



W1250 LOAD MOMENT

Calibration

(Version 1250 V2.0)

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CALIBRATION FOR W1250 V.2.0

The calibration section will guide the technician and explain the procedures to follow, with both the crane and the system, in order to calibrate rapidly and efficiently.

Through out this section, certain paragraphs will be in blue/italic to indicate special troubleshooting notes.

Other paragraphs are in red/bold to indicate verification points and testing.

PREPARATION

First, rig the main hoist line with one or two parts of line; three or four parts can also be acceptable as long as when fully telescoped with the manual extended at 60 degrees, the main hoist block can be grounded. If the hoist line friction is high, the calibration will be more difficult with three or four parts of line. With any rigging chosen, the block must hang straight and directly below the head block.

Obtain a calibration load with a known accurate weight to within 1%. The load must provide near maximum line pull when lifted by the main hoist reeved with one, two , three or four parts of lines as discussed in the above paragraph.

If a load sensor is installed on the auxiliary line, rig the auxiliary line with one or two parts of line. Obtain a calibration load with a known accurate weight to within 1%. It must provide near maximum line pull when lifted with the auxiliary hoist.

Rig the main hoist and the auxiliary hoist on the main boom.

Extend and lower the outriggers as specified in the crane's operating manual.

GENERAL PROCEDURE

If the general calibration data has not been entered by the supplier of this unit, it will have to be entered from the system's keyboard.

Then, before the calibration begins, the sensors need to be verified for good working order through the diagnostic mode. Refer to the diagnostic mode in the trouble shooting section.

The actual calibration will begin with the angle sensor on a fully retracted boom. The length will be calibrated without the manual section using the boom fully retracted and then fully extended.

The main hoist line and the auxiliary hoist line will be calibrated with the boom fully retracted using loads capable of maximum line pull on the minimum parts of lines.

The radiuses are calibrated next. The radius calibration involves lifting only a small load close to 60% capacity fully extended at 65 degrees. First the main boom at four different angle and lengths. When the main boom radius is complete, rig the auxiliary hoist with either the rooster or the first jib often called fly, swing away or lattice jib, do not pull out the manual or pin section. Once completed, extend the manual section, the manual, the rooster and the jib with manual extended will be calibrated following the same procedure. If any other jibs are present, they will be rigged subsequently and calibrated with the same procedure.

Finally, the manual will be retracted, the jibs will be removed and a heavy lift will be performed on the main hoist line to verify and adjust the hoist line friction. The load should be at least 50% of the capacity of the crane and the reeving close to the maximum number of parts of lines.

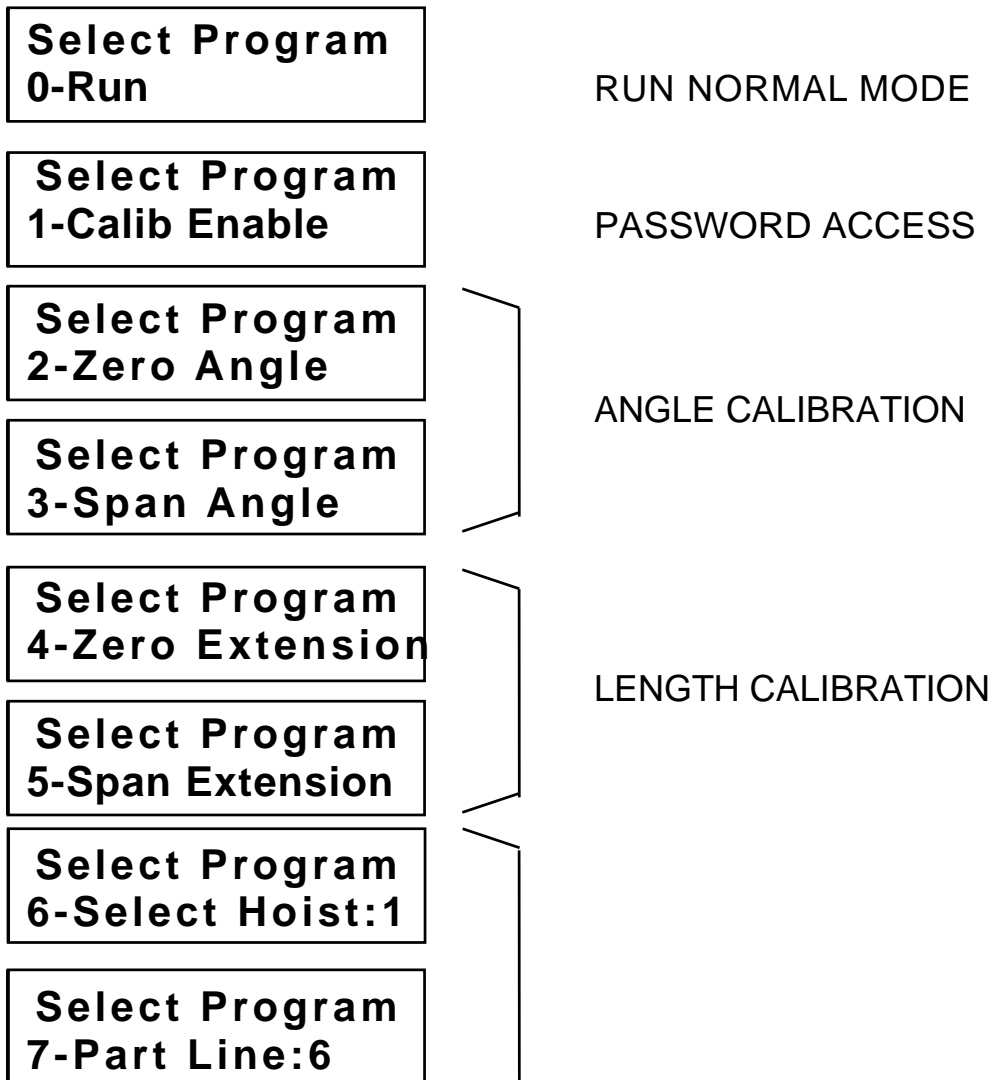
CALIBRATION MENU DESCRIPTION

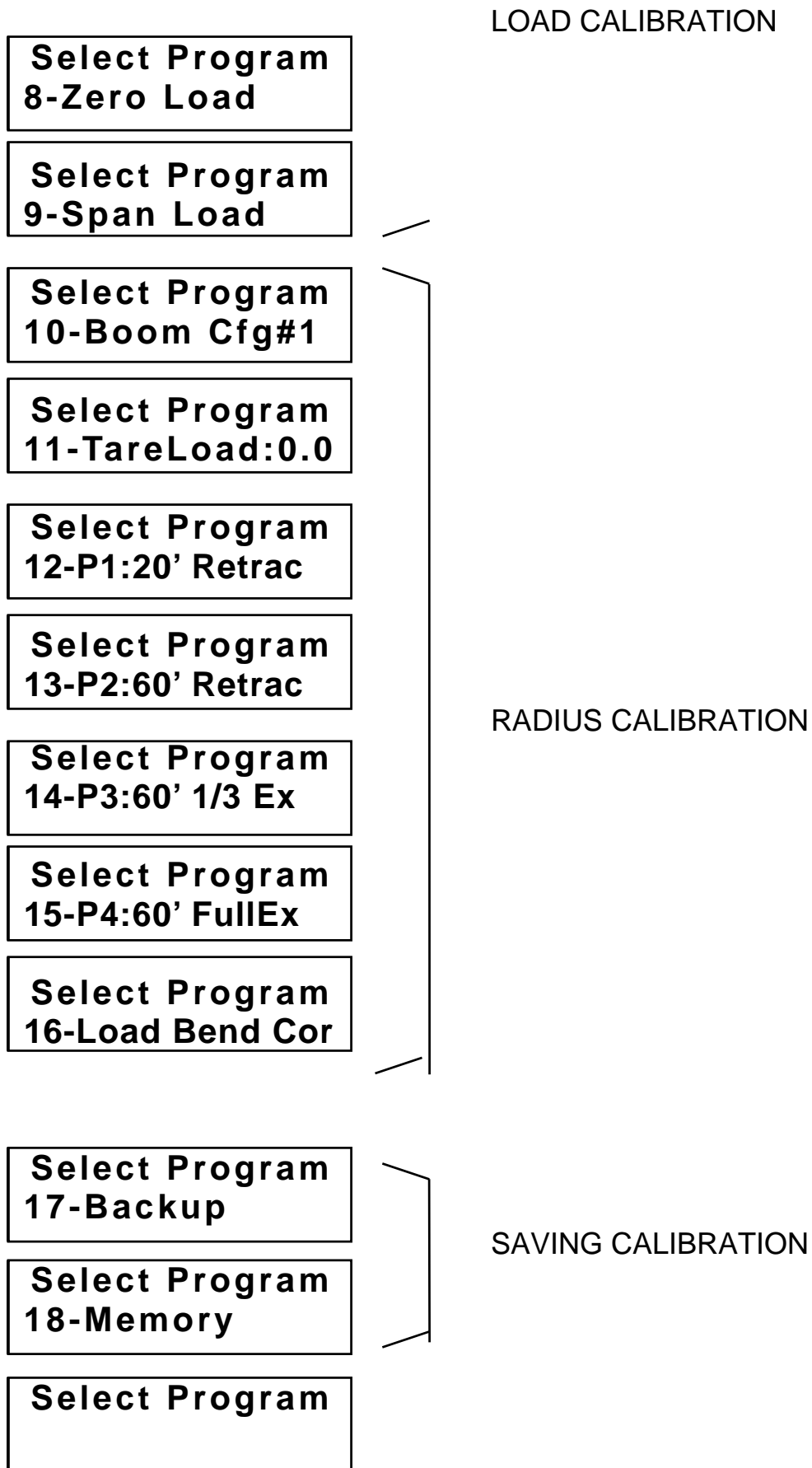
The calibration mode is a separate mode of the 1250 system. It is totally independent of the regular operating mode as if it was a different system. The

purpose of the calibration mode is to adjust the angle sensor, the length sensor, the load sensor, the radius and numerous factors or set points.

The calibration mode is accessed from pressing predetermined buttons on the key pad. The exact buttons and procedures are described in the following section.

The calibration mode is organized in a linear arrangement. A series of some 20 items or sections starting at zero will appear one after the next by using the ROLL UP or ROLL DOWN buttons. Although once in the calibration menu, it is possible to scroll and access any stage of the calibration; it is recommended to follow the progressive order as described in this manual. This will prevent calibration of stages with uncalibrated prerequisite stages.





19-Calib. Data

GENERAL DATA

ENTER CALIBRATION:

To enter calibration, turn system on, wait until the system shows the basic screen with load, angle, radius, etc... Then hold button 8 down, while holding button 8, press button 6 and 5 simultaneously and release all three buttons at the same time. It may be necessary to try again. If button 5 or 6 were pressed first, the system is waiting for a boom or outrigger change. Press button 7

(ESC) to return to the main screen and repeat the button sequence to enter calibration.

The menu should show :

Select Program
0-Run

The system is now in the calibration mode. By pressing the buttons DOWN (#3) or UP (#1), it is possible to scroll through the calibration menu.

RETURN TO NORMAL OPERATING MODE:

Select Program
0-Run

To leave the calibration mode and return to the normal operating mode, simply scroll all the way up to the very first menu: 0 - RUN. Then press the button ENTER (8). The system will automatically return to the operating mode.

If the system was configured during calibration E.G.: Main hoist, 4 part line, Main boom only; It will not retain that configuration and will return to the last configuration setting done during operating mode.

PASSWORD ACCESS:

Select Program
1-Calib Enable

PASSWORD ACCESS

It is possible to scroll through the entire calibration menu with the calibration enable or disable; however, it is not possible to confirm a new calibration or a recalibration unless the MENU 1 shows: ENABLE.

YOUR PASSWORD:_____ Standard: 1, 2, 3, 4, 5

To enable calibration, scroll down to the MENU 1- CALIB DISABLE. Press button ENTER (#8). Like a teller machine, the system will ask for the password. The password has five numbers. The numbers can be found on the upper right corner of each button. Enter the numbers one after the other. If an error is made, start the sequence again at the same point or press the ENTER button twice. Once the system receives the exact password, it will display automatically CALIB ENABLE. The calibration of the system can now be performed.

The CALIB ENABLE will remain activated on a permanent basis whether or not the system is turned off. The calibration must be disabled once completed to prevent accidental operator access.

To disable the calibration, scroll to MENU 1- CALIB ENABLE. Press ENTER. Enter any wrong password and press ENTER. The CALIB. ENABLE will automatically be disabled and display: CALIB. DISABLE.

ANGLE CALIBRATION

<p>Select Program 2-Zero Angle</p>

Scroll down to 2-ZERO ANGLE. Press ENTER.

Boom down to zero degree (main boom parallel to ground). The display will show on the upper right corner the signal in bits.

The important aspect of the display in bits is to verify if the signal is variable through the entire working area of the boom angle, and that the resolution is above 3 bits per degree.

Press ENTER to zero and ENTER to confirm.

**Select Program
3-Span Angle**

Scroll down to 3 -SPAN ANGLE. Press ENTER.

Boom up to 70 degrees (main boom referred to ground). The display will show on the upper right corner the signal in bits. This should be around 625.

Press ENTER to start the blinking of the upper right value and use the set buttons (#2 and #4) to adjust the angle; press ENTER, press ENTER again to confirm.

LENGTH SENSOR CALIBRATION

**Select Program
4-Zero Extension**

Scroll down to 4-ZERO EXTENS. Press ENTER.

Retract the boom fully. The display will show on the upper right corner the signal in bits. This must be above 50 and around 100.

Press ENTER to zero and ENTER to confirm.

Measure the boom length from foot pin to head sheave pin. Keep this measurement. You will need it for the span calibration.

**Select Program
5-Span Extension**

Scroll down to 5-SPAN EXTENS. Press ENTER.

Extend fully and measure the boom length, subtract the retracted boom length from the extended, the result is the extension. This is the value you need to calibrate. The display will show below the signal in bits. This must be above 200.

Press ENTER to start the blinking and use the set buttons (#2 and #4) to adjust the extension value; press ENTER, press ENTER again to confirm.

CHECK POINT 1:

At this stage, the angle and the extension should be working properly. Scroll up to 0-RUN and press ENTER. The system will return to the normal operating mode. Check your angle to see if it shows properly. Check your boom length. The boom length should show 0 feet when fully retracted and the extension calibrated when fully extended. If this is OK, return to the calibration mode.

MAIN HOIST LOAD CALIBRATION

For the gain adjustment, see appendix 1 at the end of this manual.

Before beginning this section, menu 19-CALIB. DATA must be completed. If not, refer to section 19.

**Select Program
6-Select Hoist:1**

MAIN HOIST

To begin load calibration, scroll down to 6 - SELECT HOIST. Press ENTER. The system will prompt the selection of the hoist to calibrate. The main hoist is referred to as MAIN and 1. Use the set buttons #2 and #4 to select the desired hoist. Press ENTER. Verify that the hoist number now showing on the screen matches the hoist selected for calibration.

**Select Program
7-Part Line:6**

MAIN HOIST

Then scroll down to the next step: 7- PART LINE. Press ENTER to access setting. The number of parts of lines will blink. Use the set buttons #2 and #4 to set the proper number of parts of lines. Then press ENTER. Verify that the number of parts of line is showing correctly.

If the parts of line is staying on one, the maximum parts of lines was not set in the MENU 19- CALIB. DATA. Refer to that section before continuing.

At this point, the load sensor is ready for calibration. Get the crane ready to lift the calibration load. The latter should provide near maximum line pull on the hoist line. The load sensor can be calibrated on any number of parts of lines. However, to avoid mixing hoist line friction and rope reading fluctuations, it is preferable to calibrate the hoist line on the fewest parts of line possible.

About rope friction, a second load will be lifted with as many parts of lines as possible to verify and adjust the load span and to compensate for hoist line friction. That stage will be done at the very end of the calibration to cut down on the rigging time.

**Select Program
8-Zero Load**

MAIN HOIST

When ready to lift the small load (load still on the ground), Scroll down to 8-ZERO LOAD. Press ENTER. Press ENTER again to zero the sensor. The number on the right will blink. Use the set buttons to set the weight hanging (hook block, slings, hoist line below boom tip). Press ENTER and ENTER to confirm.

**Select Program
9-Span Load**

MAIN HOIST

Lift the load and stop then lower a few inches and stop smoothly. Scroll down to 9 - SPAN LOAD. Press ENTER, press ENTER again. The number on the upper line will blink. Use the set buttons to adjust the weight hanging (load, slings, hook block, shackles, hoist line below boom tip). Press ENTER and ENTER again to confirm.

Return 9 - SPAN LOAD and press ENTER. Verify the weight displayed with the load suspended. Hoist and stop at least 5 different heights. Lower and stop at least 5 different heights. Hoist at constant speed. Lower at constant speed. Write the result on a record sheet.

The weight displayed must be between 100% and 110% of the actual calibration weight in any state and height.

Then, verify the weight of the hook block. The displayed load should be between 70% and 130% of the actual total weight including hoist line . This weight will be lower when fully telescoped and the block way up because of the hanging rope behind the boom.

RECORD SHEET: MAIN HOIST SMALL REEVING

DATE:					
TOT. WEIGHT:					
BLOCK WEIG:					
PART LINES:					
TIP HEIGHT:					
HOIST & STOP					
HEIGHT1:					
HEIGHT2:					
HEIGHT3:					
LOWEST:					
HIGHEST:					
LOWER&STOP					
HEIGHT 1:					
HEIGHT2:					
HEIGHT3:					
LOWEST:					
HIGHEST:					
LOWERING					
AVERAG:					
LOWEST:					
HIGHEST:					
HOISTING					
AVERAG:					
LOWEST:					
HIGHEST:					

If consistent but inaccurate, it is possible that a fluctuation or a movement of the load while calibrating may have cause a load increase or decrease when pressing ENTER. Return to calibration mode and repeat menu 6 - LOAD SENSOR, 7- PART LINE, 8 - ZERO LOAD and 9 -SPAN LOAD. Repeat the procedure as many times as necessary until the hook load with and without the calibration weight shows properly.

If load reading is inconsistent even with one part line when hoisting and stop or when lower and stop, the hoist line may be unevenly worn or simply uneven. To correct the problem change the hoist line or change the dynamometer. Either replace the dynamometer by a larger size model or double the load sensor capacity in the dynamometer and double the rope deflection. Refer to dynamometer technical specifications or obtain technical support to perform the task.

Either now or when all the radiuses calibration are done, continue the load verification with the main block for friction adjustment. The reason for doing this test after the radius calibration is that the radius calibration require 1 or 2 parts of line and the friction test the maximum number of parts of lines. Therefore, if the friction test is done now, the crane reeving will have to be increased to the maximum number of parts of lines and then reduced again to the minimum parts of lines to continue the radius calibration.

To proceed with the friction test: Lift a heavy load. The load should be at least 50% of the capacity of the crane and the reeving close to the maximum number of parts of lines. Again verify the weight displayed with the load suspended. Hoist and stop at at least 5 different heights. Lower and stop at at least 5 different heights. Hoist at constant speed. Lower at constant speed. Write the result on the main hoist record sheet.

If the hook load displayed is lower than the real weight in a particular state, most likely: Lower and stop . Return to calibration mode and repeat menu 6 - LOAD SENSOR, 7- PART LINE and 9 -SPAN LOAD. Repeat the procedure as many times as necessary until the hook load displayed remains equal or above the real weight.

AUXILIARY HOIST CALIBRATION

(The boom configuration has no impact on the hoist calibration, therefore, the auxiliary hoist calibration can be done on the main boom, manual, rooster or on a jib.)



**Select Program
6-Select Hoist:1**

AUX. HOIST

To begin load calibration, scroll down to 6 - SELECT HOIST. Press ENTER. The system will prompt the selection of the hoist to calibrate. The auxiliary hoist is referred to as AUX and 2. Use the set buttons #2 and #4 to select the desired hoist. Press ENTER. Verify that the hoist number now showing on the screen matches the hoist selected for calibration.

**Select Program
7-Part Line:6**

AUX. HOIST

Then scroll down to the next step: 7- PART LINE. Press ENTER to access setting. The number of parts of lines will blink. Use the set buttons #2 and #4 to set the proper number of parts of lines. Then press ENTER. Verify that the number of parts of line is showing correctly.

At this point, the load sensor is ready for calibration. Get the crane ready to lift the calibration load. The latter should provide near maximum line pull on the hoist line.

**Select Program
8-Zero Load**

AUX. HOIST

When ready to lift the small load (block in the air, load on the ground), Scroll down to 8- ZERO LOAD. Press ENTER. Press ENTER again to zero the sensor. The number on the right will blink. Use the set buttons to set the weight hanging (hook block, slings, hoist line below boom tip). Press ENTER and ENTER to confirm.

**Select Program
9-Span Load**

AUX. HOIST

Lift the load and stop then lower the load a few inches and stop smoothly. Scroll down to 9 - SPAN LOAD. Press ENTER, press ENTER again. The number on the upper line will blink. Use the set buttons to adjust the weight

hanging (load, slings, hook block, shackles, hoist line below boom tip). Press ENTER and ENTER again to confirm.

Return to 9 - SPAN LOAD and press ENTER. Verify the weight displayed with the load suspended. Hoist and stop at least 5 different heights. Lower and stop at least 5 different heights. Hoist at constant speed. Lower at constant speed. Write the result on a record sheet.

The weight displayed must be between 100% and 110% of the actual calibration weight in any state and height.

Then, verify the weight of the hook block. The displayed load should be between 70% and 130% of the actual total weight including hoist line. This weight will be lower when fully telescoped or with a jib and the ball way up because of the hanging rope behind the boom.

RECORD SHEET: AUXILIARY HOIST SMALL REEVING

DATE:					
TOT. WEIGHT:					
BALL WEIGH:					
PART LINES:					
TIP HEIGHT:					
HOIST & STOP					
HEIGHT1:					
HEIGHT2:					
HEIGHT3:					
LOWEST:					
HIGHEST:					
LOWER&STOP					
HEIGHT 1:					
HEIGHT2:					
HEIGHT3:					
LOWEST:					
HIGHEST:					
LOWERING					
AVERAG:					
LOWEST:					
HIGHEST:					
HOISTING					
AVERAG:					
LOWEST:					
HIGHEST:					

If consistent but inaccurate, it is possible that a fluctuation or a movement of the load while calibrating may have cause a load increase or decrease when pressing ENTER. Return to calibration mode and repeat menu 6 - LOAD

SENSOR, 7- PART LINE, 8 - ZERO LOAD and 9 -SPAN LOAD. Repeat the procedure as many times as necessary until the hook load with and without the calibration weight shows properly.

If load reading is inconsistent even with one part line when hoisting and stop or when lower and stop, the hoist line may be unevenly worn or simply uneven. To correct the problem change the hoist line or change the dynamometer. Either replace the dynamometer by a larger size model or double the load sensor capacity in the dynamometer and double the rope deflection. Refer to dynamometer technical specifications or obtain technical support to perform the task.

RADIUS CALIBRATION

MAIN BOOM (CFG#1)

Each boom configuration must be passed through the above 7 steps in order to calibrate the radius. **The main boom must be calibrated before any other boom configurations like manual, jib at 0 deg., jib at 10 deg, jib at 10 deg with manual, etc...**

**Select Program
10-Boom Cfg#1**

MAIN BOOM

Since the menu 10 automatically defaults to Cfg #1 (main boom), skip this step.

**Select Program
11-TareLoad:0.0**

MAIN BOOM

Scroll down to menu 11 - TARE LOAD:0.0. Press ENTER. Set the weight of the block as tare load. Press ENTER. This is to account for the weight of the block as a load during unloaded boom deflection in menu 14 and 15 (P3 and P4). Dismiss the weight of the other block. If a jib is erected, dismiss the weight of the jib. The jib will have to be either removed or left on the boom through to 16 -LOAD BEND COR.

**Select Program
12-P1:20' Retrac**

MAIN BOOM

Scroll down to menu 12 - P1:20' RETRAC. Press ENTER. The display will show the boom extension. If this is the main boom done for the first time, it will read 0.0. On the top right, the boom angle is displayed. As the menu described it. Boom down to between 15 and 20 degrees, fully retract the boom.

If the angle or the boom length is incorrect, the display will indicate the expected values. If the message < not retracted > is displayed, the retracted boom length cannot satisfy the requirement. Try to retract the boom. If not, telescope and retract. If displayed boom length is always above .2 foot, press

ESC and redo the 3 -ZERO EXTENS. Then return to 12-P1 and verify menu 10,11 for correct settings.

Once at the correct angle and extension. Press ENTER. The radius will blink. Measure the actual radius in feet and decimals of feet and set the value on the display. Press ENTER and ENTER again to confirm.

**Select Program
13-P2:60' Retrac**

MAIN BOOM

The system will scroll automatically to menu 13- P2:60' RETRAC. Press ENTER. The displayed radius and boom length will be wrong, dont' worry. Boom up to between 60 and 65 degrees. Press ENTER. While the radius blinks, set the correct radius. Press ENTER and ENTER again to confirm.

**Select Program
14-P3:60' 1/3 Ex**

MAIN BOOM

The system will scroll automatically to menu 14- P3:60' 1/3 EX. Press ENTER. Telescope out about 1/3 of the full extension of the main boom only. Press ENTER. If the length is improper, the system will indicate the acceptable length range. Continue to telescope until within the range and press ENTER. The radius will blink. Measure the radius. It should be close and greater or equal to the displayed radius. Enter the radius and press ENTER. Press ENTER again to confirm.

**Select Program
15-P4:60' FullEx**

MAIN BOOM

The system will scroll automatically to menu 15- P4:60' FULLEX. Press ENTER and extend fully the main boom only. Press ENTER. Measure the radius. Again it should be close and greater or equal to the displayed radius. Enter the measured radius and press ENTER and ENTER to confirm.

**Select Program
16-Load Bend Cor**

MAIN BOOM

The system will scroll automatically to menu 16 - LOAD BEND COR. Press ENTER. Move the boom to fully telescoped and at an angle between 60 and 70 degrees. Lift a load between 50% and 100% of the cranes capacity when fully telescoped and at the required angle. Measure the radius. It should be close and either equal or greater than the displayed radius. Press ENTER and the radius will blink. Increase to the new radius. Never decrease this value. Press ENTER and ENTER to confirm.

The system will scroll automatically to menu 17- BACKUP. Press ENTER to back-up.

CHECK POINT 3:

At this stage, the entire system should work properly up to the configuration calibrated. Scroll up to 0-RUN and press ENTER. The system will return to the normal operating mode. Use the HOIST, BOOM, CONFIG and PART buttons to configure the crane properly. Verify the radius, the angle and the capacity at two angles and two boom lengths. Record the data on the following table. For capacity comparison, use the load table matching the crane configuration selected in the system, and interpolate between radiuses if system is set up to interpolate.

Angle reading must be as follow: For boom angle 65 deg. or more, the indicated angle is to be neither greater than the actual boom angle nor more than 2 deg. less than the actual boom angle. For boom angle less than 65 deg. , the indicated angle is to be neither greater than the actual boom angle nor more than 5 deg. less than the actual boom angle.

Length reading must be as follow: The tolerance range for the indicated length shall be plus or minus 2 % of the actual boom length.

Radius reading must be as follow: The indicated radius is to be not less than 100% of the actual radius, nor more than 110% of the actual radius.

Capacity reading must be as follow: The indicated capacity is to be not more than 100% of the actual capacity, nor less than 91% of the actual capacity.

ANGLE, LENGTH, RADIUS, CAPACITY TABLE (MAIN BOOM)

	ACTUAL ANGLE	DISPL ANGLE	ACTUAL LENGTH	DISPLA LENGTH	ACTUAL RADIUS	DISPL RADIUS	ACTUAL CAPAC	DISPL CAPAC
20 DEG. RETRACT								
65 DEG. RETRACT								
20 DEG. 3/4 EXTEN								
65 DEG. 3/4 EXTEN								

MANUAL / JIB 1 (CFG#2)

Return to menu 10 to select another boom configuration and proceed from menu 10 to menu 19 for each subsequent boom configuration.

**Select Program
10-Boom Cfg#1**

MANUAL / JIB 1

Scroll down to menu 10 -BOOM CFG #1. Press ENTER, use the set buttons to select the boom or jib configuration to calibrate. The display will show both the

spelled description of the configuration and its designation number; remember the designation number.

**Select Program
11-TareLoad:0.0**

MANUAL / JIB 1

Scroll down to menu 11 - TARE LOAD:0.0. Press ENTER. Set the weight of the block used as tare load. Press ENTER. This is to account for the weight of the block as a load during unloaded boom deflection in menu 14 and 15 (P3 and P4). Dismiss the weight of the other block.

**Select Program
12-P1:20' Retrac**

MANUAL / JIB 1

Scroll down to menu 12 - P1:20' RETRAC. Press ENTER. The display will show the boom extension. Do not pay attention to the boom length shown on the top left. On the top right, the boom angle is displayed. As the menu describes it. Boom down to between 15 and 20 degrees, fully retract the boom. *If the angle or the boom length is incorrect, the display will indicate the expected values. If the message < not retracted > is displayed, the retracted boom length cannot satisfy the requirement. Try to retract the boom. If not, telescope and retract.*

Once at the correct angle and extension. Press ENTER. The radius will blink. Measure the actual radius in feet and decimals of feet and set the value on the display. Press ENTER and ENTER again to confirm.

**Select Program
13-P2:60' Retrac**

MANUAL / JIB 1

The system will scroll automatically to menu 13- P2:60' RETRAC. Press ENTER. The displayed radius and boom length will be wrong, do not worry. Boom up to between 60 and 65 degrees. Press ENTER. While the radius blinks, set the correct radius. Press ENTER and ENTER again to confirm.

Select Program
14-P3:60' 1/3 Ex

MANUAL / JIB 1

The system will scroll automatically to menu 14- P3:60' 1/3 EX. If this boom configuration is a rooster, the radius calibration is complete, do not perform menu 14, 15, 16 , and return to menu 10.

If this configuration is not a rooster, Press ENTER. Telescope out about 1/3 of the full extension of the main boom only. Press ENTER. If the length is improper, the system will indicate the acceptable length range. Continue to telescope until within the range. Press ENTER. The radius will blink. Measure the radius. It should be close and greater or equal to the displayed radius. Enter the radius and press ENTER. Press ENTER again to confirm.

Select Program
15-P4:60' FullEx

MANUAL / JIB 1

The system will scroll automatically to menu 15- P4:60' FULLEX. Press ENTER and extend fully the main boom only. Press ENTER. Measure the radius. Again it should be close and greater or equal to the displayed radius. Enter the measured radius and press ENTER and ENTER to confirm.

Select Program
16-Load Bend Cor

MANUAL / JIB 1

Scroll down to menu 16 - LOAD BEND COR. Press ENTER. Move the boom to fully telescoped and at an angle between 60 and 70 degrees. Lift a load between 50% and 100% of the cranes capacity when fully telescoped and at the required angle. Measure the radius. It should be close and either equal or greater than the displayed radius. Press ENTER and the radius will blink.

Increase to the new radius. Never decrease this value. Press ENTER and ENTER to confirm.

The system will scroll automatically to menu 17- BACKUP. Press ENTER to back-up.

CHECK POINT 3:

At this stage, the entire system should work properly up to the configuration calibrated. Scroll up to 0-RUN and press ENTER. The system will return to the normal operating mode. Use the HOIST, BOOM, CONFIG and PART buttons to configure the crane properly.

Verify the radius, the angle and the capacity at two angles and two boom lengths. Record the data on the following table. For capacity comparison, use the load table matching the crane configuration selected in the system, and interpolate between radiuses if system is set up to interpolate (Consult technical support or sales agreement).

Angle reading must be as follow: For boom angle 65 deg. or more, the indicated angle is to be neither greater than the actual boom angle nor more than 2 deg. less than the actual boom angle. For boom angle less than 65 deg. , the indicated angle is to be neither greater than the actual boom angle nor more than 5 deg. less than the actual boom angle.

Length reading must be as follow: The tolerance range for the indicated length shall be plus or minus 2 % of the actual boom length.

Radius reading must be as follow: The indicated radius is to be not less than 100% of the actual radius, nor more than 110% of the actual radius.

Capacity reading must be as follow: The indicated capacity is to be not more than 100% of the actual capacity, nor less than 91% of the actual capacity.

ANG., LEN., RAD., CAPACITY TABLE (MANUAL/ JIB 1/ CFG #2)

DESCRIPTION: _____

	ACTUAL ANGLE	DISPL ANGLE	ACTUAL LENGTH	DISPLA LENGT	ACTUAL RADIUS	DISPL RADIUS	ACTUAL CAPAC	DISPL CAPAC
20 DEG. RETRACT								
65 DEG. RETRACT								
20 DEG. 3/4 EXTEN								
65 DEG. 3/4 EXTEN								

JIB 2 (CFG #3)

Return to menu 10 to select another boom configuration and proceed from menu 10 to menu 16. Repeat check point 3. Record the data on the table below. If all the results are OK, return to the calibration mode. Scroll down to menu 17- BACKUP and press ENTER.

ANG., LEN., RAD., CAPACITY TABLE (JIB 2/ CFG #3)

DESCRIPTION: _____

	ACTUAL ANGLE	DISPL ANGLE	ACTUAL LENGTH	DISPLA LENGTH	ACTUAL RADIUS	DISPL RADIUS	ACTUAL CAPAC	DISPL CAPAC
20 DEG. RETRACT								
65 DEG. RETRACT								
20 DEG. 3/4 EXTEN								
65 DEG. 3/4 EXTEN								

JIB 3 (CFG #4) and SUBSEQUENT

Repeat JIB 2 or JIB 1 procedures. Record the data on the following tables.

ANG., LEN., RAD., CAPACITY TABLE (JIB 3/ CFG #4)

DESCRIPTION: _____

	ACTUAL ANGLE	DISPL ANGLE	ACTUAL LENGTH	DISPLA LENGTH	ACTUAL RADIUS	DISPL RADIUS	ACTUAL CAPAC	DISPL CAPAC
20 DEG. RETRACT								
65 DEG. RETRACT								
20 DEG. 3/4 EXTEN								
65 DEG. 3/4 EXTEN								

ANG., LEN., RAD., CAPACITY TABLE (JIB 4/ CFG #5)

DESCRIPTION: _____

	ACTUAL ANGLE	DISPL ANGLE	ACTUAL LENGTH	DISPLA LENGTH	ACTUAL RADIUS	DISPL RADIUS	ACTUAL CAPAC	DISPL CAPAC
20 DEG. RETRACT								
65 DEG. RETRACT								
20 DEG. 3/4 EXTEN								
65 DEG. 3/4 EXTEN								

ANG., LEN., RAD., CAPACITY TABLE (JIB 5/ CFG #6)

DESCRIPTION: _____

	ACTUAL ANGLE	DISPL ANGLE	ACTUAL LENGTH	DISPLA LENGTF	ACTUAL RADIUS	DISPL RADIUS	ACTUAL CAPAC	DISPL CAPAC
20 DEG. RETRACT								
65 DEG. RETRACT								
20 DEG. 3/4 EXTEN								
65 DEG. 3/4 EXTEN								

ANG., LEN., RAD., CAPACITY TABLE (JIB 6/ CFG #7)

DESCRIPTION: _____

	ACTUAL ANGLE	DISPL ANGLE	ACTUAL LENGTH	DISPLA LENGTF	ACTUAL RADIUS	DISPL RADIUS	ACTUAL CAPAC	DISPL CAPAC
20 DEG. RETRACT								
65 DEG. RETRACT								
20 DEG. 3/4 EXTEN								
65 DEG. 3/4 EXTEN								

ANG., LEN., RAD., CAPACITY TABLE (JIB 7/ CFG #8)

DESCRIPTION: _____

	ACTUAL ANGLE	DISPL ANGLE	ACTUAL LENGTH	DISPLA LENGT	ACTUAL RADIUS	DISPL RADIUS	ACTUAL CAPAC	DISPL CAPAC
20 DEG. RETRACT								
65 DEG. RETRACT								
20 DEG. 3/4 EXTEN								
65 DEG. 3/4 EXTEN								

ANG., LEN., RAD., CAPACITY TABLE (JIB 8/ CFG #9)

DESCRIPTION: _____

	ACTUAL ANGLE	DISPL ANGLE	ACTUAL LENGTH	DISPLA LENGT	ACTUAL RADIUS	DISPL RADIUS	ACTUAL CAPAC	DISPL CAPAC
20 DEG. RETRACT								
65 DEG. RETRACT								
20 DEG. 3/4 EXTEN								
65 DEG. 3/4 EXTEN								

SAVING CALIBRATION

<p>Select Program 17-Backup</p>
--

BACKUP

Scroll to menu 17- BACKUP. Press ENTER. The system will save the calibration in a spare bank called B bank. If in the next calibration stages, an error is made, it will be possible with the menu 18 - MEMORY to discard the new changes and retrieve the previously saved calibration.

The use of this function is not necessary to store calibration. Calibration is saved when confirmed, and stored in the calibration bank A. This bank like the bank B are permanent EEPROM bank. They are not battery backed up and are non volatile. The calibration will be stored forever unless changed by recalibration or damaged by powerful electrostatic or electromagnetic fields. To our knowledge, this is a very improbable situation not yet recorded for this product.

<p>Select Program 18-Memory</p>

MEMORY MANAGEMENT

Scroll to menu 18 - MEMORY. Press ENTER. The top display will indicate the status of both the memory banks A and B. A must read OK for the system to operate. By scrolling up and down, the bottom display will offer many options:

A > B

This is just like the menu 17, by pressing ENTER and the safety access code displayed on the top screen, the content of the bank A will be copied into the bank B.

B > A

This option will copy the content of the bank B into the bank A. The safety code must be entered to proceed. All the data already in bank A will be lost.

SWAP A <> B

This option will place the bank A into the bank B and at the same time the bank B in bank A. Both bank will be preserved but switched. The safety code must be entered to proceed.

INIT. MEMORY A

This option will obliterate all calibrations from the bank A. This should only be done when a system is installed for the first time or if an incompatible operating system is installed in the system. This must never be done during or after calibration. The safety code must be entered to proceed.

INIT. MEMORY C

This option is not used.

CALIBRATION DATA

The general calibration data menu is a sub-menu to access 16 different variables used in various operations of the systems. These variables are located in a sub-menu not to over crowd the main menu.

**Select Program
19-Calib. Data**

GENERAL DATA

Scroll down to menu 19 - CALIB. DATA .

In this menu, the ESC button can be used to return to the main menu at step 19. Also, there is no double confirmation when calibrating. Press ENTER. The various variables are automatically accessed. Scroll through the various variables.

Press ENTER to obtain the setting mode. Use the SET buttons to change the value and press ENTER once to confirm. Then scroll to the next value.

The variables are listed below:

**Select Program
21-Slew Off:-1.0**

The distance between the center of rotation and the boom base pin in feet and tenths of feet. Negative if the boom base pin is behind the center of rotation. Use the set button #4 until the value becomes negative. E.G: 2 feet, 4 inches on a telescopic crane becomes -2.3 .

**Select Program
22-Sheave R:0.3**

The radius of the boom head sheave block in feet and tenths of feet. It is used to compensate the radius when lifting with one part line.

**Select Program
23-Hght Off:6.0**

The height offset is the distance between the ground and the boom base pivot. It is used to determine the height of the boom head sheave block from the ground. Add the clearance height above the boom head sheave block to use

the height display as the head room height of the crane (this will be safe but not accurate).

**Select Program
24-Rope Mn :4.5**

This is the maximum line pull permitted per part of line on the main hoist according to the chart. This value will be used as the load limitation if lower than the radius capacity.

**Select Program
25-Rope Aux:1.0**

This is the maximum line pull permitted per part of line on the auxiliary hoist. This value will be used as the load limitation if lower than the radius capacity.

**Select Program
26-Rope W1:1.0**

This is the maximum line pull permitted per part of line on the whip (3rd) hoist. This value will be used as the load limitation if lower than the radius capacity.

**Select Program
27-Rope W2:1.0**

This is the maximum line pull permitted per part of line on the second whip (4th) hoist. This value will be used as the load limitation if lower than the radius capacity.

**Select Program
28-Max Parts:4**

Set the maximum number of parts of lines. This will apply to all hoists when pressing the PARTS button, the number of parts will increase to the set number and return to one.

Select Program
29-%/Part:2.0 %

This value allows derating of the hoist line capacity when reeving with more than one part. The total rope capacity will derate by the percent set except for one part.

Select Program
30-Block 1:50.0

This variable is an internal hook load limit beyond which the operator will not be allowed to change the reeving or the configuration. Outside Europe, it is usually set to a greater value than the crane's capacity. Block 1 only applies to the main boom configuration.

Select Program
31-Block 2:50.0

This variable is an internal hook load limit beyond which the operator will not be allowed to change the reeving or the configuration. Outside Europe, it is usually set to a greater value than the crane's capacity. Block 2 applies to all jib configurations, manual and rooster included.

Select Program
32-Alarm#1:90.0%

This setting is the pre-alarm on load. When the set percentage is reached, an intermittent buzzer is activated as well as blinking of the left most indicator light with the yellow triangle.

**Select Program
33-Alarm#2:100.0**

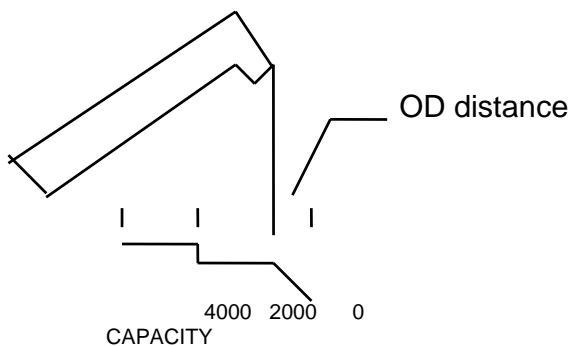
This limit is the maximum load limit set by the rope capacity or the chart. The percent used should be 100%. When reached, the red indicator light with the octagon and the pre-warning indicator light are on and the buzzer is continuous. The lock-out is not activated.

**Select Program
34-Alarm#3:102.0**

The alarm 3 is the lock-out activation. It is based on the percent of maximum load.

**Select Program
35-OD Rad:0.5**

This variable represents a transition distance between the last radius rating and zero capacity. If the operator is lifting a load at the out most radius on the chart, the alarm may sound even if there is no overload if the displayed radius exceeds the chart radius even by one inch. The OD (OUT of DUTY on RADIUS) will allow a straight line capacity from the chart value to zero and stretched over the distance set by this variable.



**Select Program
36-OD Angle:0.0**

The OD variable on the angle applies to angle based charts and allow a smooth transition from the lowest degree capacity on the chart to zero capacity. This variable is set in degrees. Usually 1.

**Select Program
37-OD Lgth:0.0**

The OD length variable represent the acceptance zone where the specific boom length based capacity chart is still accepted. This is a very important factor when the displayed boom length exceed the maximum boom length on the chart. The distance entered for this variable will extend the acceptable boom length for the maximum boom length on the chart.

**Select Program
38-ID Lgth:0.0**

The ID length variable fulfill the same task as the OD length variable but applies to the minimum retracted boom length acceptable to obtain the retracted boom length chart.

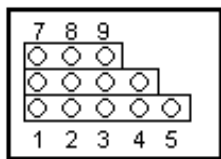
**Select Program
39-Rig Ang:10.0**

The RIG ANGLE is a set angle below which the operator can bypass permanently the lock-out by pressing on the RIG button. This function is used to allow the rigging of jibs or reeving at angles below the chart and at which the operator would be locked. The RIG function is canceled when the operator booms up above the set angle or if the system is turned off.

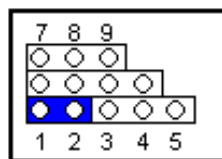
Press ESC to return to the main menu.

APPENDIX 1: GAIN ADJUSTMENT

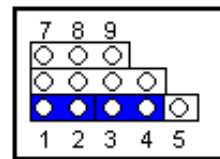
Internal Gain Settings: Little jumpers on I/O board



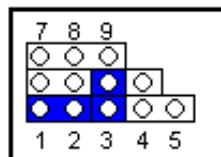
1



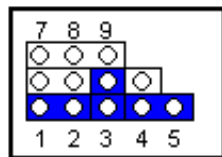
100



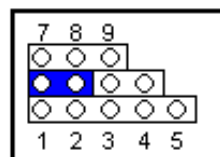
125



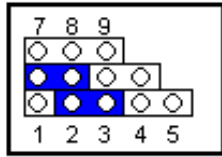
137



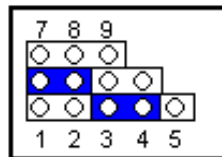
186.5



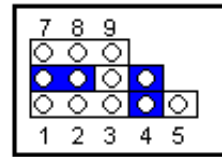
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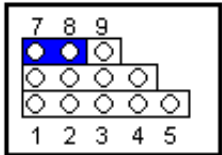
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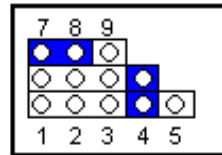
333



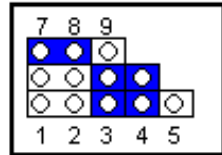
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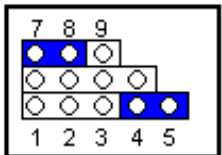
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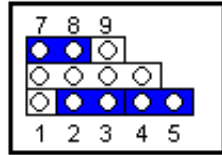
624



688



831



1000