5. AUTO-CALIBRATION

The Auto-Calibration feature provides a quick, convenient method of matching a scale base with a Model 622 or Model 625.

5.1 CALIBRATE A SCALE BASE

Make sure the instrument and scale bases have been powered-up for at least 10 minutes before performing an Auto-Calibration. In addition, the scale base should be exercised before calibration. This can be done by placing a weight equal to the capacity of the scale on the base and then removing it. Repeat this several times.

1. Switch Settings: In order to guarantee that the hardware is not over-ranged when calibration begins, make sure that all gain dip switches (see Figure 2-1, p. 13) are set to the "OFF" position for all scales which will be Auto-Calibrated.

2. Setup Parameters: In order for Auto-Cal to function properly, the resolution, count-by, decimal point location, and overload percentage must be properly selected for each scale (refer to 4.2 and 4.4 for proper programming).

3. Use the [SCALE SELECT] key to choose the scale you wish to calibrate.

4. Press [GSE] [MODE] to put the instrument into the OFFSET DISPLAYED Mode.

5. Press [GSE] [ZERO]. The scale is now in the Auto-Cal Mode.

6. Before going any further, either move the Program Jumper (JMP 9 on the Analog Board) to the PROG position, or enter the Program Jumper Bypass code ([23640] [GSE] [.]).

7. The Lower Display will prompt you through the setup of Auto-Cal. First of all, remove all weight and press [ZERO]. The scale will average the zero while it counts to 10 in the Lower Display. Counter will reset when motion is sensed.

8. When the count reaches 10, place the calibration weight on the platform, enter that amount, and press [ENTER]. If you make an error in your entry and you realize it before pressing the [ENTER] key, press [CLR] to clear the error and then re-enter the weight.

NOTE: For best results, use a weight equal to 60% to 80% of the scale capacity for calibration, whenever possible. Auto-Cal will accept a weight up to 100% of scale capacity.

9. When the procedure is complete, press [MODE] to return to OFFSET DISPLAYED.

10. If you want to Auto-Cal another scale, select the next scale with the [SCALE SELECT] key and repeat steps 5-8 above. Otherwise, press [ZERO] to re-enter the Weigh Mode.

5.2 NOTES ON USING AUTO-CAL

The Auto-Cal Mode may be exited at any point in time by pressing the [MODE] key. This will store the last valid Auto-Cal factor in the Auto-Cal memory.

Should an error occur, press [CLR]. This will return the instrument to the status it was in prior to the error.

The Auto-Cal factor does not affect the value displayed in the OFFSET DISPLAYED Mode since that mode will always allow you to view true load cell zero offset.

In step 7 of 5.1, the Auto-Cal software determines the zero offset of the scale by taking the average of ten consecutive motionless readings. The Lower Display reads "Avg'ing Zero:" followed by a counter indicating the number of readings averaged so far. Whenever motion occurs, the counter will return to "0" and stay there until motion ceases.

5.2 NOTES ON USING AUTO-CAL cont'd

If the displayed offset is still out of range, an adjustment of the internal zero settings may be necessary (refer to 2.3, p. 13).

When the weight entered in Step 8 of 5.1 is tested, it must be greater than 5% and less than 101% of Full Scale. Full Scale is considered to be the resolution multiplied by the count-by factor including the decimal point. If the measured weight exceeds the 5%-100% requirement, an error message is displayed, "Er-73/Entry < 4% of FS" or "Er-73/Entry > 100% FS".

If a Full Scale error message appears and the entered weight is believed to be within range, review 4.2.4 in regard to resolution, count-by, and decimal point selections.

After a valid weight entry is made, ten consecutive motionless readings are averaged to accurately determine the weight. Upon calculating the average, the result is tested to prevent any inaccuracies due to erroneous entries or improper setup parameters. If the results indicate that the output of the platform is too low or too high an appropriate error message is displayed. The platform output at full scale (as previously defined) must be between 0.8 mV/V and 3.2 mV/V. This is necessary to prevent over-ranging of internal components.

The Auto-Cal Factors generated for Scale Bases 1, 2 and 3 can be accessed for printing and with the Memory Matrix and Function Key features by using parameter ID numbers 67, 68 and 69 respectively. For more on these features refer to Sections 11, 18 and 24.

5.3 AUTO-CAL FACTOR ACCESS MODE

The Auto-Cal factors which were calculated during calibration can be viewed and/or modified in the Auto-Cal Access Mode.

1. From the Weigh Mode, press [GSE] [MODE] to reach the OFFSET DISPLAYED Mode.
2. Enter the Option Setup Mode by pressing [GSE] [MODE].
3. Press [MODE] again so that "Auto-Cal" appears in the Lower Display.
4. Press [ENTER] and the Auto-Cal factor stored for Scale #1 is displayed. The factor is "0.00000" when first enabled, and will range from "0.98000" to "4.49999" when a valid factor is stored.
5. The Auto-Cal factors of any other enabled scales can be viewed by pressing [NEXT] once per scale base.
6. Before a new factor can be entered, either move the Program Jumper (JMP9 on the Analog Board) to the PROG position or enter the Program Jumper Bypass Code ([23640] [GSE] [.]).
7. The new factor may then be entered followed by the [ENTER] key. If the factor is not within the allowable range (described in step 4 above), an error message will be shown. To clear the error message, press [CLR].
8. To exit this mode and advance to another option setup press [MODE] until the Lower Display indicates that you're in that mode. Otherwise press [GSE] [MODE] to return to OFFSET DISPLAYED.

5.3 AUTO-CAL ACCESS MODE cont'd

NOTE: The Auto-Cal factor as calculated for a scale base in the Auto-Cal Mode should be recorded on paper or sent to a computer for future use. That scale base can be disconnected from that instrument and re-connected at a later date and be calibrated by entering the correct Auto-Cal Factor, provided that the same scale input connector is used, that the gain and zero switches and pots have not been changed, and that the scale base has not been modified with a new load cell, or a change in the lever ratio.

To clear the Auto-Cal Factor:

1. Access the Auto-Cal Setup Mode: From the Weigh/Count Mode press [GSE] [MODE] [GSE] [MODE] [MODE] [ENTER].

2. Move the Program Jumper (JMP9) to the PROG position or enter the the Jumper Bypass Code ([23640] [GSE] [.]).

3. Press [NEXT] until the Auto-Cal factor for the scale you want to clear is displayed.

4. Enter in a "0" or a "1" and press [ENTER]. An Auto-Cal Factor of 0 or 1 will not have any effect on the displayed weight.

5.4 AUTO-CAL STANDARDIZATION

* Important *

If you want to be able to use several instruments with a variety of scale bases, calibration can be easily done by re-entering the Auto-Cal factor of the scale base. The instruments must first be adjusted using a standard such as a precision load cell simulator. To do so, the following procedure may be used.

1. Bring the scale to the OFFSET DISPLAYED Mode.

2. Attach the load cell simulator to the connector of the scale input which you wish to calibrate. Use the [SCALE SELECT] key to select this input as the currently displayed scale.

3. Set the simulator to 0 mV/V.

4. After making sure all the gain and zero dip switches are in the OFF position, use the zero pot for a fine adjustment to bring the reading to exactly +40 displayed counts (disregard the location of the decimal point within the display).

5. Change the simulator setting to 2 mV/V and then adjust the gain pot to bring the displayed reading to "13140". It may be necessary to turn on switch "SW6" to attain this reading.

6. Repeat steps 3, 4, and 5 until no further adjustments are required.

7. Repeat this procedure for all scale inputs of all instruments that will be standardized.

8. Establish the Auto-Cal Factor, one at a time, for each one of the scale bases that will be used per the instructions in 5.1, steps 5-9. Then record the Auto-Cal Factor as accessed in 5.3.

9. Now any scale base may be mated to one of the standardized scales simply by entering its Auto-Cal Factor as in 5.3.