

**LUDLUM MODEL 43-1 AND 43-1-1
SCINTLLATORS**

**SEPTEMBER 1993
Serial No. PR106136
and Succeeding Numbers**



**LUDLUM MEASUREMENTS, INC.
501 OAK ST., P.O. BOX 810
SWEETWATER, TX 79556
915/235-5494 FAX: 915/235-4672**

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M43-1/43-1-1 Scintillators

1. GENERAL

The Model 43-1 and M43-1-1 Scintillators are large area detectors with 75 cm² active areas. The Model 43-1 is an Alpha detector and the Model 43-1-1

is Alpha-Beta. The large area detectors are useful for radiation surveys and wipe test analysis.

2. SPECIFICATIONS

- WINDOW: 1.2 mg/cm² metalized mylar
- WINDOW AREA: 75 cm² active area
- EFFICIENCY:
ALPHA-60% OF 2 pi emission for ²³⁹Pu
ALPHA-BETA- 8% of 2 pi emission for ¹⁴C
- HIGH VOLTAGE: 500-1000 volts
- SCINTILLATION MATERIAL:
Model 43-1: ZnS(Ag)
Model 43-1-1: BC-400
- CONNECTOR: Series "C"; other connectors available upon request

3. MAINTENANCE

Malfunctions are normally due to either light leaks, a defective photomultiplier tube, contamination or high voltage not set properly. Malfunctions caused by light holes give an increase in the background count. This increase may cause enough counts to saturate the detector, where the instrument may indicate zero counts.

It is important to make sure that the voltage to the detector is set properly by running a plateau and setting the operating point in the first third of the plateau, above the knee of the curve.

To check for a light leak, cover the window with an opaque material. If the instrument indicates a change in count after a few minutes, the source of the light can sometimes be determined by visual inspection of the window or by uncovering small areas of the window and looking for a change in count.

The photomultiplier tube rarely fails, but a tube malfunction can be isolated by insuring the instrument is not saturated due to light leaks and does not indicate any counts in a known radiation field.

4. REPAIR/REPLACEMENT OF MYLAR WINDOW

(Refer to drawing 2 x 172)

- 1. Remove the four screws from the front face of the detector.
- 2. Remove the front face from the body of the detector.
- 3. Remove mylar window from the detector face.
- 4. Check that the o'ring on probe body is positioned properly.
- 5. Refer to drawing 2 x 172 for direction of phenolic ring.
- 6. Replace the detector front face and secure with the four screws. Check that the o'ring is properly positioned before tightening.
- 7. Wait at least 20 minutes before checking the detector response. If the instrument reads zero counts when exposed to a source, refer to the previous steps on maintenance.
- 8. The detector should not be calibrated for at least 24 hours after window replacement to allow for light decay from the ZnS(Ag) scintillator.

M43-1/43-1-1 Scintillators

PARTS LIST

Model 43-1 Alpha Scintillator

UNIT Completely Assembled
M43-1 Alpha Scintillator 47-1516

Model 43-1-1 Alpha-Beta Scintillator

UNIT Completely Assembled
M43-1-1 Alpha-Beta Scintillator 47-2336

Replacement Parts List

Part No.	Descrip.	Qty.
01-5199	(M43-1-1 ONLY) BC400-3.98 X .010	1 EA.
01-5001	PHOTO TUBE	1EA.
40-4006	TUBE SHIELD	1 EA.
40-4034	MYLAR WINDOW	1 EA.
14-5431	ZINC SULFIDE (ZnS(Ag)) (SOLD BY OZ.)	
13-7751	CONNECTOR- UG706/U SERIES "C"	1 EA.
03-5374	SILICONE COUPLING GREASE	
17-8811	4-40 X 3/16 FH SCREWS	4 EA.
17-8510	4-40 X 1/4 BH SCREWS	4 EA.
16-8279	O'RING	1 EA.
03-5412	DOUBLE-SIDED TAPE	
5002-259	1.5" TUBE SOCKET BD.	1 EA.
7002-029-04	PLEXIGLASS SPACER	1 EA.
7002-029-05	SPONGE	1 EA.
7002-029-02	CONNECTOR END CAP	1 EA.
7085-064	CONNECTOR WRENCH (FOR "C" CONNECT.)	1 EA.
7002-029-01	PROBE BODY	1 EA.
7002-127	LIGHT PIPE CASE	1 EA.
7002-128	PLEXIGLASS LIGHT PIPE	1 EA.
7002-129	FRONT FACE	1 EA.

1.5" Tube Socket Board, Drawing 2 x 178

• CONNECTORS

P1 RECPT-UG706/U SERIES "C" 13-7751

• CAPACITORS

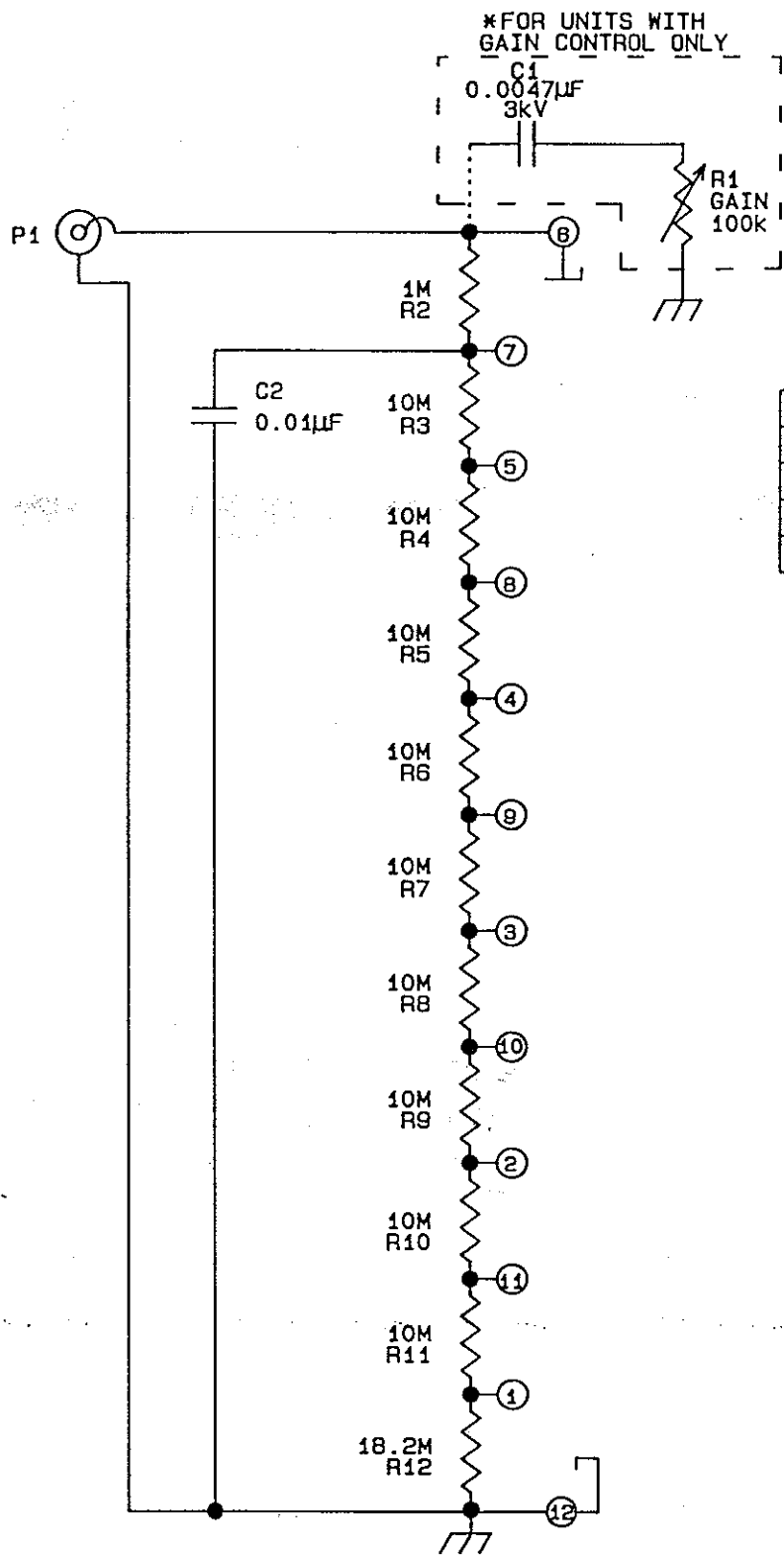
C1 0.0047 μ F, 2kV, C 04-5547
C2 0.01 μ F, 3kV, C 04-5525

• RESISTORS

R1 100k TRIMMER POT 09-6813
R2 1 MEG 10-7097
R3-R11 10 MEG 10-7098
R12 18.2 MEG 10-7033

• MISCELLANEOUS

* TEFLON WIRE (WHITE) 21-9362
* TEFLON WIRE (BLACK) 21-9537



DESC: 1.5" TUBE SOCKET BD.	
MODEL:	
PART #: 5002-259	
DWN: BK	DATE: 8-13-92
DSGN:	DATE:

CHK NO.		CHK	CHK	APP
DATE		DATE		DATE
BK	8-13-92			
TOL: SHOP STD	<input type="checkbox"/>	SCALE: FULL	<input type="checkbox"/>	
OTHER		OTHER		
TITLE 1.5" TUBE SOCKET BD.				
LUCKLIN MEASUREMENTS, INC.		SERIES	SHEET	
301 DAK STREET		2	178	
MCKEEN, TEXAS 78006				

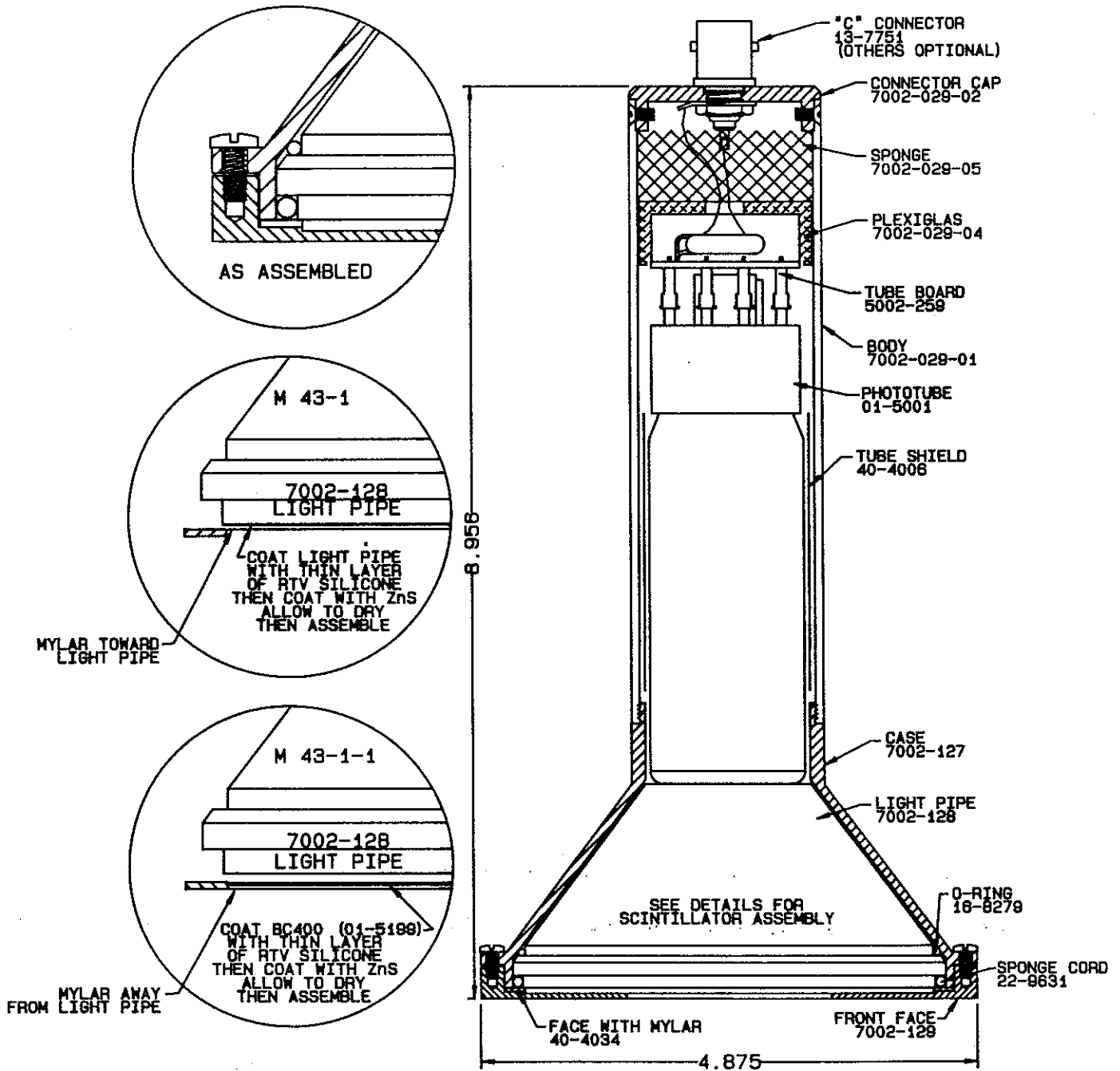
M43-1/43-1-1 Scintillators

DRAWINGS AND DIAGRAMS

Assembly View, Drawing 2 x 172

1.5" Tube Socket Board, Drawing 2 x 178

MODEL 43-1 & MODEL 43-1-1



CHG NO.	JGM 100	DWN	CHK	APP
DWN DATE	10-1-93	CHK DATE	APP DATE	
TOL: SHOP STD <input type="checkbox"/>	OTHER <input type="checkbox"/>	SCALE: FULL <input type="checkbox"/>	OTHER <input type="checkbox"/>	2-3
TITLE M 43-1 & M 43-1-1				
LUDLUM MEASUREMENTS, INC.		SERIES	SHEET	
801 GULF STREET		2	172	
DALLAS, TEXAS 75008				