

GRUMMAN AIRCRAFT ENGINEERING CORPORATION  
PLANT 52, HOUSTON, TEXAS

To: All Affected Departments/Houston

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Procedure Title: PROCEDURE FOR THE PREPARATION AND PROCESSING  
OF THE TEST PREPARATION SHEET

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GRUMMAN AIRCRAFT ENGINEERING CORPORATION  
PLANT 52, HOUSTON, TEXAS

PROCEDURE FOR THE PREPARATION AND PROCESSING  
OF THE TEST PREPARATION SHEET

I. PURPOSE

This procedure defines the use of the Test Preparation Sheet (TPS) in the LM Test Program at the MSC, Houston, Texas, and will be followed for authorizing all work (when required by NASA) except that authorized by a DR. The TPS will be a permanent record of accomplished work.

II. GENERAL

- A. There are two types of TPS's, Type "A" for configuration changes and Type "B" for all other work.

B. THE TPS MODIFICATION SHEET

The TPS Modification Sheet is used to revise or delete unworked portions of the original TPS. It will not change the intent or the bought-off (GAEC and NASA Quality Control) portions of the TPS.

The TPS Modification Sheet will be considered as an integral part of the original TPS and is kept with the subject TPS from the time of logging through ultimate filing. It has the same control number with a modification number.

C. TPS INDEX

The TPS Master Index is maintained by GAEC Quality Control in the TPS section of the Inspection Log Book, listing all TPS's. The index shall reflect completion of the TPS's by inspection acceptance stamps placed in the appropriate blocks by GAEC and NASA inspectors.

- D. A black ballpoint pen will be used in making entries. The writer must use sufficient pressure on the pen to insure a clear impression on the hard copy of the form. All blocks on the form must have a specific entry or the word "none" or "N/A." Complete and legible entries are necessary for accurate interpretation.

### III. IMPLEMENTATION

The TPS will be prepared as follows: (Block numbers correspond to MSC Form 1225, page 8, and Flow Chart page 9 indicates flow and distribution).

#### BLOCK

#### ENTRY

1

The applicable type of TPS, "A" or "B."

A. Type "A" TPS is used for, but not limited to, the following applications.

1. To accomplish a Class I change per an EO(s) which authorizes work that permanently affects configuration.
2. A type "A" TPS may precede the actual issue of an EO in the interest of accomplishing changes in order to prevent delays of tests already in progress.

NOTE: A Type "A" TPS shall not be processed after the normal work day except in emergencies. (Normal workday is defined as Monday through Friday less holidays between the hours of 7:30 AM to 4:00 PM). The after hours emergency TPS will be processed in the following manner:

- N 1. The originator will prepare the TPS and obtain Project Engineering approval and NASA Engineering approval if available.
- N 2. The TPS is to be given to the Quality Control Representative intact.
- N 3. The Quality Control Representative is to stamp the job that is accomplished and transfer the TPS, intact, to day shift QC representative.
- N 4. The day shift QC representative will forward the TPS to the day lead Engineer who will give the TPS to Configuration Management for NASA Configuration Panel presentation.

B. Type "B" TPS is used for, but not limited to, the following applications.



BLOCKENTRY

1. To perform tests per established formal procedures (for example, OCPs, DTPs, process specifications, et cetera) or to designate selected portions of formal procedures. The TPS may supplement the established procedure to specify special pretest requirements, and/or to record test results when the procedure is not impounded or does not allow space for recording.
2. To perform special tests not covered by established procedures. The TPS must be self-sufficient in supplying detailed procedural instructions, test setup requirements, special test equipment requirements, specifications and tolerances, drawings, sketches, recording of results, test constraint status, et cetera.
3. To authorize the fabrication and use of special test equipment and test tools. The fabrication of this test equipment shall be via the locally released and controlled drawings.
4. To remove or re-install equipment for access, calibration, replacement, et cetera.
5. To move or transport spacecraft, test articles, and critical items of GSE or essential support equipment.
6. To incorporate temporary configuration changes. At the conclusion of the test, the equipment will either be returned to the previous configuration, or the change will be covered by a CCP approved "permanent" EO before the next formal test. Type "A" TPS will be required to authorize the "permanent" EO configuration change.
7. To create parts not covered by released drawings or EOs. Sketches will be shown on the TPS or a separate sheet, and release of the TPS will constitute release of sketch.

2

The TPS control number will be assigned and maintained by the appropriate lead engineer.

The TPS control number will be prefixed by an identifying category followed by a dash number which will be numbered sequentially for the LTA-8 Program. The range of dash numbers is indicated below:

BLOCK

2 (Cont.)

ENTRYIDENTIFICATION  
CategoriesDash No.  
Range

CO	Crew Operations	1000 - 1999
ECS	Environmental Control System	2000 - 2999
EPS	Electrical Power Systems	3000 - 3999
FC	Flight Controls	4000 - 4999
FM	Fluid Mechanical	5000 - 5999
INS	Instrumentation	6000 - 6999

3

The applicable code designation, category and system number:

- a. S/C - Spacecraft, test article or airframe number. (For LTA-8 Test Operation - always insert LTA-8)
- b. Cat. - (To be left blank)
- c. No. - (To be left blank)

4

When it is necessary to modify or change the original TPS, enter M1, M2, et cetera. Blocks 1 through 3 on the Modification Sheets shall be identical to the original. The M1, M2 et cetera will also be entered in Block 2 after the dash number.

5

The page number and total number of pages.

6

The spacecraft or GSE end item number.

The GSE end item number is taken from the nameplate. If more than one GSE end item is affected by the TPS enter an (\*) asterisk in Block 6 and and list end items in Block 10 followed by the serial number in brackets.  
Example: LDW430-64600(1). For spacecraft TPS's enter the Spacecraft designation, and identifying category as indicated below. Example: LTA-8/270

Spacecraft Category

270	Propulsion Systems, Ascent and Descent
280	Vehicle Structure
300	GN and C System (Stabilization and Control)

BLOCKENTRY

6 Cont't

Spacecraft Category

310 Reaction Control System (RCS)  
 320 Mechanical and Explosive System  
 330 Environmental Control System (ECS)  
 340 Crew Provisions  
 350 Displays  
 360 Flight Instrumentation  
 370 GN and C System (Navigation and Guidance)  
 380 Communications System  
 390 Electrical Power System (EPS)  
 450 Supplemental Instrumentation  
 938 Thermal Heaters

7

Date TPS is prepared

8

To be left Blank.

9

Date required for completion of work and/or last  
 major program milestone code. (indicated below  
 for LTA-8 program)

Code

DA Prior to Descent Stage Arrival  
 AA Prior to Ascent Stage Arrival  
 PO Prior to Vehicle Power On  
 TVRT Prior to Thermal Vacuum Readiness Test  
 CCO Prior to Start of Chamber and Vehicle  
 Closeout  
 MR Prior to Man-rating Countdown  
 258-1 Prior to Start of 258-1 Countdown  
 258-2 Prior to Start of 258-2 Countdown  
 S4R Prior to Start of LM-4 Refurbish  
 C4R Prior to completion of LM-4 Refurbish



BLOCKENTRY

9 (Cont'd)

8S Prior to LTA-8 Shipment from SESL

FCL Prior to Final Cabin Leak Test

GS Prior to GSE Shipment from SESL

10

All drawings, documents, OCPs, et cetera, required for reference material by engineering, production, and/or inspection to properly and adequately perform the TPS functions.

11

Contract number.

12

GSE or spacecraft end item serial numbers. On non-serialized equipment, use the symbol STE (special test equipment) or "N/A." as applicable.

13

Functional description or nomenclature of the equipment.

14

LCR No./E.O.

If more than one Engineering Order (EO) is required as reference or is to be worked, mark this block "See Descrip." When this note is entered, use the first lines under description as the entry block. If the EO is not required, note "N/A."

15

A brief descriptive title of work.

16

"Yes" or "N/A." If "yes," weight of assembly is to be obtained and entered in body of the TPS.

17

Short narrative or reason for work.

18

The description of work to be performed will be listed sequentially and instructions will be detailed to the extent required for comprehension by engineering, production support and inspection.

19

Name of person preparing the TPS.

20

NASA Quality Control (QC) final acceptance stamps and date.

BLOCKENTRY

21

Tech stamp or initial

FOR EACH  
STEP ACCOMPLISHED

22

GAEC QC stamp

23

NASA QC stamp

FOR EACH MANDATORY  
INSPECTION POINT

24

Contractor approved signatures:

LTA-8 - TEST OPERATIONS

For LTA-8 The Test Operations Manager has designated the Lead Engineer and/or Test Conductor/Assistant Test Conductor.

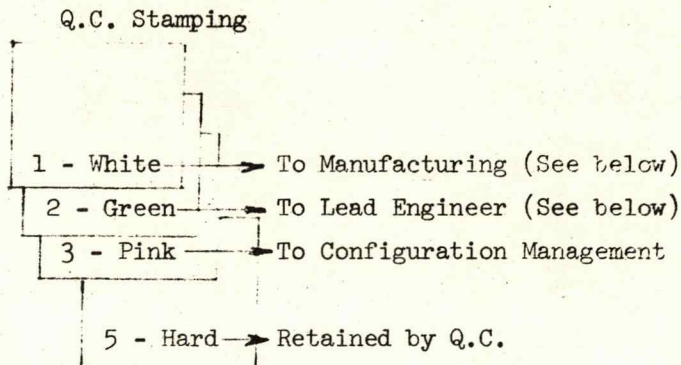
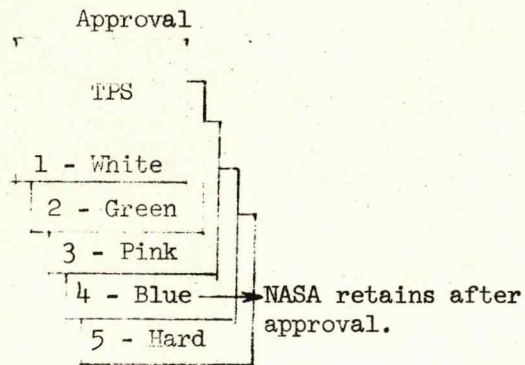
An additional approval signature for Temporary Configuration Changes and Emergency Type "A" TPS's by Project Engineering is required. The Project Engineering Chief has designated the Vehicle Systems Group Leader and the GSE Systems Group Leader.

Other Task Teams will be added as required.



[illegible]

# TPS FLOW



## Originator

1. Obtains necessary approvals:
  - a. Lead Engineer
  - b. Test Conductor
  - c. Project Eng. Group Leader\*
  - d. NASA\*\*
2. Gives all copies to Q.C. for stamping.
3. Advises Control Room of open TPS number and event constrained.
4. Distributes copies.

## Manufacturing

1. Upon receipt of white copy, Planning will alert any other support group involved.
2. Have white copy stamped simultaneously with hard copy.
3. Forward completed white copy to Lead Engineer.

## Lead Engineer

1. Files Green copy in TPS log book.
2. Schedules work.
3. Upon receipt of completely stamped white copy from Manufacturing:
  - a. Obtains NASA approval date from Q.C.
  - b. Notes completion date on green copy in log.
  - c. Advises Control Room of completion.
  - d. Forwards white copy to Supporting Services.

\* Approval required only on Type A's processed on second shift and Type B's which temporarily change configuration.

\*\* Meeting between NASA and Configuration Management on type A TPS's. Originator's attendance only if desired.