ES61-TCP-PACRATS-MCTF-001
Submittal Date: June 28, 2011

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
Marshall Space Flight Center, Alabama 35812

Payload and Components Real-time Automated Test System (PACRATS)

Data Acquisition of Leak Rate & Pressure Data Test Procedure

As Run Record Copy	in Red
Run #	_____
Start Date	_____
Finish Date	_____

Flight Systems Integration and Test Branch

Systems Development, Integration & Test Division

Space Systems Department

Engineering Directorate

VERIFY THAT THIS IS THE CORRECT VERSION BEFORE USE.

REVISION RECORD

REVISION	DESCRIPTION	DATE
Baseline	Original Release	06/28/2011

PACRATS MCTF
Approval Page

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TEST ARTICLE IDENTIFICATION

There are no test articles for this procedure. The system under test is the Payload and Components Real-Time Automated Test System (PACRATS) for the use of data-acquisition during leak-rate and pressure-data testing.

TABLE OF CONTENTS

TABLE OF CONTENTS

1.0 Introduction

1.1 Purpose

The purpose of this activity is to provide the Mechanical Components Test Facility (MCTF) with the capability to obtain electronic leak test and proof pressure data. Payload and Components Real-time Automated Test System (PACRATS) data acquisition software will be utilized to display real-time data. It will record leak rates and pressure/vacuum level(s) simultaneously. This added functionality will provide electronic leak test and pressure data at specified sampling frequencies. Electronically stored data will provide ES61 with increased data security, analysis, and accuracy. The tasks performed in this procedure are to verify PACRATS only, and are not intended to provide verifications for MCTF equipment.

1.2 System Description

An in-house Personal Computer—based data acquisition software system (PACRATS) developed by NASA Engineers will be utilized to interface with MCTF hardware to collect, display, and record real-time serial data.

1.3 Test Program Classification

This activity is a Non-Mission Critical and Non-Safety Critical Program.

1.4 Responsibilities

ES61 and ES63 will be responsible for overall test management and will develop the test plan, procedure, and a final test report. ES61/MCTF engineers will be responsible for operation of MCTF devices interfacing to PACRATS.

1.5 List of Abbreviations

CBL	Cable
CCW	Counter Clockwise
COM	Communications
ESD	Electrostatic Discharge
GHe	Gaseous Helium
GN2	Gaseous Nitrogen
GSE	Ground Support Equipment
JHA	Job Hazard Analysis
MCTF	Mechanical Components Test Facility
MSFC	Marshall Space Flight Center
OWI	Organizational Work Instruction
PACRATS	Payload and Components Real-time Automated Test System
PPE	Personal Protective Equipment

S&MA	Safety and Mission Assurance
SHE	Safety, Health, and Environment
TCP	Test and Checkout Procedure
TDR	Test Discrepancy Record
TPD	Test Procedure Deviation
TRR	Test Readiness Review
TRI	Test Readiness Inspection

1.6 Applicable Documents

ES61-JHA-003	Electrical/Mechanical Operations Job Hazard Analysis
ES61-JHA-011	Leak Detection Job Hazard Analysis
ES61-JHA-012	Pressurization Job Hazard Analysis
ES61-JHA-014	Small hand Tools Job Hazard Analysis
ES61-OWI-001	Systems Testing
ES61-OWI-004	Mechanical Components Test Facility (MCTF) Test Operations
MPR 1280.4	MSFC Corrective Action System
MPR 8715.1	Marshall Safety, Health, and Environmental (SHE) Program
MPR 8730.1	Inspection and Testing
MPR 8730.3	Control of Nonconforming Product
MPR 8730.5	Control of Inspection, Measuring, and Test Equipment
MWI 8715.15	Ground Operations Safety Assessment Program
ES61-PLAN -SSITF-302	Safety Assessment Plan
SN-C-0005	NASA Specification Contamination Control Requirements for Space Shuttle Program

2.0 Safety / Quality Assurance Information

2.1 Risk Assessment Code

A safety assessment of the operations in this procedure was performed in accordance with MWI 8715.15, Ground Operations Safety Assessment Program, and is documented in ES61-PLAN-SSITF-302, Safety Assessment Plan. The electrical/mechanical test operations specified in this procedure are categorized as a Risk Acceptance Code 3E. Based upon an assessment of the complexity and risk to the hardware, this procedure can be performed by one individual after test setup verification by a second person.

2.2 Job Hazard Analysis

Test Operations will be conducted using Job Hazard Analyses ES61-JHA-003, "Electrical/Mechanical Operations", ES61-JHA-011, "Leak Detection", ES61-JHA-012, "Pressurization" and ES61-JHA-014, "Small Hand Tools", as guidelines.

2.3 Personnel Protective Equipment

No Personnel Protective Equipment (PPE) is required.

2.4 Hardware Handling

No planned moves are to be performed during the execution of this procedure.

2.5 Cleanliness Requirements

MCTF hardware will be maintained per SN-C-0005 Level 300A.

2.6 Electrostatic Discharge (ESD) Requirements

Wrist straps will not be required for any cable connections. All cables used within this procedure are commercial grade.

2.7 Grounding Requirements

There are no specified grounding requirements.

2.8 Electrical Conventions

No test lead connections will be made as part of this procedure.

2.9 Emergency Telephone Numbers

The emergency telephone numbers are listed on the last page of the test procedure in section 9.0.

2.10 Emergency Shutdown Procedure

In case of an emergency, perform the emergency shutdown procedure located on the last page of the test procedure in section 9.0.

2.11 Close Call/Mishap Reporting

The test engineer is responsible for immediately notifying their supervisor for all ES61 mishaps and close calls. An initial estimate of the mishap severity based on injuries and cost shall be done by the responsible supervisor to determine the mishap type and notifications required in accordance with MWI 8621.1, Close Call and Mishap Reporting and Investigation Program.

All onsite mishaps and close calls shall be reported to the Industrial Safety Office within 4 hours of occurrence or awareness by calling (256) 544-4357, Option "0" (NASA Information Support Center) or the MSFC Industrial Safety Hotline at (256) 544-4357, Option "2", or by electronic submittal from the MSFC SHE Page, under the "Report a Mishap" block to generate a NASA Initial Safety Incident Report, also known as a Flash or Quick Incident Report

2.12 Test Verification

The Safety and Mission Assurance Directorate will monitor and verify all tests and inspections per MPR 8730.1. If a nonconformance or unsatisfactory condition is obtained during test operations, the Guidelines of MPR 8730.3, Control of Nonconforming Product, and MPR 1280.4, MSFC Corrective Action System will be followed to troubleshoot and document the corrective action.

3.0 Pre-Test Preparation

3.1 Test Requirements

The purpose of this procedure is to verify the operation of the PACRATS software only. MCTF hardware will be utilized to support this activity. However, no flight hardware will be required to perform operations within this procedure.

3.2 Test Readiness Review

According to ES61-PLN-PACRATS-MCTF-001, a Test Readiness Review (TRR) is not required. A Test Readiness Inspection (TRI) shall be performed following test setup and prior to the start of test operations for each test configuration. TRI will consist of personnel directly involved with the test. A TRI Checklist is in Appendix 8.0 which shall be filled out by the Test Conductor and signed by all test participants.

3.3 Test Facility

Mechanical Components Test Facility (MCTF) located in building 4493.

3.4 Test Equipment/GSE

All test equipment utilized in the performance of this test procedure shall be inspected for damage, and where appropriate, shall be verified to be operational and in current calibration.

(a) Heise Meter

Manufacturer_____ Model_____

Cal ID_____ Cal Due Date_____

(b) INFICON

Manufacturer_____ Model_____

(c) Varian

Manufacturer_____ Model_____

(d) Pressure gauge (or transducer) PG1:

Cal ID. _____ Cal. Due Date_____ Range _____

(e) Pressure gauge (or transducer) PG2:

Cal ID. _____ Cal. Due Date_____ Range _____

(f) PC Name

NEMS #_____ OS Version_____

(g) PACRATS Version _____

(h) Filter

(i) Hand Valve(s)

(j) Vent Valve

(k) Various hoses and fittings

(l) Gaseous Nitrogen (GN2) per MIL-PRF-27401

(m) Gaseous Helium (GHe) per MIL-PRF-27407 Grade A except neon

(n) Regulator

(o) Relief Valve

(p) Sniffer Probe

(q) Vacuum Chamber

(r) Cables

i. CBL Type 001 (2)
ii. CBL Type 002
iii. Com 4
iv. Com 5

3.5 Pre-test Setup

Pretest setups for the varying configurations of the three unique tests are provided in the respective test operations sections.

4.0. Test Operations

4.1 Proof Test

Reference Section 6.0 Figure 6.1 for the test setup. The steps can be performed out of sequence at the discretion of the test conductor.

4.1.1 ☐ Setup the MCTF and PACRATS hardware per Section 6.1.

4.1.2 ☐ 2nd Person Verification _____ (Print Name)

_____ (Sign Name)

4.1.3 ☐ Power on the Heise meter.

4.1.4 ☐ Press Setup.

4.1.5 ☐ Use the arrows to select "RS232."

4.1.6 ☐ Select "Enable."

4.1.7 ☐ Set the baud rate to "9600."

4.1.8 ☐ Use the arrows to select the "Remote" mode.

4.1.9 ☐ Select "Terminal Mode."

4.1.10 ☐ Select "CrLF" for the End of Message.

4.1.11 ☐ Verify/set regulator to full CCW (closed).

4.1.12 ☐ Verify/close HV1, HV2 and vent valve.

4.1.13 ☐ Verify PG1 and PG2 are reading atmospheric pressure.

4.1.14 ☐ Once the test set up is configured per Section 6.1, connect the setup to the dummy test article.

4.1.15 ☐ Conduct TRI. Complete the TRI Checklist in Appendix 8.0 Section 8.1 and the test participants shall sign and date.

4.1.16 ☐ Photograph the test setup and attach a copy to this procedure.

4.1.17 ☐ Power ON the PACRATS Computer and run the PACRATS application.

4.1.18 ☐ Record PACRATS Version by selecting Help/About PACRATS.
PACRATS Version_____

4.1.19 ☐ Load the PACRATS test file heise.tst by selecting File/Start Test and double click test file to be loaded.

Record Test File Name_____

4.1.20 ☐ Verify data is being received on the PACRATS workstation.

4.1.21 ☐ Start PACRATS data recording by selecting File/Set Record On.

Record Data File Name _____

4.1.22 ☐ Verify Heise PG1 and PG2 are reading atmospheric and record in Section 7.0 Table 7.1.

4.1.23 ☐ Verify PACRATS PG1 and PG2 are reading atmospheric and record in Section 7.0 Table 7.1.

4.1.24 ☐ Open BV1.

4.1.25 ☐ Set the pressure on PG1 to 5.0 +/- 1.0 psig by adjusting the regulator.

4.1.26 ☐ Open HV1 and pressurize up to HV2.

4.1.27 ☐ Open HV2 and pressurize the dummy test article.

4.1.28 ☐ Record the pressures of Heise PG1 and PG2 and PACRATS PG1 and PG2 in Section 7.0 Table 7.1.

4.1.29 ☐ Verify PACRATS by adjusting the regulator to change the pressure multiple times and record values from the Heise meter and PACRATS in Section 7.0 Table 7.1 after each change of pressure.

4.1.30 ☐ Close BV1.

4.1.31 ☐ Open the vent valve and vent until Heise PG1/PG2 and PACRATS PG1/PG2 read atmospheric pressure.

4.1.32 ☐ Record the final pressures in Section 7.0 Table 7.1.

4.1.33 ☐ Close HV1, HV2, and the vent valve.

4.1.34 ☐ Set the regulator to full CCW (closed).

4.1.35 ☐ Stop PACRATS data recording by selecting File/Set Record Off.

4.1.36 ☐ Close the PACRATS workspace by selecting File/Close Workspace.

4.1.37 ☐ Stop the PACRATS test file by selecting File/Stop Test.

4.1.38 ☐ Save data to .CSV file by selecting Data/Convert.

4.1.39 ☐ Select the correct file using Year/Month/Day/Time.HDR.

4.1.40 ☐ Open selected file.

4.1.41 ☐ Select the measurements tab in the Data Convert window.

4.1.42 ☐ Move measurements by selecting Heise 1 and Heise 2, and use the arrow to transfer to the right side.

4.1.43 ☐ Select Ok.

4.1.44 ☐ Select "No" on the Convert More Data to File window.

4.1.45 ☐ Exit the PACRATS application by selecting File/Exit.

4.1.46 ☐ Archive the PACRATS test data files, message log and photographs and record location:

//Australia/PACRATS_MCTF/_____

4.1.47 ☐ Turn off hardware if applicable.

4.1.48 ☐ Disconnect the test setup as required.

4.2 Sniffer Probe Leak Test with Inficon

Reference Section 6.0 Figure 6.2 for the test setup. The steps can be performed out of sequence at the discretion of the test conductor.

4.2.1 ☐ Setup the MCTF and PACRATS hardware per Section 6.2.

4.2.2 ☐ 2nd Person Verification _____ (Print Name)

_____ (Sign Name)

4.2.3 ☐ Power on the Heise meter.

4.2.4 ☐ Press Setup.

4.2.5 ☐ Use the arrows to select "RS232."

4.2.6 ☐ Select "Enable."

4.2.7 ☐ Set the baud rate to "9600."

4.2.8 ☐ Use the arrows to select the "Remote" mode.

4.2.9 ☐ Select "Terminal Mode."

4.2.10 ☐ Select "CrLF" for the End of Message.

4.2.11 ☐ Power up the Inficon, and let it warm up for 20-30 minutes.

4.2.12 ☐ While the device is warming, put the device in "All Interfaces Mode" by performing the next twelve steps.

4.2.13 ☐ Select "Menu".

4.2.14 ☐ Select "Settings".

4.2.15 ☐ Select "Interfaces".

4.2.16 ☐ Select "Control Location".

4.2.17 ☐ Select "All".

4.2.18 ☐ Select "OK".

4.2.19 ☐ Press the "Back" button to return to the Settings Menu.

4.2.20 ☐ Select "Interfaces".

4.2.21 ☐ Select "RS232 Protocol".

4.2.22 ☐ Select "ASCII".

4.2.23 ☐ Select "OK".

4.2.24 ☐ Press the "Back" button twice to return to the Main Menu.

4.2.25 ☐ Select "Mode".

4.2.26 ☐ Select "Sniff".

4.2.27 ☐ Select "OK".

4.2.28 ☐ Press the "Back" button.

4.2.29 ☐ Connect the Sniffer Probe to the Inficon.

4.2.30 ☐ Select "Start" button on Inficon.

4.2.31 ☐ Verify/set regulator to full CCW (closed).

4.2.32 ☐ Verify/close HV1, HV2 and vent valve.

4.2.33 ☐ Verify PG1 and PG2 are reading atmospheric pressure.

4.2.34 ☐ Once the test set up is configured per Section 6.2, connect the setup to the dummy test article.

4.2.35 ☐ Conduct TRI. Complete the TRI Checklist in Appendix 8.0 Section 8.2 and the test participants shall sign and date.

4.2.36 ☐ Photograph the test setup and attach a copy to this procedure.

4.2.37 ☐ Power ON the PACRATS Computer and run the PACRATS application.

4.2.38 ☐ Record PACRATS Version by selecting Help/About PACRATS.
PACRATS Version_____

4.2.39 ☐ Load the PACRATS test file Inficon-Heise.tst by selecting File/Start Test and double click test file to be loaded.

Record Test File Name_____

4.2.40 ☐ Verify data is being received on the PACRATS workstation.

4.2.41 ☐ Start PACRATS data recording by selecting File/Set Record On.

Record Data File Name _____

4.2.42 ☐ Verify Heise PG1 and PG2 are reading atmospheric and record in Section 7.0 Table 7.2.

4.5.43 ☐ Verify the Inficon Leak Rate and Record in Section 7.0 Table 7.2.

4.2.44 ☐ Verify PACRATS PG1 and PG2 are reading atmospheric; verify the Leak Rate SCCS GHe and record all values in Section 7.0 Table 7.2.

4.2.45 ☐ Open BV1.

4.2.46 ☐ Set the pressure on PG1 to 5.0 +/- 1.0 psig by adjusting the regulator.

4.2.47 ☐ Open HV1 and pressurize up to HV2.

4.2.48 ☐ Open HV2 and pressurize the dummy test article.

4.2.49 ☐ Close HV2.

4.2.50 ☐ Open vent and allow Test Article to vent until PG2 reads atmospheric.

4.2.51 ☐ Close vent.

4.2.52 ☐ Open HV2 and pressurize Test Article as read on PG2.

4.2.53 ☐ Close HV2.

4.2.54 ☐ Open vent and allow Test Article to vent until PG2 reads atmospheric.

4.2.55 ☐ Close vent.

4.2.56 ☐ Open HV2 and pressurize until PG2 reads 5.0 +/- 1.0 psig.

4.2.57 ☐ Maintain pressure for dwell for 30 minute minimum.

Start_____ Stop_____

4.2.58 ☐ Using a sniffer probe, test all seperable joints for leakage.

4.2.59 ☐ Verify that the PACRATS and Inficon data are the same and record maximum leakage from both in Section 7.0 Table 7.2.

4.2.60 ☐ Record the pressures of Heise PG1 and PG2, Inficon Leak Rate, and PACRATS PG1, PG2, and Leak Rate in Section 7.0 Table 7.2.

4.2.61 ☐ Verify PACRATS by adjusting the regulator to change the pressure multiple times and record the values from the Heise meter, Inficon, and PACRATS in Section 7.0 Table 7.2 after each change of pressure.

4.2.62 ☐ Close BV1.

4.2.63 ☐ Open the vent valve and vent until Heise PG1/PG2 and PACRATS PG1/PG2 read atmospheric pressure.

4.2.64 ☐ Record the final pressures in Section 7.0 Table 7.2.

4.2.65 ☐ Close HV1, HV2, and the vent valve.

4.2.66 ☐ Set the regulator to full CCW (closed).

4.2.67 ☐ Stop PACRATS data recording by selecting File/Set Record Off.

4.2.68 ☐ Close the PACRATS workspace by selecting File/Close Workspace.

4.2.69 ☐ Stop the PACRATS test file by selecting File/Stop Test.

4.2.70 ☐ Save data to .CSV file by selecting Data/Convert.

4.2.71 ☐ Select the correct file using Year/Month/Day/Time.HDR.

4.2.72 ☐ Open selected file.

4.2.73 ☐ Select the measurements tab in the Data Convert window.

4.2.74 ☐ Move measurements by selecting Heise 1, Heise 2, and Leak Rate, then use the arrow to transfer to the right side.

4.2.75 ☐ Select Ok.

4.2.76 ☐ Select "No" on the Convert More Data to File window.

4.2.77 ☐ Exit the PACRATS application by selecting File/Exit.

4.2.78 ☐ Archive the PACRATS test data files, message log and photographs and record location:

//Australia/PACRATS_MCTF/_____

4.2.79 ☐ Turn off hardware if applicable.

4.2.80 ☐ Disconnect the test setup as required.

4.3 Sniffer Probe Leak Test with Varian

Reference Section 6.0 Figure 6.3 for the test setup. The steps can be performed out of sequence at the discretion of the test conductor.

4.3.1 ☐ Setup the MCTF and PACRATS hardware per Section 6.3.

4.3.2 ☐ 2nd Person Verification _____ (Print Name)

_____ (Sign Name)

4.3.3 ☐ Power on the Heise meter.

4.3.4 ☐ Press Setup.

4.3.5 ☐ Use the arrows to select "RS232."

4.3.6 ☐ Select "Enable."

4.3.7 ☐ Set the baud rate to "9600."

4.3.8 ☐ Use the arrows to select the "Remote" mode.

4.3.9 ☐ Select "Terminal Mode."

4.3.10 ☐ Select "CrLF" for the End of Message.

4.3.11 ☐ Power up the varian, and let it warm up for 20-30 minutes.

4.3.12 ☐ Connect the Sniffer Probe to the Varian.

4.3.13 ☐ Press the Start/Test button on the Varian.

4.3.14 ☐ Verify/set regulator to full CCW (closed).

4.3.15 ☐ Verify/close HV1, HV2 and vent valve.

4.3.16 ☐ Verify PG1 and PG2 are reading atmospheric pressure.

4.3.17 ☐ Once the test set up is configured per Section 6.3, connect the setup to the dummy test article.

4.3.18 ☐ Conduct TRI. Complete the TRI Checklist in Appendix 8.0 Section 8.3 and the test participants shall sign and date.

4.3.19 ☐ Photograph the test setup and attach a copy to this procedure.

4.3.20 ☐ Power ON the PACRATS Computer and run the PACRATS application.

4.3.21 ☐ Record PACRATS Version by selecting Help/About PACRATS.
PACRATS Version_____

4.3.22 ☐ Load the PACRATS test file Varian-Heise.tst by selecting File/Start Test and double left click test file to be loaded.

Record Test File Name_____

4.3.23 ☐ Verify data is being received on the PACRATS workstation.

4.3.24 ☐ Start PACRATS data recording by selecting File/Set Record On.

Record Data File Name _____

4.3.25 ☐ Verify Heise PG1 and PG2 are reading atmospheric and record in Section 7.0 Table 7.3.

4.3.26 ☐ Verify the Varian Leak Rate and Record in Section 7.0 Table 7.3.

4.3.27 ☐ Verify PACRATS PG1 and PG2 are reading atmospheric; verify the Leak Rate SCCS GHe and record all values in Section 7.0 Table 7.3.

4.3.28 ☐ Open BV1.

4.3.29 ☐ Set the pressure on PG1 to 5.0 +/- 1.0 psig by adjusting the regulator.

4.3.30 ☐ Open HV1 and pressurize up to HV2.

4.3.31 ☐ Open HV2 and pressurize the dummy test article.

4.3.32 ☐ Close HV2.

4.3.33 ☐ Open vent and allow Test Article to vent until PG2 reads atmospheric.

4.3.34 ☐ Close vent.

4.3.35 ☐ Open HV2 and pressurize Test Article as read on PG2.

4.3.36 ☐ Close HV2.

4.3.37 ☐ Open vent and allow Test Article to vent until PG2 reads atmospheric.

4.3.38 ☐ Close vent.

4.3.39 ☐ Open HV2 and pressurize until PG2 reads 5.0 +/- 1.0 psig.

4.3.40 ☐ Maintain pressure for dwell for 30 minute minimum.

Start_____ Stop_____

4.3.41 ☐ Using a sniffer probe, test all seperable joints for leakage.

4.3.42 ☐ Verify that the PACRATS and Varian data are the same and record maximum leakage from both in Section 7.0 Table 7.3.

4.3.43 ☐ Record the pressures of Heise PG1 and PG2, Varian Leak Rate, and PACRATS PG1 and PG2, and Leak Rate in Section 7.0 Table 7.3.

4.3.44 ☐ Verify PACRATS by adjusting the regulator to change the pressure multiple times and record the values from the Heise meter, Varian, and PACRATS in Section 7.0 Table 7.3 after each change of pressure.

4.3.45 ☐ Close BV1.

4.3.46 ☐ Open the vent valve and vent until Heise PG1/PG2 and PACRATS PG1/PG2 read atmospheric pressure.

4.3.47 ☐ Record the final pressures in Section 7.0 Table 7.3.

4.3.48 ☐ Close HV1, HV2, and the vent valve.

4.3.49 ☐ Set the regulator to full CCW (closed).

4.3.50 ☐ Stop PACRATS data recording by selecting File/Set Record Off.

4.3.51 ☐ Close the PACRATS workspace by selecting File/Close Workspace.

4.3.52 ☐ Stop the PACRATS test file by selecting File/Stop Test.

4.3.53 ☐ Save data to .CSV file by selecting Data/Convert.

4.3.54 ☐ Select the correct file using Year/Month/Day/Time.HDR.

4.3.55 ☐ Open selected file.

4.3.56 ☐ Select the measurements tab in the Data Convert window.

4.3.57 ☐ Move measurements by selecting Heise 1 and Heise 2, and use the arrow to transfer to the right side.

4.3.58 ☐ Select Ok.

4.3.59 ☐ Select "No" on the Convert More Data to File window.

4.3.60 ☐ Exit the PACRATS application by selecting File/Exit.

4.3.61 ☐ Archive the PACRATS test data files, message log and photographs and record location:

//Australia/PACRATS_MCTF/_____

4.3.62 ☐ Turn off hardware if applicable.

4.3.63 ☐ Disconnect the test setup as required.

4.4 Documentation Update – This section is for ES61 purposes only.

4.4.1 ☐ Enter calibration data into MCTF Calibration Logbook.

4.4.1 ☐ Log all data in the ES61 database.

5.0 Post Test Verification

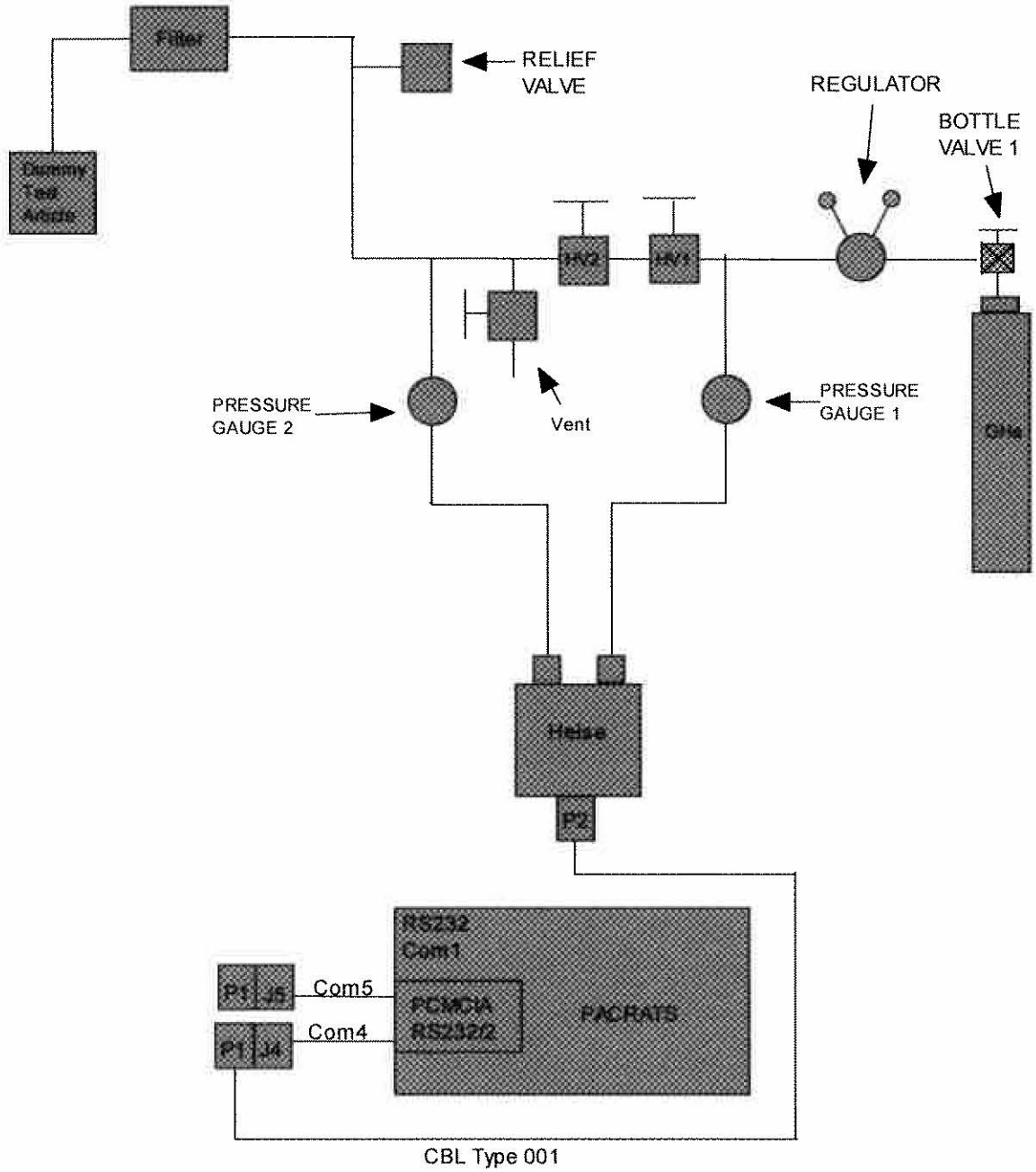
The test operations specified in this document have been satisfactorily completed.

Systems Test Engineer Date

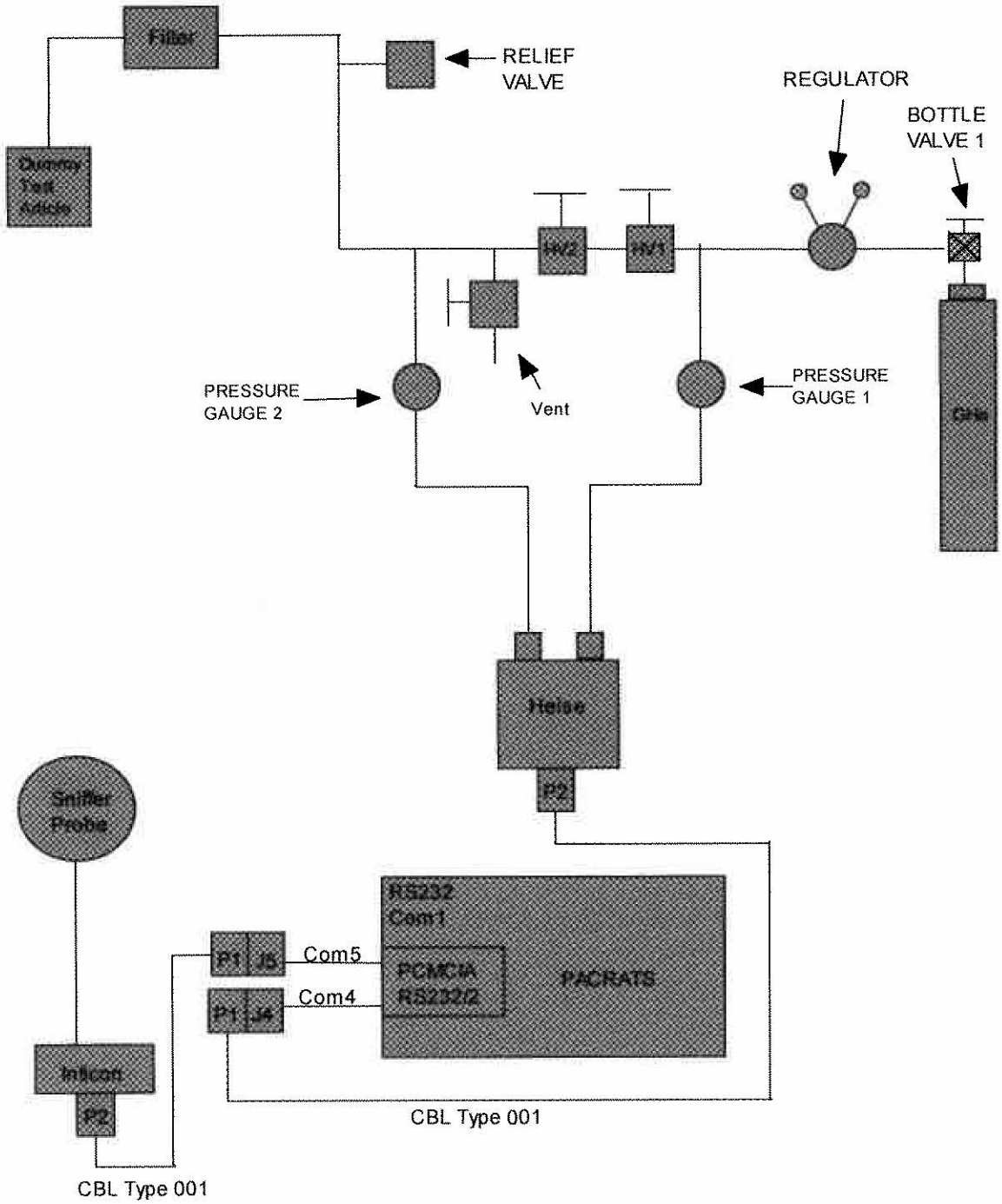
S&MA Monitor Date

6.0 Figures

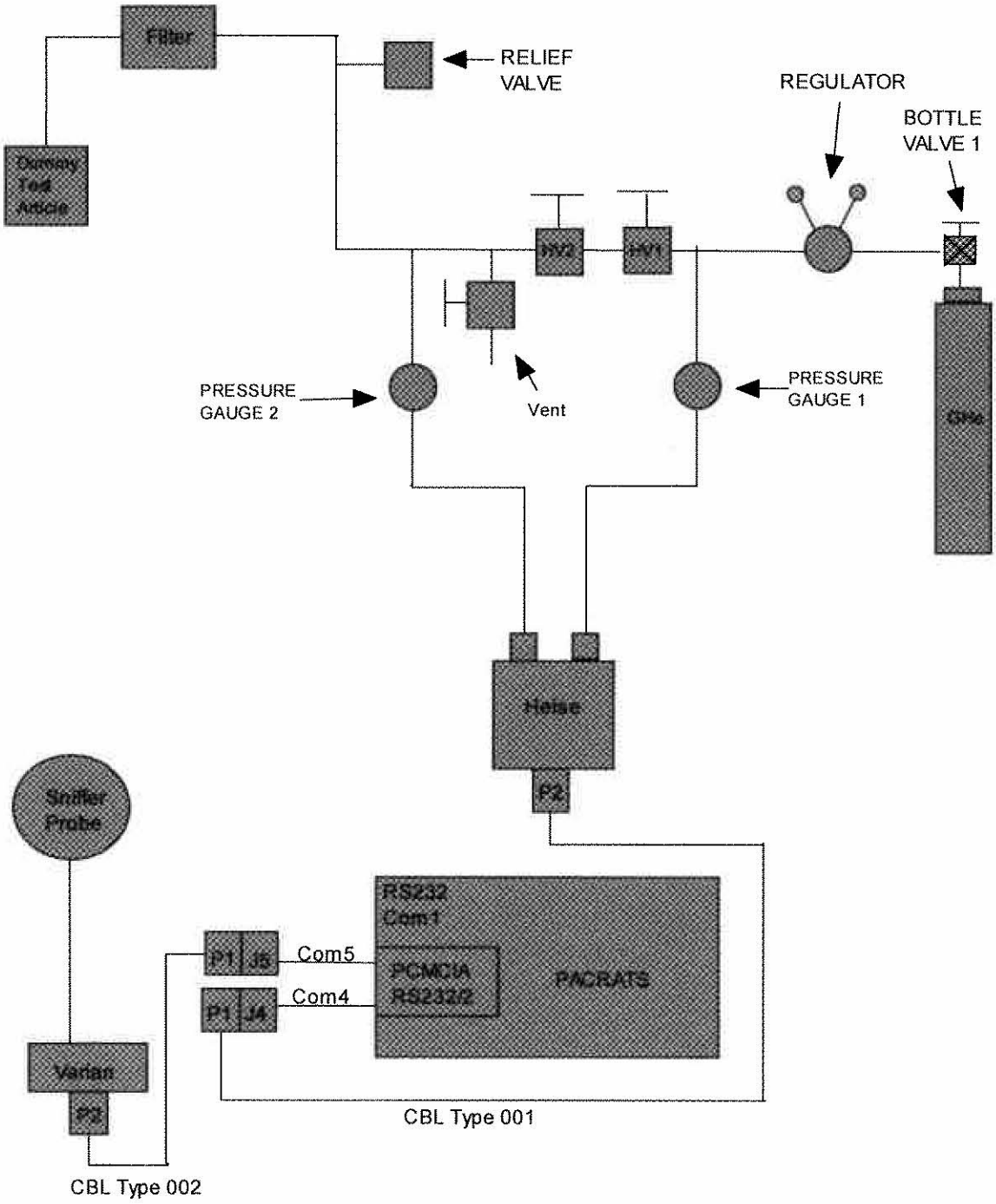
6.1 Proof Test



6.2 Sniffer Probe Leak Test with Inficon



6.3 Sniffer Probe Leak Test with Varian



7.0 Tables

7.1 Proof Test Table

	Heise Pressure Meter		PACRATS	
	PG1	PG2	PG1	PG2
Value 1				
Value 2				
Value 3				
Value 4				
Value 5				
Value 6				
Value 7				
Value 8				
Value 9				
Value 10				

7.2 Sniffer Probe Leak Test with Inficon Table

	Heise Pressure Meter		Inficon	PACRATS		
	PG1	PG2	Leak Rate SCCS GHe	PG1	PG2	Leak Rate SCCS GHe
Value 1						
Value 2						
Value 3						
Value 4						
Value 5						
Value 6						
Value 7						
Value 8						
Value 9						
Value 10						

7.3 Sniffer Probe Leak Test with Varian Table

	Heise Pressure Meter		Varian	PACRATS		
	PG1	PG2	Leak Rate SCCS GHe	PG1	PG2	Leak Rate SCCS GHe
Value 1						
Value 2						
Value 3						
Value 4						
Value 5						
Value 6						
Value 7						
Value 8						
Value 9						
Value 10						

8.0 Appendices – TRI Information

8.1 Proof Test Inspection

Test Readiness Inspection Checklist:

- ❑ Test Readiness Review has been previously held.
- ❑ All test requirements have been properly incorporated into the test procedure.
- ❑ The test article configuration has been documented and is sufficient to meet the test requirements.
- ❑ The test setup is in accordance with the test procedure and is sufficient to meet test requirements and protect the test article, facility, and personnel from injury or damage.
- ❑ Facility and test equipment certifications/calibrations are current and adequate to meet the test requirements.
- ❑ Data collection, storage, reduction, and reporting provisions are in place to meet test requirements.
- ❑ All required PPE is in place.
- ❑ Emergency shutdown procedures are reviewed, documented, posted as appropriated, and understood by all test participants.
- ❑ Personnel staffing plans to cover the test are in place and understood by test participants and that all required personnel certifications are current.

Test Conductor	Date
Test Operator	Date
Test Operator	Date
Test Operator	Date
Quality Specialist	Date

8.2 Sniffer Probe Leak Test with Inficon Inspection

Test Readiness Inspection Checklist:

- ❑ Test Readiness Review has been previously held.
- ❑ All test requirements have been properly incorporated into the test procedure.
- ❑ The test article configuration has been documented and is sufficient to meet the test requirements.
- ❑ The test setup is in accordance with the test procedure and is sufficient to meet test requirements and protect the test article, facility, and personnel from injury or damage.
- ❑ Facility and test equipment certifications/calibrations are current and adequate to meet the test requirements.
- ❑ Data collection, storage, reduction, and reporting provisions are in place to meet test requirements.
- ❑ All required PPE is in place.
- ❑ Emergency shutdown procedures are reviewed, documented, posted as appropriated, and understood by all test participants.
- ❑ Personnel staffing plans to cover the test are in place and understood by test participants and that all required personnel certifications are current.

Test Conductor	Date
Test Operator	Date
Test Operator	Date
Test Operator	Date
Quality Specialist	Date

8.3 Sniffer Probe Leak Test with Varian Inspection

Test Readiness Inspection Checklist:

- ❑ Test Readiness Review has been previously held.
- ❑ All test requirements have been properly incorporated into the test procedure.
- ❑ The test article configuration has been documented and is sufficient to meet the test requirements.
- ❑ The test setup is in accordance with the test procedure and is sufficient to meet test requirements and protect the test article, facility, and personnel from injury or damage.
- ❑ Facility and test equipment certifications/calibrations are current and adequate to meet the test requirements.
- ❑ Data collection, storage, reduction, and reporting provisions are in place to meet test requirements.
- ❑ All required PPE is in place.
- ❑ Emergency shutdown procedures are reviewed, documented, posted as appropriated, and understood by all test participants.
- ❑ Personnel staffing plans to cover the test are in place and understood by test participants and that all required personnel certifications are current.

Test Conductor	Date
Test Operator	Date
Test Operator	Date
Test Operator	Date
Quality Specialist	Date

9.0 Emergency Page

In the event of severe weather during test operations, perform the emergency shutdown procedure and proceed immediately to proper shelter.

If properly notified of a planned drill, testing may continue during a planned drill. However, if the fire alarm sounds, and it cannot be verified that a fire drill is taking place, perform the emergency shutdown procedure and evacuate the building.

The emergency telephone numbers are below.

Fire/Ambulance	911
Security	4-4357
Industrial Safety Hotline	4-0046
Facilities	4-3919
ES61 Branch Chief	4-7392

9.1 Emergency Shutdown Procedure

9.1.1 ☐ Close BV1.

9.1.2 ☐ Open vent valve and vent the assembly until PG1 and PG2 read atmospheric pressure.