THE SEED OF AN IDEA
What inspired the invention of the computerized weigher? Necessity again proved to be the mother of invention.

In the early seventies, Japanese agricultural cooperatives were dealing with a vexing problem. At that time weighing and packaging of bell peppers was a labor-intensive operation due to the uneven weights of this vegetable. In order to make packages of the desired weight, operators first placed a handful of peppers on the scale, then replaced them one at a time until the total was close to the target weight.

Because this process was inefficient, one cooperative decided to try using automatic weighers. In those days, automatic weighing was limited to the "bulk and dribble" method: bulk product was fed onto a scale until it was close to the target weight, then "dribbled" a little at a time until the weight was reached. Bell peppers, unfortunately, refused to be dribbled. A wide range of sizes meant that one more pepper in the pack could make it far overweight and producers found themselves giving away a significant portion of their profits.

AN ENGINEERING CHALLENGE
Because these customers were demanding a more efficient and cost-saving machine, the Ishida research and development team set to work on solving the problem. After months of trial and error our engineers hit upon the answer: instead of weighing peppers in a batch, each one would be weighed separately, and the weigher would select the combination of peppers closest to the target weight. Recent advances in computer technology had made the required high-speed calculations possible, so that the first truly computerized weighing system could be realized.
THE ADVENT OF
THE COMBINATION WEIGHER

In September of 1973, the first of Ishida's multi-head combination weighers, the ACW-M-1, made its debut. It was quickly put to work on the bell pepper packing lines and recorded a dramatic increase in processing efficiency. Word quickly got around the industry, and Ishida has lead the way ever since.

Model lines have progressed through the LC, RC, RLC and "S" series to the current CCW-Z units. Wide acceptance has been found particularly in the snack food industry, and recently their use in processing seafood, frozen food and meat products has been increasing. We have also been one step ahead in anticipating the trend toward integration of weighers into total factory systems.

From weighing the humble bell pepper through the high-tech equipment of today, Ishida has risen to the challenge of delivering the machines industry demands.
Principle and Function

The basic principle of combination weighing is applied in different ways to match the machine with the job at hand.

10 HEAD STANDARD TYPE

The basic combination calculation sequence, applicable to a wide range of products.

1 INFEED

The infeed equipment feeds product to the weigher which then distributes it in small quantities into 10 weigh hoppers through a dispersion feeder, radial feeders and pool hoppers.

2 WEIGHING

A load cell measures the weight of product in each weigh hopper and transmits the resulting weight signal to the calculation unit.

3 COMBINATION

The calculation unit calculates the total weights of many different combinations of weigh hopper contents.

4 SELECTION

The calculation unit selects the combination which is equal to or comes closest to the target weight, without being under it.

5 DISCHARGE

Product dumped from the selected hoppers falls through the timing hoppers (option) and discharge chutes to the packaging machine.

6 INFEED & NEXT WEIGHING

New product is then fed promptly into each of the emptied hoppers, thus continuing the weighing operation.
High speed weighing is made possible by an increased number of heads, repeated weighing and repeated selection of combinations in one weighing cycle.

<table>
<thead>
<tr>
<th>HEAD NO.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
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</tr>
</tbody>
</table>

**INFEED 1**
The infeed equipment feeds product to the weigher which then distributes it in small quantities into 14 weigh hoppers through a dispersion feeder, radial feeders and pool hoppers.

**WEIGHING 2**
A load cell measures the weight of product in each weigh hopper and transmits the resulting weight signal to the calculation unit.

**COMBINATION & SELECTION (1st time)**
The calculation unit calculates the total weights of many different combinations of weigh hopper contents. Then, it selects the combination which is equal to or comes closest to the target weight, without being under it.

**COMBINATION & SELECTION (2nd time)**
The calculation unit calculates the combinations of weigh hoppers which were not selected the first time. Then, it selects another combination.

**DISCHARGE 5**
Product dumped from the selected hoppers (1st and 2nd time) falls through separate discharge chutes and timing hoppers (option) to the packaging machine at the same time or separately.

**INFEED & NEXT WEIGHING 6**
New product is then fed promptly into each of the emptied hoppers, thus continuing the weighing operation.
Reference Models:
CCW-Z-106P (6 heads)
CCW-Z-108P (8 heads)
CCW-Z-208P (8 heads)

PAIR TYPE

A double weigh hopper per each pool hopper makes possible high speed weighing with only 8 heads.

1. **INFEED**
The infeed equipment feeds product to the pool hopper which then distributes it in small quantities into the weigh hoppers.

2. **WEIGHING**
A load cell measures the weight of product in each weigh hopper and transmits the resulting weight signal to the calculation unit.

3. **COMBINATION & SELECTION (1st time)**
The calculation unit calculates the total weights of many different combinations of weigh hopper contents. Then it selects the combination which is equal to or comes closest to the target weight, without being under it.

4. **COMBINATION & SELECTION (2nd time)**
The calculation unit calculates the combinations of weigh hoppers which were not selected the first time. Then, it selects another combination.

5. **DISCHARGE**
Product dumped from the selected hoppers (1st and 2nd time) falls through separate discharge chutes and timing hoppers (option) to the packaging machine at the same time or separately.

6. **INFEED & NEXT WEIGHING**
New product is then fed promptly into each of the emptied hoppers, thus continuing the weighing operation.
The addition of booster hoppers gives these weighers the same processing capacity as the high-speed type but with fewer heads. This makes for a space-conserving unit which is easily maintained.

**INFEED & WEIGHING 1**

The infeed equipment feeds product to the weigher which then distributes it in small quantities into weigh hoppers through a dispersion feeder, radial feeders and pool hoppers. A load cell measures the weight of product in each weigh hopper and transmits the resulting weight signal to the calculation unit.

**TRANSFER & 2ND SERIES INFEED & WEIGHING 2**

The product is transferred from weigh hoppers to booster hoppers, and removed from pool hoppers to weigh hoppers. At the same time, new product is fed promptly into each of the pool hoppers. A load cell measures the weight of product and transmits the resulting weight signal to the calculation unit.

**COMBINATION & SELECTION (1st time) 3**

The calculation unit calculates the total weights of many different combinations of weigh hopper contents. Then it selects the combination which is equal to or comes closest to the target weight, without being under it.

**COMBINATION & SELECTION (2nd time) 4**

The calculation unit calculates the combinations of weigh hoppers which were not selected the first time. Then it selects another combination.

**DISCHARGE 5**

Product dumped from the selected hoppers (1st and 2nd time) falls through separate discharge chutes and timing hoppers (option) to the packaging machine at the same time or separately.

**INFEED & NEXT WEIGHING 6**

New product is then fed promptly into each of the emptied hoppers, thus continuing the weighing operation.
The 9-inch plasma touch screen makes weigher operation, data entry, and production monitoring extremely efficient. The large (600×450 dot) display is easy to read, and user-friendly interactive menus make key commands readily accessible. Three operational levels (operator, site engineer and installation engineer) and password access ensure that key production data is correctly set and maintained.
Instead of a limited number of pre-labeled buttons, each menu is provided with the appropriate dot matrix keys in the optimum configuration to save time and reduce operator mis-entry.
Compact Control Unit

A model of ergonomic design, this control panel provides a sure and efficient interface between operator and weigher.

Simple Push-key Operation

The user-friendly "Liquid Crystal" menu display makes it possible to operate the weigher with a minimum of training simply by following the menu. The large memory capacity can store up to 50 different product settings (presets), including the target value and feed conditions, making operation easy and accurate. All necessary settings can be entered via the remote control box.

**COMBINATION HOPPER INDICATORS**
Indicate which hoppers were included in combination:
- Orange: Selected hopper
- Green: Hopper empty of product
- Red: Malfunctioning hopper

**COMBINATION RESULT INDICATORS**
Indicate combination results:
- Proper weight: Green
- Over weight: Orange
- Under weight: Red

- **ZERO** To perform zero adjustment during stand-by.
- **PROD** To start production.
- **DRAIN** To remove all product from weigher.
- **MENU** To set production values and tune weigher performance.
- **ERROR DUMP** To dump product after error.

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Bid on Equipment
1-847-683-7720
www.bid-on-equipment.com
STEPPING MOTOR PRECISION
Instead of the conventional clutch and brake drive unit, a state-of-the-art stepping motor precisely controls the speed and rotation of each hopper gate. A suitable hopper gate motion profile can be selected according to the target weight and type of product, thus increasing production speed and reducing noise.

IC MEMORY CARDS CAN BE UTILIZED FOR CUSTOM PRESETS (OPTION)
Z-series weigher systems are furnished with memory for 50 presets which can be set via the touch screen. In addition to this large preset memory, IC memory cards can be used to record presets which can then be used interchangeably within units having the same model number. Any number of additional memory cards can be used to store a virtually limitless variety of presets to be recalled whenever needed.

FACTOR AUTOMATION SYSTEM (OPTION)
CCW-Z weighers can be networked to provide true factory automation. From data collection and analysis to totally integrated communication, FA is the production engineer's dream come true.

Sample Printout

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| 105.0 | 0 |
| 106.0 | 0 |

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| 5 | 100.5 |
| 3 | 100.4 |
| 1 | 100.5 |

Factory Automation System

Online control

Personal Computer
Master Controller
CCW-Z
CCW-Z
CCW-Z
Max. 14 weighers
High standards of design, rugged construction, and leading edge weighing technology have made CCW-Z Series weighers industry’s first choice. All these weighers feature modular design, interactive operational menus, easy cleaning and maintenance, and superb precision and reliability.

By increasing the number of hoppers available for combination selection, booster hoppers provide production performance equal to weighers with twice as many heads.

Each pool hopper feeds two weigh hoppers. A pair of hoppers per weigh head means half as many heads are required to process the same number of combinations. Operation is simplified with no reduction in application range or accuracy.


Weighing accuracy maintained even in a dusty environment. Designed to resist even the finest dust and dirt, ensuring reliable operation in particle-intensive production areas.

High resolution, gas plasma touch screen displays easy-to-understand command setting controls. User-friendly menus and interactive displays make error-free operation possible with a minimum of training.
### Touch Key Display
Control panel with liquid crystal display. Easy-to-read, interactive menus guide users through operational sequences. Sufficient memory to store a large number of presets.

### Stepping Motor
Instead of the conventional clutch and brake drive unit, a state-of-the-art stepping motor precisely controls the speed and rotation of each hopper gate. Each stepping motor is controlled by computer-generated digital pulse signals to provide accurate hopper gate angle adjustment control, even down to the smallest increments.

### Small Quantity Weighing
Newly developed, super-accurate load cell, combined with small and lightweight hoppers, offers precision weighing of very small quantities. Features standard main frame wind shield and hoppers configured to operate without generating wind pressure. Many pharmaceutical and food line applications especially for expensive, small-volume items.

### Mix Weighing
In addition to the normal weighing operation, up to 4 products can be weighed and mixed. Double weighing of the same product with different target weights, and double type weighing of two separate products simultaneously, are also possible. Yields the performance of two weigher units consolidated in one system.

### System Engineered
Capability of networking with a wide variety of system equipment and a main frame computer when options are used. Provides comprehensive data regarding all facets of production, including inventory and shipment. Designed with total Factory Automation in mind.

### Easy Cleaning and Maintenance
Detachable pool/weigh hoppers and discharge chutes can be removed and attached without tools even by novice operators. Hygienic weighing can be easily maintained. Down time is reduced to maximize the weigher’s potential.
Installation Layouts

To achieve the optimum production process, Ishida weighers and auxiliary equipment can be installed in custom or standard configurations.

Over-mounted Type
Standard Layout-1

- Cross Feeder
- CCW-Z Multihead Weigher
- Vertical Type Form Fill Bagging Machine

Over-mounted Type
Standard Layout-2

- CCW-Multihead Weigher
- Bucket Elevator
- Vertical Type Form Fill Bagging Machine
- Check Weigher
### Over-mounted Type

**Standard Layout-3**

- CCW-Z Multihead weigher
- Pre-formed Bagging Machine
- Bucket Elevator
- Check Weigher with Metal Detector

### Floor-mounted Type

**Site-specific Layout-1**

- CCW-Z Multihead Weigher
- Horizontal Type Vacuum Packing Machine
- Bucket Elevator
Floor-mounted Type
Site-specific Layout -2

Vertical Type
Form Fill Bagging Machine

Over-mounted Type
Site-specific Layout-3

CCW-Z Multihead Weigher

Cartoning Machine