8571

Technical Manual
and
Parts Catalog

INTRODUCTION

This publication is provided solely as a guide for individuals who have received METTLER TOLEDO Technical Training in servicing the METTLER TOLEDO product.

Information regarding METTLER TOLEDO Technical Training may be obtained by writing to:

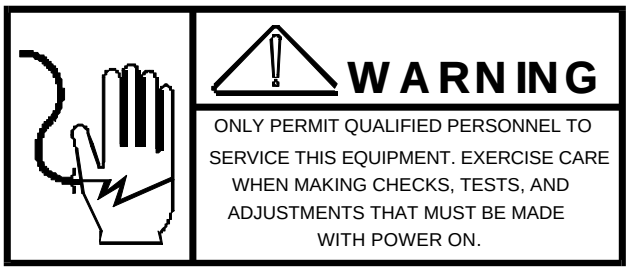
METTLER TOLEDO
Training Center
P.O. Box 1705
Columbus, Ohio 43216
(614) 438-4400

PRECAUTIONS

- **READ** this manual before operating or servicing this equipment.

- **ALWAYS REMOVE POWER** and wait at least 30 seconds **BEFORE** connecting or disconnecting any internal harnesses. Failure to observe these precautions may result in damage to, or destruction of the equipment.

- **ALWAYS** take proper precautions when handling static sensitive devices.



- **DO NOT** connect or disconnect a load cell scale base to the equipment with power connected or damage will result.

- **SAVE** this manual for future reference.

- **DO NOT** allow untrained personnel to operate, clean, inspect, maintain, service, or tamper with this equipment.

- **ALWAYS DISCONNECT** this equipment from the power source before servicing.

- **CALL** METTLER TOLEDO for parts, information, and service.

CONTENTS

1. GENERAL DESCRIPTION

The Toledo Model 8571 is a high resolution combination straight weigh/parts counter that is intended for applications that require simple, straight forward operation. The 8571 is suitable for single scale operations up to 100 ln capacity. A high resolution digital load cell is incorporated in the scale providing maximum sensitivity and accuracy for either parts counting or straight weighing. The six key keyboard minimizes operator confusion and intimidation. Basic function keys include: Tare, Sample, Clear, Zero, Recall, and Print.

The 7 segment, 7 digit liquid crystal display (LCD) shows either gross weight, net weight or piece count. Recall of percent accuracy, net weight and average piece weight (APW) is provided. The scale can be used to count parts that are removed form a container on the platter. The effect of piece weight inconsistency can be minimized using the average piece weight (APW) enhancement feature. As additional pieces (sample) are placed on the scale, the average piece weight is automatically recomputed insuring that a representative calculation is utilized to derive counts.

The Model 8571 is available with an optional compact battery that mounts inside the scale enclosure to provide up to 10 hours of portable operation. the battery can be easily accessed by removing a cover located on the back of the scale. An optional RS232 (bidirectional) I/O features is available for printer or computer interface.

1.1 FEATURES

- Simplicity of Operation: Keyboard operation is simplified to increase operator efficiency and decrease costly mistakes. A single press of the SAMPLE key accesses the counting mode.

- Highly Visible LCD: Liquid crystal display includes 0.7 inch high digits for count or weight indication. Power consumption is minimized for applications that require the portable battery feature.

- Keyboard Setup and Calibration: allows scale programming including calibration to be completed in virtually minutes saving time and associated installation expense.

- Selectable Sample Reference: Reference quantities for average piece weight calculation can be selected through the keyboard. A sample quantity ranging from 5 to 100 pieces can be used to derive a consistently accurate APW.

- Automatic Average Piece Weight (APW) Enhancement: If selected, the scale automatically recalculates APW continuously up to 4% of rated capacity.

- Optional Battery: Makes the self-contained scale ideal for applications that require portability. The internal battery provides up to 10 hours of power and can be easily changed or removed via an access cover located on the back of the scale. The battery is recharged when the scale is connected to an AC power outlet.

1.2 STATEMENT OF PERFORMANCE

The performance of any count-by weighing scale is dependent on uniformity of weight per piece, number of pieces in the sample, individual piece weight and the percent of rated load placed on the scale. In application, count accuracy is also depended upon the ability of the operator to read and record the count information accurately.

This high resolution counting indicator significantly reduces count errors induced by the operator. In most applications, it provides better practical accuracy than either hand counting or using mechanical techniques. Assuming proper capacity selection, count accuracy of +/- one part is attainable in many specific cases. However, the most significant variable is uniform weight of the parts to be counted. This variable is not controllable by the scale system.

1.3 ACCURACY CONSIDERATIONS

Counting accuracy is determined primarily by these factors:

1.3.1 Digital resolution of the sample weight.
1.3.2 Piece to piece weight variation.

Item 1 is the most frequent cause of parts counting inaccuracy because of the user's desire to count and handle the minimum number of sample pieces. For example, with a sample weight of 0.02% of full scale, sample weight resolution is +/- 1.0% at best. Use of the 0.1% or 0.05% minimum sample weight will significantly improve counting accuracy.

Item 2 is not under control of the parts counter, but is a factor which merits serious attention by the user. The overall count accuracy can be no better than the piece to piece variation, and may be much lower if the sample is not representative of the average piece weight.

2. SYSTEM DESCRIPTION

The 8571 Main PCB provides a DC supply voltage to the digital load cell which responds with numeric values proportional to the weight applied to the platter. This weight information is then used to determine the average piece weight and corresponding piece count.

Operational parameters and calibration are accessible via the front keyboard so no internal access is required. These values are stored in non-volatile ROM (Read Only Memory) so they will not be lost during a power outage.

2.1 INTERNAL FUNCTIONS

The 8571 Main consists of three major blocks. These are:

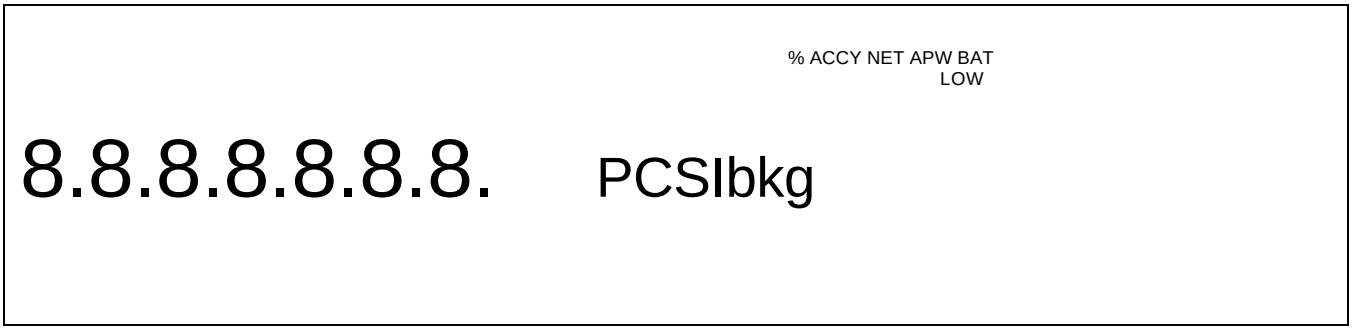
1. Digital Load Cell - Communicates bidirectionally with the Main PCB to determine weight applied to the platter.

2. Main PCB - Contains the main power fuse and all operating power supplies as well as all logic functions, keyboard interface and setup storage.

3. Display PCB - This LCD seven digit display is the visual interface between the electronics of the Main PCB and the operator.

2.2 DISPLAY

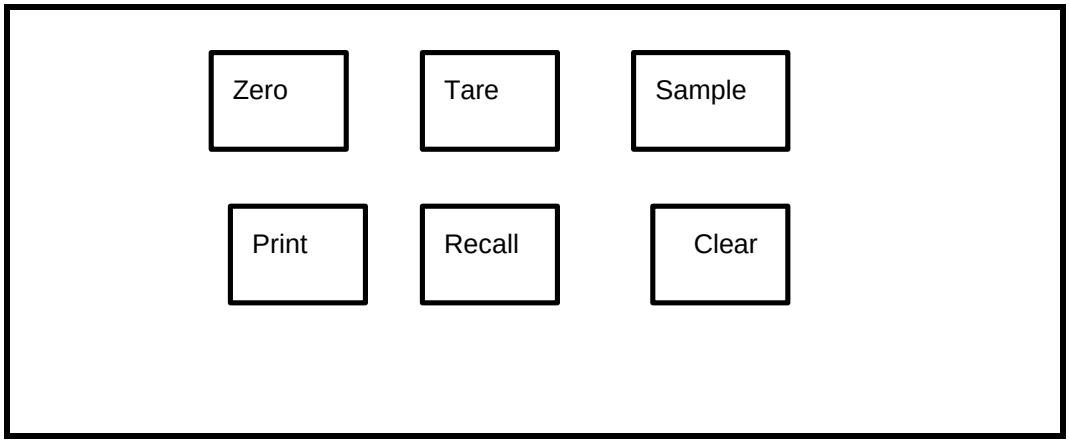
The 8571 utilizes a low power custom liquid crystal display (LCD). Depending upon which mode the scale is in, different legends will be shown. A sample display is shown below.



Sample Display

2.3 KEYBOARD

The keyboard of the 8571 is simplified to reduce operator confusion and possible error. The six keys located on the keyboard are Zero, Tare, Sample, Print, Recall and Clear. The keys are arranged as shown.



3. SPECIFICATIONS

3.1 ELECTRICAL

3.1.1 Power Requirements

The 8571 operates at 120 VAC (+10%, -15%) and 60 Hz). Power consumption is approximately 3.5 watts. A 220 VAC/50 Hz version is available as an option.

The line voltage must be within these specifications and voltage measured between neutral and ground at the power outlet should be less than 0.1 VAC. The power line for the 8571 must not be shared with equipment that generate line noise (such as motors, relays, heaters, etc.). If adverse power conditions exist, a power line conditioner may be required.

3.1.2 U.L. & C.S.A. Standards

Materials, components and electrical design comply with U.L. and C.S.A. standards and requirements, including grounding of all metal parts, fusing, etc..

3.1.3 FCC Regulations

The 8571 meets or exceeds the FCC conducted and radiated emissions requirements.

3.1.4 Radio Frequency Interface

This unit is not intended for use in environments where a high concentration of RFI is present.

3.1.5 Battery Power Option

The AC power required for charging is 7 watts. The charger output is 13.8 VDC at 400 mA. Main PCB power consumption is 12 VDC at 30 mA.

The normal cycle time for the battery is 10 hours of scale operation then 14 hours of charging. This is done by plugging the scale into an AC power outlet and leaving the power switch on the side of the unit turned off.

NOTE: Battery charging will occur during AC power operation but at a reduced rate due to reduction of the charging voltage.

3.2 ENVIRONMENT

3.2.1 Temperature Sensitivity

Zero temperature coefficient is 60 PPM/0C maximum.

Span temperature coefficient is 30 PPM/0C maximum.

3.2.2 Operating Temperature

The Model 8571 is operable from 320F (00C) to 1040F (+400C) at 5 to 95% relative humidity, non-condensing.

3.2.3 Application

1. The 8571 is intended for use in a general purpose atmosphere. It is intended for indoor applications where dirt, oil or water is not present.

2. The 8571 is not designed for hose-down applications. Typical examples of misapplication of the scale include, but are not limited to:

   a). Immersions
   b). Hosedown
   c). splashing liquids
   d). Corrosive chemical environments

   Toledo Scale manufactures other scales that are suitable for "hosedown" applications.

3.2.4 Hazardous Areas

In locations classified as hazardous by the National Electrical Code (NEC) because of combustible or explosive atmospheres, special precautions are required. DO NOT USE THE 8571 IN THESE LOCATIONS.

3.3 PHYSICAL

3.3.1 Appearance and Dimensions

The Model 8571 is fog white with a black platter assembly and multi-color keyboard. The unit is 5.4" (134mm) high, 14.7" (374mm) wide and 14.6" (370mm) deep. The 8571 weighs approximately 20 lbs (9.1 kg).

3.3.2 Construction

The base and sub-platter are made from die cast aluminum. The unit utilizes a Moment Insensitive Load Cell. The cover, bezel, and platter are made of heavy structural plastic. A level bubble is mounted in the cover, requiring only removal of the platter for viewing.

3.3.3 Platform Size

The 25, 50 and 100 pound capacity scales use a platter that is 14.5" wide (371mm) and 10.8" deep (273mm). The 5 and 10 pound units include 8" X 8" platform.

3.3.4 Shipping Information

Approximate shipping weight is 22lb, carton dimensions are 9" X 19" X 19".

3.4 DATA INTERFACE

An optional kit is available to provide capability of bidirectional RS-232-C communications. The baud rate is selectable from 300 to 9600 baud and parity is selectable as even, odd or always a "0". All data will be in 11 bit frame - 1 start bit, 7 ASCII coded data bits, 1 parity bit and two stop bits.

When a print command is received, either from the PRINT key or an external "P" character, the 8571 will output a message as formatted by setup selections. Transmissions of a checksum character is selectable as is expanded print format. Scale motion, expanded print format. Scale motion, expanded display mode, under zero or over capacity operation will disable a print command.

3.5 CONFIGURATION GUIDE (120 VAC)

Factory Number	Avoirdupois Indication	Metric Indication	Load Cell Capacity
8571-0002	5 X 0.0005 lb	2 X 0.0002 kg	3.75 kg
8571-0003	10 X 0.001 lb	5 X 0.0005 kg	7.5 kg
8571-0004	25 X 0.002 lb	10 X 0.001 kg	15 kg
8571-0005	50 X 0.005 lb	20 X 0.002 kg	30 kg
8571-0006	100 X 0.01 lb	50 X 0.005 kg	60 kg

The 220 VAC versions are designated by the factory number 8571-001X, where the "X" may be a 2 , 3, 4, 5, or 6 as shown above.

4. INSTALLATION INSTRUCTIONS

To unpack and setup the 8571, use the following procedure.

4.1 SETUP PROCEDURE

4.1.1 Examine the shipping box for any sings of damage. IF DAMAGE IS FOUND, MAKE A CLAIM WITH THE CARRIER IMMEDIATELY.

4.1.2 Open the box, remove the scale and place the scale on a flat level surface.

CAUTION:	Do Not lift the sale by the platter or sub-platter. Grasp the scale by the base to lift.

4.1.3 On 5 pound capacity scales (8571-0002 and 8571-0012), steps 3.1 through 3.4 must be followed. on all other 8571's these steps are not required - proceed to step 4.

1. Remove the rubber band securing the 8" square plastic platter to the sub-platter.

2. Grasp the plastic platter by the edges and lift straight up to remove it. The platter is held by loop and hook strips in the corners.

3. Remove the two 8-32 screws and rubber 0-rings form the top the sub-platter. See Figure 1.

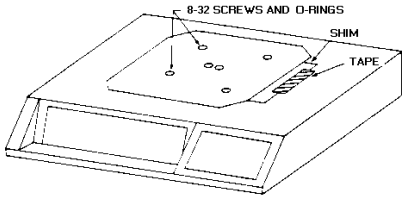


Figure 1

4. Remove the tape and shim form the top of the right side of the dead-deck. See Figure 1. Skip the following step 4.

4.1.4 Remove the platter by lifting upward and locate the level bubble.

4.1.5 Level the scale by turning the adjustable feet on the bottom of the scale base in or out. The feet should be adjusted so the scale does not rock. The correct position of the level bubble when the 8571 is level is shown in Figure 2.

INCORRECT	CORRECT
BUBBLE IS NOT CENTERED	BUBBLE IS CENTERED

Figure 2

4.2 PROGRAMMING PROCEDURE

This section of the technical manual describes the programming of the operating modes and features of the 8571, as well as the calibration.

Sample displays are given to show the programming prompts. Described under each sample display are possible selections and the effect these selections will have on the unit's operation.

The following front panel pushbuttons perform the specified functions when in the programming mode.

PRINT - Depressing this pushbutton will accept the displayed programming parameter and proceed to the next prompt.

TARE - Depressing this pushbutton will change the state of the displayed programming parameter and proceed to the next prompt unless otherwise stated.

ZERO - Depressing this pushbutton will enable the programmer to back-up tho the previous prompt.

CLEAR - Depressing this pushbutton will cause the unit to bypass any other programming parameters an advance to the [Set OFF] prompt at the end of the programming setup.

The following chart can be used as a quick reference for programming descriptions. Also listed is the recommended selection for each step as a beginning point for initial setup. Verify each selection, such as calibration in pounds to be certain it coincides with actual usage before attempting calibration.

STEP	DESCRIPTION	U.S.A. SETUP	EXPORT SETUP
F1	**OPERATIONAL FUNCTIONS**		
F1.1	Auto Clear Tare	1	0
F1.2	Auto Clear APW	1	0
F1.3	Sample Enhance	1	1
F1.4	Fixed Sample Size	10	10
F1.5	Enable Operator Setup	0	0
F1.6	Reset Setup Parameters	1	2
F2	**UNIT FUNCTIONS**		
F2.1	Sample in APW oir Pcs./Wt.	0	0
F2.2	Miniiumum Sample	0.02	0.02
F2.3	Auto Sample Acceptance	1	1
F2.4	Tare Active	1	1
F2.5	% Accuracy Recall Enable	1	0
F2.6	Operate in Pounds	1	0
F2.7	Variable Sample Select	1 (10)	0
F3	**CALIBRATION**		
F3.1	Expanded Weight Display	0	0
F3.2	Configure Scale?	0	0
F3.3	Capacity Select & Calibration	*	*
F3.4	Auto Zero Maintenance Enable	1	1
	* Program as required		
F4	**SERIAL I/O FUNCTIONS**		
F4.1	Printer Active	1	1
F4.2	Baud Rate	9600	2400
F4.3	Checksum Enable	0	0
F4.4	Parity Select	EVEN	EVEN
F4.5	STX	1	1
F4.6	CTS Enable	0	0
F4.7	Repeat Print	1	1
F4.8	Print Single Line	0	0
F4.9	Print Gross	1	1
F4.10	Print Tare	1	1
F4.11	Print Net	1	1
F4.12	Print Net Expanded	0	0
F4.13	Print APW	1	1
F4.14	Print Pieces	1	1
F4.15	Print Pieces Expanded	0	0

Four programming steps of the 8571 can be accessed without turning the setups slide switch "ON" if step F1.5 is programmed as a "1". These four steps are referenced as operator selectable setup parameters. To access these steps, press and hold the SAMPLE key while turning the power switch at the right side of the unit "ON". After the 8571 has stepped through its power up sequence, it will shown [F1.1] and the SAMPLE key may be released. the following steps will be accessed.

F1.1 Auto Clear Tare
F1.2 Auto Clear APW
F1.3 Sample Enhance
F1.4 Fixed Sample Size

NOTE: After exiting the operator selectalbe steps the 8571 will perform an automatic zero capture.

Reference the actual programming descriptions in the next section for a full explanation of each of these steps. Note that these operator entered functions are not saved in non-volatile ROM. They will be over-written by the selections stored during normal setup in the event of a power failure.

To enter the setup mode, remove the platter (on scales with 11" X 14" platform) or remove the plastic cover plug (on scales with the 8" square platter) and locate the setup switch access hole. See Figure 3. After locating the access hole, slide the setup switch (located in the access hole) forward using a pointed non-conductive object. do not use an object that could easily be dropped into the unit. The display of the 8571 should now show [F1] and the unit is ready for programming.

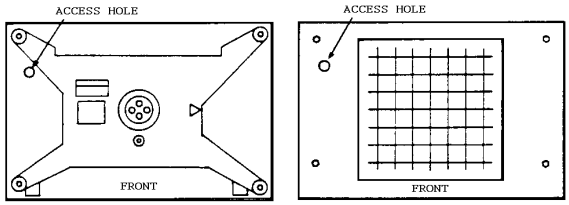


Figure 3

Remember - Press PRINT to accept the selection and TARE to change the selection unless other instructions are given.

[F1]
ACCESS OPERATIONAL FUNCTIONS?

Press:

PRINT - To enter into the setup of the operational parameters.

TARE - To skip the operational parameter programming and proceed to [F2].

[F1.1 1]
AUTO CLEAR TARE

1 - Tare will automatically clear when the scale returns to within one increment of zero after settling to a no motion condition 10 increments above net zero.

0 - Tare will be retained until the CLEAR pushbutton is depressed.

[F1.2 1]
AUTO CLEAR APW

1 - Average piece weight will automatically clear when the scale returns to within one increment of zero after settling to a no motion condition 10 increments above net zero.

0 - Average piece weight will be retained until the CLEAR pushbutton is depressed.

[F1.3 0]
SAMPLE ENHANCE ENABLE

1 - To activate the enhanced sample feature. Section V, Part 6 explains sample enhancement.

0 - The unit will operate in the normal count mode.

[F1.4 010]

FIXED SAMPLE SIZE

Select the desired quantity to be used as the fixed sample size. The available quantities are 5, 10, 20, 50 or 100. Use the TARE key to switch to the next value and the PRINT key to switch to the next value and the PRINT key to enter the correct value when displayed.

Note that the above operator entered functions are not saved in non-volatile ROM if changed when the setup switch is no on. They will be over-written by the selections stored during normal setup in the event of a power failure.

[F1.5 0]

ENABLE OPERATOR SETUP

1 - To enable operator selection of steps F1.1, F1.2, F1.3 and F1.4 without having to turn on the setup in the event of a power failure.

0 - To disable operator selection of steps F1.1, F1.2, F1.3 and F1.4. The setup must be turned on in order to change these parameters.

[F1.6 1]

RESET SETUP PARAMETERS TO DEFAULT VALUES

FOR 8571 WITH THE G REVISION LOGIC PCB (L7 REVISION SOFTWARE AS DISPLAYED AT POWERUP).

This step will reset ALL SETUP STEPS except the scale calibration group. All other setup steps will be reprogrammed to default values. Note: To configure and save custom set parameters, be sure to set *this* parameter to '"0".

0 = Disable function and advance to next setup step.
1 = Reset parameters to U.S.A. default values.
2 = Reset parameters to General Export default values.

If 1 or 2 is selected the scale will display the numeral "5" and then advance to the next prompt.

SETTING	U.S.A.	GENERAL EXPORT
F1		
F1.1	1	0
F1.2	1	0
F1.3	1	1
F1.4	10	10
F1.5	0	0
F1.6	1	2
F2.1	0	0
F2.2	0.02	0.02
F2.3	1	1
F2.4	1	1
F2.5	1	0
F2.6	1	0
F2.7	1 (10)	0
F3.1	0	0
F3.2	0	0
F3.3	-	-
F3.4	1	1
F4.1	1	1
F4.2	9600	2400
F4.3	0	0
F4.4	EVEN	EVEN
F4.5	1	1
F4.6	1	0
F4.7	1	1
F4.8	0	0
F4.9	1	1
F4.10	1	1
F4.11	1	1
F4.12	0	0
F4.13	1	1
F4.14	1	1
F4.15	0	0

The sample prompts change between the USA and EXPORT modes; “SPL” in the USA is “REF” in EXPORT. The “LO SPL” prompt reads “LO REF” in EXPORT.

[F2]
ACCESS UNIT FUNCTIONS?

Press:
PRINT - To enter into the unit function setup routine. The display will step to [F2.1].
TARE - To bypass the unit function setup routine, the display will then step to [F3].

[F2.1 0]
SAMPLE IN APW OR PCS./WT.

1 - If the average piece weight is to be entered and calculated in pieces per weight unit (lb or kg).

0 - If the average piece weight is to be entered as a decimal value.

[F2.2 0.02]
MINIMUM SAMPLE SELECT

This allows selection of the percent of scale capacity that must be reached before an average piece weight may be calculated and a count sequence initiated. The available percentages are 0.0%, 0.02%, 0.05% and 0.10%.

Use the TARE key to switch to the next value and the PRINT key to enter the correct value when displayed.

[F2.3 1]
AUTO SAMPLE ACCEPTANCE

1 - When additional sample pieces required to reach the selected minimum sample requirement [Add 5] are to be automatically accepted after the pieces are added. The exact number must be added.

0 - When additional sample pieces required are to be entered via the SAMPLE key after adding the pieces.

[F2.4 1]
TARE ACTIVE

1 - Tare will be enabled.

0 - To disable the tare function.

[F2.5 1]
PERCENT ACCURACY RECALL ENABLE

1 - To enable the recall of % Accuracy after a count has been made.

0 - To disable the recall of % Accuracy.

[F2.6 1]
OPERATE IN POUNDS

1 - The scale will weigh in the pounds mode and will not be switchable to kilograms.

0 - The scale will weigh in the kilogram mode and will not be switchable to pounds.

NOTE:	The scale must be recelebrated after changing this selection.

[F2.7 0]
VARIABLE SAMPLE ENABLE

1 - To enable the selection of different sample counts (5, 10, 20, 50, or 100) before placing the sample pieces on the scale.

0 - To disable variable sample sizes and allow only the fixed sample size to be used. (See step [F1.4]).

[F3]
ACCESS CALIBRATION?

Press:

PRINT - To enter into the calibration group of setup parameters. The setup will proceed to step [F3.1].

TARE - To bypass the calibration group of parameters and the 8561 will proceed to step [F4].

[F3.1]
EXPANDED WEIGHT DISPLAY

1 - The weight display will be expanded.

0 - The display will not be expanded.

NOTE: The 8571 should not be left in the expand mode of weighing. This should be used for installation evaluation and troubleshooting only. The scale will also output weight data continuously when expanded.

[F3.2]
CONFIGURE SCALE?

Press:

PRINT - To proceed with the calibration procedure for the 8571.

TARE - To skip the calibration of the 8571 and proceed to Step [F3.4].

Allow a minimum of 15 minutes for warm-up before attempting to calibrate the 8571. This warm-up time is required to stabilize the electronics and allow the digital load cell to "warm-up".

[F3.3 010]
SCALE CAPACITY SELECT

The unit is asking what the total capacity of the scale is to be. If the scale is to be used in pounds (lb), your valid selections will be 5 lb, 10 lb, 25 lb, 50 lb, or 100 lb. If the scale is to be used in kilograms (kg), your valid selections will be 2 kg, 5 kg, 10 kg, 20 kg or 50 kg.

Press:

PRINT - If the number displayed is the correct capacity selection. The display will then read [E SCL].

TARE - If the number displayed is not the correct capacity selection. The display will then advance to the next capacity selection. Repeated pressing of this pushbutton will cycle the display through all capacity selections. When the desired selections is displayed, press PRINT.

NOTE: That the 2 lb (or 1 kg) capacity selection appears in this step but is not yet available.

[E SCL]
EMPTY SCALE

Empty the scale platter then press PRINT.

[15 CAL]
TIME OUT

The scale will count down form 15 to 0 while an initial reading is taken.

NOTE: If motion is seen by the unit during the count down sequence, the counting will stop and the unit will automatically reset to 15 and start the count down sequence again.

[Add Ld]
ADD LOAD

Place the selected test weight on the scale platform. This should be an amount close to scale capacity. As much weight as is practical should be used. Press PRINT to continue.

[000]
TEST WEIGHT

Enter the value of test weights used for calibration. enter only whole numbers - not decimals. The digits enter form the left.

Press:

TARE - To increment the digit selected to the next higher number.

PRINT - To accept the number displayed for a particular digit and the 8571 will advance to the next digit to the right.

CLEAR - To enter the complete display as the value of test weights.

[15 CAL]
TIME OUT

The 8571 will count down from 15 to 0 while span is determined.

NOTE: If motion is seen by the unit during the count down sequence, the counting will stop and the unit will automatically reset to 15 and start the count down sequence again.

[CAL d]
CALIBRATION DONE

This display is shown for approximately 3 seconds before proceeding to the next prompt.

[F3.4 1]
AUTOZERO MAINTENANCE ENABLE

1 - To enable the autozero maintenance feature. AZM will keep the unit on gross zero in spite of small changes in weight of up to 0.06 increments per second.

0 - To describe the autozero maintenance feature.

[F4]
ACCESS SERIAL I/O FUNCTIONS?

Press:

PRINT - To access the printer program setup when data input or output is required.

TARE - To bypass the Serial I/O setup. The program will proceed to [Set OFF].

[F4.1 0]
PRINTER OUTPUT ACTIVE

1 - Data will be output when ever the PRINT key is pressed or an ASCII "P" is received.

0 - The data output function will be disabled.

[4.2 0300]

BAUD RATE

Press:

PRINT - If the value displayed is the correct baud rate.

TARE - The unit will update to another baud rate selection. The choices are 300, 1200, 2400, 4800, and 9600.

[F4.3 0]

CHECKSUM ENABLE

1 - A checksum character will be transmitted.

0 - No checksum is transmitted.

Checksum is defined as the 2's complement of the 7 low order bits of the binary sum of the 7 low order bits of all characters preceding the checksum including STX and CR.

[F4.4 EVEn]

PARITY SELECT

Press:

PRINT - To accept the displayed prompt as the desired parity selection.

TARE - To update to the next selection. The possible selections are even, odd and none (parity always a "0").

[F4.5 1]

ENABLE STX CHARACTER

1 - The STX (Hex 02) character will be the first character sent in a data transmission.

0 - The STX character will not be transmitted.

[F4.5 1]

1 - The CTS handshaking line (pin 5) at the serial I/O connector must be pulled up to allow a data transmission.

0 - The CTS line is ignored by the 8571.

[F4.7 1]

REPEAT PRINT ENABLE

1 - To enable the repeat print feature.

0 - To disable the repeat print feature.

[F4.8 0]

SINGLE LINE OUTPUT

1 - If all the data is to be transmitted in a single line.

0 - If the data is to be output one field per line. (Multiple line)

[F4.9 1]
PRINT GROSS WEIGHT

1 - If gross weigh is to be transmitted.

0 - If gross weight is not to be transmitted.

[F4.10 1]
PRINT TARE WEIGHT

1 - If tare weight is to be transmitted.

0 - If tare weight is not to be transmitted.

[F4.11 1]
PRINT NET WEIGHT

1 - If net weight is to be transmitted.

0 - If net weight is not to be transmitted.

[F4.12 0]
PRINT NET EXPANDED?

1 - The net weight will print expanded if the printer is capable of doing so when an ASCII "SO" character is received.

0 - The output will not have the ASCII character "SO" to initiate an expanded print of net weight.

[F4.13 1]
PRINT AVERAGE PIECE WEIGHT

1 - If piece count is to be transmitted.

0 - If piece count is not to be transmitted.

[F4.14 1]
PRINT PIECES

1 - If piece count is to be transmitted.

0 - If piece count is not to be transmitted.

[F4.15 0]
PRINT PIECES EXPANDED

1 - The piece count will print expanded if the printer is capable of doing so when an ASCII "SO" character is received.

0 - The output will not have the ASCII character "SO" to initiate an expanded print of pieces.

[Set OFF]
TURN SETUP SWITCH OFF

Turn the setup switch SW1 off and either reinstall the platter (on scales with the 11" X 14" platform) or reinstall the plastic cover plug (on scales with the 8" square platter) into the access hole. See Figure 3 for location of SW1.

4.3 JUMPER POSITIONING

WARNING!
DISCONNECT ALL POWER TO THIS UNIT BEFORE REMOVING THE FUSE OR SERVICING

The Main PCB of the 8571 has two jumpers that must be positioned as shown in Figure 4 or the unit will not operate properly. The Display PCB has no jumpers.

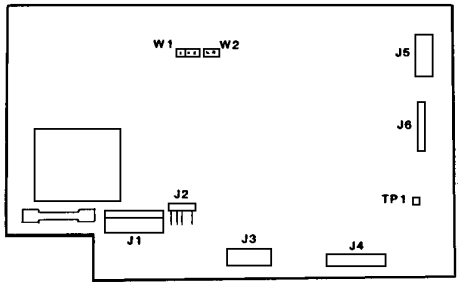


Figure 4

1. W1 - EPROM SELECT

   This jumper must be connecting pin 2 and pin 3.

2. W2 - PSEN
   This jumper must be in place connecting the two pins.

5. OPERATING INSTRUCTIONS

5.1 DISPLAY FORMAT

The 8571 utilizes a low power custom liquid crystal display (LCD). Depending upon which mode the scale is in, different legends will be shown. The location and descriptions of these legends follow.

5.1.1 % ACCY - Percent Accuracy

This indicates that the calculated percent accuracy is presently displayed during a recall sequence.

5.1.2 NET - Net Weight

When shown, this indicates that a tare has been taken and the display is showing the resulting net weight.

5.1.3 APW - Average Piece Weight

This display will be shown when the average piece weight is displayed during the recall mode.

5.1.4 BAT LOW - Battery Low

This indicates the optional battery is low and requires recharging

5.1.5 PCS - Pieces

This shows that the calculated piece count is shown on the display.

5.1.6 lb - Pounds

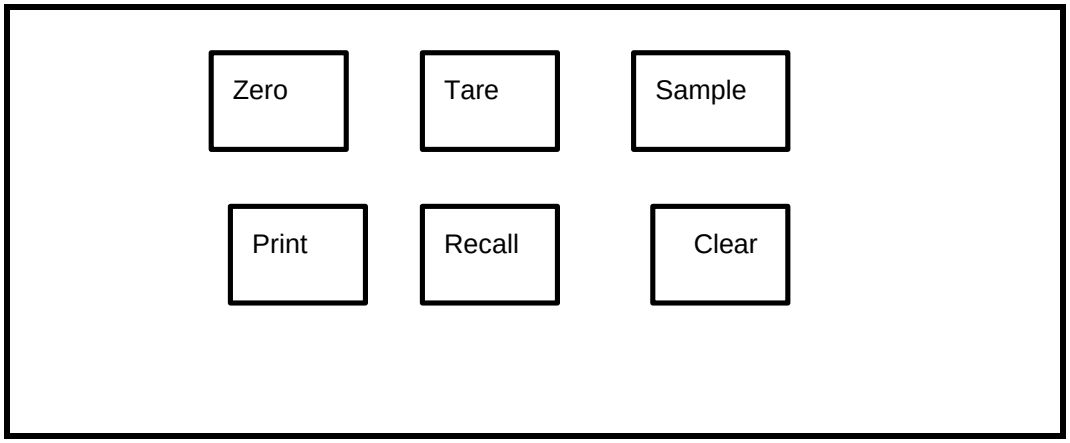
Indicates motion has stopped and the pound mode has been selected.

5.1.7 kg - Kilograms

Indicates motion has stopped and the kilogram mode has been selected.

Sample Display

5.2 KEYBOARD OPERATION



5.2.1 Zero: Provides the ability to rezero a gross weight on the scale over a range of +/- 2% of the programmed full scale capacity. Also, when a net weight is displayed, depressing the ZERO key results in the weight display switching to gross weight for approximately 2 seconds and then returning to net.

5.2.2 Tare: When the TARE button is pressed with the weight on the scale, and no weight motion present, the tare weight will be subtracted from the gross weight to proved a net weight display of zero. If the weight will be displayed as a negative value. If TARE is pressed while there is motion on the scale, the tare command will be retained and performed when motion ceases.

5.2.3 Sample: Depressing and holding the SAMPLE key while applying power via the ON/OFF switch will allow the operator to gain access to the operator selectable parameters F1.1 through F1.4. This key also enters the sample weight or toggles the sample count to alternate selections.

5.2.4 Print: When this key is pressed with no motion on the scale, data will be transmitted from the optional Serial I/O connector according to programming in Section F4. If motion is present, this command will be retained and acted upon when motion ceases. This output can be disabled in setup.

5.2.5 Recall: The RECALL key is used to examine data in memory. Sequential depressions of the RECALL key displays percent accuracy, net weight and count. The selected field will remain displayed until changed by the RECALL key or until power loss. This feature operates only in the count mode.

5.26 Clear: When entering any data , a single depression of the CLEAR key will erase the data entered; a double depression will exit the data entry mode. When not in a counting sequence (no sample has been entered) a single depression of the CLEAR key clears any tare weight that has been entered, returning the weight display to gross mode. During a counting sequence a double depression of the CLEAR key exits the counting mode and clears tare weight and APW.

5.3 INITIAL POWER-UP SEQUENCE

When power is first applied to the scale (via the power switch on the right side of the base near the front) the following sequence will occur.

5.3.1 All segments and legends will be activated for approximately tow seconds.

5.3.2 The segments and legends will clear and six decimal points will be shown for approximately tow seconds.

5.3.3 The decimal points will clear and the display will remain blank for approximately two seconds.

5.3.4 The prompt ZERO? Will then be displayed until zero has been captured. The scale must be within +/-2% of capacity form zero at power up for the 8571 to automatically capture zero.

5.3.5 If within zero capture range, the display will now show all zeroes with the weight legend (lb or kg) indicated at the right.

5.4 OPERATING SEQUENCES

The following sequences describe various methods used to count pieces on the 8571. Both variable sample and fixed sample methods are described as well as count out mode.

5.4.1 Fixed Sample - Normal Mode

1. If tare is to be taken, place empty container on platter, press TARE key otherwise proceed to step 1.2.

2. Place selected fixed sample quantity on platter and press SAMPLE (Refer to setup step F1.4).

3. If the sample weight is sufficient to meet the minimum sample requirement (setup step F2.2) the display will now show the sample weight is not sufficient, an error E51 (insufficient sample) will be displayed and these pieces cannot be counted with the fixed sample size selected.

4. Add pieces to the platter and the count will be displayed.

5.4.2 Fixed Sample - Count Out Mode

1. Place full container on platter and press the TARE key.

2. Withdraw the selected fixed sample quantity of pieces form the platter then press the SAMPLE key.

3. If the sample weight is sufficient to meet the minimum sample requirement (setup step F2.2) the display will now show the sample count. If the sample weight is not sufficient, an error E51 (insufficient sample) will be displayed and these pieces cannot be counted with the fixed sample size selected.

4. As additional pieces are removed, the count of the pieces withdrawn is displayed.

5.4.3 Variable Sample - Normal Mode

1. If tare is to be taken, place empty container on platter, press TARE key otherwise proceed to step (5.4.3, #2).

2. Press the SAMPLE key until the selected quantity for the sample count is displayed.

3. Place the sample pieces on the scale and press the SAMPLE key again. If the sample weight is sufficient to meet the minimum sample requirement (setup step F2.2) the display will now show the sample count. If the sample weight is not sufficient, the 8571 display will show either "LO" or "Add x".

   a). "LO" - This indicates the sample weight is not at least 2 display increments. This will be shown for approximately 2 seconds then the sample quantity will be automatically advanced to the next selection. Add the required sample and press SAMPLE again.

   b). "Add x" - This indicates that the sample weight was greater than 2 display increments but not great enough to meet the minimum sample requirement. The "x" value is the quantity of sample pieces that must be added for a retry of meeting the minimum sample requirement. This sequence may occur more than once as the 8571 recalculates the APW.

4 Place additional pieces on the platter and the 8571 will update to the correct calculated count.

5.4.4 Variable Sample - Count Out Mode

1. Place full container on the platter and press TARE.

2. Press the SAMPLE key until the selected quantity for the sample count is displayed.

3. Withdraw the selected sample pieces from the platter then press the SAMPLE key again. if the sample weight is not sufficient the 8571 display will show either "LO" or Add x".

   a). "LO" - This indicates the sample weight is not at least 2 display increments. This will show for approximately 2 seconds then the sample quantity will be automatically advanced to the next selection. Remove the new required sample and press SAMPLE again.

   b). "Add x" - This indicates that the sample weight was greater than 2 sample weight was greater than 2 display increments but not great enough to meet the minimum sample pieces that must be removed for a retry of meeting the minimum the sample requirement. This sequence may

occur more than once as the 8571 recalculates the APW.

4. As additional pieces are removed, the quantity of pieces withdrawn is displayed.

5.5 OPERATING ZONES

Four distinct zones of counting exist in relation to the weight on the platter. these zones are shown in the following four sections. Note that if sample enhancement is disabled zone 3 does not exist. Note also that if the minimum sample weight is chosen as 0.0% then zeros 1 and 2 essentially do not exist and the APW computation may have a large error. A sample weights when 0.0% is chosen to disable AZM.

ZONE	WEIGHT	CONDITION
1.	Below Minimum APW Computation (Below 2 display Increments).	No sampling, Display shows "E51" or "LO".
2.	2 Increments Minimum Sample weight.	Sampling allowed. Display shows "Add-x"
3.	Minimum Sample Weight to 4%. Print allowed.	Count Mode. APW Enhancement allowed. Display shows selected data field.
4.	4% to Scale Capacity Print allowed. shows selected data field.	Normal Counting Mode. No Enhancement. Display

ZONE 1

Average piece weight (APW) cannot be accurately computed below 2 increment counts. Any attempt to enter a sample piece count by pressing the SAMPLE key will result in the message "LO" or "E51". If the 8571 is in the variable sample mode the display "LO" will be shown for approximately two seconds. The sample quantity required will automatically advance to the next selection and additional sample pieces should be added. If the error "E51" is shown in the fixed sample mode, a count will not be possible since the weight of the fixed sample count selected is less than 2 display increments.

ZONE 2

In setup the 8571 can be programmed to permit the operator to continuously update the average piece weight based on larger and larger samples (Setup step [F1.3]) A minimum APW weight, as defined in Zone 1 previously, is required for the initial calculation of APW. As additional pieces are placed on the scale, each time the scale sees a motion/ no-motion sequence, a new APW is calculated, based upon the new total sample weight with the sample count calculated using the APW previously established. See Section 5, part 6 for further discussion of APW enhancement.

Minimum sample weight is selected during Setup as 0.02%, 0.05%, 0.1% or 0.0% of scale capacity. The display shows "Add(x)", when the sample weight is below the minimum selected. (x) is the value of additional pieces required to reach the minimum sample requirement. It is calculated by using the original sample to calculate an APW, and using this APW to calculate the maximum number of pieces allowed maximum is exceeded, "OVER" will be displayed and the operator should remove parts until a motion/ no-motion sequence does not result in the "OVER" display.

A manual sample acceptance mode is also selectable in the setup mode which requires an exact number of samples (x) be added and the SAMPLE key is pressed. This results in the most accurate APW.

ZONE 3

From the minimum sample weight to 4% of scale capacity the scale is in full counting mode. Printing may be done as desired. The APW will be enhanced may be done as desired. The APW will be enhanced if selected by setup step [F1.3] throughout this range, unless too many pieces are added to the platter. If the count of pieces added exceeds the number which can be reliably counted using the previous APW, the display shows "OVER" for 2 seconds, after which the count is again displayed. If the operator wishes to continue APW enhancement pieces must be removed until each motion/no-motion sequence no longer results in an "OVER" display. APW enhancement then occurs.

If the operator ignores the "OVER" display and adds more pieces or prints, no further APW enhancement is possible for the current transaction. Once the counting weight reaches 4% of scale capacity, APW enhancement is discontinued.

ZONE 4

From 4% to 1005 of scale capacity is the normal counting zone, during which the displayed APW will not change and no APW enhancement is done.

5.6 AVERAGE PIECE WEIGHT ENHANCEMENT

The initial computed value of average piece weight (APW) may not have the accuracy needed to reliably count large numbers of small pieces. This problem is inherent in a single scale parts counter, since it must have the weighing range to count large quantities of parts. To compensate for this, the APW is allowed to be enhanced constantly up to 4% of scale capacity. In order to ensure a minimum APW initial accuracy, a minimum sample weight of 2 display increments is required. APW's below this value should be accurately determined on a more sensitive scale then entered via the Serial I/O port suing remote entry of APW form a terminal.

APW enhancement is based on the fact that an inaccurate APW, while not able to count large numbers of parts, will very reliably count a small number of pieces. This count will then allow a new determination of APW based on a larger weight. Given enough enhancements the APW will become very accurate.

Enhancement occurs on a motion/ no-motion sequence with the following two conditions satisfied:

5.6.1 Pieces must have been added that is, the weight must have increased (or decreased in count out mode).

5.6.2 The pieces added (or removed) must not exceed the amount which can be counted accurately with the current APW. A display of "OVER" results when this amount is exceeded.

6. OPTIONAL ACCESSORY INSTALLATION

6.1 SERIAL I/O KIT

This kit # 129346 00A (0901-0224) consists of a harness that connects to J6 on the Main PCB and has the 25 pin output connector J10 at the other end. The 25 pin connector is located on the bottom of the base of the 8571. To install thee new harness, follow these steps.

6.1.1 Remove power to the 571 by turning the power switch off and unplugging the power cord from the AC power source.

WARNING!
DISCONNECT ALL POWER TO THIS UNIT BEFORE REMOVING THE FUSE OR SERVICING.

6.1.2 Remove the platter, sub platter, dead deck (on low capacity units) and cover to gain access to the interior of the scale.

CAUTION!
OBSERVE PRECAUTIONS FOR HANDLING ELECTRO STATIC SENSITIVE DEVICES

6.1.3 Tip the scale base on its right side as shown in Figure 5 and remove the two phillips head screws that hold the blank plate to the base.

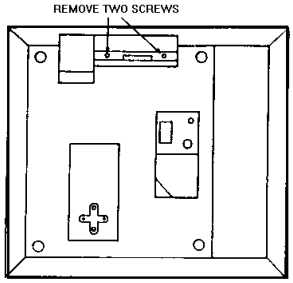


Figure 5

6.1.4 Remove and discard this blank plate.

6.1.5 Install the new harness #129346 00A by feeding the harness through the cavity hole in the base and securing the metal bracket to the base using the screws removed in step 3.

6.1.6 Attach the 9 pin connector end (P6) of the harness #129346 00A to J6 on the Main PCB. See Figure 4 for location of J6.

6.1.7 Connect any harnesses that had been removed and reinstall the top cover.

6.1.8 Reinstall the dead deck (on low capacity units), sub-platter and platter.

6.1.9 Reapply AC power and verify operation of the Serial I/O option referencing the 8571 technical manual TM008571 I00.

6.2 REPLACEMENT BATTERY

When the optional battery kit (0919- 0017) is ordered, it will contain installation instructions describing its installation procedure. The following instructions only describe replacement of the battery once the kit is installed.

6.2.1 Remove power to the scale by turning the power switch (on the right front side of the base) off and unplugging the AC power cord.

WARNING!
DISCONNECT ALL POWER TO THIS UNIT BEFORE REMOVING THE FUSE OR SERVICING.

6.2.2 Rotate the scale so that the rear panel is accessible. See Figure 6.

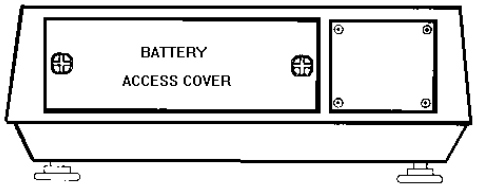


Figure 6

6.2.3 Rotate the two plastic screws on the battery access cover 1/4 turn by inserting a coin and twisting. Remove the cover.

6..2.4 Lift the front of the scale slightly while holding a hand over the battery opening. This should allow the battery to slide out of the cavity and into your hand

6.2.5 Set the front of the scale down and entirely remove the battery form the battery cavity.

6.2.6 Disconnect the in-line connector to the battery leaving the spade lugs and short harness connected to the battery.

6.2.7 Exchange the battery. The new battery must have the short harness that connects to the in-line connector. Connect the new battery to the connector on the 8571 internal harness.

6.2.8 Insert the battery, on its side, into the battery tray noting the positioning of the label on the bottom of the battery. See Figure 7.

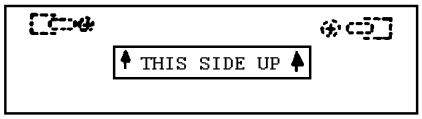


Figure 7

6.2.9 Position the connector form the battery harness so that it fits into the small cavity in he left rear section of the battery tray. Press the battery completely in toward the load cell cavity. The bottom of the battery must be completely in toward the load cell cavity. The bottom of the battery must be completely inside the rear edge of the cover.

6.2.10 Reinstall the cover plate into the two square holes on the back of the 8571 and snap the two fasteners down.

6.2.11 Verify operation of the battery option referencing the 8571 technical manual, TM 008571 I00.

7. SERIAL INPUT/OUTPUT DESCRIPTIONS (OPTIONAL)

The 8571 serial port is a bidirectional port that is capable of receiving certain ASCII characters as well as transmitting selected scale data. The input and output operations will be described separately in the next sections.

7.1 DATA OUTPUT DESCRIPTIONS

Data output is RS-232-C only. the baud rate is selectable as 300, 1200, 2400, 4800. or 9600 baud. the data will always be in an 11 bit frame - parity bit (even, odd or "0") and 2 stop bits. A checksum character and STX (start of text) character may be enabled in the setup mode to allow flexibility in the data output. The maximum recommended cable length for RS-232 is 50 feet.

7.1.1 RS-232 Handshaking Lines

1. RTS - When the 8571 receives a print command from the keyboard or a remote 'P" and it is ready to send data, it will change the status of RTS (Request to Send) form -10VDC to +10VDC. This signal will remain at +10 VDC until the data transmission is complete.

2. CTS - When this signal is disabled in setup (step [F4.6]) the CTS (Clear to Send) line is ignored by the 8571. When the CTS line is monitored by the 8571 (setup step [F4.6 =1]). CTS needs to be at +10VDC to permit the data transmission. If RTS goes to +10VDC (indicating the 8571 is ready to transmit), CTS must respond to a +10VDC level or an error E40 will be shown on the display.

3. DTR - Data Terminal Ready will go to +10 VDC when the 8571 is powered on and is ready to operate.

7.1.2 Repeat Print

The operation of the repeat print function is the same in both the weigh and count modes.

1. Repeat Print Disabled

   When repeat print is turned OFF, only one print is permitted after weight is applied to the scale. Additional print requests are ignored until the scale returns to gross zero or until the CLEAR key is pressed twice. The recall function remains active throughout the sequence.

2. Repeat Print Enabled

   When repeat print is turned ON, the weight or count display will lock after a print request. Repeated prints of this information are available using the PRINT key. The recall sequence is inhibited. If pieces are added to the scale (or removed in the count down mode) in an amount greater than one display increment, the 8571 will unlock the display when motion ceases. The RECALL key will then become active and a print of the new values is possible. After a print, the display will lock and multiple prints of these values are possible.

7.1.3 Data Format

During setup, the format for the demand mode output is selectable as either single or multiple line. Both of these selections are described next.

Note that for use with Toledo Scale printers Models 8804, 8806, 8840, 8855 (with interface KOP) and 8860 (configured for RS-232), the STX character should be enabled.

1. Single Line Output

The 8571 can transmit any or all of its fields on a single line. The data will always be sent in the following order.

Gross - Tare - Net - APW - Pieces

The net weight and piece count can also have the "SO" character added to indicate expanded print. In order to print all fields on a single line, the receiving device must be capable of printing up to 68 characters on a line. The format and number of characters in each field are shown below.

STX	X	X	X	X	X	X	sp	X	X	X	X	X	X	sp	Lk	Bg	sp	T	R

SO	sp	*	X	X	X	X	X	X	sp	Lk	Bg	sp	N	E	T	SI	sp	X	X	X	X	X	X	X	X

sp	Lk	Bg	sp	A	P	W	sp	SO	X	X	X	X	X	X	sp	P	C	S	SI	CR	CKS	LF

STX - Optional Start of Text Character

sp - Space Character

X - Numeric data or space

* - Space or minus sign

CR - Carriage Return Character

CKS - Optional Shift Out Character for expanded print.

SO - Optional Shift Out Character for expanded print.

SI - Optional Shift in Character to end expanded print.

The 8571 will not output a comma in place of a decimal point.

The 8571 will not output leading zeroes. Non-significant leading zeroes are transmitted as spaces.

If a particular field is selected not to print, all following fields will be shifted let accordingly.

If the 8571 is not in the count mode, only gross, tare and net data will be transmitted.

2. Multiple Line Output

The five fields sent from the 8571 (or three fields in weight only mode) can each be sent on a separate line if the multiple line output is selected in the following order:

Gross
Tare
Net*
APW
Pieces

The net weight and piece count can also have the "SO" character added to indicate expanded print. The exact format and number of characters in each field are shown below.

STX	sp	sp	X	X	X	X	X	X	X	sp	Lk	Bg	CR	CKS	LF

SO	sp	*	X	X	X	X	X	X	sp	Lk	Bg	sp	T	R	CR	CKS	LF

SO	sp	*	X	X	X	X	X	X	sp	Lk	Bg	sp	N	E	T	SI	CR	CKS	LF

X	X	X	X	X	X	X	X	sp	Lk	Bg	sp	A	P	W	SI	CR	CKS	LF	

SO	sp	sp	X	X	X	X	X	X	sp	P	C	S	SI	CR	CKS	LF		

STX - Optional Start of Text Character

sp - Space Character

X - Numeric data or space

* - Space or minus sign

CR - Carriage Return Character

CKS - Optional Shift Out Character for expanded print.

SO - Optional Shift Out Character for expanded print.

SI - Optional Shift in Character to end expanded print.

The 8571 will not output a comma in place of a decimal point.

The 8571 will not output leading zeroes. Non-significant leading zeroes are transmitted as spaces.

If a particular field is selected not to print, all following fields will be shifted up accordingly.

7.2 DATA INPUT DESCRIPTION

7.2.1 Format

The parity and baud rate of the data input must be the same as what has been selected for the data output in setup section [F4]. The format of the input data must also be an 11 bit frame - 1 start bit, 7 ASCII data bits, 1 parity bit and 2 stop bits.

Input data is free format with a maximum number of digits as noted. a decimal point is needed only if data interpretation requires. it. Leading zeroes are not required ("0.12" may be entered as ".12"). The Carriage Return (CR) character is used to terminate a command. Data will only be accepted when RTS is low (false). Data should not be sent if RTS is high (true) this means printer output is in process.

7.2.2 Commands

The external commands that will be recognized by the 8571 are described next with descriptions when required. The brackets <> are for clarity only and must not be transmitted. All letters sent are capital letters.

Command Format	Description
<Z> <CR>	Zero the scale if within +2% of capacity from zero.
<T> <CR>	Tare the scale to net zero.
<T> <X.XXXX><CR>	Enter the digital value transmitted as the tare value. From 1 to 5 digits (plus decimal point) may be transmitted.
<C> <CR>	Clear the scale to home position.
<S><CR>	Enter fixed sample count chosen during setup. Fixed sample is used independent of variable or fixed mode keyboard operation. Sample pieces must be on the scale.
<S> <XXX><CR>	Enter the number of pieces (XXX) as the sample count. Three digits maximum. Sample pieces must be on the scale.
<A><X.XXXXX><CR>	Enter the value transmitted (up to 6 digits plus decimal point) as either the APW or PCS/wt depending upon setup step [F2.1].
<P> <CR>	Print command. This functions the same as the keyboard PRINT.

7.2.3 Operation

The 8571 must be in the same condition to receive a remote command as it would be in for the corresponding keyboard function. If RTS is true, a command will be ignored.

Once a command and data string is received by the scale it will take approximately 250 ms to process it. Another command, received before original one is interpreted, will be ignored, along with all further transmission until the next command character.

Command strings should be spaced no closer than 2 seconds apart. Any character not shown in the command chart will be ignored. The maximum recommended cable length for RS-232 is 50 feet.

7.3 INTERFACING

7.3.1 Pin Configuration

The optional serial kit will contain a 25 pin connector that mounts to the bottom of the 8571. Only eight of the 25 pins are used. These pin numbers and respective descriptions are shown next. The 8571 is configured as a DTE device.

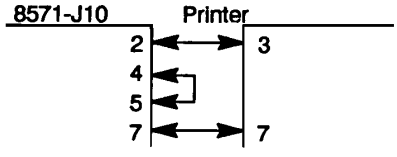
J10 PIN	DESCRIPTION
2	TxD - Transmit (RS-232)
3	RxD - Receive (RS-232)
4	RTS - Request to Send (RS-232)
5	CTS - Clear to send (RS - 232)
7	Logic Ground
19	Logic Ground
20	DTR - Data Terminal Ready (RS-232)
23	Logic Ground

7.3.2 Printer Cables

1. The Toledo models 8804*, 8806, 8840 and 8860* (configured for RS-232) all use the same 6 foot interconnecting cable to the 8571. * Not adaptors used.

   Cable Part Number B128220 00A
   Cable Factory Number 0900-0214

   The configuration of the cable is shown below.



2. Use with a Toledo 8855 printer requires the installation of a special interface capable. This cable will have an interface PCB attached to the printer end. It will be necessary to remove the existing Interface PCB from the 8855 and install the special one.

NOTE: The 8571 must be programmed for 1200 baud to operate with the 8855.

Kit Part Number 129618 00A
Kit Factory number 0900-0244

8. PREVENTIVE MAINTENANCE

The Model 8571 is designed to require a minimum of maintenance and service. This section provides instructions and procedures for maintenance of the indicator, as well as a troubleshooting guide to problem analysis.

8.1 REQUIRED TOOLS AND SUPPLIES

The following items are recommended for proper maintenance and repairs. Common hand tools are also required:

--Volt - Ohm Meter
--Load Cell simulator (P/N 100865 00A)
--Cleaning Cloth
--Static Bag
--Static Wrist Strap

8.2 MAINTENANCE SCHEDULE

The frequency at which normal maintenance (cleaning and inspection) should be performed, when installed in a clean office environment, should be twice a year. However, if the unit is subjected to a dusty or a dirty environment the frequency should be increased as required.

8.3 CLEANING

Clean the keyboard and cover with a soft, clean cloth that has been dampened with a mild window type cleaner. (DO NOT USE ANY TYPE OF INDUSTRIAL SOLVENT.) DO NOT SPRAY CLEANER DIRECTLY ONTO THE UNIT).

8.4 TROUBLESHOOTING

8.4.1 Procedure

1. If operational difficulties are encountered, obtain as much information as possible regarding the particular trouble, as this may eliminate a lengthy, detailed checkout procedure.

WARNING!
ELECTRIC SHOCK HAZARD,
DO NOT REMOVE COVER.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

WARNING!
ONLY PERMIT QUALIFIED PERSONNEL TO SERVICE THIS EQUIPMENT. EXERCISE CARE WHEN MAKING CHECKS, TESTS AND ADJUSTMENTS THAT MUST BE MADE WITH POWER ON.

2. Check fuses, primary power lines, external circuit elements and related wiring for possible defects. Failures and malfunctions often may be traced to simple causes such as loose or improper circuits, power supply connections or fuse failure.

3. Use the electrical interconnecting diagram as an aid in locating trouble causes. Part 5 of this section contains various voltage measurements that are average for normal operation. Use instrument probes carefully to avoid causing short circuits and damaging circuit components.

4. Malfunctions in the 8571 are best located by substitution. A printed circuit board believed to be defective may be checked by replacing it with a known good PCB and observing whether the problem is corrected. WHEN HANDLING A PCB, USE A "VELOSTAT" STATIC BAG FOR BOTH THE NEW AND DEFECTIVE PCB.

CAUTION!
OBSERVE PRECAUTIONS FOR HANDLING ELECTRO STATIC SENSITIVE DEVICES.

5. To verify the problem, as being in the removed PCB, removed the defective PCB and retest. This simple test will eliminate the possibility of having replaced a good PCB because of a loose or poor connection.

   Be sure to consult the technical manual for proper programming.
   Do not automatically program the replacement PCB like the suspected faulty PCB as the problem may be a programming error.

   Exchange PCB's or sub-assemblies are available from your authorized Toledo Scale representative. These assemblies are repaired and tested at various Toledo Scale factories.

8.4.2 Error Codes

ERROR CODES		
Error Code	Description	Corrective Measures
E1	ROM Error	1. Power Down / Wait 15 Sec./ Power Up 2. Replace Main PCB
E2	Ram Error	1. Power Down / Wait 15 Sec. / Power Up 2. Replace Main PCB.
E3	NOV ROM Error	1. Power Down / Wait 15 Sec./ Power Up 2. Perform Setup Again. 3. Perform Diagnostic Test in troubleshooting section of T.M.
E4	RAM Error	4. Replace Main PCB
E8	Load Cell Out of Range	1. Power Down / Wait 15 / Sec./ Power Up 2. Replace Main PCB
E9	Load Cell Error in Communication	1. Check Voltage to Load Cell. 2. Check for Mechanical Overload 3. Replace Load Cell. 4. During CAL - Use 3/4 total cap.
E10	Load Cell Data Format Error	1. Power Down / Wait 15 Sec./ Power Up 2. Recalibrate Scale 3. Replace Load Cell
E11	Load Cell Error in Download	1. Recalibrate / Reconfigure 2. Replace Load Cell.
E13	Load Cell ROM or RAM Error	1. Power Down / Wait 15 Sec./ Power Up 2. Recalibrate scale. 3. Replace Load Cell
E21	Scale Build Error	1. Power Down / Wait 15 Sec. / Power Up 2. Check Voltage to Load Cell. 3. Replace Load Cell.
E22	Calibration Error	1. Reconfigure scale. 2. Recalibrate.
E40	CTS Error	1. Recalibrate / Reconfigure 2. Replace Load Cell.
E51	Insufficient Sample	1. Check Setup Step [F4.6]. 2. Check status of External Device. 1. Change Fixed Sample size. 2. These small pieces cannot be counted.

8.4.3 Diagnostic Test

There is a short diagnostic routine that can be accessed by grounding TP1 on the Logic PCB. See Figure 4 for location of TPI. During this routine, setup parameters will be changed so calibration ad all setup functions must be reprogrammed after the test. The diagnostic routine will proceed through the following sequence.

Step 1 - Turn power off, ground TP1 on the Logic PCB and reapply power.

NOTE: In order to complete the test, an RS-232 jumper plug (# 115518 00A) must be installed at the optional printer connector J10 on the bottom of the base. If an optional serial harness has not been installed, two jumper plugs (# 109067 00A) must be installed at J6 on the Min PCB between pins 5 and 6 and between pins 7 and 8. If this is not done, the test will not proceed past step 8. See figure 4 for the location of J6.

Step 2 - The 8571 will cycle the display on and off then displayed next. Press PRINT to continue the test.

Step 3 - The revision level of the software [02] is displayed next. Press PRINT to continue.

Step 4 - The 8571 will display the numbers 1, 2 and 3 in sequence as it verifies the software, internal RAM and external RAM for internal RAM and external RAM for integrity. Error codes that may be shown are described in the section previous to this section, Section 2.

Step 5 - The display will then show [Set on] indicating the setup switch SW1 (Figure 3) must be turned on.

Step 6 - The 8571 will proceed with tests 4 and 5 where the NOVROM is reprogrammed then read to check its condition. Error codes that may occur are described in the previous section, Section 2.

Step 7 - The 8571 will then show a 6 to the left of the display indicting the beginning of the keyboard test. As numbers are displayed at the right of the display, the corresponding key must be depressed. Follow the following chart.

8571 Display	**Press Key**
6_____1	Zero
6____12	Tare
6___123	Sample
6__1234	Print
6_12345	Recall
6123456	Clear

The test will not proceed if the correct key is not detected as being pressed.

Step 8 - The 8571 will now check the operation of the input and output ports as well as the RTS and CTS handshaking lines. The display will show [7 1] and [7 2] during these tests. Remember that an RS-232 test plug (or jumpers on J6) must be in place or the test will not pass. Reference the note after step 1 of this procedure. If this test does not pass, the routine will not proceed further.

Step 9 - The display should now show [8 on] indicating the status of the setup switch SW1. Turn the setup switch off and the display should show [8 off]. Leave the setup switch tuned off. Press the PRINT key.

Step 10 - The 8571 will show [9] next. Press the PRINT key and the display will show [End]. The diagnostic routine is now complete.

Step 11 - Turn off power, remove the TP1 jumper and remove the jumpers from J6 on the Logic PCB (or remove the test plug form J10). Reassemble the 8571 and reapply AC power. Reprogram and recalibrate the scale for correct operation.

8.4.4 Shift Test

To verify if the 8571 is within specifications for shift variance, use the following test procedure.

4.1 Enter setup and program step [F3.1] as a "1" for expanded weight.

4.2 Place test weights equal to one-half scale capacity sequentially on the platter at the points (A,B,C,D and E) indicated in Figure 8. Note that points A, B, D and E are one-half the distance from the center of the platter to the edge of the platter.

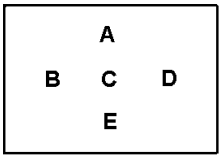


Figure 8

4.3 If the weight does not differ by more than 100 counts between any of the points, the 8571 is operating within spec.

4.4 If the error is greater than 100 counts, two possible causes are: 1) a mechanical bind or defect, or 2) a defective load cell.

4.5 Reprogram step [F3.1] to a "0" for operation.

NOTE: The 100 internal counts is equivalent to two display increments.

8.4.5 Testing Power Supply Voltages

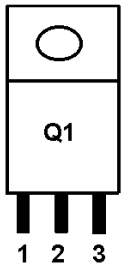
1. Raw Supply Voltage

The 8571 has its transformer mounted on the Main PCB. Verify the correct voltage is between pins 4 and 7 on P1. This is the input form the power cord and line filter of the Main PCB (or Charger PCB if the battery option is installed).

8571 Version	Min. AC Voltage	Max. AC Voltage
120 VAC	102 VAC	132 VAC
220 VAC	187 VAC	242 VAC

2. +5 Volt Supply

This voltage can be checked at Q1 on the Main PCB If the voltage is out of tolerance but the AC voltage at J1 (form the previous check 5.1) is within tolerance - replace the Main PCB.



The center pin (3) of the device should read form 4.85 to 5.2 VDC with respect to ground.

3. Charger PCB (Optional)

the voltage measured between TP1 and TP2 on the Charger PCB should be between 13.4 VDC and 13.8 VDC with the battery connected. If this voltage is out of tolerance, replace the Battery Charger PCB. To determine if a defective battery may be affecting this voltage a resistor may be substituted for the battery. Install a 274 ohm, 1 watt resistor form J3-1 to J3-2 (see Figure 4) and make the same voltage check at TPI.

8.5 REPLACEMENT OF LOAD CELL

CAUTION: When replacing the load cell or any of the PCB's remove power form the scale and wait a minimum of 30 seconds before disconnecting anything or damage may result.

8.5.1 Remove power from the scale. If the battery option is installed, disconnect the battery.

8.5.2 Remove the platter, sub-platter, dead deck, and cover assemblies.

NOTE: On 8571-0002 and 8571-0012 utilizing the 3.75 kg load cell, reinstall the two 8-32 shipping screws through the sub-platter into the two hex standoffs. See Figure 1. Do not tighten these screws down. They are used to keep the sub-platter form twisting while tightening or loosening the two load cell screws. DAMAGE MAY RESULT IF THIS PROCEDURE IS NOT FOLLOWED. After loosening or tightening the load cell screws, the two 8-32 screws may be removed.

8.5.3 Remove the spacer block on top of the load cell and turn the scale on its side.

6.5.4 Remove the two hex head screws from the bottom of the scale that secure the load cell. The load cell can now be removed. Be sure to return the spacer under the load cell.

8.5.5 With the scale still on its side, reinsert the two hex head screws through the base and slide the bottom spacer over the screws.

8.5.6 Carefully install the load cell by re-screwing the screws into the bottom of the load cell, tightening them to 75 - 85 inch/pounds.

8.5.7 Stand the scale base upright and re-install the top load cell spacer.

8.5.8 Reinstall the cover and dead deck (on low capacity units).

8.5.9 Reattach the sub-platter and platter to the 8571. Reference the procedure described in the note after step 2 of this procedure for 8571-0002 units.

8.5.10 Reapply AC power and verify operation of the new load cell referencing the 8571 technical manual TM008571 I00.

8.6 OVERLOAD STOPS

Adjusting the overload stops is required when the load cell and/or spider has been replaced. Refer to Figure 11 for overload stop positions. There can be up to six overload stops, identified as X1 thru X7. The 5 lb capacity scales use stops X1, X2, and X3. Overload stop X1 is located under the load cell on the 5 lb capacity scales. Refer to Figures 9 and 10 for locations. The 10 lb and greater capacity scales use stops X2 through X7, refer to Figure 11.

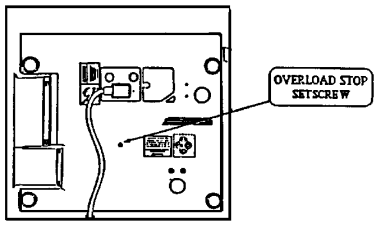


FIGURE 9 - Load Cell, Overload Stop Setscrew Locations

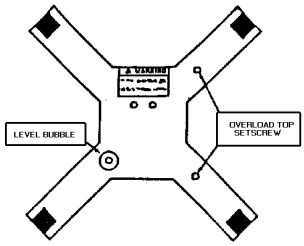


FIGURE 10 - Subplatter Overload Stop Setscrew Location

CAUTION: NEVER APPLY WEIGHT EXCEEDING THE CAPACITY OF THE SCALE OR SHOCK LOAD THE SCALE IF THE OVERLOADS HAVE NOT BEEN SET.

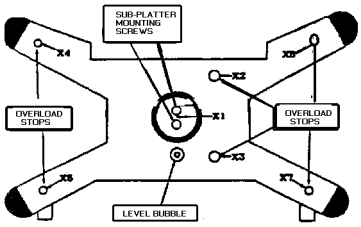


FIGURE 11

1. Assemble the base, load cell, and spider. Mounting screws should be snug but not tight.

Check that the corner and center overload stops are aligned with the overload adjust screws.

Tighten all four (4) load cell and spider mounting screws to 75/85 inch/pounds. Use a torque wrench to ensure proper screw tension without overtightening.

NOTE: All spider and cell mounting screws must be tightened to the proper specification as detailed in Step 1 before adjusting the overload stops. Failure todo so may result in the overloads being incorrectly set.

Adjust the overload screws per Chart 1. The 5 lb capacity scales use instructions in Section 4.1. The 10 lb and greater capacity scales use instructions in Section 4.2.

4.1 With power applied, place the 5 lb capacity scales into expanded display mode and loosen overload stops X1, X2, and X3.

The test weight, refer to Chart 13 for correct weight, is placed in the center of the platter to adjust X1, the right rear corner to adjust position X2, and the right front corner to adjust position X3. Refer to Figure 14.

Place the test weight into position.

Tighten the overload screw until the display weight just starts to change. This shows that the overload screw has just touched the overload stop.

Repeat this procedure for each of the three overloads X1, X2, and X3.

4.2 The 10 lb and greater capacity scales overload stops are set by measuring the gap between the overload stop and overload screw and adjusting that gap until it meets the specification listed in Chart 1. All dimensions are listed in inches. Use round wire gauges, or wire drill bits listed, tomeasure the gap, do not use flat feeler gauges.

Chart 1 - Overload Stop Adjustment

OVERLOAD STOP POSITION	SCALE CAPACITY					WIRE GAUGE TOLERANCE
	5 LB	10 LB	25 LB	50 LB	100 LB	
X1	6.5 LB	N.A.	N.A.	N.A.	N.A.	±0.001 IN
X2	6 LB	0.014/#79	0.015/#79	0.016/#78	0.024/#73	
X3	6 LB	0.016/#78	0.017/#77	0.020/#76	0.026/#71	
X4	N.A.	0.047/#56	0.059/#53	0.084/#45	0.153/#42	± 0.005 IN
X5	N.A.	0.047/#56	0.064/#52	0.057/#54	0.094/#42	
X6	N.A.	0.047/#56	0.059/#53	0.084/#45	0.153/#42	
X7	N.A.	0.047/#56	0.064/#52	0.057/#54	0.094/#42	

Note: The Overload stop gap measurements for overload stop positions X4, X5, X6, and X7 are listed both in inches and the wire drill bit number size equivalent.

Tighten the overload screw until the gap is smaller than the wire gauge.

Loosen the overload screw, slowly, until the wire gauge snaps through the gap.

Repeat this procedure for each of the six overloads X2, X3, X4, X5, X6, X7.

9. GENERAL INFORMATION

9.1 RECOMMENDED SPARE PARTS

It is recommended that these spare parts be kept in stock in order to keep downtime to a minimum. The items are available through your local Authorized Toledo Scale Service Representative.

Part Number	Description	Qty
(*) 131351 00A	Keyboard Assembly Kit	1
(*) 129332 00A	Main PCB (120 VAC)	1
(*) 120185 00A	Fuse (0.1A Slo - Blo)	2
(*) 129334 00A	Display PCB	1
(*) 129336 00A	Battery Charger PCB (120VAC)	?
(*) 131355 00A	Main PCB (220 VAC)	1
(*)131350 00A	Battery Charger PCB (220VAC)	?

(*) - May have letter prefix.

(?) - Quantity of 1 only when using the battery option.

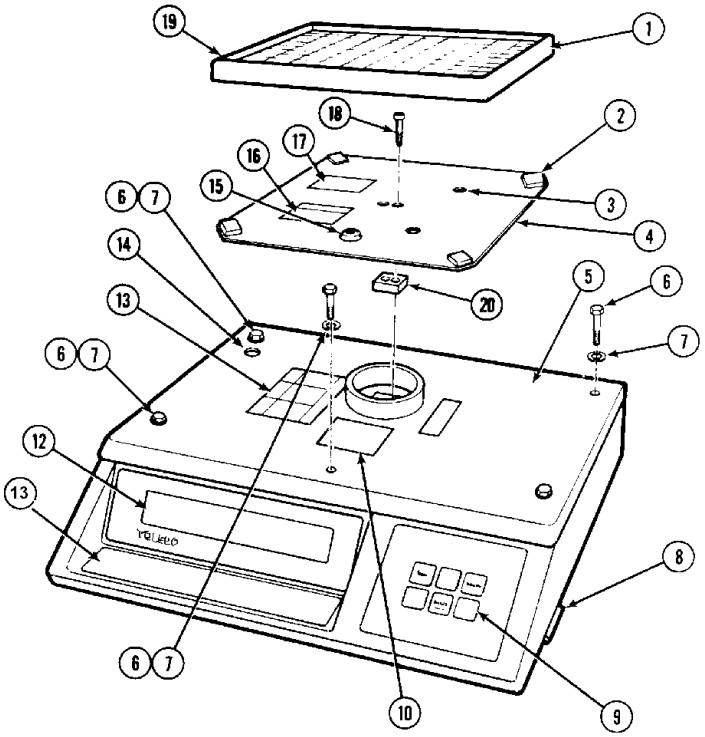
9.2 ACCESSORIES

The following accessories are available for use with the Model 8571.

Option Description	Part Number	Factory Number
Battery Operation for 120 VAC unit	(*) 129590 00A	0919-0017
Spare 12 Volt Battery	(*) 129574 00A	0919-0018
Remote Battery Charger for Item # 1	(*) 131358 00A	0919-0019
Battery Operation for 220 VAC unit	(*) 131363 00A	0919-0020
Serial Input/Output Harness	(*) 129346 00A	0901-0224
Serial Part Mating Connector	(*) 128881 00A	0917-0144
Interconnecting Cable	(*) 128220 00A	0900-0214
Printer Interface Kit (8855)	(*) 129618 00A	0900-0244
Stainless Steel 11" X 14"	(*) 123611 00A	0906-0122
1-1/2 Quart Shoe Scoop	(*) 115208 00A	0906-0081

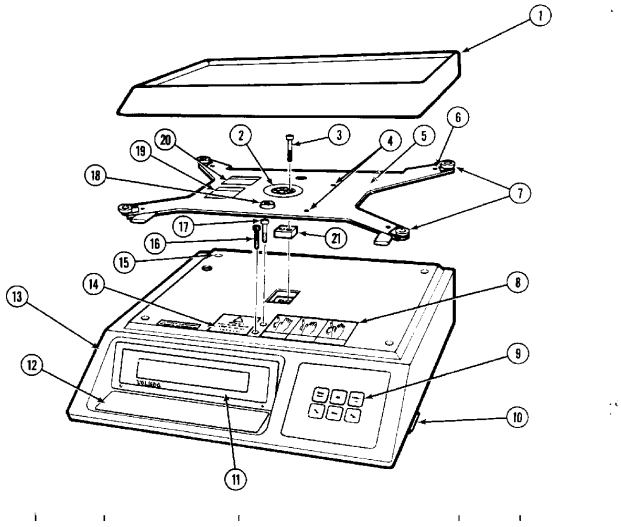
(*) - May have revision letter prefix.

10.1 EXTERIOR (LOW CAPACITY)



REF.	PART NUMBER	DESCRIPTION	QTY.
1	115193 00A	Plastic Platter Assembly	1
2	126983 00A	Hook Fastener	4
3	R03575 00A	Set Screw 3/8 -24 X 1/2"	2
4	26984 00A	Sub-platter Assembly	1
5	A126987 00A	Dead Deck	1
6	03719 00A	Nylon Screw, 8-32 X 3/4"	5
7	03708 00A	Nylon Washer. #8	5
8	119133 00A	Power Switch	1
9	131351 00A	Keypad Assembly	1
10	116033 00A	Static Caution Label	1
11	125134 00B	Decorative Whit Bezel	1
12	129351 00A	Display Lens	1
13	A118792 00A	Power Warning Label	1
14	R03816 00A	Setup Hole Plug	1
15	102689 00A	Level Bubble	1
16	119859 00A	Load Cell Spec. Label	1
17	122692 00A	Set Screw Caution Label	1
18	R03508 00A	Screw. 1/4-28 X 1-1/2"	2
19	115190 00A	Loop Fastener (N.S.)	4
20	127395 00A	Spacer Block	1

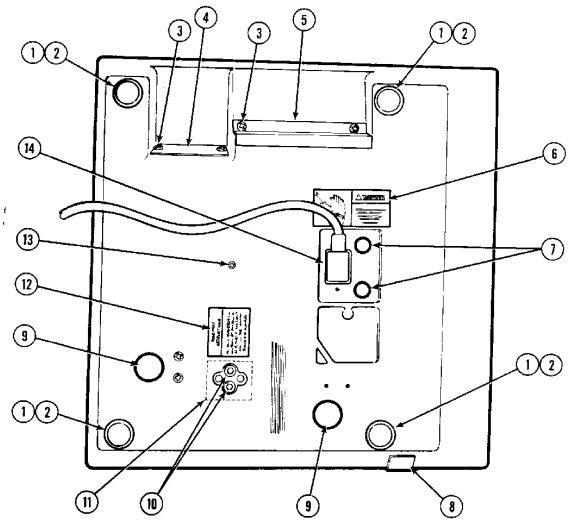
10.2 EXTERIOR (High Capacity)



REF.	PART NUMBER	DESCRIPTION	QTY.
1	A129352 00A	Plastic Platter	1
2	B122347 00A	Platter Pad	1
3	R03508 00A	Hex Screw 1/4-28 x 1-1/2"	2
4	R03575 00A	Set Screw, 3/8 -24 x 1/2"	2
5	129353 00A	Sub-Platter Assembly (4)*	1
	129353 00A	Sub-Platter Assembly (5 & 6)*	1
6	R03646 00A	Set Screw, 1/4 -28 x 1/2"	2
7	B115413 00A	Conductive Grommet	4
8	A118792 00A	Power Warning Label	1
9	131351 00A	Keypad Assembly	1
10	119133 00A	Power Switch	1
11	129351 00A	Display Lens	1
12	125134 00 B	Decorative White Bezel	1
13	129350 00A	Cover	1
14	116033 00A	Static Caution Label	1
15	R03498 00A	Screw, 8-32 x 3/8"	4
16	R03573 00A	Black Sealing Screw	1
17	R02596 00A	Sealing Screw	1
18	102689 00A	Level Bubble	1
19	119859 00A	Load Cell Spec. Label	1
20	122692 00A	Set Screw Caution Label	1
21	A122339 00A	Spacer Block (5) *	1

**** Indicates Factory Number***

10.3 BOTTOM OF SCALE

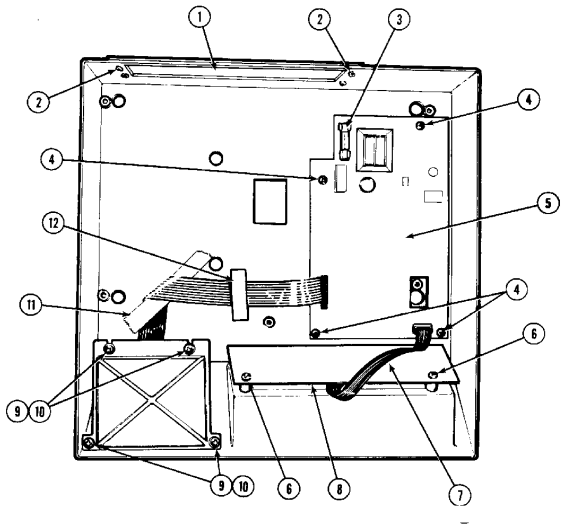


REF.	PART NUMBER	DESCRIPTION	QTY.
1	122410 00A	Leveling Leg	4
2	001874 00B	Nut, 5/16 - 18 (N.S.)	4
3	R02180 050	Taptite Screw, 8-32 x 3/8"	2
4	122322 00A	Small Cover Plate	1
5	122321 00A	Large Cover Plate	1
6	A122373 00A	Fuse Warning Label	1
7	R03221 00A	White Hole Plug	2
8	119133 00A	Power Switch	1
9	R03020 00A	Black Hole Plug	2
10	R03507 00A	Hex Screw 1/4 - 28 x 1" (2,3,4 & 5)"	2
	R02401 00A	Hex Screw 1/4-28 x 3/4" (6)*	2
11	A122339 00A	Bottom Load Cell Spacer (2,3,4 & 5)* (N.S.)	1
12	119859 00A	Assembly Spec Label	1
13	R03046 00A	Overload Screw, 1/4 - 28 x 1" (2 & 3)*	1
14	109445 00A	Line Cord	1

* Indicates Factory Number

N.S. - Not Shown

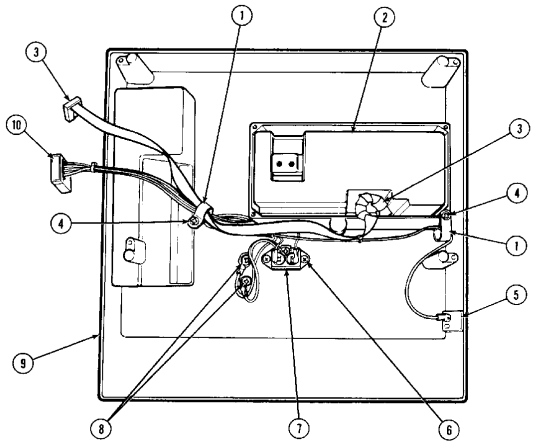
10.4 PCB AND COVER



REF.	PART NUMBER	DESCRIPTION	QTY.
1	129340 00A	Rear Cover Plate	1
	129622 00A	Battery Access Cover (Optional) (N.S.)	1
2	R02459 00A	Nylon rivet	4
3	120185 00A	Fuse, 0.1 Amp Slo-Blo	1
4	R03225 00A	Plastite Screw, #6 x 1/4"	4
5	C129332 00A	Main PCB (120VAC)	1
	A131355 00A	Main PCB (220VAC)	1
6	R03495 00A	Plastite Screw, #6 x 5/8"	2
7	122655 00B	Display Harness	1
8	129334 00A	Display PCB	1
9	R02541 00A	Washer, # 76	4
10	R02640 00A	Plastite Screw, # 6 x 3/8*	4
11	754160 00A	Tape	5*
12	125768 00A	Keyboard Cable Clamp	1

N.S. - Not Shown

10.5 INTERIOR OF BASE



REF.	PART NUMBER	DESCRIPTION	QTY.
1	124718 00A	Cable Clamp	2
2	131398 00A	Digital Load Cell, 3.75 kg (2)*	1
	129828 00A	Digital Load Cell, 7.5 kg (3) *	1
	129830 00A	Digital Load Cell, 15 kg (4)*	1
	129838 00A	Digital Load Cell 30 kg (5)*	1
	129842 00A	Digital Load Cell, 60 kg (6)*	1
3	129575 00A	Load Cell Harness	1
4	R02180 050	Taptite Screw, 8-32 x 3/8"	2
5	119133 00A	Power Switch	1
6	R03225 00A	Screw, #6 x 1/4"	2
7	119932 00A	Line Filter	1
8	R03612 00A	Screw, 8-32 x 3/8*	2
9	126985 00A	Scale Base (2 & 3)	1
	124224 00A	Scale Base (4, 5 & 6)*	1
10	129345 00A	Power Supply Harness (see Note)	1

* - Indicates Factory Number
Note - Power Supply Harness Includes item 7 also.

10.6 BATTERY OPTION PARTS LISTING

10.6.1 120 Volt AC Version

REF.	PART NUMBER	DESCRIPTION
4	R01771 050	Lockwasher, #6 Internal Tooth
2	R02245 00A	Screw, 6-32 x 5/8"
2	R02865 00A	Screw, 6-32 x 1/4"
4	R03820 00A	Screw, 8-32 x 3/4"
1	(*) 108339 00A	Adhesive Cable Clamp
2	(*) 126334 00A	hex Post, 6-32 x 3/4"
1	(*) 129336 00A	Charger PCB
1	(*) 129341 00A	Battery Tray
1	(*) 129347 00A	Charger Interconnect Harness
1	(*) 129348 00A	Internal Battery Harness
1	(*) 129574 00A	Battery Assembly
1	(*) 129354 00A	Battery Access Cover Plate
2	(*) 129611 00A	Panel Fastener
1	(*) 131344 00A	Installation Instructions

(*) May have letter prefix.

10.6.2 220 Volt AC Version

REF.	PART NUMBER	DESCRIPTION
4	R01771 050	Lockwasher, #6 Internal Tooth
2	R02245 00A	Screw, 6-32 x 5/8"
2	R02865 00A	Screw, 6-32 x 1/4"
4	R03820 00A	Screw, 8-32 x 3/4"
1	(*) 108339 00A	Adhesive Cable Clamp
2	(*) 126334 00A	Hex Post, 6-32 x 3/4"
1	(*) 131350 00A	Charger PCB
1	(*) 129341 00A	Battery Tray
1	(*) 129347 00A	Charger Interconnect Harness
1	(*) 129348 00A	Internal Battery Harness
1	(*) 129574 00A	Battery Assembly
1	(*) 129354 00A	Battery Access Cover Plate
2	(*) 129611 00A	Panel Faster
1	(*) 131364 00A	Installation Instructions

(*) May have letter prefix.

11. INTERCONNECTING DIAGRAM