

Certificate of Calibration

Manufacturer **Radian Research, Inc.**
Instrument Model: **RD-21-303 Dytronic Portable Standard**
Serial Number 123456
Firmware Revision: 07.10.14
Error Specification .02% worst case



Quality Management System
ISO 9001 Certified

Customer Name: RADIANT RESEARCH, INC.
Address: 3852 FORTUNE DRIVE
LAFAYETTE, INDIANA 47905

P.O. Number:

CE Number:

RMA / Certificate Number: RO12345

Calibration Date: 19-May-11

Environmental Conditions

Temperature: 23°C +/- 1°C

Humidity: between 35% and 60%

Based on the recommended calibration interval, the next calibration is due on: 18-May-12

Radian Research's As-Found Test Results showed this Instrument to be:

New In Tolerance Out of Tolerance Inoperative Limited Calibration
For Out of Tolerance conditions, As-Found Data Reports are furnished.

Radian Research Inc. certifies the instrument listed above meets or exceeds all published specifications and was calibrated in compliance with ANSI/NCSL Z540-1 using applicable Radian Research procedures which meet the requirements of ISO 9001:2000. This instrument was calibrated by a Radian Research RS-703A Syntron Automated Calibration System which is traceable to the National Institute of Standards and Technology (NIST). The RS-703A Calibration System is traceable within the limitations of NIST's services, by accuracies derived from accepted values of natural physical constants, or by accuracies derived from accepted ratio type calibration techniques. The RS-703A Calibration System is cross checked and calibrated on a schedule which is adjusted to maintain required accuracies and traceability.

Software used for Calibration: RS-703A Control Program Rel.04.20.02 May 30, 2006
RS-703A serial numbers: 703142, 703185, 703187

Applicable Traceability & Report Numbers for References used by Radian's Metrology Lab:

Watt-hour, VA-hour, VAR-hour, Q-hour, Amp-hour, Volt-hour, Volt-Squared hour, AC Volt

Radian Dytronic Transfer Standards consisting of (3) RD-22-RTS,
Serial Numbers: 200717, 200718, 200719
NIST Test Report Number: 697/280054-10; Calibration Due Date 6-Jan-2012.

Time Base (Frequency)

Arbiter Systems Model 1083B Satellite-Controlled Frequency Standard s/n B1057. GPS controlled system with an uncertainty of 0.000002ppm. No calibration required.

DC Volts

Fluke Model 732B DC Volt Standard s/n 7703004 with an uncertainty of $\pm .1$ ppm.
Fluke Certificate Number 9D5460; Calibration Due Date: 14-July-2012.

Resistance

Guildline Standard Resistor Model 9330/10K s/n 62623, 62624. Guildline Test Certificate Numbers C13274 and C13275; with an Expanded Uncertainty of $\pm .390$ ppm. Calibration Due Date: 25-May-2012.

Other

Hewlett Packard 8 Digit Multi-Meter Model 3458A s/n 2823A02816. Agilent Technologies
Test Certificate Number 53298: Calibration Due Date 2-Mar-2012.

Metrology Laboratory Technician Signature

LAB
88

This report shall not be reproduced, except in full, without prior written approval of the Calibration Facility

Calibration Report

RD-21-303 Dytronic Portable Standard

Function..... Watt-hour 60 Hz

Date..... 19-May-11

Serial Number..... 202105

RADIANT RESEARCH, INC.

The following data was taken at 3852 FORTUNE DRIVE
 System. The RS-703A is a Dytronic Transfer Standard certified by the National Institute of Standards and Technology (NIST) to an uncertainty of 0.002% @ unity and 0.003% @ 60 degrees lagging Power Factor. Calibration temperature is 23.45°C. The stabilization time in between points is 5 seconds. For lagging power factors the current lags the voltage. All results are listed as Percent Error. The RS-703A has at least a 4 times greater accuracy than the Instrument under test.

Voltage & Phase Angle

Amps	120 Unity	120 60°Lag	240 Unity	240 60°Lag	480 Unity	480 60°Lag	600 Unity	600 60°Lag
0.2	0.000	0.001	-0.001	0.001	-0.002	0.001	-0.001	0.001
0.25	-0.001	0.000	-0.002	0.000	-0.002	0.000	-0.001	0.001
0.3	-0.001	0.000	-0.002	0.000	-0.002	0.000	-0.002	0.001
0.5	0.000	0.001	-0.001	0.001	-0.001	0.001	-0.001	0.001
1.0	0.000	0.001	-0.001	0.001	-0.001	0.001	-0.001	0.001
2.0	0.000	0.001	-0.001	0.000	-0.001	0.001	-0.001	0.001
2.5	0.000	0.000	-0.001	0.000	-0.001	0.001	-0.001	0.001
3.0	0.000	0.000	-0.001	0.000	-0.001	0.000	-0.001	0.001
4.0	0.000	0.001	0.000	0.001	-0.001	0.001	0.000	0.002
5.0	0.000	0.001	-0.001	0.001	-0.001	0.001	0.000	0.002
7.0	0.000	0.001	-0.001	0.001	-0.001	0.001	-0.001	0.002
10.0	0.000	0.000	-0.001	0.000	-0.001	0.000	-0.001	0.001
15.0	0.000	0.000	-0.001	0.000	-0.001	0.000	-0.001	0.001
20.0	-0.001	0.000	-0.001	0.000	-0.001	0.000	-0.001	0.001
25.0	-0.001	0.000	-0.001	-0.001	-0.002	0.000	-0.002	0.000
30.0	-0.001	0.000	-0.001	0.000	-0.002	0.000	-0.001	0.001
35.0	-0.001	0.000	-0.001	0.000	-0.001	0.000	-0.001	0.001
40.0	0.000	0.000	-0.001	0.000	-0.001	0.001	-0.001	0.002
45.0	-0.001	0.000	-0.001	0.000	-0.001	0.000	-0.001	0.001
50.0	-0.002	-0.001	-0.002	0.000	-0.002	0.000	-0.001	0.001
60.0	0.000	0.000	-0.001	0.000	-0.001	0.001	-0.001	0.001
80.0	0.001	0.002	0.001	0.002	0.000	0.002	0.001	0.003
100.0	0.001	0.002	0.001	0.002	0.000	0.002	0.000	0.003
120.0	0.001	0.003	0.000	0.002	0.000	0.002	0.000	0.003
150.0	0.001	0.003	0.000	0.003	0.000	0.003	0.000	0.003
180.0	0.001	0.003	0.000	0.003	0.000	0.003	0.000	0.004
200.0	0.001	0.003	0.001	0.003	0.000	0.003	0.000	0.004
Average	0.000	0.001	-0.001	0.001	-0.001	0.001	-0.001	0.002
Minimum	-0.002	-0.001	-0.002	-0.001	-0.002	0.000	-0.002	0.000
Maximum	0.001	0.003	0.001	0.003	0.000	0.003	0.001	0.004

<u>Overall</u>	Unity	60°Lag
Average	-0.001	0.001
Minimum	-0.002	-0.001
Maximum	0.001	0.004

Calibration Report

RD-21-303 Dytronic Portable Standard

Function..... Watts 60 Hz

Date..... 19-May-11

Serial Number..... 202105

RADIANT RESEARCH, INC.

The following data was taken at 3852 FORTUNE DRIVE
 System. The RS-703A is a Dytronic Transfer Standard certified by the National Institute of Standards and Technology (NIST) to an uncertainty of 0.002% @ unity and 0.003% @ 60 degrees lagging Power Factor. Calibration temperature is 23.0°C. The stabilization time in between points is 5 seconds. For lagging power factors the current lags the voltage. All results are listed as Percent Error. The RS-703A has at least a 4 times greater accuracy than the Instrument under test.

Voltage & Phase Angle

Amps	120 Unity	120 60°Lag	240 Unity	240 60°Lag	480 Unity	480 60°Lag	600 Unity	600 60°Lag
0.2	0.000	0.001	-0.001	0.001	-0.002	0.001	-0.001	0.001
0.25	-0.001	0.000	-0.002	0.000	-0.002	0.000	-0.001	0.001
0.3	-0.001	0.000	-0.002	0.001	-0.002	0.000	-0.001	0.001
0.5	0.000	0.001	-0.001	0.001	-0.001	0.001	-0.001	0.001
1.0	0.000	0.001	-0.001	0.001	-0.001	0.001	-0.001	0.002
2.0	0.000	0.001	-0.001	0.000	-0.001	0.001	-0.001	0.001
2.5	0.000	0.001	-0.001	0.001	-0.001	0.001	-0.001	0.002
3.0	0.000	0.000	-0.001	0.000	-0.001	0.000	-0.001	0.001
4.0	0.000	0.001	0.000	0.001	-0.001	0.001	0.000	0.002
5.0	0.000	0.001	0.000	0.001	-0.001	0.001	0.000	0.002
7.0	0.000	0.001	-0.001	0.001	-0.001	0.001	-0.001	0.002
10.0	0.000	0.000	-0.001	0.000	-0.001	0.000	-0.001	0.001
15.0	0.000	0.000	-0.001	0.000	-0.001	0.000	-0.001	0.001
20.0	0.000	0.000	-0.001	0.000	-0.001	0.000	-0.001	0.001
25.0	-0.001	0.000	-0.001	0.000	-0.001	0.000	-0.001	0.001
30.0	-0.001	0.000	-0.001	0.000	-0.002	0.000	-0.001	0.001
35.0	0.000	0.000	-0.001	0.000	-0.001	0.001	-0.001	0.002
40.0	0.000	0.000	-0.001	0.000	-0.001	0.001	-0.001	0.002
45.0	-0.001	0.000	-0.001	0.000	-0.001	0.000	-0.001	0.001
50.0	-0.002	-0.001	-0.002	0.000	-0.002	0.000	-0.001	0.001
60.0	0.000	0.000	-0.001	0.000	-0.001	0.001	-0.001	0.001
80.0	0.001	0.002	0.001	0.002	0.000	0.002	0.001	0.003
100.0	0.001	0.002	0.001	0.002	0.000	0.002	0.000	0.003
120.0	0.001	0.003	0.001	0.003	0.000	0.002	0.000	0.003
150.0	0.001	0.003	0.000	0.003	0.000	0.003	0.000	0.004
180.0	0.001	0.003	0.000	0.003	0.000	0.003	0.000	0.004
200.0	0.001	0.003	0.001	0.003	0.000	0.003	0.000	0.004
Average	0.000	0.001	-0.001	0.001	-0.001	0.001	-0.001	0.002
Minimum	-0.002	-0.001	-0.002	0.000	-0.002	0.000	-0.001	0.001
Maximum	0.001	0.003	0.001	0.003	0.000	0.003	0.001	0.004

<u>Overall</u>	Unity	60°Lag
Average	-0.001	0.001
Minimum	-0.002	-0.001
Maximum	0.001	0.004

Calibration Report

RD-21-303 Dytronic Portable Standard

Function..... VAR-hour 60 Hz

Date..... 19-May-11

Serial Number..... 202105

RADIAN RESEARCH, INC.

The following data was taken at 3852 FORTUNE DRIVE
 System. The RS-703A is a Dytronic Transfer Standard certified by the National Institute of Standards and
 Technology (NIST) with the use of an ultra low distortion synthesis and digital delay.
 Uncertainty is 0.005% for VAR- RO12345
 Test time is 2 seconds and the stabilization time in between points is 5 seconds. For
 lagging power factors the current lags the voltage. All results are listed as Percent Error.
 The RS-703A has at least a 4 times greater accuracy than the Instrument under test.

Voltage & Phase Angle

Amps	120	120	240	240	480	480	600	600
	90°Lag	30°Lag	90°Lag	30°Lag	90°Lag	30°Lag	90°Lag	30°Lag
0.2	-0.001	-0.001	-0.001	-0.003	-0.001	-0.003	-0.001	-0.002
0.25	-0.001	-0.002	-0.001	-0.003	-0.002	-0.004	-0.002	-0.003
0.3	-0.001	-0.002	-0.002	-0.003	-0.002	-0.004	-0.001	-0.004
0.5	0.000	-0.001	-0.001	-0.002	-0.002	-0.004	-0.001	-0.003
1.0	0.000	-0.001	-0.001	-0.003	-0.002	-0.004	-0.002	-0.004
2.0	0.000	-0.001	-0.001	-0.002	-0.002	-0.004	-0.002	-0.004
2.5	0.000	-0.001	-0.001	-0.002	-0.002	-0.004	-0.002	-0.004
3.0	-0.001	-0.001	-0.001	-0.003	-0.002	-0.004	-0.002	-0.004
4.0	0.000	-0.001	-0.001	-0.002	-0.001	-0.004	-0.001	-0.004
5.0	0.000	0.000	-0.001	-0.002	-0.001	-0.003	-0.001	-0.004
7.0	0.000	-0.001	-0.001	-0.003	-0.002	-0.004	-0.002	-0.005
10.0	-0.001	-0.001	-0.002	-0.003	-0.002	-0.004	-0.002	-0.004
15.0	0.000	-0.001	-0.001	-0.003	-0.002	-0.004	-0.002	-0.005
20.0	0.000	-0.001	-0.002	-0.003	-0.002	-0.004	-0.002	-0.004
25.0	0.000	-0.001	-0.002	-0.003	-0.002	-0.003	-0.002	-0.004
30.0	0.000	-0.001	-0.002	-0.003	-0.002	-0.004	-0.002	-0.005
35.0	0.000	-0.001	-0.001	-0.003	-0.002	-0.004	-0.002	-0.004
40.0	0.000	0.000	-0.001	-0.003	-0.001	-0.003	-0.001	-0.004
45.0	0.000	0.000	-0.001	-0.003	-0.001	-0.003	-0.001	-0.004
50.0	0.000	0.000	-0.001	-0.003	-0.001	-0.003	-0.001	-0.003
60.0	0.001	0.001	-0.001	-0.003	-0.001	-0.003	-0.001	-0.003
80.0	0.002	0.002	0.001	-0.001	0.000	-0.001	0.001	-0.001
100.0	0.002	0.001	0.000	-0.001	0.000	-0.001	0.000	-0.002
120.0	0.002	0.001	0.000	-0.001	0.001	-0.001	0.001	-0.002
150.0	0.002	0.001	0.000	-0.002	0.001	-0.001	0.001	-0.001
180.0	0.002	0.001	0.000	-0.002	0.001	0.000	0.001	-0.001
200.0	0.002	0.002	0.001	-0.001	0.002	0.000	0.002	0.000
Average	0.000	0.000	-0.001	-0.002	-0.001	-0.003	-0.001	-0.003
Minimum	-0.001	-0.002	-0.002	-0.003	-0.002	-0.004	-0.002	-0.005
Maximum	0.002	0.002	0.001	-0.001	0.002	0.000	0.002	0.000

<u>Overall</u>	90°Lag	30°Lag
Average	-0.001	-0.002
Minimum	-0.002	-0.005
Maximum	0.002	0.002

Calibration Report

RD-21-303 Dytronic Portable Standard

Function..... VAR 60 Hz

Date..... 19-May-11

Serial Number..... 202105

RADIANT RESEARCH, INC.

The following data was taken at 3852 FORTUNE DRIVE
 System. The RS-703A is a Dytronic Transfer Standard certified by the National Institute of Standards and
 Technology (NIST) with the use of an ultra low distortion synthesis and digital delay.
 Uncertainty is 0.005% for VAR- RO12345
 Test time is 2 seconds and the stabilization time in between points is 5 seconds. For
 lagging power factors the current lags the voltage. All results are listed as Percent Error.
 The RS-703A has at least a 4 times greater accuracy than the Instrument under test.

Voltage & Phase Angle

Amps	120		240		480		600	
	90°Lag	30°Lag	90°Lag	30°Lag	90°Lag	30°Lag	90°Lag	30°Lag
0.2	0.000	-0.001	-0.001	-0.002	-0.001	-0.003	-0.001	-0.002
0.25	-0.001	-0.002	-0.001	-0.003	-0.002	-0.004	-0.002	-0.003
0.3	-0.001	-0.002	-0.002	-0.003	-0.002	-0.003	-0.001	-0.003
0.5	0.000	-0.001	-0.001	-0.002	-0.002	-0.003	-0.001	-0.003
1.0	0.000	-0.001	-0.001	-0.002	-0.002	-0.004	-0.002	-0.004
2.0	0.000	-0.001	-0.001	-0.002	-0.002	-0.004	-0.002	-0.004
2.5	0.000	-0.001	-0.001	-0.002	-0.002	-0.004	-0.002	-0.004
3.0	-0.001	-0.001	-0.001	-0.002	-0.002	-0.004	-0.002	-0.004
4.0	0.000	-0.001	-0.001	-0.002	-0.001	-0.004	-0.001	-0.004
5.0	0.000	-0.001	-0.001	-0.002	-0.001	-0.003	-0.001	-0.004
7.0	0.000	-0.001	-0.001	-0.003	-0.002	-0.004	-0.002	-0.005
10.0	0.000	-0.001	-0.001	-0.003	-0.002	-0.004	-0.002	-0.004
15.0	0.000	-0.001	-0.001	-0.003	-0.002	-0.004	-0.002	-0.005
20.0	0.000	-0.001	-0.001	-0.003	-0.002	-0.003	-0.002	-0.004
25.0	0.000	-0.001	-0.002	-0.003	-0.002	-0.003	-0.002	-0.004
30.0	0.000	-0.001	-0.002	-0.003	-0.002	-0.004	-0.002	-0.005
35.0	0.000	0.000	-0.001	-0.003	-0.002	-0.003	-0.001	-0.004
40.0	0.000	0.000	-0.001	-0.003	-0.001	-0.003	-0.001	-0.004
45.0	0.000	0.000	-0.001	-0.003	-0.001	-0.003	-0.001	-0.004
50.0	0.000	0.000	-0.001	-0.002	-0.001	-0.002	-0.001	-0.003
60.0	0.001	0.001	-0.001	-0.002	-0.001	-0.003	-0.001	-0.003
80.0	0.002	0.002	0.001	0.000	0.001	0.000	0.001	-0.001
100.0	0.002	0.001	0.000	-0.001	0.000	-0.001	0.000	-0.002
120.0	0.002	0.001	0.001	-0.001	0.001	-0.001	0.001	-0.001
150.0	0.002	0.001	0.000	-0.002	0.001	-0.001	0.001	-0.001
180.0	0.002	0.001	0.001	-0.002	0.001	0.000	0.001	-0.001
200.0	0.002	0.002	0.001	-0.001	0.002	0.000	0.002	0.000
Average	0.000	0.000	-0.001	-0.002	-0.001	-0.003	-0.001	-0.003
Minimum	-0.001	-0.002	-0.002	-0.003	-0.002	-0.004	-0.002	-0.005
Maximum	0.002	0.002	0.001	0.000	0.002	0.000	0.002	0.000

<u>Overall</u>	90°Lag	30°Lag
Average	-0.001	-0.002
Minimum	-0.002	-0.005
Maximum	0.002	0.002

Calibration Report

RD-21-303 Dytronic Portable Standard

Function.....VA-hour RMS 60 Hz

Date..... 19-May-11

Serial Number..... 202105

RADIANT RESEARCH, INC.

The following data was taken at 3852 FORTUNE DRIVE
 System. The RS-703A is a Dytronic Transfer Standard certified by the National Institute of Standards and Technology (NIST) to an uncertainty of 0.002% @ unity and 0.003% @ 60 degrees lagging Power Factor. Calibration temperature is 23.45°C. The stabilization time in between points is 5 seconds. For lagging power factors the current lags the voltage. All results are listed as Percent Error. The RS-703A has at least a 4 times greater accuracy than the Instrument under test.

Voltage & Phase Angle

Amps	120	120	240	240	480	480	600	600
	Unity	60°Lag	Unity	60°Lag	Unity	60°Lag	Unity	60°Lag
0.2	-0.001	0.000	-0.001	-0.001	-0.002	-0.001	-0.001	-0.001
0.25	-0.001	-0.001	-0.002	-0.002	-0.002	-0.002	-0.001	-0.001
0.3	-0.001	-0.001	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
0.5	0.000	0.000	-0.001	-0.001	-0.001	-0.002	-0.001	-0.001
1.0	0.000	0.000	-0.001	-0.001	-0.001	-0.002	-0.001	-0.001
2.0	0.000	0.000	-0.001	-0.001	-0.001	-0.002	-0.001	-0.001
2.5	0.000	0.000	-0.001	-0.001	-0.001	-0.002	-0.001	-0.001
3.0	0.000	-0.001	-0.001	-0.001	-0.001	-0.002	-0.001	-0.001
4.0	0.000	0.000	-0.001	-0.001	-0.001	-0.001	0.000	-0.001
5.0	0.000	0.000	-0.001	-0.001	-0.001	-0.001	0.000	-0.001
7.0	0.000	0.000	-0.001	-0.001	-0.001	-0.002	-0.001	-0.002
10.0	-0.001	-0.001	-0.001	-0.001	-0.002	-0.002	-0.001	-0.002
15.0	0.000	0.000	-0.001	-0.002	-0.001	-0.002	-0.001	-0.002
20.0	-0.001	0.000	-0.001	-0.002	-0.002	-0.002	-0.001	-0.002
25.0	-0.001	-0.001	-0.002	-0.002	-0.002	-0.002	-0.001	-0.002
30.0	-0.001	0.000	-0.001	-0.002	-0.002	-0.002	-0.001	-0.002
35.0	-0.001	0.000	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
40.0	-0.001	0.000	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
45.0	-0.001	0.000	-0.001	-0.001	-0.002	-0.001	-0.001	-0.001
50.0	-0.002	-0.001	-0.002	-0.002	-0.002	-0.002	-0.001	-0.001
60.0	0.000	0.000	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
80.0	0.001	0.001	0.001	0.000	0.000	0.000	0.001	0.001
100.0	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000
120.0	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.001
150.0	0.001	0.002	0.000	0.000	0.000	0.001	0.000	0.001
180.0	0.001	0.002	0.000	0.000	0.000	0.001	0.000	0.001
200.0	0.001	0.002	0.001	0.001	0.000	0.001	0.000	0.002
Average	0.000	0.000	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
Minimum	-0.002	-0.001	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
Maximum	0.001	0.002	0.001	0.001	0.000	0.001	0.001	0.002

<u>Overall</u>	Unity	60°Lag
Average	-0.001	-0.001
Minimum	-0.002	-0.002
Maximum	0.001	0.002

Calibration Report

RD-21-303 Dytronic Portable Standard

Function..... VA RMS 60 Hz

Date..... 19-May-11

Serial Number..... 202105

RADIANT RESEARCH, INC.

The following data was taken at 3852 FORTUNE DRIVE
 System. The RS-703A is a Dytronic Transfer Standard certified by the National Institute of Standards and Technology (NIST) to an uncertainty of 0.002% @ unity and 0.003% @ 60 degrees lagging Power Factor. Calibration temperature is 23.0°C. The stabilization time in between points is 5 seconds. For lagging power factors the current lags the voltage. All results are listed as Percent Error. The RS-703A has at least a 4 times greater accuracy than the Instrument under test.

Voltage & Phase Angle

Amps	120	120	240	240	480	480	600	600
	Unity	60°Lag	Unity	60°Lag	Unity	60°Lag	Unity	60°Lag
0.2	0.000	0.000	-0.001	-0.001	-0.002	-0.001	-0.001	-0.001
0.25	-0.001	-0.001	-0.002	-0.001	-0.002	-0.002	-0.001	-0.001
0.3	-0.001	-0.001	-0.002	-0.002	-0.002	-0.002	-0.001	-0.001
0.5	0.000	0.000	-0.001	-0.001	-0.001	-0.002	-0.001	-0.001
1.0	0.000	0.000	-0.001	-0.001	-0.001	-0.002	-0.001	-0.001
2.0	0.000	0.000	-0.001	-0.001	-0.001	-0.002	-0.001	-0.001
2.5	0.000	0.000	-0.001	-0.001	-0.001	-0.002	-0.001	-0.001
3.0	0.000	-0.001	-0.001	-0.001	-0.001	-0.002	-0.001	-0.001
4.0	0.000	0.000	0.000	-0.001	-0.001	-0.001	0.000	-0.001
5.0	0.000	0.000	-0.001	-0.001	-0.001	-0.001	0.000	-0.001
7.0	0.000	0.000	-0.001	-0.001	-0.001	-0.002	-0.001	-0.001
10.0	0.000	0.000	-0.001	-0.001	-0.001	-0.002	-0.001	-0.001
15.0	0.000	0.000	-0.001	-0.001	-0.001	-0.002	-0.001	-0.002
20.0	-0.001	0.000	-0.001	-0.002	-0.002	-0.002	-0.001	-0.002
25.0	-0.001	0.000	-0.001	-0.002	-0.002	-0.002	-0.001	-0.002
30.0	-0.001	0.000	-0.001	-0.002	-0.002	-0.002	-0.001	-0.002
35.0	0.000	0.000	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
40.0	0.000	0.000	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
45.0	-0.001	0.000	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
50.0	-0.002	-0.001	-0.002	-0.002	-0.002	-0.002	-0.001	-0.001
60.0	0.000	0.000	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
80.0	0.001	0.001	0.001	0.000	0.000	0.000	0.001	0.001
100.0	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.001
120.0	0.001	0.002	0.000	0.000	0.000	0.001	0.000	0.001
150.0	0.001	0.002	0.000	0.000	0.000	0.001	0.000	0.001
180.0	0.001	0.002	0.000	0.000	0.000	0.001	0.000	0.001
200.0	0.001	0.002	0.001	0.001	0.000	0.001	0.000	0.002
Average	0.000	0.000	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
Minimum	-0.002	-0.001	-0.002	-0.002	-0.002	-0.002	-0.001	-0.002
Maximum	0.001	0.002	0.001	0.001	0.000	0.001	0.001	0.002

<u>Overall</u>	Unity	60°Lag
Average	-0.001	-0.001
Minimum	-0.002	-0.002
Maximum	0.001	0.002

Calibration Report

RD-21-303 Dytronic Portable Standard

Function..... Q-hour 60 Hz

Date..... 19-May-11

Serial Number..... 202105

RADIANT RESEARCH, INC.

The following data was taken at 3852 FORTUNE DRIVE
 System. The RS-703A is a Dytronic Transfer Standard certified by the National Institute of Standards and
 Technology (NIST) with the use of an ultra low distortion synthesis and digital delay.
 Uncertainty is 0.005% for Q-hour. The RS-703A has at least a 4 times greater accuracy than the Instrument under test.

Voltage & Phase Angle

Amps	120	120	240	240	480	480	600	600
	60°Lag	Unity	60°Lag	Unity	60°Lag	Unity	60°Lag	Unity
0.2	0.000	-0.002	-0.001	-0.003	-0.001	-0.004	-0.001	-0.003
0.25	-0.001	-0.002	-0.001	-0.003	-0.002	-0.004	-0.001	-0.004
0.3	-0.001	-0.002	-0.002	-0.004	-0.002	-0.004	-0.002	-0.004
0.5	0.000	-0.001	-0.001	-0.003	-0.002	-0.003	-0.001	-0.004
1.0	0.000	-0.001	-0.001	-0.003	-0.002	-0.004	-0.001	-0.004
2.0	0.000	-0.001	-0.001	-0.003	-0.002	-0.004	-0.001	-0.004
2.5	0.000	-0.001	-0.001	-0.003	-0.001	-0.004	-0.001	-0.004
3.0	-0.001	-0.001	-0.001	-0.003	-0.002	-0.003	-0.001	-0.004
4.0	0.000	-0.001	-0.001	-0.003	-0.001	-0.004	-0.001	-0.004
5.0	0.000	-0.001	-0.001	-0.002	-0.001	-0.003	-0.001	-0.004
7.0	0.000	-0.001	-0.001	-0.003	-0.002	-0.004	-0.002	-0.004
10.0	-0.001	-0.001	-0.001	-0.003	-0.002	-0.004	-0.002	-0.004
15.0	0.000	-0.001	-0.001	-0.003	-0.002	-0.004	-0.002	-0.004
20.0	0.000	-0.001	-0.002	-0.003	-0.002	-0.003	-0.002	-0.004
25.0	0.000	-0.001	-0.002	-0.003	-0.002	-0.003	-0.002	-0.004
30.0	0.000	-0.001	-0.002	-0.003	-0.002	-0.004	-0.002	-0.005
35.0	0.000	-0.001	-0.001	-0.003	-0.001	-0.004	-0.001	-0.004
40.0	0.000	0.000	-0.001	-0.003	-0.001	-0.003	-0.001	-0.004
45.0	0.000	-0.001	-0.001	-0.003	-0.001	-0.003	-0.001	-0.004
50.0	-0.001	-0.001	-0.002	-0.004	-0.002	-0.003	-0.001	-0.004
60.0	0.000	0.000	-0.001	-0.003	-0.001	-0.003	-0.001	-0.003
80.0	0.001	0.001	0.000	-0.001	0.000	-0.001	0.001	-0.002
100.0	0.001	0.001	0.000	-0.001	0.000	-0.001	0.001	-0.002
120.0	0.001	0.001	0.000	-0.002	0.001	-0.001	0.001	-0.002
150.0	0.002	0.001	0.000	-0.002	0.001	-0.001	0.001	-0.002
180.0	0.002	0.001	0.000	-0.002	0.001	-0.001	0.001	-0.001
200.0	0.002	0.001	0.001	-0.001	0.001	0.000	0.002	-0.001
Average	0.000	-0.001	-0.001	-0.003	-0.001	-0.003	-0.001	-0.003
Minimum	-0.001	-0.002	-0.002	-0.004	-0.002	-0.004	-0.002	-0.005
Maximum	0.002	0.001	0.001	-0.001	0.001	0.000	0.002	-0.001

	60°Lag	Unity
Average	-0.001	-0.002
Minimum	-0.002	-0.005
Maximum	0.002	0.001

Calibration Report

RD-21-303 Dytronic Portable Standard

Function..... Volts RMS 60 Hz

Date..... 19-May-11

Serial Number..... 202105

The following data was obtained from the RS-703A Transfer Standards certified by the National Institute of Standards and Technology (NIST) to an uncertainty of 0.0008%. Calibration temperature is 23 degrees Centigrade. Test time is 2 seconds per point with RO12345. All readings are in Percent Error. The RS-703A has at least a 4 times greater accuracy than the Instrument under test.

Voltage

	V RMS	Vh RMS	V2h RMS
60	0.002	0.002	0.004
80	0.002	0.002	0.004
100	0.002	0.002	0.004
120	0.002	0.002	0.004
140	0.001	0.001	0.003
160	0.001	0.001	0.002
180	0.001	0.001	0.002
200	0.001	0.001	0.002
220	0.001	0.001	0.002
240	0.001	0.001	0.002
260	0.001	0.001	0.002
280	0.001	0.001	0.002
300	0.001	0.001	0.001
320	0.000	0.000	0.001
340	0.000	0.000	0.001
360	0.001	0.001	0.001
380	0.001	0.001	0.001
400	0.001	0.001	0.002
420	0.001	0.001	0.002
440	0.001	0.001	0.002
460	0.001	0.001	0.001
480	0.001	0.001	0.002
500	0.001	0.001	0.002
520	0.001	0.001	0.002
540	0.001	0.001	0.002
560	0.001	0.001	0.003
580	0.001	0.001	0.002
600	0.001	0.001	0.002
Average	0.001	0.001	0.002
Minimum	0.000	0.000	0.001
Maximum	0.002	0.002	0.004

Calibration Report

RD-21-303 Dytronic Portable Standard

Function..... Amps RMS 60 Hz

Date..... 19-May-11

Serial Number..... 202105

The following data was obtained from the RS-703A Transfer Standards System. The RS-703A is a Radian RD-22-RTS Dytronic Transfer Standards which are certified by the National Institute of Standards and Technology (NIST) for an uncertainty of .0028%. Calibration Temperature is 23° Centigrade. The RS703A has at least a 4 times greater accuracy than the Instrument under test.

Amps	A RMS	Ah RMS	A2h RMS
0.2	-0.003	-0.003	-0.006
0.25	-0.003	-0.003	-0.006
0.3	-0.003	-0.003	-0.006
0.5	-0.003	-0.003	-0.005
1.0	-0.002	-0.003	-0.005
2.0	-0.002	-0.003	-0.005
2.5	-0.003	-0.003	-0.005
3.0	-0.003	-0.003	-0.006
4.0	-0.002	-0.002	-0.004
5.0	-0.002	-0.002	-0.004
7.0	-0.002	-0.002	-0.005
10.0	-0.003	-0.003	-0.006
15.0	-0.003	-0.003	-0.006
20.0	-0.003	-0.003	-0.006
25.0	-0.003	-0.003	-0.006
30.0	-0.003	-0.003	-0.006
35.0	-0.003	-0.003	-0.006
40.0	-0.003	-0.003	-0.006
45.0	-0.003	-0.003	-0.006
50.0	-0.004	-0.004	-0.008
60.0	-0.003	-0.003	-0.005
80.0	-0.001	-0.001	-0.003
100.0	-0.002	-0.002	-0.003
120.0	-0.002	-0.002	-0.004
150.0	-0.002	-0.002	-0.004
180.0	-0.002	-0.002	-0.004
200.0	-0.002	-0.002	-0.004
Average	-0.003	-0.003	-0.005
Minimum	-0.004	-0.004	-0.008
Maximum	-0.001	-0.001	-0.003

Calibration Report

RD-21-303 Dytronic Portable Standard

Mode..... Frequency
123456
Date..... 19-May-11
Serial Number..... 202105
RADIAN RESEARCH, INC.

The following data was 3852 FORTUNE DRIVE
System. The RS-70 LAFAYETTE, INDIANA 47905
Arbiter Systems Model 1083B GPS Satellite-Controlled Frequency Standard. Uncertainty
of the GPS System is .00005 parts per million, traceable to United States Naval
Observatory (USNO). Calibration RO12345
is 2 seconds with a stabilization of 2 seconds in between points. All Results are
listed as Percent Error. The RS703A has at least a 4 times greater accuracy
than the Instrument under test.

Frequency

45	0.0005
46	0.0005
47	0.0005
48	0.0005
49	0.0005
50	0.0005
51	0.0005
52	0.0006
53	0.0005
54	0.0004
55	0.0005
56	0.0005
57	0.0005
58	0.0005
59	0.0005
60	0.0005
61	0.0005
62	0.0005
63	0.0005
64	0.0005
65	0.0005
Average	0.0005
Minimum	0.0004
Maximum	0.0006