

Three-field Ionization Chamber  
Calibration Procedure for Pre-Amplifier board 61136A

The following adjustments apply to the calibration of a 61136A, 61136C or 61136E pre-amplifier board for a stationary 3-field ion chamber, e.g. for chest or table use.

Pre-amp Assembly	Description	Difference from 61136A
61136A	Siemens Compatible, 3-Field Pre-amp, Standard Gain	None
61136C	Siemens Compatible, 3-Field Pre-amp, High- Master-Gain	R22 = 50k pot R25 = 33k
61136E	Siemens Compatible, 3-Field Pre-amp, High-Master-Gain, Side-Turn Pots	R22 = 50k side turn pot R25 = 33k

**WARNING:**

- This service manual is available in English only.
- If a customer's service provider requires a language other than English, it is the customer's responsibility to provide translation services.
- Do not attempt to service the equipment unless this service manual has been consulted and is understood.
- Failure to heed this warning may result in injury to the service provider, operator or patient from electric shock and mechanical or other hazards.

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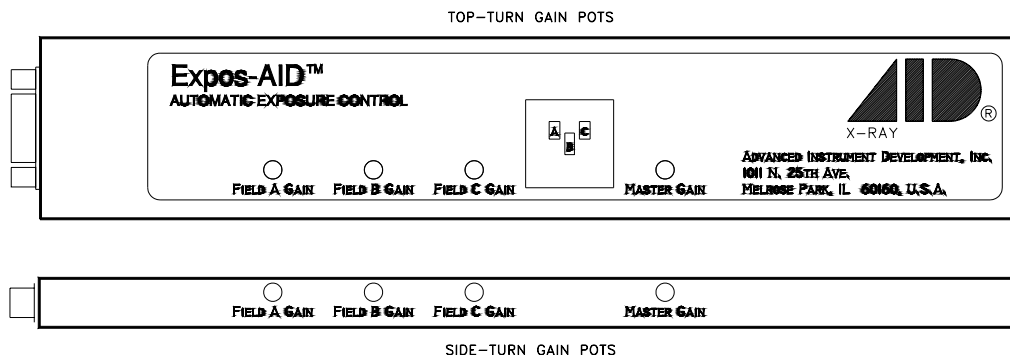
The procedure assumes that the installation of the Automatic Exposure Control (AEC) is complete and that the AEC and x-ray generator are in proper working condition. After making the necessary interconnections between the ion chamber and the AEC, power up the system.

**Calibration/Test Set Up:**

Select the center field of the ion chamber. Set the generator for 100 kVp and maximum backup time. For 100 kVp use 8 to 10 inches (20 to 25 cm) of water or plastic for a phantom. Metals such as copper, aluminum or lead are not suitable for use as phantoms. Make sure the phantom is homogeneous and completely covers all fields equally. Center the x-ray beam on the center field. Collimate the x-ray beam so that it completely covers all three fields but does not extend beyond the limits of the phantom.

#### Adjustment Potentiometers:

All necessary adjustment potentiometers are accessible through the pre-amp chassis cover. There is no need to open the pre-amp cover during normal calibration procedures.



#### Master Gain Adjustment (61136A R22):

Typically, the chamber gain adjustment is the only adjustment needed when installing a ICX series ion chamber. Use the chamber gain adjustment to match the overall chamber sensitivity to that of the other stationary chambers connected to the system. Note that the chamber gain adjustment is a multi-turn potentiometer. A clockwise adjustment to the master gain potentiometer will increase the sensitivity of the chamber, causing the length of the exposure (mAs) to decrease.

Make exposures and process the films. Adjust the chamber gain for the desired optical density. Make the chamber gain adjustment for each stationary chamber being installed.

#### Field Balance Check:

Using the AEC post-exposure mAs display or other calibrated mAs meter check the individual fields to see that they are balanced, that is, that they produce the same mAs reading. If mAs readings are not stable from exposure to exposure for an individual field, then it will be necessary to expose films and make these adjustments based upon optical density.

The individual gain potentiometers (61136A R5, R10 and R15) correspond to ion chamber fields A, B and C respectively which in turn correspond to field selection signals 2, 1 and 3 respectively. If necessary, adjust the individual gain potentiometers to balance the outputs to give the same mAs reading for each field. Note that individual gain adjustments are multi-turn potentiometers. A clockwise adjustment to a gain potentiometer will increase the sensitivity of a field, causing the length of the exposure (mAs) to decrease.

Ionization Chamber Pin-outs:

61136A Pre-amp Board Pin-out	Function	9-Pin Sub-D Pin-Out
no connection	NONE	1
2	FIELD 2 SELECT	2
3	FIELD 1 SELECT	3
4	FIELD SELECT RETURN	4
5	OUTPUT	5
6	FIELD 3 SELECT	6
7	-15VDC	7
8	+15VDC	8
9	GROUND	9

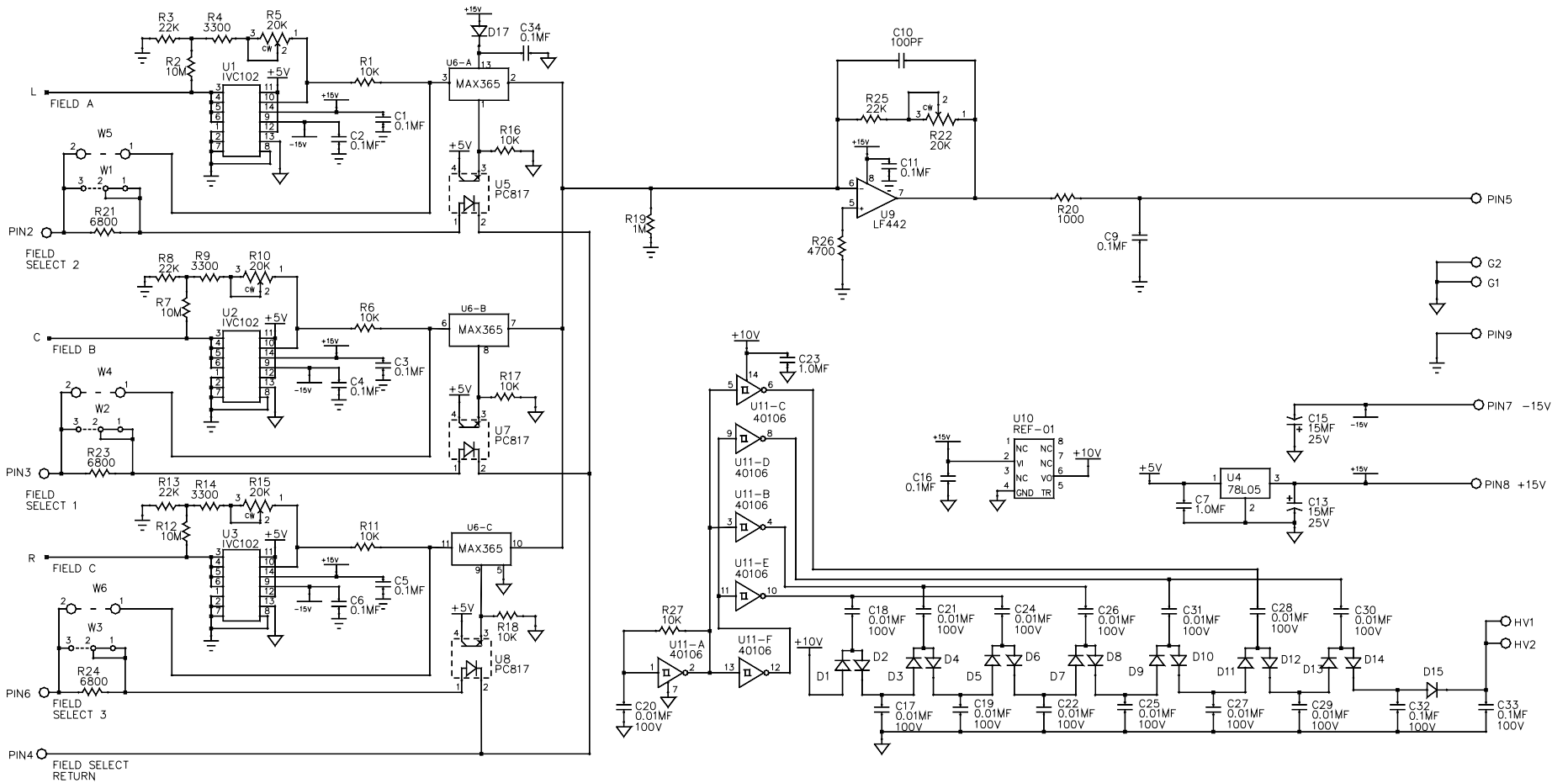
**NOTE:** Cable wire colors do not match those inside the pre-amp chassis. Cable pin-out details are available on-line at <http://www.aidxray.com> or by contacting Advanced Instrument Development, Inc.

Ionization Chamber Inputs and Output:

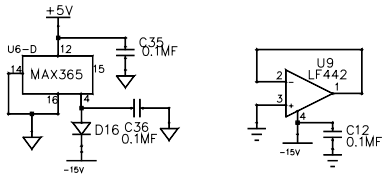
Signal	Jumper	Comments
Positive Supply Voltage Range	None	+11.4VDC to +15.75VDC less than 85 mA.
Negative Supply Voltage Range	None	-11.4VDC to -15.75VDC less than 15 mA.
Positive DC Level Output	None	DC level signal ranging from 0VDC to a maximum of at least 80% of the supply voltage (+9.6VDC for +12VDC supply). The amplitude of this signal is directly proportional to the amount of x-ray flux received.
AEC Field Select without series resistor	W1, W2 and W3 = 1-2	High-active: Driving the field select lines high (+15VDC to +27VDC) will select the field. This jumper setting uses the series resistors on the pre-amp.
AEC Field Select with series resistor	W1, W2 and W3 = 2-3	High-active: Driving the field select lines high (+15VDC to +27VDC) will select the field. This jumper setting uses the series resistors in the AEC.


Acceptable Power Supply Ranges for 61136A Pre-amp:

Supply Voltage	Measurement Point	Acceptable Range
+12VDC Pos. Input Supply Voltage	61136A pin 8	From +11.4VDC to +15.8VDC
-12VDC Neg. Input Supply Voltage	61136A pin 7	From -11.4VDC to -15.8VDC
+5VDC Regulated on board	61136A C7 (positive lead)	From +4.7VDC to +5.3VDC
+75VDC Internal Bias Voltage Regulated on board	61136A C33 at the cathode of D15	From +65VDC to +85VDC



NOTES:  
 1. \* MANUFACTURER MAY USE ALTERNATE COMPONENTS UNLESS NOTED OTHERWISE.



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					SCALE	DRAWN BY	DATE			
01	1924	23SEP00	U6 WAS 4066	CJL	NONE	CJL	16NOV98		<b>SIEMENS REPLACEMENT            3-FIELD PRE-AMP BD.</b>	
00	1770	16NOV98	NEW	CJL						
REV.	ECN NO.	DATE	REVISIONS	BY	<small>THIS DRAWING REPRESENTS PROPRIETARY AND CONFIDENTIAL INFORMATION            ORIGINATED BY ADVANCED INSTRUMENT DEVELOPMENT, INC. AND WHICH SHALL NOT BE            DISCLOSED OR UTILIZED IN ANY MANNER DETRIMENTAL TO THE COMPANY'S BUSINESS.</small>		<small>USED ON</small> <b>ICX SERIES</b>	<small>NEXT ASSY.</small> 	<small>DRAWING NO.</small> <b>61136A</b>	<small>REV.</small> <b>01</b>