

**LUDLUM MODEL 43-92  
ALPHA SCINTILLATOR DETECTOR**

**October 2024**

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**LUDLUM MEASUREMENTS, INC**  
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## 1. GENERAL

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The Model 43-92 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 Mylar to reduce light response (causing excessive background counts). An 88% open, square-hole screen protects the window.

The Model 43-92 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.

**MYLAR WINDOW REPLACEMENT AND  
CALIBRATION**

When changing the Mylar 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

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**Photomultiplier Tube:** 2.9 cm  
(1.125 in.) diameter

**Scintillator Material:** ZnS(Ag)

**Window:** 0.8 mg/cm<sup>2</sup> Mylar (1.2 mg/cm<sup>2</sup> recommended for outdoor use)

**Window Area:**

Active area: approximately 100 cm<sup>2</sup>

Open area: approximately 88 cm<sup>2</sup>

**Efficiency (4π):**

Typically 20% for <sup>239</sup>Pu

**Typical Background:** 3 cpm or less

**Detector Uniformity:**

within 10% of average reading

**Operating Voltage:** 500-1200 V (1500 V maximum)

**Temperature Range:** -20 to 50 °C  
(-4 to 122 °F)

**Connector:** series "C," unless specified otherwise

**Protective Screen:** 0.79 mm (0.03 in.) thick stainless steel, 6.5 mm (0.26 inch) square-hole, 88% open  
Outdoor Dimensions (LxW): 168 x 92 mm  
(6.6 x 3.6 in.)

**Size:** 6.4 x 9.7 x 31.2 cm (2.5 x 3.8 x 12.3 inches)

**Weight:** 0.5 kg (1.0 lb)

**Construction:** aluminum with beige powder coating

**Environmental Rating:** IP rating of 63

**3. REPLACEMENT PARTS LIST**

<b>Reference No.</b>	<b>Description</b>	<b>Part No.</b>
<b><u>Assembly View, Drawing 393 x 165</u></b>		
UNIT	Complete Assembly Model 43-92 Scintillator	47-2555

<b>Part No.</b>	<b>Description</b>	<b>Qty.</b>
01-5019	Foil-netic	1 ea.
01-5026	Foil-co-nectic	1 ea.
2393-141	Welded Body Assembly	1 ea.
4393-069	Mylar Window Assembly	1 ea.
5002-702	2.9 cm (1.125 in.) Voltage Divider Board	1 ea.
4002-572	Photomultiplier Tube/Socket Assy	1 ea.
16-8366	O-Ring	1 ea.
2310698	Mirror	1 ea.
7002-065-04	Sponge	2 ea.
2393-117	Tube Holder	1 ea.
7393-171	Window Screen (external snap-on)	1 ea.
4393-164	Window Backup	1 ea.
7393-137	Face Ring	1 ea.
7393-139	Gasket	1 ea.
4478-011	RECPT-UG706/U SERIES "C"	1 ea.
7393-162	Vinyl Cover	1 ea.

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<b>Reference No.</b>	<b>Description</b>	<b>Part No.</b>
<b>2.9 cm (1.13 in.) Voltage Divider Board, Drawing 2 x 356</b>		
BOARD	Assembled 2.9 cm (1.25 in.) Voltage Divider Board	5002-570
<b>CAPACITORS</b>		
C003	0.01 $\mu$ F, 3kV	04-5525
<b>RESISTORS</b>		
R008	1 MEG, 1/4 W, 1%	12-7844
R001-R007	10 MEG, 1/8 W, 1%	12-7996
R009	10 MEG, 1/8 W, 1%	12-7996
R101	10 MEG, 1/8 W, 1%	12-7996

## **DRAWINGS AND DIAGRAMS**

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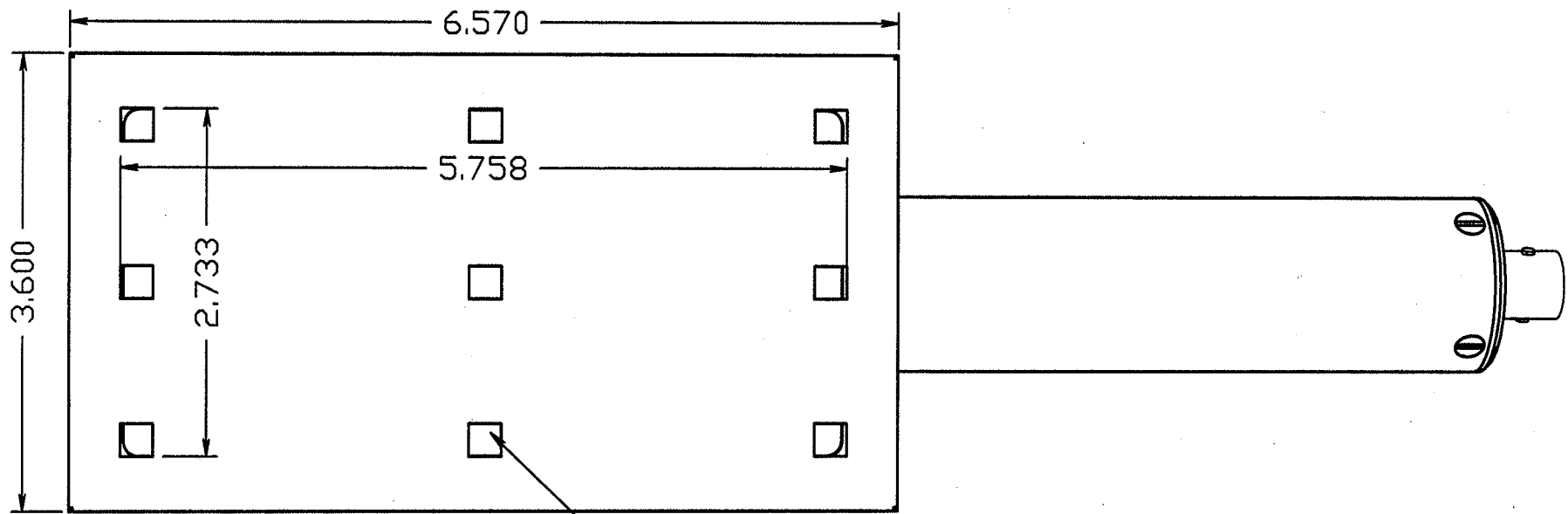
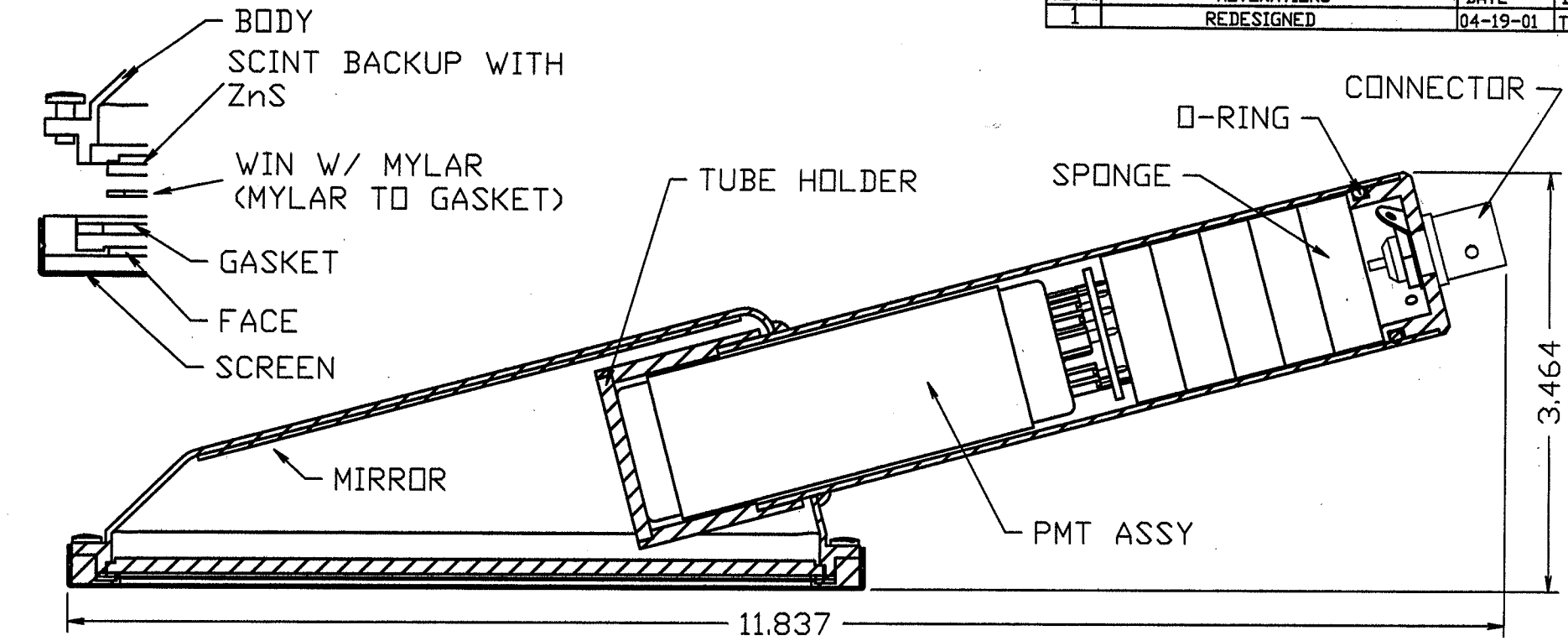
Assembly View, Drawing 393 x 165

Mylar Window Replacement, Drawing 393 x 165A

2.9 cm (1.125 in.) Voltage Divider Board, Drawing 2 x 356

2.9 cm (1.125 in.) Voltage Divider Board Component Layout, Drawing 2 x 357A (2 sheets)

REV #	ALTERATIONS	DATE	BY
1	REDESIGNED	04-19-01	TJR



88% OPEN  
(ALL HOLES ARE NOT SHOWN)

DWN	DATE	CHECKED	APPROVED
TJR	04-19-01	vw 5-22-01	bck 5-23-01
TITLE: 43-92 W/ SNAP ON SCRIN			
LUDLUM REPAIRMENTS, INC. 818 DUK STREET SWEETWATER, TEXAS 75556		SERIES	SHEET
		393	165

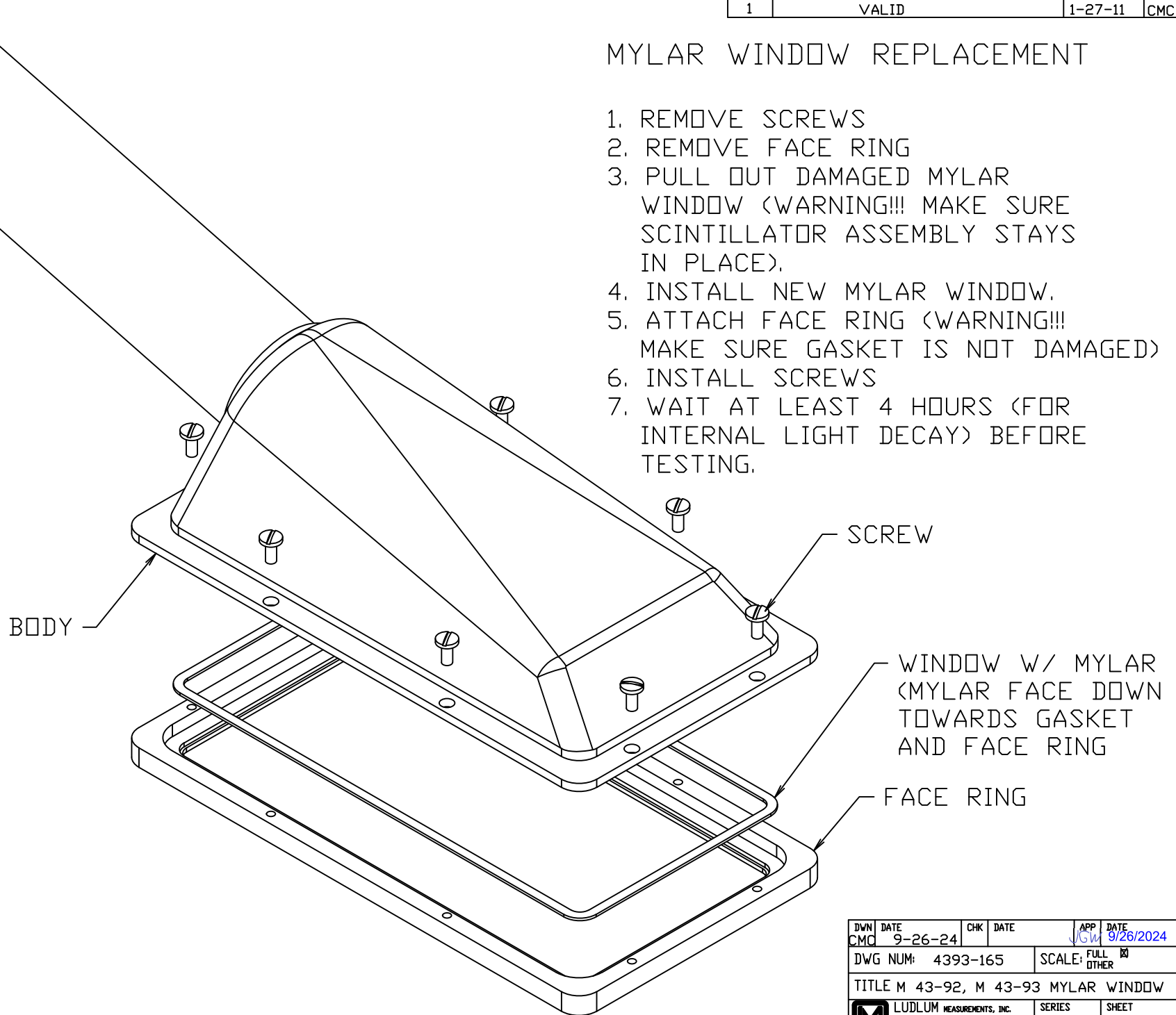
VIF




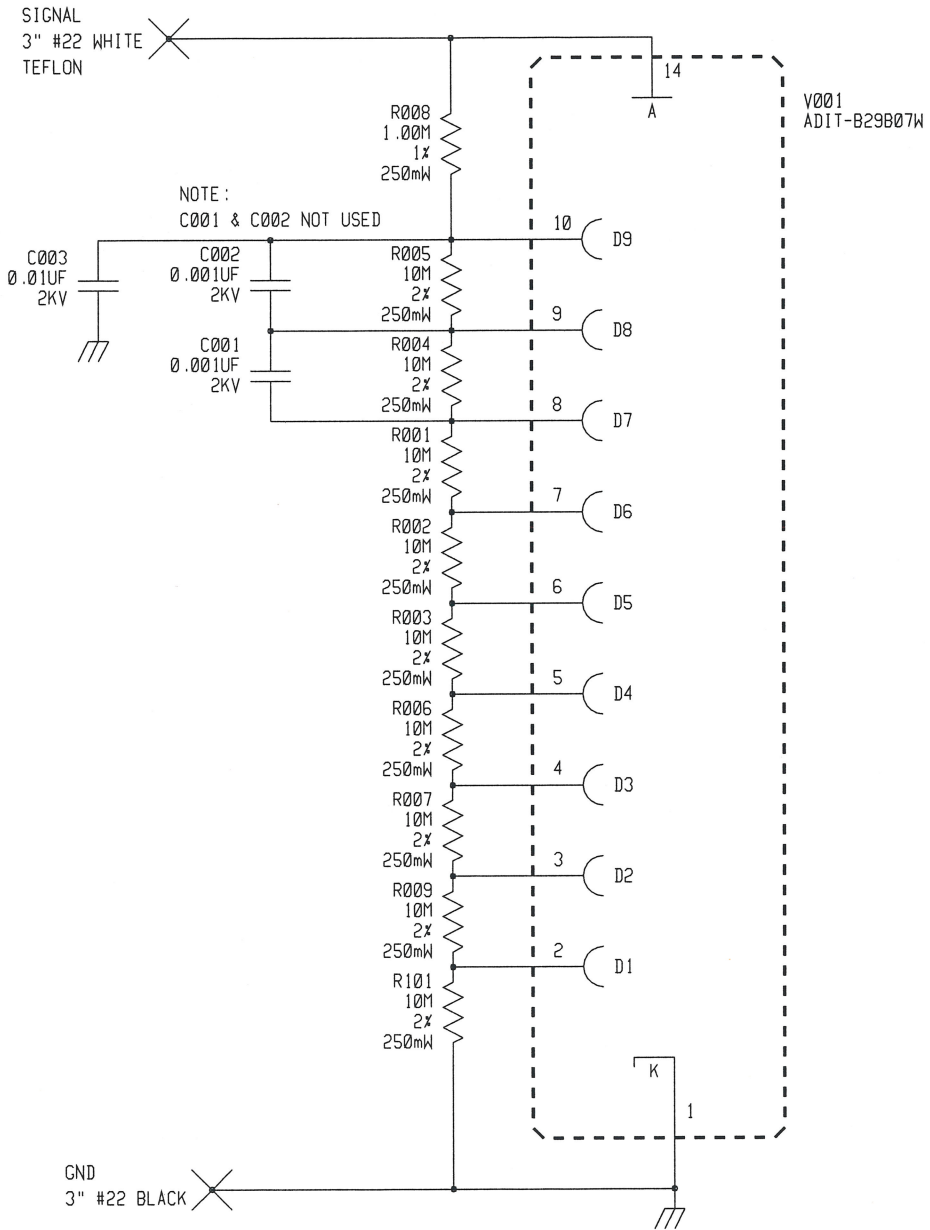
REV #	ALTERATIONS	DATE	BY
1	VALID	1-27-11	CMC

## MYLAR WINDOW REPLACEMENT

1. REMOVE SCREWS
2. REMOVE FACE RING
3. PULL OUT DAMAGED MYLAR WINDOW (WARNING!!! MAKE SURE SCINTILLATOR ASSEMBLY STAYS IN PLACE).
4. INSTALL NEW MYLAR WINDOW.
5. ATTACH FACE RING (WARNING!!! MAKE SURE GASKET IS NOT DAMAGED)
6. INSTALL SCREWS
7. WAIT AT LEAST 4 HOURS (FOR INTERNAL LIGHT DECAY) BEFORE TESTING.



DWN	DATE	CHK	DATE	APP	DATE
CMC	9-26-24			JCW	9/26/2024
DWG NUM: 4393-165				SCALE: FULL <input checked="" type="checkbox"/> OTHER	
TITLE M 43-92, M 43-93 MYLAR WINDOW					
 LUDLUM MEASUREMENTS, INC. 501 DAK STREET SWEETWATER, TEXAS 79556				SERIES	SHEET
				393	165A



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	

A

B

C

D

1

1

6" WHITE WIRE

2

2

Top Layer (Scale 4:1)

\*C002

\*C001

3

3

R001

C003

0.01UF

R004

4

4

R002

5002-570

R101

R003

5

5

\*C001 AND C002 NOT PLACED

6" BLACK WIRE

R006

R007

R009

6


6

A

B

C

D

 <b>LUDLUM MEASUREMENTS</b>				
Part: 5002-570		Model: 1.125"		
Desc: 1.125" Voltage Divider 9 Stage				
Design: RC	Date: 11/25/97	Rev:	1	
Drawn: PAB	Date: 1/19/2023	SHEET	SERIES	SHEET
Apr: RDS	Date: 19 Jan 23	1 of 3		
\\freedom\pcb\Projects\LM1\VoltageDividers\5002-570\Rev1			2	357A

A

B

C

D

1

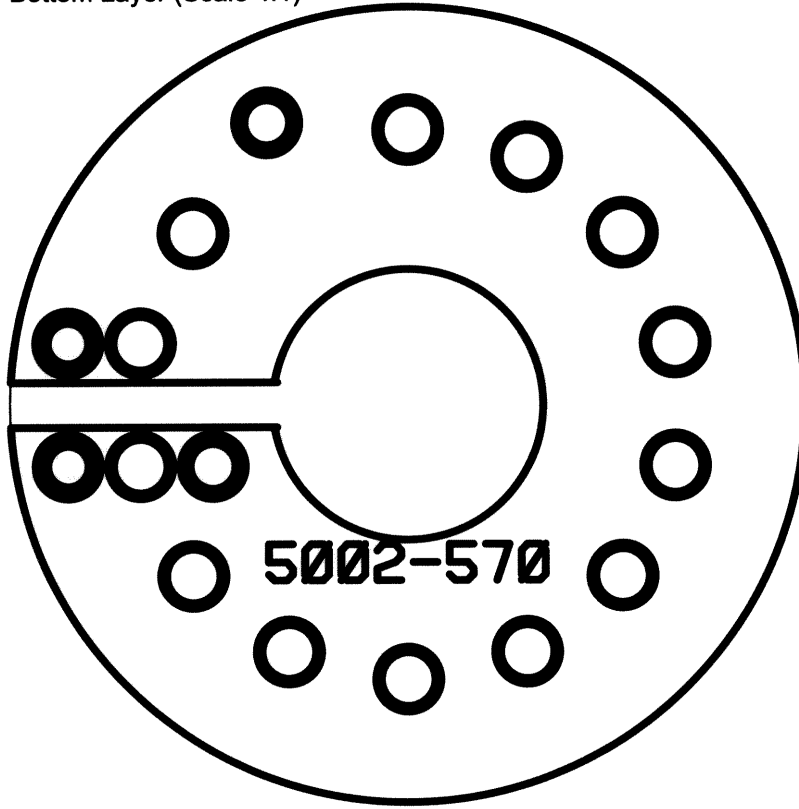
1



Bottom Layer (Scale 4:1)

2

2



3

3

4

4




5

5

6

6

 <b>LUDLUM MEASUREMENTS</b>				
Part: 5002-570		Model: 1.125"		
Desc: 1.125" Voltage Divider 9 Stage				
Design: RC	Date: 11/25/97	Rev:	1	
Drawn: PAB	Date: 1/19/2023	SHEET	SERIES	SHEET
Apr: <i>RDS</i>	Date: <i>19 Jan 23</i>	2 of 3		
\\freedom\pcb\Projects\LMI\VoltageDividers\5002-570\Rev1			2	357A

A

B

C

D