LUDLUM MODEL 43-92
ALPHA SCINTILLATOR DETECTOR

April 2011

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LUDLUM MEASUREMENTS, INC
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TABLE OF CONTENTS

1. GENERAL 1

2. SPECIFICATIONS 1

3. REPLACEMENT PARTS LIST 2
Assembly View, Drawing 393 x 165 2
2.9 cm (1.13 in.) 9 Stage Voltage Divider Board, Drawing 2 x 232 3

DRAWINGS AND DIAGRAMS 4

1. GENERAL

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

- **Photomultiplier Tube:** 2.9 cm (1.13 in.) diameter
- **Scintillator Material:** ZnS(Ag)
- **Window:** 0.8 mg/cm^2 Mylar (1.2 mg/cm^2 recommended for outdoor use)
- **Window Area:**
Active area: approximately 100 cm^2
Open area: approximately 88 cm^2
- **Efficiency (4π):**
Typically 20% for ^{239}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, 6.5 mm (0.26 inch) square-hole, 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

3. REPLACEMENT PARTS LIST

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

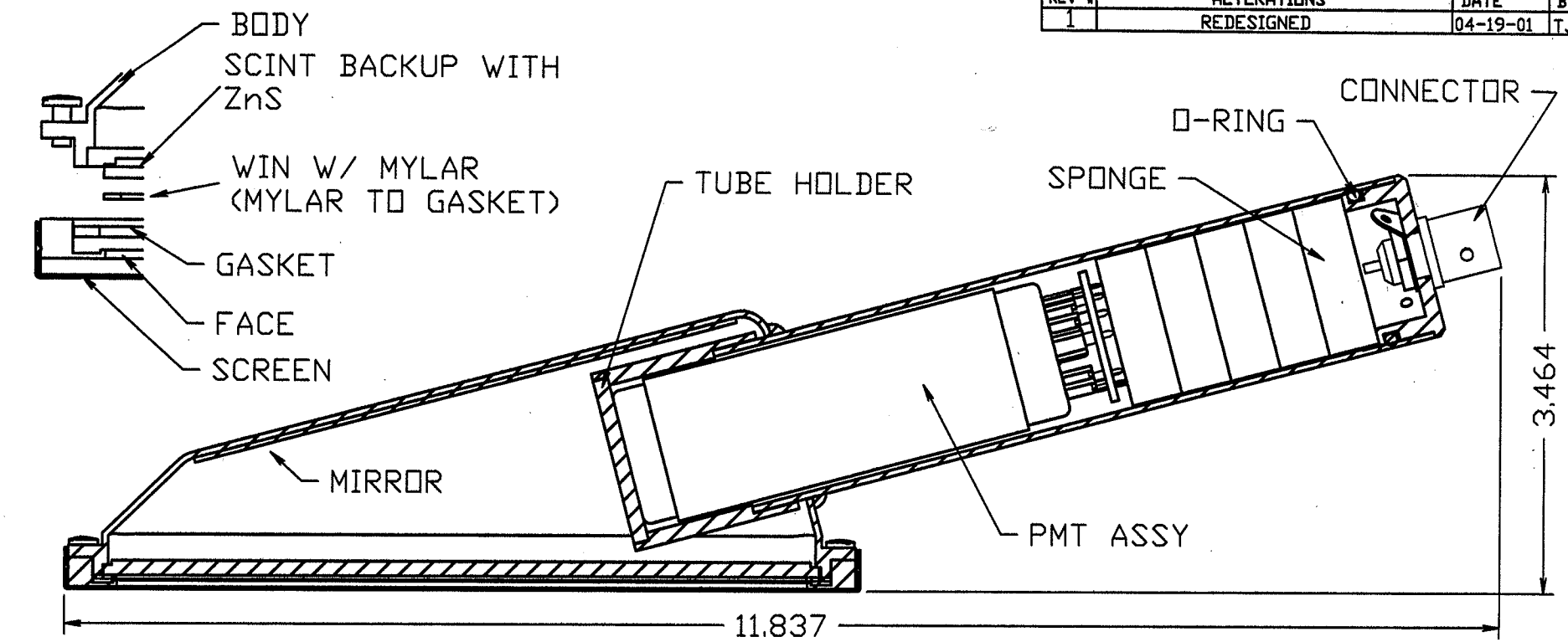
Part No.	Description	Qty.
01-5019	Foil-netic	1 ea.
01-5026	Foil-co-nectic	1 ea.
2393-141	Welded Body Assembly	1 ea.
4393-069	Mylar Window Assembly	1 ea.
5433-318	2.9 cm (1.13 in.) Voltage Divider Board	1 ea.
4002-572	Photomultiplier Tube/Socket Assy	1 ea
7002-505	Connector End Cap	1 ea.
16-8366	O-Ring	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.

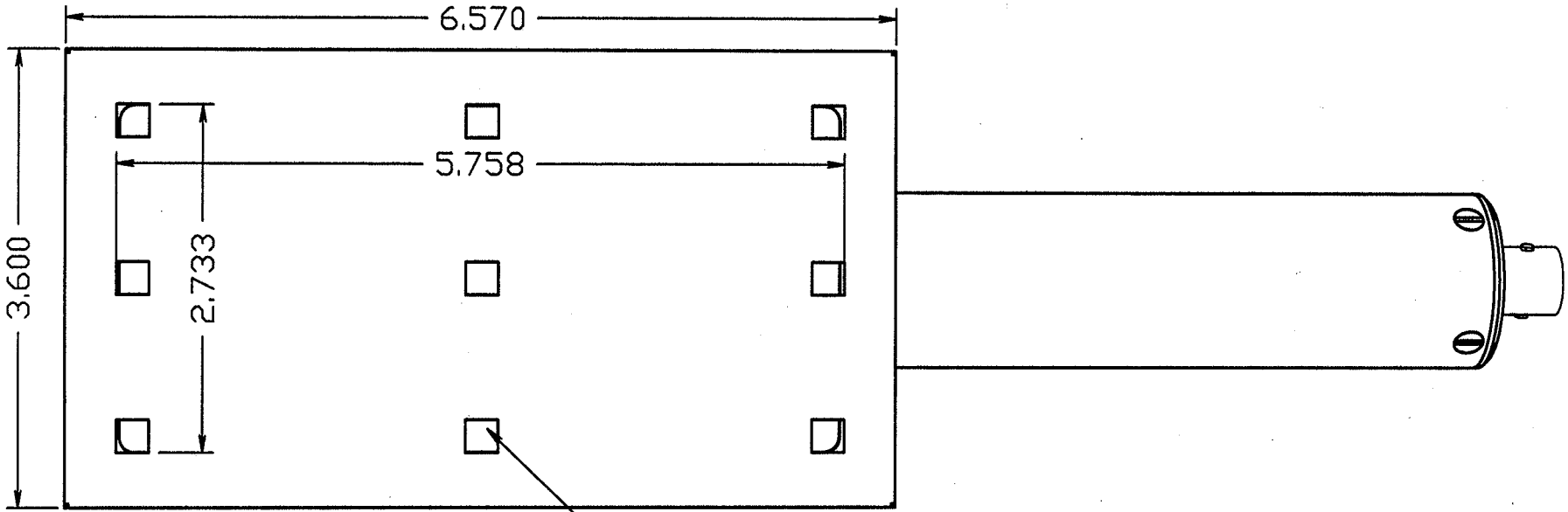
Reference No.	Description	Part No.
2.9 cm (1.13 in.) Voltage Divider Board, Drawing 2 x 232		
BOARD	Assembled 2.9 cm (1.13 in.) Voltage Divider Board	5002-570
CAPACITORS		
C003	0.01µF, 500V	04-5696
RESISTORS		
R008	1 MEG,1/4 W, 1%	12-7844
R001-R007	10 MEG,1/8 W, 1%	12-7996
R009-R101	10 MEG, 1/8 W, 1%	12-7996

DRAWINGS AND DIAGRAMS

Assembly View, Drawing 393 x 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	JGW 5-22-01	BCH 5-23-01

TITLE: IM 43-92 W/ SNAP ON SCRN

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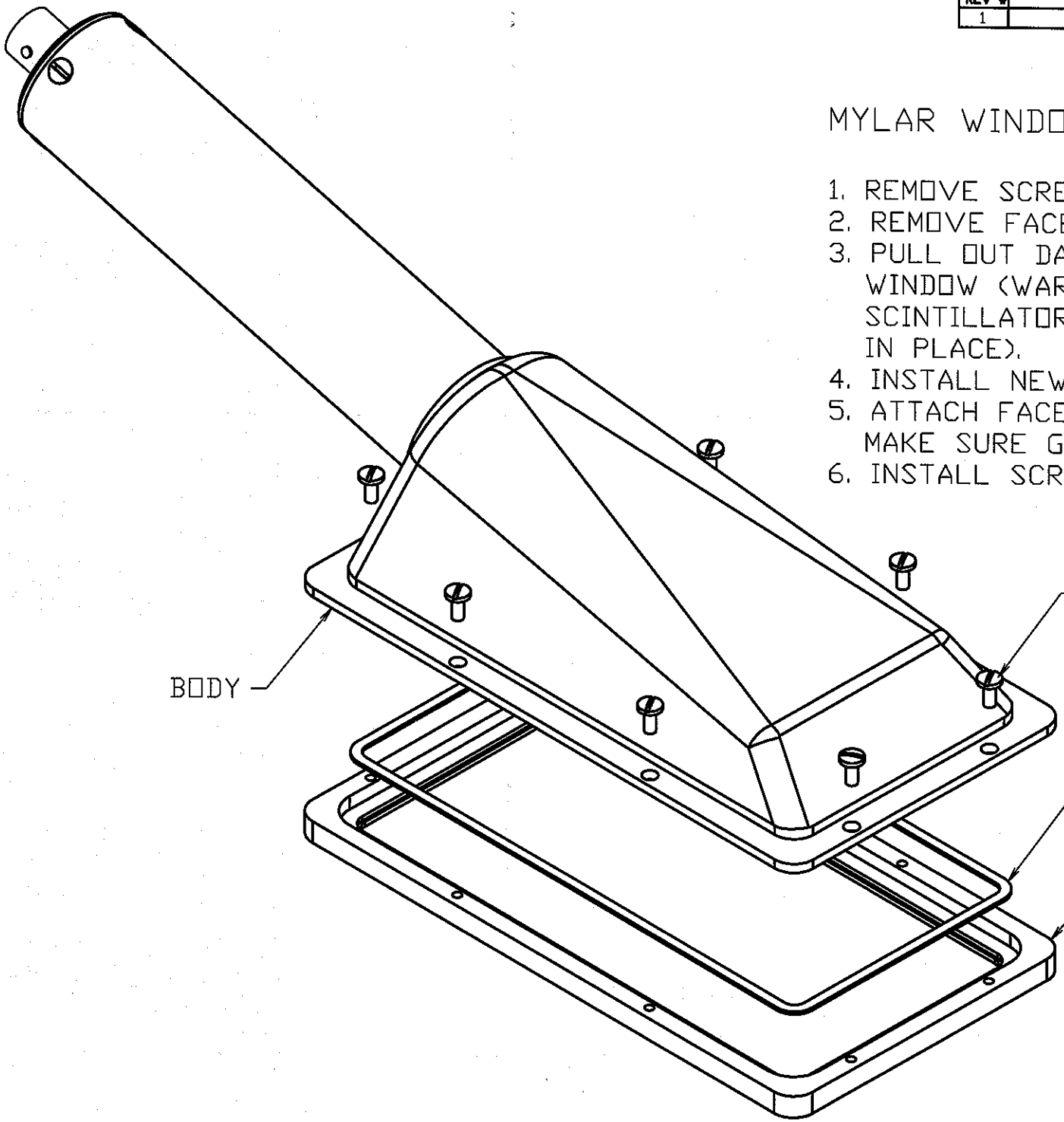
SERIES	SHEET
393	165

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



DWN	DATE	CHK	DATE	APP	DATE
CMC	1-27-11			JGW	1-27-11

DWG NUM: 4393-165 SCALE: FULL OTHER

TITLE: M 43-92, M 43-93 MYLAR WINDOW

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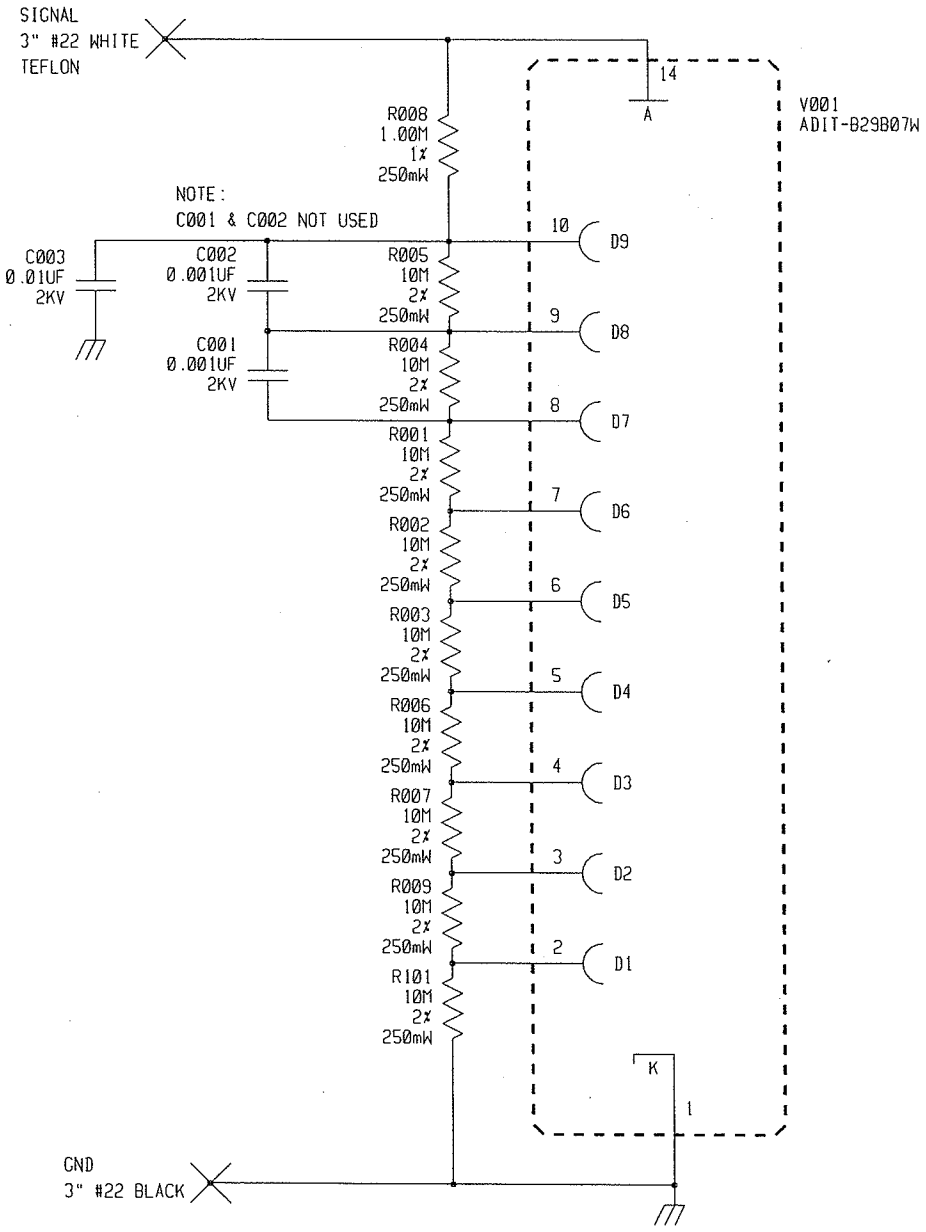
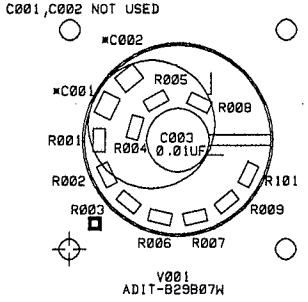
SERIES 393 SHEET 165A



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	RJS	13Jan07	SIZE C / MODEL 1.125" / SERIES 2 / SHEET 232
NEXT HIGHER ASSY. -			
14:06:06	7-Feb-06		SB002570 / SHEET 1 OF 1

NOTE:
C001,C002 NOT USED



LUDLUM MEASUREMENTS INC. SWEETWATER, TX.				
DR CKB	03-DEC-97	TITLE: 9 STAGE VOLTAGE DIVIDER		
CHK		BOARD# 5002-570		BS002570
DSGN RC	26-NOV-97	MODEL 1-1/8"	SERIES 2	SHEET 233
APP RS	13 Jun 07	COMP ARTWORK ☐		SLDR ARTWORK ☐
08:28:25	13-Jun-07	COMP OUTLINE ☐		SLDR OUTLINE ☐
COMP PASTE ☐	COMP MASK ☐	SLDR PASTE ☐	SLDR MASK ☐	