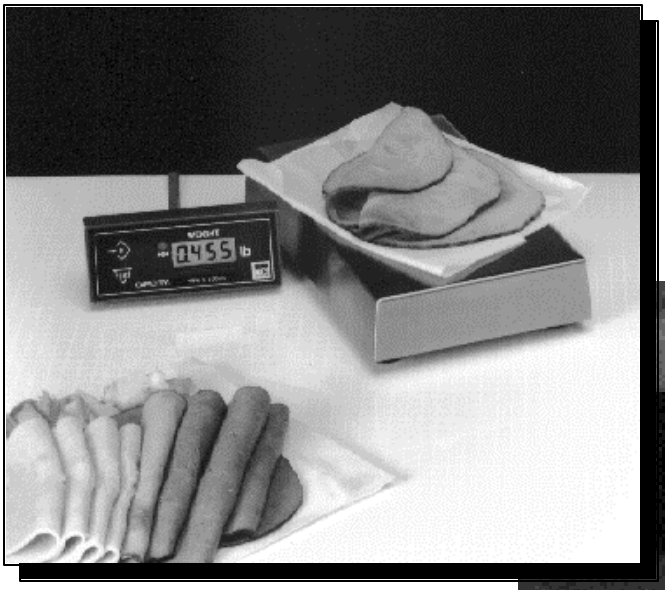
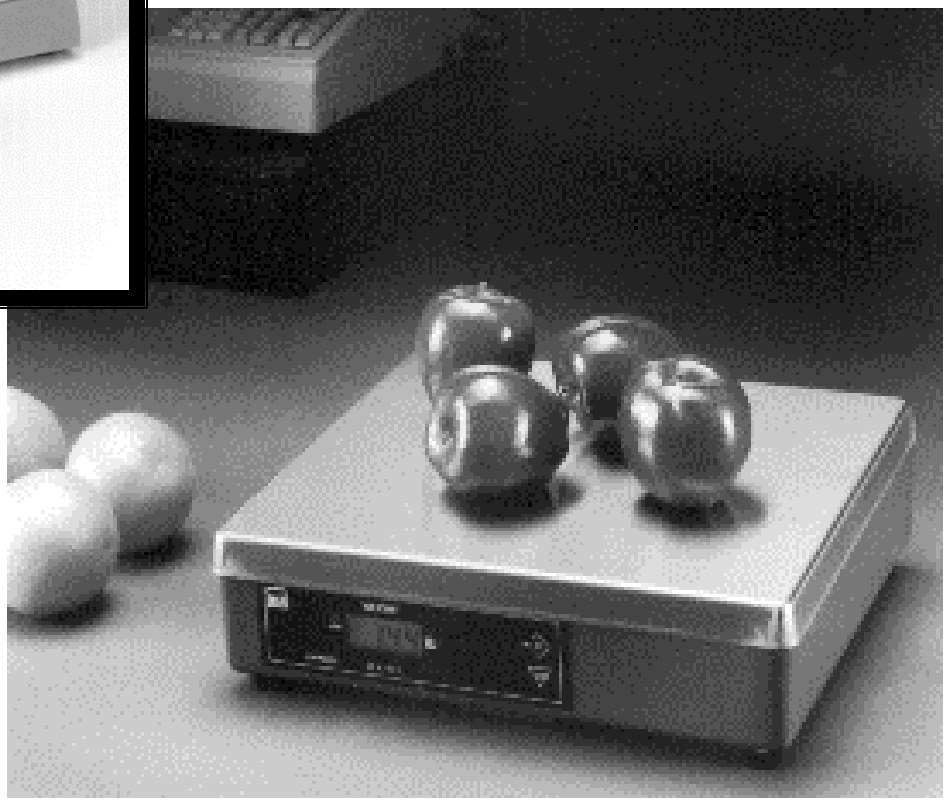




Models 6702, 6710, and 6720
User Manual

UNITED STATES

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates , uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CANADA

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the radio Interference Regulations of the Canadian Department of Communications.

Le present appareil numerique n'emet pas de bruits radioelectroniques depassant les limites applicables aux appareils numeriques de la Class A prescrites dans le Reglement sur le brouillage radioelectrique que edicte par le ministre des Communications du Canada

CAUTION

Risk of electrical shock. Do not remove cover. No user serviceable parts inside. Refer servicing to qualified service personnel.

Weigh-Tronix reserves the right to change specifications at any time.

Specifications

IMPORTANT !

Weights & Measures requires inspection of scale before scale is placed into operation

Capacity / Resolution

Model	Capacity (lb)	Capacity (kg)	Divisions
6702 - 7	10 x .005	7 x .002	2000/3500d
	15 x .005*		3500d
6702 - 15	30 x .01	15 x .005 *	3000d
6710 - 7	10 x .005	7 x .002	2000/3500d
	15 x .005*		3500d
6710 - 15	30 x .01	15 x .005 *	3000d
6720 - 7	10 x .005	7 x .002	2000/3500d
	15 x .005*		3500d
6720 - 15	30 x .01	15 x .005 *	3000d
6720 - 30	60 x .02	30 x .01	3000d
6720 - 60	100 x .05	60 x .02	2000/3000d
	120 x .05 *		3000d

* These capacities require a 6-digit display.

Agency Requirements

Model 6702
US & Canada Approved Legal for trade
NTEP approval - COC #95-070A3
Canada - COC# AM-5076

Model 6710
US & Canada Approved Legal for trade
NTEP approval - COC #92-051A2/95-070A3
Canada - COC# AM-5076

Model 6720
US & Canada Approved Legal for trade
NTEP approval - COC # 95-070
Canada - COC# AM-5076

Zero window

Initial automatic zero setting is +/- 10% of maximum capacity - active at power up.
Manual zero setting range is +/- 2% of maximum capacity - active using the **ZERO** key.

Transformer voltage

Input : 120 VAC +10%-15% Standard 3 wire w/ground
Output: 15 VDC @.3 Amps DC minimum

Frequency

50/60 Hz Standard

Power Requirements

0.1 amp maximum

Over Capacity limits

Over capacity indication will be given with upper dashes on the display whenever 9d over maximum capacity is exceeded or the four digit display limit is exceeded.

About This Manual

This manual covers the service needs of the model 6702, 6710, and 6720 Point of Sale (POS) bench scales. This maul is divided into these general areas:

- About This Manual
- Modes of operation
  - Diagnostics Mode
  - Configuration Mode
  - Calibration Mode
- Error Codes
- Communications

Major section headings of the manual appear in a black bar as shown above. Subsection headings appear in the left column of each page with corresponding information in the wider, right column. Notes and tips about operation of the scale will appear in *italized* text in the left column where appropriate.

If you have any questions about your scale please contact your local dealer.

Modes of Operation

Accessing the Menu Mode

The 6702/6710/6720 powers up in normal weighing mode, ready for weighing operations. You can access the MENU Mode by setting switch 1 shown in figure 1 (Model 6702 & 6710) or figure 2 (Model 6720), to the OPEN or Menu Mode position.

Bottom view of 6710 scale.

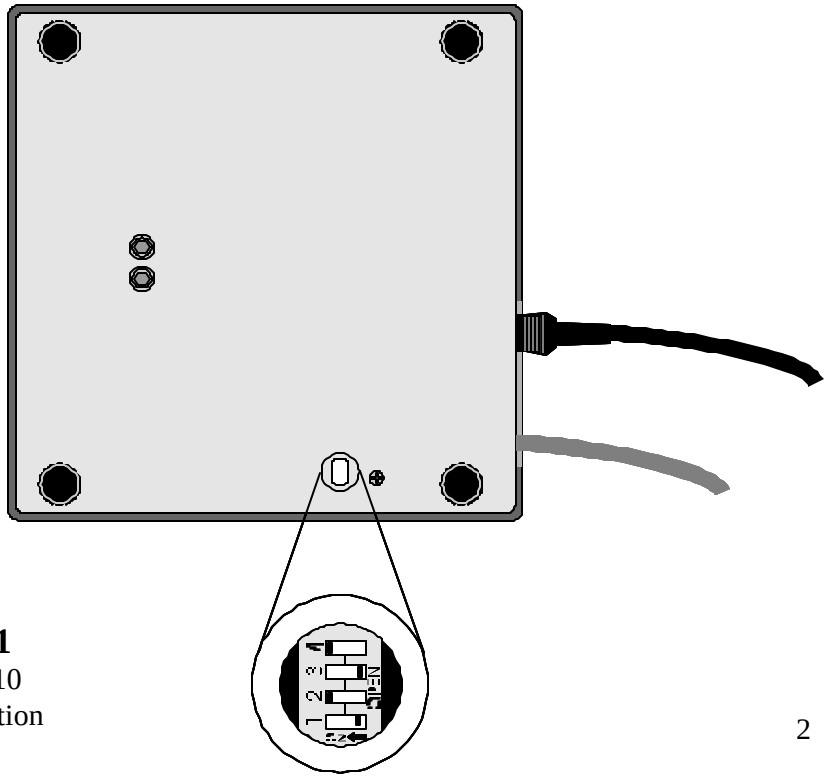


Figure 1
6702 & 6710
Switch location

Modes of Operation - Continued

Top view of 6720 scale with platter removed

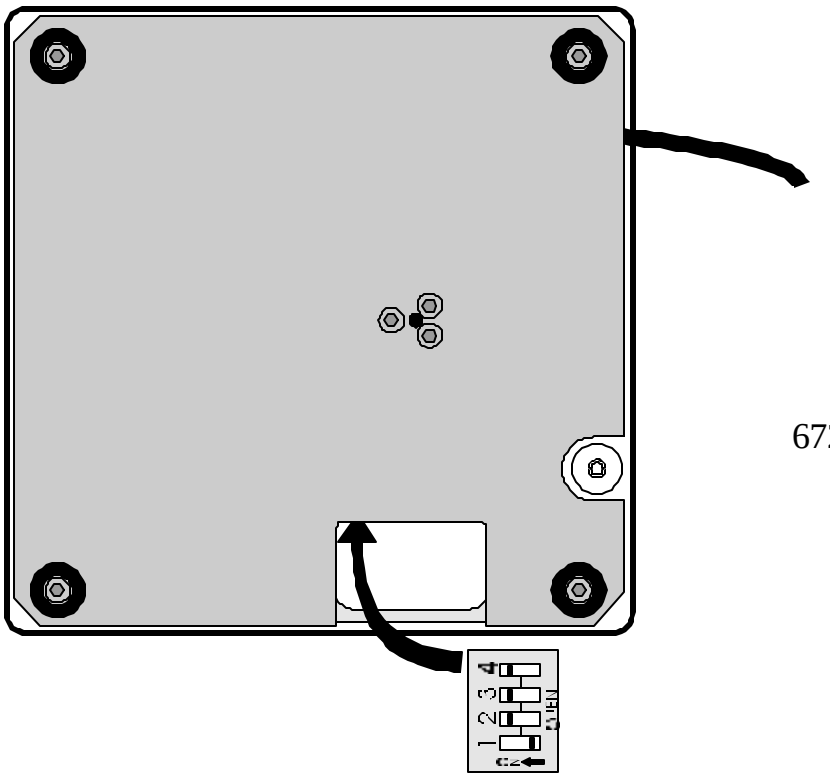


Figure 2
6720 Switch Location

With switch 1 in the Menu Mode or Open position, there are three modes available to you. They are as follows:

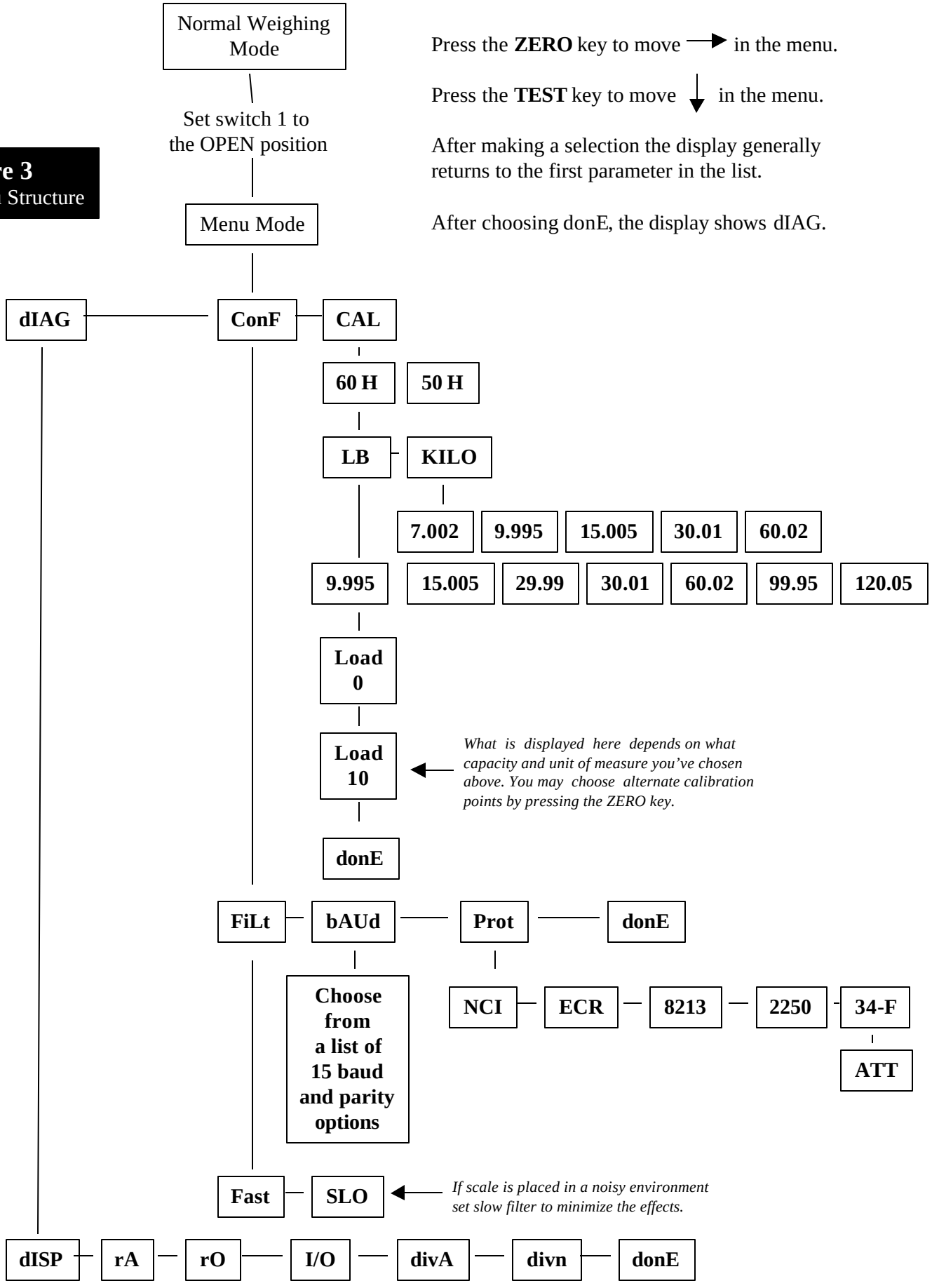
Diagnostic Mode - used to test areas of the scale's function
Configuration Mode - used to configure your scale for your application
Calibration Mode - used when calibrating the scale

The structure for these menus is shown in Figure 3. The following page is specific information about each mode and following that are the step-by-step instructions for accessing them.

- Internal & External Display Selection -

The 6720 remote display is used for weight only, the **ZERO** and **TEST** keys are inoperable when the internal display is in use. Dip switch 3 select internal or external display keypad operation.

Figure 3
67XX Menu Structure



Press the **ZERO** key to move → in the menu.

Press the **TEST** key to move ↓ in the menu.

After making a selection the display generally returns to the first parameter in the list.

After choosing donE, the display shows dIAG.

Diagnostics Mode

Diagnostic (dIAG) Mode

The diagnostic (**dIAG**) mode menu lets you test specific areas of the scale's function. These areas are:

Display (**dISP**) -	- Shows the version and revision of the software, followed by a display segment test.
RAM (**rA**)	- Performs a non-destructive test of RAM in the processor. Displays **pASS** or **fAIL**.
ROM (**rO**)	- Performs a checksum of all locations in ROM in the processor. Displays **pASS** or **f**AIL**.**
Input/Output **(I/O)**	- Data is output by the scale and through the use of a loopback connector the data is immediately read back into the receive channel and verified against what was sent. **PASS** or **FAIL** is displayed. Requires a jumper (short) between transmit & receive data lines.
Division, Test w/AZT **(divA)**	- Weight data is normalized to 120,000 counts of displayed resolution. AZT is enabled.
Division, test w/o / AZT **(divn)**	- Weight data is normalized to 120,000 counts of displayed resolution. AZT is disabled.

Step-by-Step Instructions for dIAG Mode

Follow these steps to access and the tests in the **dIAG** menu.

1. From normal weighing mode , move switch 1to the Menu Mode or OPEN position. (See Figures 1 & 2)	Display shows **dIAG.**
2. Press the **TEST** key. . .	**dISP** is displayed. This stands for display.
3. Press the **TEST** key to perform the display test described earlier. .	Display test is performed and the shows **dISP** after the test is completed.
4. Press the **ZERO** key . . .	**rA** is displayed. This stands for the RAM test.

Diagnostics Mode - continued

Step-by-Step Instructions for dIAG Mode

*Press the **ZERO** key to scroll through lists of selections.*

*Press the **TEST** key to make a selection.*

*If you want to skip a test, press the **ZERO** key to scroll to the next test.*

5. Press the **TEST** key to perform the RAM test. . . — **PASS** or **FAIL** is displayed briefly, then **dISP**. If the test fails, contact your local Weigh-Tronix distributor for service.

6. Press the **ZERO** key twice to scroll to the ROM test. . . — **rO** is displayed. This stands for the ROM test.

7. Press the **TEST** key to perform the ROM test . . . — **PASS** or **FAIL** is displayed briefly, then **dISP**. If the test fails, contact your local Weigh-Tronix distributor for service.

8. Press the **ZERO** key three times to scroll to the I/O test . . . **I/O** is displayed. This stands for the Input/Output test.

9. With a loopback connector in place, press the **TEST** key to perform the I/O test. . . — **PASS** or **FAIL** is displayed briefly, then **dISP**. If the test fails, check your connections and / or contact your local Weigh-Tronix distributor for service.

***dIAG** will flash every 15 seconds during the high resolution test to remind you that you are doing a test and not seeing normal weight readings.*

10. Press the **ZERO** key four times . . . — **divA** is displayed. This stands for the high resolution test with AZT enabled.

11. Press the **TEST** key to perform this test. . . — The display shows the weight on the scale at a resolution of 120,000 counts.

12. Press the **TEST** key to stop the test. . . **dISP** is displayed.

13. Press the **ZERO** key five times. . . — **divn** is displayed. This stands for the high resolution test without AZT enabled.

14. Press the **TEST** key to perform this test. . . — The display shows the weight on the scale at a resolution of 120,000 counts.

Diagnostics - continued

15. Press the **TEST** key to stop the the test. . . **dISP** is displayed.

16. When you are finished with the test press the **ZERO** key six times, which displays **donE**, and press the **TEST** key. . . or place switch 1 back to normal mode to return back to normal weighing mode. **dIAG** is displayed.

Configuration Mode

The configuration **(ConF)** mode menu lets you configure your scale to your specific application needs. The items you can configure are as follows:

Filtering **(FiLt)** - Choose between FAST and SLO filtering. Slow should be chosen in area susceptible to vibration. Choose FAST filtering for more stable conditions.

Baud **(bAUd)** - Choose a baud and parity from table 1.

DISPLAY	BAUD	PARITY
12 e	1200	Even
24 e	2400	Even
48 e	4800	Even
96 e	9600	Even
19.2 e	19,200	Even
12 o	1200	Odd
24 o	2400	Odd
48 o	4800	Odd
96 o	9600	Odd
19.2 o	19,200	Odd
12 n	1200	None
24 n	2400	None
48 n	4800	None
96 n	9600	None
19.2 n	19,200	none

Protocol **(Prot)** - Select the RS-232 communication protocol from below:

NCI - NCI standard
ECR - Cash resister compatible
8213 - 8213 compatible (Sharp)
2250 - 2250 compatible (Swintec)
34-F - 34-MF compatible (Sweda-Mexico)
ATT - A T & T compatible

Configuration Mode- Continued

Step-by-Step Instructions for ConF Mode

Follow these steps to access and configure the items in the **ConF** menu. Refer to figure 3.

1. From the **dIAG** display press the **ZERO** key

OR

From normal weighing mode, move switch 1 to Menu Mode or OPEN position, then press the **ZERO** key. . . **ConF** is displayed

2. Press the **TEST** key. . . **FiLt** is displayed. This stands for filtering.

3. Press the **TEST** key. . . The current setting, **FAST** or **SLO**, is displayed.

4. Use the **ZERO** key to toggle between the two choices. Press the **TEST** key when the choice you want is displayed. . . Your choice is accepted and the display shows **FILt**.

5. Press the **ZERO** key once. . . **BAUD** is displayed.

6. Press the **TEST** key. . . The current baud and parity choice is displayed.

7. Use the **ZERO** key to scroll the choices found in Table 1. When the choice you want is displayed, press the **TEST** key. . . Your choice is accepted and the display **FILt.**

8. Press the **ZERO** key twice. . . **PROT** is displayed. This stands for protocol.

9. Press the **TEST** key. . . The current RS-232 communication protocol is displayed.

10. Press the **ZERO** key to scroll through the choices. When the choice you want is displayed, press of the **TEST** key. . . Your choice is accepted and the display shows **FILt.**

11. When you are finished with configuring your scale press the **ZERO** key three times, which displays **donE**, then press the **TEST** key. . . **dIAG** is displayed

Calibration Mode

The calibration (**CAL)** mode menu lets you calibrate your scale. The items in the calibration menu are as follows:

Line Frequency (50 or 60H)	- Select the AC line frequency you are using.
Pounds/Kilograms (LB or KILO)	- Selects the unit of measure of your calibration test weights.
Capacity (9.995, etc..)	- Select the capacity of your scale.

Step-by-Step Instructions for CAL Mode

Follow these steps to calibrate your scale. refer to Figure 3.

1. From the **dIAG** display press the **ZERO** key twice OR From normal weighing mode, move switch 1 to the Menu Mode or OPEN position, then press the **ZERO** key twice. . .	**CAL** is displayed. This stands for calibration.
2. Press the **TEST** key. . .	**50 h** or **60 H** is displayed. This is the AC line frequency.
3. Press the **ZERO** key to toggle between the choices. When the choice you want is displayed, press the **TEST** key. . .	That choice is accepted and **LB** or **KILO** is displayed. This is the unit of measure of your test weights.
4. Press the **ZERO** key to toggle between the choices. When the choice you want is displayed, press the **TEST** key. . .	That choice is accepted and a scale capacity is displayed. Example: **9.995**.
5. Press the **ZERO** key to toggle between the choices. When the choice you want is displayed, press the **TEST** key. . .	That choice is accepted and **LOAD 0** is displayed.
6. Clear all weight from the scale platter and press the **TEST** key. . .	After a brief wait **LOAD 10** is displayed . 10 is used only as an example here.

Calibration Mode - Continued

7. Place ten pounds of test weights on the scale and press the **TEST** key. — After a brief wait ***DONE*** is displayed.

8. Press the **TEST** key. . . — ***DIAG*** is displayed.

or

9. Return switch 1 to the closed position. . . — The scale returns to normal weighing mode.

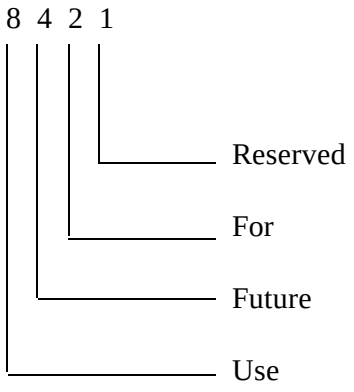
The scale is now tested, configured and calibrated. It is ready for use in your application.

Error Codes

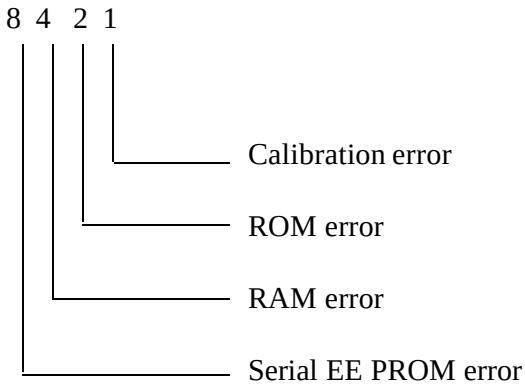
Any system errors detected by the scale will be displayed as the letter *E* followed by a two-digit error code. Press the **TEST** key to continue operation. If a calibration error occurs the only way to clear it is by recalibrating the scale.

The error codes are broken down into two hexadecimal numbers, with each bit defining a single error condition. The error codes are defined as follows:

Most Significant Digit



Least Significant Digit



Communication

The 67XX is capable of interfacing with an EIA Standard RS-232, full duplex, asynchronous, smart device, or 4-bit parallel interface for output of weight data to an ECR device. The 67XX 15 pin style is configured as a 4-Bit Parallel standard from the factory. To configure the 67XX to the RS-232 interface operation, there is a dip shunt jumper located at JMP 2 on the main PCB that needs to be positioned with shortening pins placed away from the DE-15 connector or to the inside of the PCB. The second uses a DE-9 connector and is only capable of communicating in the EIA Standard RS-232 method.

NCI Serial Communications Protocol

This standard will be used by all products other than ECR scales.

Symbol Key:
- <ETX> End of Text character (03) hex
- <LF> Line Feed character (0A hex)
- <CR> Carriage Return character (0D hex)
- <SP> Space (20 hex)
- x Character from display including minus sign.
- hh. . . Two or more status bytes
- uu Units of measure (lb, kg, oz, g, etc. using ANSI standard abbreviations)

Mandatory Commands

Command	Scale Response	Results
W<CR>	<LF>xxxx.xxuu<CR> <LF>hh...<CR><ETX>	Returns decimal weight with units plus scale status.
	or	
	<LF>xxxxxx<CR> <LF>hh...<CR><ETX>	Returns contents of display (other than wt) & scale status
S<CR>	<LF>hh...<CR><ETX>	Returns to scale status
Z<CR>	<LF>hh...<CR><ETX>	Scale is zeroed, returns status.
H<CR>	<LF>xxxx.xxuu<CR> <LR>hh...<CR><ETX>	Returns decimal wt in 10x with units plus scale status.
	or	
	<LF>xxxx.xxoz<CR> <LF>hh...<CR><ETX>	Returns lb-oz wt in 10X with units plus scale status(if required by application).
	or	
	<LF>xxxxxx<CR> <LF>hh...<CR><ETX>	Returns contents of display (other than wt) & scale status
all else	<LF>?<CR><ETX>	Unrecognized command

Communication - Continued

Weight Command ("W")

Implementation of this command will be mandatory. This command causes the scale to return to a WYSIWYG (What you see is what you get) of its display when it is in normal weighing mode. That is, the scale will send whatever is showing on its display including any minus sign/and or decimal point. If it is weight, the units of measure will be returned in addition to the displayed weight. For decimal weight, the length of the weight field will be equal to the length of the scale's display plus two for the units, e.g., ("lb"). Units of measure will appear in their ANSI standard abbreviation form ("lb" for pounds, "kg" for kilograms, etc.) If the scale is displaying all upper bars ("over capacity"), the weight field will be filled with carets("^^^^^^"). If the scale is displaying all lower bars (under capacity), the weight field will be filled with underscores ("____"). If the scale is displaying middle bars (zeroing error), the weight field will be filled with dashes ("- - - - - -"). These examples are for scale with a 6-digit display.

Scale Status Command ('S')

Implementation of this command will be mandatory. There will be at least two status bytes. If bit 6 of the second status byte is set then there will be a third byte. Bit 6 of each byte will indicate whether or not another status byte follows. The bit will be clear (0) in the last status byte. At this time only the first three bytes are defined. Others may be added in the future. The status bits are defined as follows:

Bit	First Status Byte	Second Status Byte
0	1 = Scale in motion 0 = Stable	1 = Under capacity 0 = Not under capacity
1	1 = Scale at zero 0 = Not at zero	1 = Over capacity 0 = Not over capacity
2	1 = RAM error 0 = No RAM error	1 = ROM error 0 = No ROM error
3	1 = EEPROM error 0 = No EEPROM error	1 = Faulty calibration data 0 = caliobration data okay
4	Always 1	Always 1
5	Always 1	Always 1
6	Always 0	1 = Byte follows 0 = Last byte
7	Parity	Parity

Zero Command ('Z')

Implementation of this command will be mandatory. If zeroing criteria are met, the scale will is zeroed. In any case, scale status is returned.

Communication - Continued

High Resolution Command ('H')

This command will be optional. It is the same as the "W" command except that when weight is returned, it is returned with ten times the scale's displayed resolution. Thus, for decimal weight, the length of the weight field is equal to the length of the scale's display plus three or four, and for pounds-ounce it will be the display length plus five or six (depending on the presence of a decimal point.)

Undefined Commands

When the scale receives an unrecognised or unsupported command, it returns a question mark.

ECR Serial Communication Protocol

The ECR serial communication protocol adheres to the pre-existing "standard" for ECR scales. It also includes optional commands and the new scale status bit definitions (described in the general protocol) as extensions which do no affect backwards compatibility.

This standard will be used by all other products other than ECR scales.

Symbol Key:

<ETX>	End of Text character (03 hex)
<LF>	Line Feed character (0A hex)
<CR>	Carriage Return character (0D hex)
<SP>	Space (20 hex)
x	Weight numeric digit.
hh	Two status bytes
uu	Units of measure (LB, KG, OZ, G, etc.., all upper case)

Mandatory Commands

Command	Scale Response	Results
W<CR>	<LF>xxx.xxuu<CR> <LF>Shh<CR><ETX> **or** <LF>Shh<CR><ETX>	Returns decimal weight with units plus scale status. Scale status only if wt <0, in motion or out of capacity, or zero error.
S<CR>	<LF>Shh<CR><ETX>	Returns to scale status
Z<CR>	<LF>Shh<CR><ETX>	Scale is zeroed, returns status.
all else	<LF>?<CR><ETX>	Unrecognized command

Scale bits will be the same as for the general protocol.

Communication - Continued

Serial Data Transmission

Modem control lines will not be supported for RS-232.

Baud Rates:	1200, 2400, 4800, 9600, or 19.2K
Word Length:	10 Bits 1 Start, 7 Data, 1 Parity, 1 Stop
Parity	Even, Odd, or None

The scale is DTE

4-Bit Parallel ECR Interface

The 15 pin version of the 67XX is shipped configured to function as a 4-Bit Parallel interface device.
Follow these steps to configure the scale to serial RS-232 interface operation:

1. Locate the dip shunt jumper at JMP2 on the main PC board.

2. Place the jumper so the shorting pins are located away from the DE-15 connector at end of the PC board. See figure 4 below.

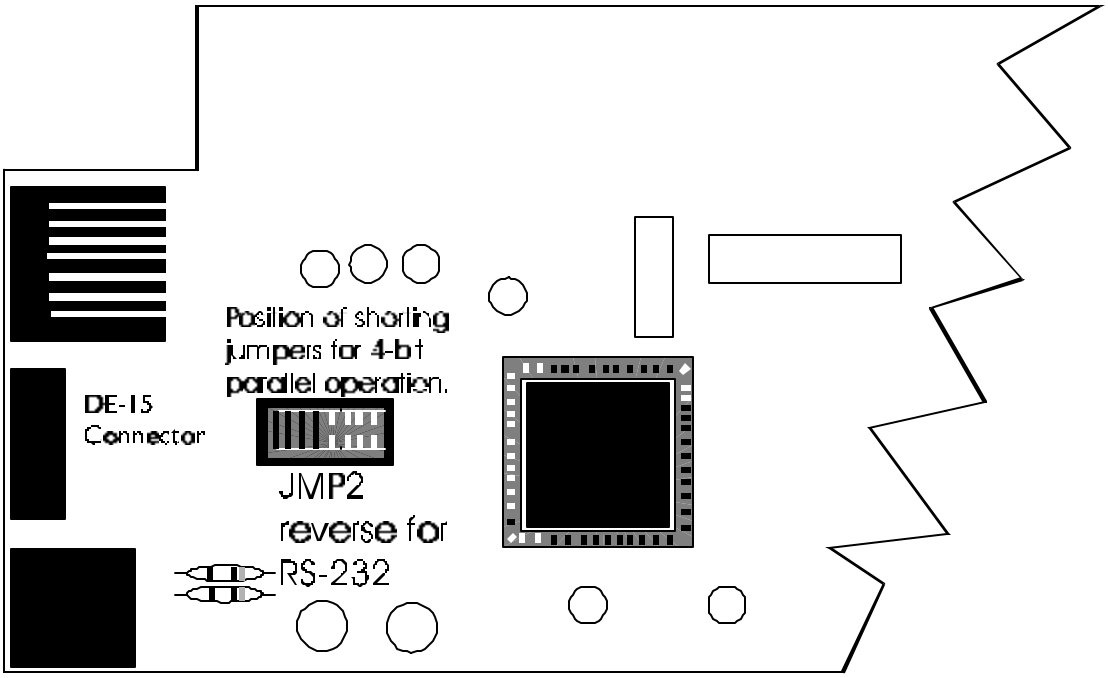


Figure 4
Partial view of the main PC Board

Communication - Continued

Interface Cable

The scale end of the interface cable plug is a DA 15 pin socket. The other end is as required by your application

Below is a pin and signal list for the DA 15 pin interface cable

Pin	RS-232	4-Bit Parallel
1	RXD	Data 1
2	TXD	Data 2
3	Sig Gnd	Sig Gnd
4	Data 4	Data 4
5	Data 8	Data 8
6	DSR	Over Capacity
7	DTR	NC
8	BHZ	BHZ
9	/In Motion	/In Motion
10	Sig Gnd	Sig Gnd
11	/Enable	/Enable
12	Sig Gnd	Sig Gnd
13	Clock	Clock
14	Sig Gnd	Sig Gnd
15	Sig Gnd	Sig Gnd

There is one 9 pin DE type female connector accessible at the rear of the unit. The functional pinout of this cable is that of a standard PC which is as follows:

DE-9 Female Scale			DE-9 Male Host	
Pin	**Name**	**Direction**	**Name**	**Direction**
1	JMP 1	-	DCD	IN
2	TXD	OUT	RXD	IN
3	RXD	IN	TXD	OUT
4	JMP 1	-	DTR	OUT
5	SG	-	GRD	-
6	JMP 1	-	DSR	IN
7	JMP 2	-	RTS	OUT
8	JMP 2	-	CTS	IN
9	NC	-	RI	IN

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01/20/98 PN 7424-14787C Printed in USA