

May 4, 1972

Stan,
Here is the copy of the test plan
I promised you.

JWachholz

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SUBJECT: TEST PLAN FOR G&N SYSTEM 218 - Apollo 16

This test plan is intended to localize and/or provide additional data for analysis of the G&N anomalies encountered during the flight. The tests outlined below shall be performed in the spacecraft at NR prior to removal or disassembly of any of the PGNS. The tests are designed to provide systems level information and in general not intended to provide detailed information for analysis that is available at the subsystem or component level.

There were several problems or suspected problems associated with the OUA performance and operation. Tests will not be performed in this area because the OUA has been soaked with sea water. Therefore, it can not be energized nor could any meaningful viewing be accomplished. If required by subsequent data, the eyepieces can be tested individually outside the spacecraft. It is recommended that the OUA be disposed of in the normal manner.

The anomalies to be investigated are:

1. 90 degree M. G. ICDU Z offset resulting in gimbal lock indication.
2. ICDU fail indications.

Perform the following tests:

I. NO POWER TESTING

A. SET UP

1. Remove hardware as necessary for access to 56P30 and 56P31. Do not remove any G&N hardware.
2. Obtain suitable interface for 56P30 and 56P31 for continuity tests. Note. Do not probe or use single contact connection to any G&N connector.

3. Install PSAAM.
4. Use Simpson Model 260 or equivalent for continuity tests.

B. TEST

1. Perform Standard Ground Isolation Test.
2. Perform Continuity Test at 56P30, 56P31, and PSAAM BOB.
3. Review data for anomalies prior to powered testing.

II. POWERED TESTING

A. SET UP

1. Install breakout at 120J2 (TVSA) ref: G&N interface, 56P7.
2. Monitor listed signals on strip chart recorder

PSAAM

IG FE	CG 2220
CG FE	CG 2280
MG FE	CG 2250

PSAAM B.O.B.

1% 800 Hz IMU	J8-59
	J8-60

120J2 TVSA Breakout

Ref: G&N interface

SH DAC DC 56P7-47
 TR DAC DC 56P7-27
 SH DAC LO 56P7-46
 TR DAC LO 56P7-13

DAC SCALING

<u>OCTAL</u>	DECIMAL	
	<u>AC</u>	<u>DC</u>
375	6.68V 00	3.34 VDC

3. Optics Power Off
4. S/C Control SW. in CMC position
5. Nominal 28 V DC Buss
6. Nominal Coolant
7. Power up G&N to operate. Enable Optics EEC.
8. Load in Software program patches

- a. DAC Loading

The DAC loading program is a task which zeros and reloads the TVC DACs with the contents of location E7, 1464

- b. TVC Discrete Moding

The TVC moding program is a job which continuously monitors for a CDU FAIL and causes the TVC relay to follow the state of the PRO key. (PRO key depressed = TVC deenergized)

- c. ICDU Fail Monitor

The ICDU fail monitor program continuously monitors for a CDU FAIL signal (CH 30-12) and determines if the failure is caused by a CDU FAIL (CH 30-12) to TVC ENABLE (CH-12-8) short or CDU FAIL (CH 30-12) to SIVB TAKE OVER (CH 12-9) short.

9. Coarse Align to 275, 275, 5 and up-mode to inertial
10. Load SH and TR DACs with 000 using patch

B. TEST

1. Test per Flowgram
2. Change 28 VDC buss to Hi limit and change coolant to ICD Max. Temp. and Min. Flow, and repeat flowgram.
3. Mechanically disturb front panel.

START

PERFORM SETUP AS LISTED IN HA
X, Y, Z = 275, 275, 5
SH, TR DAC = 0, 0
IN INERTIAL MODE

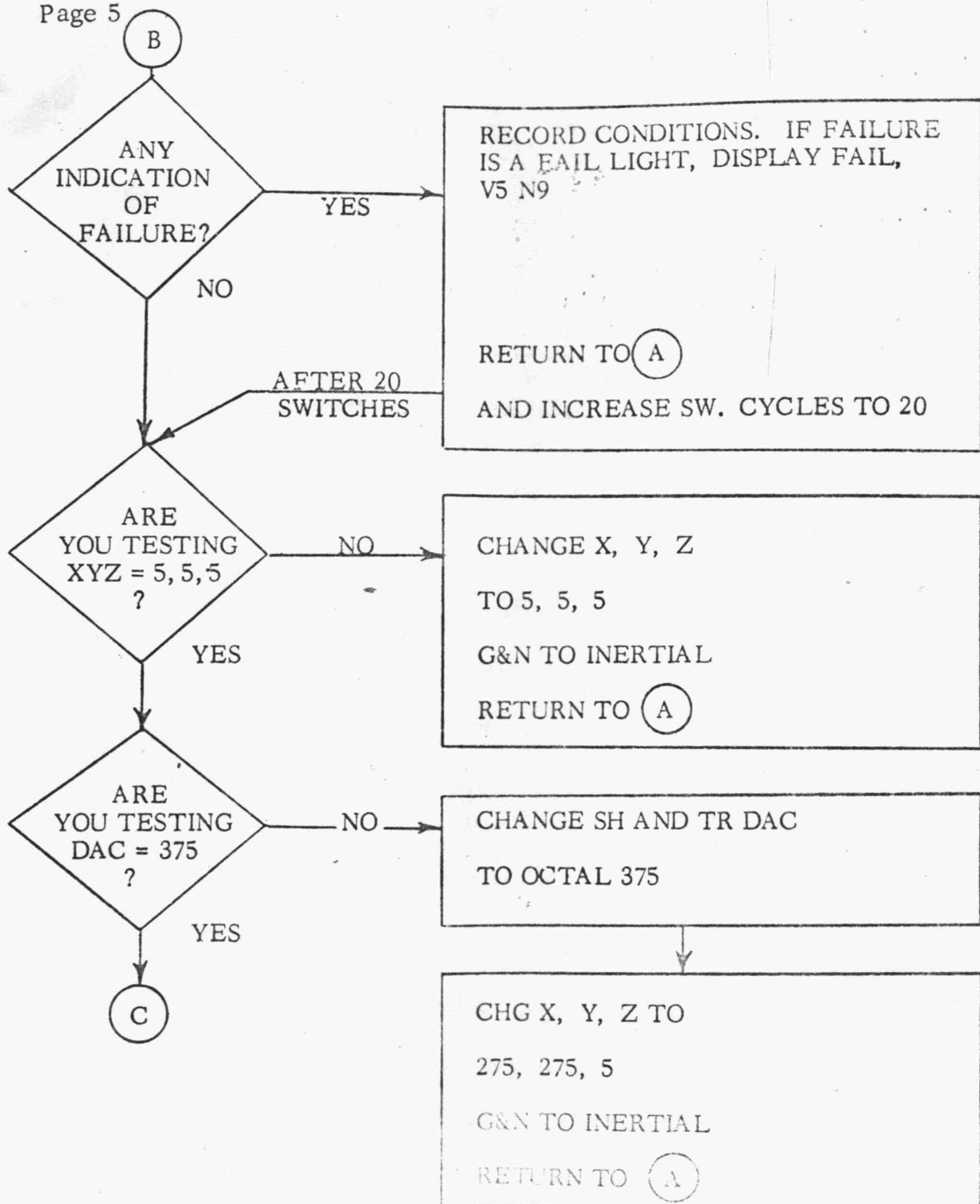
A

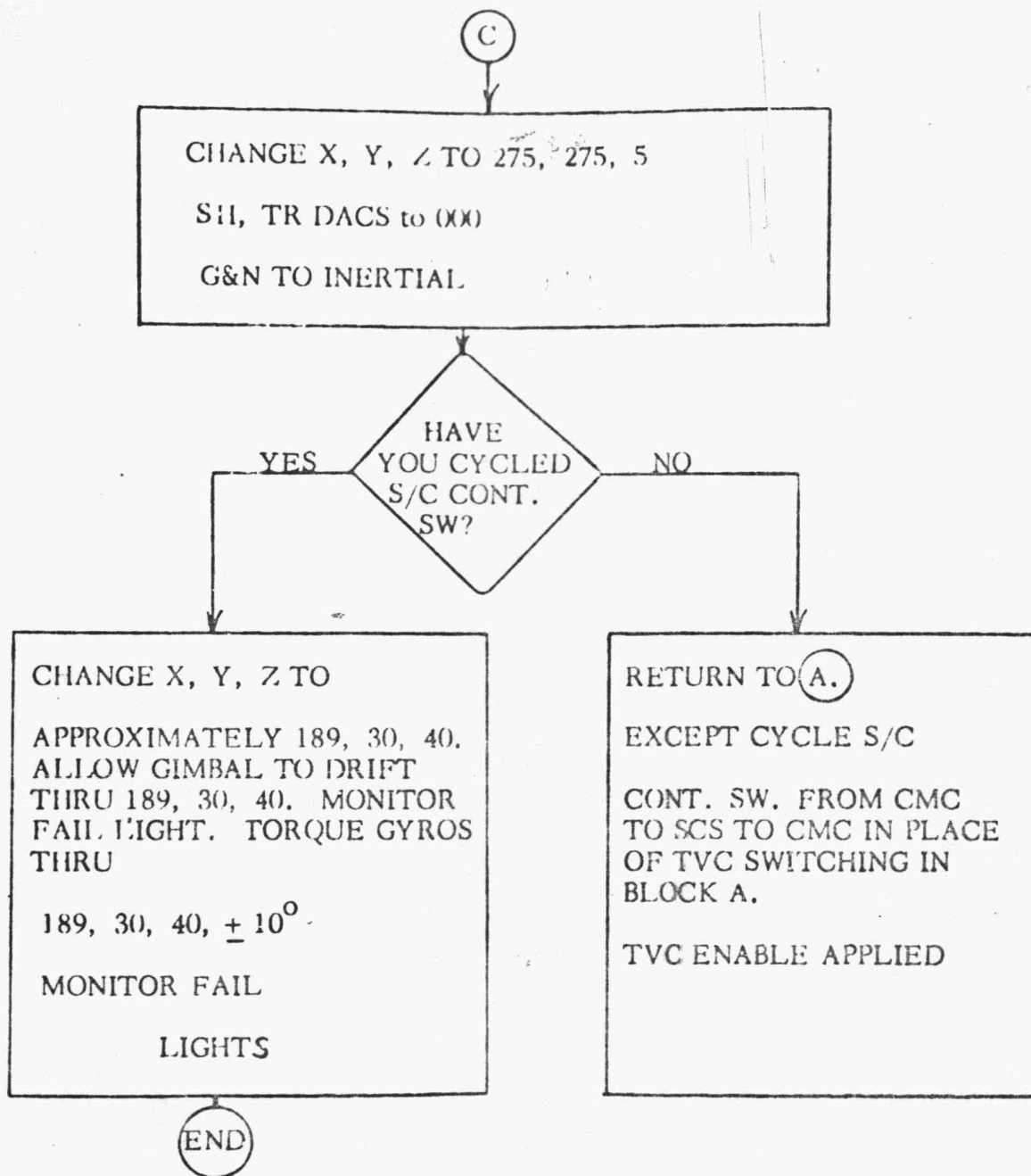
ENABLE AND DISABLE
TVC DISCRETE WITH PRO BUTTON USING TVC MODING PROGRAM
PATCH-TEN TIMES WITH SUFFICIENT
TIME IN BETWEEN TO NOTE ANY CHANGES

MONITOR

- 1) ICDU ON DSKY (X, Y, Z)
- 2) STRIP CHART RECORDER
- 3) FAIL LIGHTS, DSKY & GNIC

B





After test completion and review of the data the following disassembly and inspection procedure shall be followed:

1. Remove close out panels and cover on the end of the CDU to gain access to the CDU/coldplate interface.
2. Observe this interface. Mounting rails should be up tight. Center area (between mounting rails) is probably not making contact.
3. Use long 0.001 inch feeler gage to determine fit condition between bottom of CDU cover and cold plate.
4. Check torque to tighten CDU mounting screws. (Not break-away torque) specification is 65 ± 5 in. -lbs.
5. Inspect cold plate fit using a mirror.
6. Remove NR equipment necessary to disconnect 56 P1 thru 56 P8.
7. Loosen AGC and electrically isolate from S/C structure.
8. Attach meter (Simpson 260 or equivalent) to end of CDU where the cover was removed. Measure resistance to structure. Should be less than 1 ohm.
9. Remove CDU and AGC - Do not rub against the cold plate. Inspect condition of thermal grease. Was there good thermal contact?
10. Maintain the CDU, AGC, and A Harness assembly in the flight configuration.
11. Prepare for shipment to Delco-Milwaukee in this configuration. Harness connectors 56 P1 through 56 P8 must be supported to prevent damage.


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