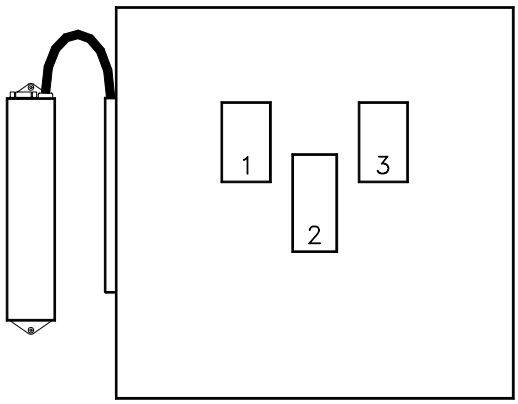
Advanced Instrument Development, Inc.
2545 Curtiss St.
Downers Grove, IL 60515 U.S.A.
Phone: (630) 271-9729 www.aidxray.com Fax: (630) 271-9995

ICX247 Three-field Ionization Chamber
(GEHC P/N 2210104)
Calibration Procedure for Pre-Amplifier board 61154P

The following adjustments apply to the calibration of the 61154P pre-amplifier board used with the model ICX247 three-field ion chamber.



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.

Note: When working with the pre-amplifier assembly it is important that electrostatic discharge (ESD) prevention techniques be observed. Before touching the pre-amp assembly, attach an ESD wrist strap to yourself. Be sure to ground yourself and the ion chamber frame to dissipate static charges.

Note: The pre-amp assembly is a very delicate and sensitive device. It is important to keep it as clean as possible. Wash and dry your hands thoroughly before working with it and, when possible, use unpowdered latex or cotton gloves. Take care to touch the pre-amp board as little as possible. Take extra care to avoid touching the three air-mounted field inputs. Oils from your fingers on the air-mounts or their components can cause performance degradation.

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

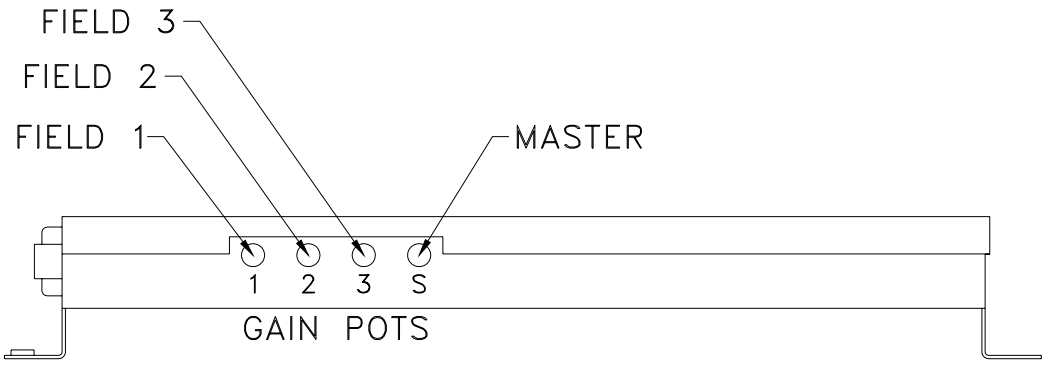
Calibration/Test Set Up:

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.

Master Gain Adjustment (61154P R4):

Typically, the master gain adjustment is the only adjustment needed when installing an ICX series ion chamber. Use the master gain adjustment to match the overall chamber sensitivity to that of the other stationary chambers connected to the system. Note that the master gain adjustment is a multi-turn potentiometer. A counter-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 master gain for the desired optical density. Adjust the master gain for each chamber being installed.



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 (61154P R1, R2 and R3) correspond to ion chamber fields 1, 2 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.

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Ionization Chamber Pin outs:

J1 9-PIN SUB-D PIN NUMBER	FUNCTION	61154P PRE-AMP BOARD PAD NUMBER
1	GROUND, 24V RTN	1
2	FIELD 2 SELECT (CENTER)	2
3	FIELD 1 SELECT (LEFT)	3
4	OUTPUT	5*
5	START INTEGRATE	4*
6	FIELD 3 SELECT (RIGHT)	6
7	-15VDC	7
8	+15VDC	8
9	GROUND, 15V RTN	9

* The 9-pin sub-D connector is not wired 1-to-1 at pins 4 & 5.

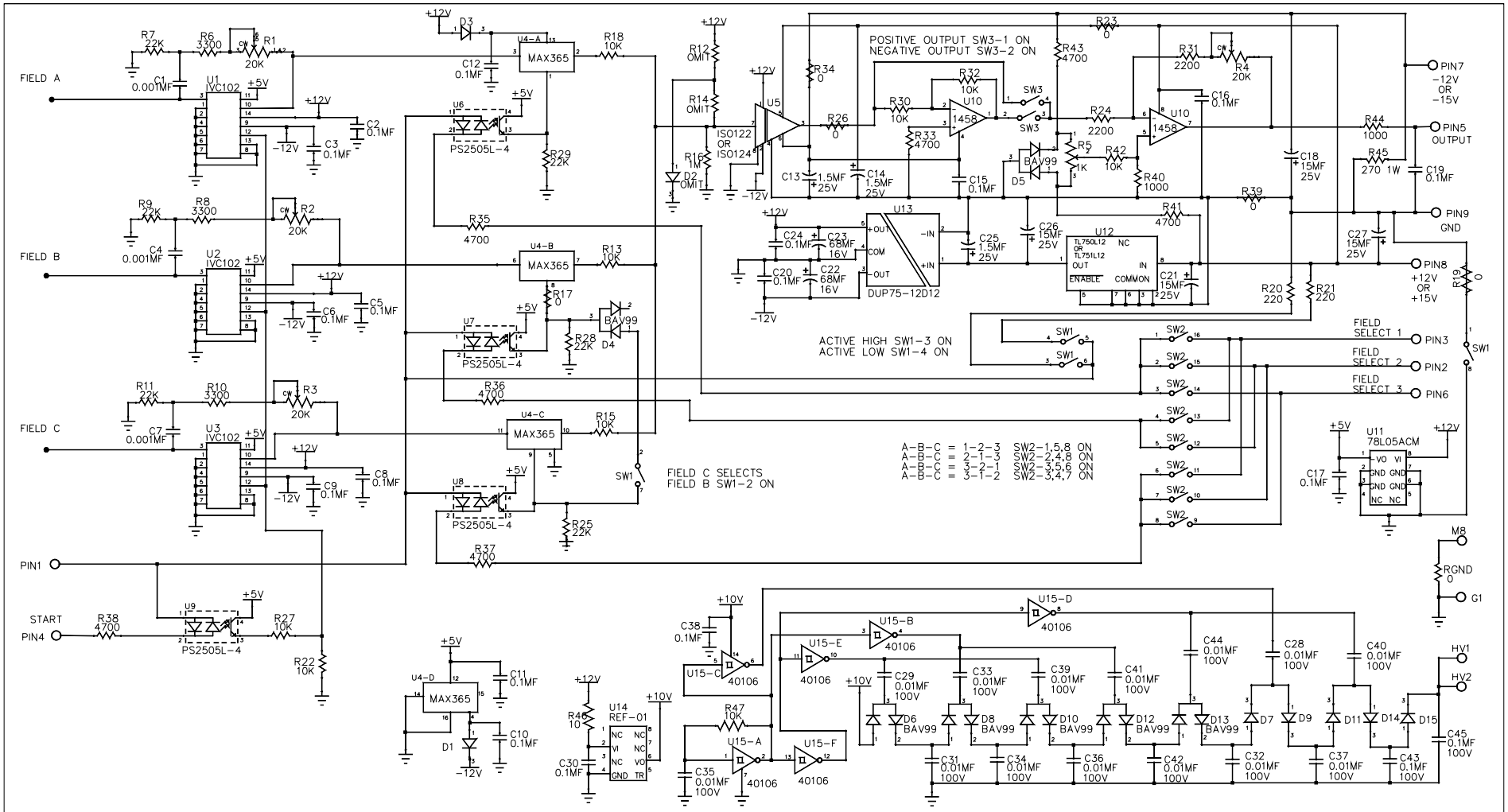
NOTE: Cable wire colors do not match those inside the pre-amp chassis. Cable pin-out details are available on-line at http://www.aidxray.com or by contacting Advanced Instrument Development, Inc.

Acceptable Power Supply Ranges for 61154P Pre-amp:

Supply Voltage	Measurement Point	Acceptable Range
External +15VDC	61154P pin 8 (referenced to 61154P pin 9)	+11.4VDC to +15.8VDC
External -15VDC	61154P pin 7 (referenced to 61154P pin 9)	-11.4VDC to -15.8VDC
Internal +12VDC	Measure across 61154P C23	+10.8VDC to +12.5VDC
Internal -12VDC	Measure across 61154P C22	-10.8VDC to -12.5VDC
Internal +5VDC	Measure across 61154P C17	+4.7VDC to +5.3VDC
Internal +75VDC	Measure across 61154P C45 (HV1 to G1)	+65VDC to +85.0VDC

Switch Settings for ICX247 with 61154P Pre-amp:

Function	Switch Setting
Defeat: Power Supply Isolation	SW1-1 ON
Enable: Alternate Field Selection	SW1-2 OFF
High-Active Commands: Start Integrate & Field Selects	SW1-3 ON SW1-4 OFF
Field Configuration: A=1, B=2, C=3	SW2-1,5 & 8 ON SW2-2,3,4, 6 & 7 OFF
Positive Output	SW3-1 ON SW3-2 OFF



NOTES:
1. * MANUFACTURER MAY USE ALTERNATE COMPONENTS UNLESS NOTED OTHERWISE.
2. ALL SWITCHES OFF UNLESS OTHERWISE NOTED.
3. U6,U7,U8, AND U9 MAY BE (4) SINGLE OR (1) QUAD DEVICE.

REV.	ECN NO.	DATE	REVISIONS	BY
01	2261	10MAR05	COPPER DATE 03MAR05	BRP
			ADDED R5, R41, R42, R43 & D5	
			SAME AS 61154A EXCEPT: R24 & R31 = 2200	
00	2247	09FEB05	SAME AS 61154A EXCEPT:	BRP
			R23=1800, R34=1500, R35=1000	

DO NOT SCALE

UNLESS SPECIFIED OTHERWISE; DIMENSIONS ARE IN INCHES.
FRACTIONS ±1/64 DECIMALS ±0.010 ANGLES ±1°

SCALE	NONE	DRAWN BY	TRW
MATERIAL	NONE	CHECKED BY	
FINISH	NONE	APPROVED BY	
DATE	09FEB05		

ADVANCED INSTRUMENT DEVELOPMENT, INC.
1011 N. 25TH AVE.
MELROSE PARK, IL. 60160

X-RAY

3-FIELD ISOLATED PRE-AMP
CALCULATED GAIN RANGE: 1 TO 10.1
SIDE-TURN POTS

USED ON	NEXT ASSY.	DRAWING NO.	REV.
ICX SERIES		61154P	01