

Three-field Ionization Chamber  
Calibration Procedure for Pre-Amplifier board 61136B, 61136D, 61136F or 61136G

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

Pre-amp Assembly	Description	Difference from 61136B
61136B	Toshiba Compatible, 3-Field Pre-amp, High-Gain	None
61136D	Toshiba Compatible, 3-Field Pre-amp, Standard Gain, Side-Turn Pots	R5, R10 & R15 = 20k side turn pots
61136F	Toshiba Compatible, 3-Field Pre-amp, High-Gain, Side-Turn Pots	side turn pots
61136H	Toshiba Compatible, 3-Field Pre-amp, Standard Gain, Top-Turn Pots	R5, R10 & R15 = 20k top turn pots

**WARNING:**

- 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:

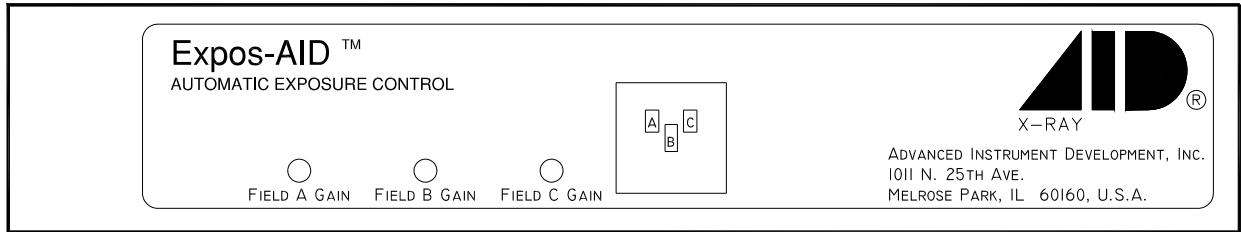
Your X-Ray Generator/AEC Manual should cover this subject. Calibration procedures are specific to the X-Ray Generator/AEC. The Following is provided as additional information only.

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.

TOP-TURN GAIN POTS (61136B & 61136H)

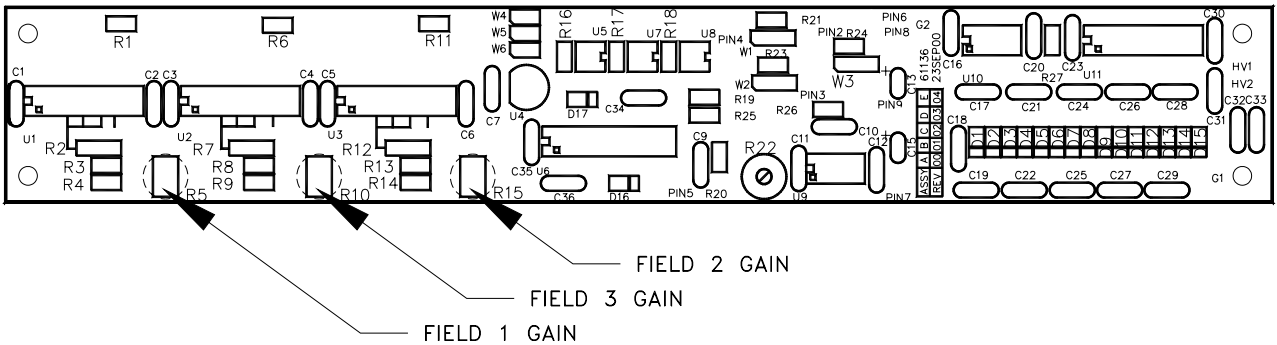


SIDE-TURN GAIN POTS (61136D & 61136F)

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 (R5, R10 and R15) correspond to ion chamber fields 1, 3 and 2 respectively. These adjustment pots also correspond to the A, B and C fields, respectively, as shown on the pre-amp chassis label. 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.



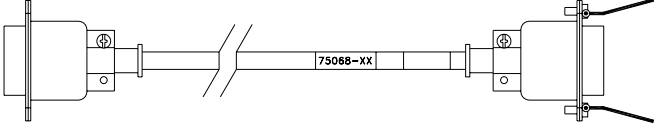
Ionization Chamber Pin-outs:

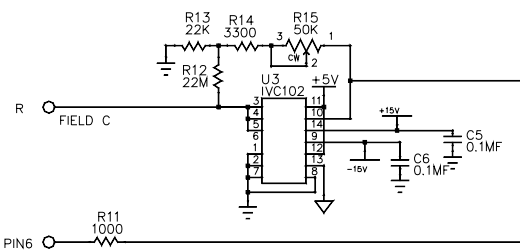
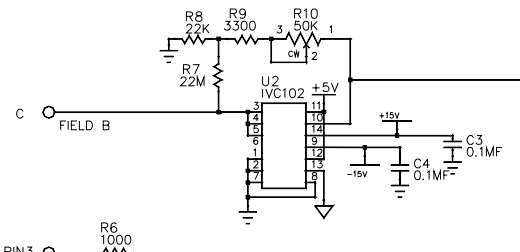
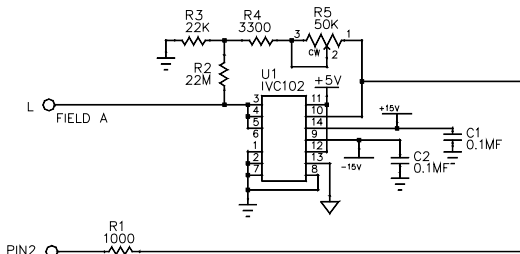
61136 Pre-amp Board Pin-out	Function	14-Pin Parallel Connector
2	FIELD 1 OUTPUT	14
6	FIELD 2 OUTPUT	12
3	FIELD 3 OUTPUT	10
8	+15VDC	6
9	GROUND	4
7	-15VDC	2
1, 4, 5	NONE	N/C

Ionization Chamber Inputs and Output:

Signal	Comments
Positive Supply Voltage Range	+11.4VDC to +15.75VDC less than 85 mA.
Negative Supply Voltage Range	-11.4VDC to -15.75VDC less than 15 mA.
Negative DC Level Outputs	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.

Additional cabling will be required to run from the pre-amp to the x-ray generator AEC. The following table lists the pin-out of the Toshiba compatible ion chamber cable, AID P/N 75068-XX, that is available in 45, 65 and 85 foot lengths. Specify cable length as a suffix to the cable part number (-XX).

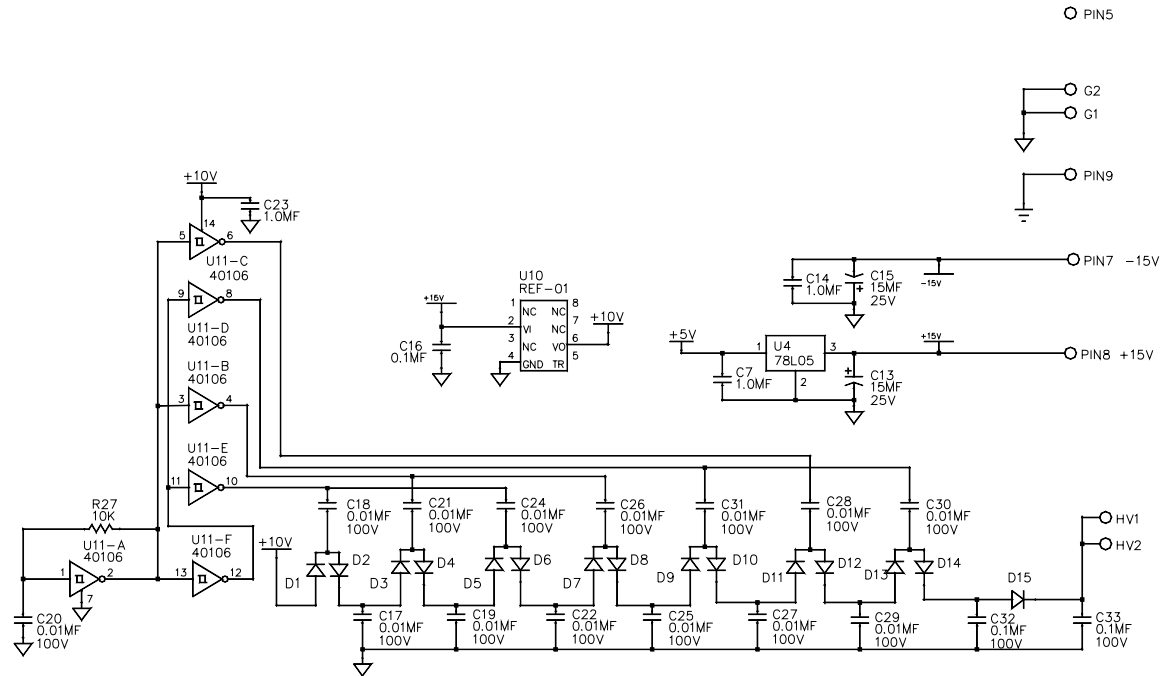
75068-XX “-XX” = CABLE LENGTH IN FEET			
ION CHAMBER CONNECTOR	ION CHAMBER CABLE TOSHIBA COMPATIBLE		AEC CONNECTOR
MALE 14-PIN CENTRONICS PARALLEL			FEMALE 14-PIN CENTRONICS PARALLEL
PIN NUMBER	WIRE COLOR	FUNCTION	PIN NUMBER
1,3,5,7,8,9,11&13	NONE	NO CONNECTION	1,3,5,7,8,9,11&13
2	BROWN	-15VDC	2
4	BLACK	GROUND	4
4	CLEAR	SHIELD	N/C
6	RED	+15VDC	6
10	VIOLET	FIELD 3 SIGNAL	10
12	WHITE	FIELD 2 SIGNAL	12
14	ORANGE	FIELD 1 SIGNAL	14




NOTES:

- MANUFACTURER MAY USE ALTERNATE COMPONENTS UNLESS NOTED OTHERWISE.

	TYPE	GND	+15V	-15V	+10V	+5V
U1	IVC102	1,2,4,5,6,7,11				11
U2	IVC102	1,2,4,5,6,7,11				11
U3	IVC102	1,2,4,5,6,7,11				11
U4	78L05	2	3			1
U5	OMIT					
U6	OMIT					
U7	OMIT					
U8	OMIT					
U9	OMIT					
U10	REF-01		2		6	
U11	40106				14	



					DO NOT SCALE			ADVANCED INSTRUMENT DEVELOPMENT, INC. 1011 N. 25TH AVE. MELROSE PARK, IL 60160				
					UNLESS SPECIFIED OTHERWISE: DIMENSIONS ARE IN INCHES							
					FRACTIONS +/- 1/84	DEC. +/- 0.010					ANGLES +/- 1 DEGREE	
03	2170	09JUN04	SEE COMPONENT LAYOUT	SO	SCALE	NONE	DRAWN BY	CJL	DATE	25OCT99		
02	2002	05SEP01	R5, R10, R15 FROM 20K TO 50K OHMS	BRP	MATERIAL		CHECKED BY		TOSHIBA REPLACEMENT 3-FIELD PRE-AMP BD. (TOP TURN POTS)			
01	1924	23SEP00	SEE COMPONENT LAYOUT	CJL	FINISH		APPROVED BY		USED ON	ICX SERIES		
REV					ECH NO. DATE REVISIONS BY					NEXT ASSY.	DRAWING NO.	REV
					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 BUSINESS.						61136B	03