's Stamp
	h. STRAND 9 within limits	_____	Testman's Stamp
	i. STRAND 10 within limits	_____	Testman's Stamp
	j. STRAND 11 within limits	_____	Testman's Stamp
	k. STRAND 12 within limits	_____	Testman's Stamp

17. Repeat Steps B22.4 - B22.18

REF STEP B22.4 Value and Core Address

V _p min	_____
Core Address	_____
V _n min	_____
Core Address	_____

Record
Record
Record
Record

REF STEP B22.5 V₀ max

NMT 25 MV

REF STEP B22.15 V₀ max ABORT mode

NMT 25 MV

FINAL AMBIENT TEST

19. Repeat Steps B2 - B26.17

REF STEP B2 Test equipment
calibrated

Testman's Stamp

REF STEP B3 DVM ground strap
disconnected

Testman's Stamp

REF STEP B4 Scope Adjusted

Testman's Stamp

REF STEP B5 Station CAL stand-
ard measurements
made

Testman's Stamp

REF STEP B6 Station CAL stan-
dard measurements
within limits

Testman's Stamp

DATE _____

APOLLO G&N
EQUIPMENT TEST
DATA SHEET₁₀ OF ₁₂

JDC
NO. <u>04255</u>
REV. <u>D</u>

JOB: FIXED MEMORY TEST

		<u>Results</u>	<u>Limits</u>
19.	REF STEP B20	Temp. Switch in ambient position.	_____ Testman's Stamp
	REF STEP B22.2	No ZERO outputs	_____ Testman's Stamp
	REF STEP B22.3	V _p max V _n max	_____ NMT 350 MV _____ NMT 350 MV
	REF STEP B22.4	Value and Core Address V _p min Core Address V _n min Core Address	_____ Record _____ Record _____ Record _____ Record
	REF STEP B22.6	V ₀ max	_____ NMT 25 MV
	REF STEP B22.15	V ₀ max ABORT mode	_____ NMT 25 MV
	REF STEP 24.3	Tape Program Successful (No indication of error)	_____ Testman's Stamp/NO
	REF STEP B24.4	If step B24.3 is NO, initial if all indicated errors have been verified as not valid. Record N/A if step B24.3 initialed	_____ Testman's Stamp/ REJ/NA
	REF STEP B26.3	No outputs over 5MV	_____ Testman's Stamp
	REF STEP B26.8	STRAND 1 No outputs over 5 MV	_____ Testman's Stamp
	REF STEP B26.9	STRAND 2 No outputs over 5 MV STRAND 3 No outputs over 5 MV STRAND 4 No outputs over 5 MV STRAND 5 No outputs over 5 MV	_____ Testman's Stamp _____ Testman's Stamp _____ Testman's Stamp
		STRAND 6 No outputs over 5 MV STRAND 7 No outputs over 5 MV	_____ Testman's Stamp _____ Testman's Stamp

DATE _____

APOLLO G&V
EQUIPMENT TEST
DATA SHEET 11 OF 12

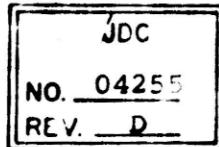
JDC
NO. 04255
REV. D

JOB FYD MEMORY TEST

	<u>Results</u>	<u>Limits</u>
REF STEP B26.9 (Con't)	STRAND 8 No outputs _____ over 5 MV	Testman's Stamp
	STRAND 9 No outputs _____ over 5 MV	Testman's Stamp
	STRAND 10 No outputs _____ over 5 MV	Testman's Stamp
	STRAND 11 No outputs _____ over 5 MV	Testman's Stamp
	STRAND 12 No outputs _____ over 5 MV	Testman's Stamp
REF STEP B26.14	STRAND 1 Waveform limits _____	Testman's Stamp
REF STEP B26.15	a. STRAND 2 within limits _____	Testman's Stamp
	b. STRAND 3 within limits _____	Testman's Stamp
	c. STRAND 4 within limits _____	Testman's Stamp
	d. STRAND 5 within limits _____	Testman's Stamp
	e. STRAND 6 within limits _____	Testman's Stamp
	f. STRAND 7 within limits _____	Testman's Stamp
	g. STRAND 8 within limits _____	Testman's Stamp
	h. STRAND 9 within limits _____	Testman's Stamp
	i. STRAND 10 within limits _____	Testman's Stamp
	j. STRAND 11 within limits _____	Testman's Stamp
	k. STRAND 12 within limits _____	Testman's Stamp
20.	Original Vp min - Final Vp min _____	NLT - 25 MV and NMT +25 MV
21.	Original Vn min - Final Vn min _____	NLT - 25 MV and NMT +25 MV

DATE _____

**APOLLO G&N
EQUIPMENT TEST
DATA SHEET 12 OF 12**



JOB: FIXED MEMORY TEST

22. Verify H Procedure complete

<u>Results</u>	<u>Limits</u>
_____	Testman's Stamp

MECHANICAL INSPECTION

I. PROCEDURE

- | | | |
|---------------------------------|-------|---------------------|
| 1. Good Workmanship appearance | _____ | Inspector's Stamp |
| 2. Connector Pins Okay | _____ | Inspector's Stamp |
| 3. Hardware Okay | _____ | Inspector's Stamp |
| 4. Identification Marking Okay | _____ | Inspector's Stamp |
| 5. Record Weight | _____ | Nearest (.01 pound) |
| 6. Verify I Procedure complete. | _____ | Inspector's Stamp |

DATE _____