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WEIGH SCALE BLENDER  
with  
"TWELVE" SOFTWARE

FEBRUARY 2, 1999

TUTORIAL

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TUTORIAL  
for controllers using TWELVE software.

This TUTORIAL BOOKLET is designed to help FIRST TIME USERS understand and operate the CONTROLLER on the MAGUIRE WEIGH SCALE BLENDER.

We have written it for those who have never seen this unit before.

Follow the instructions, one page at a time, with the controller next to you.

Another booklet, our INSTRUCTION MANUAL, covers everything there is to know about this controller. Everything.

Here, in the "TUTORIAL", we only cover the important points, just enough to make it work for you, and to allow you to feel comfortable with the controls.

FIRST, we cover the CONTROLS:

1. TOGGLE SWITCHES
2. THUMBWHEEL SWITCHES
3. KEYPAD functions; including:
  - a. keys that work all the time,
  - b. keys that work only in the PROGRAM mode.

NEXT, we explain the SETUP routine; required before startup to match your blender to your application.  
The unit WILL NOT OPERATE until this is done.

LAST, we cover the ALARMS, what they mean, and how to respond to them.

First... the Toggle switches.

Turn to the next page.

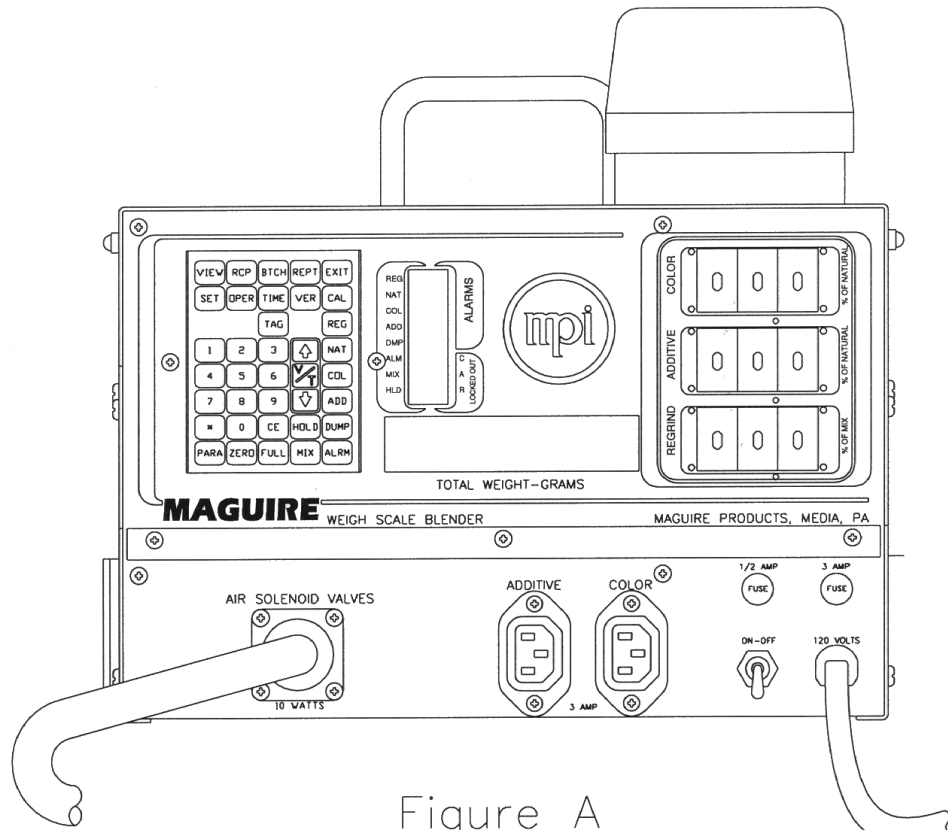


Figure A  
Controller Front

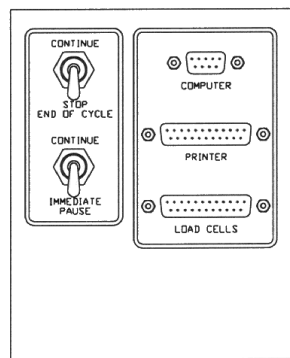


Figure B  
Left Side

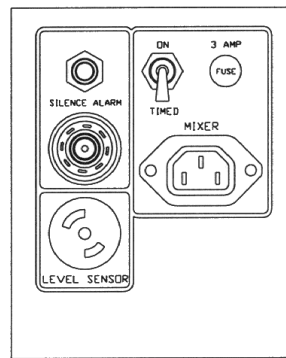


Figure C  
Right Side

On the FRONT of the controller,

There is a single toggle switch:

```
POWER:  +-----+
         | ON / OFF |
         +-----+
```

It controls all power to the controller and the weigh scale blender. Because the computer memory chip inside contains a small battery, all the information that the unit has learned while running will NOT be lost when you turn the unit off.

Turning power off in the middle of a cycle might cause one batch to be blended incorrectly, but it will not cause any other problems. Never be afraid to just turn the unit off at any time. When you turn it back on, it will work just fine.

On the LEFT SIDE of the controller:

There are two switches:

```
+-----+
| STOP - END OF CYCLE |
+-----+
```

and

```
+-----+
| IMMEDIATE PAUSE   |
+-----+
```

These provide two ways to STOP the blender.

The "IMMEDIATE PAUSE" switch stops the unit IMMEDIATELY. The "STOP - END OF CYCLE" lets the blender finish a full cycle before stopping.

BOTH must be UP for your blender to run.

The PAUSE switch is only used if you want to make an adjustment in the middle of a cycle. But usually you want the cycle to end first.

When you use the "STOP - END OF CYCLE" switch, the blender will complete the batch it is currently blending and then stop at the end of that cycle.

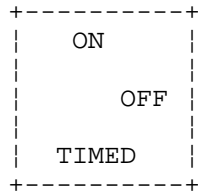
SO.....

```
+-----+
| Use "STOP - END OF CYCLE" to start and stop the blender. |
+-----+
```

Leave the PAUSE switch "UP" in the "CONTINUE" position.

On the RIGHT SIDE of the controller:

The one switch on this side controls the MIXER motor.



In the up (ON) position, the MIX motor will run ALL THE TIME.

Only under unusual mixing conditions would you run the mix motor continuously.

In the middle (OFF) position, the MIX motor will NOT run.

In the down (TIMED) position, the mix motor will only run for a short time (10 seconds) at the end of each blend cycle.

Running for only a short time is usually BETTER.

```
+-----+
| Leave the MIX MOTOR switch DOWN in the TIMED position. |
+-----+
```

The unit is set to MIX for ten (10) seconds at the end of each cycle. It is also set to "jog" 1 turn every 30 seconds, to keep the pile in the mix chamber level.

You can change these times later if you want, but for most customers, these times are correct.

Next..... The THUMBWHEEL SWITCHES ....

... Turn to the next page.

There are three. Controllers that use our standard FOUR software use these switches for entering settings. But TWELVE component software may have to control up to twelve materials.

SO.... since there are only three switches, we do not use them for entering settings. Instead, we use the SET key on the KEYPAD.

The THUMBWHEEL SWITCHES normally do NOTHING and you can ignore them.

HOWEVER..... these switches can be assigned to particular components allowing you to enter settings this more convenient way.

There are TWO cases where you might do this.

1. If your application uses only four components, then three switch settings are enough. As with FOUR software, the fourth component setting can be figured out by the computer based on the other 3.
2. If you wish to more easily control a few of the components so that operators can make changes during production, then you might feel the thumbwheel switches are easier to deal with.

In either case, you can assign the switches to the components you want. The INSTRUCTION MANUAL covers this in detail:

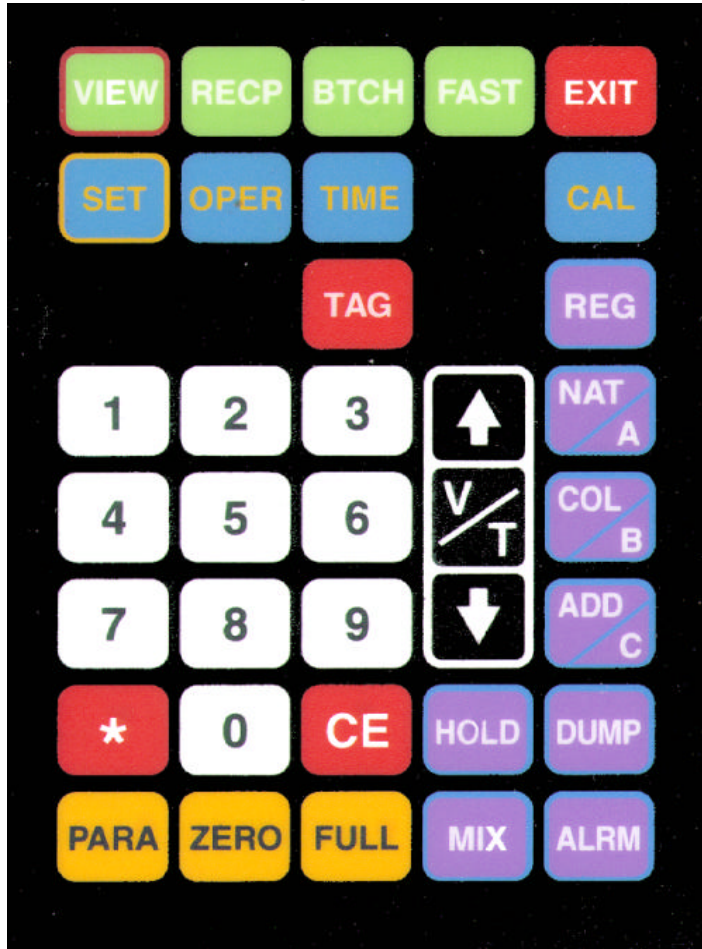
For case 1, above, see KEYPAD section - STAR FUNCTION (\*04) for making this software operate like FOUR software.

For case 2, above, see ENTERING SETTINGS - THUMBWHEEL ASSIGNMENTS.

Since you probably won't do this, we won't cover these options.

Next..... The KEYPAD....

Turn to the next page.



KEYPAD

MAGUIRE  
WEIGH SCALE BLENDER  
CONTROLLER



+-----+ +-----+ +-----+

... on the next page.

Page 8

+-----+  
The | VIEW | key:  
+-----+

The VIEW key simply displays some information for you. You can press it at any time. You don't need this information to operate the machine, but you should know how to retrieve it.

Try it now.

Each time you press the VIEW key, a new piece of information is displayed.

First the current DATE, then the TIME, then the date and time when all totals were last cleared to zero. Then you will see the number of cycles run, followed by the total material used, in pounds, for each component that is turned on. A grand total follows this and then the message (00=CLEAR) is displayed for 5 seconds. If you want, press 00 within 5 seconds to clear all fields.

+-----+  
The | EXIT | key:  
+-----+

This is IMPORTANT. EXIT always works, in all modes.

It is always the key to press to GET OUT of whatever it is you are doing. It's a good key to know.

+-----+  
The | SET | key:  
+-----+

You will use this key all the time to enter settings.

If you press the SET key now, the display may say (SET TYPES). Setting TYPES is part of the SETUP routine, explained later.

For now just be aware that the SET key is used for entering settings.

Remember; use the | EXIT | key to get out of this mode.  
+-----+

Now.... for the rest of the KEYS.

ALL the OTHER KEYS are used only in the PROGRAM mode.

So let's get into the PROGRAM mode....

....on the next page.

Page 9  
The PROGRAM MODE:

To enter the PROGRAM mode:

Press:     +----+           The display will say (PASSWORD).  
          | \* |  
          +----+

The Password is 22222.

You can change it later if you want, but most customers never do.

Press:     +-----+-----+-----+-----+  
          | 2 || 2 || 2 || 2 || 2 | (the "2" key 5 times).  
          +-----+-----+-----+-----+

The display will now show a "P" on the left. This is your indication that you are in the PROGRAM mode: (P           x).

In the PROGRAM mode you can do these four things:  
  Calibrate the LOAD CELLS.  
  Change PARAMETERS.  
  Use the STAR (\*) functions.  
  Do MANUAL TESTING.

#### CALIBRATE LOAD CELLS:

You must first be in the PROGRAM mode.

          +-----+       +-----+  
The | ZERO | and | FULL | keys are used for this.  
          +-----+       +-----+

We already did this at the factory. But if something BAD happens, you may have to recalibrate sometime in the future.

The INSTRUCTION MANUAL explains this in detail, but since we already did this.... you can forget about this for now.

Please continue...

...on the next page.

Page 10

#### PARAMETERS:

Parameters control the way your blender works. You don't need to know them all, but you may need to alter a few of them.

```
+-----+
The | PARA | key is used to change PARAMETERS.
+-----+
```

Try it. Each time you press it, the next parameter is displayed.

There are 176 parameters, one group of 20 GENERAL parameters followed by 12 groups of COMPONENT parameters, each with 13 parameters that pertain to that component only.

While the PARA key moves you forward through the list, the \* key allows you to back up if you pass the one you want.

The SET key allows you to skip forward in the list, jumping directly from one component list to the identical parameter in the next component list. The VIEW key allows you to skip backward.

Notice that every parameter has a 3 letter identification code followed by a 5 digit number. The number keys are used to enter or change a parameter.

The INSTRUCTION MANUAL explains all parameters in DETAIL. If you want to change one, READ THE MANUAL first.

A typical parameter looks like this:

```
+-----+
| MIX 03010 |
+-----+
```

This particular parameter tells us the MIX motor will run for 10 seconds at the end of a cycle. It also tells the computer to JOG the mix blade every 30 seconds. Thus the numbers 10 and 30 are part of the parameter.

Later, you may need to adjust a parameter for some special circumstance. But for now, you can leave all of them alone.

In fact, IF YOU ARE NOT SURE WHAT YOU ARE DOING.....

PLEASE..... leave them alone.

Before you change any, READ THE INSTRUCTION MANUAL.

Don't forget the +-----+  
| EXIT | key. Use it to get out of the list.  
+-----+

Please continue...

...on the next page.

Page 11

STAR (\*) FUNCTIONS:

Star functions allow access to certain setup routines.  
As with parameters, you must first be in the PROGRAM mode.

+----+  
The | \* | key followed by a two digit number (from 00 to 99)  
+----+  
allows access to the STAR functions.

All STAR (\*) functions are listed on the LABEL on the under side  
of the hinged controller door. Lift it up to read the list of \*  
functions.

Each function is different. You may be required to enter the  
change you want or to press the \* key again to display various  
options.

See the INSTRUCTION MANUAL for complete information.

+-----+  
Again, the | EXIT | key will get you out.  
+-----+

The most important STAR function is the one you will use to SETUP your  
system. This is explained later.

A few other important STAR functions are:

- \*11 - Correct the DATE, or the TIME if you are running reports and care  
about having the correct time show on these reports. Your  
Weigh Scale Blender doesn't need the correct date, but you  
might.
- \*89 - Change the weight unit from pounds to kilograms for customers who  
are on the metric system (everyone except the U.S.) and who  
want to be able to print reports in kilograms. The blender  
does all blending in grams and coverts to pounds or kilos for  
reports only.
- \*54 - Turn the Printer flag on (if you have a printer) so you can see

exactly what your blender is doing every cycle; in other words, see that it is as accurate as we say it is.

- \*23 - Save process information for future recovery if the software gets zapped. You will notice, on the left side of the controller, an INSTRUCTION LABEL. It tells about this very useful Star function. Read it. You may need it.

Please continue...

... on the next page.

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#### MANUAL TESTING:

These keys allow manual operations using the keypad. Again, be sure you are in the PROGRAM mode.

Look at the following keys:

OPERATE	TIME	CALIBRATE
---------	------	-----------

OPERATE, TIME and CALIBRATE work only when followed by a "device" key. "Device" keys are the shown here:

1	2	3	A
4	5	6	B
7	8	9	C
0	HOLD	DUMP	
	MIX	ALARM	

For example: Press "OPERATE" followed by "1" and the slide gate for hopper one will open (#1 LED will light).

The OPERATE key is good for testing that all the devices work. This is part of the CHECK OUT procedure for each new blender.

The other keys have little use in normal operation. If you want to know more about them, see the INSTRUCTION MANUAL.

For now, you can forget them.

This ends our brief description about the PROGRAM mode and the KEYPAD.

Remember: Press the 

```
+-----+
| EXIT |
+-----+
```

 key to get out of the PROGRAM mode.

NEXT.... the SETUP routine...

...on the next page.

Page 13  
SETUP

You now know about the PROGRAM mode and using the KEYPAD.  
The FIRST thing you will use the KEYPAD for is the SETUP.

TWELVE software WILL NOT WORK until SETUP is complete.

Our standard FOUR software was designed for the mix of materials used by most injection molders; that is, NATURAL, COLOR, REGRIND, and sometimes an ADDITIVE. FOUR software is already programmed, or "set up", to handle this blend.

But many customers have complex requirements that FOUR software can't handle. TWELVE component software works for these customers.

SETTINGS, the meaning of the numbers.

All Gravimetric blenders require SETTINGS for each material, generally a PERCENTAGE, or a RATIO, or a WEIGHT. Unfortunately, for us, the SETTINGS that customers want to enter have different meanings to different customers.

Settings can be very CONFUSING.

For example: You want to blend TWO NATURALS at a RATIO of 50 / 50,  
plus REGRIND at 20 percent,  
plus COLOR at 4 percent.

What will 100 pounds of blend look like?

The NATURALS will NOT be 50 pounds each.  
The COLOR will NOT be 4 pounds.

The REGRIND, however, will be 20 pounds.

Of the remaining 80 pounds, the NATURALS will NOT be 40 pounds each because some of this space is for color.

The NATURALS will, in fact, be 38.46 pounds.  
Together, they will total 76.92 pounds.  
The COLOR will be 3.08 pounds, which is 4 percent of the NATURALS,  
or 4 percent of 76.92.

All totaled, the blend will then be 100 pounds.

It is VERY CONFUSING and you need a calculator to do this.

Please continue...

...on the next page.

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Most blenders require that you enter settings as percentages of the blend, BUT..... we give you another option.

Using the example above:

	on other blenders:	on MAGUIRE blenders:
Natural 1:	is set to 38.46	is set to 50
Natural 2:	is set to 38.46	is set to 50
Regrind:	is set to 20.00	is set to 20
Color:	is set to 3.08	is set to 4

Our settings relate more directly to how many customers think of the blend. So some customers prefer these simpler numbers.

SO.....

FIRST, you must decide what you want each setting to mean.....  
a percent of the entire blend (like Regrind at 20%)  
a percent of the Natural material only (like Additive at 4%)  
a ratio number to other components (like 2 Naturals at 50/50).

THEN, for each component you are going to meter.....  
you will designate it as one of these three TYPES:

+-----+	+-----+	or	+-----+
REGRIND	NATURAL		ADDITIVE
+-----+	+-----+		+-----+

LAST, when you enter SETTINGS, each setting will be handled one of three ways, depending on the TYPE you have selected for that component.

If the type is REGRIND,  
the setting will be read as a PERCENT of the TOTAL BLEND.

If the type is NATURAL,  
the setting will be read as a RATIO number that will be compared to OTHER NATURAL settings, to determine the ratio this

particular NATURAL should be to all the other NATURALS.  
(With only one NATURAL, their is no "ratio", so any number will work.)

If the type is ADDITIVE,  
the setting will be read as a PERCENTAGE of all the NATURALS  
added together. REGRINDS will be ignored when figuring the  
additive amount.

We will show you an example...

...on the next page.

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Here is an example:

You are blending SIX materials.

1. A CRYSTAL natural material
2. A HI-IMPACT natural material
3. A PCR (Post Consumer Re grind) that needs color added.
4. COLOR
5. Some "in house" REGRIND, that already has color in it.
6. Some REPROCESSED material that is already colored.

Components 1, 2, and 3 are all considered NATURALS because they all  
need the COLOR added.

Component 4, COLOR, is considered an ADDITIVE, because it is to be  
added to the "NATURALS" only.

Component 5, the REGRIND, is considered a REGRIND because it does not  
get any COLOR added to it.

Component 6, the REPROCESSED material, is also considered a REGRIND  
because it, too, does not need any COLOR added.

So.... in the blend above:

Let's say that the three NATURALS are to be blended in EQUAL parts.  
The "in house" regrind is to be 10 percent.  
The Repossessed regrind is to be 15 percent.  
The Color is to be added at the rate of four pounds color for each 100  
pounds of natural.

The TYPES and SETTINGS are entered like this:

Component #:	Type:	Setting:
1	NATURAL	001
2	NATURAL	001
3	NATURAL	001
4	COLOR	04.0
5	REGRIND	10.0
6	REGRIND	15.0

This is explained further...

...on the next page.

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For the NATURALS, components 1, 2, and 3, you want equal parts of each, so the important thing is that all three settings are equal. In this way the computer knows to meter each one equally. You could have set them all to 10, or 100, or 33, or any number for that matter, as long as the RATIO between their settings was the ratio you wanted.

If you wanted a 20, 40, 40 blend, you can use settings of 20, 40, 40; or 2, 4, 4; or 1, 2, 2; since all these RATIOS are the same.

For the COLOR, component 4, your entry is the percent of the Natural blend, 4 percent; or 4 pounds color to 100 pounds natural.

For the REGRINDS, components 5 and 6, your entries are the percentages you want, 10 and 15 percent.

In the example above, with the TYPES selected and SETTINGS entered as shown; when you blend 1000 pounds, you will get the following amounts of each component:

Component #:	Type:	Setting:	weight:
1	NATURAL	001	240.38
2	NATURAL	001	240.38
3	NATURAL	001	240.38
4	COLOR	04.0	28.86
5	REGRIND	10.0	100
6	REGRIND	15.0	150
			----- total:
			1000.00

Now.... some customers would rather just enter PERCENTAGES. They already have recipes figured out, and these recipes are given as percentages of the blend.

So.... these customers will SIMPLY call ALL materials REGRINDS, and every SETTING will be a percentage of the entire blend. Types and settings will look like this:

Component #:	Type:	Setting:	weight:
1	REGRIND	24.0	240
2	REGRIND	24.0	240
3	REGRIND	24.0	240
4	REGRIND	2.9	29
5	REGRIND	10.0	100
6	REGRIND	15.0	150
			-----
			total: 1000

This blend is the same, except for fractional errors due to rounding.

NOTE: When ALL types are set to REGRIND, all the settings must add up to 99, or 100, or in between.

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By the way.....

The software can handle 12 components but you will TURN ON only the ones you want to use, only the ones that you have hardware for.

For example: If you have 4 dispense valves and 2 feeders, you will turn on components 1 through 6.

When setting the TYPES, the options are REG, NAT, ADD, and OFF.

For the valves and feeders you intend to use, set these components to either REG, NAT, or ADD.

If you don't have any hardware in place for a particular component, leave it set to OFF.

If you have an extra dispense valve that you NEVER EVER intend to use, leave it set to OFF.

For instance, in the example we have been using above:

Components 7, 8, 9, A, B, and C are left set to OFF.

If you CHANGE component types frequently, it may be simpler for you to set all component types to REGRIND and just figure out all percentages yourself for every blend you run.

BUT.... if your application is always a blend of known materials, then you may find it simpler to set up with proper TYPES specified for

each material. In this way the job of figuring out settings and percentages is made simpler for those without math degrees (and without calculators).

So..... this might be a good time to decide what TYPE you are going to assign to each component.....

.... and then enter them.

See.... the next page.

Page 18

Here is the proper keystroke sequence to assign TYPES:

```
Press:  +----+
        | * |           Display will say: (PASSWORD)
        +----+
Press:  +----+ +----+ +----+ +----+ +----+
        | 2 | | 2 | | 2 | | 2 | | 2 |
        +----+ +----+ +----+ +----+ +----+
                               Display will say: (P      x)
```

You are now in the PROGRAM mode.

```
Press:  +----+
        | * |           Display will say: (INSTR --)
        +----+
Press:  +----+ +----+
        | 1 | | 4 |     Display will say: (1TY= OFF)
        +----+ +----+
```

The first digit is the component or device number.  
This is component 1. It will control Hopper 1.

```
Press:  +-----+
        | CE |         repeatedly to scan the four options.
        +-----+         Display will say: (1TY= REG)   (Regrind)
                               (1TY= NAT)   (Natural)
                               (1TY= ADD)   (Additive)
                               (1TY= OFF)   (turned off)
```

When selection you want is displayed, move on to NEXT component.

Press: +-----+  
| \* |            Display will say: (2TY= OFF)  
+-----+

REPEAT the +-----+ +-----+  
| \* | | CE | sequence for ALL components you use.  
+-----+ +-----+

The +-----+  
| \* | key walks you through all components.  
+-----+

The +-----+  
| CE | key changes the TYPE for a component.  
+-----+

Components NOT CONNECTED, or NEVER USED, set to OFF.

When done:

Press: +-----+  
| EXIT | twice  
+-----+

After EXIT, if display says (NEED NAT) then you have specified an ADDITIVE without specifying a NATURAL. This is an unacceptable condition. Try again.

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Now..... let's check to see if you did everything right.

Press: +-----+  
| SET | ... The first component that you have turned on will  
+-----+ be displayed with a letter to tell you its TYPE.

For example: (1 R 00.0) or (2 N 000).

Each time you press +-----+  
| SET | the next component will be displayed.  
+-----+

SCAN the entire list. Check which ones are turned on and their types.

If the list is not what you expected, go back and do it again.

Once the SCAN of components looks right, we can move on to actually entering the SETTINGS.

To ENTER SETTINGS:

You DO NOT have to be in the PROGRAM mode.

+-----+

Press the | SET | key just as you did above.  
+-----+

When the component you want is displayed you may enter the setting number directly.

For example: Component 1 reads (1 R 00.0).  
To enter a setting of 20 percent,

press: +----+ +----+ +----+  
| 2 | | 0 | | 0 |  
+----+ +----+ +----+

Display will say: (1 R 20.0)

Use the +-----+  
| SET | key to SCAN through all components.  
+-----+

Enter new settings as required.

Press: +-----+  
| EXIT | when done.  
+-----+

For ALARMS...

...turn to the next page.

Page 20  
ALARMS:

The ALARMS are: the STOBE light flashing,  
the BEEPER sounding.

There are only a few things that can cause an ALARM:

1. If a component runs out of material, or for any other reason is not feeding correctly.
2. If you try to operate the unit with the weigh bin removed.
3. If you try to operate the unit with material stuck in the weigh bin.

Number 1:

Running out of material, will cause the display to flash with a number in the first position.

The number indicates which material is not feeding.

Just add material and the unit will recover by itself. The blender never stops trying to meter it.

So.... you must add material.

Number 2:

This is caused by the TARE weight being too low (below -50). If the bin is not in its place, then the display will show minus about 1200 grams. The blender will not start with this low tare weight.

So.... you must replace the weigh bin.

Number 3:

This is caused by the TARE weight being too high (above 100). There may be something stuck in the bin.

So.... check the bin to see what the problem is.

Please turn to the next page ....

.... for the CONCLUSION.

Page 21  
CONCLUSION:

This completes our brief outline of ALL the CONTROLS.

As you read through the INSTRUCTION MANUAL, you will now have a better idea how all the software parts fit together and how you can make changes and add features.

A few points to remember to help you feel comfortable:

- . The +-----+  
| EXIT | key always gets you OUT.  
+-----+
- . As with any computer, turning power off also gets you out.
- . Turning power off will never hurt.
- . Except for entering settings, pressing keys on the keypad will never change anything as long as you are NOT in the program mode.
- . Parameters DO effect operation.  
Do not change them unless you understand them.

. If you are confused or have questions, call us.  
610 494 5353. Ask for service.

Thank you for taking the time to complete this booklet.

We hope your MAGUIRE Weigh Scale Blender serves you well.