

**GE Medical Systems** 

# **Technical Publications**

# 2198176–100 Revision 7

# Omega IV and V Calibration sm Service Manual

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# **ATTENTION**

### LES APPAREILS À RAYONS X SONT DANGEREUX À LA FOIS POUR LE PATIENT ET POUR LE MANIPULATEUR SI LES MESURES DE PROTECTION NE SONT PAS STRICTEMENT APPLIQUEES

Bien que cet appareil soit construit selon les normes de sécurité les plus sévères, la source de rayonnement X représente un danger lorsque le manipulateur est non qualifié ou non averti. Une exposition excessive au rayonnement X entraîne des dommages à l'organisme.

Par conséquent, toutes les précautions doivent être prises pour éviter que les personnes non autorisées ou non qualifiées utilisent cet appareil créant ainsi un danger pour les autres et pour elles-mêmes.

Avant chaque manipulation, les personnes qualifiées et autorisées à se servir de cet appareil doivent se renseigner sur les mesures de protection établies par la Commission Internationale de la Protection Radiologique, Annales 26 : Recommandations de la Commission Internationale sur la Protection Radiologique et les normes nationales en vigueur.

# WARNING

### X-RAY EQUIPMENT IS DANGEROUS TO BOTH PATIENT AND OPERATOR UNLESS MEASURES OF PROTECTION ARE STRICTLY OBSERVED

Though this equipment is built to the highest standards of electrical and mechanical safety, the useful x-ray beam becomes a source of danger in the hands of the unauthorized or unqualified operator. Excessive exposure to x-radiation causes damage to human tissue.

Therefore, adequate precautions must be taken to prevent unauthorized or unqualified persons from operating this equipment or exposing themselves or others to its radiation.

Before operation, persons qualified and authorized to operate this equipment should be familiar with the Recommendations of the International Commission on Radiological Protection, contained in Annals Number 26 of the ICRP, and with applicable national standards.

# ATENCION

### LOS APARATOS DE RAYOS X SON PELIGROSOS PARA EL PACIENTE Y EL MANIPULADOR CUANDO LAS NORMAS DE PROTECCION NO ESTAN OBSERVADAS

Aunque este aparato está construido según las normas de seguridad más estrictas, la radiación X constituye un peligro al ser manipulado por personas no autorizadas o incompetentes. Una exposición excesiva a la radiación X puede causar daños al organismo.

Por consiguiente, se deberán tomar todas las precauciones necesarias para evitar que las personas incompetentes o no autorizadas utilicen este aparato, lo que sería un peligro para los demás y para sí mismas.

Antes de efectuar las manipulaciones, las personas habilitadas y competentes en el uso de este aparato, deberán informarse sobre las normas de protección fijadas por la Comisión Internacional de la Protección Radiológica, Anales No 26: Recomendaciónes de la Comisión Internacional sobre la Protección Radiológica y normas nacionales.

# ACHTUNG

# RÖNTGENAPPARATE SIND EINE GEFAHR FÜR PATIENTEN SOWIE BEDIENUNGSPERSONAL, WENN DIE GELTENDEN SICHERHEITSVORKEHRUNGEN NICHT GENAU BEACHTET WERDEN

Dieser Apparat entspricht in seiner Bauweise strengsten elektrischen und mechanischen Sichereitsnormen, doch in den Händen unbefugter oder unqualifizierter Personen wird er zu einer Gefahrenquelle. Übermäßige Röntgenbestrahlung ist für den menschlichen Organismus schädlich.

Deswegen sind hinreichende Vorsichtsmaßnahmen erforderlich, um zu verhindern, daßunbefugte oder unqualifizierte Personen solche Geräte bedienen oder sich selbst und andere Personen deren Bestrahlung aussetzen können.

Vor Inbetriebnahme dieses Apparats sollte sich das qualifizierte und befugte Bedienungspersonal mit den geltenden Kriterien für den gefahrlosen Strahleneinsatz durch sorgfältiges Studium des Hefts Nr. 26 der Internationalen Kommission für Strahlenschutz (ICRP) vertraut machen: Empfehlungen der Internationalen Kommission für Strahlenschutz und anderer nationaler Normenbehörden.

# **WARNING** VOLTAGE PRESENT

Before any intervention:

- 1. Switch **OFF** CB2 on the AC Power Distribution (VPE1 A2 A25) in Positioner Cabinet.
- 2. Switch **OFF** Positioner Cabinet Circuit Breaker in Generator Power Cabinet.

# LOCK OUT/ TAG OUT

When necessary, perform the following lock out / tag out procedure:

- 1. Cut the customer power distribution cabinet from its energy source.
- 2. Inform all concerned parties of the lockout.
- 3. Lock and put a lockout label on the cabinet.
- 4. Verify the absence of voltage in the cabinet.
- 5. Proceed with service to the equipment.
- 6. Unlock the cabinet and remove the label from the cabinet.
- 7. Power–up the system.

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# **IMPORTANT INSTRUCTION**

This documentation is only available for "Cal & Config software"

Do not use Cal & Config software and documentation for Advantx-E system with "Roadrunner" CPU



Use "Positioner Setup Tool" (PST) software for Innova Systems & all Advantx-E systems (Documentation is part of the software)

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### **REVISION HISTORY**

REV	DATE	REASON FOR CHANGE
А	December, 1997	Preliminary release
0	February, 1998	Updated Release
1	February, 2000	Update (ZID1M3). Added Cal Lat & Vert in JC RG012, changed "TSSC" to "control panel or TSSC".
2	April, 2000	For ZID1M4: BUCge49834
3	November, 2000	For ZID2M3 : Introdution of OMEGA V. Added JC RG007B and RG017
4	February, 2002	<ul> <li>Updated with Omega IV and Omega V designations.</li> <li>RG017 updated TSCC &amp; Smart Box/Smart Handle function identification)</li> </ul>
5	April 2002	Important instruction added (page iii) for Advantx-E system with "Roadrunner" CPU.
6	February 2004	Added Jobcard RG001 – Table Calibration. Updated RG013 with Positioner service tools software.
7	October 2004	Added Chapter 2 – Jobcards for TSUI Component Calibration.

### LIST OF EFFECTIVE PAGES

PAGE NUMBER	REVISION NUMBER	PAGE NUMBER	REVISION NUMBER	PAGE NUMBER	REVISION NUMBER
Title page Safety Instruction	7				
i thru vi	7				
1-1 thru 1-82	7				
2-1 thru 2-18	7				

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### **CHAPTER 1 – ADJUSTMENTS**

### SECTION 1 INTRODUCTION

1–1 Purpose

This chapter describes the adjustments for OMEGA IV and OMEGA V tables.

# WARNING

THE TABLE IS FACTORY ADJUSTED BEFORE SHIPMENT. DO NOT MAKE ADJUSTMENTS UNLESS TABLE HAS FAILED THE FUNCTIONAL CHECKS.

Details of the adjustments are described in Job Cards RG001 to RG016.

Whenever possible, each adjustment procedure conforms to the following sequence:

- 1. Removal of components/parts to access the part requiring adjustment.
- 2. Actual adjustment procedure.
- 3. If required, partial or complete re-assembly of removed components/parts prior to testing that the adjustment corrected the problem.
- 4. Complete re-assembly of removed components/parts and final testing.

WARNING

ELECTRICAL SHOCK HAZARD - MAKE SURE POWER IS ON ONLY WHEN SPECIFICALLY REQUIRED TO PERFORM PART OF AN ADJUSTMENT PROCEDURE. MAKE SURE POWER IS OFF AT ALL OTHER TIMES DURING THE ADJUSTMENT PROCEDURE.

### SECTION 2 TOOLS & DOCUMENTATION REQUIRED

2–1 Standard tools

• Standard Service Engineer's toolkit.

### 2–2 Necessary documentation

• ADVANTX-E LCA System Operating Manual.

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### JOB CARD RG001 - Table Calibration

Time: x h xx min - Personnel: 1 field engineer

### SECTION 1 TOOLS

- Laptop computer.
- LCA CDROM.
- Standard engineer's toolkit.

SECTION 2 PREREQUISITES

• Connect laptop computer to J16 on the Table base. Make sure MIS cable 10942 in Positioner Cabinet is connected to BJ18 on Table Bulkhead (Positioner Cabinet).

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JOB CARD RG001 – Table Calibration

### SECTION 3 TASK DESCRIPTION

### **3–1** Table Top Isocenter Height Determination

- 1. Type? to display the main calibration/configuration menu. Pot-Cal is initially selected.
- 2. Press ENTER with Pot-Cal selected to display its sub-screen.
- 3. Select Table, press ENTER.
- 4. Position L-arm at  $0^{\circ}$ , C-arc at  $0^{\circ}$ .
- 5. Position pivot to + or  $-90^{\circ}$ .
- 6. On the DLX, perform calibration V070 Size and Center DX512. The DLX will be in the technical menu and a cross will be centered on the screen.
- 7. Start a fluoroscopic X–Ray and move the table up or down until the table edge is in the center of the cross on the screen. If the image is not clear, measure the edge of the table, and tape a small metal object (for example, a strip of solder, or preferably a copper plate such as is supplied with the CV phantom) in the center of the table edge. Then use the clear image of the metal object to center the cross.
- 8. Measure the table-top isocenter (distance from the floor to the top of the table) and record this value for use during calibration (see 1).

 Table top isocenter (in millimeters)=

### 1 - Tabletop to Isocenter Value



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JOB CARD RG001 - Table Calibration

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**3–1–1** Low Setpoint (Highest tabletop position)

See 2.

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- 1. Position table at MAX distance from the floor.
- Measure and record distance from the top surface of the table to floor in millimeters:
   Maximum Height (in millimeters)= \_\_\_\_\_\_
- 3. Subtract Isocenter value (see 3–1 Step 8.) from this distance. Record this negative value for the Low Setpoint:

Low Setpoint (in millimeters) = - (Maximum Height - ISO Height) = -\_

- 4. Select **Height**, press **ENTER**; **Low Setpoint** is initially selected on the Pot-Cal sub-screen.
- 5. Press **ENTER** with **Low Setpoint** selected and the next prompt appears: ENTER Cal Position [-10]:
- 6. Enter the negative value for the Low Setpoint and then press ENTER.

### 2 – Low Setpoint (Table Height)



### **Omega IV and V Calibration**

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JOB CARD RG001 - Table Calibration
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**3–1–2** High Setpoint (Lowest tabletop position)

See 3.

- 1. Position table at MIN distance from the floor.
- 2. Measure and record distance from the top of the table to the floor in millimeters:

Minimum Height (in millimeters)=

3. Subtract this distance from that measured at Isocenter (see 3–1–1). Record this positive value for the High Setpoint:

High Setpoint (in millimeters)= (ISO Height – Minimum Height) = \_\_\_\_\_

- 4. Select **High Setpoint**, press **ENTER** and the next prompt appears: ENTER Cal Position [290]:
- 5. Press ENTER
- 6. Enter the positive value for the High Setpoint, press ENTER.
- 7. Press ESC to return to the Table Cal sub-screen.

### 3 – High Setpoint (Table Height)



JOB CARD RG001 - Table Calibration

### SECTION 4 TABLE IN LONGITUDINAL

### 4–1 Low Setpoint

- 1. Place the table at lateral and rotational center position.
- 2. Place the L-Arm in a lateral position (L-arm =  $+90^{\circ}$  or  $-90^{\circ}$ ).
- 3. On the DLX, perform calibration V070 Size and Center DX512. The DLX will be in the technical menu and a cross will be centered on the screen.
- 4. Depending on the Omega IV or Omega V model, proceed as follows:
  - a. Omega IV or Omega V Angio table:

Unlock the table longitudinal brake at control panel or TSSC, manually move the table longitudinally to end-of-travel at the foot end, then move it back slowly (about 10 mm) and stop when you hear the electrical end-of-travel switches operate.

b. Omega IV or Omega V Cardiac table:

Move the table to maximum foot end position and lock the longitudinal brake.

- 5. Place a small metal object (for example, a nut) on the table, under the I.I.
- 6. Start a fluoroscopic X-Ray.
- 7. Move the metal object on the table top until it is in the center of the cross on screen. The small metal object is now at the longitudinal isocenter of the table.
- 8. Mark the isocenter point on the tabletop and measure the distance X1 (in millimeters) from the mark to the tip of the table (see 4).
- 9. Record the distance as a positive number in step 11. as the Low Setpoint value.

### 4 – Low Setpoint (When You Cannot Get Tip of Table to Isocenter)



ENTER Cal Position [140]:

12. Enter the value recorded in step 9. for Low Setpoint and press ENTER.

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### JOB CARD RG001 – Table Calibration

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4–1–1	High	Setpoint
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See 5.

- 1. Depending on the Omega IV or Omega V table model in question, proceed as follows:
  - a. Omega IV or Omega V Angio table:

Manually move the table longitudinally to end-of-travel at the head end, then move it back slowly (about 10 mm) and stop when you hear the electrical end-of-travel switches operate.

b. Omega IV or Omega V Cardio/Neuro table:

Move the table all the way to the L-arm and lock the longitudinal brake.

- 2. Select High Setpoint.
- 3. On the DLX, perform calibration V070 Size and Center DX512. The DLX will be in the technical menu and a cross will be centered on the screen.
- 4. Place a small metal object (for example, a nut) on the table, under the I.I.
- 5. Start a fluoroscopic X-Ray.
- 6. Move the metal object on the table top until it is in the center of the cross on screen. The small metal object is now at the longitudinal high isocenter of the table.
- 7. Mark the isocenter point on the tabletop and measure the distance X2 (in millimeters) from the mark to the tip of the table (see 5).
- 8. Record the distance X2 from the tip of the table to isocenter (refer to Illustration 5).
- 9. Press ENTER and the next prompt appears:

ENTER Cal Position [1820]:

10. Enter the distance in millimeters and press **ENTER**. Press **ESC** once to return to the Pot Cal sub-screen.





JOB CARD RG001 - Table Calibration

### 4–2 Table in lateral

**4–2–1** Isocenter (see 6).

- 1. To avoid a collision, move the table to the extreme foot end position .
- 2. Place the table at lateral and rotation center position.
- 3. Place the C-arc and the pivot at  $0^{\circ}$ .
- 4. Place a small metal object (for example, a nut) on the table, under the II.
- 5. Start a fluoroscopic X-Ray.
- 6. Move the metal object on the table top until it is in the center of the cross on screen. The small metal object is now at the lateral isocenter of the table.
- 7. Draw a line through the small object, parallel to the table top sides.
- 8. Move the II to maximum SID.
- 9. Rotate the L-arm to  $0^{\circ}$  and the pivot to  $+90^{\circ}$  (CW).
- Measure and record the distance in millimeters from the mark to the II metal housing:
   Isocenter mark to II distance = \_\_\_\_\_

### 6 - Iso to II Distance (Table Lateral)



Line mark through center of table

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### **Omega IV and V Calibration**

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JOB CARD RG001 – Table Calibration
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**4–2–2** Low Setpoint (see 7)

- 1. Position table laterally all the way to the patient's right (away from the II)
- 2. Measure and record distance in millimeters from the table-top center to II:

**Patient right distance** (in millimeters)=

3. Subtract Iso to II distance (see 4–2–1) from this distance. Record this negative value for the Low Setpoint:

Low Setpoint (in millimeters)= - (Patient right dist. - Iso Mark to II dist.) = -

- 4. At the Table Cal sub–screen, select Lateral.
- 5. Press **ENTER** twice and the next prompt appears:

ENTER Cal Position [-130]:

6. Enter the distance (as a negative number) in millimeters. Press **ENTER** once to return to the previous level screen.

### 7 – Low Setpoint (Table Lateral)



### **Omega IV and V Calibration**

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JOB CARD RG001 - Table Calibration
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4-2-3 High Setpoint
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See 8.

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- 1. Position the table laterally all the way to the patient's left (towards the II).
- 2. Measure and record the distance in millimeters from the table center to II:

Patient left distance (in millimeters)=

3. Subtract this distance from that measured at Isocenter (see 4–2–1). Record this positive value for the High Setpoint:

High Setpoint (in millimeters) = (Iso Mark to II dist. – Patient left dist.) = \_\_\_\_

4. Select High Setpoint. Press ENTER and the next prompt appears:

ENTER Cal Position [130]:

5. Enter the distance in millimeters and press **ENTER**. Press **ESC** twice to return to the Table Cal sub-screen.

### 8 - High Setpoint (Table Lateral)



6. Reconnect MIS10942 when finished.

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# Omega IV and V Calibration

# Job Card RG 002 1 of 2

Personnel:

 Purpose:
 ADJUSTMENT OF THE LONGITUDINAL
 Version No.:

 POSITION POTENTIOMETER P401/P402
 Date: April 1997

Time:

### SECTION 1 SUPPLIES

• Not applicable

### **SECTION 2**

### TOOLS

• Standard Service Engineer's toolkit.

### SECTION 3 SPECIAL SAFETY PRECAUTIONS

• None

### SECTION 4 PREREQUISITES

• None

### SECTION 5 TASK 1 DESCRIPTION

### 5.1 Accessing and Adjusting the Potentiometer (Stepping Control Table)

- 1. Remove the table top (see Job Card DR 001).
- 2. Remove the servo covers.
- 3. If the table is powered up, go to step 4. If the table is not powered up, go to step 6.
- 4. If the table is powered up, move the table to the head end, as far as the mechanical stop. Connect a multimeter (between pin 4 and pin 5 for the the Angio table and pin 2 and pin 3) for the Cardiac/Neuro table, on the Panning Board terminal (TB1 for the Omega IV Angio table and TB2 for the Omega IV Cardiac/Neuro table) block. The reading should be 0.7 Volts (+ or -2%) for the Omega IV Angio table and 1.0 volts for the Omega IV Cardiac/Neuro table.
- **Note:** For Omega V only: If the table is powered up, move the table to the Foot end, as far as the mechanical stop and connect a multimeter (between pin 4 and 5) on the Panning Board TB1 terminal.

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### ADJUSTMENT OF THE LONGITUDINAL Job Card RG 002 2 of 2 **POSITION POTENTIOMETER P401/P402**

5. If the reading is outside the above limits, use an Allen key loosen the potentiometer fixing bolts and disengage the potentiometer from its drive wheel. Turn the potentiometer to obtain a reading of 0.7 Volts for the Omega IV Angio table (1.0 for the Omega IV Cardiac/Neuro table), then carefully reinstall the potentiometer. Check the reading before tightening the fixing bolts.

Note: For Omega V only: Turn the potentiometer to obtain a 11.2 volts (+ or -2%) reading.

- 6. If the table is not powered up, move the table to the head end, as far as the mechanical stop. Connect a multimeter (between pin 4 and pin 5 for the Angio table and pin 2 and pin 3 for the Cardio/Neuro table) on the Panning Board (TB1 for the Angio table and TB2 for the Cardiac/Neuro table) block. The reading should be 118 ohms for the Angio table. For the Cardiac/Neuro table, disconnect teh XJ3 connector on the panning board. The reading should be 210 ohms.
- Note: For Omega V only: If the table is not powered up, move the table to the Foot end, as far as the mechanical stop and connect a multimeter (between pin 4 and 5) on the Panning Board TB1 terminal. The reading should be 1610 ohms (+ or -2%).
  - 7. If the reading is outside the above limits, use an Allen key loosen the potentiometer fixing bolts and disengage the potentiometer from its drive wheel. Turn the potentiometer to obtain a reading of 118 ohms for the Omega IV Angio table, 1610 ohms for Omega V angio table and 210 ohms for the Omega IV Cardiac/Neuro table. Then carefully reinstall the potentiometer. Check the reading before tightening the fixing bolts.

### **ILLUSTRATION 1** LONGITUDINAL POTENTIOMETER P401/P402 ADJUSTMENT



LONGITUDINAL POTENTIOMETER

PANNING BOARD



**OMEGA IV CARDIAC/NEURO TABLE** 

OMEGA IV AND V ANGIO TABLE

### **Omega IV and V Calibration**

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# Omega IV and V Calibration

Job Card RG 003 1 of 2

Personnel:

 Purpose:
 VERTICAL POTENTIOMETER P300
 Version No.:

 ADJUSTMENT
 Date:

Time:

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### SECTION 1 SUPPLIES

• None

### SECTION 2 TOOLS

• Standard Service Engineer's toolcase.

### SECTION 3 SPECIAL SAFETY PRECAUTIONS

• None.

### SECTION 4 PREREQUISITES

• None.

### SECTION 5 TASK DESCRIPTION

- 1. Drive the table into a middle position. The movement range is 300 mm, from 780 mm (lowest position) to 1080 mm (highest position). The middle position needed is 930 mm from the table top to the floor.
- 2. Remove the foot end trim panel.
- 3. If the table is connected to an electronic positioner control, follow the instructions in step 4. If the table is without external control, adjust the P3000 potentiometer to a value of  $1000 \Omega$  (+ or -4%) between terminal 1 and terminal 2 on the XP300 connector on cable 45258933 (disconnect this cable first).
- 4. If the table is connected to an electronic positioner control, adjust the the P300 potentiometer so that it has a voltage of 5 volts (+ or − 4%) between terminals 2 and 3 on the XJ1 block of the Vertical Drive board.
- 5. Re-install the head end trim panel.

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### VERTICAL POTENTIOMETER P300 ADJUSTMENT

# Job Card RG 003





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Omega IV and V Calibration	Job Card RG 004	1 of 4
Purpose: VERTICAL DRIVE DOWN LIMIT ADJUSTMENT	Version No.: Date: July 1997	
Time: 1 hour	Personnel: 1 field engineer	
SECTION 1 SUPPLIES		
SECTION 2 TOOLS		
• Standard Service Engineer's toolkit.		
SECTION 3 SPECIAL SAFETY PRECAUTIONS		
• None.		
SECTION 4 PREREQUISITES		
• None.		
SECTION 5 TASK DESCRIPTION		
1. Remove head end cover.		
2. Raise the table to its medium position to facilitate a	ccess to the switch (Illustrations 1 and 2).	

**Omega IV and V Calibration** 

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### VERTICAL DRIVE DOWN LIMIT ADJUSTMENT

# Job Card RG 004

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ILLUSTRATION 1 OMEGA IV ANGIO DRIVE DOWN LIMIT SWITCH - PREVIOUS MODEL DOWN LIMIT SWITCH ILLUSTRATION 2 OMEGA IV DRIVE DOWN LIMIT SWITCH – NEW MODELS 10 10 DOWN LIMIT SWITCH

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### VERTICAL DRIVE DOWN LIMIT ADJUSTMENT

Job Card RG 004

3 of 4

- 3. Disconnect the switch connector.
- 4. Check continuity of switch connections with an ohmeter
- 5. Check continuity "bell" between pins  $C_1$  and  $C_3$  (Illustration 3).

### ILLUSTRATION 3 LIMIT SWITCH



- 6. Check the absence of continuity when D lever is pressed.
- 7. If the switch is faulty, replace the switch (see Job Card 009).
- 8. Reconnect the switch connector.
- 9. Loosen the two M5X12 hex socket head cap screws (A and B in Illustration 3).
- 10. Adjust the down limit switch as follows:
  - Lower table and observe the action of the lower limit switch. The switch should activate at least 10 mm before the table reaches its mechanical down limit stop.
  - Adjust the switch actuator up (if the table is too low) or down (if the table is too high).
- 11. Reposition the switch horizontally until it just actuates. Tighten attaching screws and recheck vertical down limit.
- 12. Drive table up and down its full range 2 or 3 times and check the action of the switch at the lower level. Repeat steps 4. to 6. if further adjustment is required.
- 13. Re-install head end cover.

### Omega IV and V Calibration

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VERTICAL DRIVE DOWN LIMIT ADJUSTMENT	Job Card RG 004	4 of 4
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# Omega IV and V Calibration Job Card RG 005

# **RG 005** 1 of 4

### Purpose: VERTICAL DRIVE UP LIMIT SWITCH

Date: July 1997

Version No.:

Personnel: 1 field engineer

### SECTION 1 SUPPLIES

Time: 1 hour

• None.

### SECTION 2 TOOLS

- - Standard Service Engineer's toolkit.

### SECTION 3 SAFETY PRECAUTIONS

• None.

### SECTION 4 PREREQUISITES

• None.

### SECTION 5 TASK DESCRIPTION

- 1. Drive table up in accordance with the Operating Manual until table top is  $42.5 \pm 0.1''$  ( $1080 \pm 3$ mm) from the floor.
- 2. Remove head end cover.
- 3. Loosen attaching screws securing the vertical drive up limit switch to its mounting bracket.

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### VERTICAL DRIVE UP LIMIT SWITCH

# Job Card RG 005





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VERTICAL DRIVE UP LIMIT SWI	тсн Job Card RG 005	3 of 4		
<ul> <li>4. Reposition the switch until it JUST actuates (opens). Tighten attaching screws and recheck vertical up limit. With table fully up, table top should be at 42.5 ± 0.1" (1080 ± 3mm) from floor (see Illustration 2) and rubber bumper should just miss mechanical stop. Repeat steps 3 and 4 if any readjustment is required.</li> </ul>				
ILLUSTRATION 3 VERTICAL UP LIMIT Alt the	ways measure to e top of the table Maximum height			
	Maximum height (mm)= 1080 mm			

### Omega IV and V Calibration

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VERTICAL DRIVE UP LIMIT SWITCH	Job Card RG 005	4 of 4
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Personnel: 1 field engineer

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### Omega IV and V Calibration Job Card RG 006 1 of 2 Version No.: Purpose: LATERAL CENTER LIMIT SWITCH (SW401) **ADJUSTMENT** Date:

Time: 1 hour

### **SECTION 1 SUPPLIES**

• None.

### **SECTION 2** TOOLS

Standard Service Engineer's toolcase. •

### **SECTION 3** SAFETY PRECAUTIONS

None.

### **SECTION 4** PREREQUISITES

None. 

### **SECTION 5** TASK DESCRIPTION

- 1. Drive table fully up in accordance with the Operating Manual.
- 2. Remove lateral bearing covers.
- 3. Move table top laterally full left and then full right while taking measurements to determine full lateral travel. Halve the travel dimension and move table top to this lateral center position.
- 4. Loosen two M2.5 x 16 hex socket button head screws securing lateral center limit switch actuator (secured to left side of lateral plate) (See Illustration 2) and/or two M5 x 20 hex socket head cap screws securing lateral center limit switch bracket (secured to center tube top plate) and reposition actuator/switch until switch JUST actuates (closes).

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### LATERAL CENTER LIMIT SWITCH (SW401) ADJUSTMENT

# Job Card RG 006





- 5. Tighten attaching screws and check for proper external light indication when table is/is not laterally centered. Repeat steps 4 and 5 if any readjustment is required.
- 6. Reinstall lateral bearing covers.
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# Omega IV and V Calibration

### Job Card RG 007 1 of 2

Purpose: RC	DTARY CENTER LIMIT SWITCHES	Version No.:
(SV	W402 & SW404) ADJUSTMENT	Date:
Time:		Personnel:

### Time:

### **SECTION 1 SUPPLIES**

• None.

### **SECTION 2** TOOLS

Standard Service Engineer's toolkit. •

### **SECTION 3** SAFETY PRECAUTIONS

• None.

### **SECTION 4** PREREQUISITES

• None.

### **SECTION 5** TASK DESCRIPTION

- 1. Remove table top and servo covers (See Job Card DR 001).
- 2. Align sides of lateral and rotary plates to place table in the  $0^{\circ}$  position. Using access holes through rotary plate, loosen, do not remove, two M4 x 10 hex socket head cap screws securing each of two rotary center limit switch plates to lateral plate. Reposition each switch until it just actuates (closes). If you cannot hear the actuator click, connect an ohmmeter across the switch terminals.

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### ROTARY CENTER LIMIT SWITCHES (SW402 & SW404) ADJUSTMENT

# Job Card RG 007 2 of 2

### ILLUSTRATION 1 ROTARY CENTER LIMIT SWITCHES



- 3. Tighten attaching screws and for limit switch SW402 (See Illustration), check the ROTATE CNTR indicator on the control panel or TSSC is on when the table is at 0°, 90° and 180°. For limit switch SW404, check for continuity between terminals 7 and 8 on TB2 of panning board. Repeat steps 2 and 3 if any readjustment is required. If indicator operates properly at 0° and 180° but not at 90°, or vice versa, call GE service to replace a worn or missing switch actuator (mounted to bottom of rotary plate).
- 4. Reinstall Servo covers and table top (See IST 006).

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Omega IV and V Calibration Job Card RG 008 1 of 4 Version No.: Purpose: LONGITUDINAL END OF TRAVEL LIMIT SWITCH (SW403) ADJUSTMENT - OMEGA IV ANGIO TABLE Date: April 1997 Personnel: Time: **SECTION 1 SUPPLIES** • None. **SECTION 2** TOOLS • Standard Service Engineer's toolkit. **SECTION 3** SAFETY PRECAUTIONS • None. **SECTION 4** PREREQUISITES • None. Note: This procedure does not apply to the OMEGA IV Cardiac/Neuro table.



- 1700mm +6 -3
- 3. Loosen two M2.5 x 16 hex socket button head screws securing longitudinal end of travel limit switch actuator (foot end) to left hand side rail.
- 4. Extend rails **FULLY** toward head end of table and force them into the mechanical stops to compress the rubber bumper. Adjust position of actuator until the switch (See Illustrations 2 & 3) **JUST** actuates (opens). Tighten attaching screws and then check continuity across switch connections with a Volt-Ohm-Milliammeter to be certain switch is electrically open when in contact with actuator.
- 5. Loosen two M2.5 x 16 hex socket button head screws securing longitudinal end of travel limit switch actuator (head end) to left hand side rail.
- 6. Extend rails **FULLY** toward foot end of table and force into mechanical stop to compress the rubber bumper. Adjust position of actuator until the switch **JUST** actuates (opens). Tighten attaching screws and then check continuity across switch connections with a Volt-Ohm-Milliammeter to be certain switch is electrically open when in contact with actuator.



### Omega IV and V Calibration

### REV 7

LONGITUDINAL END OF TRAVEL LIMIT SWITCH (SW403) ADJUSTMENT – OMEGA IV ANGIO TABLE	Job Card RG 008	4 of 4
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Omega IV and V Calibration	Job Card RG 008B	1 of 6
Purpose: LONGITUDINAL END OF TRAVEL LIMIT SWITCH (SW403) ADJUSTMENT – OMEGA V ANGIO TABLE	Version No.: Date: September 30th, 2000	
Time:	Personnel:	
SECTION 1 SUPPLIES		
• None.		
SECTION 2 TOOLS		
• Standard Service Engineer's toolkit.		
SECTION 3 SAFETY PRECAUTIONS		
• None.		
SECTION 4 PREREQUISITES		
• None.		





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# LONGITUDINAL END OF TRAVEL LIMIT SWITCH Job Card RG 008B 4 of 6 (SW403) ADJUSTMENT - OMEGA V ANGIO TABLE 3. FULLY extend rails toward foot end of table. Adjust the gap between magnet and hall effect at a spacing of 4,5 mm +/- 0,5 mm. 4. FULLY extend rails toward head end of table. Check that the gap between magnet and hall effect is at a spacing of 4,5 mm +/- 0,5 mm. **ILLUSTRATION 4** $\bigcirc$ $\bigcirc$ O 6 C 4,5 mm +0,5 Õ -0,5 )

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## LONGITUDINAL END OF TRAVEL LIMIT SWITCH Job Card RG 008B (SW403) ADJUSTMENT - OMEGA V ANGIO TABLE 5. Loosen the two M5 x 10 button head screws securing the longitudinal end of travel limit switch magnet (head end) to left hand side rail.

6. FULLY extend rails toward foot end of table and force into mechanical stop to compress the rubber bumper. Adjust position of magnet until the effect hall switch JUST opens (see ohmmeter). Move the rails toward head. Tighten attaching screws and then check .

### **ILLUSTRATION 5**



- 7. Loosen the two M5 x 10 button foot screws securing the longitudinal end of travel limit switch magnet (head end) to left hand side rail.
- 8. FULLY extend rails toward head end of table and force into mechanical stop to compress the rubber bumper. Adjust position of magnet until the effect hall switch JUST opens (see ohmmeter). Move the rails toward foot, Tighten attaching screws and then check .
- 9. Reinstall servo covers and table top (See IST 006).

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### LONGITUDINAL END OF TRAVEL LIMIT SWITCH (SW403) ADJUSTMENT – OMEGA V ANGIO TABLE

# Job Card RG 008B 6 of 6

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Omega IV and V Calibration	Job Card RG 009	1 of 4
Purpose: LATERAL TABLE LOCK ADJUSTMENT	Version No.: Date: July 1997	
Time: 1 hour	Personnel: 1 field enginee	r
SECTION 1 SUPPLIES		
• None.		
SECTION 2 TOOLS		
• Standard Service Engineer's toolkit.		
SECTION 3 SAFETY PRECAUTIONS		
• None.		
SECTION 4 PREREQUISITES		
• None.		

# <section-header> LATERAL TABLE LOCK ADJUSTMENT Job Card RG 009 2 of 4 SECTION 5 TASK DESCRIPTION . 1. Drive table fully up in accordance with the Operating Manual. . . 2. Remove lateral bearing covers (See Illustration 1). . . ILLUSTRATION 1 TABLE TOP AND LATERAL BEARING COVERS . EFT LATERAL . . . LEFT LATERAL . . . Difference .

3. The lateral table lock magnet is located below the turntable (see Illustration 2). Activate the magnet (apply power), and use a feeler gauge to check the clearance between the magnet and its interface on the plate. Clearance should be 0.0020" (0.05 mm). If clearance is excessive, the brakes will make a jarring noise when they lock. In this case, turn the 4 adjusting screws to adjust the magnet. If clearance is insufficient, the brakes will rub when they are off. In this case, turn the 4 adjusting screws to provide more space in order to find the right compromise between these two extremes.

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4. Activate magnet and check that table top does not move easily in lateral direction when locked.

5. Reinstall lateral bearing covers (See Illustration 1).

### Omega IV and V Calibration

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LATERAL TABLE LOCK ADJUSTMENT	Job Card RG 009	4 of 4
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# Omega IV and V Calibration Job Card RG 010 1 of 4 Version No.: 2 Purpose: ROTARY TABLE LOCK ADJUSTMENT Date: November 1997 Time: 1 hour Personnel: 1 field engineer **SECTION 1 SUPPLIES** • None. **SECTION 2** TOOLS • Standard Service Engineer's toolkit. **SECTION 3** SAFETY PRECAUTIONS • None. **SECTION 4** PREREQUISITES • None.

# SECTION 5 TASK DESCRIPTION 1. Drive table fully up in accordance with the Operating Manual. 2. Remove lateral bearing covers (See Illustration 1). ILLUSTRATION 1 TABLE TOP AND LATERAL BEARING COVERS FIGHT LATERAL EFT LATERAL LEFT LATERAL EARING COVER

3. With rotary table lock magnets activated (power applied), use a feeler gauge and check clearance between the magnet and its interface on the rotary plate. Clearance should be 0.0020" (0.05 mm).

If clearance is excessive, the brakes will make a jarring noise when they lock. In this case, turn the 4 adjusting screws to lower the magnet away from the turn able. If clearance is insufficient, the brakes will rub when they are off. In this case, turn the 4 adjustment screws to lower the magnet away from the turntable in order to find the right compromise between these two extremes.

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### ROTARY TABLE LOCK ADJUSTMENT

# Job Card RG 010



4. Repeat step 3 for remaining rotary table lock magnet.

5. Deactivate magnets and check that table top does not rotate easily in the locked position.

6. Reinstall lateral bearing covers (See Illustration 1).

### Omega IV and V Calibration

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ROTARY TABLE LOCK ADJUSTMENT	Job Card RG 010	4 of 4
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# Omega IV and V Calibration Job Card RG 011 1 of 4 Version No.: 2 Purpose: LONGITUDINAL BRAKE ADJUSTMENT Date: November 1997 Time: Personnel: 1 field engineer **SECTION 1 SUPPLIES** Set of feeler gauges, 0.05 mm thru 0.5 mm (approx.). ٠ Two (at least) feeler gauges, 0.2 mm (or strips of 0.2 mm radiological film). • Thread-locking compound. • **SECTION 2** TOOLS Standard Service Engineer's toolkit. **SECTION 3** SAFETY PRECAUTIONS • None. **SECTION 4** PREREQUISITES • The brake must be engaged (brake ON).

### LONGITUDINAL BRAKE ADJUSTMENT

Job Card RG 011 2 of 4

### SECTION 5 TASK DESCRIPTION

- 1. Remove table top and servo covers (See Illustration 1).
- 2. Loosen the three setscrews securing the end plate.
- 3. Loosen (by a few turns) the four Allen screws securing the brake to its mounting.
- 4. Free the brake from its mounting by pulling the brake and levering it very slightly left and right.

### ILLUSTRATION 1 DISASSEMBLY OF SERVO COVERS



- 5. Insert the two 0.2 mm shims between the brake and its mounting. The shims must pass through the gap Refer to Illustration 2.
- 6. Push the end plate firmly against the brake.
- 7. Tighten the four Allen screws until the 0.2 mm shims can be moved with a slight effort.
- 8. Apply thread-locking compound to the three setscrews securing the end plate, and tighten the setscrews.





- a. Move the rail manually  $\pm$  20 cm (ensure that you do not move the intermediate rail at the same time).
- b. Return to the initial position. Release the longitudinal brake with the dedicated button on the control panel or TSSC, then move the rail manually 5 cm. Set the brake to ON.
- c. Repeat a) and b) three times. If you detect significant differences in effort required during these three trials, replace the brake with a new one.

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# Omega IV and V Calibration Job Card RG 012 1 of 4 Version No.: Purpose: LATERAL POTENTIOMETER P403 ADJUSTMENT Date: Personnel: Time: **SECTION 1 SUPPLIES** • None. **SECTION 2** TOOLS • Standard Service Engineer's toolkit. **SECTION 3** SAFETY PRECAUTIONS • None. **SECTION 4** PREREQUISITES • None.



- 6. Secure potentiometer in its mounting bracket using hexagon nut and tooth lockwasher supplied with potentiometer. Install spur gear firmly onto the potentiometer shaft (See Illustration 1).
- 7. Move table top full left. Turn lateral potentiometer shaft full clockwise (viewing from shaft end) and then back off slightly (1/8 turn maximum) from the full clockwise position. Secure potentiometer mounting bracket to the casting, being careful not to turn the potentiometer shaft, with two M5 x 20 hex socket head cap screws

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### LATERAL POTENTIOMETER P403 ADJUSTMENT

# Job Card RG 012

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- 8. Check resistance of potentiometer with a Volt-Ohm-Milliammeter; resistance should be 1575 ohms. If required, adjust potentiometer until proper resistance value is obtained.
- 9. Move table top full right, approaching end of travel slowly and carefully. If potentiometer was properly installed and adjusted, at least 1/8 additional turn is available before potentiometer reaches end of travel. If potentiometer appears to reach end of travel before the table top reaches its end of travel, repeat this adjustment procedure. With the table top full right, check resistance of potentiometer with a Volt-Ohm-Milliammeter; resistance should be 440 ohms.
- 10. Secure potentiometer electrical leads to table top pc board PL41, terminals 4, 5 and 6 on TB2.
- 11. Re-install lateral bearing covers (See Illustration 1).

### Omega IV and V Calibration

REV 7

LATERAL POTENTIOMETER P403 ADJUSTMENT	Job Card RG 012	4 of 4
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# Omega IV and V Calibration

### Job Card RG 013 1 of 14

Version No.: 2 LONGITUDINAL, LATERAL AND VERTICAL Purpose: TRAVEL CALIBRATION Date: October 1999 Personnel:

Time:

### **SECTION 1 SUPPLIES**

• None.

### **SECTION 2** TOOLS

- Standard Engineer's toolkit.
- Laptop computer. •
- Positioner service tools software. •
- Tape mesure.
- Plomb line •

### **SECTION 3** SAFETY PRECAUTIONS

• None.

### **SECTION 4** PREREQUISITES

Connect laptop computer to J16 on the Table base. Make sure MIS cable 10942 in Positioner Cabinet is connected to BJ18 on Table Bulkhead (Positioner Cabinet).

<sup>⊢</sup> LONGITUDINAL, LATERAL AND VERTICAL TRAVEL CALIBRATION	Job Card RG	2 of 14
SECTION 5 TASK DESCRIPTION 5.1 Table in Longitudinal 1. Chooose "Calibrate" on Positioner service tools. ILLUSTRATION 2 CALIBRATION WINDOW		
Calibrate Calibrate Configuration	II Tube Pivot C-Arc	able Lateral Longitudinal Height
Others     Smart-Handle A     Smart-H       Q     Select table "Longitudinal"	andle B B <b>Rocker</b>	olus joystick
3. Click "NEXT".		

# LONGITUDINAL, LATERAL AND VERTICAL TRAVEL CALIBRATION

# Job Card RG 013

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### 5.2 Isocenter determination

- 1. Move the L–Arm to –90°, Pivot at 0°, C–Arc at 0°, Elevator at SID max, rotation & lateral table centered.
- 2. Place a plumb line in the middle of the Image Intensifier.

### ILLUSTRATION 3 PLUMB LINE PLACEMENT





LONGITUDINAL, LATERAL AND VERTICAL TRAVEL CALIBRATION		IAL, LATERAL AND VERTICAL TRAVEL N	Job Card RG 013	5 of 14
	4.	Enter X1 measured value in the window.		

	Move the table top to
	max feet position
	like on the picture
Isocenter	Current position :
	When it is in the indicated position,
X1	enter X1 (in mm)
L-arm	93
Make sure the table is at lateral and rotational center	
	And then click on calibrate
	CALIBRATE
< BACK	NEXT > Finish Cancel
5. Click "Calibrate".	
6. Clik " <b>NEXT</b> "	

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## LONGITUDINAL, LATERAL AND VERTICAL TRAVEL CALIBRATION Job Card RG 013 6 of 14

### 5.4 High–Setpoint

1. Angio table:

Unlock the table longitudinal brake at control panel or TSSC, manually move the table longitudinally to end–of–travel at the head end, then move it back slowly (about 10 mm) and stop when you hear the electrical end–of–travel switches operate.

2. Cardiac table:

Move the table to maximum head end position and lock the longitudinal brake.

3. Measure the distance  $\mathbf{X2}$  between the table top head end and the Isocenter point.



Make sure the table is at lateral and rotational center

LONGITUDINAL, LATERAL AND VERTICAL T CALIBRATION	Job Card RG 013	7 of 14
4. Enter X2 measured value in the win	dow.	
ILLUSTRATION 7 ENTER X2 VALUE		
Calibration	Doc	
	Move the table top to max head position	
X2 Isocenter	like on the picture Current position :	
	When it is in the indicated position, enter X2 (in mm)	
	1 003	
Make sure the table is at lateral and rotational center	And then click on calibrate	
	CALIBRATE	
< BACK NEXT	r > Finish Cancel	
<ol> <li>Click "Calibrate".</li> <li>Click "NEXT".</li> </ol>		




LONGITUDINAL, LATERAL AND VERTICAL TRAVEL CALIBRATION	Job Card RC	G 013 9 of 14
5.7 Lateral Calibration 1. Choose "calibrate" on Positioner service tools LLUSTRATION 2 CALIBRATION WINDOW	S Lateral II Divot CArc	Table          X         Lateral         Longitudinal         Height
Calibrate Configuration Configuration Cothers ISO Overritle Park Align Off Pot Control Disable No Travel Limits Anticollision disabled	nart-Handle B Rocker Twist Lever NEXT > Finis	Bolus joystick  Longitudinal Cancel
Positioner Service Tool 2. Select table "Lateral" 3. Click "NEXT"		

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LONGITUDINAL, LATERAL AND VERTICAL TRAVEL CALIBRATION	Job Card RG 013 10 of 14
<ul> <li>5.7.1 Low–Set Point <ol> <li>Move the table top fully LEFT.</li> <li>Measure Z2 .</li> </ol> </li> <li>ILLUSTRATION 3 LOW SET POINT </li> </ul> Calibration	⊠ Doc
Z Iso Z Z Iso Low set point = Z Iso - Z2	Move the table to maximum left position like on the picture Current position : 0 When it is in the indicated position, enter Z2 (in mm) 1200 Enter Z Iso (in mm) And then click on calibrate CALIBRATE
3 Enter <b>72</b> value measured in the window 72	T > Finish Cancel
<ol> <li>Enter ZZ value measured in the window Z2.</li> <li>Enter Z Iso in the window Z Iso</li> <li>Click "Calibrate".</li> <li>Click "NEXT"</li> </ol>	

LONGITUDINAL, LATERAL AND VERTICAL TRAVEL CALIBRATION	Job Card RG 013	11 of 14
<ul> <li>5.7.2 High Set Point.</li> <li>1. Move the table top fully RIGHT.</li> <li>2. Measure Z1.</li> <li>ILLUSTRATION 4</li> <li>HIGH SET POINT</li> <li>Calibration</li> </ul>		Doc
Image: Algorithm   High set point = Z Iso - Z1	Move the table to   max right position   like on the picture   Current position :   0   When it is in the indicated position,   enter Z1 (in mm)   940   Enter Z lso (in mm)   And then click on calibrate	
<ul> <li>Senter Z1 value measured in the window Z1.</li> <li>Enter Z Iso in the window Z Iso</li> <li>Click "Calibrate".</li> <li>Click "NEXT"</li> </ul>	T > Finish Cancel	

LONGITUDINAL, LATER CALIBRATION	AL AND VERTICAL TRAVEL	Job Card R	G 013	12 of 14
5.8 Table in Vertica 1. Choose "Ca	al alibrate" on Positioner service to	ols		
ILLUSTRATION 5				
Calibrate Configuration	ation elect what you want to calibrate	Lateral II Tube Pivot C.Arc	Table Lateral Longitudinal Height	X
Others Diso Override Park Align Off	Smart-Handle A g	Smart-Handle B  Rocker Twist Lever	Bolus joystick	
Pot Control Disable No Travel Limits Anticollision disabled	< EAC)	K NEXT > Fin	ish Cancel	)
2. Select table	"Height".			
3. Click " <b>NEX</b>	Κ <b>Τ</b> ".			

ONGITUDINAL, LATERAL AND VERTICAL TRAVEL CALIBRATION	Job Card RG 013	13 of 14
5.9 High Set Point 1. Move the table fully UP. 2. Measure the distance between the floor and the table SET POINT MEASUREMENT Solution Solution Interpret of the set of the	p panel. Move the table to its high position like on the picture Current position : 0 When it is in the indicated position, enter the measured height 1,080 Enter the isocenter height 1,070 And then click on calibrate	Doc
<ul> <li>3. Enter the measured height value in the window.</li> <li>4. Enter the ISO height value in the window: Iso val</li> <li>5. Click "Calibrate".</li> <li>6. Click "NEXT".</li> </ul>	XT > Finish Cancel	

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LONGITUDINAL, LATERAL AND VERTICAL TRAVEL CALIBRATION	Job Card RG 013 14 of 14
<ul> <li>5.10 Low Set point <ol> <li>Move the table top fully DOWN.</li> <li>Measure the distance between the floor and the top</li> </ol> </li> <li>ILLUSTRATION 7 LOW SET POINT MEASUREMENT </li> </ul> Calibration	panel.
Minimum Height in (mm)	Move the table to its low position like on the picture Current position : 0 When it is in the indicated position, enter the measured height 780 Enter the isocenter height 1,070 And then click on calibrate CALIBRATE
< BACK NEXT	r > Finish Cancel
3. Enter the measured height value in the window.	
4. Enter the ISO height value in the window: Iso value	e = 1070  mm.
5. Click "Calibrate".	
6. Click " <b>NEXT</b> ".	

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## Omega IV and V Calibration Job Card RG 014

#### Purpose: MAINTENANCE CHECKS

Date: Nov 1994

Version No.:

Personnel: 1 field engineer

#### Time:

#### SECTION 1 SUPPLIES

• None

#### SECTION 2 TOOLS REQUIRED

- Standard Service Engineer's toolkit with metric and US wrenches.
- Torque wrench 2 to 20 daN.m

#### SECTION 3 SPECIAL SAFETY PRECAUTIONS

• Not applicable

#### SECTION 4 PREREQUISITES

• None

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#### MAINTENANCE CHECKS

### Job Card RG 014 2 of 2

#### SECTION 5 TASK DESCRIPTION

#### 5.1 Checking table securing bolts

• Use the torque wrench to check that the table securing bolts are still set to 16.3 daN.m (120 ft.lbs) if they are anchor bolts and 12.9 daN.m (95 ft.lbs) if they are through-bolts.

#### 5.2 Cables and connections check

- Check the general condition of all the cables and the tightness of their connectors.
- Check the tightness of the ground connections for the pedestal and the table-side accessories.

#### 5.3 Mechanical checks

- Check the condition of the rails and the smooth movement of the table-top.
- Check the condition of the central tube.
- check the condition and operation of the ball-headed jackscrew.

#### 5.4 Table-top Checks

- With a torque wrench set to 25-30 inch-pounds (2.8 to 3.4 Nm) check the tightness of the screws securing the table-top to the rails.
- Check that the edges of the table-top are in good condition.
- Check that the table-top mattress is in a good serviceable condition.

#### 5.5 Miscellaneous checks

• Check that all indicators on the table-side accessories are in good legible condition.

#### 5.6 Operational checks

- Check for smooth motion in the longitudinal, lateral, vertical, and rotational directions.
- If fitted, check for proper operation of the stepper function.

Time:

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### Omega IV and V Calibration

Job Card RG 015 1 of 6

#### Purpose: TABLE TOP DRIVE BELT – ADJUSTMENT

Date: November 1997

#### Personnel: 1

Version No.: 2

#### SECTION 1 SUPPLIES

• None

#### SECTION 2 TOOLS REQUIRED

- Standard Service Engineer's toolkit with metric and US wrenches.
- Tension tool: for the Omega IV Angio table– tension tool reference number 36005331. for the Omega IV Cardiac/Neuro table– tension tool reference number 2155499 for the Omega V Angio table – tension tool reference number 2155499.

#### SECTION 3 SPECIAL SAFETY PRECAUTIONS

• Not applicable

#### SECTION 4 PREREQUISITES

• None

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#### TABLE TOP DRIVE BELT – ADJUSTMENT

### Job Card RG 015

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#### SECTION 5 TASK DESCRIPTION

- 1. Move the table top rails towards the head end to the maximum limit.
- 2. Switch off the drive belt electric motor (Omega IV Angio table only).
- 3. Make sure the belt is accessible. For the Omega IV Angio table, go to step 4. For the Omega IV Cardiac/ Neuro table, go to step 5. For Omega V Angio table, go to step 6.
- 4. For the Omega IV **Angio** table, place the tension tool (a square weight) on the belt, at the end of the subrail, as shown in Illustration 1.
- 5. For the Omega IV Cardiac/Neuro table, place the tension tool (a weight) on the belt one millimeter from the rotary plate, as shown in Illustration 1.
- 6. For the Omega V Angio table, place the tension tool (a round weight) on the belt, at the end of the subrail, as shown on Illustration 1.
- 7. Place an Allen key in the tension adjustment screw (see Illustration 2).
- 8. Switch the table ON and release the longitudinal brake.
- 9. Turn the screw until the top of the tension tool hook is 34 mm (Omega IV Angio table) ,43 mm (Omega IV Cardiac/Neuro table) or 35 mm (Omega V Angio table) below the top of the rail.





#### **Omega IV and V Calibration**

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#### TABLE TOP DRIVE BELT – ADJUSTMENT

### Job Card RG 015



#### Omega IV and V Calibration

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TABLE TOP DRIVE BELT – ADJUSTMENT	Job Card RG 015	6 of 6
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### Omega IV and V Calibration

### Job Card RG 016 1 of 2

# Purpose: SYNCHRONIZATION CABLES ADJUSTMENT – Version No.: 3 OMEGA IV ANGIO TABLE Date: Novemb

Date: November 2000

Personnel: 1 field engineer

Time:

#### SECTION 1 SUPPLIES

• None

#### SECTION 2 TOOLS REQUIRED

- Standard Service Engineer's toolkit with metric and US wrenches.
- Tension tool supplied with the table. Omega IV Angio table– tension tool number : 36005331

#### SECTION 3 SPECIAL SAFETY PRECAUTIONS

• Not applicable

#### SECTION 4 PREREQUISITES

• None

Note: This procedure does not apply to the Omega IV Cardiac/Neuro or to the Omega V tables.

#### SECTION 5 TASK DESCRIPTION

- 1. Push the table to the head end as far as it will go.
- 2. Make sure the cables are accessible.
- 3. Choose the cable you want to adjust and place the tension adjustment tool (a weight) on the cable.
- 4. Hang the weight on the wire next to the edge of the turntable as shown in Illustration 1.
- 5. Tighten the adjustment screw at the end of the cable until the cable is at the correct tension. The cable deflects the distance D as shown in Illustration 1 at the correct tension.
- 6. Repeat the above procedure for the other cable.



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### Omega IV and V Calibration Job Card RG 017 1 of 4 Version No.: Purpose: LONGITUDINAL MOTOR BELT TENSION ADJUSTMENT -OMEGA IV AND V ANGIO TABLES Date: October 2000 Time: Personnel: 1 field engineer **SECTION 1 SUPPLIES** • None **SECTION 2 TOOLS REQUIRED** Standard Service Engineer's toolkit with metric and US wrenches. ٠ Tension tool supplied with the table. • **SECTION 3** SPECIAL SAFETY PRECAUTIONS • Not applicable **SECTION 4** PREREQUISITES • The table top must be removed. Power must be OFF. • This procedure does not apply to the OMEGA IV Cardiac/Neuro table. Note:

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LONGITUDINAL MOTOR BELT TENSION ADJUSTMENT – OMEGA IV AND V ANGIO TABLES

Job Card RG 017 2 of 4

#### SECTION 5 TASK DESCRIPTION

- 1. Loosen the three screws (Illustration 1) sufficiently to allow slight movement of assembly.
- 2. Position the tension tool on the belt, as shown on Illustration 2.
- 3. Press firmly on the tool (the nominal force is 25 N and the deflection is  $2.4 \pm 0.1$  mm)
- 4. If the tension is correct, the shoulder of the tool is flush with the surface 1 (Illustration 2).
- 5. Adjust screw 3 until the correct tension is obtained.
- 6. Tighten the three screws (Illustration 1).
- 7. Using the tool, check that the tension has not changed. If necessary, repeat the procedure.

#### ILLUSTRATION 1 LONGITUDINAL MOTORIZATION



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#### Omega IV and V Calibration

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LONGITUDINAL MOTOR BELT TENSION ADJUSTMENT -		
OMEGA IV AND V ANGIO TABLES	Job Card RG 01/	4 of 4

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### **CHAPTER 2 – TSUI COMPONENT CALIBRATION**

JOB CARD RG 018 – TSUI JOYSTICK OR SATELLITE ADJUSTMENT	2–3
JOB CARD RG 019 – SMART BOX/SAMART HANDLE – MAIN MENU	2–20

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# Omega IV and V Calibration

### Job Card RG 018 1 of 16

#### Purpose: TSUI JOYSTICK OR SATELLITE ADJUST-MENT

Date: March 2002

Version No.:

Personnel: 1 field engineer

#### SECTION 1 SUPPLIES

Time:

• None

#### SECTION 2 TOOLS REQUIRED

- RS232C ITT interface with cord and isolated jumper (included in Spare Parts)
- VT100 terminal or PC terminal emulator

#### SECTION 3 SPECIAL SAFETY PRECAUTIONS

• Not applicable

#### SECTION 4 PREREQUISITES

• The Advantx System must be operational





TSUI JOYSTICK OR SATELLITE	ADJUSTMENT	Job Card RG 018 4 of 16
5.2 Configuration of VT100	terminal emulation on a Wir	195 or Windows NT PC
	of Hypertermination	
ILLUSTRATION 5		
-		
	Range Accessories	🕨 🖙 Hyperterminal 🔹 🕒 🖓 AT&T Mail.ht
	📼 Internet Explorer	▶ 🛱 Multimedia ► 🕮 CompuServe.ht
?	ित्त Startup	Calculator     Generation      Generation
	🚜 Command Prompt	Character Map NyperTerminal
·	🕰 Windows NT Explorer	🗊 Clipboard Viewer 🛛 🖓 MCI Mail.ht
- - -	Administrative Tools (Common)	Clock     Microsoft BBS.ht
	Adobe Acrobat	Bial-Up Networking
· ·	Adobe Acrobat 4.0	Maging
-	AutoRSPL	► 2 Notepad
	Chameleon UNIX(R) Link 97	Giject Packager
	Leg Cygnus Solutions	▶ ∭3 Paint
<u>&gt;</u>	Le Diskeeper Lite	Company Phone Dialer
	L@ Doors	▶ <u>₩</u> WordPad
- -	EAI License Server	
Netscape SmartUpdate		•
	Matrox PowerDesk NT	•
New Office Document	Microsoft Developer Network	•
	Microsoft Visual C++ 6.0	•
Upen Office Document	Minitab 12 for Windows	▶
	Netscape Communicator	▶
ess <u>P</u> rograms	🙉 New Visio Drawing	•
<b>*</b> Favorites	NFS Maestro Solo	•
	III Norton AntiVirus	
Documents	▶ L@ Pkware	
	L@JPs7	
Barry Settings	<ul> <li>Use Python 1.5</li> <li>Device and Device 00 Entermine Entities</li> </ul>	
.들 I Find	<ul> <li>Rational Rose 38 Enterprise Edition</li> <li>Reset/Out</li> </ul>	
😤 🛷 Help	Carlos Carlos	•
	S Microsoft Access	
	Standar Microsoft Binder	
S	Microsoft Excel	
🧧 🖑 Log Off Vaissje	E Microsoft Outlook	
E R Chut Dame	Microsoft PowerPoint	
Snut Down	107 Microsoft Word	EXT OVR WPH
🏦 Start 🛛 🏉 🏝 💋 👳 🗒	🔹 👪 Visio Technical	👔 🔄 📴 Inbox - Microsoft Outlook 🛛 🕎 Microsof
		,

TSUI JOYSTICK OR SATEL	LITE ADJUSTMENT	Job Card RG 018	6 of 16
4. Select COM1 st ILLUSTRATION 8 5. Enter the COM ILLUSTRATION 9	LITE ADJUSTMENT etial port  Connect To  Connect To  Country/region: France (33)  Arga code: 01  Phone number: [ Connect using: COM1  Phone number: [ Connect using: [COM1  Phone number: [ Connect using: [COM1  Phone number: [ Com1  Phone number: [ Com1 Phone number: [ Phone n	Job Card RG 018	6 of 16
	COM1 Properties         Port Settings         Bits per second:         Data bits:         Barity:         None         Stop bits:         Image: Stop bits: <td>Image: Second state   Image: Second state</td> <td></td>	Image: Second state   Image: Second state	

TSUI JOYSTICK OR SATELLITE ADJUST	Job Card RG 018	7 of 16
6. Select VT100 emulation ILLUSTRATION 10	tsui Properties       ? ×         Connect To       Settings         Function, arrow, and ctrl keys act as         Image:	
	Emulation:         Auto detect         ANSI         Auto detect         Minitel         TTY         Viewdata         VT100         VT52         ASCII Setup         OK       Cancel	
Displays the properties of the current session 7 Save your TSUI-hyperterminal	file	11
8. Switch power ON		
ILLUSTRATION 11		

TSUI JOYSTICK OR SATELLITE ADJUSTMENT	Job Card RG 018	8 of 16
9. Lines of Z letter appear on the screen ILLUSTRATION 12		
Image: second system       Image: second system         File       Edit       View       Call         Image: second system       Image: second system       Image: second system         Image: second system       Image: second system       Image: second system         Image: second system       Image: second system       Image: second system         Image: second system       Image: second system       Image: second system         Image: second system       Image: second system       Image: second system         Image: second system       Image: second system       Image: second system         Image: second system       Image: second system       Image: second system         Image: second system       Image: second system       Image: second system         Image: second system       Image: second system       Image: second system         Image: second system       Image: second system       Image: second system         Image: second system       Image: second system       Image: second system         Image: second system       Image: second system       Image: second system         Image: second system       Image: second system       Image: second system         Image: second system       Image: second system       Image: second system         Image: second system       Image: seco		
Connected 0:01:18 VT100 19200 8-N-1 SCROLL CAPS NUM Ca Terminal COM 1 Parameters	apture Print echo	
10. Type a 'Q' on the keyboard to call up	the Test Main Menu	

TSUI JOYSTICK OR SATELLITE ADJUSTMENT	Job Card RG 018	9 of 16
<ul> <li>5.3 Description of test screens <ol> <li>TSSC</li> <li>Main Menu</li> <li>Type on the terminal keyboard the number of the service of</li></ol></li></ul>	he Joystick Calibration menu option (1).	
00:00:32 connecté VT100 19200 8-N-1 Défi Mai Num Capturer Impri	mer Técho	

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c. Joystick Calibration

The movements of the joystick on two axis (X, Y) is represented by 4 numeric values grading from 0 to 255 for each of the 4 directions, high, low, right and left. The TSUI software must convert the 4 values into 2 X and Y position parameters, grading from +100 to -100.Calibration allows to determine these values for the mechanical standby position of the joystick and for the high, low, left and right mechanical limit stop positions.The information is stored during calibration in the ROM memory of the TSUI.

#### TSUI JOYSTICK OR SATELLITE ADJUSTMENT Job Card RG 018 11 of 16 Procedure: Strike the Spacebar of the keyboard to select the joystick to be calibrated. Leave the joystick in the mechanical standby position, then type a 'Z' to memorize measured • values. Check the calibrated value has been written in the E2PROM field labeled Zero (Center). Place the joystick in the high limit stop position, then strike the '\' key. Check that the value has been correctly written in the E2PROM field labeled Haut (Up). Place the joystick in the low limit stop position, then strike the ' $\downarrow$ ' key. Check that the value has been correctly written in the E2PROM field labeled Bas (Down). Place the joystick in the left limit stop position, then strike the ' $\leftarrow$ ' key. Check that the value has been correctly written in the E2PROM field labeled Gauche (Left). Place the joystick in the right limit stop position, then strike the ' $\rightarrow$ ' key. Check that the value has been correctly written in the E2PROM field labeled Droite (Right). Strike the Spacebar of the keyboard to select the next joystick to be calibrated. d. Type a 'Q' on the keyboard to go back to the Test Main Menu **ILLUSTRATION 15** 🍓 GEMS - HyperTerminal \_ 🗆 × Eichier Edition Affichage Appel Transférer ? 06 98 08 6 Memorized Values E2PROM ETALONNAGE Calibrated Values +100/-100 Joystick Autopos (1) (Right) Droite 239 230 (Up) Haut -2 70 27 (Center) Zero 14 78 (Center) Zero 1 -234 0 72 -227 0 (Left) Gauche (Down) Bas 64 Joystick Contour Filter (1) Immediate (Right) Droite 195 (Up) Haut 203 **ADC Values** (Center) Zero - 1 3 64 (Center) Zero 9 8 69 (Left) Gauche -198 0 61 (Down) Bas -1970 61 Joystick Collimator (1) (Right) Droite 187 (Up) Haut 195 2 -2 68 (Center) Zero 2 68 (Center) Zero -1 (Left) Gauche -199 0 \_ 70 (Down) Bas -195 0 66 . 00:01:33 connecté VT100 19200 8-N-1 Défil Maj Num Capturer Impri

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### TSUI JOYSTICK OR SATELLITE ADJUSTMENT

Job Card RG 018

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e. The following tables allow you to trace the joystick calibration.

TABLE 1

Joystick Autopos	Action	Check	Result
Zero Position	Joystick in central position, type 'Z' on the keyboard	Xcal= Ycal=	
High Position	Joystick in high limit stop position, type ' $\uparrow$ '	Vi= Vcal=	
Low Position	Joystick in low limit stop position, type ' $\downarrow$ '	Vi= Vcal=	
Right Position	Joystick in right limit stop position, type ' $\rightarrow$ '	Vi= Vcal=	
Left Position	Joystick in left limit stop position, type ' $\leftarrow$ '	Vi= Vcal=	

Joystick Contour Filter	Action	(	Check	Result
Zero Position	Joystick in central position, type 'Z' on the keyboard	Xcal=	Ycal=	
High Position	Joystick in high limit stop position, type ' $\uparrow$ '	Vi=	Vcal=	
Low Position	Joystick in low limit stop position, type ' $\downarrow$ '	Vi=	Vcal=	
Right Position	Joystick in right limit stop position, type ' $\rightarrow$ '	Vi=	Vcal=	
Left Position	Joystick in left limit stop position, type ' $\leftarrow$ '	Vi=	Vcal=	

Joystick Collimator	Action	Check	Result
Zero Position	Joystick in central position, type 'Z' on the keyboard	Xcal= Ycal=	
High Position	Joystick in high limit stop position, type ' $\uparrow$ '	Vi= Vcal=	
Low Position	Joystick in low limit stop position, type ' $\downarrow$ '	Vi= Vcal=	
Right Position	Joystick in right limit stop position, type ' $\rightarrow$ '	Vi= Vcal=	
Left Position	Joystick in left limit stop position, type ' $\leftarrow$ '	Vi= Vcal=	

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#### TSUI JOYSTICK OR SATELLITE ADJUSTMENT

### Job Card RG 018

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- 2. Smart Box/ Smart Handle
  - a. Main Menu

Type on the terminal keyboard the number of the Joystick Calibrabration menu option (1).

#### **ILLUSTRATION 16**

<u>Ei</u>	t <b>ruc -</b> chier <u>F</u>	Hyper dition	Terminal Affichage App 3 0 0 0	bel <u>T</u> ransférer	2						
	1 2 3 4 5 6 7	::	<b>Calibra</b> Bus CAN Enables Touchess Entrées PWM Mesure	PWM	sticks						
00	:00:32 c	onnect	6	VT100	19200 8-N-1	Défil	Maj	Num	Capturer	Imprimer l'écho	

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#### TSUI JOYSTICK OR SATELLITE ADJUSTMENT

### Job Card RG 018 14





c. Joystick Calibration

The movements of the joystick on two axis (X, Y) is represented by 4 numeric values grading from 0 to 255 for each of the 4 directions, high, low, right and left. The TSUI software must convert the 4 values into 2 X and Y position parameters, grading from +100 to -100. Calibration allows to determine these values for the mechanical standby position of the joystick and for the high, low, left and right mechanical limit stop positions. The information is stored during calibration in the ROM memory of the TSUI.

#### Procedure:

- Strike the Spacebar of the keyboard to select the joystick to be calibrated.
- Leave the joystick in the mechanical standby position, then type a 'Z' to memorize measured values. Check that the calibrated value has been written in the E2PROM field labeled 'Zero'.
- Place the joystick in the high limit stop position, then strike the '<sup>†</sup>' key. Check that the value has been correctly written in the E2PROM field labeled Haut (High).
- Place the joystick in the low limit stop position, then strike the '↓' key. Check that the value has been correctly written in the E2PROM field labeled Bas (Low).
- Place the joystick in the left limit stop position, then strike the '←' key. Check that the value has been correctly written in the E2PROM field labeled Gauche (Left).
- Place the joystick in the right limit stop position, then strike the ' $\rightarrow$ ' key. Check that the value has been correctly written in the E2PROM field labeled Droite (Right).
- Strike the Spacebar of the keyboard to select the next joystick to be calibrated.
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TSUI JOYSTI	CK OR SATELLITE ADJUSTMENT	Job Card RG 018	15 of 16
	d. Type a 'Q' on the keyboard to go	back to the Test Main Menu	
ILLUSTRATI	.ON 18 <b>© GEMS - HyperTerminal</b> <u>Fichier Edition Affichage Appel Iransférer ?</u>		3
			<u>.</u>
	Memorized Values E2PROM	GE Calibrated Values +100/-100	
	Joystick I2 (0) (Right) Droite -124 (Center) Zero 6 4 90 (Center) Center 137 (Left) Gauche 137	CW) Haut _129 nter) Zero 1 -4 84 CCW) Bas 131 0 88	
	Joystick I3 (0) Ininediate   (Right) Droite 182 ADC Values (Up, Center) Zero -24 -24 58   (Left) Gauche -195 0	) Haut -185 enter) Zero 4 3 69 own) Bas 193 0 66	
	Joystick I4 (0)     (Right) Droite 218     (Up       (Center) Zero     -5     -4     68     (Ce       (Left) Gauche     -207     0     72     (Do	) Haut -212 enter) Zero -20 -21 59 own) Bas 208 0 80	
	Joystick TOGGLE (0) (unused) Droite -34 (Up) (unused) Zero 0 0 0 (Ce (unused) Gauche -34 0 0 (Dc	) Haut -165 Inter) Zero -38 -37 129 Jwn) Bas 90 0 166	1
	00:51:13 connecté VT100 19200 8-N-1 Défi	Maj Num Capturer Imprimer l'écho	

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# TSUI JOYSTICK OR SATELLITE ADJUSTMENT

# Job Card RG 018

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TABLE 2

Orthogonal Joystick I2	Action	Check	Result
Zero Position	Joystick in central position, type 'Z' on the keyboard	Xcal= Ycal=	
High Position	Joystick in high limit stop position, type ' $\uparrow$ '	Vi= Vcal=	
Low Position	Joystick in low limit stop position, type ' $\downarrow$ '	Vi= Vcal=	
Right Position	Joystick in right limit stop position, type ' $\rightarrow$ '	Vi= Vcal=	
Left Position	Joystick in left limit stop position, type ' $\leftarrow$ '	Vi= Vcal=	

Orthogonal Joystick I3	Action		Check	Result
Zero Position	Joystick in central position, type 'Z' on the keyboard	Xcal=	Ycal=	
High Position	Joystick in high limit stop position, type '1'	Vi=	Vcal=	
Low Position	Joystick in low limit stop position, type ' $\downarrow$ '	Vi=	Vcal=	
Right Position	Joystick in right limit stop position, type ' $\rightarrow$ '	Vi=	Vcal=	
Left Position	Joystick in left limit stop position, type ' $\leftarrow$ '	Vi=	Vcal=	

Orthogonal Joystick I4	Action		Check	Result
Zero Position	Joystick in central position, type 'Z' on the keyboard	Xcal=	Ycal=	
High Position	Joystick in high limit stop position, type ' $\uparrow$ '	Vi=	Vcal=	
Low Position	Joystick in low limit stop position, type ' $\downarrow$ '	Vi=	Vcal=	
Right Position	Joystick in right limit stop position, type ' $\rightarrow$ '	Vi=	Vcal=	
Left Position	Joystick in left limit stop position, type ' $\leftarrow$ '	Vi=	Vcal=	

Joystick toggle I6	Action	Check	Result
Zero Position	Joystick in central position, type 'Z' on the keyboard	Xcal= Ycal=	
High Position	Joystick in high limit stop position, type ' $\uparrow$ '	Vi= Vcal=	
Low Position	Joystick in low limit stop position, type ' $\downarrow$ '	Vi= Vcal=	

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# Omega IV and V Calibration

# Job Card RG 019 1 of 2

#### Purpose: SMART BOX/SAMART HANDLE – MAIN MENU

Version No.: 1 Date: oct 2004

Personnel: 1 FE

Time:

## SECTION 1 SUPPLIES

• None

# SECTION 2 TOOLS REQUIRED

- RS232C ITT interface with cord and isolated jumper (2325744)
- VT100 terminal or PC terminal emulator

### SECTION 3 SPECIAL SAFETY PRECAUTIONS

• Not applicable

## SECTION 4 PREREQUISITES

• None

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SMART BOX/SAMART HANDLE – MAIN MENU	Job Card RG 019	2 of 2
SECTION 5 TASK DESCRIPTION a. Main Menu Type on the terminal keyboard the number ILLUSTRATION 1	er of the Joystick Calibrabration menu option	n (1).
1   :   Calibration joysticks   Calibra     2   :   Bus CAN   Bus CAN     3   :   Enables   Enables     4   :   Clavier   Keyboar     5   :   Entrées sorties   Inputs/     6   :   PWM   PWM     7   :   Mesure PWM   PWM Mea	ation Joysticks T s rd YOutputs surement	
DE:00:32 connecté JVT100 19200 8-N-1 Defil	Maj <b>Num</b> Capturer Imprimer l'écho	