

**LUDLUM MODEL 3500-1000  
RADIATION GATE MONITOR SYSTEM**

**April 2012**

**Serial No. 150001 and Succeeding  
Serial Numbers**

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RADIATION GATE MONITOR SYSTEM**

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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**

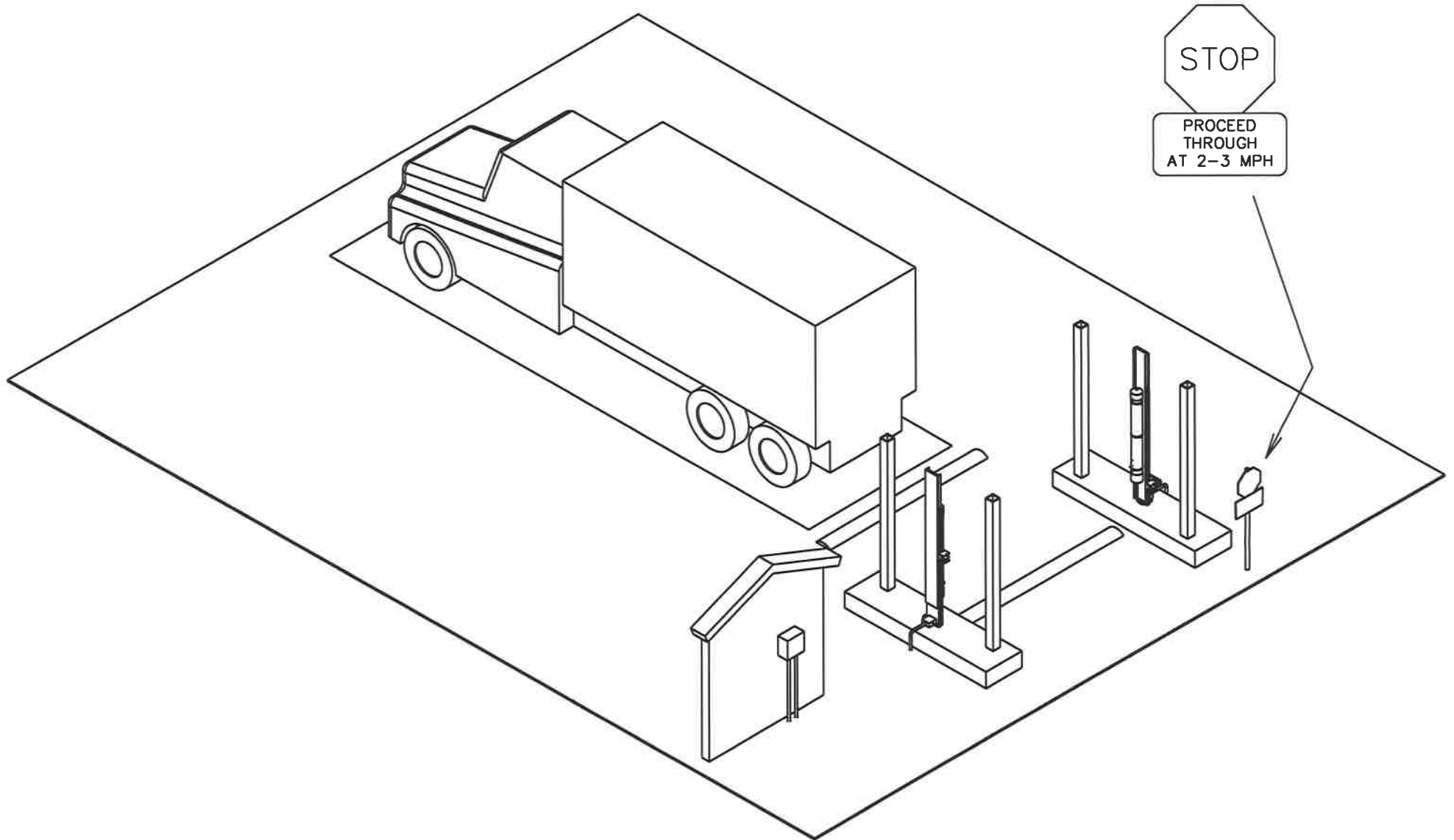
If equipment needs to be returned to Ludlum Measurements, Inc. for repair or calibration, please send to the address below. All shipments should include documentation containing return shipping address, customer name, telephone number, description of service requested, and all other necessary information.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



REV #	ALTERATIONS	DATE	BY
	VALID	7-17-98	JGW



SEE ALSO SHEETS  
384 X 311 A,B,C,D

SHOWN WITH OPTIONAL CURB AND SPEED BUMPS

DWN JGW	DATE 7-17-98	CHECKED JGW	DATE 7-17-98	APPROVED BLH	DATE 9-24-98
TITLE: M 3500-1K ISO VIEW					
LUDLUM MEASUREMENTS, INC. 300 ONE STREET EVANSTON, ILLINOIS 60120		SERIES 384	SHEET 311E		

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## Section

# 1

## Introduction

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The Model 3500-1000 Radiation Monitor System is designed to detect low levels of radiation in loads passing through the system.

Two scintillation detectors, each containing approximately 7865 cm<sup>3</sup> (480 in<sup>3</sup>) of plastic detector media, provide coverage on both sides of a vehicle. The detectors' large size, 122 x 12.7 x 5.1 cm (48 x 5 x 2 in.) (L x W x D), provides a large area for the capture of gamma radiation. The detectors are housed in weather-tight PVC pipes.

The microprocessor-based electronics is constructed in a steel box. This unit provides automatic background compensation and automatic alarm point setting above the current background reading. Each detector has its own high-voltage power supply to minimize the risk of total system failure. The monitor is very easy to use and requires only minimal operator interaction. Upon power-up, the monitor requires approximately 15 seconds to measure background readings. It is then ready for operation.

Diagnostic routines provide assurance that the system is operating correctly, and indicators warn of possible detector failure. Meter override buttons check the count from each detector. Alarm settings are internal, allowing for tamper-resistant operation of the system. A digital RS-232 output is provided for connection of a computer or printer. An alarm relay output is also provided to drive additional beacons or sirens in an alarm condition. An infrared sensor is placed with the detectors. The sensor is used to signal the microprocessor to switch from updating background to monitoring for an increase in radiation level.



### Unpacking and Repacking

Remove calibration certificate and place in secure location. Remove instrument and accessories (batteries, cable, etc.) and ensure that all of the items listed on the packing list are in the carton. If more than one instrument is in the carton, refer to the calibration certificate(s) for serial number match. The Model 3500-1000 S/N is located on the front panel near the lower left-hand corner.

To return an instrument for repair or calibration, provide sufficient packing material to prevent damage during shipment. Provide appropriate warning labels to ensure careful handling. Include detector(s) and related cable(s) for calibration. Include brief information as to the reason for return and return shipping instructions (address, P.O.#, etc.).

- Return shipping address
- Customer name or contact
- Telephone number
- Description of service requested and all other necessary information



## Section

# 2

## Specifications

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### Electronics

Indicated Use: low-level radiation monitoring

System Operation: The system will continuously monitor background levels until the infrared sensor identifies an object. It will then automatically switch to checking the object for radiation.

Detectors: two each 7865 cm<sup>3</sup> (480 in<sup>3</sup>) plastic detectors in weather-tight PVC enclosures

Audio: unimorph type speaker with volume control (greater than 80 dB at 61 cm {2 ft})

Meter: 15.2 cm (6 in.) arc 1 mA analog type

Meter Dial: 0-25 kcps

Power OK: (green LED) indicates that the power is connected to the system

System OK: (green LED) indicates that system is functioning properly

Checking: (green LED) indicates vehicle is passing through system

Channel 1: pushbutton to check current radiation level of Channel 1

Channel 2: pushbutton to check current radiation level of Channel 2

Alarm: indicated by red LEDs and audible tone (can be set internally from 1 to 8.5 deviations above background in half-step increments)

Fail: (yellow LEDs) indicates when signal not received from the detectors and/or high background

RS-232: 9-pin connector to allow for connection of computer or printer

Controls: 5-pin connector allowing for connection of infrared sensor(s)

## Model 3500-1000 Radiation Gate Monitor System

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Relays: 3-pin connector allowing for connection of external alarm indicators

Setup Controls: (internal)

Detector Number(DET): a two-position dipswitch to select between using one detector or two detectors

PC/Printer: a two-position dipswitch that is used to select a printer output or PC output for the RS-232 port

Alarm Level: a 16-position rotating switch, labeled from 0 to 9 and A to F. Zero indicates a 1 sigma alarm level, 1 = 1.5 sigma, 2 = 2 sigma, etc. A “normal” setting when infrared truck sensors are used is 5 sigma. Without truck sensors the alarm typically needs to be set at E = 8 sigma.

Power: 95-135 Vac (178-240 Vac available on request), 50-60 Hz single phase (less than 100 mA)

Construction: steel NEMA 12 enclosure

Temperature Range: -29 to 60 °C (-20 to 140 °F); may be certified to operate from -40 to 65 °C (-40 to 150 °F)

Size: 31.2 x 38.1 x 17.3 cm (12.3 x 15 x 6.8 in.) (H x W x D)

Weight: 8.2 kg (18 lb)

### Detectors

Scintillator: 7865 cm<sup>3</sup> (480 in<sup>3</sup>) plastic detector media (each)

Tube: 2.9 cm (1.13 in.) diameter magnetically shielded photomultiplier

Housing: 15.2 cm (6 in.) diameter PVC

Size: approximately 17.8 (7 in.) diameter x 163 cm (64 in.) long

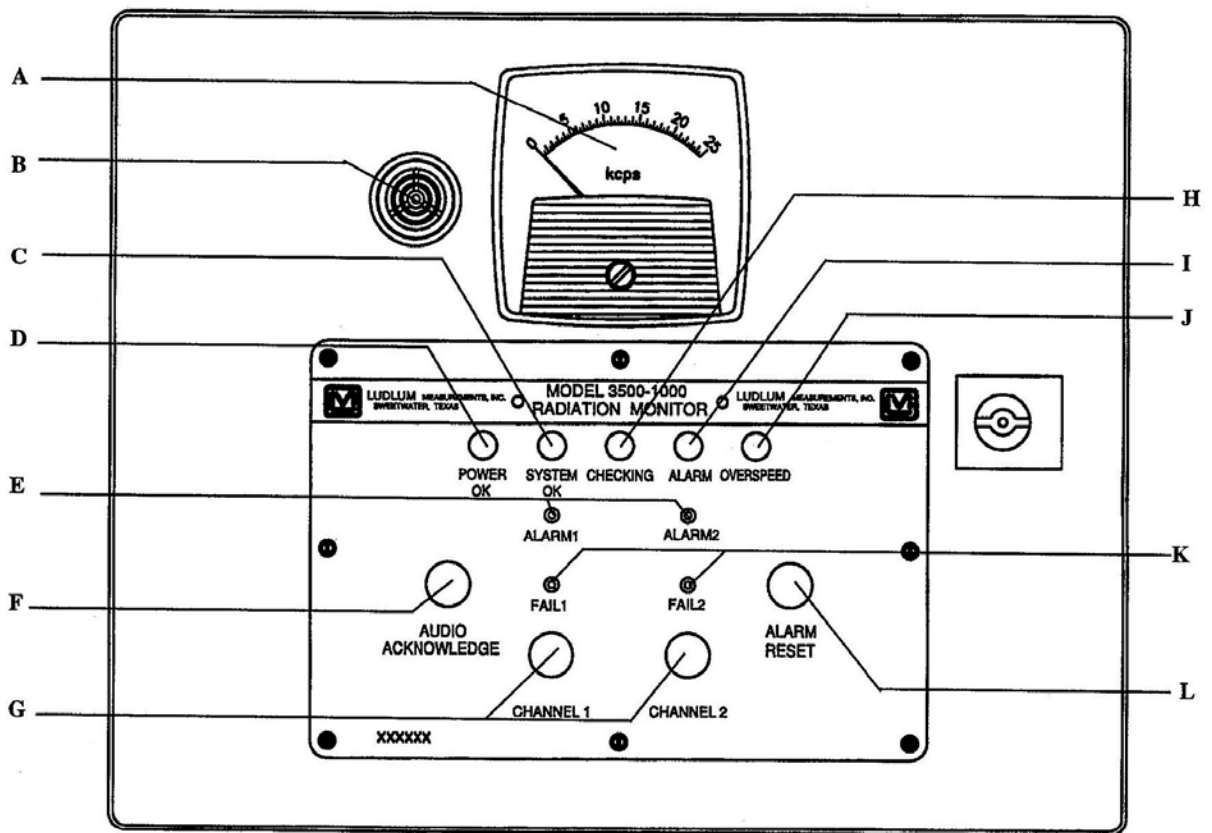
Weight: 31.8 g (70 lb) each

Section

3

Description of Controls and Functions

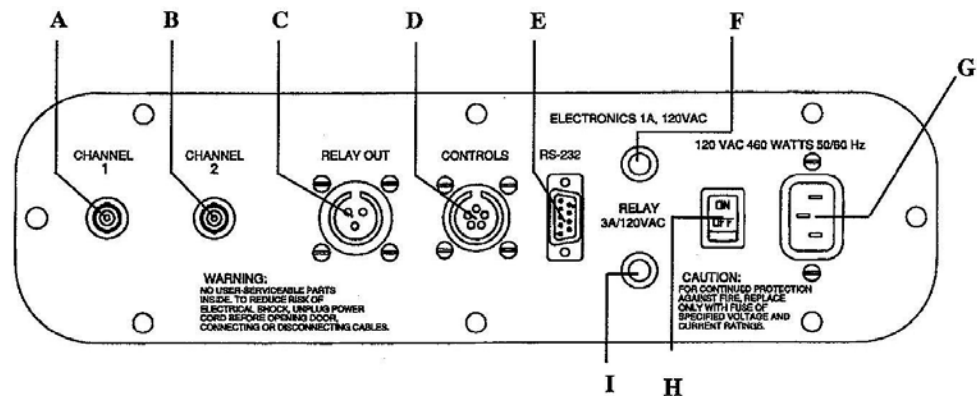
Front Panel



- A. **Meter:** Provides a visual reading of the radiation level being monitored with a range from 0 to 25 kcps.
- B. **Audio Unimorph:** Provides an audible tone in the event of an alarm (greater than 80 dB at 0.61 m {2 ft}).
- C. **System OK LED:** A green LED that lets the user know that the system is operating properly.

## Model 3500-1000 Radiation Gate Monitor System

- D. Power OK LED:** A green LED that indicates that the instrument is connected to a power source and is turned on.
- E. Channel Alarm Indicators:** A set of red LEDs labeled ALARM1 and ALARM2 to let the user know which detector caused an alarm.
- F. Audio Acknowledge:** A pushbutton to silence the audio after an alarm has been indicated.
- G. Meter Override Buttons:** Two pushbuttons labeled CHANNEL 1 and CHANNEL 2 that allow the operator to view the reading coming from each channel on the meter.
- H. Checking:** A green LED that lets the user know when a vehicle or other object is being monitored.
- I. Alarm:** A red LED that lets the user know when an alarm has been indicated.
- J. Overspeed (optional):** A red LED that lets the user know when a vehicle has passed through the system at a speed greater than 16 kph (10 mph).
- K. Failure Indicators:** Two yellow LEDs labeled FAIL1 and FAIL2 that let the user know if the system has had a detector failure.
- L. Alarm Reset:** A pushbutton that is used to reset both the audible and visual alarm indicators after an alarm has been indicated.



### Connector Plate

- A. Channel 1:** A BNC connector to allow for connection of one detector to the electronics.
- B. Channel 2:** A BNC connector to allow for connection of a second detector to the electronics.

## Model 3500-1000 Radiation Gate Monitor System

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- C. Relay Out: A three-pin connector that allows for connection of an optional alarm strobe or horn.
- D. Controls: A five-pin connector that allows the vehicle sensor to be connected to the electronics.
- E. RS-232: A nine-pin connector to allow for connection of a printer or computer to the system.
- F. Electronics 1A: A 1 amp fuse to protect the electronics from a power surge or internal component failure.
- G. 120 VAC: A three-pin connector for the instrument power cord.
- H. On/Off: A two-position rocker switch to turn the power on or off.
- I. Relay 3A: A three-amp fuse to protect the optional strobe or horn in the event of a power surge or internal component failure.

Section

4

## Safety Considerations

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### Environmental Conditions for Normal Use

No maximum altitude

Temperature range of -29 to 60 °C (-20 to 140 °F); may be certified to operate from -40 to 65 °C (-40 to 150 °F)

Maximum relative humidity of less than 95% (non-condensing)

Mains supply voltage range 95-135 Vac

Maximum transient voltage of 1500 Vac

Installation Category (Overvoltage Category) II (as defined by IEC 1010-1)

Pollution Degree 4 (as defined by IEC 644)

### Cleaning Instructions and Precautions

The Model 3500-1000 may be cleaned externally with a damp cloth, using only water as the wetting agent. Do not immerse the instrument in any liquid. Observe the following precautions when cleaning:

1. Turn the instrument OFF and disconnect the instrument power cord.
2. Allow the instrument to sit for one minute before cleaning.

### Warning Markings and Symbols

**Caution!**

The operator or responsible body is cautioned that the protection provided by the equipment may be impaired if the equipment is used in a manner not specified by Ludlum Measurements, Inc.

## Model 3500-1000 Radiation Gate Monitor System

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### Warning!

The operator is strongly cautioned to take the following precautions:

1. No user-reserviceable parts inside.
2. To reduce electrical shock, unplug power cord before opening door, connecting or disconnecting cables.

## Replacement of Fuses

### Warning!

For continued protection against risk of fire, replace only with fuses of the specified type and current rating!

## Section

# 5

## How it Works

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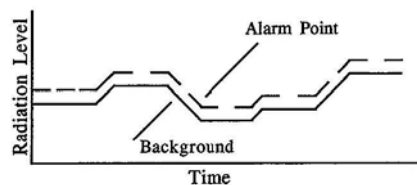
The Model 3500-1000 Radiation Monitor is a two-channel dynamic monitoring system. It is designed primarily to be used at a facility's weigh scale or entry point; however, it can also be used in other areas as well.

The purpose of the system is to help in the detection of any sources of radiation in a load of material. It is strongly recommended that this be used as a first line of defense. This should be backed up by monitoring the material in the yard with a handheld unit periodically throughout the processing of the material to ensure optimum coverage of the material.

When the system is turned on, it will perform a self-diagnostic routine and take background samples. Once the background is established, the alarm point will be automatically set at a certain point above the background reading.

**Note:** This alarm point is set at six deviations above background when shipped. It can be changed if desired by the operator.

The system will continue to monitor the background reading while there are no vehicles passing through the system. As the readings change, the alarm point will change in order to stay at the same level above background.



When a vehicle passes through the system, the infrared sensor triggers the system to stop monitoring background and begin monitoring the vehicle for any radiation sources that may be in the load. Once the vehicle has passed completely through the system, the processor will analyze the data to determine if there is a source of radiation in the load.

If the system detects excessive radiation, the alarm circuit will be activated to warn the user. Otherwise, the system will resume background monitoring and is ready for the next vehicle.



## Model 3500-1000 Radiation Gate Monitor System

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In the event of an alarm, the user simply has to press the alarm reset button, and the instrument will then resume monitoring background. If the user wants to maintain the alarm condition until a supervisor or other person is aware of it, the user can press the AUDIO ACKNOWLEDGE button to silence the audio while still having the alarm identified by the lights.

Other options include a printer to obtain a hard copy of the data on the vehicle that caused the alarm or a computer interface to have all the data dumped to a file for use at a later time. This latter option also provides the user with a visual presentation of the approximate location of the source in the load on a depiction of the vehicle.

### Section

# 6

## Operating Procedures

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### Initial Instrument Check

Once the Model 3500-1000 Gate Monitor has been properly installed, it should be ready for normal operation. The following procedures will take you through the initial checkout of the instrument and its operation.

#### Note:

Installation instructions, with drawings and diagrams, can be found in a separate manual, Model 3500-1000 Installation Manual.

1. Ensure that detectors, vehicle sensors, and any optional accessories are properly connected to the main electronics (i.e. printer, computer, strobes, horns, etc.).
2. Confirm that the main electronics is connected to 110 Vac (220 Vac if applicable).

**Note:** When this is done, the meter should momentarily deflect to full scale, and all of the lights on the electronics will light up for approximately one second. The meter will then begin indicating a reading from the detectors. The lights should all go off with the exception of the POWER OK light, which will stay on; and the SYSTEM OK light, which will flash for approximately 15 seconds while the instrument obtains a background reading and completes a diagnostic check of all parameters. The SYSTEM OK light will then come on and stay on.

### Vehicle Sensor and Alarm Check

For the next part of the checkout, it is necessary to use the check source that is provided with the instrument to check the alarm function for proper operation.

1. You should get the source and place it so that it is located on the Ludlum Measurements, Inc. sticker on the detector while placing the other hand in front of the infrared sensor. Hold it there for approximately five seconds, then remove the source from the detector and your hand from in front of the sensor.

## Model 3500-1000 Radiation Gate Monitor System

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**Note:** The alarm circuit should activate, causing the audio to come on and the alarm lamp to light up. The ALARM1 or ALARM2 lamp should also illuminate, depending on which detector is being tested. Any remote alarm indicators should also be activated (i.e. strobe or horn if applicable).

2. Press the AUDIO ACKNOWLEDGE button. The audio on the electronics should quit, but the alarm lights and remote indicators will still be activated.
3. Press the ALARM RESET button. All alarm indicators should go off, including any remote strobe or horn that is connected (if applicable).

Repeat this procedure for the other detector. Once completed successfully, the system is ready for normal operation.

**Note:**

This procedure should be done periodically. It is suggested that it be done on a weekly basis. As long as the instrument passes the alarm check, there is no need for a complete recalibration.

4. The alarm point is user adjustable by way of the 16-position rotary switch located on the main board. This switch is located mid-point along the bottom edge of the main board and is marked "ALARM." The factory setting is six deviations above background, which is position A on the switch.

<u>Switch Position</u>	<u>Number of Deviations</u>
0	1
1	1.5
2	2
3	2.5
4	3
5	3.5
6	4
7	4.5
8	5
9	5.5
A	6
B	6.5

## Model 3500-1000 Radiation Gate Monitor System

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C	7
D	7.5
E	8
F	8.5

### Instrument Operation

During normal operation, there is very little operator intervention required. After the procedures in 7.1 and 7.2 have been completed, the system is ready to monitor vehicles. In the event of an alarm, the system is easily reset by pressing the ALARM RESET button on the front panel. Once this is done, the instrument is again ready to monitor vehicles.

## Section

# 7

## Troubleshooting

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This section is intended to assist the user of the Model 3500-1000 Gate Monitor system in isolating and identifying problems with the system if and when they occur. Ludlum Measurements, Inc., (LMI) provides technical support for our customers who wish to repair their instruments. If you have any questions regarding instrument repairs, please contact our repair/calibration department at 800-622-0828 (USA) or 325-235-5494.

<b>SYMPTOM</b>	<b>PROBABLE CAUSE</b>	<b>POTENTIAL SOLUTION</b>
Detector fail light comes on.	The system electronics is either receiving an excessively high number of counts or not counts from the detector.	Check the detector and cabling to ensure proper connection.  Check the detector HV setting for proper adjustment.
Instrument alarms when no vehicle is present.	The infrared sensors are not properly aligned.  The infrared sensors are not working at all.	Check the alignment of the sensors using the guides on the mounting brackets. Check for proper connection of the sensors to the electronics.
Meter reads full scale and SYSTEM OK light blinks.	The system electronics is still in calibration mode.	Remove the two-pin connector at P6 to restore the system to operating mode.
One detector continually alarms.	The electronics are not working properly.  The cable has failed and is causing excessive noise.	Switch detector connections at the electronics and see if the problem follows the detector or stays on the same channel. If the problem follows the detector, then the problem is not in the electronics.  Swap a “good” detector for a “bad” one. If the problem persists, the cable should be replaced.

## Model 3500-1000 Radiation Gate Monitor System

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	The detector is not working properly.	The detector must be repaired.
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If the above recommendations do not correct the problem, the problem is most likely more serious in nature and will probably need to be investigated by an electronics technician.

### Section

# 8

## Recycling

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Ludlum Measurements, Inc. supports the recycling of the electronics products it produces for the purpose of protecting the environment and to comply with all regional, national, and international agencies that promote economically and environmentally sustainable recycling systems. To this end, Ludlum Measurements, Inc. strives to supply the consumer of its goods with information regarding reuse and recycling of the many different types of materials used in its products. With many different agencies – public and private – involved in this pursuit, it becomes evident that a myriad of methods can be used in the process of recycling. Therefore, Ludlum Measurements, Inc. does not suggest one particular method over another, but simply desires to inform its consumers of the range of recyclable materials present in its products, so that the user will have flexibility in following all local and federal laws.

The following types of recyclable materials are present in Ludlum Measurements, Inc. electronics products, and should be recycled separately. The list is not all-inclusive. Nor does it suggest that all materials are present in each piece of equipment:

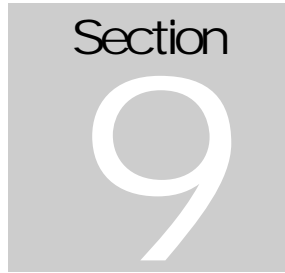
- Batteries
- Glass
- Aluminum and Stainless Steel
- Circuit Boards
- Plastics
- Liquid Crystal Display (LCD)

Ludlum Measurements, Inc. products, which have been placed on the market after August 13, 2005, have been labeled with a symbol recognized internationally as the “crossed-out wheelie bin.” This notifies the consumer that the product is not to be mixed with unsorted municipal waste when discarding; each material must be separated. The symbol will be placed near the AC receptacle, except for portable equipment where it will be placed on the battery lid.



# Model 3500-1000 Radiation Gate Monitor System

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## Parts List

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	<u>Reference</u>	<u>Description</u>	<u>Part Number</u>
Model 3500-1000 Gate Monitor System	UNIT	Completely Assembled Model 3500-1000 Gate Monitor System	48-3046
Main Board, Drawing 384 x 884	BOARD	Assembled Main Board	5384-884
Assembled LED Board, Drawing 384 x 136	BOARD	Assembled LED Board	5384-187
Model 3500-1000 Unistrut Brackets, Drawing 384 x 307		Assembled Unistrut Brackets	4384-307
Connector Plate, Drawing 384 x 324		Assembled Plate	4384-263
Detector Interface Board, Drawing 344 x 139	BOARD	Assembled Detector Interface	5344-135
Voltage Divider Board, Drawing 2 x 191	BOARD	Assembled Voltage Divider	5002-241
Detectors and Infrared Sensors	2 ea.	Model 44-128 Detector	47-2957
	1 ea.	Model 3500 IR and Unistrut	4384-307
	1 ea.	10 kohm 1/4W 5% Res	10-7016
	8 ea.	8-32 x 3/8 BH Screws	17-8525
	4 ea.	8-32 x 1 BH Screws	17-8558
	4 ea.	8/32 Reg Patt Nut .343	20-9006
	12 ea.	#8 IITL Washers	20-9010



## Model 3500-1000 Radiation Gate Monitor System

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<u>Reference</u>	<u>Description</u>	<u>Part Number</u>
6 ea.	71B Ideal 30-071 Wire Nuts	20-9142
1 ea.	Infrared Sensor	2310498
1 ea.	Infrared Cable	8303-398

Section

10

Drawings and Diagrams

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Main Board, Drawing 384 x 884 (3 sheets)

Main Board Component Layout, Drawing 384 x 885

LED Board, Drawing 384 x 136 (2 sheets)

Unistrut Brackets, Drawing 384 x 307

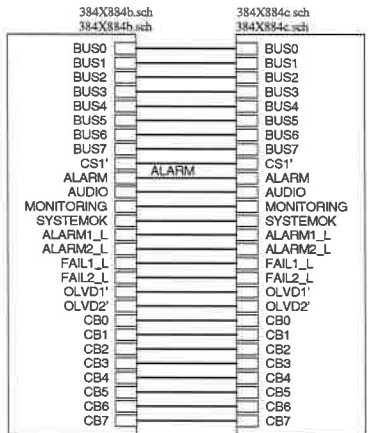
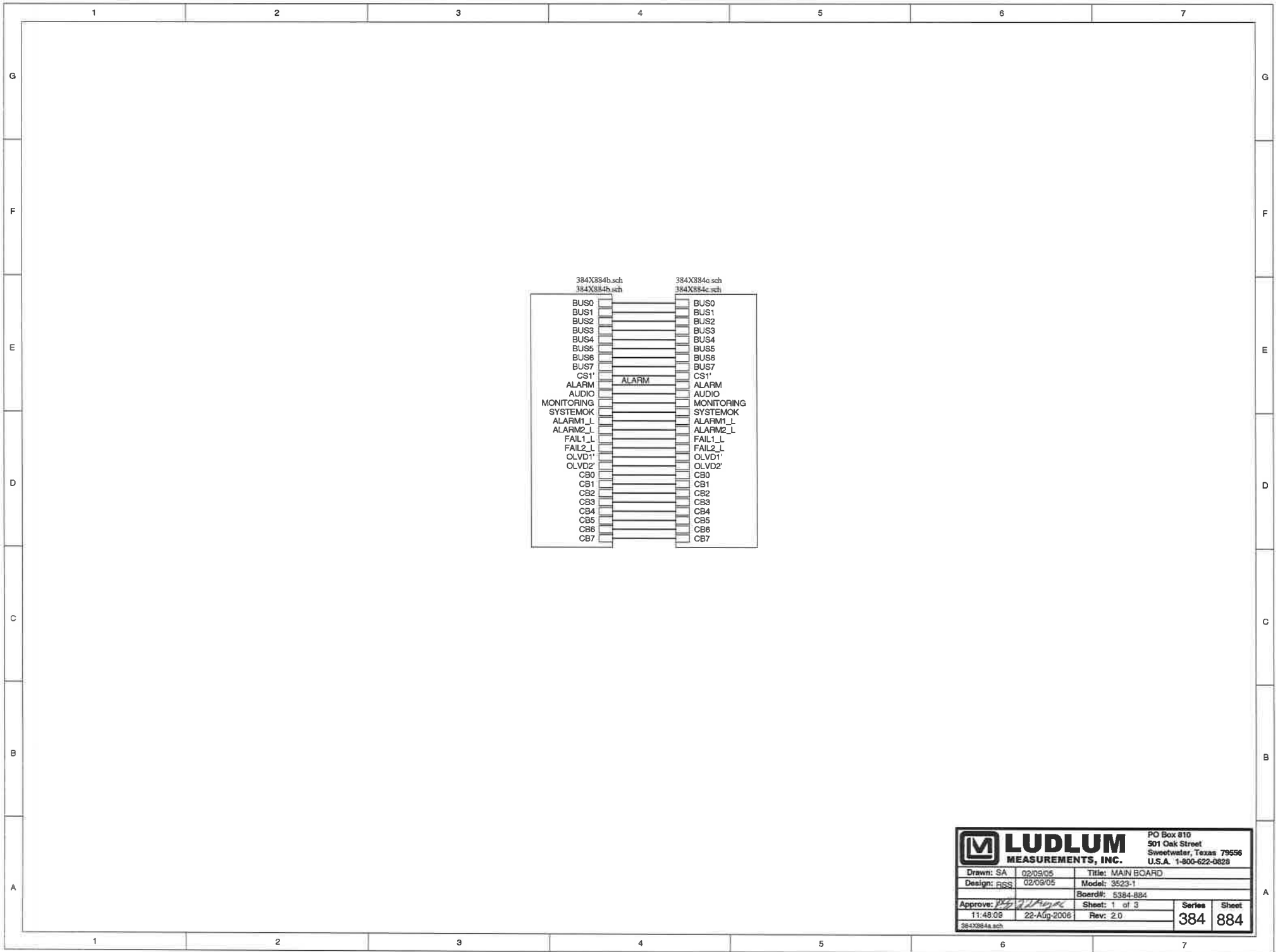
Model 3500-1000 Connector Plate, Drawing 384 x 324

Detector Interface Board, Drawing 344 x 139

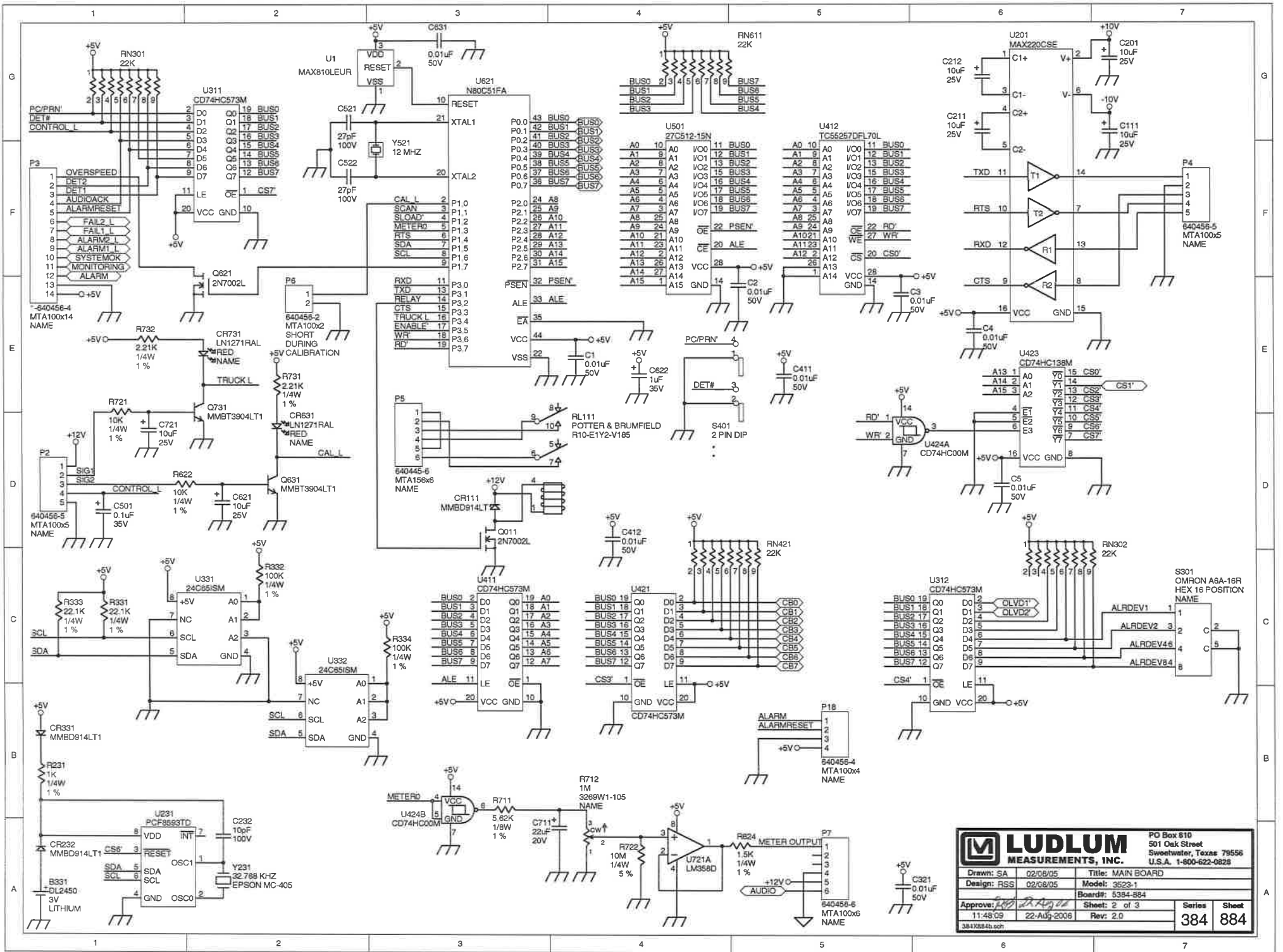
Detector Interface Board Component Layout, Drawing 344 x 140

Wiring Diagram, Drawing 384 x 486

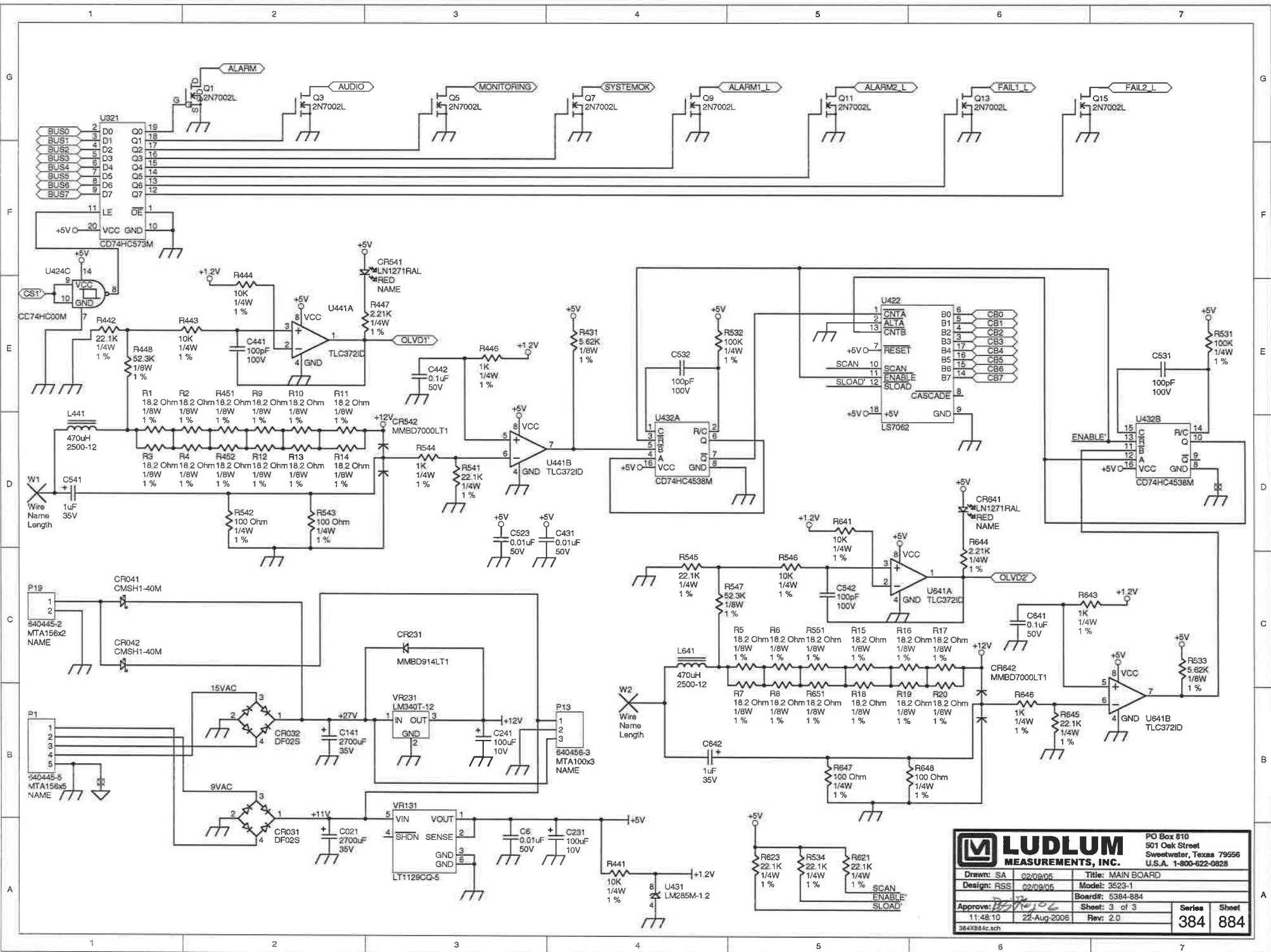
Voltage Divider Board, Drawing 2 x 191



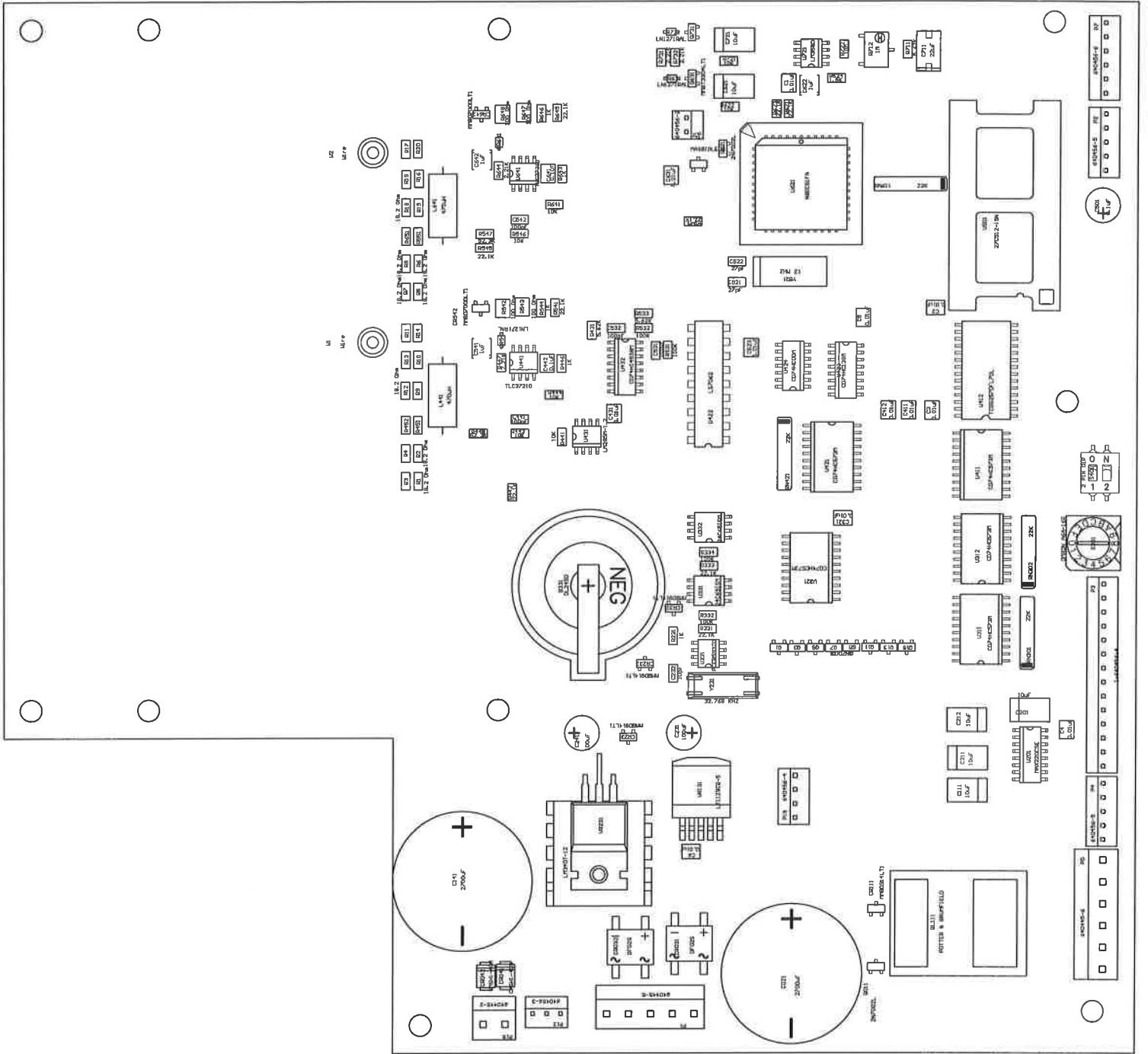
		PO Box 810 501 Oak Street Sweetwater, Texas 79556 U.S.A. 1-800-622-0828	
Drawn: SA	02/09/05	Title: MAIN BOARD	
Design: RSS	02/09/05	Model: 3523-1	
		Board#: 5394-884	
Approve: <i>[Signature]</i>		Sheet: 1 of 3	
11:48:09	22-Aug-2006	Rev: 2.0	
384X884a.sch		384	884



<b>LUDLUM</b>		PO Box 810	
MEASUREMENTS, INC.		501 Oak Street	
		Sweetwater, Texas 79556	
		U.S.A. 1-800-622-0828	
Drawn: SA	02/08/05	Title: MAIN BOARD	
Design: RSS	02/08/05	Model: 3523-1	
Approve: <i>[Signature]</i>		Board#: 5384-884	
11:48:09	22-AUG-2008	Sheet: 2 of 3	Series
		Rev: 2.0	Sheet
			<b>384 884</b>

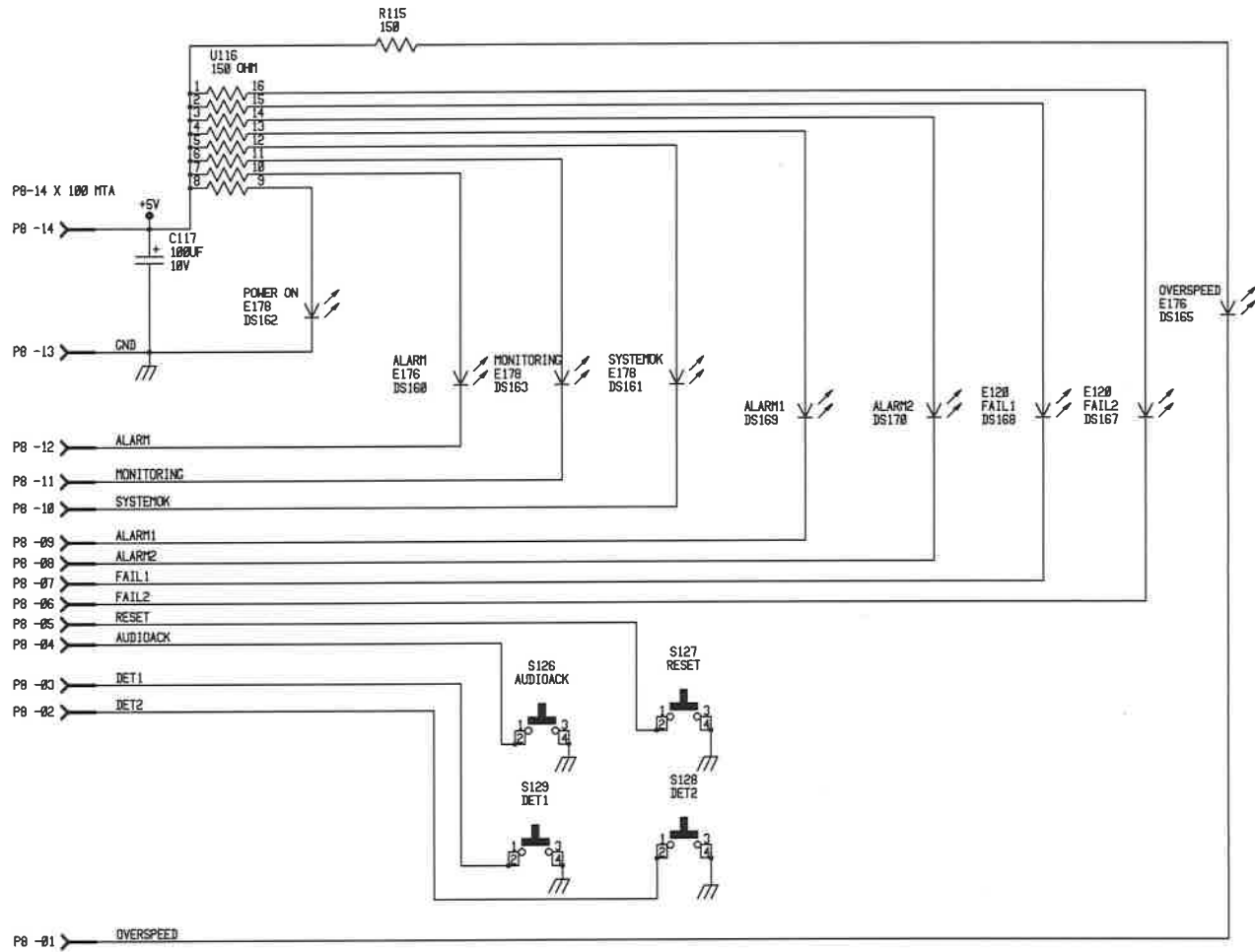


		PO Box 810 501 Oak Street Sweetwater, Texas 79556 U.S.A. 1-800-622-0828	
		Drawn: SA 02/09/05 Design: RSS 02/09/05 Approve: <i>[Signature]</i> 11-48-10	Title: MAIN BOARD Model: 3523-1 Board#: 5384-884 Sheet: 3 of 3 Rev: 2.0

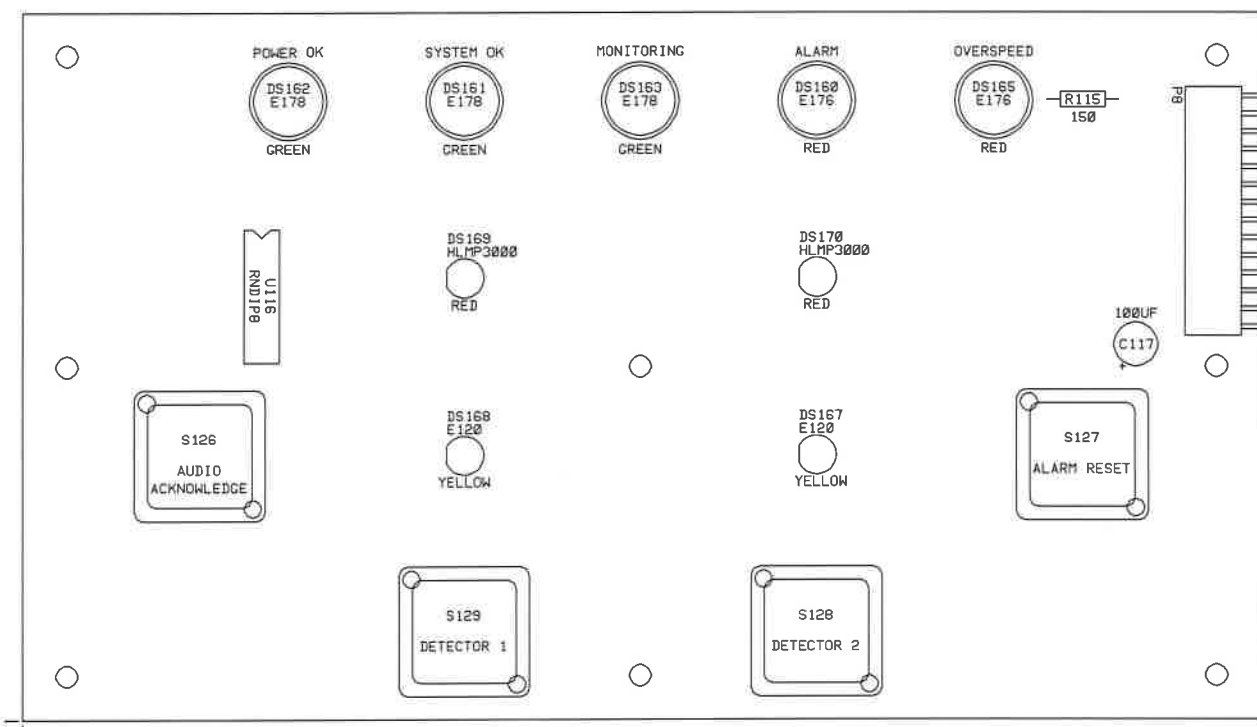


Drawn:	SA	03/25/05	Title:	
Design:	RSS	03/25/05	MAIN BOARD	
Approve:	<i>BS</i>	<i>22 Aug 06</i>	Model: 3523-1	
Layer:			Board#: 5384-884	
Mech.1	MD:		Rev: 2.0	Series
	11:47:41	22-Aug-2006	SCALE: 0.94	Sheet
BS384884.PCB			384	885

				REVISIONS		
EFF	AUTHORITY	ZONE	LTR	DESCRIPTION	DATE	APPROVED



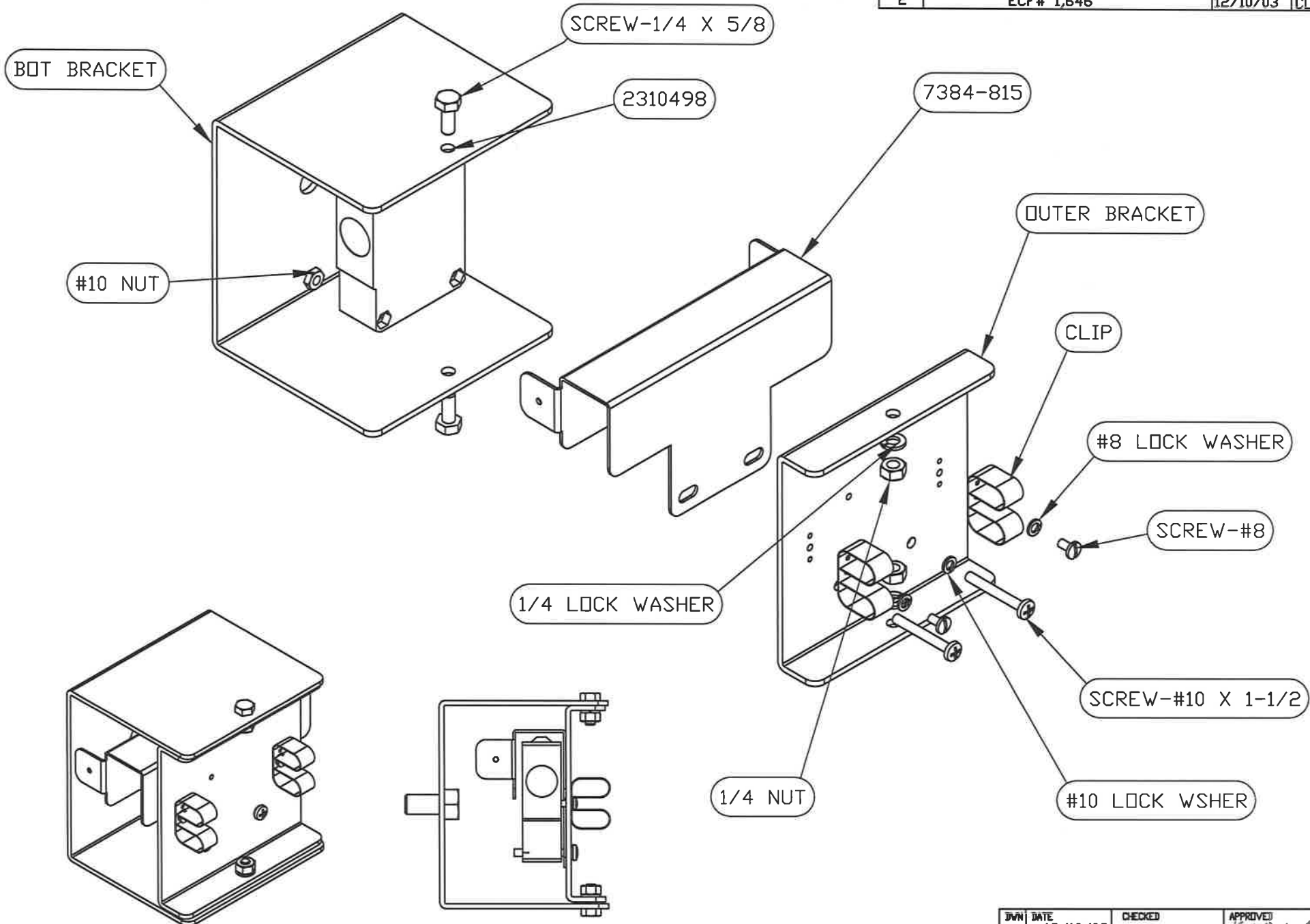
UPDATED	-	LUDLUM MEASUREMENTS INC.			
DR RSS	07-24-95	TITLE: LED BOARD			
CHK <i>P. W.</i>	<i>6-15-98</i>	BOARD# 5384-107			
DSGN RSS	07-24-95	SIZE	MODEL	SERIES	SHEET
APPD <i>RDS</i>	<i>17 JUN 98</i>	C	3523	384	135
NEXT HIGHER ASSY.					
08:56:42	17-Jun-98	SB384107		SHEET	OF



<input checked="" type="checkbox"/> LUDLUM MEASUREMENTS INC. SHEETWATER, TX.			
DR	RSS	07-24-95	TITLE: LED BOARD
CHK	P.W.	6-17-98	BOARD# 5384-187 BS384187
DSGN	RSS	07-24-95	MODEL 3523 SERIES 384 SHEET 136
APP	RSS	6-17-98	COMP ARTWORK <input type="checkbox"/> SLDR ARTWORK <input type="checkbox"/>
08:35:57		6-Jun-98	COMP OUTLINE <input type="checkbox"/> SLDR OUTLINE <input type="checkbox"/>
COMP PASTE	COMP MASK	SLDR PASTE	SLDR MASK

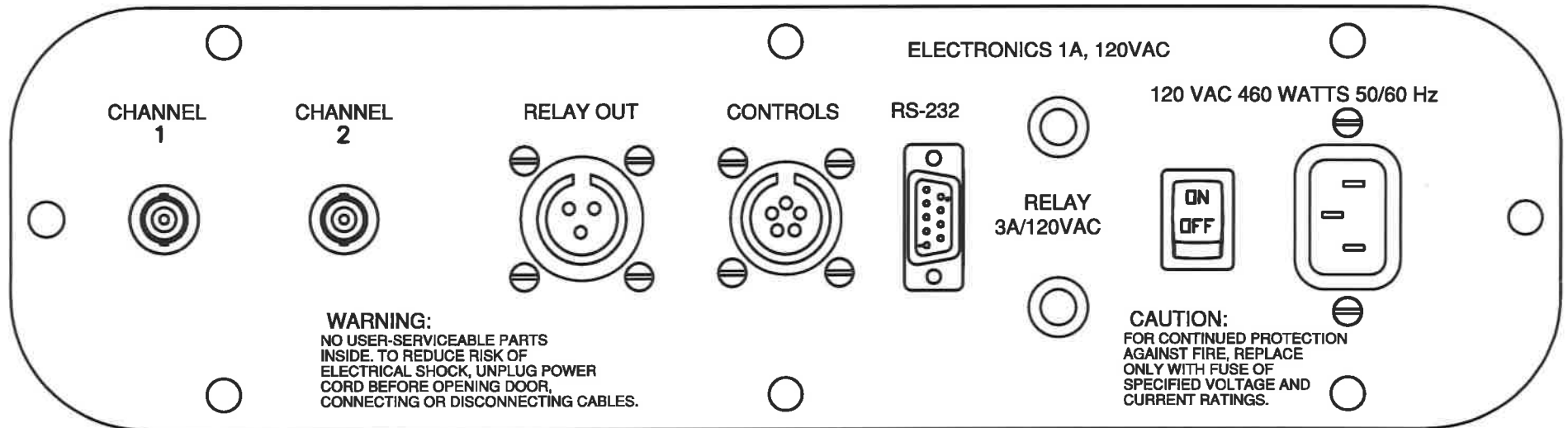


REV #	ALTERATIONS	DATE	BY
	VALID	6-18-98	JGW
2	ECF# 1,646	12/10/03	CLW

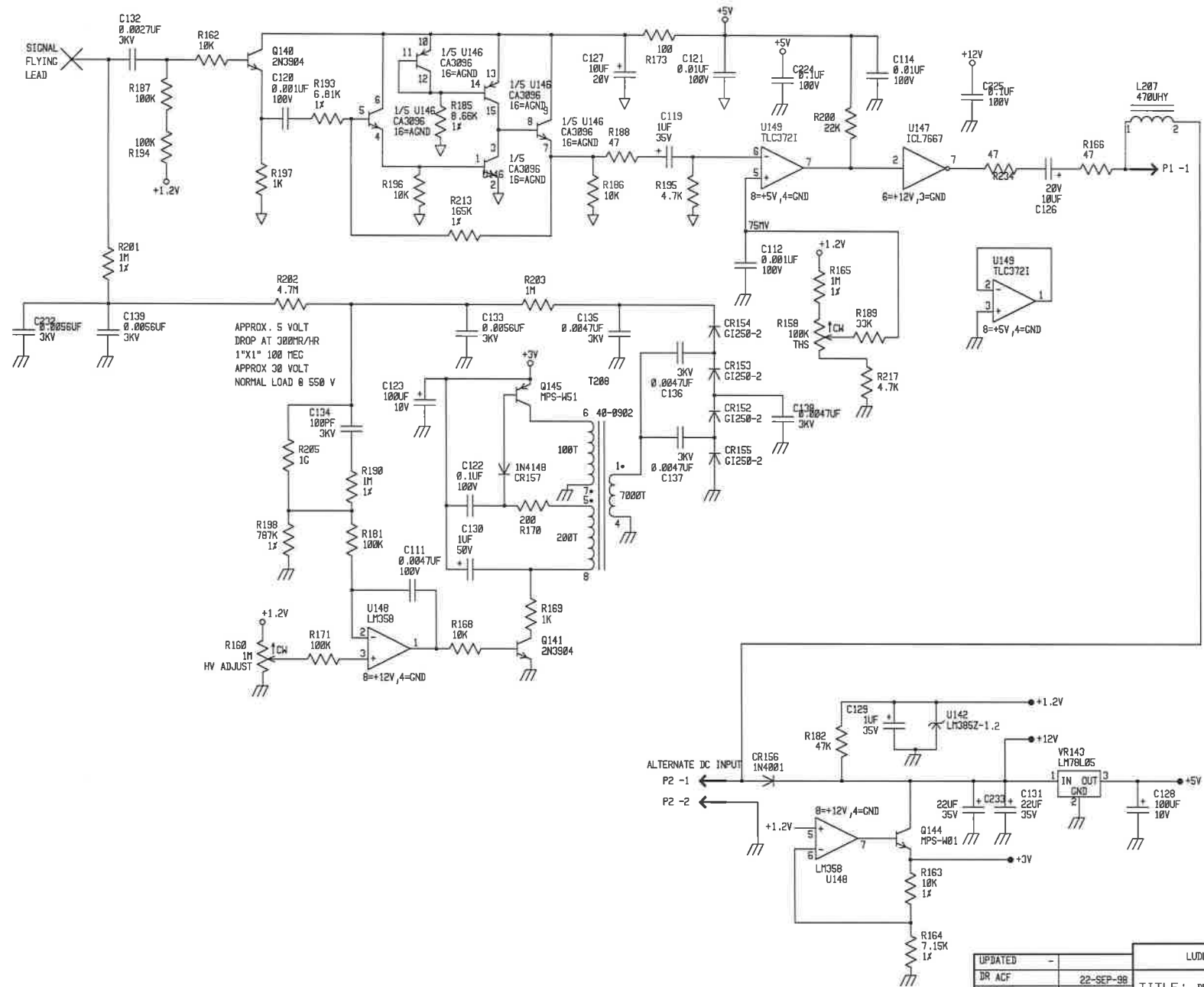


JWN	DATE	CHECKED	APPROVED
CLW	12/10/03		JGW 12-10-03
TITLE: M 3500-3K IR UNISTRUT BRKTS			
<b>LUDLUM MEASUREMENTS, INC.</b> <small>501 DAK STREET SHEETPORTER, TEXAS 79086</small>		SERIES	SHEET
		384	307

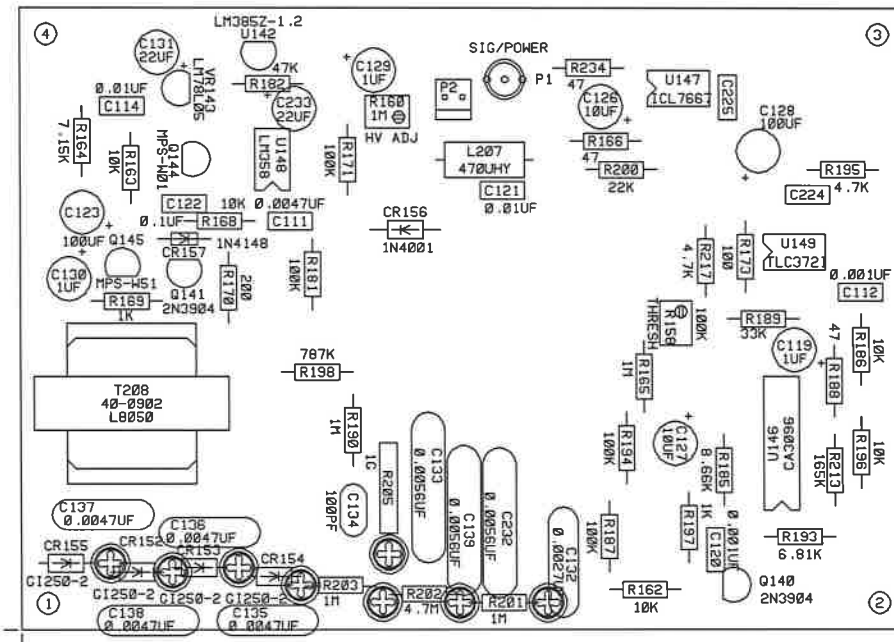
REV #	ALTERATIONS	DATE	BY
	VALID	06-30-98	TJR



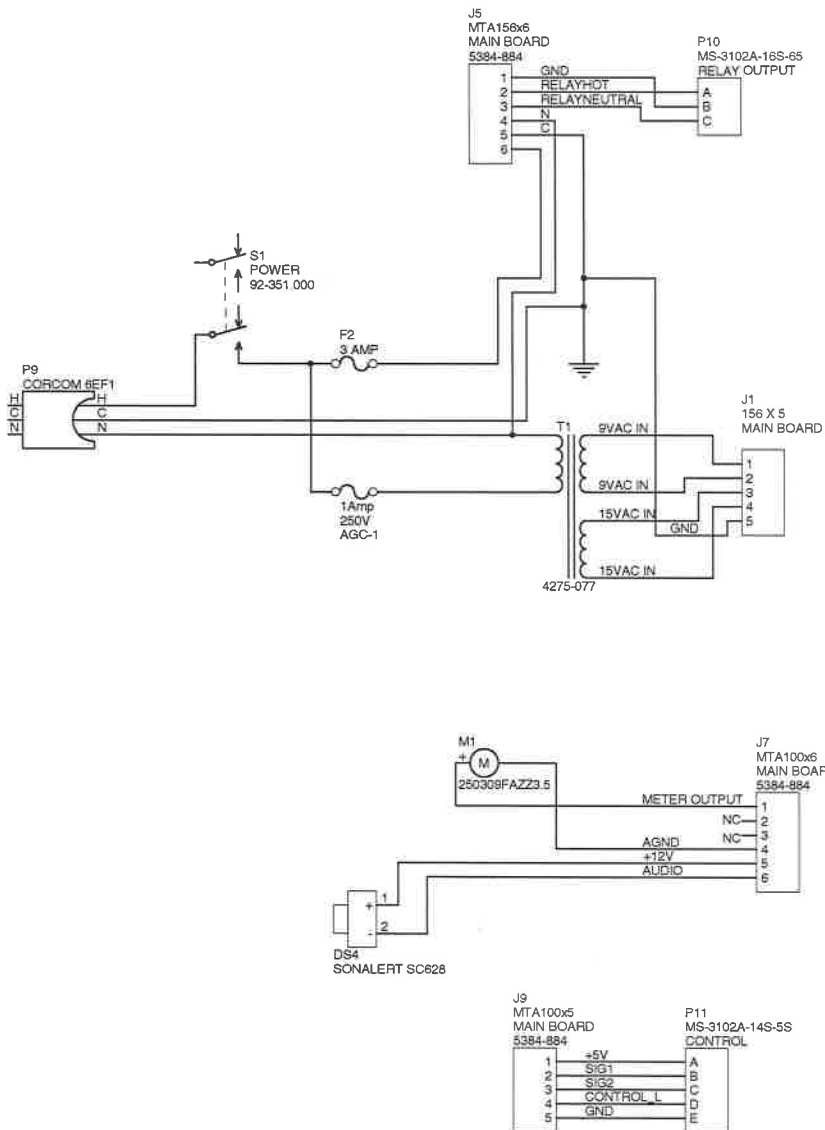
DWN DATE TJR 06-30-98	CHECKED J6W 6-30-98	APPROVED J6W 6-30-98
TITLE: M 3500-1000 CON. PLATE		
LUDLUM INDUSTRIES, INC. 201 800 STREET BAYVIEW, TEXAS 75007	SERIES 384	SHEET 324



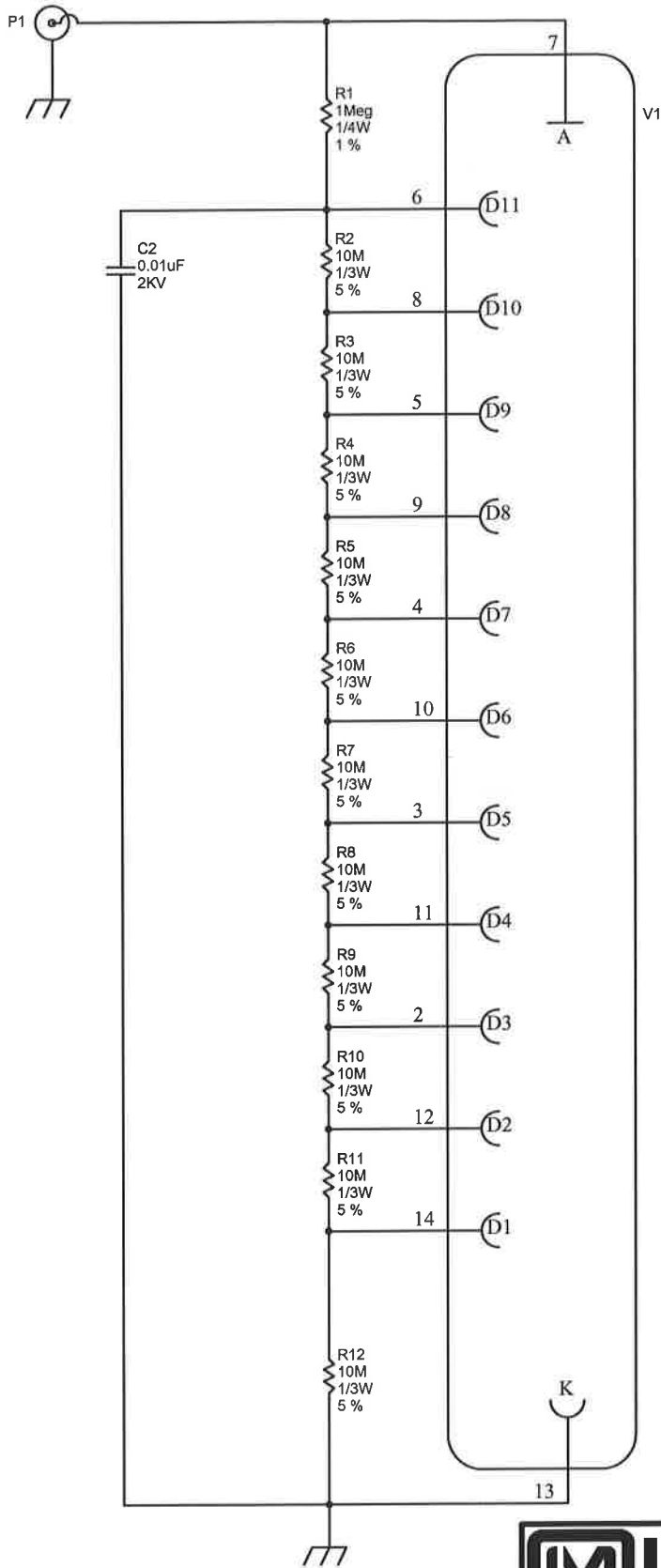
UPDATED	-	LUDLUM MEASUREMENTS INC.		
DR ACF	22-SEP-88	TITLE: DETECTOR INTERFACE BOARD		
CHK		BOARD# 5344-135		
DSON RSS	14-SEP-88	SIZE	MODEL	SERIES
APPD		C	440-7	344
NEXT HIGHER ASSY.		SIZE	MODEL	SHEET
				139
15-27-85	22-Jan-95	58344135		SHEET 1 OF 1



<input checked="" type="checkbox"/> LUDLUM MEASUREMENTS INC., SWEETWATER, TX.			
DR	ACF	22-SEP-98	TITLE: DETECTOR INTERFACE
CHK		//	BOARD# 5344-135 BS344135
DSGN	RSS	14-SEP-98	MODEL 440-7 SERIES 344 SHEET 140
APP	<i>[Signature]</i>	COMP ARTWOK	<input type="checkbox"/> SLDR ARTWOK <input type="checkbox"/>
14:31:51	7-Mar-02	COMP OUTLINE	<input checked="" 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"/>



		PO Box 810 501 Oak Street Sweetwater, Texas 79556 U.S.A. 1-800-622-0828	
Drawn: SA	08/27/06	Title: WIRING DIAGRAM	
Design: RSS	08/27/06	Model: 3500-1000 -3000 -6000 -7500	
Check:		Board#: 384-486	
Approved: <i>[Signature]</i>	10/24/05	Sheet: 1 of 1	Series: 384
	28-Aug-2006	Rev: 2.0	Sheet: 486
384X486			



**LUDLUM MEASUREMENTS, INC.** PO Box 810  
501 Oak Street  
Sweetwater, Texas 79556  
U.S.A. 1-800-622-0828

Drawn: ACF	25-OCT-99	Title: VOLTAGE DIVIDER	
Design:		Model: 1.125"	
Check: CKB	25-OCT-99	Board#: 5002-241	
Approve: R.C.	25-OCT-99	Sheet: 1 of 1	Series
11:34:11	25-Oct-1999	Rev: 1.0	Sheet
X:\Projects\adit\5002-241\2x191.sch			2 191