

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

**April 2011**

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ALPHA SCINTILLATOR DETECTOR**

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**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**

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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 (1.13 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
- **Response Uniformity:**  
less than 10% from average reading
- **Operating Voltage:** 500-1200 volts (1500 maximum)
- **Temperature Range:** -20 to 50 °C (-4 to 122 °F)
- **Connector:** series "C," unless specified otherwise
- **Protective Screen:** 0.030 thick stainless steel square-hole (0.25 inch), 88% open
- **Size:** 6.4 x 9.7 x 31.2 cm (2.5 x 3.8 x 12.3 inches)
- **Weight:** 0.05 kg (1.0 lb)
- **Construction:** aluminum with beige powder coating

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**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.
5433-318	2.9 cm (1.13 in.) Voltage Divider Board	1 ea.
4002-572	Photomultiplier Tube/Socket Assy	1 ea.
7002-505	Connector End Cap	1 ea.
16-8366	O-Ring	1 ea.
2310698	Mirror	1 ea.
7002-065-04	Sponge	2 ea.
2393-117	Tube Holder	1 ea.
7393-017	Window Holder	1 ea.
7393-171	Window Screen (external snap-on)	1 ea.
4393-164	Window Backup	1 ea.
7396-137	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 232</b>		
BOARD	Assembled 2.9 cm (1.13 in.) Voltage Divider Board	5002-570
<b>CAPACITORS</b>		
C003	0.01 $\mu$ F, 500V	04-5696
<b>RESISTORS</b>		
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**

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Assembly View, Drawing 393 x 165

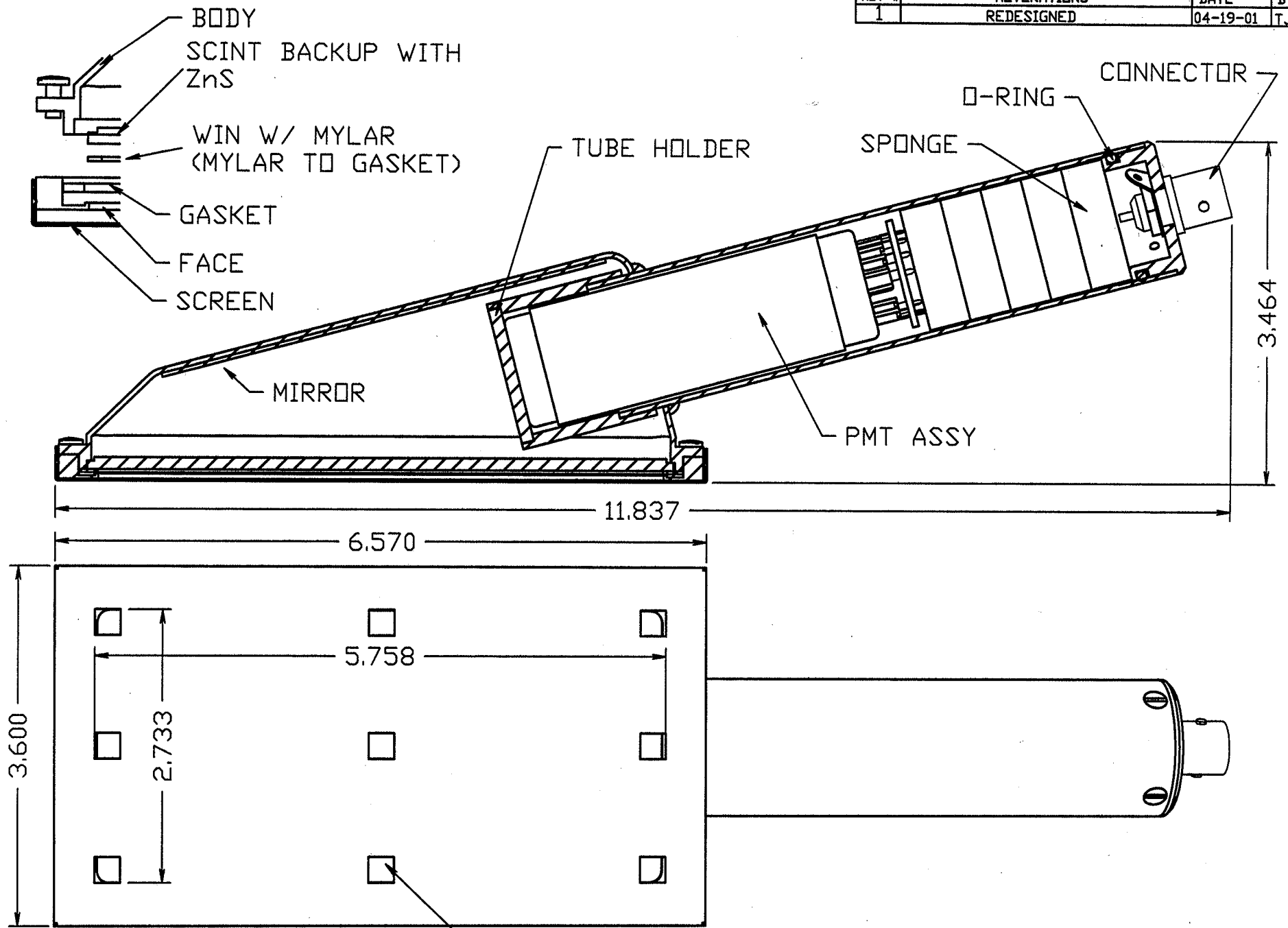
Mylar Window Replacement, Drawing 393 x 165A

2.9 cm (1.13 cm) Voltage Divider Board, Drawing 2 x 232

2.9 cm (1.13 cm) Voltage Divider Board Component Layout, Drawing 2 x 233



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



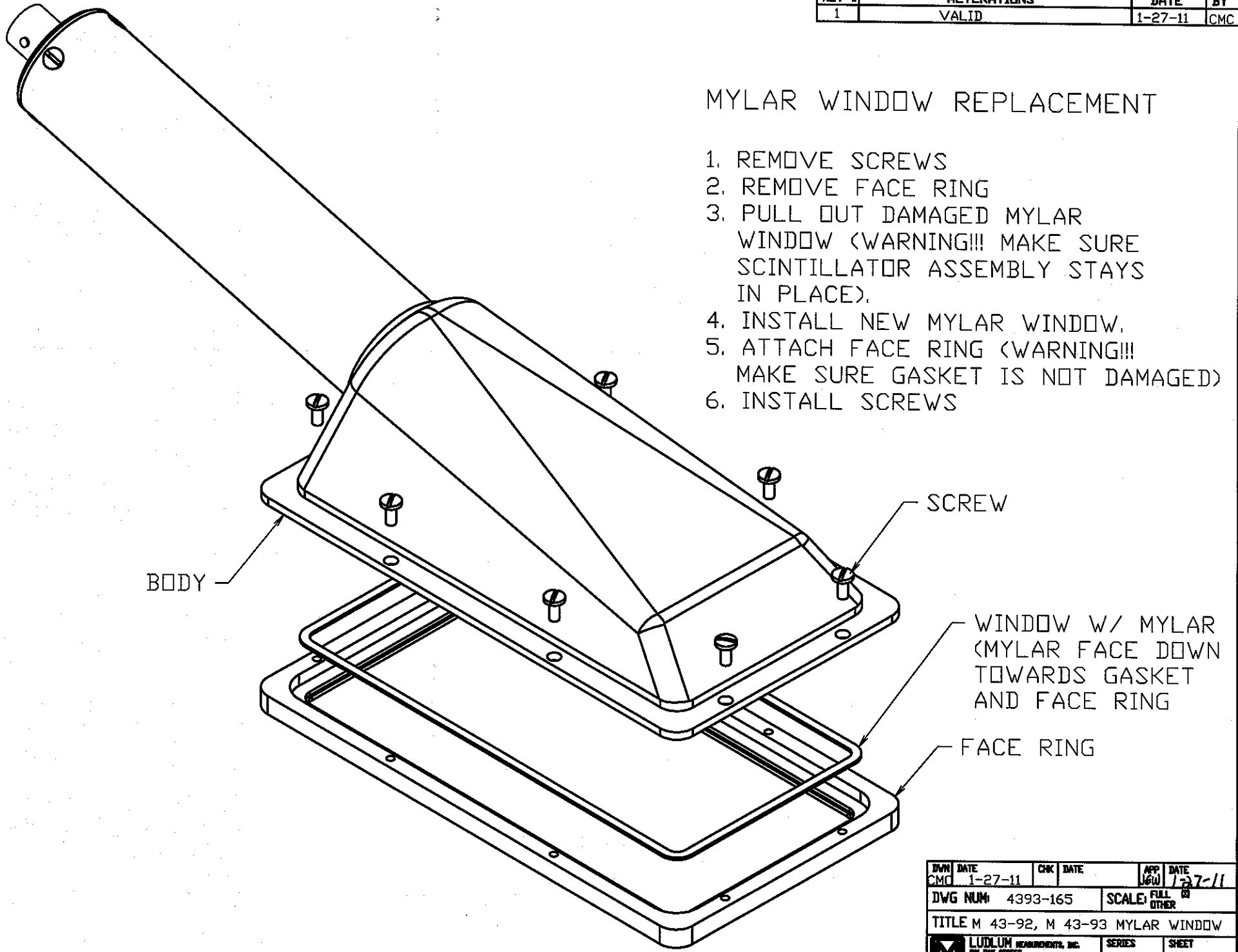
88% OPEN  
(ALL HOLES ARE NOT SHOWN)

DWN	DATE	CHECKED	APPROVED
TJR	04-19-01	vw 5-22-01	bck 5-23-01
TITLE: 43-92 W/ SNAP ON SCRN			
LUDLUM REPAIRS, INC. 816 DUK STREET SWEETWATER, TEXAS 75556		SERIES	SHEET
		393	165

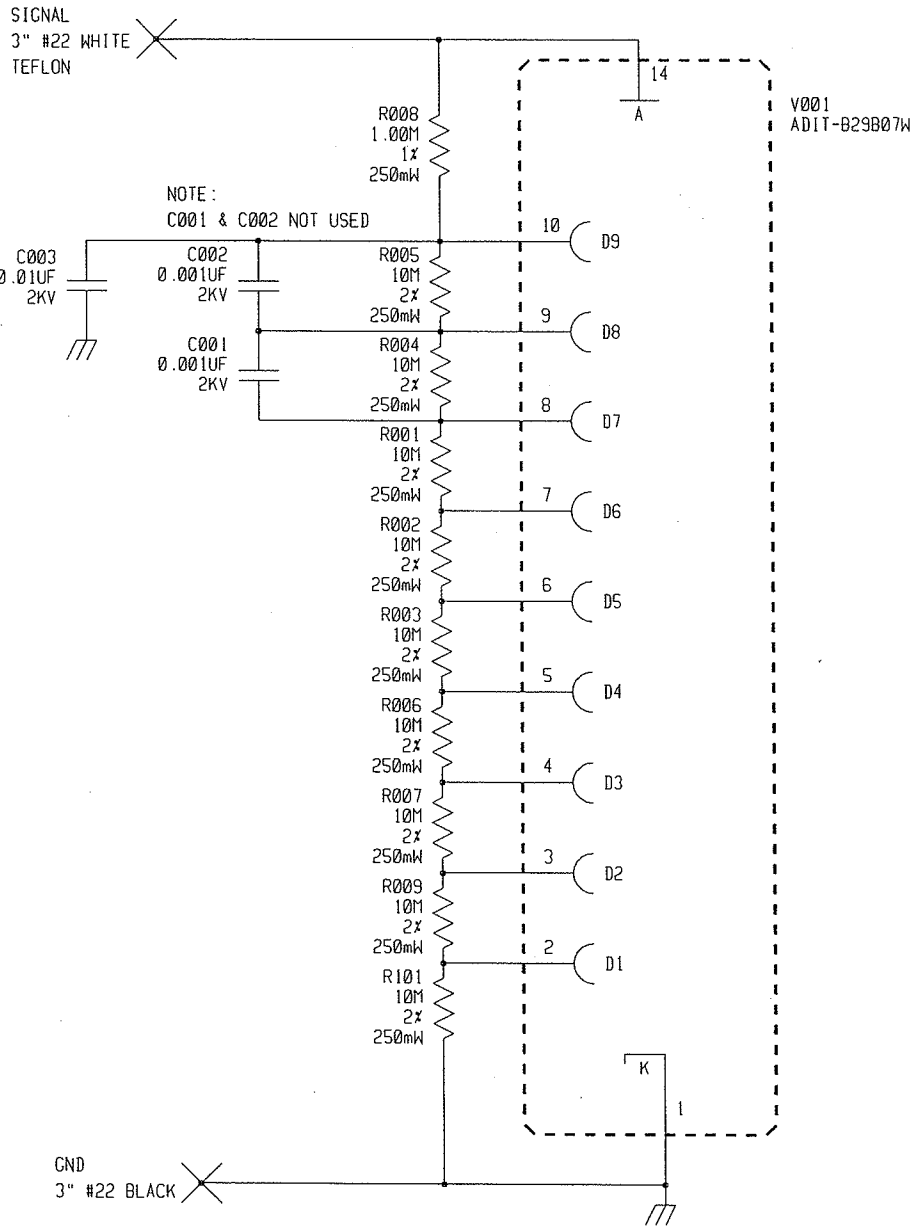
REV #	ALTERATIONS	DATE	BY
1	VALID	1-27-11	CMC

## 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

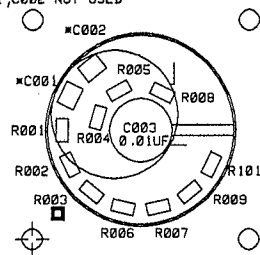


DNW	DATE	CHK	DATE	APP	DATE
CMC	1-27-11			LOW	1-27-11
DWG NUM	4393-165		SCALE	FULL	OTHER
TITLE			M 43-92, M 43-93 MYLAR WINDOW		
LUDLUM MEASUREMENTS, INC.			SERIES	SHEET	
501 ONE STREET			393	165A	
SHELTON, CT 06484					



UPDATED		-		LUDLUM MEASUREMENTS INC.			
DR	CKB	25-NOV-97		TITLE: 1.125" VOLTAGE DIVIDER 9 STAGE			
DSCN	RC	25-NOV-97		BOARD# 5002-570			
APPD	<i>R/S</i>	<i>13J007</i>		SIZE	MODEL	SERIES	SHEET
NEXT HIGHER ASSY.				C	1.125"	2	232
14:06:06		7-Feb-06		SB002570		SHEET 1 OF 1	

NOTE:  
C001, C002 NOT USED



V001  
ADIT-B29B07H

LUDLUM MEASUREMENTS INC. SHEETWATER, TX.			
DR	CKB	03-DEC-97	TITLE: 9 STAGE VOLTAGE DIVIDER
CHK		BOARD# 5002-570	BS002570
DSCN	RC	26-NOV-97	MODEL 1-1/8" SERIES 2 SHEET 233
APP	<i>BS</i>		COMP ARTWORK <input type="checkbox"/> SLDR ARTWORK <input type="checkbox"/>
08:28:25		13-Jun-07	COMP OUTLINE <input type="checkbox"/> SLDR OUTLINE <input type="checkbox"/>
			COMP PASTE <input type="checkbox"/> COMP MASK <input type="checkbox"/> SLDR PASTE <input type="checkbox"/> SLDR MASK <input type="checkbox"/>