

Appendix

Technical Publication
AP-0015R0

Quick Installation Guide for TXR Generators

HF Series Generators

REVISION HISTORY

REVISION	DATE	REASON FOR CHANGE
0	JAN 7, 2004	First edition.

This Document is the English original version, edited and supplied by the manufacturer.

The Revision state of this Document is indicated in the code number shown at the bottom of this page.

ADVISORY SYMBOLS

The following advisory symbols will be used throughout this manual. Their application and meaning are described below.



DANGERS ADVISE OF CONDITIONS OR SITUATIONS THAT IF NOT HEHEDED OR AVOIDED WILL CAUSE SERIOUS PERSONAL INJURY OR DEATH.



ADVISE OF CONDITIONS OR SITUATIONS THAT IF NOT HEHEDED OR AVOIDED COULD CAUSE SERIOUS PERSONAL INJURY, OR CATASTROPHIC DAMAGE OF EQUIPMENT OR DATA.



Advise of conditions or situations that if not heeded or avoided could cause personal injury or damage to equipment or data.

Note 

Alert readers on pertinent facts and conditions. Notes represent information that is important to know but which do not necessarily relate to possible injury or damage to equipment.

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SECTION 1 INSTALLATION

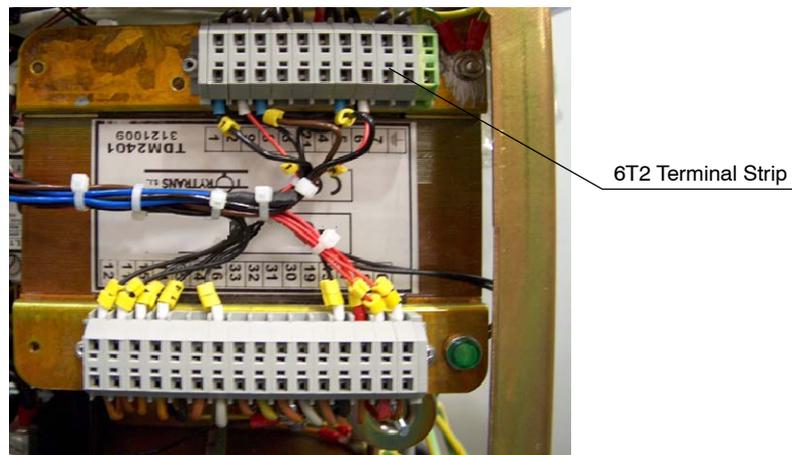


THIS DOCUMENT IS A HELP NOT INTENDED TO TAKE THE PLACE OF THE SERVICE MANUAL. AS STEPS ARE COMPLETED CHECK OFF THIS LIST TO THE LEFT OF EACH NUMBER OR PARAGRAPH.

1. Place the Power Module close to its permanent position. For easy interconnection and calibration place the Generator Cabinet on a table or mount it to the wall using the Wall Support provided.
2. Verify that wire marked “*” on Transformer 6T2 terminal strip is matched to the incoming power. Mind the Generator type: Single-Phase, Three-Phase or Battery Powered.

	POWER SUPPLY LINE FOR SINGLE-PHASE OR BATTERY POWERED GENERATORS			
	110 VAC or Stand-Alone option	208 VAC	230 VAC (or 220 VAC)	240 VAC
Cable-* in Transformer 6T2	TB-3 or TB-8	TB-21	TB-4 or TB-5	TB-6 or TB-7

	POWER SUPPLY LINE FOR THREE-PHASE GENERATORS					
	230 VAC (or 220 VAC)	240 VAC	400 VAC	415 VAC	440 VAC	480 VAC
Cable-* in Transformer 6T2	TB-4 or TB-5	TB-6	TB-8	TB-7	TB-9	TB-10



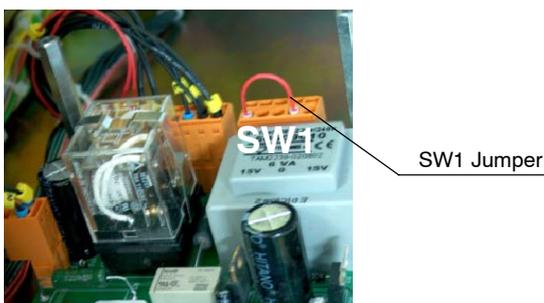
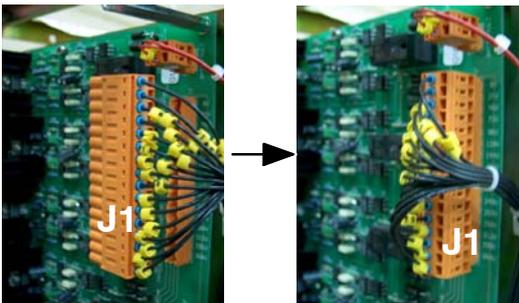
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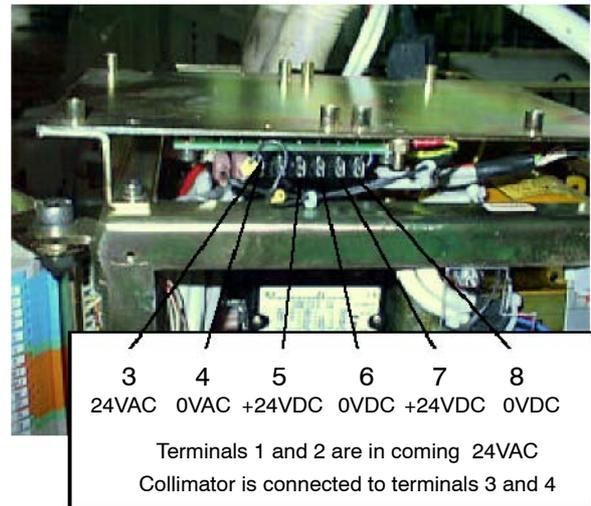
3. **THIS POINT ONLY APPLIES TO BATTERY POWERED GENERATORS.**
 - a. Open hinged door to access to Charger Module (Mod 1) by removing the Allen screws.
 - b. Verify that wire marked “*” is connected to Transformer 2T1 terminal strip - 110 (for 110 VAC).
 - c. Remove plastic covers over Charger Board and Line Monitor Board.
 - d. Plug in J1 on Charger Board it will come unplugged for safety.
 - e. Verify Jumper is SW1-5 to SW1-4 (for 110 VAC) SW1 jumper.
 - f. Re-install plastic covers.



J1 Connection



4. Most of TXR products requires 24 VAC for locks. At top of the newer Generator cabinet versions are added a 24 VAC Distribution Board where connected the locks.



5. Remove Allen screws that secure hinged door on MOD3 side.



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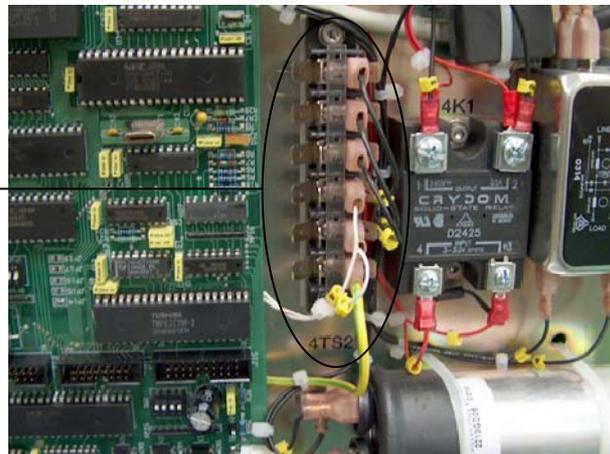
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6. Terminal Strip 4TS2 is located in Module 4 (back of Module 3) at the hinged door. Connect the X-ray Tube Rotor wiring as follows:

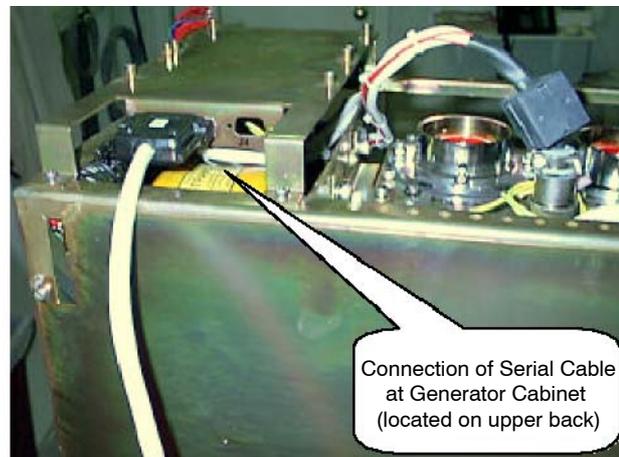
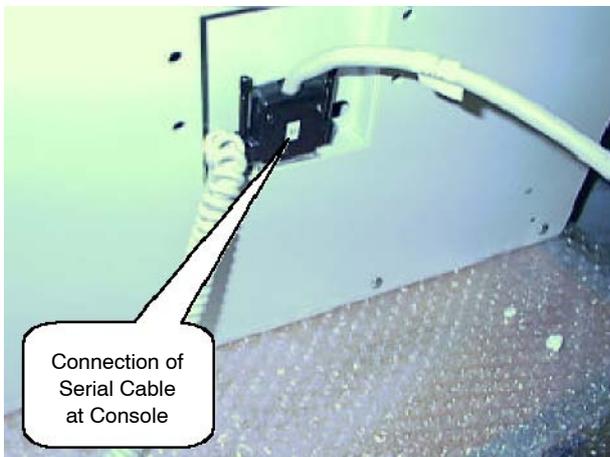
WIRE FROM X-RAY TUBE	CONNECTION IN 4TS2
BLACK	4TS2-1
RED	4TS2-2
WHITE	4TS2-3
THERMAL	4TS2-4
THERMAL	4TS2-5
GROUND *	4TS2-6

** If X-ray Tube have not a shielded Ground wire, terminal 4TSS-6 is not used.*

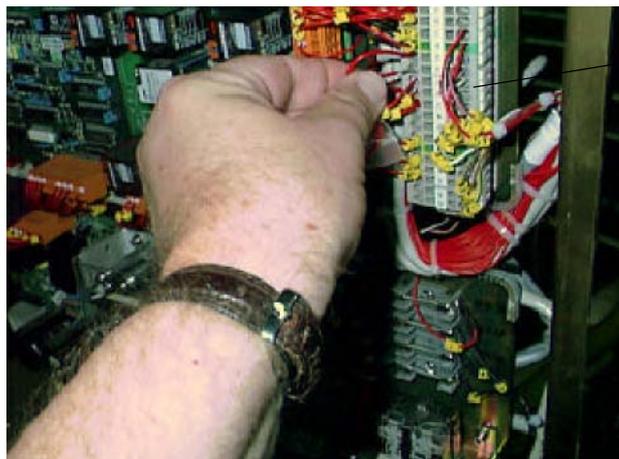
4TS2 Terminal Strip



7. Carefully connect the Serial cable to the Console and mount it on the shelf you have provided or mount the Console onto the optional stand. Carefully route the Handswitch wire and connect the Serial cable between the Console and the Generator Cabinet.



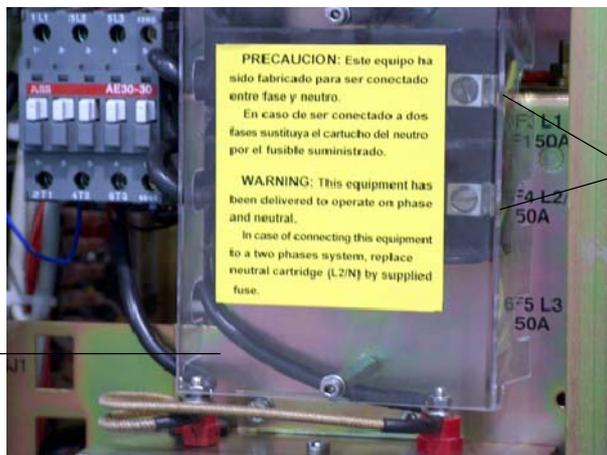
8. Add insulating compound or insulating oil to both High Voltage Transformer receptacles. Connect both High Voltage cables (Anode and Cathode) between the X-ray Tube and HV Transformer receptacles.
9. Terminal Strip 3TS1 is located in Module 3 (out-side of hinged door). Verify or connect a jumper between terminals 3TS1-22 and 3TS1-23 to bypass the Door Interlock.



Terminal Strip 3TS1

10. ***THIS POINT ONLY APPLIES TO LINE POWERED GENERATORS.***

Remove the plastic cover over Line Fuses and connect the Line Power cables to the right side of Fuses.

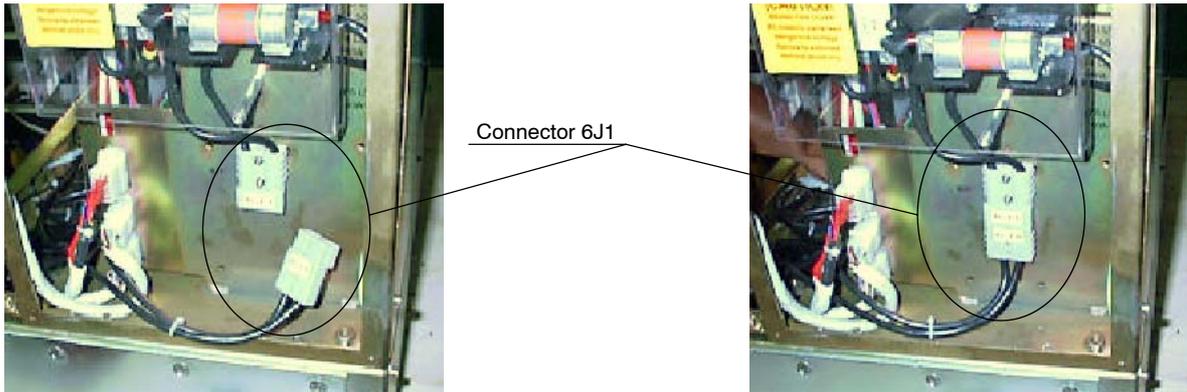


Connections of Line Power Cables

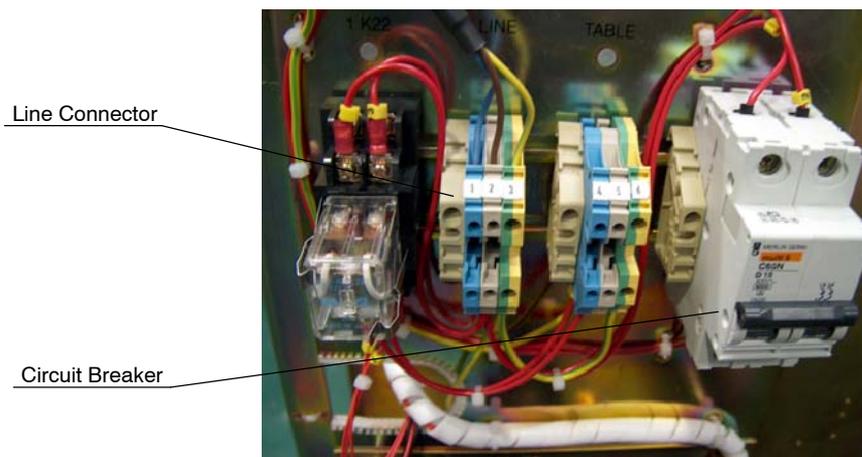
Plastic Cover over Line Fuses

11. THIS POINT ONLY APPLIES TO BATTERY POWERED GENERATORS.

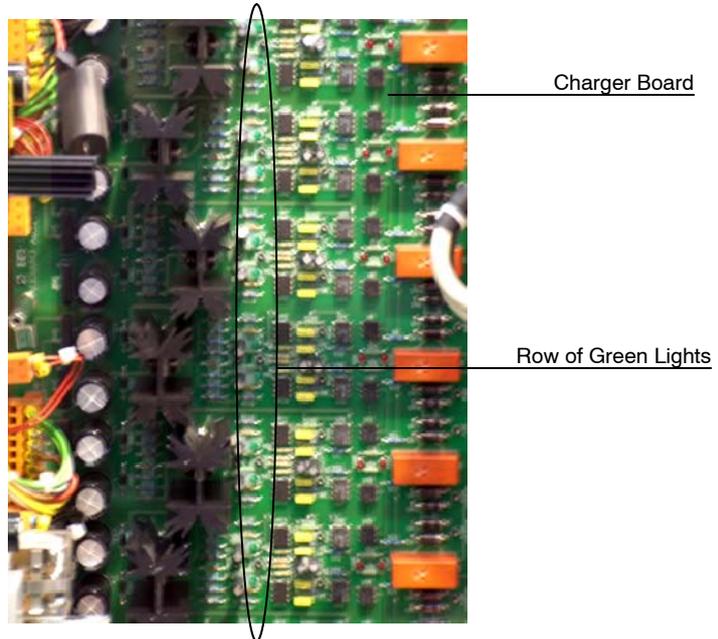
- a. Connector 6J1 on right side of Generator Cabinet (Module 6) is unplugged for safety during transport. Plug it in.



- b. Connect the Line Power cable to Line Connector (wire-1 to left, wire-2 to middle, ground wire to right).



- c. Turn On the Circuit Breaker. Visually check that all green lights are lit on Charger Board.



- d. Visually verify that **LED DL1** (yellow) is **flashing** on the Line Monitor Board (2A3). The **MAX and MIN LEDs** (red) on the Line Monitor Board check the line coming in, **neither should be on**.

Potentiometer POT1 is factory adjusted. If MAX or MIN LED is ON, first check that Mains Voltage is according to specifications. If Mains Voltage is correct, adjust POT1 (CW up, CCW lower) measuring between TP-1 and TP-2 on Line Monitor Board. Potentiometer adjustment should be:

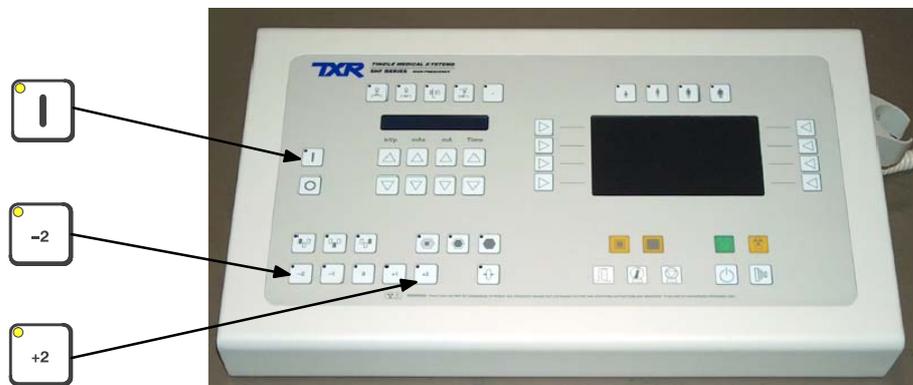
$$\text{Potentiometer} = \frac{\text{Mains Voltage}}{\text{Nominal Voltage}} \times 2.5$$



2.2 CONFIGURING THE WORKSTATIONS

1. With the Generator OFF, make sure Dip Switch 3 of Switch #2 on the ATP Console CPU Board is placed in the up (ON) position (Service Mode enabled).

2. Turn ON the Line Power. Enter in configuration mode by holding pressed the "ON" push-button and then simultaneously press "+2" and "-2" density push-buttons, until all the workstations push-buttons are illuminated.



3. Results you should see:

A display of numbers will be visible in the kVp, mAs, and mA LCD Display. The visible numbers will either be 0, 1, 2 etc.

The Console is equipped to operate in five different modes (workstations). The five push-buttons at the top left provides a way to program for different operations.

4. Select the first workstation to be configured by pressing the respective push-button, only this push-button blink and the console shows one of the following values:

DISPLAY	FUNCTION	VALUE	DESCRIPTION
1 st Value	SELECT THE TUBE	0	No-configured workstation
		1	Tube-1
		2	Tube-2
2 nd Value	SELECT THE DEVICE (WORKING MODE)	0	Direct (No Bucky)
		1	Bucky-1
		2	Bucky-2
		3	Standard Tomo *1)
		4	Standard RF
3 rd Value	SELECT THE ION CHAMBERS BEING USED (ONLY WITH AEC)	0	No AEC
		1	Ion Chamber-1
		2	Ion Chamber-2
		3	Ion Chamber-3
		4	Ion Chamber-4
<p><i>Notes. - Some of listed values are not configurable depending on the Generator model .</i></p> <p><i>*1) Only when the Tomo is controlled by the Generator.</i></p>			

5. Set the new value by pressing the corresponding “Increase” or “Decrease” push-buttons below each Display. When the first value is “0” the second and third value are “0”.

6. **Configure each workstations** as indicated:

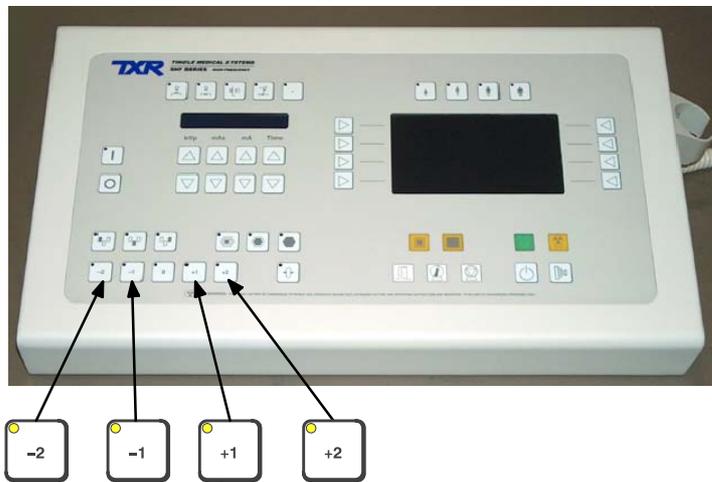
Icon	Workstation (Write down the values set)	First Value	Second Value	Third Value
	<p>Press the First Workstation:</p> <ul style="list-style-type: none"> - The LED inside the push-button will begin blinking. - If using Table-Top set: <ul style="list-style-type: none"> first value to "1", second value to "0", third value to "0". - If not using Table-Top set all values to "0". 			
	<p>Press the Second Workstation:</p> <ul style="list-style-type: none"> - The LED inside the push-button will begin blinking. - If using Table-Top set: <ul style="list-style-type: none"> first value to "1", second value to "0" for Grid or "1" for Bucky, third value to "0" unless using AEC. - If not using Table-Top set all values to "0". 			
	<p>Press the Third Workstation:</p> <ul style="list-style-type: none"> - The LED inside the push-button will begin blinking. - If using Wall Bucky set: <ul style="list-style-type: none"> first value to "1", second value to "0" for Grid or "2" for Bucky, third value to "0" unless using AEC. - If not using Wall Bucky set all values to "0". 			
	<p>Press the Fourth Workstation:</p> <ul style="list-style-type: none"> - The LED inside the push-button will begin blinking. - Set all values to "0". 			
	<p>Press the Fifth Workstation:</p> <ul style="list-style-type: none"> - The LED inside the push-button will begin blinking. - Set all values to "0". 			

7. Exit from configuration by pressing simultaneously the "-2" and "+2" pushbuttons. **Configuration of the Workstations is now completed.**



2.3 CONFIGURING THE TUBE TYPE

1. With the Generator OFF, make sure Dip Switch 3 of Switch #2 on the ATP Console CPU Board is placed in the up (ON) position (Service Mode enabled).
2. Turn ON the Line Power and the Console.
3. Select a workstation related to the X-ray Tube to be configured.
4. To configure the X-ray Tube type is necessary to enter in calibration mode by pressing the “+2” and “-2” push-buttons simultaneously. The light of the selected workstation blinks.

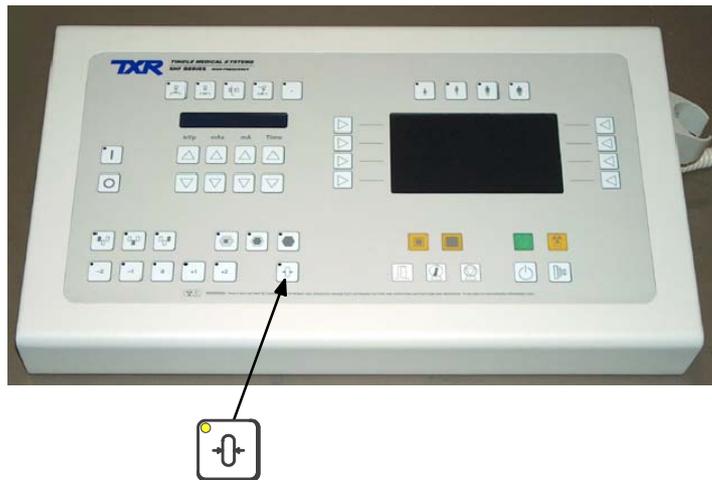


5. Press the “mA Increase” push-button until you reach the maximum mA capacity of the unit. Press the “mA Increase” push-button two more steps, “E02” Extended Memory code will appear on the mA Display.
6. In order to configure the X-ray Tube type and model, press the “+1” or “-1” push-buttons until one of the Tube Type numbers listed below is shown on the kVp Display.

Normally one of the following three Tube capacities is chosen.

TUBE NUMBER (kVp Display)	TUBE CODE (ID) (mAs Display)	MODEL	FOCAL SPOT	POWER RATINGS		KHU
				LS (kW)	HS (kW)	
001	139	TOSHIBA E7239X	1.0 / 2.0	22 / 45	-	133
003	140	TOSHIBA E7242X	0.6 / 1.5	18 / 49	-	187
004	090	TOSHIBA E7252X	0.6 / 1.2	15 / 42	26 / 73	300

7. Verify that the Tube code (ID) showed in the mAs Display is the same of the tube code listed before.
8. Press the “AEC Reset” Push-button to save and permanently store the X-ray Tube configuration.



9. Exit from calibration mode by pressing again the “+2” and “-2” push-buttons simultaneously. At this time, the RAD Displays will indicate all the RAD parameters.

SECTION 3 CALIBRATION

3.1 PREVIOUS TASKS

Before calibration, keep in mind that:

1. For calibration and measure the kVp it is needed a Non-Invasive kVp Meter.

Place and center a Non-Invasive kVp Meter on the X-ray Tube output at the required SID (*refer to the Non-Invasive kVp Meter documentation*).

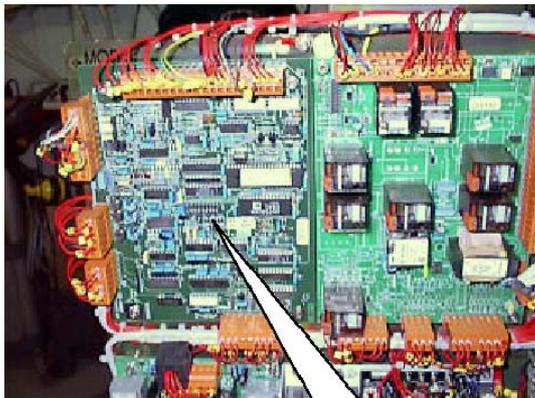
2. For calibration and measure mA or mAs it is needed a mAs Meter plugged to the banana connections on the HV Transformer.

With the Generator power OFF, remove the cross bar (link plate) between the banana plug connections on the HV Transformer. Connect the mAs Meter to the banana plug connections to measure mA or mAs. Remember to re-install the cross bar between the banana plug connections after removing the mAs meter.

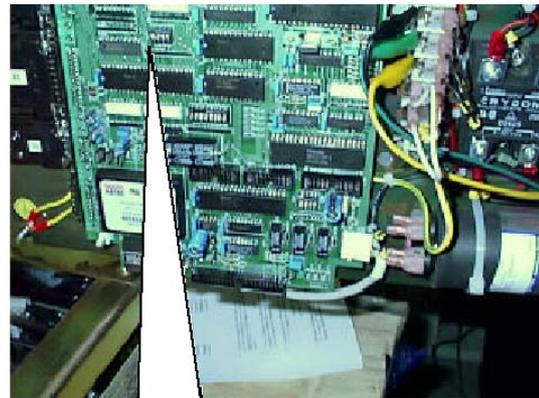
Remove the cross bar (link) and plug the mAs meter here.



3. With the Generator OFF, make sure Dip Switch 3 of Switch #2 on the ATP Console CPU Board is placed in the up (ON) position (Service Mode enabled).
4. During calibration procedure, verify the position of Dip Switches of Switch #2 of the HT Controller Board (A3000-xx). This board is located on Module 3 at the hinged door.



Switch #2 on the HT Controller Board



Switch #2 on the ATP Console CPU Board

3.2 DIGITAL KV LOOP OPEN

Extended Memory Location E06 contains the calibration factor for Digital kV Loop Open.

Note 

*Value in E06 Memory Location is only related to the Generator performance (it is not related to the X-ray Tube(s) or another components installed), so value in **this Memory Location is factory adjusted**. Only perform this procedure if the HT Controller Board and/or HV Transformer have been replaced in the unit. For that, refer to the Service Manual - Calibration Chapter.*

3.3 DIGITAL mA LOOP CLOSED

Extended Memory Locations E03 and E05 contain the calibration factor for Digital mA Loop Closed.

Note 

*Values in E03 and E05 Memory Locations are only related to the Generator performance (they are not related to the X-ray Tube(s) installed), so values in **these Memory Locations are factory adjusted**. Only perform this procedure if the HT Controller Board and/or HV Transformer have been replaced in the unit. For that, refer to the Service Manual - Calibration Chapter.*

3.4 AUTO-CALIBRATION OF DIGITAL mA LOOP OPEN

To achieve the most accurate calibration, **this procedure has to be automatically performed by the Generator (Auto-calibration)**.

Calibration procedure will be manually performed only if Auto-calibration is not possible. In this case, refer to the Service Manual (*Calibration Chapter - Section "Manual Calibration of Digital mA Loop Open"*).

1. With the Generator power OFF:
 - Set Dip Switch 2 of Switch #2 on the HT Controller Board (A3000-xx) in "**Off**" position (enables Filament and Rotor Interlocks).
 - Set Dip Switch 4 of Switch #2 on the HT Controller Board (A3000-xx) in "**On**" position (Digital mA Loop Open).



BEFORE STARTING WITH AUTO-CALIBRATION, VERIFY THAT THE CROSS BAR (LINK) BETWEEN THE BANANA PLUG CONNECTIONS ON THE HV TRANSFORMER IS INSTALLED.

Auto-calibration of the Filament Current Numbers is divided in two separated procedures related to the mA stations configured for the Small or Large Focal Spots. Start with the Small Focal Spot (first group) and continue with the Large Focal Spot (second group).

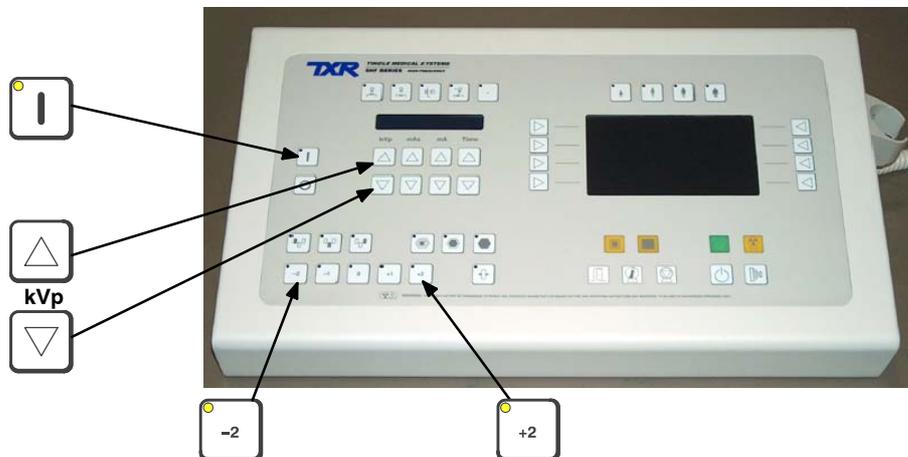


EACH TIME THAT AUTO-CALIBRATION IS ACTIVATED IN A mA STATION (OR IN “E01” MEMORY LOCATION), ALL THE FILAMENT CURRENT NUMBERS OF THE SELECTED FOCAL SPOT ARE AUTOMATICALLY SET TO “344”. SO A NEW COMPLETE CALIBRATION OF THE FILAMENT CURRENT NUMBERS FOR THIS FOCAL SPOT WILL BE REQUIRED.

Auto-calibration starts with the minimum available mA station for the selected Focal Spot at 50 kV and follows with the other combinations of mA stations for the Focal Spot at the kV break points as indicated in the next table.

mA STATIONS		FILAMENT CURRENT NUMBERS AT kV BREAK POINT			
		40	50	80	120
SMALL FOCAL SPOT	minimum available mA station	↑	↓	→	→
	other mA stations	↑	↓	→	↓
	maximum available mA station	←	←	→	←
LARGE FOCAL SPOT	minimum available mA station	↑	↓	→	→
	other mA stations	↑	↓	→	↓
	maximum available mA station	←	←	→	←

- Turn the Console ON and select the “Direct” workstation for the X-ray Tube selected.
- Enter calibration mode by pressing the “+2” and “-2” push-buttons simultaneously and select one of the configured mA stations for the **Small Focal Spot**.



4. Enter Auto-calibration mode pressing the “Power On” and “kV increase” push-buttons. After releasing both push-buttons, code “**222**” is flashing on the Console accompanied of an alarm waiting confirmation for entering in Auto-calibration mode.

Keep pressed the “kV increase” and “Power On” push-buttons again until code “**222**” disappears on the Console to confirm Auto-calibration mode or press only the “Power On” push-button to leave Auto-calibration mode and return to manual calibration.

Auto-calibration is activated after releasing both push-buttons. At this moment, the Generator will check the mA stations available for the **Small Focal Spot**. A “double-beep” will sound when the verification is completed.

5. Check that the Heat Units available for the X-ray Tube are 100% (kV Display shows “H - -” on the Console).



BEFORE MAKING ANY EXPOSURE IN AUTO-CALIBRATION, VERIFY THAT THE LINK BETWEEN THE BANANA PLUG CONNECTIONS ON THE HV TRANSFORMER IS INSTALLED.

6. Keep fully pressed the Handswitch push-button or use the Exposure Controls on the Console to perform continuous exposures.



Auto-calibration can be stopped momentarily releasing the Handswitch push-button or the Exposure Controls. Do not exit from Auto-calibration before the procedure has been completed.

If the Heat Units available for the X-ray Tube are less than 40%, exposures are inhibited momentarily and code “**111**” will be flashed on the Console accompanied of an alarm. In this case, release the Handswitch or Exposure Controls to stop momentarily the Auto-calibration procedure. The alarm will stop when the X-ray Tube begins to cool and recovers the Heat Units capacity, exposures can be performed again even though code “**111**” is shown on the Console.

At this point, it is recommended to wait until the Heat Units available are closed to the 80% of the X-ray Tube capacity without making any exposure.

Generator tries to calibrate each kV / mA combination for ten (10) attempts (maximum). If calibration is aborted (after ten attempts), code “**888**” will be flashing on the Console until press the “*Power On*” push-button. Calibration can be also aborted due to space charge during calibration of the lowest kV at the highest mA stations for the Focal Spot selected, so code “**777**” will be flashing on the Console until press the “*Power On*” push-button.



IF AUTO-CALIBRATION IS ABORTED (CODE “888” OR “777”), CONTINUE THE AUTO-CALIBRATION PROCEDURE FOR THE OTHER FOCAL SPOT. CHECK AT THE END OF THE AUTO-CALIBRATION PROCEDURE WHICH KV / MA COMBINATIONS HAVE NOT BEEN AUTO-CALIBRATED FOR EACH FOCAL SPOT (THESE COMBINATIONS HAVE THE FILAMENT CURRENT NUMBER SET TO “344”). MANUALLY CALIBRATE THESE KV / MA COMBINATIONS AS EXPLAIN IN THE SERVICE MANUAL (CALIBRATION CHAPTER - MANUAL CALIBRATION OF DIGITAL mA LOOP OPEN).

When Auto-calibration is successfully performed, code “**999**” will be flashing on the Console until press the “*Power On*” push-button to exit from Auto-calibration mode. A double “double-beep” sound and new values displayed on the Console indicates Auto-calibration is deactivated.

7. Repeat the same procedure for the **Large Focal Spot** selecting one of the configured mA stations for the Large Focal Spot previous to enter in Auto-calibration mode.

Before starting the exposures, it is recommended to wait until the Heat Units available are closed to the 80% of the X-ray Tube capacity.

8. After performing both procedures (for Small and Large Focal Spots), select in calibration mode each combination of the available mA stations at the kV break points (40, 50, 80 and 120 kV). Press the “*AEC Reset*” push-button to read on the kV Display the new value of the Filament Current Number stored for each combination and write down the new values in the Data Book.

Note that the highest mA station for Small Focal Spot may have numbers larger than the lowest mA station for Large Focal Spot. This is normal.

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9. Repeat the above calibration process for the second tube.
10. Exit calibration mode.
11. Turn the Generator power OFF and set Dip Switch 4 of Switch #2 on the HT Controller Board in "**Off**" position (Digital mA Loop Closed).

Table 3-1
mA Calibration Numbers

mA STATION	FILAMENT CURRENT NUMBERS AT kV BREAK POINT			
	40	50	80	120
10				
12.5				
16				
20				
25				
32				
40				
50				
64				
80				
100				
125				
160				
200				
250				
320				
400				
500				
640				
800				

Note. - Some Generator models do not contain all the mA stations listed above.

3.5 FINAL CHECKS

Verify that all Configuration and Calibration data have been properly stored in memory.

1. Enter in calibration mode and check that the values noted for the “*Filament Current Numbers*” and “*Extended Memory Locations*” tables of the Data Book are the same that the values displayed and stored in memory. Press the “*AEC Reset*” button to read the stored values.
2. Exit from calibration mode and Service mode.
3. Turn the Generator OFF and verify position of Dip Switches of Switch #2 on the HT Controller Board are:
 - Dip Switch 2 in “**Off**” position (enables Filament and Rotor Interlocks).
 - Dip Switch 4 in “**Off**” position (Digital mA Loop Closed).
4. Set Dip Switch 3 of Switch #2 on the ATP Console CPU Board in “**Off**” position to place the Generator in normal operating mode.

SECTION 4 OPERATION OF ANATOMICAL PROGRAMMER (APR)

Anatomical Programmer (APR) module is comprised of the controls which select the Patient Size and Display Selectors. The process is shown on the APR Display.

There are different version of software. make sure all functions work, for example make sure that you get a centimeters reading and it changes when press the “*Thickness Increase or Decrease*” push-buttons.

The APR techniques are factory pre-programmed according to different standard technique sets in a X-Y matrix format that combines eight Body Regions (Y-axis) with eight Anatomical Views (X-axis). Besides the radiographic parameters, selections of the workstation or AEC (density, fields and film / screen combination) can be assigned to the APR techniques. These selections will be always common for all the patient sizes (second bank) of each Anatomical View. These techniques may be modified and stored anew into non-volatile memory by the operator.

The APR techniques are intended as a guide line only. Accurate exposure factors are dependent among other things on Bucky grid factors, table top absorption, screen film combinations and film processing.

Note 

APR language may be changed, just after selecting one of the patient size (APR activation), pressing the “Power ON” push-button. Language selected remains stored even after the equipment is turned Off. (Only for generators equipped with this option).

Note 

If an APR technique is to be stored with AEC parameters, a suitable back-up time (and/or mAs) MUST be stored in the programme by the operator.



APR DISPLAY: Shows the following Body Regions: “Skull”, “Facial”, “Upper Trunk”, “Lower Trunk”, “Chest”, “Extremity on Bucky”, “Extremity on Table Top” and “Special”. When a Body Region has been selected, the APR Display shows directly all its respective Anatomical Views. In some cases an Anatomical View may show a sub-menu with its respective Anatomical Views. (Refer to Table 4-1).

When the APR selection is completed, the APR Display shows the final selection (Body Region and Anatomical View) with indication of the SID (Source Image Distance) and the Thickness in centimeters of the Body Region to be expose, and the Console indicates the respective workstation, AEC selections and the technique parameters.

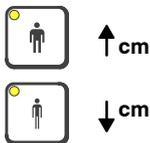
Because each area of the APR Display is limited in length to eight characters, some regions and views are abbreviated.



APR MODE SELECTION: This push-button is used to activate (lighted) or deactivate the APR mode.



SECOND DATABANK: Two different databanks can be used. The access to the first databank is directly when the APR mode is activated. Press also this push-button to access to the second databank (push-buttons lighted).



THICKNESS INCREASE / DECREASE: These push-buttons are used to increase or decrease the thickness in centimeters of the body area to be expose, in order to adjust the parameters of the APR program to the patient size.

This data is shown on the right side of the APR Display after selecting the Body Region and Anatomical View. Thickness can be also modified by using the APR push-buttons 7 and 8 (to increase or decrease cm) (refer Illustration 4-1).

Any thickness variation means to change the mAs factor in the technique, and only when it is not possible the thickness variation changes the kV factor.



DISPLAY SELECTORS: Each push-button is related with the nearest area of the APR Display, and used to select one of the displayed Body Regions or Anatomical Views, SID information and Thickness (cm) (refer Illustration 4-1).

With this APR mode, the kV / mAs factors of the technique can be balanced by using the APR push-buttons 1 and 4 (to increase or decrease kV). It changes both factor and adjusts the contrast and/or brightness, in order to get an equivalent exposure.

If balancing kV / mAs factors to obtain a new equivalent exposure, the RAD Display shows lines (- - -) on the mA, mAs and Time values, it means the mAs value has reached its limit and the new technique is not equivalent to the original selection. Press the “On” push-button to remove the lines (- - -) and display all the values.

Also, any Film/Screen combination can be selected. A new selection means to change the mAs factor in the technique, and only when it is not possible it changes the kV factor. This operation maintains an equivalent exposure.

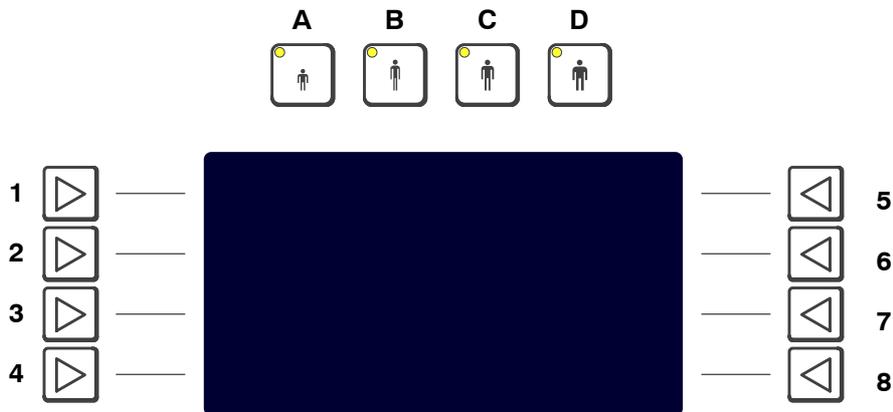
SID indication can be modified by using the APR push-buttons 5 and 6 (to increase or decrease SID) (*refer to Illustration 4-1*).

Note 

SID indication on the Display is only an information data stored by the operator, it has not effect on the APR technique.

After the final selection of a Body Region and Anatomical View (it is shown on the APR Display), go back to Body Regions level pressing the push-button 2, or go back to Anatomical Views level pressing the push-button 3.

**Illustration 4-1
APR Push-buttons**



APR Push-buttons	Functions
A	Second Databank
B - D	Thickness Increase / Decrease
C	APR : ON / OFF
1 to 8	Body Region and Anatomical View Selection
1 - 4	Balance of kV / mAs for equivalent exposure
2	Go back to Body Regions level
3	Go back to Anatomical Views level
5 - 6	SID Increase / Decrease
7 - 8	Thickness Increase / Decrease
simultaneously 2 and 6	New APR technique storage

**Table 4-1
APR Matrix (English)**

APR MATRIX	ANATOMICAL VIEWS							
	View-1	View-2	View-3	View-4	View-5	View-6	View-7	View-8
SKULL	AP / PA	LATERAL	TOWNES	MASTOID	MASTOID LATERAL	TEMPORO-MANDIBULAR JOINT	SELLA TURCICA AP	SELLA TURCICA LATERAL
FACIAL	AP / PA	LATERAL	WATERS	ZYGOMA ARCH	OPTIC FORAMINA	MANDIBLE LATERAL	STENVERS	LAW'S
UPPER TRUNK	CERVICAL AP	CERVICAL LATERAL	THORACIC AP	THORACIC LATERAL	THORACIC SWIMMER	SCAPULA LATERAL	SHOULDER	CLAVICLE
LOWER TRUNK	LUMBAR AP	LUMBAR LATERAL	PELVIS AP	SACRUM AP	SACRUM LATERAL	ABDOMEN AP	ABDOMEN LATERAL	PELVI-METRY
CHEST	AP / PA	LATERAL	60° CART	UPPER RIBS	LOWER RIBS	STERNUM	STERNUM LATERAL	LORDOTIC
EXTREM BUCKY	HIP AP	HIP FROG	FEMUR	KNEE AP	KNEE LATERAL	KNEE AXIAL	HUMERUS	HUMERUS TRANS-THORACIC
EXTREM TBL TOP	HAND	WRIST	FOREARM	ELBOW	FOOT	ANKLE	TIBIA	KNEE
SPECIAL	TOMO	AUX	CHANGER 1	CHANGER 2	USER-1	USER-2	USER-3	CONTRAST

SUB-MENU OF EXTREM TBL TOP	ANATOMICAL VIEWS							
	View-1	View-2	View-3	View-4	View-5	View-6	View-7	View-8
HAND	PA	LATERAL	OBLIQUE	FINGERS	-	-	-	-
WRIST	PA	LATERAL	OBLIQUE	-	-	-	-	-
FOREARM	PA	LATERAL	OBLIQUE	-	-	-	-	-
ELBOW	PA	LATERAL	AXIAL	-	-	-	-	-
FOOT	PA	LATERAL	OBLIQUE	TOES	-	-	-	-
ANKLE	PA	LATERAL	OBLIQUE	-	-	-	-	-
TIBIA	PA	LATERAL	OBLIQUE	-	-	-	-	-
KNEE	PA	LATERAL	AXIAL	-	-	-	-	-

SUB-MENU OF SPECIAL	ANATOMICAL VIEWS							
	View-1	View-2	View-3	View-4	View-5	View-6	View-7	View-8
CONTRAST	GALL BLADDER	STOMACH AP	STOMACH LATERAL	COLON	AIR CONTRAST	IVP	ESOPH 40	ESOPH 72

4.1 APR TECHNIQUE CHANGES

The APR techniques are factory pre-programmed to standard technique sets. All the parameters and selections for the APR techniques may be modified by the operator and stored in the non-volatile memory for later use.

To store different techniques, select the region of interest and the centimeters for the technique you are using.

If the operator determines that some factors in an APR technique should be re-programmed, use the following procedure:

1. Select an APR technique (Body Region and Anatomical View).
2. Modify the factors, thickness (cm) and selections of workstation or AEC which require to be re-programmed.
3. Verify that all factors of the technique are at the required values.
4. Simultaneously press the push-buttons 2-6 of the APR Display to store the new technique. A tone (sound) indicates it is stored.

The newly selected technique is now stored in memory and can be recalled for future examinations.

Note 

This procedure only changes the technique values of the selected patient size, repeat the procedure for the other patient sizes.

Illustration 4-2
APR Storage Push-buttons

