

**LUDLUM MODEL 43-136
ALPHA SCINTILLATOR DETECTOR**

May 2017

**LUDLUM MODEL 43-136
ALPHA SCINTILLATOR DETECTOR**

May 2017



LUDLUM MEASUREMENTS, INC
501 OAK STREET, P.O. BOX 810
SWEETWATER, TEXAS 79556
325-235-5494, FAX: 325-235-4672

STATEMENT OF WARRANTY

Ludlum Measurements, Inc. warrants the products covered in this manual to be free of defects due to workmanship, material, and design for a period of twelve months from the date of delivery. The calibration of a product is warranted to be within its specified accuracy limits at the time of shipment. In the event of instrument failure, notify Ludlum Measurements to determine if repair, recalibration, or replacement is required.

This warranty excludes the replacement of photomultiplier tubes, G-M and proportional tubes, and scintillation crystals which are broken due to excessive physical abuse or used for purposes other than intended.

There are no warranties, express or implied, including without limitation any implied warranty of merchantability or fitness, which extend beyond the description of the face there of. If the product does not perform as warranted herein, purchaser's sole remedy shall be repair or replacement, at the option of Ludlum Measurements. In no event will Ludlum Measurements be liable for damages, lost revenue, lost wages, or any other incidental or consequential damages, arising from the purchase, use, or inability to use product.

RETURN OF GOODS TO MANUFACTURER

If equipment needs to be returned to Ludlum Measurements, Inc. for repair or calibration, please send to the address below. All shipments should include documentation containing return shipping address, customer name, telephone number, description of service requested, and all other necessary information. Your cooperation will expedite the return of your equipment.

**LUDLUM MEASUREMENTS, INC.
ATTN: REPAIR DEPARTMENT
501 OAK STREET
SWEETWATER, TX 79556**

**800-622-0828 325-235-5494
FAX 325-235-4672**

TABLE OF CONTENTS

1. GENERAL1

2. SPECIFICATIONS1

3. REPLACEMENT PARTS LIST.....2

Assembly View, Drawing 393 x 232 & 393 x 232A2

0.03 cm (1.1 in.) 9 Stage Voltage Divider Board, Drawing 2 x 3563

DRAWINGS AND DIAGRAMS4

1. GENERAL

The Model 43-136 alpha scintillation detector is designed for alpha contamination surveys. An alpha scintillator, zinc sulfide [ZnS (Ag)], is applied to the window backup, which is covered by metalized polyester to reduce light response (causing excessive background counts). An 87.5% open, square-hole screen protects the window.

The Model 43-136 is compatible with any LMI general purpose survey meter, ratemeter, or scaler. Refer to the instrument

manual for calibration procedures.

The photomultiplier tube may easily be removed for repair. Refer to the assembly view drawing near the end of this manual for details of construction and parts.

The photomultiplier tube typically operates between 500-1200 volts, and the manufacturer recommends no more than 1500 volts.

METALIZED POLYESTER WINDOW REPLACEMENT AND CALIBRATION

When changing the metalized polyester window on a detector, it is not necessary to recalibrate the instrument as long as a functional check is performed on the instrument and its readings are consistent with the readings before the window was replaced.

2. SPECIFICATIONS

- **Photomultiplier Tube:** 2.9 cm (1.1 in.) diameter
- **Scintillator Material:** ZnS(Ag)
- **Window:** 0.8 mg/cm² metalized polyester (1.2 mg/cm² recommended for outdoor use)
- **Window Area:** Active area: approximately 65.3 cm²
- **Efficiency (4 π):** typically 20% for ²³⁹Pu
- **Typical Background:** 3 cpm or less
- **Response Uniformity:** less than 10% from average reading
- **Operating Voltage:** 500-1200 volts (1500 maximum)
- **Temperature Range:** -20 to 50 °C
- **Temperature Range:** (-4 to 122 °F)
- **Connector:** MHV
- **Protective Screen:** 0.05 cm (0.02 in.) thick stainless steel square hole 0.64 cm (0.25 in.), 87.5% open. Open area is approximately 57.9 cm².
- **Optional Screen:** 0.05 cm (0.02 in.) thick stainless steel square hole 0.64 (0.25 in.), 65.6% open. Open area: approximately 57.9 cm²
- **Size:** 8.8 x 6.9 x 29.7 cm (3.5 x 2.7 x 11.7 in.) (H x W x L)
- **Weight:** 0.43 kg (0.95 lb)
- **Finish:** aluminum casting with beige powder coat

3. REPLACEMENT PARTS LIST

Reference No.	Description	Part No.
	Assembly View, Drawing 393 x 232	
	Assembly View, Drawing 393 x 232A	

UNIT	Complete Assembly Model 43-136 Scintillator	47-3829
------	--	---------

Part No.	Description	Qty.
01-5019	Foil-netic	1 ea.
01-5026	Foil-co-nectic	1 ea.
13-7775	RECPT-SCREW MHV	1 ea.
16-8366	O-Ring	1 ea.
2393-241	Welded Body Assembly	1 ea.
2393-247	Tube Holder	1 ea.
4002-572	Photomultiplier Tube	1 ea.
4393-236	Mylar Window Assembly	1 ea.
4393-239	Window Backup w/Zinc	1 ea.
5002-570	1.125 in. 9 Stage Voltage Divider Board	1 ea.
7002-065-04	Sponge	2 ea.
7393-102	Connector Cap	1 ea.
7393-233	Gasket	1 ea.
7393-237	Face for Snap On Screen	1 ea.
7393-238	Mirror	1 ea.
7393-229	87.5% Snap On Screen	1 ea.
7393-242	65.6% Snap On Screen	1 ea.

LUDLUM MODEL 43-136

<u>Reference No.</u>	<u>Description</u>	<u>Part No.</u>
<u>1.125 inch Voltage Divider Board, Drawing 2 x 356</u>		
BOARD	Assembled 0.03 m (1.1 in.) Voltage Divider Board	5002-570
CAPACITORS		
C003	0.01 μ F, 500V	04-5696
RESISTORS		
R008	1 MEG, 1/4 W, 1%	12-7844
R001-R007	10 MEG, 1/8 W, 1%	12-7996
R009-R101	10 MEG, 1/8 W, 1%	12-7996

DRAWINGS AND DIAGRAMS

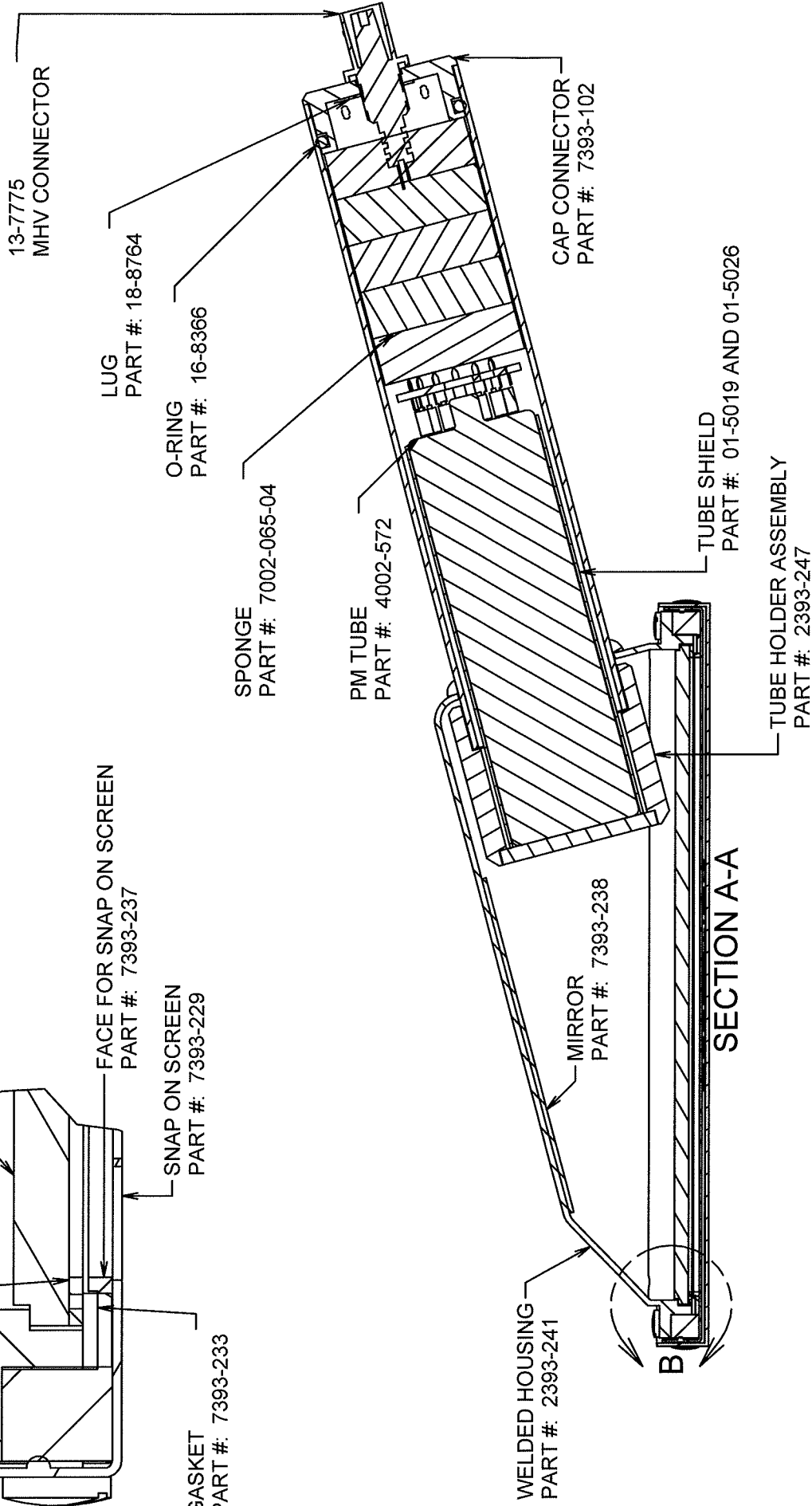
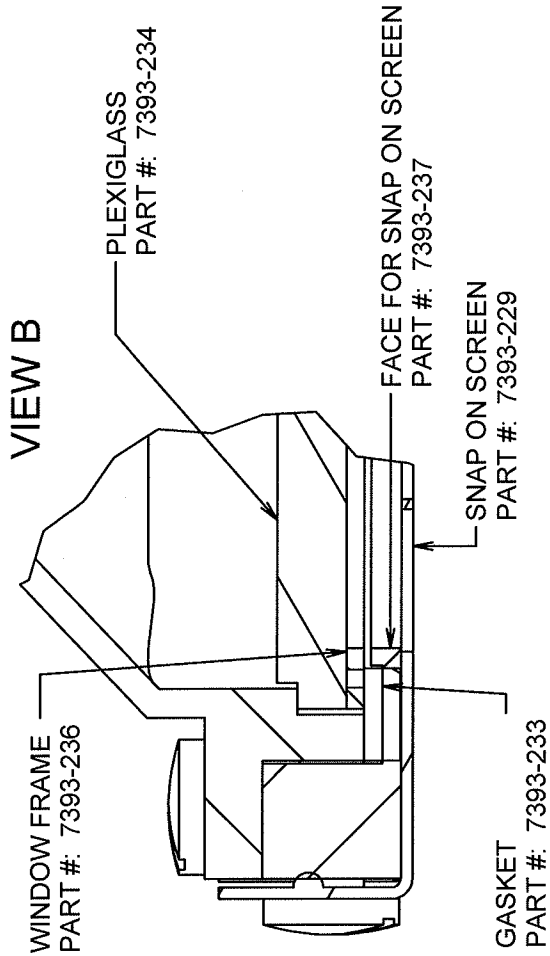
Assembly View, Drawing 393 x 232

Assembly View, Drawing 393 x 232A

1.125 inch Voltage Divider Board, Drawing 2 x 356

1.125 inch Voltage Divider Board Component Layout, Drawing 2 x 357A

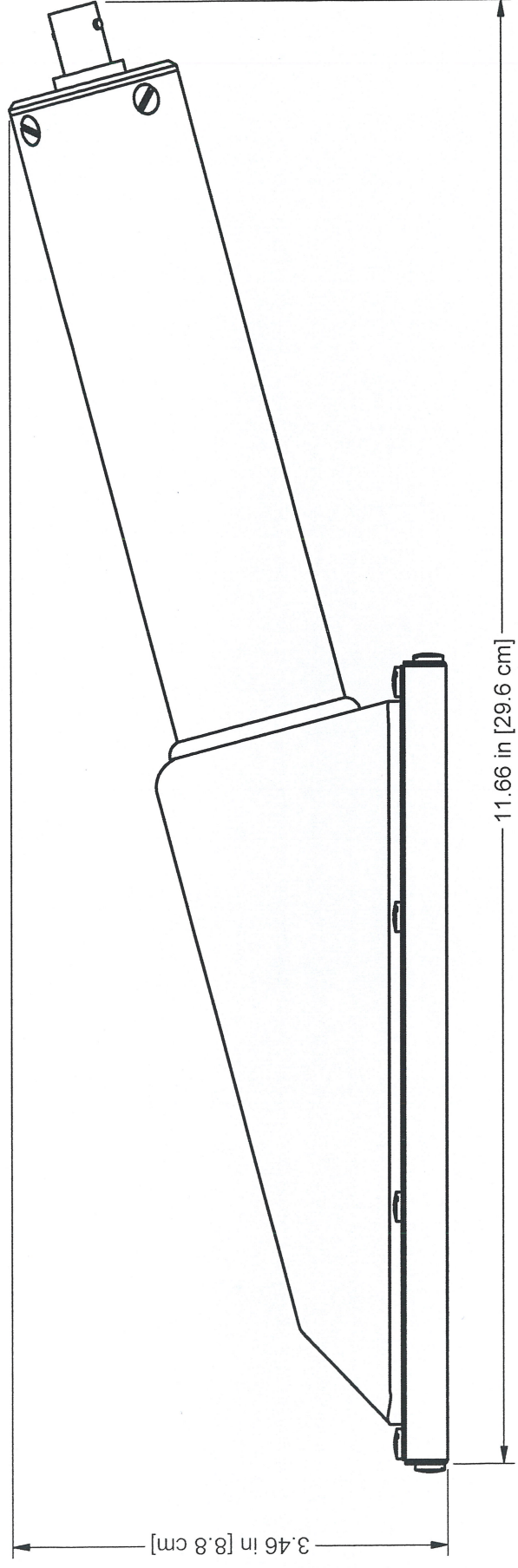
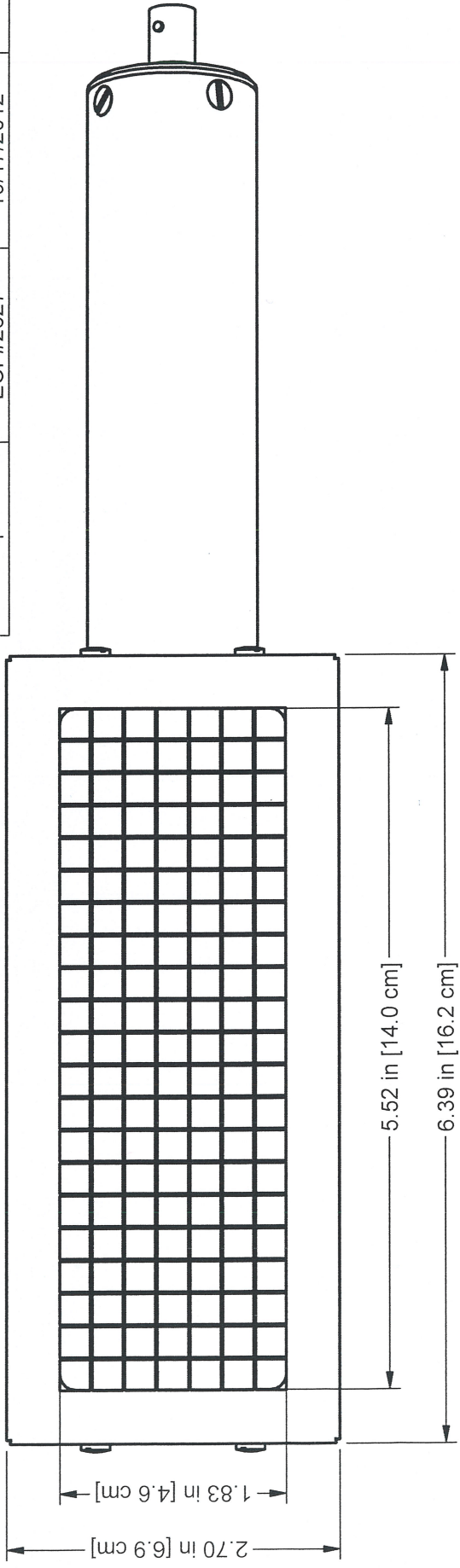
REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
1	VALID	10/27/10	DWW
2	ECF#2490	6/29/2011	CMC
3	ECF 2532	5/4/2012	MSC
4	ECF#2627	10/17/2012	ADG



DWN	DATE	CHK	DATE	APP	DATE
CMC	8-10-17			N6W	5-10-17
DWG NUM: 4393-232			SCALE: 3/4		
TITLE M 43-136 ASSEMBLY					
LUDLUM MEASUREMENTS, INC. 501 OAK STREET SWEETWATER, TEXAS 79556				SERIES 393	
				SHEET 232	

REVISION HISTORY

REV	DESCRIPTION	DATE	BY
1	VALID	10/27/10	DWW
2	ECF#2490	6/29/2011	CMC
3	ECF 2532	5/4/2012	MSC
4	ECF#2627	10/17/2012	ADG



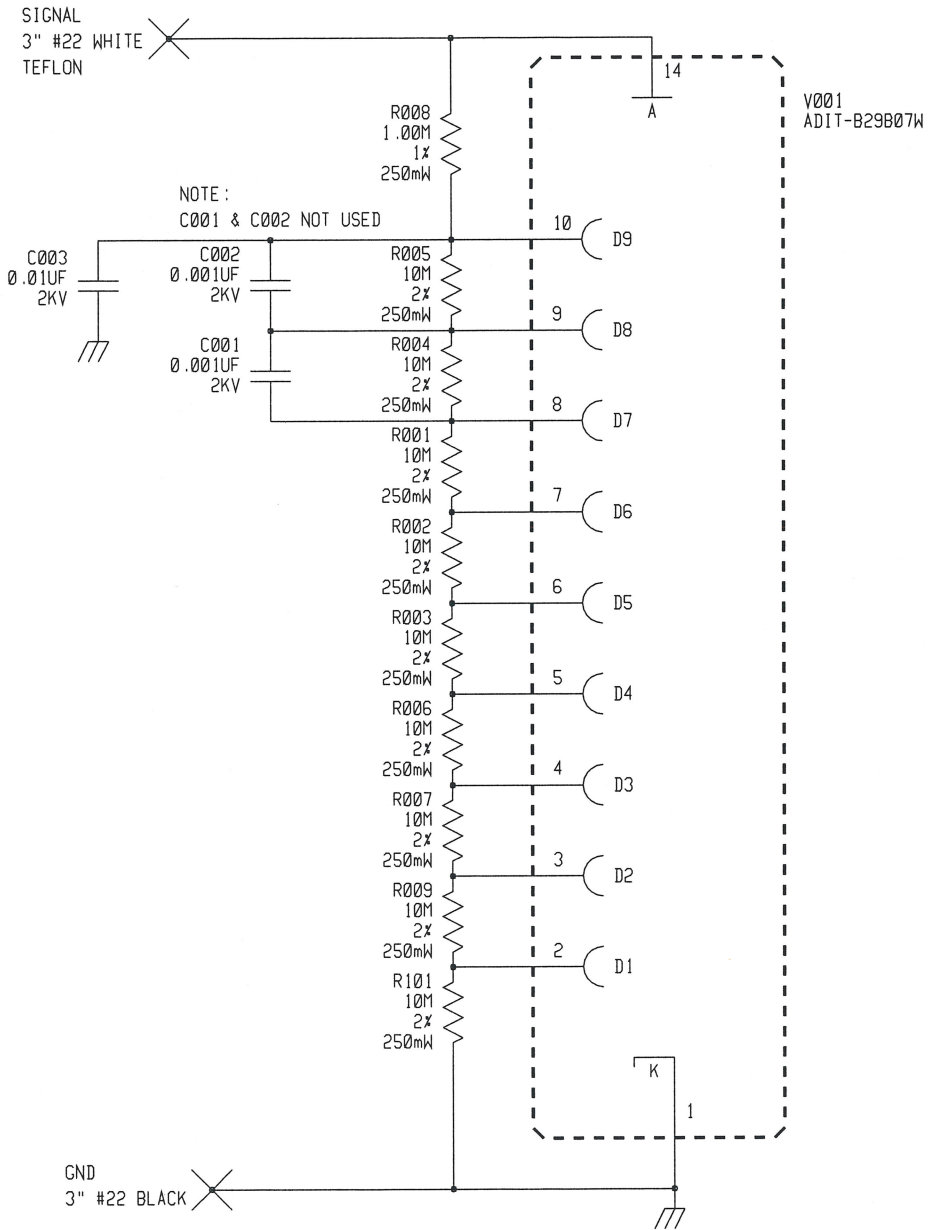
SCREEN:

OPEN AREA: 87.5%

MATERIAL: STAINLESS STEEL

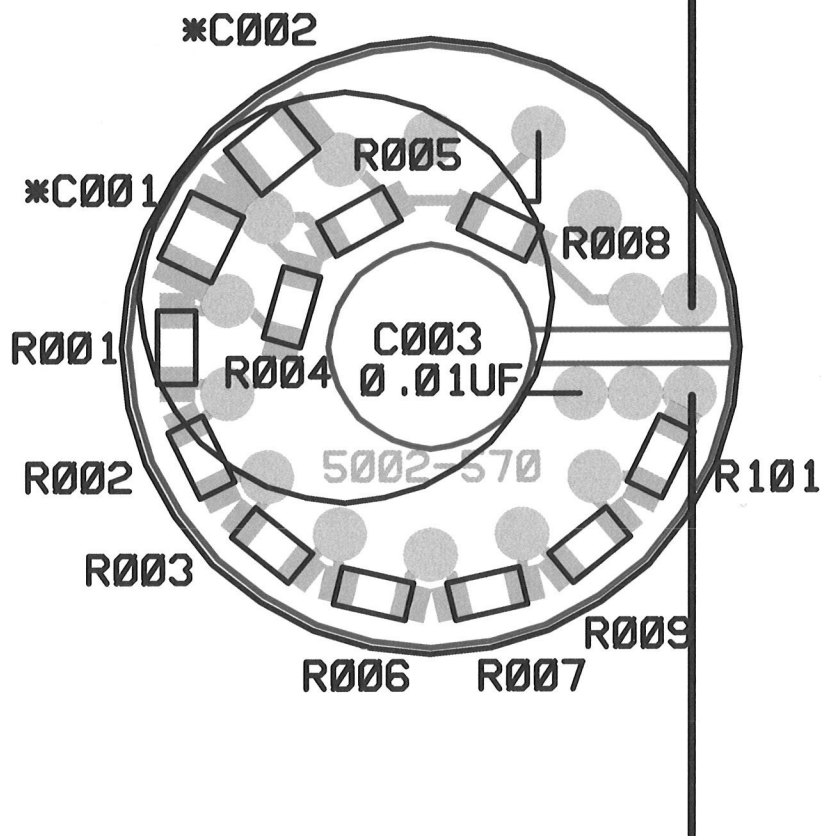
ACTIVE AREA: 65.1 cm²

DWN	ADG	DATE	10/17/2012	CHK		DATE		APP	DWW	DATE	10-17-12
DWG NUM:		4393-232		SCALE:		3/4		TITLE M 43-136 ASSEMBLY			
M				LUDLUM MEASUREMENTS, INC.				SERIES 393			
801 OAK STREET				SWEETWATER, TEXAS 79556				SHEET 232A			



UPDATED	-		LUDLUM MEASUREMENTS INC.			
DR	CKB	25-NOV-97	TITLE : 1.125" VOLTAGE DIVIDER 9 STAGE			
DSGN	RC	25-NOV-97	BOARD# 5002-570			
APPD	R35	26 Jun 12	SIZE	MODEL	SERIES	SHEET
NEXT HIGHER ASSY.			C	1.125"	2	356
15:23:28		25-Jun-12	SB002570		SHEET 1 OF 1	

#22 WHITE WIRE



#22 BLACK WIRE

* C001 & C002 ARE NOT PLACED



LUDLUM
MEASUREMENTS, INC.

PO Box 810
501 Oak Street
Sweetwater, TX 79556
U.S.A. 1-800-622-0828

Title: 1.125" Voltage Divider 9 Stage			
Drawn: CKB	11/25/97	Model: 1.125"	
Design: RC	11/25/97	Board#: 5002-570	
Approve: RDS	14 Jun 16	Rev: 1	
PCBA Drawing		SCALE: 1.00	Series
Print Date: 10/2/2015 10:31:05 AM	Top Overlay	2	Sheet 357A

W:\Projects\LM\VoltageDividers\5002-570\Rev 1\002570R1_Assy.PcbDoc