Tru-Test Model 703

User Manual

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Contents

About This Manual

This manual tells you how to operate the *TRU-TEST* Model 703 Indicator - the keyboard and display unit for the *TRU-TEST* 700 Series agricultural weighing system.

Operation of the Indicator is described in the main text of this manual. Complete lists of keys, display pointers and messages are given in Quick Reference Sections at the end.

If you are setting up the system for the first time, read the *Installation* and *Setup* section in this manual, also read the *TRU-TEST Loadbars Manual* for instructions on installing the Loadbars.

To gain the best possible performance from your Indicator and especially if you have an internal battery installed, read the *Care And Maintenance* section.

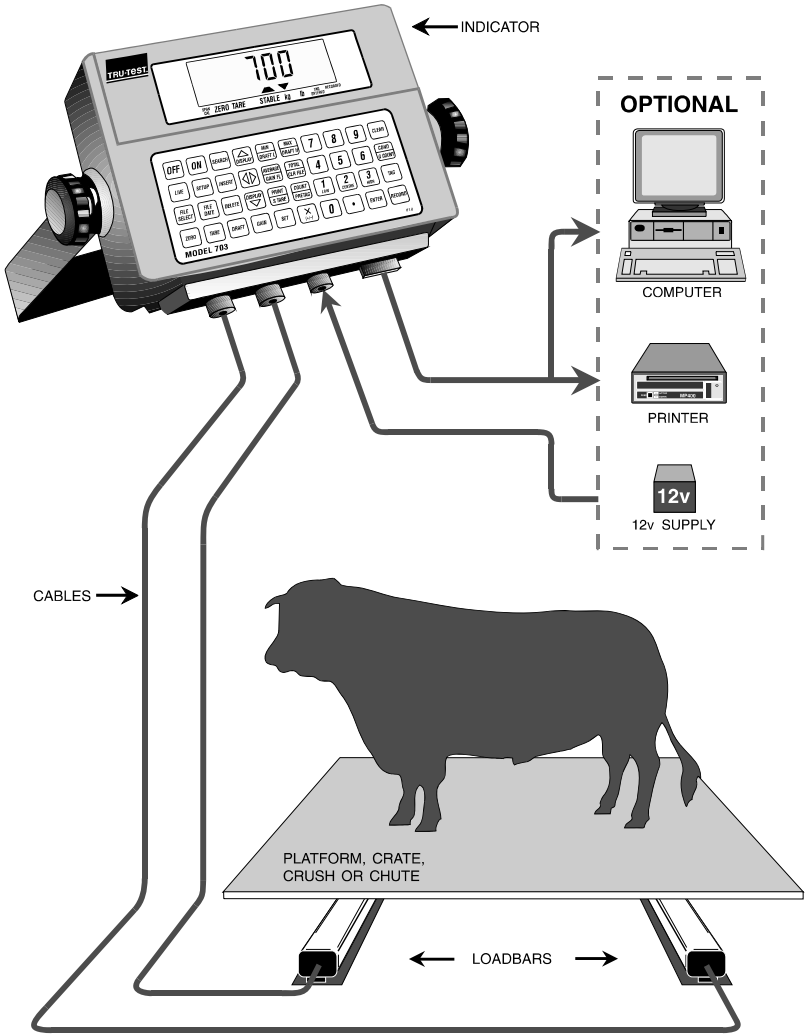
If problems arise, refer to *Troubleshooting* on page 99 before contacting your *TRU-TEST* Service Centre.

Special versions of the Indicator are made which comply with the regulations for "trade" use in particular countries. Differences which may apply are noted at the end of sections under the heading *Weights And Measures Versions* and specifications for particular countries are given in *Weights And Measures* on page 126.

In this manual, the term "Loadbar" is used to mean "Loadbar, Suspension Cell or Produce Platform".

The *TRU-TEST* Model 703 Indicator has dual purpose keys with different labels on top and bottom. In this manual, only the relevant part of the key label is shown. The other half is left blank for clarity.

TRU-TEST Model 703
Agricultural Weighing System



System Overview

The *TRU-TEST* 700 Series is an advanced and versatile agricultural weighing system. It has been designed with the benefit of many years of animal weighing experience and is used by farm management professionals and agricultural scientists the world over.

The system consists of a microprocessor controlled Indicator (keyboard and display unit) and one or more Loadbars or Suspension Cells. The Loadbars are fitted beneath a platform or crate and the animal's weight is transmitted from the Loadbars to the Indicator. The Indicator gives a digital readout of the weight and, through the keypad, provides control over the processing capabilities of the scale.

Weight data is recorded in the Indicator's memory and can be output to a printer at any stage during or after weighing. Comprehensive reports including weights, tag (ID) numbers, condition codes (or group counts) and statistics can be printed. The data can also be directly down loaded to a computer via a cable for permanent storage and further analysis.

A computer program, the *TRU-TEST* AgLinker, is available from your *TRU-TEST* Dealer for easy transfer of data between the Indicator and a PC computer.

Calibration

On power up, the Indicator automatically identifies and calibrates itself to the Loadbars connected. The latest Indicators operate (without re-calibration) with the complete range of *TRU-TEST* Loadbars, Suspension Cells or Produce Platforms. This is known as *Standard Calibration* and eliminates the need for time consuming calibration using test weights.

Applications using other manufacturers' Loadbars, which are not pre-programmed, can be satisfied using *Span Calibration* with known test weights.

Indicator Options

- An internal rechargeable battery is available which allows the Indicator to be conveniently independent of any external power supply.
- The *TRU-TEST* Model 703 can be connected to a *TRU-TEST* printer to print results or to a computer for storing and further processing data.

Reliability

- The *TRU-TEST* Indicator is a rugged and robust product designed to withstand the environment associated with livestock handling. The case is made from extremely tough, ultraviolet resistant polycarbonate. The keyboard is completely sealed for all weather operation.
- The Indicator keeps three copies of calibration data in a separate battery backed memory so that it can recover automatically after a power failure or electrical disturbance.
- The Indicator can be unplugged from the Loadbars and taken indoors for you to study the data and recharge the battery.
- For livestock weighing, animal movement can sometimes be a problem with a digital scale. The Indicator eliminates this problem using *SUPERDAMP*© - a sophisticated statistical damping technique.
- The large digital display is easy to read. Stabilisation of the display is usually extremely fast - within seconds.

Main Features

- LIVE display mode.

- FLEECE (FINE WEIGHT) Mode for better precision at low weights.
- Records TAG (ID) numbers along with animal weights.
- Stores up to 7600 animal records in up to 99 files.
- Provides statistics on recorded data.
- Provides a range of different print reports.
- Computer interface to record weights.
- Records condition code or group count for each record.
- Reports on animal weight gain and drafting.
- Provides automatic (hands off) weight recording.
- *Span Calibration* using known weights if required.
- Separate *TARE* and *ZERO* controls.

Weights And Measures Versions

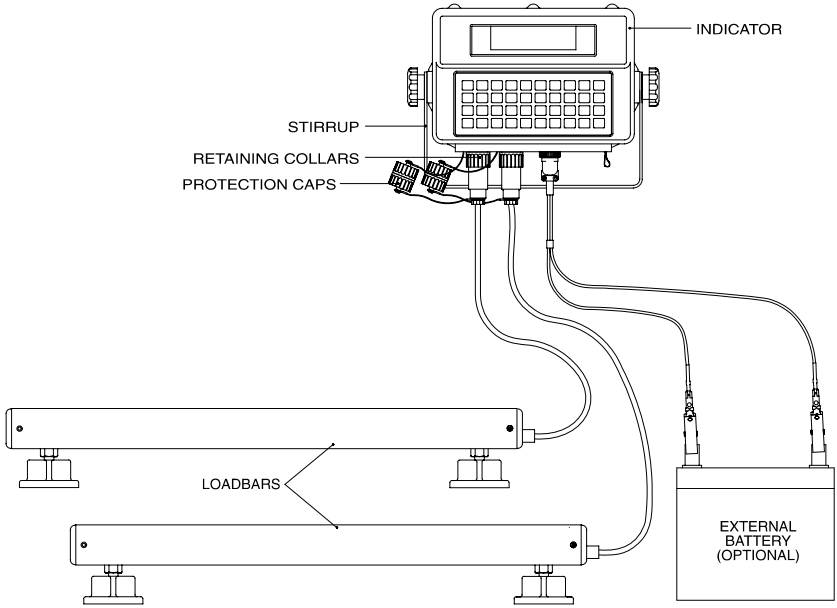
Special versions of the Indicator are available which comply with the regulations for "trade" use in particular countries.

(See *Weights And Measures Versions* on page 126).

Installation

In general, this section needs to be read only when setting up your system for the first time.

When you unpack your new Indicator, complete and post the warranty card to ensure you receive the service you are entitled to.



700 Series System

1. Unpack and install the Indicator mounting stirrup in a convenient position. Ensure that it is located securely.
2. Install the Loadbars or Suspension Cells according to the manual which comes with them (*TRU-TEST Loadbars Manual*).
3. Run the Loadbar cables to the Indicator, making sure they are protected from damage.

4. Unscrew the protection caps from the cable plugs and the Indicator sockets marked CELL1 and CELL2.
   Insert the plugs into the sockets and tighten the retaining collars by hand only. The plugs can go into either socket. Screw the protection caps together to keep out dirt and moisture.

5. If an internal battery is installed, charge it by connecting the Indicator to a good 12 volt DC source, either the recommended power supply unit or a 12 volt car/bike battery. Refer to *Internal Battery Charging* on page 97 for full details.

6. If no internal battery is installed, 12 volts must be available where the Indicator is mounted. One of the following options must be used:

   - 12 volt battery

     Note: Red lead to positive terminal.
     Black lead to negative terminal.

   - Power Supply Unit
     230 or 115 volts AC to 13.8 volts DC at 5 amps.

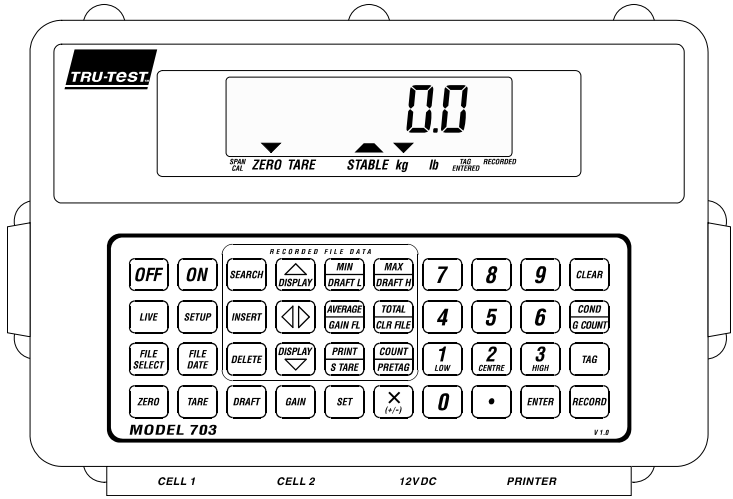
   - AC Adaptor
     230 or 115 volts AC to 13.8 volts DC at 600mA.
     (NOT suitable if a 12V printer is connected).

   Use only the power cable supplied by *TRU-TEST*. Plug it in to the socket marked 12V DC on the Indicator and tighten the retaining collar by hand only.

Calibration

The Indicator automatically identifies and calibrates itself to the Loadbars connected to it. This is known as *Standard Calibration*. *Span Calibration* with known weights can also be carried out. (See your *TRU-TEST* Service Centre.)

Operation



Operating the *TRU-TEST* Model 703 is straightforward and logical. Many functions are performed with a single key press.

Safety

To avoid damage, never load the scale further if the overload message appears on the display.

Keypad

The Indicator comes ready to use with default options set by the factory. However, you can use the keypad to set your own preferred options, such as kilograms or pounds for the units of measure. These options remain in memory until they are changed, even when the Indicator is not connected to a power supply.

The keys to use are listed in the instructions below.

A quick reference to all the keys is given on page 80.

Display

Normally the display shows the current live weight on the platform.

When the Indicator is carrying out an operation, for example re-setting zero, the display shows an appropriate message.

(If the weight is about half way between two values, it is normal for the display to switch occasionally between the two, even while the *Stable* pointer is *On*.)

Pointers

A row of triangular pointers at the bottom of the screen give status information. The labels beneath them show their purpose.

Resolution

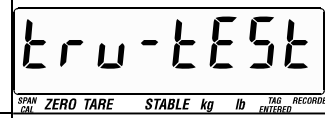
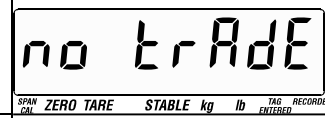
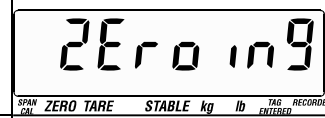
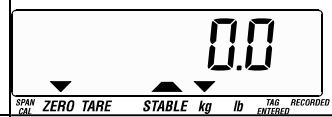
The resolution is the smallest weight change that can be displayed at a particular time (also known as a division), for example 0.5kg or 1.0kg division size.

The division size close to zero (base resolution) depends on the Loadbars fitted. (See your *TRU-TEST Loadbars Manual*.)

The division size automatically changes at particular weight limits to reflect the accuracy of the scale. (See *Autoranging* on page 122.)

Switching On

1. If there is no internal battery, connect the 12 volt supply, red lead to the positive terminal, black to negative.

2. Press **ON**. Display shows:	
Message showing that this is not a Weights and Measures approved version for trade use:	
The scale zeroes itself automatically (if *Power Up Zero* is *On*, see page 17).	
Current weight:	
If there is no Loadbar connected:	

Live Mode

Normally the display shows the current live weight on the platform (Live Mode). The reading is called Live because it never locks up - when the weight changes, the reading changes.

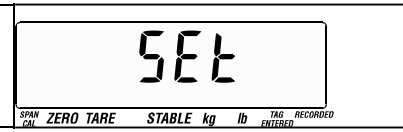
You can press any grey key (same colour as *LIVE*) to initiate its labeled function.

- To return to Live Mode at any time, press **LIVE**

Set Keys

The set keys are the white coloured bottom half of some keys on the keypad. They are used to set parameters such as tare weight or draft limits.

- To activate the set keys, press [SET].



- Press the appropriate set key.
- Key in the required value.
- Press [ENTER].

The Indicator automatically returns to live mode.

Weighing

To weigh an animal:

1. Make sure the Indicator is displaying zero. If not, refer to *Zeroing* on page 17. (If the display shows a negative number and the *Tare* (*Net*) pointer is *On*, then a *Tare* has been entered, see *Taring* on page 20.)
2. Move the animal onto the platform or crate making sure it does not lean on any other structure.
3. Wait for the *Stable* pointer to come *On* which shows that the scale has settled and the reading is reliable.
4. Read the weight displayed.

Switching Off

1. Press [OFF].
2. Disconnect the external power supply if required.

Automatic Power Off

The *TRU-TEST* Model 703 automatically switches *Off* after 30 minutes if no change in weight or key press is detected. This conserves battery life when the scale is not being used.

Automatic Power Off can be disabled if required. Contact your *TRU-TEST* Service Centre for details.

Changing Units of Measurement

Weights can be displayed in kilograms or pounds.

The *kg* and *lb* pointers show which units are being displayed.

To change the units of measure, see *Setup Mode* on page 13.

Weights And Measures Versions

- Units selection may be disabled

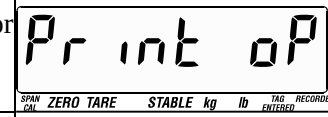
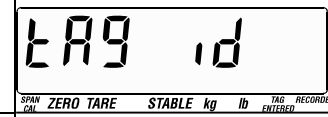
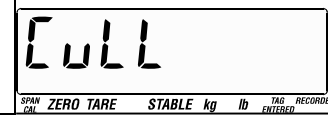
(See *Weights And Measures Versions* on page 126.)

Setup Mode

Setup Mode allows you to change various parameters and options which affect the operation of the Indicator, for example, the units of measurement or the print option.

You can also display the battery voltage and the model number of the Indicator.

To enter *Setup Mode*, press [SETUP].

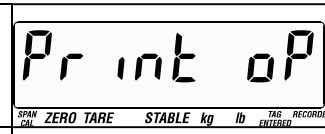
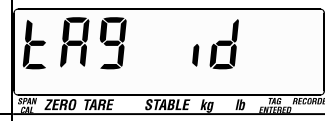
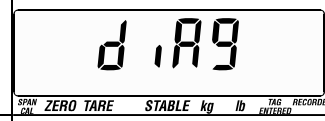
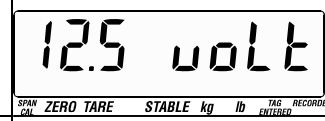
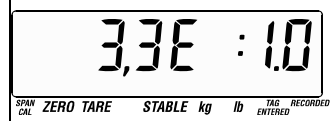
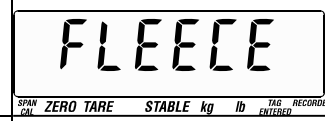
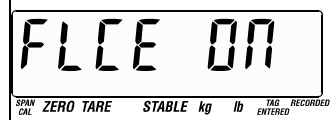
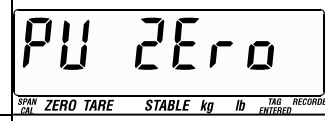
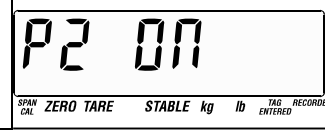
The first setup option is displayed for 2 seconds.	
Then the current setting is displayed	
To change, press [△ DISPLAY] or [DISPLAY ▽].	

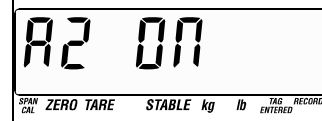
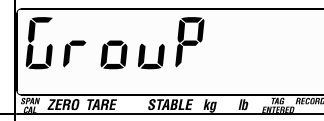
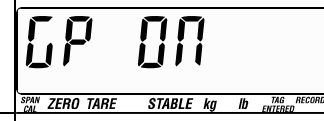
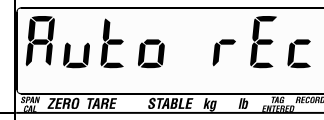
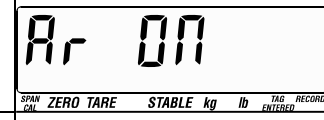
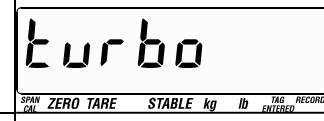
To save the new value and move on to the next setup option, press [SETUP].

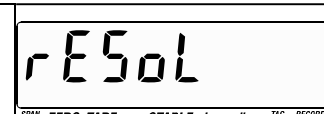
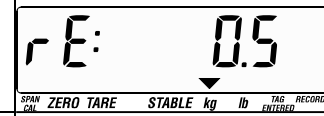
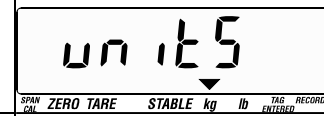
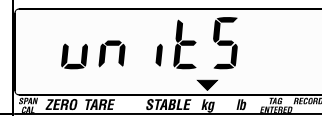
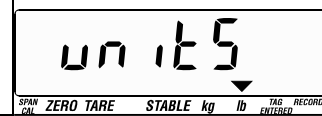
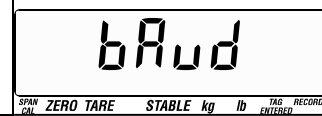
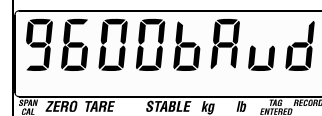
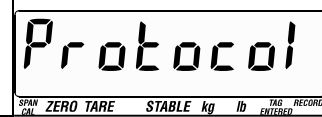
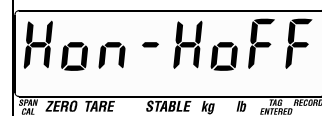
You can press [LIVE] at any stage to save the displayed value and return to live mode.

After the last setup option, the Indicator automatically returns to the first setup option.

The options available are as follows:

Print (Report) Options	
Tag / ID Report. See *Printing Reports* on page 64.	
Diagnostic Information	
Battery voltage. See *Battery Charging* on page 97.	
Model, language and software. For detailed information see *Service* on page 110.	
Fleece (Fine Weight) Mode	
Fleece (Fine Weight) Mode *On*. (Also *Off* option.) See *Fleece (Fine Weight) Mode* on page 23.	
Power Up Zero	
Power Up Zero On. (Also *Off* option.) See *Power Up Zero* on page 17.	

Auto Zero	
Auto Zero On. (Also *On Net* and *Off* options.) See *Auto Zero* on page 17.	
Group Mode	
Group Mode On. (Also *Off* option.) See *Group Mode* on page 73.	
Automatic Weight Recording	
Auto Record On. (Also *Off* option.) See *Auto Recording* on page 32.	
Turbo mode	
Turbo setting 1 per cent (default setting). Available options are 0.5%, 1%, and 2%. See *Turbo Mode* on page 33.	

Resolution	
Resolution 0.5kg. See *Resolution* on page 24.	
Units	
kg units.	
lb units.	
Baud	
Baud rate 9600. See *Technical Information* on page 112.	
Protocol	
Hon-Hoff protocol. See *Technical Information* on page 112.	

Zeroing

To compensate for any build up of dirt on the weighing platform, the *TRU-TEST* Model 703 has three methods of zeroing the scale:

- *Power Up Zero*
- *Automatic Zero*
- *Manual Zero*

Power Up Zero

The scale normally zeroes itself on power up, i.e. when it is turned *On*. The weight of the platform or crate on the Loadbars is zeroed. Any *Tare* weight is also cleared. In some situations, it may be desirable to turn this feature *Off*.

To view or change the *Power Up Zero* setting (*Off* or *On*) see *Setup Mode* on page 13.

A typical situation where *Power Up Zero* should be turned *Off* is when wool bales are being filled and the scale has been zeroed for the wool press. For the displayed weight after turn *On* to be the same as when the Indicator was turned *Off* (e.g. overnight break or power failure), ensure *Power Up Zero* is set to *Off*.

Weights And Measures Versions

- Weights more than 2% (of capacity) from the span calibrated zero may show "ZEro oL" (zero overload).

(See *Weights And Measures Versions* on page 126).

Automatic Zero

The *TRU-TEST* Model 703 normally re-zeroes automatically when a load is taken off. However, this feature can be changed. The options are:

"Off" Automatic zeroing disabled.

"On" Automatic zeroing occurs when the G*ross* weight is near zero.

"On Net" Automatic zeroing occurs when the *Net* weight is near zero.

To view or change the automatic zero setting, see *Setup Mode* on page 13.

When there is no *Tare* , there is no difference between the operation of the "On" and "On Net" modes.

When a *Tare* is present (see *Taring* on page 20), "On" allows automatic zeroing when the container is off the platform, and the display reads close to the negative of the tared weight. "On Net" allows automatic zeroing when the tared container is on the platform (empty of course) and the display is reading close to zero.

If *Automatic Zeroing* is *On*, *Manual Zeroing* is usually unnecessary, unless the weight being zeroed is relatively large and is outside the range for *Automatic Zeroing* (6 divisions maximum). See *Specifications* on page 127.

In some situations this feature should be turned *Off*. For example, when weighing animals in certain crates where opening and closing the doors may cause the Indicator to zero incorrectly.

Weights And Measures Versions

- Zero tracking range may be set to 0.5, 1 or 3 divisions.

- Weights more than 2% (of capacity) from the span calibrated zero may show "ZEro oL" (zero overload).

- Automatic zero tracking on *Net* weight maybe disabled.

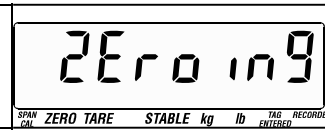
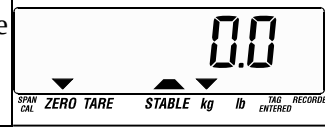
  (See *Weights And Measures Versions* on page 126).

Manual Zero

If *Automatic Zeroing* is *Off*, the scale should be manually zeroed occasionally.

To manually zero the scale:

1. Remove load.
2. Press ZERO.

Waiting for a stable zero reading:	
The *Zero* pointer comes *On* when the scale has settled.	

Zeroing differs from taring in that the capacity of the scale is not affected; you can still weigh up to live capacity on top of the zeroed out amount before overload is displayed. Overload is also displayed when the platform weight plus the live weight are greater than the Total Loading Capacity.

Weights And Measures Versions

- Zeroing may clear *Tare* .
- Weights more than 2% (of capacity) from the span calibrated zero may show "ZEro oL" (zero overload).

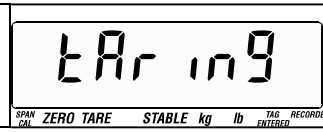
(See *Weights And Measures Versions* on page 126).

Taring

Taring subtracts the container weight so that the display reads a *Net* weight. The *TRU-TEST* Model 703 can automatically *Tare* an empty container which is placed on the scale, or you can enter the container weight using the keyboard (see *Setting a Tare* on page 21).

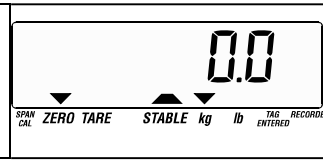
Taring a Container

1. Place the empty container on the platform.
2. Wait for a stable reading.
3. Press TARE, display shows:



After taring, the display should read zero and the *Zero* pointer should be *On*.

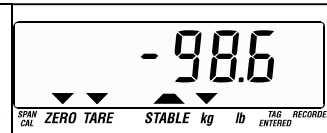
The *Tare* (*Net)* pointer turns *On* to show that the displayed weight for the following animals is now a *Net* weight.



Unlike zeroing, taring affects the remaining capacity of the scale. That is, the *Gross* weight (*Tare* weight plus *Net* weight) cannot exceed the total loading capacity of the Loadbar (see *TRU-TEST Loadbars Manual*).

Up to 100% of the live capacity can be tared.

Very small weights cannot be tared because, if the tared weight is close to zero, the *TRU-TEST* Model 703 assumes you are clearing the *Tare* .

When a tared container is removed from the Loadbars, the display shows the negative of the container's weight:	

To display *Gross* weight, the *Tare* must be cleared (see *Clearing A Tare* on page 22).

If the *Power Up Zero* function is *Off*, then any *Tare* or *Set Tare* is retained even when the Indicator is switched *Off*.

Weights And Measures Versions

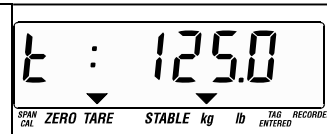
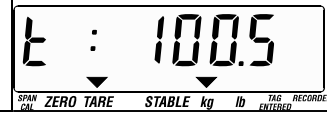
- The *Tare* may operate down to 1 division.
- The *Tare* feature may be disabled.
- The *ZERO* key may be set to clear the *Tare* .

  (See *Weights And Measures Versions on* page 126).

Setting a Tare

You can enter a *Tare* weight manually using the keyboard.

1. Press SET.

2. Press S TARE. The current *Set Tare* value is displayed.	
3. Key in the new *Tare* . 4. Press ENTER.	

Whenever a non zero *Set Tare* is present, the *Tare* pointer is *On*.

The *Set Tare* value entered is rounded to the Indicator's base resolution (see *Setting Resolution* on page 24).

Entering a *Set Tare* replaces any existing *Tare* or *Set Tare*.

Weights And Measures Versions

- *Set Tare* may be disabled.

(See *Weights And Measures Versions on* page 126).

Clearing a Tare

To clear a *Tare*:

- Press SET, S TARE, CLEAR.

Note: clearing the *Tare* does not zero the scale.

Example use of Tare and Zero

Taring and zeroing are useful in situations such as produce weighing, for example weighing potatoes in bins.

At the beginning of a session the scale is zeroed, then the empty bin is placed on the platform and tared.

When the bin is removed, the display reads the negative of the bin weight, for example, -100kg. During weighing dirt may fall *on the platform* and gradually accumulate until the display reads say -95kg. By simply pressing *ZERO*, the display is corrected so that it again reads -100kg.

If the *bin* picks up residue, first re-zero the scale without the bin, then re-tare the bin.

If *Automatic Zeroing* is *On*, the Indicator automatically maintains the reading of -100kg between uses without having to press the *ZERO* key.

Fleece (Fine Weight) Mode

Fleece (Fine Weight) Mode allows precise measurement of relatively small weights on certain Loadbar systems.

You can weigh wool fleece(s), produce or small animals up to 300kg (660lb) with weight changes as small as 0.1kg (0.2lb).

Weight changes as small as 0.05kg (0.1lb) can be measured using a single Loadbar system (see the *TRU-TEST Loadbars* manual).

To view or change *Fleece Mode* setting, see *Setup Mode* on page 13.

(*Fleece Mode* is disabled for particular markets and models and when using span calibrated Loadbars.)

Weights And Measures Versions

- *Fleece Mode* is disabled.

  (See *Weights And Measures Versions on* page 126).

Setting Resolution

The base resolution (or division size) is automatically set by the Loadbar connected. The displayed (and printed) resolution can be manually set to a coarser value if desired.

Four different settings are available starting from the base resolution of the Loadbars connected (eg. 0.5, 1.0, 2.0 and 5.0 kilograms for a base resolution of 0.5kg).

A finer resolution (0.1kg or 0.2lb) is provided by *Fleece Mode* (see page 23).

To view or change the resolution, see *Setup Mode* on page 13.

The resolution control can be used to prevent the Indicator autoranging when animals are both above and below an autoranging boundary (see *Autoranging* on page 122).

For example, if the base resolution is 0.5kg increments, the Indicator normally changes to a resolution of 1kg increments at weights above 250kg. If you are weighing animals with weights both above and below 250kg, you can fix the resolution at 1kg increments using *Setup Mode* so that you get the same resolution for all your animals.

The coarser of the manually set resolution and the current autoranging resolution is used by the Indicator.

Weights And Measures Versions

- Resolution setting may be disabled.

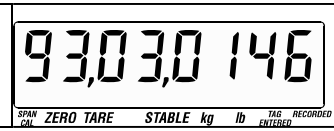
(See *Weights And Measures Versions on* page 126).

Entering Tag (ID) Numbers

The *TRU-TEST* Model 703 Indicator stores animal weights in a memory file along with a tag (ID) number and condition code (see *Entering Condition Codes* on page 29) or group count (see *Group Weighing Mode* on page 73).

Tag numbers are separated into three parts so that you can specify different categories in one tag number.

For example year, herd and individual animal:

Year 1993, herd 3, animal 146,	

When tag numbers are printed the three parts are separated by spaces rather than commas.

You do not have to use all the available number places, a simple 2-digit number may be sufficient.

The tag number must be entered prior to pressing the *RECORD* key, otherwise the Indicator generates one automatically (beginning at 00,00,0001). To reset the automatic tag number see *Prefixes* below.

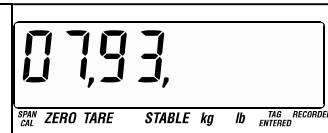
Entering Tag Prefixes (Pretag)

If identical numbers are to be used for the first part of many tag numbers (eg. date), you can enter these numbers as common *tag prefixes* (up to 6 digits) so that you do not have to enter them for each animal.

Tag prefixes remain until changed or cleared.

1. Press SET to activate set keys.

2. Press PRETAG (PREFIX).	

3. Key in the tag prefix (digits appear on the left) 4. Press ENTER.	

A tag prefix can also be useful when generating automatic tag numbers. It can be used to set the start number to 00,00,0100 for example.

You can reset the automatic tags to begin from 00,00,0001 by clearing the tag prefix or by clearing any file.

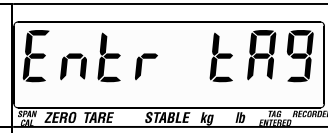
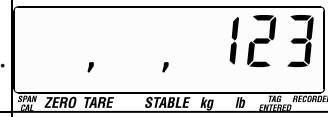
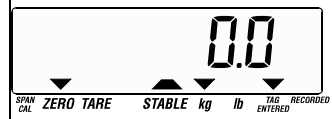
Clearing Tag Prefixes (Pretag)

- Press SET, PRETAG (PREFIX), CLEAR.

Entering Individual Animal Tags

The tag must be entered prior to pressing the *RECORD* key.

To enter a tag:

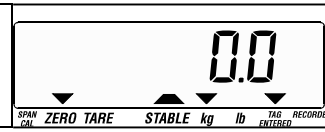
1. Press TAG (ID). The display shows:	
2. Key in a tag number (up to 8 digits) using the numeric keys.	
3. Press ENTER to enter the tag. The *Tag Entered* pointer comes on	

4. When ready, (tag entered, animal in place, reading stable), press *RECORD* to store the tag, condition code (or group count) and weight into the memory file. See *Recording* on page 31 for more details.

There is a faster method of entering tags; you can key in the digits of the tag directly then press *TAG* (*ID*). This saves having to press *ENTER* each time.

(You can enter the tag number while the scale is determining the animal's weight.)

The *Tag Entered* (*ID Entered*) pointer turns *On* when a tag is entered and turns *Off* again when the weight is recorded. This shows whether or not a tag has been entered for the current animal. It also shows whether or not you have pressed the *RECORD* key for the current animal.

Tag entered, but animal weight and tag not yet recorded	

When a new tag is entered, the memory is checked to make sure the number is unique.

If not unique, "duplicate" is displayed.	

If a duplicate tag is OK, press *ENTER* again (if using the quick method of entry described above, press *TAG* (*ID*) a second time), otherwise, enter a new number.

Making Corrections

If incorrect numbers have been keyed in, but you have not yet pressed *ENTER*, you can:

- Delete digits one at a time by pressing CLEAR.

If *ENTER* has been pressed, you can:

- View the tag you have entered by pressing TAG (ID).
- If it is okay, press LIVE to return to live mode.
- If not okay, re-enter the tag.

If you have already pressed *RECORD* to store the data in memory, you can quickly delete the last record:

- Press DISPLAY, DELETE, LIVE.

You can edit other records later - see *Editing Records* on page 39.

Entering Condition Codes

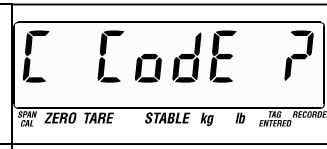
In addition to a tag number (see *Entering Tag Numbers* on page 25), each animal can have a code number representing its condition.

Condition codes are useful as a means of marking stock condition, performance or animals to be sold. Later a report can be printed of just those animals with particular condition codes and you can obtain statistics of just those animals. Also condition codes are printed along with the tag and weight on most print reports.

If condition codes are required, *Group Mode* must be turned *Off* (see *Setup Mode* on page 13).

If a condition code is required, it must be entered before pressing the *RECORD* key (either before or after entering the tag).

To enter a condition code:

1.	Press COND. The display prompts you to enter the condition code.	
2.	Key in a code number (up to 4 digits) using the numeric keys. (No decimal point.)	

3. Press ENTER to enter the condition code.

- When ready, (tag entered, condition code entered, animal in place), press *RECORD* to store the tag, condition and weight in the memory file.

If the "Count?" message is displayed, you need to turn *Off Group Mode* (see *Setup Mode* on page 13).

Making Corrections

If incorrect digits have been typed, but you have not yet pressed *ENTER*, you can:

- Delete digits one at a time by pressing CLEAR.

If *ENTER* has been pressed, you can:

- View the code you have entered by pressing COND.
- If it is okay, press LIVE to return to live mode.
- If not, re-enter the code.

If you have pressed *RECORD* to read the weight and store the data in memory, you can edit the record later - see *Editing Records* on page 39.

Recording

The *TRU-TEST* Model 703 can store up to 7600 animal records (weight, tag and condition code). The data is retained in memory until cleared, even when the Indicator is switched *Off*. The records can be displayed one at a time on the display screen or printed out as a report using the *TRU-TEST* printer.

Up to 99 different files of animal records can be stored (see *Multiple Files* on page 44).

There are two methods of recording; manual recording and automatic recording.

Manual Recording

1. Move the animal onto the platform or crate.
2. Enter a tag number if required. (See *Entering Tag Numbers* on page 25.)
3. Enter a condition code (or group count) if required. (See *Entering Condition Codes* on page 29 or *Group Weighing Mode* on page 73.)
4. Wait for the *Stable* pointer to come *On*.
5. Press RECORD.

The display blinks and the *RECORDED* pointer comes *On*. This prevents further recording of the same animal.

(If the Indicator will not record, it is because the display is not showing a live weight - press *LIVE*.)

When the animal leaves the platform (or the platform weight changes), the *RECORDED* pointer goes *Off* ready for the next animal. This feature greatly helps to prevent operator errors.

If a printer is connected, the *TRU-TEST* Model 703 scale normally prints the data when *RECORD* is pressed. (This feature can be disabled at your *TRU-TEST* Service Centre if required.)

There are several conditions which prevent recording. In each case, the Indicator beeps when *RECORD* is pressed and a brief message to identify the problem is displayed (see *Display Messages* on page 86).

If the *Stable* pointer goes *Off* just as the *RECORD* key is pressed (because the animal jumps off the platform say), the Indicator still stores the true weight. There is a 0.5 second period provided for this, after which the *RECORD* key is disabled until the *Stable* pointer comes *On* again.

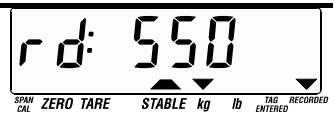
The *Recorded* pointer may not go *Off* or may be delayed in turning *Off* during speed weighing when a new animal, which is equal in weight to the previous animal, quickly follows onto the platform (especially when the second animal is moving about). Usually a short pause is all that is necessary for the Indicator to recognise a slight change in weight. If not, press *CLEAR* to force the *Recorded* pointer *Off*.

Automatic Weight Recording

The *TRU-TEST* Model 703 is capable of totally hands off operation. In this mode the Indicator effectively presses the *RECORD* key itself when there is a stable weight on the platform.

To view or change the Auto Record status *(On, Off* or *On Tag (ID))* see *Setup Mode* on page 13.

When a weight is recorded with Auto Record *On*, the display shows the recorded weight with an "rd" prefix for about two seconds. The *Recorded* pointer also comes *On* as it does for manual recording. You can let the animal go as soon as the "rd" prefix comes *On*.



The Indicator has several sophisticated safeguards to prevent malfunctions during Auto Record operations. However, if the *Recorded* pointer fails to turn *Off* when a new animal of the same weight quickly follows onto the platform, press the *CLEAR key*.

On Tag (ID) - Setting for Electronic Tag (EID) Recognition

As well as "OFF" and "ON" there is a third Auto Record setting called "On Tag" which allows auto recording only after a tag has been entered. This mode is mainly used with automatic tag (EID) recognition systems which send the Indicator a tag via the serial port. (See *Electronic Tag (EID) Reading* on page 121.)

The "On Tag" setting can also be used with manual tag entry, eliminating the need to press the RECORD key.

Weights And Measures Versions

- Auto Record may be disabled.

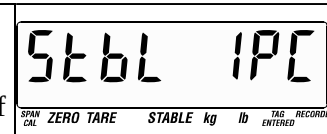
(See *Weights And Measures Versions on* page 126.)

Turbo Setting

If the *Stable* pointer is not *On* when you press the *RECORD* key, a message is displayed and the weight is not recorded.	

Using the *Turbo Setting*, you can change the speed of response of the *Stable* pointer so that it comes *On* faster for rapid throughput of animals or slower for greater accuracy.

To view or change the turbo setting, see *Setup Mode* on page 13.

Turbo setting of 1 per cent (default setting). ie. the *Stable* pointer comes *On* when the reading is within 1% of the true weight.	

Available options are 0.5%, 1%, and 2%.

Settings:

- To do speed weighing, select 2% for rapid throughput of animals.
- Alternatively, to ensure that weights are not recorded until measured to the best accuracy of the scale, select 0.5%.

Note: This feature affects only the speed at which the *Stable* pointer comes *On*, the display can still update to more accurate readings even after the *Stable* pointer is *On*.

Weights And Measures Versions

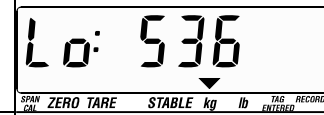
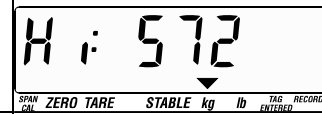
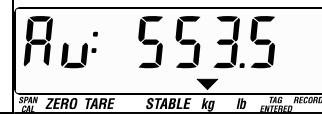
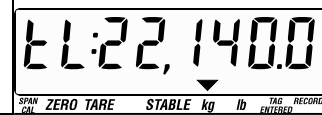
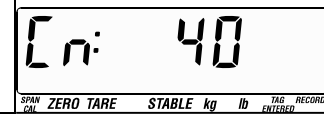
- The *Turbo* function may be disabled.

(See *Weights And Measures Versions on* page 126).

Displaying Statistics

The *TRU-TEST* Model 703 Indicator has five keys to display statistics about the animal records held in the current file.

If you are using multiple files, first select the file required (see Scanning Files on page 46) then use the following keys:

MIN Minimum weight recorded.	
MAX Maximum weight recorded.	
AVERAGE Average of weights recorded.	
TOTAL Total of weights recorded.	
COUNT Number of weights recorded.	

Press LIVE to return to *Live Weighing Mode*.

The statistics are calculated differently in Group Weighing Mode (see page 73).

Statistics are also available in various printed reports - see *Printing Reports* on page 64.

The global file (file 0) is a special file that allows you to do statistics and print reports on all data in all files. You cannot record or edit data in file zero.

1. Press [FILE SELECT], [0], [ENTER] to select the global file.
2. Display statistics or print reports as normally done for any other file.

The global file should not be used if various files contain data from different types of Loadbars or if the files are in different units (*kg* and *lb*).

Displaying Records

You can display the records in the current file one by one in chronological or weight order. This is important if you do not have a printer as it allows you to study the results at leisure after the weighing session.

To display the records in chronological order:

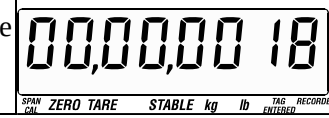
- Press [DISPLAY ▽] to start at the first animal recorded.

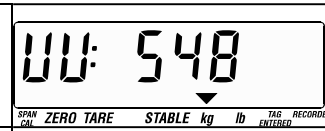
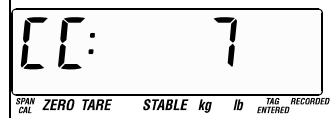
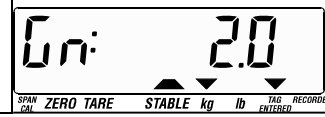
OR

- Press [△ DISPLAY] to start at the last animal recorded.

  (for weight order, press [SEARCH] before the display key)

- To scroll up and down the list use [DISPLAY ▽] and [△ DISPLAY].
- To scroll rapidly, hold down the appropriate key.

Initially the tag numbers of the records are displayed. (In this example tag number 18)	

• Press ◁▷ to see the corresponding weight (W)	
• Press ◁▷ to see the corresponding condition code (or group count, see *Group Mode* on page 73)	
• Press ◁▷ again for gain (if gain file set).	

- Press LIVE at any stage to return to live mode.

Deleting Records

Warning: **when the *DELETE* key is pressed, the record is totally lost and cannot be recovered**.

You can delete any record (tag, weight and condition code or group count) as follows:

1. Use DISPLAY, DISPLAY or SEARCH to find the unwanted record.

   (See *Displaying Records* on page 36, or *Searching Records* on page 42).

2. Press DELETE.

Confirmation that the record has been deleted:	

If the last record of a file is deleted, the Indicator then displays the previous record. If a record in the middle of a file is deleted, then the next record in sequence is displayed.

(If you press *DELETE* again, the currently displayed record is immediately deleted and the "Del Rec" message does not appear - this is to save time when deleting multiple records.

- Press LIVE to return to normal weighing mode.

Quick Delete

To undo the last press of the *RECORD* key:

- Press DISPLAY, DELETE, LIVE.

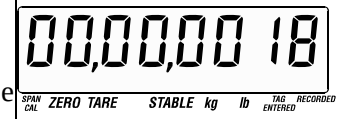
Also see *Editing Records* on page 39.

Editing Records

The *TRU-TEST* Model 703 allows editing (changing) of data stored in memory.

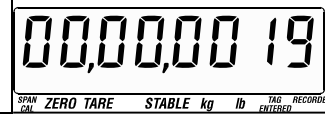
Records which have been edited are marked with an * on all printed reports.

1. Display the tag, weight or condition code (or group count) you wish to change (see *Displaying Records* on page 36).



(In this example tag number 18)

2. Key in the new value.
3. Press ENTER.



4. Press LIVE to return to *Live Weighing Mode*.

Weights And Measures Versions

- Editing of the weight part of the record may be disabled.

(See *Weights And Measures Versions on* page 126).

Inserting Records

The *TRU-TEST* Model 703 Indicator allows manual insertion of complete animal records into the memory file. This allows animals to be added which were missed out during weighing. It also allows the Indicator to be used as a notepad (see page 78).

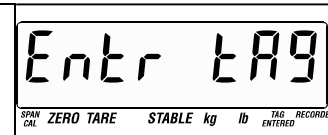
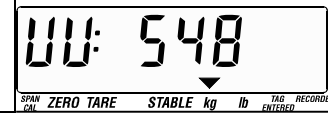
Note:

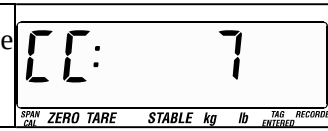
If you are inserting records without the Indicator connected to Loadbars, make sure the resolution setting matches that of the Loadbars (see *Setting Resolution* on page 24). If the data is to be used for weight gain calculations, the resolution must be the same as the minimum resolution in the gain reference file (usually 0.5kg or 1lb).

To insert a record:

1. Press INSERT.

The Indicator creates a new record with zero values of weight and condition code (or group count) and an automatically generated tag; it then goes into edit mode:

2. Override the automatically generated tag by keying in a new number. If automatic tag number acceptable go to step 3. 3. Press ENTER.	
4. Then key in the weight. 5. Press ENTER.	

6	Then key in the condition code (or group count) if required.	

7. Press ENTER.

The Indicator automatically returns to live mode.

This completes the insertion of one record. To insert another, repeat the procedure from step 1.

To check the inserted records, see *Displaying Records* on page 36.

After *ENTER* is pressed for a condition code (or group count), the Indicator automatically prints the entire record (as it does when the *RECORD* key is pressed). This function can be disabled if required, consult your *TRU-TEST* Service Centre.

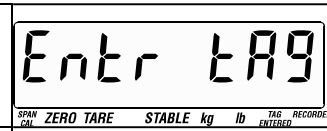
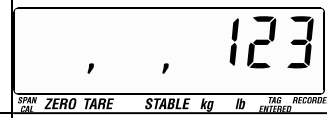
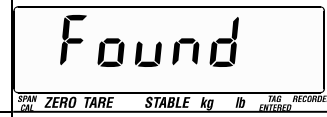
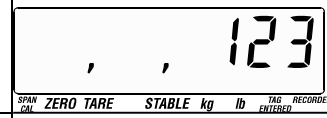
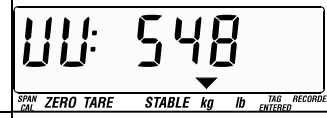
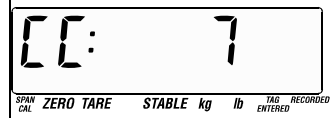
Weights And Measures Versions

- The *Insert* function may be disabled.

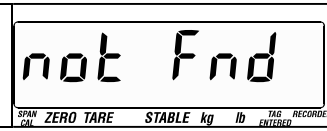
(See *Weights And Measures Versions on* page 126).

Searching Records

You can search through the records in memory to find a particular tag (ID):

1. Press [SEARCH], display shows:	
2. Key in the tag number required.	
3. Press [ENTER].	
If the Indicator finds the tag number in memory, it displays:	
Then the tag is displayed.	
• Press [◁▷] to display weight.	
• Press [◁▷] again for condition code (or group count).	

- Press [LIVE] to return to *Live Weighing Mode*.

If the tag number is not found, the display shows:	

Press SEARCH to enter a new tag number

OR

Press LIVE to return to *Live Weighing Mode*.

Searching for Minimum or Maximum Weight

To search the current file for the maximum weight recorded:

- Press SEARCH, DISPLAY △.

The record is found and you can display the tag number or weight as required (see *Displaying Records* on page 36).

To search the current file for the minimum weight recorded:

- Press SEARCH, DISPLAY ▽.

Multiple Files

The *TRU-TEST* Model 703 Indicator can store data in multiple files (up to 99 files) and you can record the date of each file. The Indicator is pre-set to file 1 at the factory and it may be that you have no need to use other files.

However, multiple files can be used for many purposes such as separating different mobs or herds, keeping the data from different jobs until they are all printed at the end of the day or keeping data from different Loadbar systems separate.

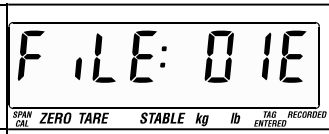
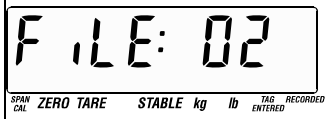
The most exciting use for multiple files is for weight gain analysis (see *Weight Gain* on page 52). Another use is in setting up the Indicator to check the tag numbers as they are entered in order to reduce human error. (See *Tag Checking* on page 62.)

The *FILE SELECT* key is located in a handy position on the keyboard so it is possible to change files on an animal by animal basis in order to sort them on some characteristic. This allows you to obtain separate statistics or reports on different types of animals weighed during the same session.

There are four parameters kept for each file. They are the file number, the date, the draft limits and the gain reference file number.

Selecting Files

To view or change the current file:

1. To view, press FILE SELECT. ("E" means an empty file)	
2. To change, key in a new file number. 3. Press ENTER.	

To assist with file management, enter a *File Date* each time a new file is started (see *Setting File Dates* on page 53).

The global file (file 0) is a special file that allows you to do statistics and print reports on data in all the files. This is only relevant if the data is from the same Loadbars and is in the same units. You cannot record or edit data in file zero.

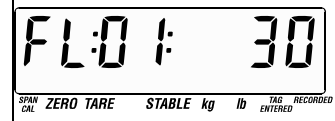
Scanning Files

1. Press FILE SELECT.

2. Press DISPLAY or DISPLAY to scroll through the file numbers.

(To rapid scroll, press and hold down the key.)

You can scan for an empty file by looking for the "E" sign.

Press ◁▷ to display file numbers and animal counts. (In this example File 1, 30 animals.)	
Press ◁▷ again to display file numbers and dates.	

(In this example File 1, 30th August 1993.)

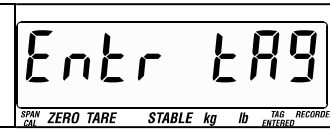
When the required file is found, press LIVE.

Finding a File by Tag (ID) Search

If you know the tag number of one of the animals in the file, you can do a global (all files) search for it.

1. Press FILE SELECT, 0, ENTER to select the global file.

2. Press SEARCH.



3. Key in the known tag number.

4. Press ENTER.

The Indicator searches for the first file containing the tag number and, if found, selects the file and displays that record.

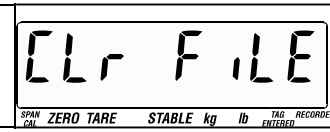
Clearing Files

Warning: Once a file has been cleared, the weight data cannot be recovered.

To clear a file:

1. Select the file using FILE SELECT, DISPLAY △, and DISPLAY ▽.

2. Press SET, CLR FILE.



3. Press CLR FILE again to confirm.

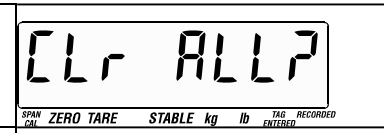
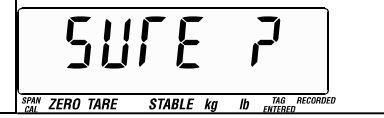
(Or press *LIVE* to abort the clear operation.)

Clearing all of Memory

Warning: Once the memory has been cleared, the weight data cannot be recovered.

1. Press [FILE SELECT], [0], [ENTER] to select the global file.

2. Press [SET] to enter set mode.

3. Press [CLR FILE].	
4. Press [CLR FILE].	

5. Press [CLR FILE] a third time to confirm the clear operation.

   (or press *LIVE* to abort the clear operation)

The following table shows the affect of clearing file 0.

Items Cleared	Not Affected By Clearing Memory
1. All records in all files. 2. The draft limits of all files. 3. The date of all files. 4. The gain reference file number of all files. 5. Any *Tare* or *Set Tare*. 6. Any pre-tag. 7. The calculator constants. 8. Resets auto tag number to 1.	1. *kg/lb* setting. 2. *Auto Zero* tracking *On*/*Off* status. 3. *Power Up Zero On*/*Off* status. 4. *Stable* pointer speed setting. 5. Resolution selected. 6. Print option selected. 7. Baud rate. 8. Interface handshaking method.

Drafting (Sorting by Weight)

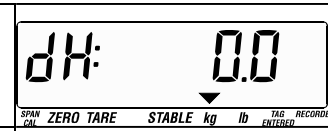
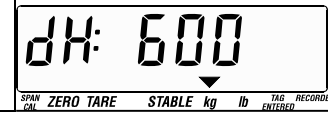
The *TRU-TEST* Model 703 has the ability to do two-way or three-way drafting (sorting by weight).

Setting Draft Limits

If you have been using Weight Gain and you don't want weight gain drafting, you need to clear the gain reference file number before setting draft limits (see *Weight Gain* on page 52 and *Weight Gain Drafting* on page 58).

If two-way drafting (above or below the limit) is required, you set only one draft limit (Draft High). (Alternatively, set Draft High and Draft Low to the same value.)

1. Press SET.

2. Press DRAFT H, the current high limit is displayed:	
3. Key in a new limit. 4. Press ENTER.	

If three-way drafting (above, below or between) is required, set the lower limit using the *DRFT L* key in the same way.

The draft limits can be changed at any time. Changing the draft limits alters any draft report or draft summary accordingly, even for animals already weighed.

If the Indicator displays "diF cELL" when entering a draft limit, it means that there are memory records or draft limits present which apply to different Loadbars to those connected. To enable use with the current Loadbars, clear the file or select another file.

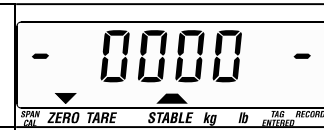
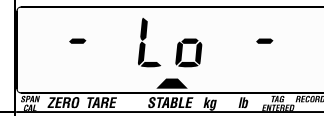
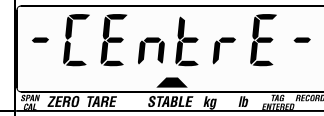
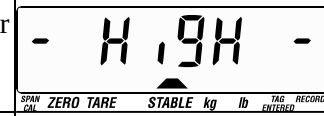
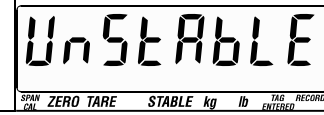
Negative numbers

To enter negative numbers for weight gain drafting, press the "-" sign after keying in the number.

Weighing in Draft Mode

- Press DRAFT to enter draft mode.

When draft mode is selected (with draft limits set) the Indicator displays one of the following drafting messages during live weighing:

No weight on Scales:	
Weight below the lower limit:	
Weight greater or equal to the lower limit but less than the upper limit:	
Weights greater or equal to the upper limit:	
Unstable reading:	

Draft mode is akin to live mode. All the functions normally available in live mode are also available in draft mode. The tag and weight recording operations described in *Recording* (see page 31) also apply to draft mode.

(Also see *Weight Gain Drafting* on page 58.)

- When finished with draft mode, press [LIVE] to return to *Live Weighing Mode*.

Clearing Draft Limits

1. Press [SET], [DRAFT H], [CLEAR].
2. Press [SET], [DRAFT L], [CLEAR].

Displaying Statistics for Draft Ranges

When draft limits are set, the statistics for each draft range can be obtained separately by pressing *LOW*, *CENTRE* or *HIGH* (on numeric keys 1, 2, 3 respectively) after one of the statistics keys (see *Displaying Statistics* on page 35).

For example, to see the number of weights recorded in the low weight range:

Press [COUNT], [1 LOW].

Weight Gain

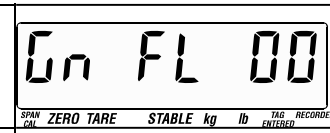
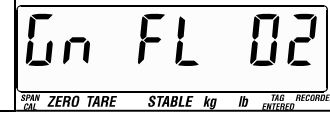
Using an animal's unique tag number, the *TRU-TEST* Model 703 can display the weight gain (or loss) as well as the current *Gross* weight. When a tag number is entered, the Indicator searches a specified file (the *gain reference file*) for the same number, finds the previous weight and compares it with the current weight on the platform.

If dates have been entered, the Indicator can calculate the weight gain per day.

The weight gain capabilities of the Indicator are extensive, including drafting on weight gain, weight gain statistics and printing weight gain reports. These operations are described in other sections (see *Contents*).

Setting Up for Weight Gain

Before any weight gain operation, you must specify a gain reference file where the previous data is stored:

1. Press SET, GAIN FL.	
2. Key in the reference file. 3. Press ENTER.	

If you want daily weight gain, the file dates must be set for both the current file and the gain reference file.

If you want total (rather than daily) weight gain, one of the file dates must not be set.

Setting File Dates

To view or change the date of the current file:

1. Press FILE DATE.	
2. Key in the date, including zeros as shown. 3. Press ENTER.	

If used for daily weight gain, the file date must be in MM:DD:YY format for the USA or DD:MM:YY format for all other countries.

If necessary, select the gain reference file and set the date in the same way. (Don't forget to re-select the current file afterwards).

If you weigh each month, a possible file numbering scheme is to use files 1 to 12 in rotation for the respective months. This makes it easy to keep track of a full year's data.

If you have trouble getting daily weight gain to work (but you have total weight gain) it is most likely that the dates are not in the correct format.

1. Check that the date of the current file is later than the gain reference file.
2. Check that the date formats are both the in the correct format for your country as above.

The maximum period for daily weight gain is 15 years.

The earliest date the Indicator can accept is 1st March 1976.

To change from daily weight gain to total weight gain, you must clear one of the dates:

Clearing Dates

1. Select the required file.

2. Press FILE DATE, CLEAR.

The date is also cleared when the file data is cleared.

Displaying Weight Gain During Weighing

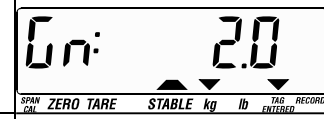
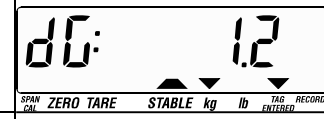
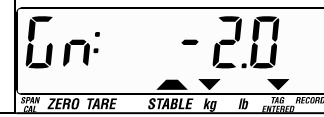
1. Press GAIN to select *Weight Gain Mode*.

   (You can press this key at any time during weight display to toggle between normal weight and weight gain. A brief message "On" or "Off" shows whether *Weight Gain Mode* is being switched *On* or *Off*.)

2. Move the animal onto the platform and enter the tag (and condition code (or group count) if required).

   If the same tag number is found in the gain reference file, the weight gain is displayed.

   With weight gain *On* the weight display has a prefix:

Prefix "Gn" for total gain (when file dates not set).	
Prefix "dG" for daily gain (file dates have been set).	
A minus sign represents a loss in weight.	

If a tag is entered which does not exist in the gain reference file, the Indicator beeps and briefly displays "not Fnd".

This may occur if:

1. The animal has only recently been introduced to the herd and so was not recorded in the last weighing session. In this case you can still record the weight.

2. The tag number has not been entered correctly.

The tag number is re-displayed for you to re-enter if necessary.

When the animal leaves the platform, the display reverts to normal weight reading until another tag is entered. This prevents display of invalid weight gain data for the next animal on the platform.

When the Indicator is turned *Off*, *Weight Gain Mode* is automatically turned *Off*.

If the Indicator displays "no Gn Fl" (no gain file) when you try to select *Weight Gain Mode*, it is usually for one of the following reasons:

- There is no gain reference file number set for the current file.
- The gain reference file is empty.
- The current file and gain reference file have different base resolutions - that is, they were created using different Loadbars. Ensure that Loadbars with the same base resolutions are used or get one set of Loadbars span calibrated to match the other set(s). (See your *TRU-TEST* Service Centre.)

Displaying Weight Gain After Weighing

You can view the weight gains after the weighing session. This is especially important if you do not have a printer because it allows you to run through the results at leisure after the heat of the weighing session.

- Make sure the two files are set up for weight gain as described above. When a gain reference file is set, the option to display weight gain rather then *Gross* weight becomes available.
- Display the records in the normal way as described on page 36. Use the *GAIN* key to select display of weight gain. If a tag does not exist in the gain reference file, the Indicator displays "not Fnd" for the weight gain.

It is not necessary to turn *On Weight Gain Mode* to display weight gain after a weighing session. *Weight Gain Mode* is only for displaying live weight gain during weighing.

Printing Weight Gain Reports

See *Printing Reports* on page 64 for general instructions on printing.

- Both weight gain and normal statistics are printed on weight gain reports.
- The condition codes (or group counts) are not printed.

Daily weight gain is identified as kg/day or lb/day on all daily weight gain print reports and summaries.

If a particular tag does not exist in the gain reference file, the weight gain statistic is left blank for that animal.

Clearing the Gain Reference File Number

It is necessary to clear the gain reference file number before setting any non weight gain draft limits (see *Drafting* on page *49)*.

To clear the gain reference file number:

- Press 

.

Weights And Measures Versions

- Weight gain operation may be disabled.

(See *Weights And Measures Versions on* page 126).

Weight Gain Drafting

Weight gain drafting combines the use of the *Weight Gain* function (see page 52) and the *Drafting* function (see page 49).

When a file has a gain reference file number set, its draft limits are interpreted as weight gain draft limits. If both file dates are also set, the draft limits are interpreted as daily weight gain draft limits and may have a considerably finer resolution than the Indicator's base resolution.

Because the draft limit resolution depends on whether or not file dates are set, the draft limits must be set after the gain reference file number and file dates have been set.

When the *DRAFT* key is pressed to go into weight gain drafting mode, the display does not change to the low, centre or high format unless *Weight Gain Mode* is *On* and a tag has been entered and a load is on the platform.

Unlike normal drafting, weight gain draft limits can be zero or even negative. To change the sign of an entered draft limit, press the key with the (±) label below it after the numerals and before you press *ENTER*.

Weight Gain Drafting Check List

1. Select an empty file for this weighing session.
2. Set the gain reference file number.
3. Check both file dates (if daily weight gain required).
4. Enter the weight gain draft limits.
5. Press DRAFT for draft mode.
6. Press GAIN key for *Weight Gain Mode*.
7. Animal on platform.
8. Enter animal's tag number.
9. Press RECORD if required.

Repeat steps 7 to 9 for next animal.

Weight Gain Statistics

Weight Gain On

When *Weight Gain Mode* is *On* and the gain reference file is set, the statistics keys, *MIN*, *MAX*, *AVERAGE*, *TOTAL* and *COUNT* give weight gain statistics for those animals whose tags exist in both the current file and the gain reference file. For example the average weight gain of all the animals can be displayed.

If suitable draft limits are set for weight gain, then weight gain statistics for the three draft ranges are obtained by following a statistics key with the appropriate *LOW*, *CENTRE* or *HIGH* key (on numeric keys 1, 2 and 3 respectively).

For example the average weight gain of only the animals with high weight gain can be displayed by pressing *AVERAGE* followed by HIGH.

Weight Gain Off

When weight gain is *Off* and the gain reference file is set, the statistics keys give the gross weight statistics of all animals in the current file.

If suitable draft limits are set, gross weight statistics for the three draft ranges are obtained by following the statistics key with the appropriate *LOW*, *CENTRE* or *HIGH* key. The ranges are still sorted by weight gain even though *Weight Gain Mode* is *Off*. Only animals whose tag numbers exist in the current file and the gain reference file are included.

Example

You can look at the average gross weight of the animals in the low weight gain range of the current file to see if there is a correlation between gross weight and weight gain.

To do this:

1. Select a gain reference file.
2. (Check both file dates if daily weight gain is required)
3. Set draft limits for appropriate weight gain limits.
4. Set *Weight Gain Mode* to *Off* with the *Gain* key.
5. Then press *AVERAGE*. You see the average Gross weight of all animals in the current file.
6. Then press **1**. You see the average gross weight of the animals in the low weight gain range.

Note

All printed weight gain reports and weight gain summaries have both absolute weight and weight gain statistics printed on them.

Tag Number Checking

A common source of errors during weighing is the entry of tag numbers. The Indicator's ability to search for a tag number in another file (when calculating weight gain) can be used to verify the tag numbers as they are entered.

Setting Up for Tag Checking

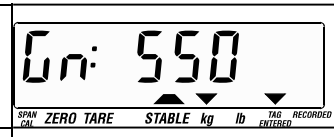
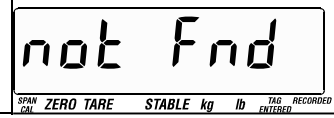
1. Set up a file containing all the valid tag numbers for the next weighing session. This can easily be done using the *INSERT* function (see *Inserting Records* on page 40).

   The file's date should not be set and the weights should be zero so that when "weight gain" is displayed, it is the same as the actual weight.

   If you have a Personal Computer you can use the *TRU-TEST* AgLinker program to load a ready made file of tag numbers into the Indicator.

2. Set up the Indicator for weight gain operation. That is, select a current working file and then set its gain reference file number to the file containing the list of valid tags. (See *Weight Gain* on page 52.)

3. Use the Indicator with *Weight Gain Mode On* during weighing. As you enter each tag, the Indicator searches for it in the reference file.

Prefix "Gn" can be thought of as "Good number".	
If tag number is not found in the reference file:	

The weight displayed is the same as the normal weight because the weights in the gain reference file are zero and we are not using daily weight gain because no date is set in the gain reference file.

The tag checking capability could also be used to do drafting by tag number. That is, you could sort animals into two groups as you weigh, by previously setting up a file containing all the tags of one group. Then use the "not Fnd" or "Gn" status as your sorting Indicator.

Printing Reports

The *TRU-TEST* Model 703 can print eight different full reports and five different summary reports. You select the required report using the *PRINT OP (REPORT OP)* option in *Setup Mode* (see page 13) and then start printing using the *PRINT (REPORT)* key in live mode.

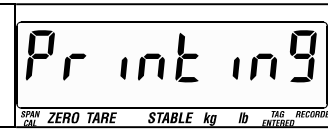
Warning: The Indicator must only be connected to a serial printer cable. Never connect to a parallel (Centronics) printer interface as damage to the printer may result. Never use a parallel IBM printer cable. See *TRU-TEST Printer* on page 71 and *Printer Interfacing* on page 120.

The printer cable used with AG500 series *TRU-TEST* scales can be used with the 700 Series.

Since the Indicator stores data in a highly reliable memory, it is recommended that the printer be left indoors away from the dirt and moisture of the weighing area. At the end of the weighing session, take the Indicator to the printer for printing (and charging if applicable).

To print a report:

1. Connect the printer to the Indicator's printer socket using the correct cable. Make sure the printer is supplied with power, turned *On* and is ready for printing.
2. If you wish to have a date printed on the report, set the current date (see *Setting Dates* on page 53).
3. If you are printing a draft report or draft summary, you may change the draft limits as required to affect the printout.
4. Select the type of report you require (see *Reports Available* below).

5. Press PRINT (REPORT)	

To abort a printout, press LIVE.

Reports have the relevant animal records in the current file printed on them.

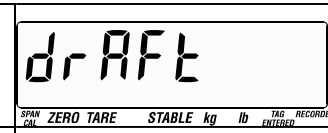
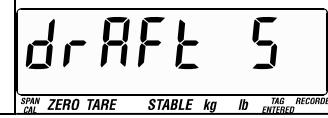
Summary reports have statistics only and do not show the information on individual animals.

All reports are in tag (ID) number order except the "Cull" report, which is in weight order and the "Condition Code" report, which is in condition code order (only those records with a non-zero condition code are included).

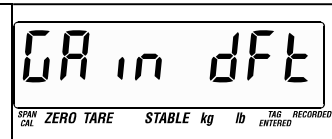
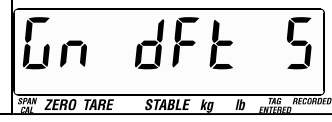
Draft reports are divided into each draft range with data arranged in tag number order.

Weight gain reports can be printed only if a valid gain reference file is set.

With drafting reports, the following print options are only available when no gain reference file is set; the data relates only to the current file:

• Draft Report	
• Draft Summary	

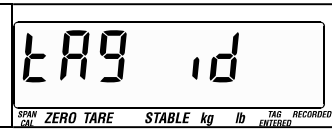
If a gain reference file is set, then the Indicator can compare weights between the two files and the following reports are available.

• Weight Gain Draft Report (daily or accumulated gain).	
• Weight Gain Draft Summary (daily or accumulated gain).	

In addition, setting file dates affects the type of gain report printed. If dates are set for both the current file and the gain reference file, then daily weight gains are printed. Otherwise, accumulated weight gain is printed.

Reports Available

The required report is selected in *Setup Mode (*see page 13).

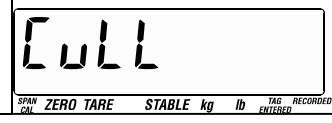
Tag (ID) Ordered Report	

File number:Date (if set):

Columns: Tag/ID Weight Condition Code (or group count)

Statistics: Count, Total, Average, Min, Max

This report format changes in *Group Mode*, see page 73.

Cull Report In Weight Order	

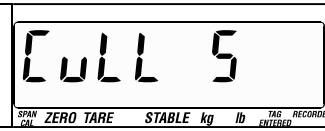
File number:Date (if set):

Columns: Tag/ID Weight Condition Code

Cull Summary: 10%, 20%, 25%, 50%, 75%, 100%

(percentage of animals with weights below each limit)

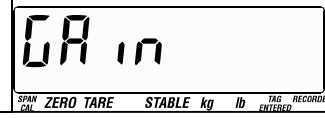
Statistics: Count, Total, Average, Min, Max

Cull Summary Report	

File number: Date (if set):

Cull Summary: 10%, 20%, 25%, 50%, 75%, 100%

Statistics: Count, Total, Average, Min, Max

Daily Weight Gain Report (Requires gain ref file and both dates set)	

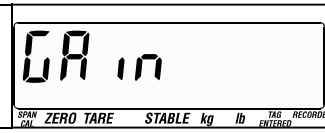
File number: Date:

Gain ref file number: Date: Days:

Columns: Tag/ID Weight Weight Gain / Day

Weight gain / day stats: Count, Total, Average, Min, Max

Weight statistics: Count, Total, Average, Min, Max

Accumulated Weight Gain Report (Requires gain ref file set, date not set)	

File number: Date (if set):

Gain ref file number:

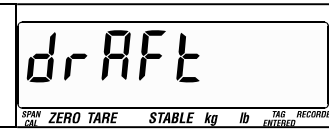
Columns: Tag/ID Weight Weight Gain

Weight Gain Statistics: Count, Total, Average, Min, Max

Weight Statistics: Count, Total, Average, Min, Max

Draft Report

(When gain ref file not set)



File number:

Low draft limit: High draft limit:

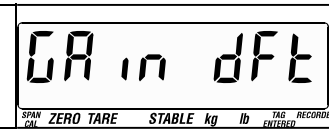
Columns (in ranges): Tag/ID Weight Condition Code

Statistics (in ranges): Count, Total, Average, Min, Max.

Statistics (overall): Count, Total, Average, Min, Max.

Daily Weight Gain Draft Report

(Requires gain ref file and both dates set)



File number: Date:

Low draft limit: High draft limit:

Gain ref file number Date: Days:

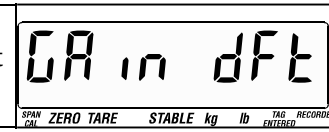
Columns (in ranges): Tag/ID Weight Gain/day

Weight gain stats/day Count, Total, Average, Min, Max.

Weight statistics Count, Total, Average, Min, Max.

Accumulated Weight Gain Draft Report

(Requires gain ref file set, date not set)



File number:

Low draft limit: High draft limit:

Gain ref. file number:

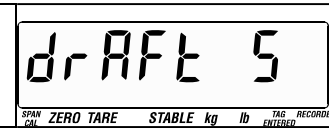
Columns (in ranges): Tag/ID Weight Weight Gain

Weight gain statistics: Count, Total, Average, Min, Max.

Weight statistics: Count, Total, Average, Min, Max.

Draft Summary

(When gain ref file not set)



File number:

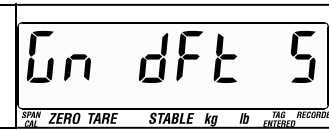
Low draft limit: High draft limit:

Statistics (in ranges) Count, Total, Average, Min, Max.

Statistics (overall) Count, Total, Average, Min, Max.

Daily Weight Gain Draft Summary

(Requires gain ref file and both dates set)



File number: Date:

Low Draft Limit: High Draft Limit:

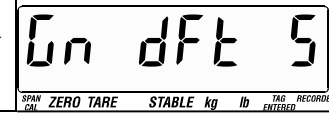
Gain ref. file number: Date: Days:

Weight gain statistics in ranges:
Count, Total, Average, Min, Max.

Weight gain statistics: Count, Total, Average, Min, Max.

Accumulated Wgt Gain Draft Summary

(Requires gain ref file set, dates not set)



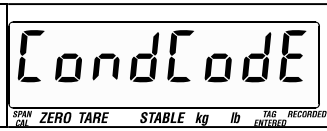
File number:

Low Draft Limit: High Draft Limit:

Gain ref. file number:

Weight gain statistics: Count, Total, Average, Min, Max.

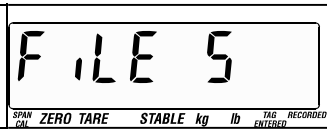
Weight statistics: Count, Total, Average, Min, Max.

Condition Code Report	

File number: Date:

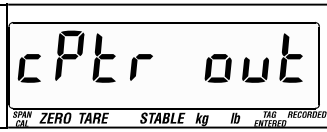
Columns: Tag/ID Weight Condition Code

Statistics: Count, Total, Average, Min, Max

File Summary	

For each file, prints:

file number, date, low draft limit, high draft limit, gain ref. file number and date, days, count, total, average, minimum, maximum.

Computer download format	

Prints the records as stored in memory.

Weights And Measures Version

- Weight gain reports are not available if weight gain is disabled.

(See *Weights And Measures Version on* page 126).

Global (all files) Reports

The special global file (file 0) allows you print reports on all data in all files.

The global file should not be used if the files contain data from different types of Loadbars or Suspension Cells or if the files are in different units (*kg* and *lb*).

TRU-TEST MP400 Printer

Use only the printer cable supplied by *TRU-TEST*.

The printer is powered from the Indicator via this cable. The Indicator must be connected to an external power supply, the internal battery is not sufficient to power the printer as well as the Indicator. See *Installation* on page 6.

Note: The printer cable used with the *TRU-TEST* Citizen printers cannot be used with the MP400 printer.

The *TRU-TEST* Model 703 Indicator and printer are factory configured with compatible settings. Earlier model Indicators may need to be set up to communicate correctly with the printer. See *Printer Interfacing* on page 120.

For changing the printer paper and general care of the printer refer to the *MP400 Printer Operators Manual* supplied with the printer.

If there are any problems, refer to *Troubleshooting* on page 99 of this manual.

TRU-TEST Citizen Model Printer

Use only the RS232 cable supplied by *TRU-TEST*.

To change the paper, refer to the underside of the mechanism cover on the printer.

If there are any problems, refer to *Troubleshooting on page* 99.

DC Power

The DC power version of the printer receives its power from the Indicator via the printer cable. The Indicator must be connected to an external power supply, the internal battery is not sufficient to power the printer and the scale. See *Installation* on page 6.

AC Power

The AC power version requires an AC supply for the printer and the normal 12 volt supply or internal battery for the Indicator.

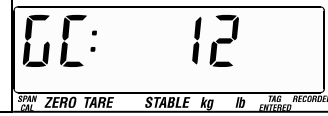
Group Weighing Mode

Group Weighing Mode allows you to weigh several animals at once and record the number of animals along with the group weight.

Reports can be printed showing statistics for group weights and calculated average animal weights.

To enter *Group Mode* see *Setup Mode* on page 13.

When weighing, the number of animals in the group must be entered before pressing the *RECORD* key:

Press G COUNT.	
Key in the number of animals eg. Group Count = 12	

Press ENTER.

If required, enter a tag (ID) number for the group.

When ready (animals in place, *Stable* pointer *On*), press *RECORD* to record the group weight and group count.

Accumulating Group Weights

If *Group Mode* is *On* and a new group of animals is weighed using the same tag (ID) number as a previously recorded group, the weight and group count are added together.

In this way a large group can be weighed in small groups (to suit scale capacity), but is recorded as one large group.

Making Corrections

If incorrect numbers have been keyed in, but you have not yet pressed *ENTER*, you can:

- Delete digits one at a time by pressing CLEAR.

If *ENTER* has been pressed, you can:

- View the number of animals you have entered by pressing G COUNT.
- If it is okay, press LIVE to return to live mode.
- If not okay, re-enter the number.

If you have pressed *RECORD* to store the data in memory, you can edit the record later - see *Editing Records* on page 39.

Displaying Statistics

With *Group Mode On* the statistics keys display the following:

COUNT	Sum of the group counts in the current file. For example, If three groups of two animals are recorded, the *COUNT* key displays "6".
TOTAL	Sum of the group weights in the current file.
AVERAGE	Average animal weight (TOTAL / COUNT).
MIN	Minimum group weight.
MAX	Maximum group weight.

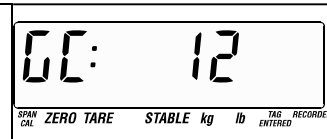
With *Group Mode Off* the statistics keys display the following:

COUNT	The number of groups in the current file.
TOTAL	Sum of the group weights in the current file.
AVERAGE	Average group weight (TOTAL / COUNT).
MIN	Minimum group weight.
MAX	Maximum group weight.

Displaying Records

When displaying records in *Group Mode*, the group count is displayed in place of condition code.

See *Displaying Records* on page 36.



Note

If no group count is entered, the Indicator assumes a single animal is being weighed. The group count is displayed as zero and is not printed (if a printer is being used). The single animal and its corresponding weight are added to the statistics.

Printing Reports

In *Group Mode*, the Tag (ID) ordered report shows group counts instead of condition codes. Also, the total number of animals and average animal weight are printed in addition to the number of groups and average group weight.

Using the Indicator as a Calculator

The *TRU-TEST* Model 703 has the ability to perform multiplication's on a displayed quantity - live weight, statistic, weight gain, condition code, tag or even the result of a previous calculation.

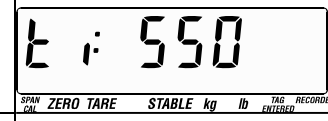
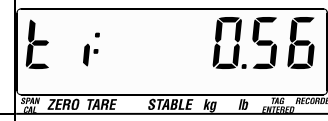
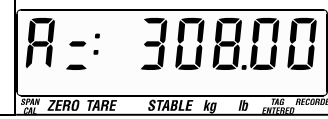
However, the result of any calculation cannot be stored in memory.

The calculator function is useful for calculating carcass weights. For example if the bone out percentage is 56%, you can multiply the average weight by 0.56 to get the average carcass weight.

Another application is animal dosage requirements. For example, if the dosage is 2ml/100kg, multiply the displayed animal's weight by 0.02.

To Multiply a Weight

While a weight or a statistic is displayed:

1. Press [× (+/-)].	
2. Key in the multiplier.	
3. Press [ENTER].	

The result of the multiplication is then displayed. If you were displaying animal records in memory, the Indicator remains in that mode (see *Displaying Records* on page 36).

Often the displayed weight needs to be multiplied by the same number for each animal - a constant. In this case, there is no need to enter the number every time.

To multiply by a constant number:

1. Carry out the same steps for normal multiplication for the first weight.
2. For every subsequent weight, simply omit entering the constant number (simply press the × key followed immediately by the *ENTER* key). The Indicator then uses the number entered originally.

Negative numbers

To enter negative numbers, press the "-" sign after keying in the number and before pressing *Enter*.

Using the Indicator as a Notepad

The *Insert Record* function (see page 40) of the Indicator can be used for manual entry of numeric data other than weights and tag numbers. The data can then be downloaded to a computer if required.

The fields available are those normally used for weight, tag number and condition code as follows:

Tag field: integers up to 8 digits.

Condition code field: integers up to 4 digits.

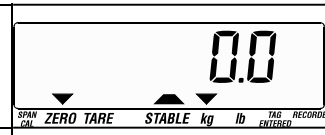
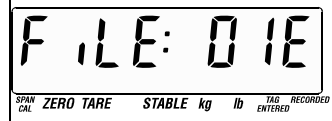
Weight field:

The use of the weight field depends on the resolution selected. If there is no Loadbar connected and the current file is empty, all possible resolution sizes are available (0.0001..100). The maximum value you can enter is 16000 times the selected resolution size.

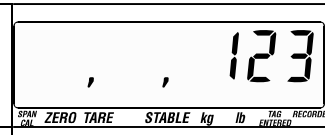
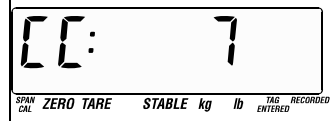
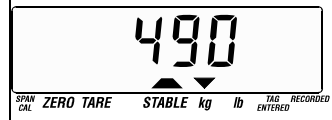
Note: The Indicator cannot store negative quantities.

Quick Reference Section

Typical Weighing Session

1.	**ON** Turn the Indicator *On*.	
2.	**FILE SELECT**, **DISPLAY** or **DISPLAY** Scan for an empty file ("E").	
3.	**LIVE** Return to live mode.	

4. First animal onto platform.

5.	**1 LOW** **2 CENTER** **3 HIGH**, **TAG** Enter tag (ID) number.	
6.	**COND**, **7**, **ENTER** Enter condition code (alternatively group count).	
7.	Wait for Stable pointer. **RECORD** Record the data (display blinks).	

8. Repeat from step 4 (next animal onto platform).
9. At the end of the session, turn the Indicator *Off*.

A handy reference card which clearly shows how to *Record* weights is also supplied with the Indicator.

Keys

Grey coloured keys are accessible during *LIVE* mode.

White coloured keys are accessible during *SET* mode.

	(0 to 9) - numeric keys.
	Displays the average weight or weight gain, of all animals recorded in the current file.
	Clears the last digit entered during numerical keypad entry (tags, draft limits, date, condition codes, weights, *Set Tare* etc). Also clears the RECORDED pointer, draft limits, pre-tag, file date, gain file number, etc.
	Clears the current file of all animal records, draft limits, date and gain reference file number. As a safety feature, this key must be pressed twice before records are deleted.
	Views or initiates entry of a condition code ready to be recorded with the *RECORD* key.
	Displays the total number of animals recorded in the current file.
	Deletes the displayed record from a file.

	From live display, displays the top (last) animal record. If displaying records, scrolls up. When selecting files - selects the next file. This key auto-repeats when held down. If pressed after the *Search* key, finds and displays the heaviest animal record.
	From live display, displays the first record. If displaying records, scrolls down. When selecting files - selects the previous file. This key auto-repeats when held down. If pressed after the *Search* key, finds and displays the lightest animal record.
	When displaying animal records, toggles between tag / weight / condition code (or group count) / weight gain (optional). When selecting files, toggles between the different file select display formats.
	Selects *draft* display format.
	View or set the high drafting limit.
	View or set the low drafting limit.
	Final key press for entering numbers using the numeric keypad.

FILE DATE	View or set the current file date.
FILE SELECT	View or set the current file number.
GAIN	Selects *Weight Gain* display format.
GAIN FL	View or set the gain reference file number.
G COUNT	View or enter current group count.
(ID)	Displays the current id number or initiates entry of an ID (USA Model Indicators).
INSERT	Inserts a new animal record into memory.
LIVE	Selects *Live Weighing Mode* (the normal state of the Indicator). In this mode the grey keys are active. This key can be pressed at any stage during the operation of the Indicator.
MAX	Displays the maximum weight or weight gain, recorded in the current memory file.
MIN	Displays the minimum weight or weight gain, recorded in the current memory file.
× (+/-)	Multiply any displayed value.
OFF	Turns the Indicator *Off*.

ON	Turns the Indicator *On*.
PRETAG	View or set the pre-tag number.
(*PREFIX*)	View or set the ID prefix (USA Model Indicators).
PRINT	Prints a report or summary of the records in the current memory file.
RECORD	Records the displayed live weight (and associated tag and condition code (or group count)).
(*REPORT*)	Prints a report of the records in memory (USA Model Indicators).
SEARCH	Search for the record with minimum or maximum weight or particular tag number.
SET	Activates *Set* keys. The white lower function on the dual function keys become active.
S TARE	View or set the *Tare* entered through the keyboard.
SETUP	Access *Setup Mode*.
TAG	View or enter the current tag number.
TARE	Cancels out a container weight.
TOTAL	Display the total weight or weight gain of animals recorded in the current memory file.

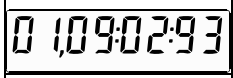
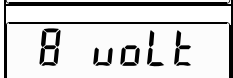
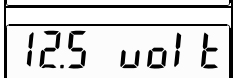
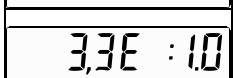
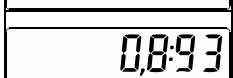
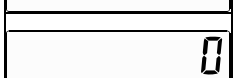
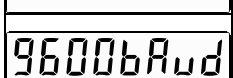
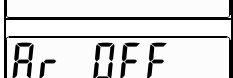
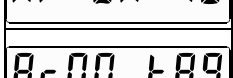
ZERO	Cancels out dirt and excrement accumulating on the platform and returns the display to exactly zero.

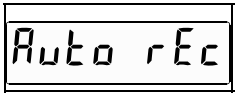
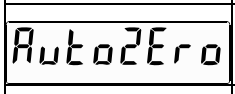
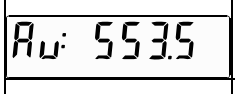
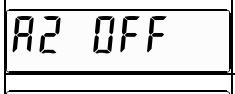
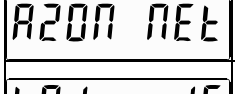
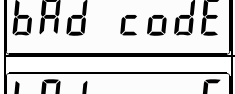
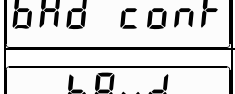
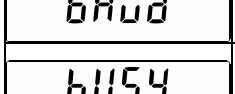
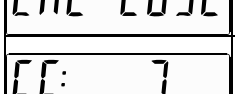
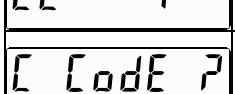
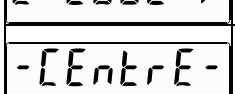
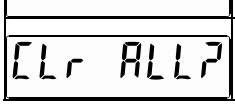
Display Pointers

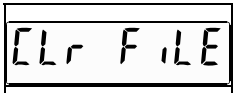
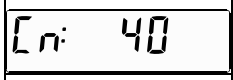
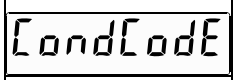
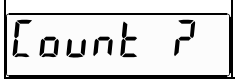
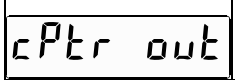
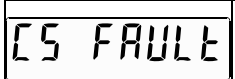
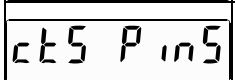
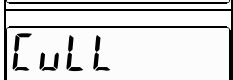
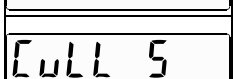
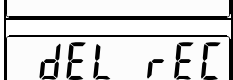
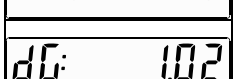
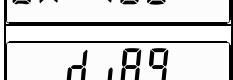
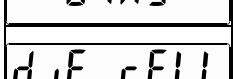
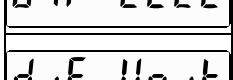
	SPAN CAL		Shows that the *Span Calibration* option is being used. (For Service Centres' use only.)
	ZERO		Shows that the weight is within one quarter of a division of zero.
	TARE		Shows that *Net* weights are being displayed (a *Tare* has been entered).
	NET		Shows that *Net* weights are being displayed (a *Tare* has been entered). USA Model Indicators.
	STABLE		Shows that the reading is stable.
	kg		Shows that the displayed weight is in kilograms.
	lb		Shows that the displayed weight is in pounds.
	TAG ENTERED		Tag number has been entered ready to record the weight.
	ID ENTERED		ID number has been entered ready to record the weight (USA Model Indicators).
	RECORDED		The current weight has been recorded.

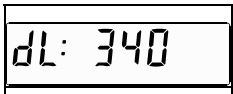
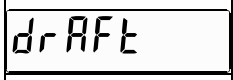
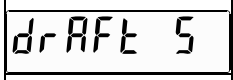
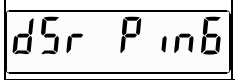
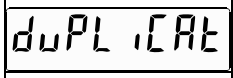
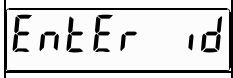
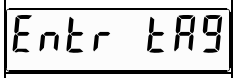
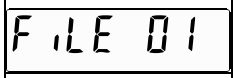
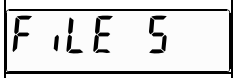
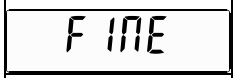
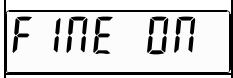
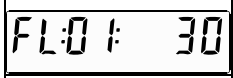
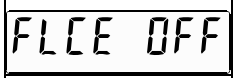
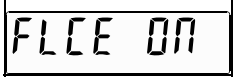
Weights and Measures Versions: Some keys and pointers may have been removed or changed to conform with local regulations. (See *Weights And Measures Versions* on page 126).

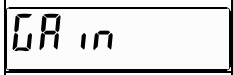
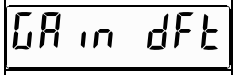
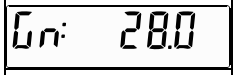
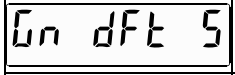
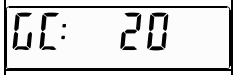
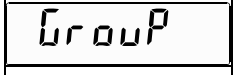
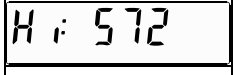
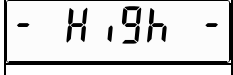
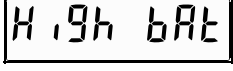
Display Messages

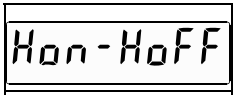
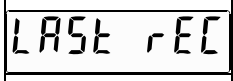
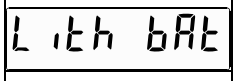
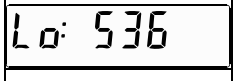
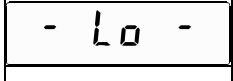
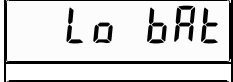
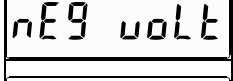
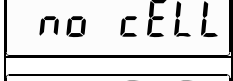
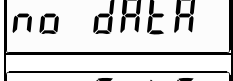
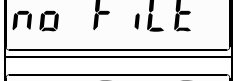
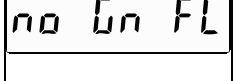
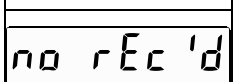
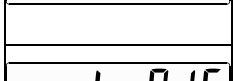
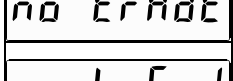
Message		**Meaning**
	**- 0000 -**	Drafting, no weight on platform.
		File number and date.
	**8 Volt**	Internal 8 volt supply failure.
	**12.5 Volt**	Diag information 1, supply voltage.
		Diag information 2.
		Diag information 3.
		Diag information 4.
	**9600Baud**	Baud rate of communications port.
	**A=:**	Calculator result.
	**Ar Off**	Automatic weight recording *Off*.
	**Ar On**	Automatic weight recording *On*.
	**Ar on ID**	Automatic weight recording after ID entry.
	**Ar on Tag**	Automatic weight recording after tag entry.

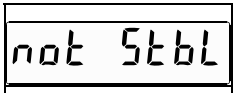
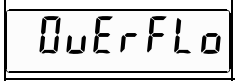
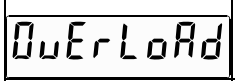
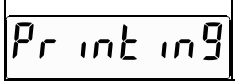
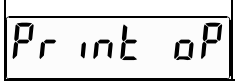
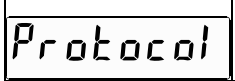
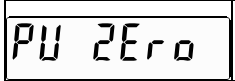
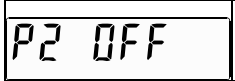
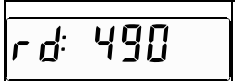
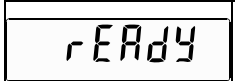
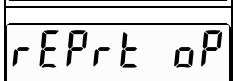
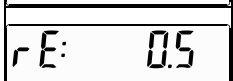
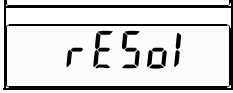
	**Auto Rec**	Setup automatic weight recording options.
	**Autozero**	Setup Automatic zero options.
	**Av:**	Average weight statistic.
	**Az Off**	Automatic zeroing *Off*.
	**Az On**	Automatic zeroing *On*.
	**Az on Net**	Automatic zeroing on *Net* weights.
	**Bad Code**	Bad code from Loadbar cable plug.
	**Bad Conf**	Configuration data is lost.
	**Baud**	Setup Baud rate options.
	**Busy**	Busy performing sorting or calculations.
	**Cal Lost**	*Standard Calibration* data lost.
	**CC:**	Condition code.
	**C Code ?**	Enter a condition code.
	**-Centre-**	Drafting CENTRE range.
	**Clr All?**	Do you want to clear all files?

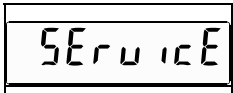
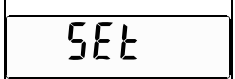
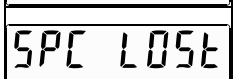
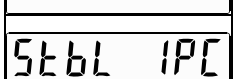
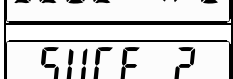
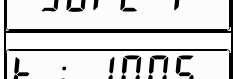
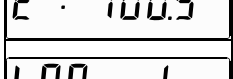
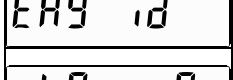
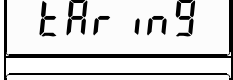
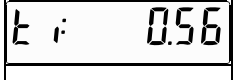
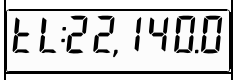
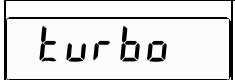
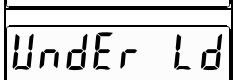
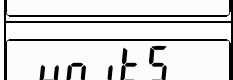
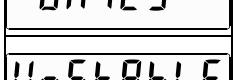
	**Clr File**	Do you want to clear file?
	**Cn:**	Count statistic.
	**Condcode**	Print option: Condition code report.
	**Count**	Enter group count.
	**Cptr Out**	Computer output format.
	**Cs Fault**	Checksum Fault in EPROM.
	**Cts Pin5**	CTS handshaking on pin 5 of the communications interface.
	**Cull**	Print option: Cull report in weight order.
	**Cull S**	Print option: Cull summary report.
	**Del Rec**	Delete animal record done.
	**Dg:**	Daily gain.
	**Dh:**	Draft High limit.
	**Diag**	Setup Diag options.
	**Dif Cell**	Memory records present which were recorded with a different Loadbar.
	**Dif Unit**	The units (*kg/lb*) are different to those in other memory records.

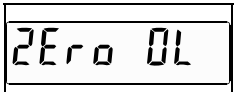
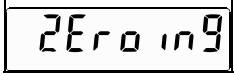
	**Dl:**	Draft low limit.
	**Draft**	Print option: Draft report.
	**Draft S**	Print option: Draft summary report.
	**Dsr Pin6**	DSR handshaking on pin 6 of communications interface.
	**Duplicat**	Duplicate tag warning.
	**Enter ID**	Enter an identification number.
	**Entr Tag**	Enter a tag.
	**File**	Current file number.
	**File S**	Print option: File Summary report.
	**Fine**	Setup *Fine Weight Mode* options.
	**Fine Off**	*Fine Weight Mode Off*.
	**Fine On**	*Fine Weight Mode On*.
	**Fl:**	File number and animal count.
	**Flce Off**	Fleece Mode *Off*.
	**Flce On**	Fleece Mode *On*.

	**Fleece**	Setup Fleece Mode options.
	**Found**	Tag found.
	**Full**	Memory is full.
	**Gain**	Print option: Weight gain report.
	**Gain Dft**	Print option: Weight gain draft report.
	**Gn:**	Gain (accumulated).
	**Gn Dft S**	Print option: Weight gain draft summary.
	**Gn Fl xx**	Gain reference file is xx.
	**GC:**	Group count field of memory record.
	**GP Off**	*Group Mode Off*.
	**GP On**	*Group Mode On*.
	**Group**	Setup *Group Mode* options.
	**Hi:**	Maximum (high) weight statistic.
	**- High -**	Drafting HIGH range.
	**High Bat**	High supply voltage indicated.

	**Hon-Hoff**	XON XOFF handshaking on the communications interface.
	**Last Rec**	Last record before memory is full.
	**Lith Bat**	Internal lithium battery flat.
	**Lo:**	Minimum (low) weight statistic.
	**- Lo -**	Drafting LOW range.
	**Lo Bat**	Low supply voltage indicated.
	**Neg Volt**	Internal negative voltage failure.
	**No Cell**	No Loadbar is connected.
	**No Data**	No data in memory file.
	**No File**	No data recording file selected (file 00 selected).
	**No Gn Fl**	No gain reference file number set or the gain reference file has a different base resolution or it is empty.
	**No Rec'd**	*RECORD* key pressed but a weight has already been recorded for this animal.
	**No Trade**	Not legal for trade.
	**Not Fnd**	Tag not found.

	**Not Stbl**	Not stable when attempting to record.
	**Overflo**	Overflow in number entry (value too large).
	**Overload**	Overload on scale.
	**Pr Fault**	Processor fault.
	**Printing**	Printing in progress.
	**Print Op**	Setup print options.
	**Protocol**	Setup handshaking protocol options.
	**Pu Zero**	Setup *Power Up Zero* options.
	**Pz Off**	*Power Up Zero Off*.
	**Pz On**	*Power Up Zero On*.
	**Rd:**	Recorded weight during auto record.
	**Ready**	The Indicator is ready, but no Loadbar is connected.
	**Reprt Op**	Setup report options.
	**Re: 0.5**	Resolution (set to 0.5 *kg* or *lb*).
	**Resol**	Setup resolution options.

	**Service**	The Indicator requires service.
	**Set**	Indicator *Set Mode* keys active.
	**Spc Lost**	*Span Calibration* data is lost.
	**StbL xPC**	Stable pointer *On* when within x%.
	**Sure ?**	Are you sure about clearing all files?
	**t :**	Set *Tare* value.
	**Tag Id**	Print option: tag (ID) ordered report.
	**Taring**	The Indicator is taring.
	**Ti:**	Times (multiplier) entry.
	**Tl:**	Total weight statistic.
	**Turbo**	Setup turbo options.
	**Under Ld**	The voltage from the Loadbars is abnormally low.
	**Units**	Setup measuring units options (*kg* or *lb*).
	**Unstable**	Drafting, unstable reading.
	**W(UU)**	Weight field of memory record.

	**Zero OL**	Zero overload for Weights and Measures versions and when using *Span Calibration*.
	**Zeroing**	The Indicator is Zeroing.

Care and Maintenance

The *TRU-TEST* Model 703 Indicator is a rugged and robust product designed to withstand the environment associated with livestock handling. The case is made from extremely tough, ultraviolet-resistant polycarbonate. The keyboard is completely sealed for all-weather operation.

Like any equipment, however, appropriate care and maintenance ensures long life and good appearance.

A set of simple guidelines is given below:

- Both the Indicator and Loadbars or Suspension Cells are designed to be shower proof. Under no circumstances should the equipment be submerged in water or left in a damp environment for extended periods.
- Occasionally clean away foreign material from the underside of the platform to make sure that all the load is taken by the Loadbars.
- The Indicator should be stored in a dry cool place.
- Keep the Indicator clean. Use a soft damp cloth to remove dust and mud. *Do not use abrasive cleaners*.
- Replace the protection caps onto the plugs and sockets whenever the Loadbars are detached from the Indicator. When the cables are plugged in, screw the protection caps together. Dust and moisture can be removed from the plugs and caps with methylated spirits or ethyl alcohol. Stronger spirits must not be used as they may react with the plastic.
- If fitted with an internal battery, store the Indicator in a fully charged state and recharge every three months.

- To extend the life of the Indicator keep it indoors when not in use. If the internal battery is fitted, it is convenient to do the charging at the same time.
- **Do not open the Indicator case.** There are no user serviceable parts inside. Refer all servicing matters to your *TRU-TEST* Service Centre. The case is a sealed unit and, if opened, moisture could affect the operation of the Indicator. The product warranty becomes void if the case seal is broken.

Internal Battery

The rechargeable internal battery option allows the Indicator to be conveniently independent of any external power supply.

The internal battery comes with its own internal battery charger. See *Internal Battery Charging* below.

Once charged the internal battery (if installed) gives 8 hours of continuous operation at normal temperatures
(5°C - 20°C (40°F - 70°F)) with two Loadbars connected.

The battery lasts for 3 to 5 years or approximately 250 charges if stored in a charged state and not submitted to temperature extremes.

To preserve battery life, observe the following simple guidelines:

- Never use an insufficiently charged or exhausted battery.
- Recharge the battery regularly.
- Recharge the battery once every 3 months even if not in use.
- Store the Indicator in a cool dry place.
- Use the recommended power supply.

Internal Battery Charging

Automotive battery chargers are NOT suitable for charging. The voltage and current they supply may be outside the required range. They may damage the Indicator resulting in the warranty becoming void.

Small AC to DC adaptors are NOT suitable for charging.

A special system automatically controls the internal battery charging. This is designed to provide maximum protection for the battery and to allow charging while the Indicator is in use or when it is switched *Off*.

The internal battery charger maintains maximum life of the battery, while giving the fastest charging rate possible. It automatically changes from a full charge rate to a trickle charge depending on the internal battery state. Charging from a flat state takes six hours. A quiet buzzing noise from within the Indicator shows that the battery charger is working.

The internal battery charger operates from either the recommended *TRU-TEST* power supply unit or a 12 volt car battery. Other charging supplies may damage the Indicator resulting in the warranty becoming void.

When charging the Indicator from a car battery, the car battery will lose energy equivalent to leaving the car headlights on for approximately 1 hour.

If the power source is unable to supply the required power, the charger switches *Off* and does not charge the internal battery. The Indicator continues to operate from the external power source. The charger only restarts once the external power supply has been disconnected or turned *Off* and then reapplied.

The *TRU-TEST* Model 703 enables the user to read the voltage at any time in order to check the condition of the internal battery, see *Setup Mode* on page 13.

If an external supply is connected, the charging voltage is displayed. Otherwise, the internal battery voltage is displayed.

A fully charged internal battery reads 12.5 volts or more when the *TRU-TEST* Model 703 has been *On* for 5 to 10 minutes with no Loadbars or external power source connected.

The internal battery is considered low when the voltage reads less than 11.0 volts.

You can use the internal voltmeter to determine if the battery has been charged by displaying the voltage 30 minutes after connecting it to the external 12 volt supply. If the battery has been charged, the display should read greater than 13.5 volts. However, this does not mean that charging is complete.

Troubleshooting

"8 VoLt" displayed

Cause — The internal 8 volt supply (used to supply the Loadbars) is outside its specified limits.

Solution — Disconnect the Loadbar cables from the Indicator one at a time. If the "8 voLt" message disappears then there is a fault in the Loadbars or their cables. If, after disconnecting the cables, the message is still displayed then the Indicator is faulty. Return all faulty items to your Service Centre.

"Bad Code" displayed

Cause — The code resistors in the Loadbar cable plugs are not recognised. (This message also displays for Loadbars which are only used with *Span Calibration* before being calibrated.)

Solution — If you have two Loadbars, disconnect one at a time to determine which has faulty code resistors. Return faulty parts to your Service Centre.

Cause — Moisture inside the Indicator.

Solution — Return the Indicator to your Service Centre.

"Cal Lost" displayed during turn on

Cause — The Indicator has not been calibrated or has lost its *Standard Calibration* data.

Solution — The standard calibration data is not used if the Indicator has been span calibrated. If this is the case then the extreme left pointer (SPAN) should be *On* when the Loadbars or Suspension Cells are plugged in. The Indicator can then be used normally.

If the Indicator is not using *Span Calibration* then it may still be used without its *Standard Calibration* but with reduced accuracy.

The accuracy cannot be guaranteed. Return the Indicator to your Service Centre to have its *Standard Calibration* data cleared or restored.

"CS Fault" displayed

Cause The EPROM CheckSum self test has failed.

Solution Turn the Indicator *Off* and then *On* again. If the condition persists, return the Indicator for service.

Daily weight gain doesn't work but accumulated does

Cause There is something wrong with the dates.

Solution Make sure both dates are set properly. Try swapping the day and month fields. If this works, contact your Service Centre to have the date format configured to your requirements.

"Dif Cell" when pressing the *RECORD* key

Cause Memory records are present which were recorded with a different Loadbar.

Solution Clear memory or select an empty file before starting the recording session.

"Dif Unit" when pressing the *RECORD* key

Cause The currently selected measurement units (*kg* or *lb*) is different to that used for previous memory records.

Solution Change the measurement units, clear the file, or select another file.

Display is unstable

	The display jumps from reading to reading or cycles up or down.
Cause	Moisture or dirt in the Indicator or Loadbar plugs.
Solution	Clean with methylated spirits or ethyl alcohol and dry out the Indicator and Loadbar plugs.
Cause	Loadbar cable damaged.
Solution	Check for broken or split areas on the covering of the Loadbar cable and repair by covering with waterproof tape. If any of the wires in the Loadbar cable are exposed, cut or frayed, return the Loadbar to your Service Centre for repair.
Cause	One Loadbar foot off the ground.
Solution	Ensure all feet are in firm contact with ground. Use spacers under the feet if required.
Cause	Dirt or other material build - up underneath the platform.
Solution	Clean the underside of the platform.
Cause	An animal having one leg off the platform and resting on the ground.
	An animal touching the side of the race.
Solution	Ensure animal correctly positioned on the platform.

"Full" displayed

Cause	Memory is full.
Solution	Print or download some files to a computer (if they are needed) and then clear the data in those files.

"High Bat" displayed

Cause The supply voltage is greater than 16 volts DC. This message is displayed for 15 seconds and then the Indicator switches itself *Off*.

Solution Replace power supply with a unit that can provide 10.5 to 16 volts DC.

Cause Moisture inside the Indicator.

Solution Return the Indicator to your Service Centre.

Indicator functions suddenly behave abnormally

Cause An Indicator memory variable may have become corrupted by severe electrical disturbance.

Solution Turn the Indicator *Off* and then *On* again. If the problem persists, check all Indicator settings and change if necessary. If problem persists, clear all of memory.

"Lith Bat" displayed

Cause The internal memory lithium battery is near the end of its life. (Normal life 7 years).

Solution Return the Indicator to the Service Centre for lithium battery replacement.

Cause Moisture inside the Indicator.

Solution Return the Indicator to your Service Centre.

"Lo Bat" displayed

Cause The supply is below 10.5 volts DC or the battery terminals are dirty. This message is displayed for 15 seconds, and then the Indicator switches itself *Off*.

Solution Replace power pack or battery with a unit that can provide 10.5 to 16 volts DC. Clean the battery terminals. Recharge the battery if necessary.

"Neg Volt" displayed

Cause The internal negative supply is outside its specified limits.

Solution Disconnect any cable plugged in to the communications (printer) socket. If the problem disappears check the cable. Otherwise return the Indicator to your Service Centre.

"No Cell" displayed during turn on and then displays "Ready"

Cause There is no Loadbar connected or the Loadbar code resistors are open circuit.

Solution The Indicator can be used without the Loadbars connected for setting up, editing, electronic note pad and report printing. If the condition persists when the Loadbar cables are plugged in, refer to "bAd codE" above.

Cause Old code 99 Loadbars are being used.

Solution Contact your Service Centre for reconfiguration of the Indicator to recognise 99 as a valid code.

"No Gn Fl" displayed.

Cause There is no gain reference file number set or the gain reference file is empty.

Solution Ensure you have the correct file selected as the current file. Set a gain reference file number to a non-empty file using the *GAIN FL* key in set mode.

Cause The files have incompatible minimum resolutions (they must be the same).

Solution If using two Loadbar systems with different minimum resolutions either obtain compatible Loadbars, or contact your local *TRU-TEST* Service Centre and get one of the Loadbar systems span calibrated to match the other (the majority of *TRU-TEST* systems are 0.5kg (lb)).

If using heavy duty (SHD100) Loadbars or Loadbars with a minimum resolution different from 0.5kg (1lb) and the display doesn't show "Ready" when no Loadbars are connected, contact your *TRU-TEST* Service Centre and ask to have "code 99" Loadbars disabled.

"No Rec'd" displayed when pressing *RECORD*

Cause The weight has already been recorded.

Solution If a new animal is on the platform and the *Recorded* pointer has not gone *Off*, press the *CLEAR* key to force it to go *Off* ready for the current animal.

"Not Fnd" displayed when tags are entered.

Cause *Weight Gain Mode* is *On* and the tag does not exist in the gain reference file. If a pre-tag is set, it becomes part of each entered tag and may cause the "not Fnd" message.

Solution If not using weight gain, turn *Weight Gain Mode Off* using the *Gain* key. Clear the pre-tag unless the tags in the gain reference file all begin with it.

"Not StbL" when pressing the *RECORD* key

Cause The *Stable* pointer was not *On* when the *RECORD* key was pressed.

Solution Wait for the *Stable* pointer to come *On* and then press *RECORD* again.

"Pr Fault" displayed

Cause — The processor inside the Indicator has "crashed", probably due to an electrical trauma in the power supply line.

Solution — Turn the Indicator *Off* and then *On*. If there is a "Bad Conf", "Cal Lost" or "SPC Lost" message during turn *On* then the crash has caused the loss of vital internal data which the Indicator has been unable to recover by itself. (The Indicator keeps three copies of calibration data to enable recovery in most cases.) Refer to the Troubleshooting section specific message(s) you get.

If the "PR Fault" recurs regularly, check the power supply by running the Indicator from a 12 volt car battery. If the condition persists, return the Indicator for service.

Printer doesn't print and the Indicator locks up

Cause — The handshake mode is set incorrectly.

Solution — See *Printer Interfacing* on page 120. Try both "Dsr Pin 6" and "Cts Pin 5". Then try again with the hand shaking set to XON-XOFF to verify that it is a handshaking problem. If the printer now prints, check that there are no sections of the printout missing.

Printer prints garbage

Cause — Incorrect baud rate.

Solution — Set the baud rate to that of the printer. See *Printer Interfacing* on page 120.

Printer prints nothing but the Indicator doesn't lock up

Cause — Incorrect baud rate or faulty cabling.

Solution — Check the cable. Set the baud rate to that of the printer See *Printer Interfacing* on page 120.

Printout - sections missing

Cause Hand shaking is not working.

Solution Try changing the handshaking to DSR pin 6. If the Indicator now locks up when printing, check the cabling. See *Printer Interfacing* on page 120.

"Service" or "Bad Conf" displayed

Cause Essential memory data containing the configuration number has been corrupted or an upgrade attempt has failed.

Solution Contact your Service Centre.

"Spc Lost" displayed during turn on

Cause The *Span Calibration* data has been lost.

Solution If configured to do so, and if standard Loadbars are being used, the Indicator may continue to function using *Standard Calibration* although possibly with different resolutions and load ratings and with reduced accuracy.

If you need to use *Span Calibration*, the system must be re calibrated in situation. If you do not use *Span Calibration*, you may continue to use the Indicator normally. Return the Indicator to your Service Centre to have the *Span Calibration* cleared.

If your Indicator is a Weights and Measures model, contact your Service Centre.

"Taring" or "Zeroing" message persists indefinitely

Cause The signal from the Loadbars is excessively noisy or the cables are contaminated with moisture or the 12 volt power source is excessively noisy.

Solution Remove any live weight from the platform. If you have two Loadbars, disconnect one at a time to determine if one is faulty. Check the power supply by replacing it or running the Indicator from a 12 volt car battery.

"Under Ld" displayed

Cause The signal from the Loadbars is abnormally low (negative) or the Indicator is faulty.

Solution If you have two Loadbars, disconnect one at a time to determine if one is faulty. Return faulty units to your Service Centre.

Weights are out by a factor of nearly two

Cause The Indicator is working in the wrong units of measurement.

Solution If both kilograms and pounds are available, two pointers labeled "kg" and "lb" indicate which one is currently being used. Change the units (see *Changing Units* on page 12).

If the Indicator's units of measurement cannot be changed, it must be returned to your Service Centre to have the configuration number corrected.

Weights cannot be recorded

Cause The displayed value is not a live weight or the displayed weight is negative. (Also check for "Not Stbl", "No Rec'd", "Dif Unit", "Dif Cell", "Full", "Overload".)

Solution Press *LIVE* to return the Indicator to a live weight display. Only positive weight readings can be recorded.

Weight gain doesn't work.

Cause *Weight Gain Mode* is not *On*, there is no weight on the platform or the entered tag has been canceled by the weight returning to zero.

Solution Press the *Gain* key to turn *Weight Gain Mode On*. (If it turns *Off*, press again to turn back *On*.) The display does not switch to weight gain display until a weight is on the platform. Try re-entering the tag.

Weight readings inaccurate

Cause
- loose Loadbar feet
- load bearing surface is not supporting foot
- faulty Loadbar
- uneven or non-level surface
- faulty Indicator.

Solution Carefully tighten loose Loadbar feet lock nuts and ensure that all four feet are resting on concrete or 25mm (1 inch) of timber. If a Loadbar or the Indicator is faulty, return faulty item to your Service Centre.

See also "Weights are out by a factor of nearly two".

"Zero Ol" displayed

Cause The Indicator is using *Span Calibration* without the 50% dead load configuration option and is trying to zero more than 2% of live capacity.

Solution If a Weights and Measures approved scale, remove any dead weight which did not exist on the platform when it was span calibrated and re-zero manually.

If not a Weights and Measures approved scale, have your Service Centre to check the configuration to ensure that 50% dead load allowance is included.

Service Centres

If after carrying out the above recommended solutions to the various problems the fault has not been rectified, contact your local *TRU-TEST* Service Centre:

New Zealand

Phone	Facsimile	Toll Free
(09) 274 5799	(09) 274 6367	0800 653 356

USA

Phone	Facsimile	Toll Free
(210) 377 2885	(210) 377 2932	1 800 874 8494

Australia Vic. S.A. Tas.

Phone	Facsimile	Toll Free
(03) 5831 5525	(03) 5831 5524	1 800 682 880

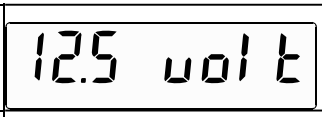
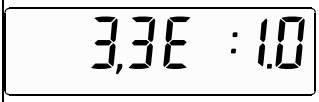
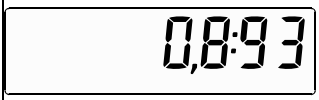
Australia Qld. N.S.W. N.T.

Phone	Facsimile	Toll Free
(07) 3807 8800	(07) 3807 8877	1 800 682 880

Australia W.A.

Phone	Facsimile	Toll Free
(08) 9274 5122	(08) 9274 4824	1 800 682 880

Selecting the *Diag SETUP* option, then pressing the DISPLAY key three times gives the information in the following sequence (see *Setup* on page 13):

1.	Battery voltage	
2.	Model numbers, language and software version.	
3.	PCB type, memory size and Loadbar code.	
4.	Configuration number.	

Write the diagnostic information here:

1. Voltage ____ . ___
2. Diag number _____
3. Diag number _____
4. Config number _____

Technical Information

Communications Port

The *TRU-TEST* Model 703 is equipped with an RS232C serial interface port for connection to a computer or printer.

The Indicator is configured as a DTE (Data Terminal Equipment) device and therefore requires a cross-wired cable for most computers which are also DTE devices.

WARNING: Never use the printer cable to connect the Indicator to an IBM computer as damage to the computer could result.

The interface connector pin assignment for the *TRU-TEST* Model 703 is as follows:

Pin Number	Name	Function	Direction
2	TX	Transmit	output
3	RX	Receive	input
4	RTS	Request To Send	output
5	CTS	Clear To Send	input
6	DSR	Data Set Ready	input
7	SG	Signal Ground	
20	DTR	Data Terminal Ready	output
1	PG	0 volts supply	output
25		+12 volts DC	output

For connection to a computer or printer using software ("Hon-HoFF" selected), only TX, RX and SG need to be wired. TX and RX usually must be cross wired.

For connection to a printer using hardwired (or sometimes called DTR) handshaking, only TX, DSR and SG need to be wired. Usually TX (pin 2) on the 700 Series Indicator is wired to RX (pin 3) on the printer. DSR (pin 6) is wired to DTR (pin 20) on the printer.

Serial Data Format

The format of the serial data is asynchronous, eight data bits, no parity, one stop bit. Baud rate and handshaking method are user selectable.

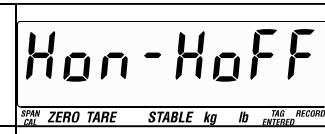
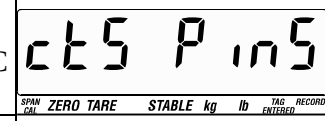
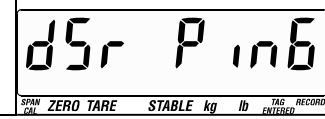
Setting Communications Port

The baud rate and the handshaking protocol can be set to the requirements of the connected device. The factory default is 9600 baud and Xon-Xoff ("Hon-Hoff") handshaking.

To set the baud rate and hand shaking protocol see *Setup Mode* on page 13.

The possible baud rates are 110, 150, 300, 600, 1200, 2400, 4800 and 9600.

The available handshaking protocols are:

XON-XOFF for use with computers and printers with software handshaking.	
CTS-PIN5 for use with hardwired handshaking on pin 5 of the RS232C port.	
DSR-PIN6 for use with hardwired handshaking on pin 6.	

Downloading to a Computer

The *TRU-TEST* Model 703 has the facility to download the records in its memory to a computer. This allows tag (ID) numbers, condition codes (or group counts) and weights to be saved on the computer and used for further farm management purposes.

The *TRU-TEST* program, AgLinker, takes care of the entire process. Connection to the computer is via the RS232 serial port (marked "printer"). The computer must have a corresponding serial port.

The following technical information is given for those wishing to write their own software.

Computer Download Format

When the print function of the Indicator is executed with the print option set to "cPtr out", the data records are output as ascii characters, one record per line. Each record contains the tag, weight, and condition code (or group count) fields delimited by commas. Leading zeros are suppressed. Each line ends in a <CR><LF>. At the end of all the data is a line containing the word END.

eg. 1,377.5,20
2,389.0,18
.
.
END

The number of decimal places given for the weights is appropriate for the resolution of those weights.

Remote Control by Computer

In addition to being able to down load data from the Indicator to a printer or computer, the *TRU-TEST* Model 703 can be remotely controlled by a computer.

The following gives details for those writing their own software to control the Indicator.

Remote control of the Indicator is gained by sending a STX (02Hex) or a SOH (01Hex) to the Model 703.

> STX temporarily sets the Indicator to 9600 baud and Xon-Xoff.
>
> SOH doesn't change the baud rate or handshaking protocol.

While the Indicator is under remote control, it does not respond to the keyboard.

Control of the Indicator is relinquished by sending an ETX (03Hex).

All keys on the keyboard with exception of the *ON* and *OFF* keys are coded with two digit codes. The first digit is the row, 0..3, and the second is the column, 0..9. That is, from 02 to 39.

To simulate a key press, the computer must send a key code having two ASCII characters eg. the LIVE key is code 10. To remotely access this key, the computer needs to send '1','0', (31H,30H).

Hidden Remote Functions

In addition to keyboard codes, there are a number of 'hidden' key functions which allow information to be extracted from the Indicator. These are codes 42 through 46.

42 Turn *Off* all output modes (ie. key code 45).

43 Data output on RECORD key mode. In this mode, the Indicator outputs to the serial port the TAG (ID), WEIGHT, and COND CODE or GROUP COUNT information (and draft status if in the draft mode) each time a weight is recorded by pressing the RECORD key. This is used for printing as animals are weighed or for semi-automatic draft gate control. (The Indicator is factory preset into this mode.)

44 LCD one shot echo. On this command, the Indicator outputs to the serial port the contents of the LCD buffer. The format is the same as for the continuous LCD echo mode.

45 Continuous LCD echo mode. In this mode, the Indicator outputs to the serial port the contents of the LCD buffer every time it changes. This can be used for a complete remote display which mimics the *TRU-TEST* Model 703 display.

46 Continuous draft output mode. In this mode the Indicator outputs the draft status information continuously when a stable weight is detected. This can be used for draft gate control. The output consists of a single character: 0, L, C, H which mean zero, low, centre or high respectively.

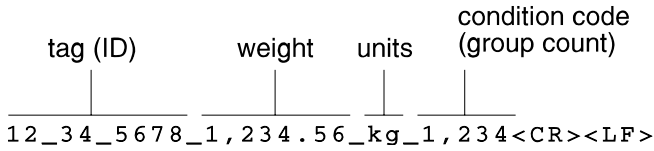
47 Beep. Activates the *TRU-TEST* Model 703 beeper.

Remote keys 42, 43, 45 & 46 control output modes which are mutually exclusive. The output mode activated remains active when computer control is relinquished and over Indicator power downs.

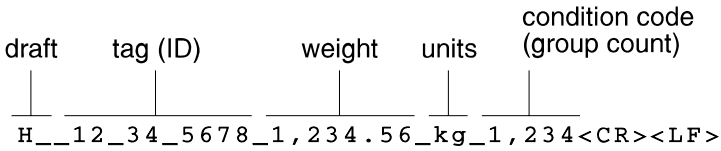
Remote keys 42, 43, 45 & 46 can be executed from the Indicator's keyboard if necessary. This allows the Indicator to talk to some unintelligent output devices. To do this, turn the Indicator *Off* and then hold down the '0' key while turning it back *On*. The display will go blank. Release the *ON* key. Then press the two digits of the required function, eg. 42 will turn *Off* data output on *RECORD* and allow a printer used for reports to be permanently connected.

Key 43. Output Data Format

In live mode:



In drafting mode:



The number of decimal places printed varies according to the current resolution of the Indicator. If no decimal places are printed, no decimal point is printed. Leading zeros on the weight fields are spaces. The underlines represent space(s). For the draft field character, see Key 46 below.

Key 44 and 45. LCD Echo Data Format

The first two bytes contain the pointers encoded as follows:

	bit7							bit0
byte 1	0	1	0	T5	T4	T3	T2	T1
byte 2	0	1	0	0	T9	T8	T7	T6

Where T1..T9 are the nine display pointers from left to right.

The contents of the LCD display then follow as ASCII characters, including any decimal points, commas or colons in their respective positions. Leading or trailing spaces are not removed, so the number of characters is always at least 8.

For example the TOTAL statistics display would be sent as follows:

@AtL:1,234.5_<CR>

'@A' are the encoded pointers which in this case indicate that only T6 (kg) is *On*. The 'tL' is the prefix for the TOTAL statistic display. The underscore represents a space. The string is terminated with a <CR> (0DH).

Key 46. Draft Output Data Format

Single ascii character only (no <CR> or <LF>).

Draft status characters:

0 = zero.

L = Low range.

C = Centre range.

H = High range.

Setting Baud Rate and Handshaking Remotely

To facilitate the computer automatically determining the Indicator's current baud rate, the Indicator responds if it receives an ENQ with an ACK regardless of the handshaking mode. Wait a time dependent on the transmission time of one character there and back at the baud rate being tested.

eg. for 110 baud, wait 200mS. Discard any characters received except ACK. Start at 9600 baud and work down to avoid the Indicator getting junk characters.

After determining the baud rate, send an STX (this will temporarily set the Indicator to 9600 baud and Xon-Xoff). Wait until all characters have been sent and then change the computer to 9600 baud, Xon-Xoff.

The computer and Indicator should now be communicating. Use remote control of the keyboard to identify the model (read Diag information through Setup key) and carry out other functions as required.

Once the Indicator has been turned *Off* and back *On* again, the baud and protocol settings are automatically set back to the previous Indicator settings.

Printer Interfacing

This section describes technical details of the communications interface with a printer.

For instructions on how to print reports, see *Printing Reports* on page 64.

For instructions on operating a particular printer, refer to its user manual.

If you are using a *TRU-TEST* printer, the factory default settings of both printer and Indicator are correct and there is no need to read further.

If another make of printer is used, or for some reason the factory settings have been changed, the required details are described in *Non Tru-Test Printers* below.

The Indicator's factory default baud (data transfer) rate is 9600 and the handshaking method is "Hon-Hoff" to suit the *TRU-TEST* printer.

To set the baud rate and hand shaking method see *Setting Communications Port* on page 113.

TRU-TEST MP400 Printer

The Indicator and printer are factory configured with compatible settings. On earlier Indicators the baud rate may need to be set to "9600" and the handshaking may need to be set to "Xon-Xoff".

TRU-TEST Citizen Model Printer

The printer is factory configured to "9600" baud rate and "dSr Pin6" handshaking. The Indicator needs to be set to match the printer. If the above settings don't work, set the Indicator baud rate to "600" as earlier printers needed this setting.

Non TRU-TEST Printers

The printer must have a *SERIAL* interface, otherwise known as RS232C. A suitable serial cable must be available (or a standard null modem cable). If necessary refer to *Communications Port* on page 112 for details on cable pin assignments.

Caution: 12 volts is available from pin 25 on the Indicator which could damage a printer if the cable is incorrectly wired.

If possible, set the printer to use "9600" baud rate and "Xon-Xoff" handshaking to match the Indicator. Otherwise set the Indicator to match the printer. Check your printer manual for the parameters.

Electronic Tag (EID) Reading

The *TRU-TEST* Model 703 Indicator can be coupled to electronic tag readers. This section gives technical information about communication between the two devices.

The preferred method is for the tag reader to input the number using the *TRU-TEST* Model 703's keyboard remote control functions and for the Indicator to store the data.

If "hands off" operation is required, select *Setup* Auto Record "ON TAG" option - the weight is automatically recorded once the tag has been read. (This requires that the animal is in the crate when the tag is read.)

Example Transmission Data

1. Identify the tag number and convert to an 8 digit (or less) whole number. No decimal points allowed.

2. Gain control of the Indicator by transmitting STX ASCII (03hex), if identification is valid.

3. Transmit numbers to the Indicator:

LIVE	10	ASCII (31hex, 30hex)
TAG	29	ASCII (32hex, 39hex)
1	26	ASCII (32hex, 36hex)
2	27	ASCII (32hex, 37hex)
3	28	ASCII (32hex, 38hex)
4	16	ASCII (31hex, 36hex)
5	17	ASCII (31hex, 37hex)
6	18	ASCII (31hex, 38hex)
7	06	ASCII (30hex, 36hex)
8	07	ASCII (30hex, 37hex)
ENTER	38	ASCII (33hex, 38hex)

4. Switch control back to the Indicator with ETX ASCII (03hex).

5. The animal weight can now be recorded along with the tag number.

Note

It is advisable to execute the *LIVE* key first to ensure the Indicator is in a known state before transmitting the tag.

Autoranging

The scale is usually set to autorange. This means that the display resolution automatically changes to coarser steps when the weight reaches the equivalent of 250 times the next coarser division size. This better reflects the actual accuracy of the scale.

The weight is still displayed in kilograms or pounds.

Example Autorange (standard Loadbars)

Range	**Resolution**
0 to 250kg (500lb)	0.5kg (1lb)
250kg (500lb) to 500kg (1250lb)	1kg (2lb)
500kg (1250lb) to 1250kg (2500lb)	2kg (5lb)
1250kg (2500lb) to capacity	5kg (10lb)

The live capacity of the scale is usually a round multiple of the base resolution, for example:

3000 x 0.5kg = 1500kg.

Refer to the *TRU-TEST Loadbars Manual* for live capacities of *TRU-TEST* Loadbars and Suspension Cells.

Weights And Measures Versions

- Autoranging may be disabled.
- Autoranging intervals are different to the above example.

USA Model Indicators

USA Model Indicators have some different key names, pointer names and display messages from the standard model. See *Keys Reference* on page 80 and *Display Pointers* on page 85.

See also *Weights and Measures Versions* on page 126.

FCC Warning

The *TRU-TEST* Model 703 Indicator is certified to comply with the limits for a Class B computing device in accordance with the specifications in subpart B of Part 15 of FCC rules if installed and used as instructed in the *TRU-TEST* manuals. Only peripherals certified to comply with the Class B limits may be attached to this Indicator. Operation with non certified peripherals is likely to result in interference to radio and TV reception.

Shielded cables must be used between the external devices and the Indicator serial port.

These specifications are designed to minimise radio frequency interference in a residential installation; however there is no guarantee that interference will not occur in a particular installation.

If this Indicator does cause interference to radio or TV, which can be determined by turning the Indicator *Off* and *On* when the radio or TV is on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna.
- Relocate the Indicator with respect to the receiver.
- Move the Indicator away from the receiver.

- Plug the Indicator into a different power outlet (if used) so that the Indicator and the receiver are on different branch circuits.

If necessary, the user should consult the dealer or experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

"How to Identify and Resolve Radio-TV Interference Problems".

This booklet is available from the U.S. Government Printing Office, Washington D.C. 20402 by ordering stock number 004-000-00345-4.

Weights and Measures Versions

Weights and Measures models of the Indicator are specially manufactured to conform with local regulations for trade use. The printed circuit board is Type 1 for Weights and Measures Indicators (see diagnostic information on page 111).

Generally, the following items are different to the standard version:

- circuit board
- keyboard
- window legend
- labeling
- Loadbars are matched to the Indicator and must not be mixed up with other Loadbars
- configuration number.

For further details on correct configuration numbers contact your local *TRU-TEST* Dealer.

The weighing system needs to be checked and approved for trade by a Weights and Measures inspector on a regular basis. (This is the responsibility of the user.)

Model 703 Specifications

Note

For configuration details of Weights and Measures versions see *Weights And Measures Versions on* page 126.

Analogue input

Loadcell excitation: 8 volts DC, 4 wire, 6 x 350 ohm loadcells max.

Sensitivity: 3 microvolts/division minimum.

(Weights and Measures versions)

Full Scale: 27mV max. including dead load.

Input Ranges: 2.0 or 3.0 mV/V.

Accuracy *Standard Calibration* (System):

greater of ± 1 division or 0.5% of reading OR,
greater of ± 2 division or 1.0% of reading,

depending on the Loadbar type used. Refer *TRU-TEST Loadbars Manual*.

Accuracy Span Cal. (Indicator only, Weights and Measures):

± 0.35 divisions below 500 divisions.
± 0.7 divisions from 500 to 2000 divisions.
± 1.05 divisions above 2000 divisions.

Display

Display divisions: Single-interval (Weights and Measures):

3000 maximum. Number of divisions selectable as required during *Span Calibration*.

	Multi-interval (Weights and Measures):
	5000 maximum (Max3/d1). Three division sizes (d1, d2, and d3). Transitions at 500d2 and 500d3. Requires configuration. Maximum number of divisions selectable as required during *Span Calibration*.
	Standard versions (non trade):
	Set by built-in configuration, dependent on loadcell type used. Four division sizes (d1, d2, d3, and d4). Transitions at 250d2, 250d3, 250d4.
Centre of Zero:	Pointer turns *On* when scale is within ± 0.25d of centre of zero. (*Net* or *Gross* weight.)
Stable pointer:	(Weights & Measures versions):
	On when displayed result is within ± 1d or ±0.5d of the static condition depending on configuration.
	(Non Weights and Measures versions):
	On when displayed result is within 0.5%, 1% or 2% of the true weight (user selectable).
Weighing speed:	For a step change in weight, the display will indicate a stable reading within 0.8 seconds.
Damping algorithm:	Non locking, based on intelligent statistical analysis.
Maximum displayed weight:	
	999,999kg or lb.
Division sizes:	0.0001 through 100 (kg or lb).
Zone of uncertainty	0.3d
Overload indication:	Displays "Overload" at greater than 9 divisions above live capacity.
Under zero:	Displays negative weights until the hardware limits, then displays "UndEr Ld".

Zero and Tare controls

Push button Zero:	For span cal and Weights and Measures: Maximum weight which can be zeroed is ± 2% of live capacity. For std cal or 50% deadweight allowance option: Any weight up to live capacity may be zeroed. Capacity reduces if zeroed weight is greater than the built-in dead weight allowance.
Auto Zero tracking:	User selectable (*On* or *Off* or *On Net*). Capture range factory configured to 0.5d, 1d, 3d or 6d. Minimum time between operations: 8 seconds. Non Weights and Measures Capture Range: 6d. Weights and Measures Versions: Capture range and disabling of *On Net* option depends on configuration.
Auto power up zero:	User selectable *On*/*Off*. Limits are same as for push button zero.
Push-button Tare:	Any weight up to live capacity. Not rounded to nearest division.
Set Tare:	Any weight up to live capacity. Rounded to nearest division.
Minimum Tare	6d or 1d depending on configuration. (Taring with *Gross* weight within ± 6d (or ±1d) of zero clears the *Tare*.)

Power requirements

Voltage:	+10.5 to +16.0 volts DC (Protected against polarity reversal).
Current:	200mA. 1.5A with internal battery charger option.

Internal battery

Sealed lead acid. Must be stored in a charged state.

Operating time: 8 hours @ 20°C (70°F), with two Loadbars connected.

Charging time: Not less than 6 hours using 12 volt DC 1.5A (3 Amp 20uS pulses) @ 20°C (70°F).

Environmental

Operating temperature: -10 to +40°C (+15 to +105°F).

Storage temperature: -20 to +80°C (-5 to +175°F).

Storage with internal battery:

-10 to +30°C (+15 to +85°F).

Approximately 20°C (70°F) recommended if stored for extended periods.

Humidity: 95% relative humidity. Case is proof to IP53 moisture and dust.

Communications port - RS232C serial port.

Baud rates for printers: 110, 150, 300, 600, 1200, 2400, 4800, 9600.

Baud rate for computer interfacing: 9600.

Handshaking: Software: Xon Xoff.

Wired: CTS pin 5 (printers only)
DSR pin 6 (printers only)

Format: Asynchronous 8 data bits.
No parity.
1 stop bit.

Memory capacity

64K RAM: 7600 records.

Tag numbers: Eight numerical digits.

Stored Weights: Up to 16383 divisions (Positive weights only).

Condition codes or group counts: up to 4 digits.

Number of files: up to 99.

Physical dimensions

Display:	8 by 7-segment LCD. Height 18mm (3/4 inch). 9 pointers.	
Dimensions:	Height	210mm (8.25 inches).
	Width	315mm (12.5 inches).
	Depth	62mm (2.5 inches).
Weight:	Indicator only:	1.8kg (4.0lb).
	With battery:	2.6kg (6.0lb).

Note: Product Specifications may change without prior notice.

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