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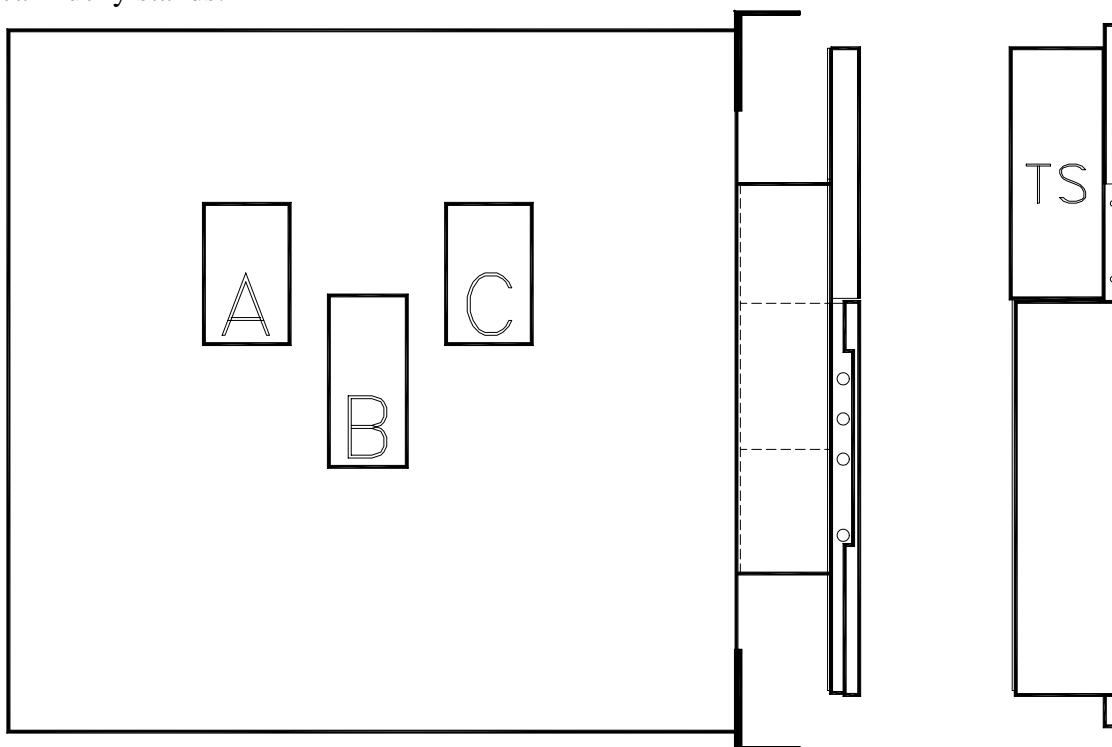
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Models ICX111, ICX211 and ICX411  
Three-field Ionization Chambers  
Calibration Procedure for Pre-Amplifier board 61135D

The models ICX111, ICX211 and ICX411 are normally shipped wired to be used in a right hand vertical Bucky stand.

For ICX111, ICX211 or ICX411 when replacing P/N 46-158297 or 46-178529 for right hand vertical Bucky stands:



ICX111/ICX211/ICX411 for right hand (R.H.) vertical Bucky stand  
as viewed from the patient side.  
“TS” denotes the location of the terminal strip.

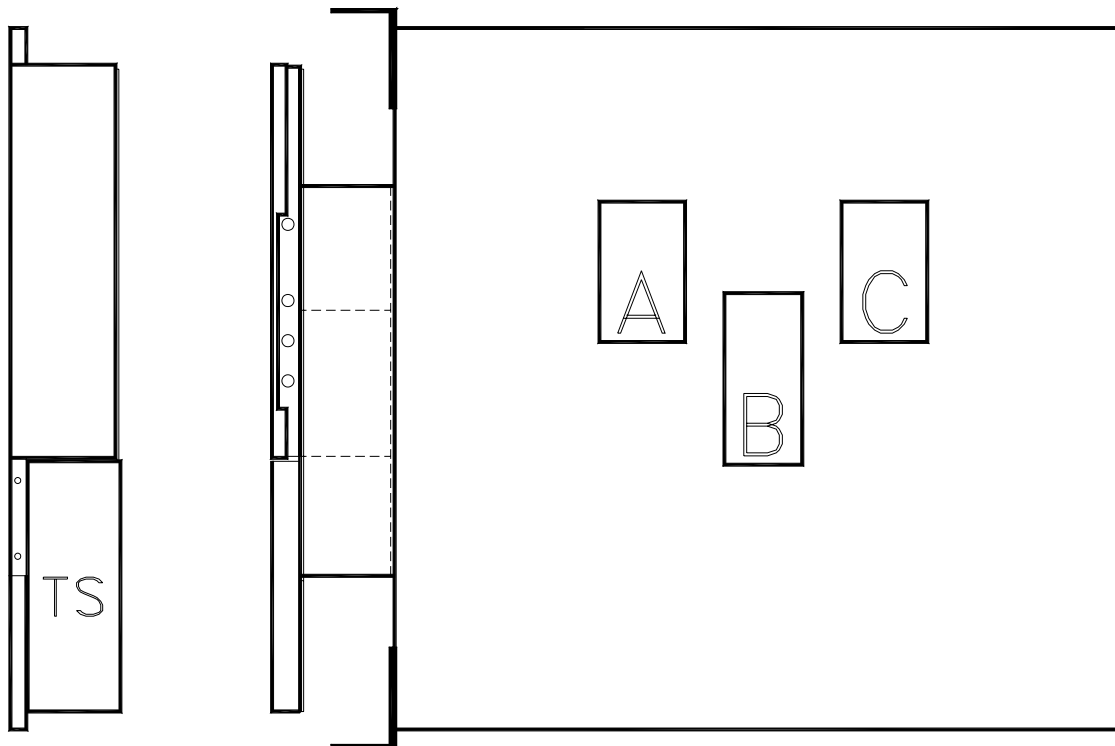
Use the following procedure to reconfigure for use in a left hand vertical Bucky stand. Take care not to strain any of the wire connections when reconfiguring the pre-amp chassis.

1. Unscrew the entire pre-amp chassis assembly where it attaches to the ICX111/ICX211/ICX411 frame. Rotate the pre-amp chassis assembly so that the terminal strip is now located toward the bottom of the ion chamber. Reconnect the pre-amp chassis assembly to the ICX111, ICX211/ICX411 frame.
2. Switch the brown and violet wires at the barrier block terminal strip (TS) as follows:

For R.H. vertical Bucky stand  
violet = TS pin 4 and brown = TS pin 6.

For L.H. vertical Bucky stand  
brown = TS pin 4 and violet = TS pin 6.

For ICX111, ICX211 or ICX411 when replacing P/N 46-158296 or 46-178528 for L.H. Vertical Bucky Stands:



ICX111, ICX211/ICX411 for left hand (L.H.) vertical Bucky stand  
as viewed from the patient side  
TS denotes the location of the terminal strip.

The following adjustments apply to the calibration of a 61135D pre-amplifier board for a stationary 3-field ion chamber, e.g. for chest or table use.

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 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.

#### Master Chamber Gain Adjustment (61135D R22):

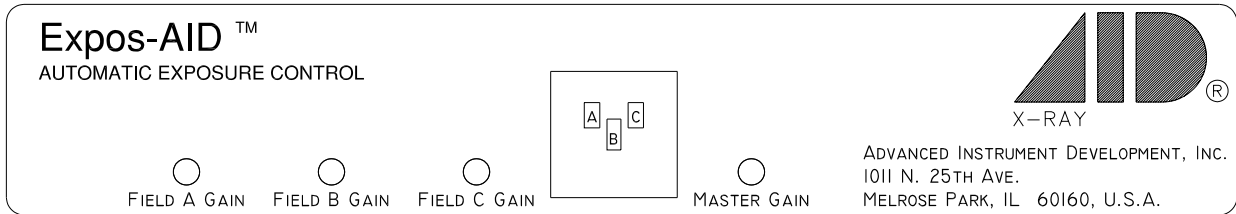
Typically, the master chamber gain adjustment is the only adjustment needed when installing an ICX series ion chamber. Use the chamber gain adjustment to match the overall chamber sensitivity to that of the other stationary chambers connected to the system. Note that the chamber gain adjustment is a multi-turn potentiometer accessible through the pre-amp chassis cover. A clockwise adjustment to the chamber 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.

**Balance Check:**

Using the Expos-AID 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.

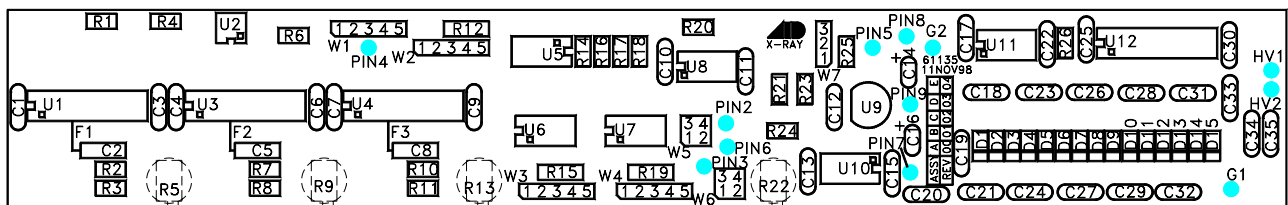
The individual gain potentiometers (61135D R5, R9 and R13) correspond to Field A, Field B and Field C respectively. If necessary, adjust the individual gain potentiometers to balance the outputs to give the same mAs reading for each field. Note that individual gain adjustments are multi-turn potentiometers. A clockwise adjustment to a gain potentiometer will increase the sensitivity of a field, causing the length of the exposure (mAs) to decrease.



61135D PIN OUTS	FUNCTION	WIRE COLOR	TERMINAL STRIP POSITION
1	NO CONNECTION		
2	FIELD 2 SELECT	YELLOW	5
3	FIELD 1 SELECT	PURPLE	R.H. = 4, L.H. = 6
4	RESET	GRAY	3
5	OUTPUT	WHITE	7
6	FIELD 3 SELECT	BROWN	R.H. = 6, L.H. = 4
7	-15VDC	BLUE	2
8	+15VDC	ORANGE	1
9	GND	BLACK	8

**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.
Low-Active Reset (Exposure Duration)	W1 = 1-2 & 3-4	Pulling this line to ground ( $\leq 8$ VDC) beginning at exposure start and lasting for the entire duration of the exposure allows the integrator to operate.
High-Active Reset (Exposure Duration)	W1 = 2-3 & 4-5	Pulling this high ( $\geq 4$ VDC) beginning at exposure start and lasting for the entire duration of the exposure allows the integrator to operate.
Low-active Field Selects	W2, W3 and W4 = 1-2 & 3-4	Low-active: Pulling the field select lines to ground (0VDC) will select the field.
High-active Field Selects	W2, W3 and W4 = 2-3 & 4-5	High-active: Driving the field select lines high (+12VDC to +24VDC) will select the field.
Field Configuration A-B-C = 1-2-3	W5 = 1-3 & 2-4 and W6 = 1-2 & 3-4	Field selects 1, 2 and 3 select left (A), center (B) and right (C), respectively, as viewed from the x-ray tube-side of the ion chamber.
Field Configuration A-B-C = 2-1-3	W5 = 1-2 & 3-4 and W6 = 1-2 & 3-4	Field selects 2, 1 and 3 select left (A), center (B) and right (C), respectively, as viewed from the x-ray tube-side of the ion chamber.
Field Configuration A-B-C = 3-1-2	W5 = 1-2 & 3-4 and W6 = 1-3 & 2-4	Field selects 3, 1 and 2 select left (A), center (B) and right (C), respectively, as viewed from the x-ray tube-side of the ion chamber.
Field Configuration A-B-C = 3-2-1	W5 = 1-3 & 2-4 and W6 = 1-3 & 2-4	Field selects 3, 2 and 1 select left (A), center (B) and right (C), respectively, as viewed from the x-ray tube-side of the ion chamber.
Negative Output	W7 = 1-2	Time integrated signal ramping from 0VDC to a maximum of at least 80% of the supply voltage (-9.6VDC for -12VDC supply). The slope of this signal is directly proportional to the amount of x-ray flux received.
Positive Output	W7 = 2-3	Time integrated signal ramping from 0VDC to a maximum of at least 80% of the supply voltage (+9.6VDC for +12VDC supply). The slope of this signal is directly proportional to the amount of x-ray flux received.



Specific Configurations:

Unless specified otherwise, ICX ion chambers are delivered with an AID compatible jumper configuration. AID compatible means that the input and output signals will interface with Advanced Instrument Development, Inc's Expos-AID™ Automatic Exposure Control. This same configuration will also interface with Acoma, Control-X, CPI, Electromed, Gendex, Innerscan, OEC, Summit Industries, etc. Various configurations are listed below.

AID Compatible jumper configuration:

Jumper	Position	Function
61135D W1	1-2 & 3-4	Low-active reset
61135D W2, W3 and W4	1-2 & 3-4	Low-active field select
61135D W5 and 61135D W6	1-2 & 3-4 and 1-2 & 3-4	A-B-C = 2-1-3
61135D W7	2-3	Positive output signal

Trex Medical - Continental, Keithley, Ratheon, Xonics Compatible jumper configuration:

Jumper	Position	Function
61135D W1	1-2 & 3-4	Low-active reset
61135D W2, W3 and W4	1-2 & 3-4	Low-active field select
61135D W5 and 61135D W6	1-3 & 2-4 and 1-2 & 3-4	A-B-C = 1-2-3
61135D W7	2-3	Positive output signal

Trex Medical - Bennett Compatible jumper configuration:

Jumper	Position	Function
61135D W1	1-2 & 3-4	Low-active reset
61135D W2, W3 and W4	1-2 & 3-4	Low-active field select
61135D W5 and 61135D W6	1-3 & 2-4 and 1-2 & 3-4	A-B-C = 1-2-3
61135D W7	1-2	Negative output signal

GE, Fischer, Varian Compatible jumper configuration:

Jumper	Position	Function
61135D W1	2-3 & 4-5	High-active reset
61135D W2, W3 and W4	2-3 & 4-5	High-active field select
61135D W5 and 61135D W6	1-3 & 2-4 and 1-2 & 3-4	A-B-C = 1-2-3
61135D W7	2-3	Positive output signal

Picker Compatible jumper configuration:

Jumper	Position	Function
61135D W1	1-2 & 3-4	Low-active reset
61135D W2, W3 and W4	1-2 & 3-4	Low-active field select
61135D W5 and 61135D W6	1-2 & 3-4 and 1-2 & 3-4	A-B-C = 2-1-3
61135D W7	1-2	Negative output signal

GTR Labs Compatible jumper configuration:

Jumper	Position	Function
61135D W1	1-2 & 3-4	Low-active reset
61135D W2, W3 and W4	1-2 & 3-4	Low-active field select
61135D W5 and 61135D W6	1-2 & 3-4 and 1-3 & 2-4	A-B-C = 3-1-2 (= GTR Labs fields 1-2-3)
61135D W7	2-3	Positive output signal