

APOLLO G&N Specification

PS 2003053 Rev. B
Original Issue Date: 6-1-66
Release Authority: TDRR 29204
Class A Release

PROCUREMENT SPECIFICATION

PRODUCT CONFIGURATION AND ACCEPTANCE TEST REQUIREMENTS

FIXED MEMORY MODULE B1-B6 ASSEMBLY

DRAWING NO. 2003053

Record of Revisions

This specification consists of pages 1 to 19 inclusive.

APPROVALS	A. C. METZGER NASA/MSC	E.C. Hall 6/1/66	J.W. Walker 6/1/66	F. Price 5/23/66	Bernard B. Schindler 5/23/66 3C-Sub-Elem SHIG A. Belmonte 6/1/66 RAY
-----------	---------------------------	---------------------	-----------------------	---------------------	--

3.1.2 Insulation Resistance. The resistance between chassis ground (pin 301) and all other pins connected together shall be not less than 100 megohms.

3.1.3 Isolation Resistance. The resistance between the pins listed in Table I and all other pins (with exceptions as noted), shall be not less than 100 megohms.

TABLE I

<u>PIN NO.</u>	<u>ALL OTHER PINS EXCEPT</u>	<u>PIN NO.</u>	<u>ALL OTHER PINS EXCEPT</u>
224	--	117	417
324	--	116	416
102	402	115	415
124	123	114	414
101	401	113	413
122	121	112	412
103	104	111	411
424	423	110	410
403	404	109	409
422	421	108	408
120	420	107	407
119	419	106	406
118	418	105	405

3.1.4 Resistance. The resistance between the pairs of pins listed in Table II shall be as specified.

TABLE II

<u>PIN NO.</u>	<u>to</u>	<u>PIN NO.</u>	<u>Limit (ohms)</u>	
			<u>(Voltage on 201)</u>	<u>(Voltage return on 201)</u>
308		201	2 meg min.	1200 + 120
309		201	2 meg min.	1200 + 120
310		201	2 meg min.	1200 + 120
311		201	2 meg min.	1200 + 120
312		201	2 meg min.	1200 + 120
313		201	2 meg min.	1200 + 120
314		201	2 meg min.	1200 + 120
315		201	2 meg min.	1200 + 120
316		201	2 meg min.	1200 + 120
317		201	2 meg min.	1200 + 120
318		201	2 meg min.	1200 + 120
319		201	2 meg min.	1200 + 120
320		201	2 meg min.	1200 + 120
321		201	2 meg min.	1200 + 120
322		201	2 meg min.	1200 + 120

3.2 PRODUCT CONFIGURATION

3.2.1 Drawings. The configuration of the assembly shall be in accordance with APOLLO G&N Drawing 2003053 and all drawings and engineering data referenced thereon.

3.2.2 Weight. Maximum allowable weight of the assembly shall be 2.00 pounds.

4. QUALITY ASSURANCE PROVISIONS

4.1 GENERAL. The contractor responsible for the manufacture of the assembly shall be responsible for the accomplishment of each test required herein. See Table IV, Product Performance and Configuration Requirement/Quality Verification Cross Reference Index.

TABLE IV

REQUIREMENTS	VERIFICATION
3.1.1	4.2.2
3.1.2	4.2.3
3.1.3	4.2.4
3.1.4	4.2.5
3.1.5.1	4.2.6.1
3.1.5.2	4.2.6.2
3.1.5.3	4.2.6.3
3.1.7	4.2.7
3.1.8	4.2.8
3.1.9.1	4.2.9.1
3.1.9.2	4.2.9.2
3.1.9.3	4.2.9.3
3.1.9.4	4.2.9.4
3.1.10.1	4.3.1.1
3.1.10.2	4.3.1.2
3.1.11	4.3.2
3.2.1	4.2.1
3.2.2	4.2.10

4.1.1 Test Conditions

4.1.1.1 Environmental. Unless otherwise specified, the assemblies shall be tested under the following ambient conditions:

- | | |
|------------------------|------------------------|
| a. Temperature | 25° C + 100° |
| b. Relative Humidity | 90% max. |
| c. Barometric Pressure | 28 to 32 inches of Hg. |

4.1.8 (Cont'd)

(i) <u>LOGIC RESET (FCR)</u>	<u>LIMITS</u>
Amplitude (A)	NLT 0.5 volt
Rise Time (T_R)	NMT 250 nanosec
Fall Time (T_F)	NMT 300 nanosec
Time Differential (T_{d10})	+1 usec
Pulse Width (PW)	-0 2.5 ± 0.1 usec
(j) <u>RESET CURRENT (FCR)</u>	<u>LIMITS</u>
Amplitude (A)	450 ± 5 ma
Level (low)	NMT 1.0 ma
Time Differential (T_{d11})	NMT 125 ± 75 nanosec
Rise Time (T_R)	0.6 ± 0.2 usec
Off Time (T_{off})	NMT 0.5 usec

4.1.8.1 The Rope Module test requires a series combination of a $10 \text{ ohm} \pm 10\%$ resistor and $22 \text{ microhenry} \pm 10\%$ inductor in the clear input line. The limits specified herein for CLEAR CURRENT (4.1.8(f)) are to be measured with only the resistor in the circuit.

4.2 TESTS

4.2.1 Drawing Compliance. The assembly shall be visually examined for compliance with the requirement of APOLLO G & N Drawing 2003053. Particular attention shall be given to inspection for damage to surfaces, structure, and equipment, including contaminants, pin misalignment, and legibility and appearance of marking.

4.2.2 Thermal Conditioning. Verify that the module was subjected to two complete thermal cycles as specified in 3.1.1 prior to performing the acceptance tests specified herein.

4.2.3 Insulation Resistance. Using test equipment with a test potential of 100 VDC limited to a short circuit current of 1 milliamper, measure the resistance between chassis ground (pin 301) and all other pins connected together. Verify that the resistance is as specified in paragraph 3.1.2.

4.2.4 Isolation Resistance. Using test equipment with a test potential of 100 VDC limited to a short circuit current of 1 milliamper, measure the resistance between combinations of pins specified in Table I. Verify that resistances are as specified in paragraph 3.1.3.

4.2.5 Resistance. Using test equipment with a test potential of not less than 3 VDC and not more than 6 VDC, measure resistance between the combinations of pins specified in Table II. Verify that resistances are as specified in Table II (paragraph 3.1.4).

4.2.6 Continuity

4.2.6.1 Verify that the resistance between chassis ground (pin 301) and the module chassis is as specified in paragraph 3.1.5.1. Anodizing may be penetrated to assure good electrical connection.

4.2.6.2 Verify that the resistances between pairs of pins specified in Table III are as specified in paragraph 3.1.5.2.

4.2.6.3 Verify that the resistance between pins 401 and 101 is as specified in paragraph 3.1.5.3.

4.2.7 Program Content Test. Compare contents of the module with the appropriate programmed tape and verify that each core contains the correct information.

4.2.8 Clear Mode Test. With the inputs of 4.1.8(a), (d), (e), (f), (i) and (j) applied to the module, and the module loaded as specified in paragraph 4.1.4, verify that the output waveform at the manufacturer's test sense line (pins 101 and 401) is as specified in paragraph 3.1.8.

4.2.9 Sense Output Tests. With the inputs of 4.1.8(a), (b), (c), (d), (e), (g), and (h) applied to the module, and the module loaded per paragraph 4.1.4, perform the following tests:

4.2.9.1 Verify that the output on sense lines parity through sign is as specified in paragraph 3.1.9.1.

4.2.9.2 Verify that zero noise value (V_o max) is as specified in paragraph 3.1.9.2.

4.2.9.3 Verify that an all zero output is obtained when Logic STAGAT is zero. (V_o max = NMT 5 mv 1.1 to 2.3 usec after RESET)

4.2.9.4 Verify that an all zero output is obtained when Module Select current is removed. (V_o max = NMT 5 mv 1.1 to 2.3 usec after RESET (FR)).

4.2.10 Weight. Weigh the module to the nearest 0.01 pound. Verify that the weight does not exceed the maximum allowable weight specified in paragraph 3.2.2.

4.3 WORKMANSHIP. The following tests shall be performed under the conditions specified as a verification of good workmanship.

4.3.1 Temperature Extremes.

4.3.1.1 With the ambient temperature as specified in paragraph 3.1.10.1, repeat tests of paragraphs 4.2.7 and 4.2.8. Verify that the module performs as specified in paragraphs 3.1.8 and 3.1.9.

4.3.1.2 With the ambient temperature as specified in paragraph 3.1.10.2, repeat tests of paragraphs 4.2.7 and 4.2.8. Verify that the module performs as specified in paragraphs 3.1.8 and 3.1.9.

4.3.2 Vibration. Subject the module to the vibration limits specified in paragraph 3.1.11, and verify that the module meets the continuity requirements of paragraph 3.1.11.

5. PREPARATION FOR DELIVERY

5.1 GENERAL. Preparation for delivery shall be in accordance with Specification ND 100221⁴.

6. NOTES. None.