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**MLAN For Windows**

**Version 1.2**

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**Computer Communications for  
MLAN – Maguire Local Area Network**

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*NOTE: Depending on the date of the chip in your controller, all features may not be available. The date is displayed as the controller is powered up. The format of the date is YMMDD, e.g. 41026 represents October 26, 1994. The chips can be upgraded, so if you need a newer chip, please call. The oldest chip that will provide the minimum features is October 26, 1994.*

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# I. Overview

This manual is intended to provide information for individuals who are using the MLAN for Windows software package. This program provides material usage tracking reports and remote access of the basic control settings, such as recipes (materials and settings), work order numbers, and operator numbers. MLAN for Windows utilizes the Maguire Local Area Network (MLAN) protocol for communicating with Maguire Weigh Scale Blenders. In addition to MLAN for Windows, Maguire Products offers the complete documentation of the MLAN protocol. This documentation can be used by programmers to write custom software to communicate with the Maguire Weigh Scale Blender. For more information on the MLAN protocol please call Maguire Products and ask for a copy of the MLAN Protocol Manual.

For a complete understanding of the operation of the Weigh Scale Blender (WSB), it is recommended that you have the four and/or twelve component controller manual(s) available as a reference.

All numbers in this document are assumed to be decimal (base 10) unless otherwise noted. Also, when a year is represented by its last two digits, if it is between 90 and 99 its assumed to be between 1990 and 1999 and if it is between 00 and 89 its assumed to be between 2000 and 2089.

The data files for MLAN are Microsoft Access 2.0 database files. This means that with a little knowledge of Microsoft Access you can use it to convert the data to another format.

# II. Hardware Requirements

## Computer, monitor, keyboard, and mouse

Computer	--	IBM-PC or Compatible (386 or faster; 486 recommended)
Operating System	--	MS-DOS with Windows 3.1, 3.11 (or Windows for Workgroups 3.1, 3.11)
Free HD Space	--	10 MB Minimum (20 MB recommended)
Video	--	VGA
Memory	--	4 MB Minimum (8 MB or more recommended)

## MLAN Interface, required for most installations (see Communication Wiring)

This “black box” device is positioned next to the computer. If you are connecting to more than 25 controllers or are running cable over 500 feet, additional MLAN interface devices may be required.

## Communication Cable

A single 4 conductor shielded cable connects all WSB controllers to the computer. This is generally done with a single cable run through the ceiling over all of the process machines with “drops” to each controller. Be sure to read the Wiring Considerations section.

## Printer

A printer is required when you wish to obtain printed reports.

### III. Communication Wiring (MLAN or RS-232)

Weigh Scale Blender (WSB) controllers can communicate over two different protocols, MLAN and RS-232. Both are available at the DB9 port on the WSB controller. MLAN should be used in all factory installations; however, RS-232 may be used for lab testing and limited applications. RS-232 is NOT recommended for factory installations.

#### MLAN Communication

If you are communicating over a distance greater than 50 feet or with more than three WSBs, then you must use the **MLAN Signal Amplifier** (part # MLAN-SA). The MLAN-SA utilizes a stronger, more reliable signal transmission method than a standard RS-232 interface. It utilizes optically isolated couplers for all communication lines to reduce the potential of noise and other electrical interference from entering the computer circuitry.

The standard computer RS-232 serial port signal is fed into the MLAN-SA unit and then sent out to the WSB controllers through optically isolated signal drivers. At the controller this MLAN signal is carried onto the board through additional optical couplers for further isolation. The MLAN-SA comes with a cable hardwired into it with a DB9 connector on the other end. The DB9 connector is for connecting the MLAN-SA to a computer's RS-232 (serial) port.

The cable from the **MLAN-SA** device to all WSB controllers (or to other **MLAN-SA** devices), utilizes the following pin connection:

<b>MLAN TO CONTROLLER CABLE PINOUT</b>		
<b>MLAN-SA DB9 Connector pin # (or terminal strip)</b>	<b>Wire Color</b>	<b>WSB Controller DB9 Connector pin #</b>
1	Black	1
4	Red	4
6	White	6
7	Green	7
5	<i>Shield</i>	<b>connected to housing (not pin 5)</b>

Up to 25 WSB controllers may be connected in parallel using one MLAN-SA. If you are connecting more than 25 controllers or all your cabling (including drops) totals over 2000 feet, additional MLAN-SA devices are recommended.

The **shield** is connected at all points **except** at the controller where is connected to the housing of the cable (see wiring diagram). This shield is intended to tie all external noise to ground at the MLAN-SA, at the computer and at the WSB controllers.

MLAN requires four (4) conductor cable with a shield for conveying information. Wire size should be 18 to 22 gauge. Use 18 gauge for the long runs (especially over 500 feet). Twenty-two (22) gauge is

recommended for the “drops” to each controller. Twenty-two (22) gauge wire is used at each controller termination because it solders more easily to the DB9 connector required at each WSB controller location.

We recommend:      CAROL WIRE, Part #C2555  
                               or                BELDON WIRE, Part #9402

Conductors are Black, Red, White, and Green, plus a shield.

Black                is the positive power supply (16 to 24 volts)  
 Red                 is the neutral from the power supply  
 White               is communication from PC to WSB controller  
 Green               is communication from WSB controller to PC

Wiring generally requires a single cable run through the ceiling over all the process machines with “drops” to each controller. This main wire may “T” off to other locations if required for more efficient wiring. Be sure to read the WIRE CONSIDERATIONS section on page 5, also see wiring diagram on page 7.

**RS-232 Communication** (for limited applications)

RS-232 uses a direct connection from the computer to the WSB controller. This type of communication is reliable for short runs where little or no “noise” or static interference is present. This may be the case in a lab or another closely controlled environment. A low noise environment is not common in a factory and we do NOT recommend RS-232 for factory installation.

Other restrictions are that the computer must be close (less than 50 feet) to the WSB controller and can only communicate with a few units (maximum of three). If all three conditions are met, then you may cable directly to the RS-232 serial port on your computer without any other hardware interface. Under these circumstances, the MLAN-SA is not required. The proper pin connections are as follows:

<b>RS-232 TO WSB CONTROLLER CABLE PINOUT</b>			
<b>WSB DB9 Connector</b>	<b>Computer Connector</b>		
<b>pin #</b>	<b>DB9</b>	<b>or</b>	<b>DB25</b>
3	3		2
2	2		3
5	5		7 and 1
	6, 7, 8		4, 5, 6
	pins tied together		

Do NOT use a standard off-the-shelf cable. Standard cables have ALL pins connected, or at least more than just those listed above. ALL pins connected will NOT work. You must wire a special cable according to the diagram provided. You may also obtain these cables from us.

**Wiring Consideration**

The wiring of your communication lines is very important for reliable operation. To minimize problems, consider the following:

1. Communication lines are **low voltage** lines. Be sure that these lines are not bundled to any high voltage lines. If you run them in conduit, do not run high and low voltage lines together.
2. It is not necessary to run this wire in conduit. If you do run cables without conduit, do not wire tie these lines to material conveying lines or other conduit containing high voltage or high amperage electrical lines.
3. Keep all **communication lines** away from all **vacuum loader conveying lines**. Conveying plastic produces **extreme** static charges. An electrical line, even in conduit, that runs next to a vacuum line, can introduce extreme static pulses into the processor. Keep these lines **separated** from conveying lines.

WIRING DIAGRAM PAGE

## IV. New Program Chip — Installation

In October 1994, the method MLAN for Windows uses to communicate with all WSB controllers was changed. All of your controllers **MUST** have software dated October 26, 1994 or later to operate with MLAN for Windows. To check the date of each controller's software, watch the display closely when you turn power on. The first display you will see is the **version date** (V=41026A or V=41026T). This number is the **year** (4 for 1994), **month** (10 for October), and **day** (26 for the 26th). A "T" indicates 12 component software. If all version dates are October 26, 1994 or later, you do not need to change the chip.

Chips with version dates before October 26, 1994 **must** be changed. If you need a new program chip and we have not provided one please call. There is no charge for these updated chips.

### Installation:

#### 1. REMOVE THE LID

The lid is held on by 10 screws (4 top, 3 left side, 3 right side). Then remove the three screws that hold the panel front to the bottom. This will allow the panel front to lay down flat providing easy access to the circuit board.

#### 2. REMOVE OLD CHIP FROM BOARD

The program chip is the one with a paper label on it (e.g. TC41026A or WS41026A). Stand in front of the controller and look down into the box at the circuit board. The program chip is located on the bottom edge of the circuit board to the right. It is near the side of the board that lies next to the thumbwheel switches.

The program chip is right next to the memory chip. The memory chip stands higher off the board and may also have a small paper label on it. Be careful not to remove the memory chip. The program chip is to the right of the memory chip, closer to the thumbwheel switches.

Use a long thin screwdriver to slip behind the chip and pry it gently from its socket.

#### 3. INSTALL NEW CHIP

One end of the chip has a small notch in it. Be sure that the chip is installed with the **small notch up**. **BE CAREFUL NOT TO BEND ANY PINS**. All pins should go into the socket. It is very easy to insert the chip one pin too high or one pin too low. The bottom of the chip will be even with the bottom of the socket if you have installed it correctly.

#### 4. REPLACE PANEL FRONT AND LID

5. PERFORM THE “CLEAR ALL - RESTART” ROUTINE  
This is necessary to clear old memory information and assign new memory positions to match the new chip.

**Do the following:**

With power OFF, hold down the following three keys on the keypad: the TOP LEFT, TOP MIDDLE, and TOP RIGHT keys. These are the VIEW, BATCH, and EXIT keys.

With all three keys held down, turn power on, then release. Watch the display. It must say “CLEAR ALL.” If it doesn’t, repeat this step until it does.

6. CONFIRM (OR SET) MODEL NUMBER  
All newer versions of software allow the selection of different models. This presets a number of parameters for different types of equipment. Any time power is turned on, the model number is displayed. At this point, **confirm** that you have the proper model selected.

There are various models; the 100 and 200 series display weights in 1/10 grams ( x.x), whereas the 400, 900, and 1800 series display weights in full grams ( x).

To change models:

Press: \* Display will say (PASSWORD).  
Press: 97531 Display will say (MODEL 220) or current model.  
Press: \* To walk through the available models.

When the model you want is displayed, press EXIT.

8. RECALIBRATE - LOAD CELLS  
Follow the **Recalibrate Load Cells** procedure given in the WSB Instruction Manual.

## V. WSB Controller Identification Numbers

Each WSB controller **must** have its own **unique** identification number. This number must be entered at the controller using the keypad. These numbers can range from 001 to 254. Do not use 000 or 255. If the same number is assigned to two or more controllers, these controllers will not communicate successfully with the computer. They will both answer to the same request.

This ID number is used for all communications, and for identifying the source of all report information. It may be helpful to you if you choose a numbering sequence that relates in some way to each controller’s location.

To enter an **identification** number into a controller, do the following (at the controller):

Turn the “STOP END OF CYCLE” switch OFF (down),  
Turn power ON

Press: \* Display will say: (PASSWORD)  
Press: 22222 Display will say: (P x.x)

Press: \*66      Display will say:                    (ID            000)  
Enter: New correct ID  
Enter all 3 digits.  
Use leading zeros.  
Correct entries are 001 to 254.  
Do not allow 2 controllers to have the same number.

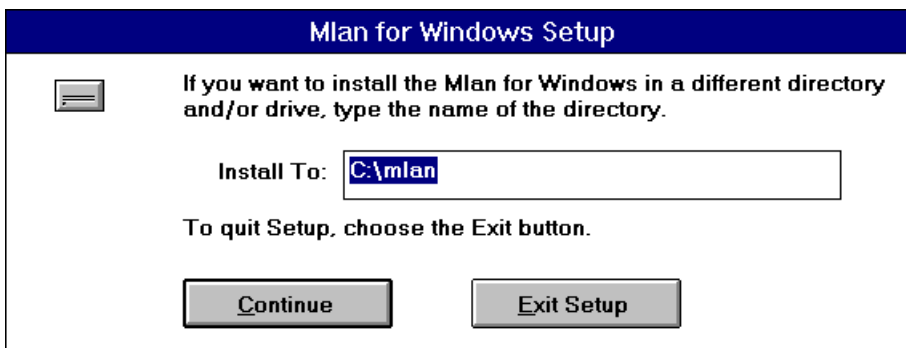
Repeat this sequence for ALL controllers.

Write down the numbers. This list must be entered into the computer using the SETUP routine before any communication can begin.

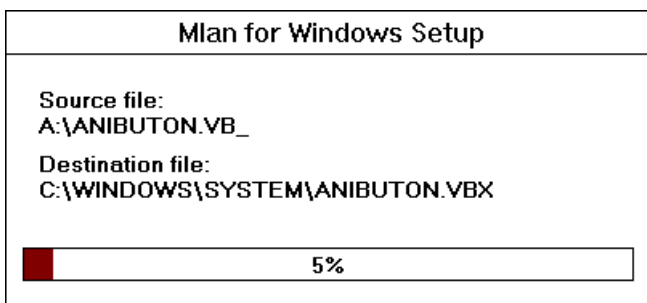
## VI. Software Installation

1. Start Microsoft Windows.
2. Insert Disk 1 into drive A (or B).
3. From Program Manager, select **File** Menu and choose **Run**.
4. Type **a:\setup** (or **b:\setup**) and press the *Enter* key.

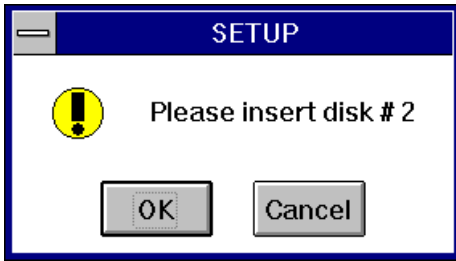
The following screen will appear:



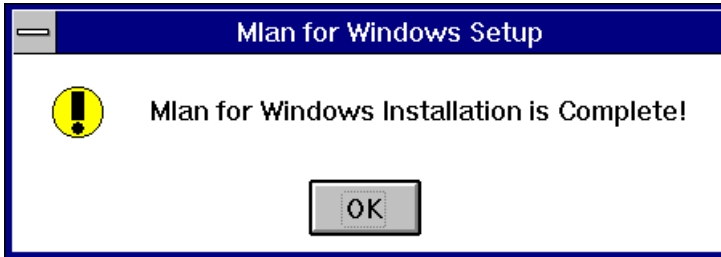
5. If needed, change the installation directory. Choose **CONTINUE** to begin the installation. You should see the following screen:



6. After all files have been copied from the current disk, you will be prompted to insert the next disk. Remove the current disk from the disk drive and insert the next disk. Choose **OK**.



7. The installation is complete after all diskettes have been copied. Choose **OK**.

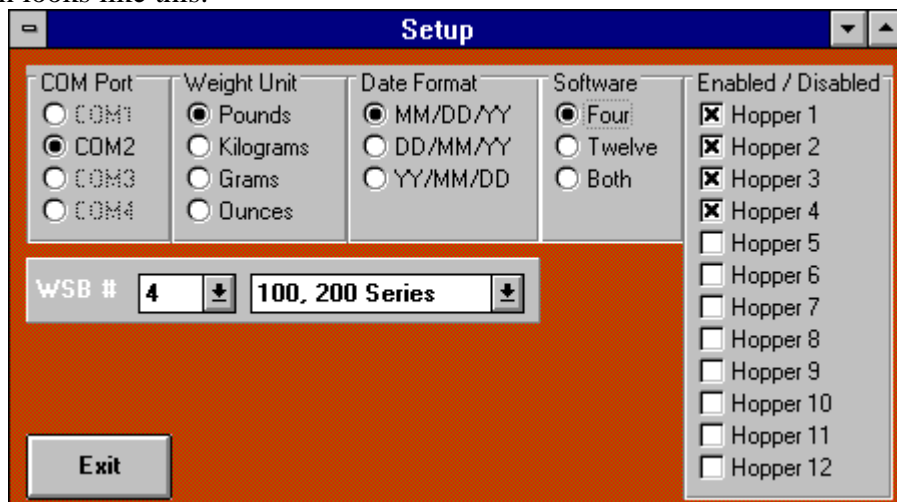


A new windows group named “Weigh Scale Blender” has been added. The new group contains one program named “Weigh Scale Blender”.

## The Setup File

The setup option must be selected and correct information entered before your system will operate properly.

The Setup screen looks like this:



### FIELD:

COM Port:

### OPTIONS:

COM1, COM2, COM3, COM4

You will not be able to select COM ports that are unavailable.

Weight Unit: POUNDS, KILOGRAMS, GRAMS, OUNCES  
GRAMS and OUNCES are usually only used for running short term tests.

Date Format: MM/DD/YY, DD/MM/YY, YY/MM/DD  
Select a date format that is correct for your country.

Software: FOUR, TWELVE, BOTH  
If you have a combination of FOUR component and TWELVE component controllers select BOTH. Otherwise, select the option that matches your controller software. If unsure, select BOTH.

Enabled / Disabled: Hopper 1, Hopper 2, etc.  
Select ENABLED for all of the hoppers that are available on your most complex system. This option limits the entry of recipe settings to valid components only.

Select DISABLED for all component numbers that your system will never specify as part of a recipe.

NOTE: Systems using FOUR software:  
Component 2, Natural, is always enabled. You will enable or disable only components 1, 3, and 4.

Systems using TWELVE software: Remember that Auger feeders, that plug into the duplex receptacle on the front of the panel, are **always** components 5 and 6 (Hoppers 5 and 6).

WSB ID#: Numbers from 001 to 254  
Enter **every** controller ID number you have assigned to your controllers. This is the list that the scanning routine will use to monitor all units. ID numbers 000 and 255 are reserved.

INACTIVE:  
100, 200 Series  
400, 900, 1800 Series  
When a WSB ID number is entered, you will be prompted for the correct model: 100, 200, 400, 900, 1800, or Inactive. Select one of these options.

Select **100, 200 Series**:  
for WSB1xx models that use 1000 gram weigh bins.  
for WSB2xx models that use 2000 gram weigh bins.  
These models store and display weights in tenths (1/10) of grams.

Select **400, 900, 1800 Series**  
for WSB4xx models, that use 4000 gram weigh bins.  
for WSB9xx models that use 9000 gram weigh bins.  
for WSB18xx models that use 18000 gram weigh bins.  
These models store and display weights in whole grams.

Select **INACTIVE** if you are discontinuing the use of this ID number. Inactive will remove this number from the list.

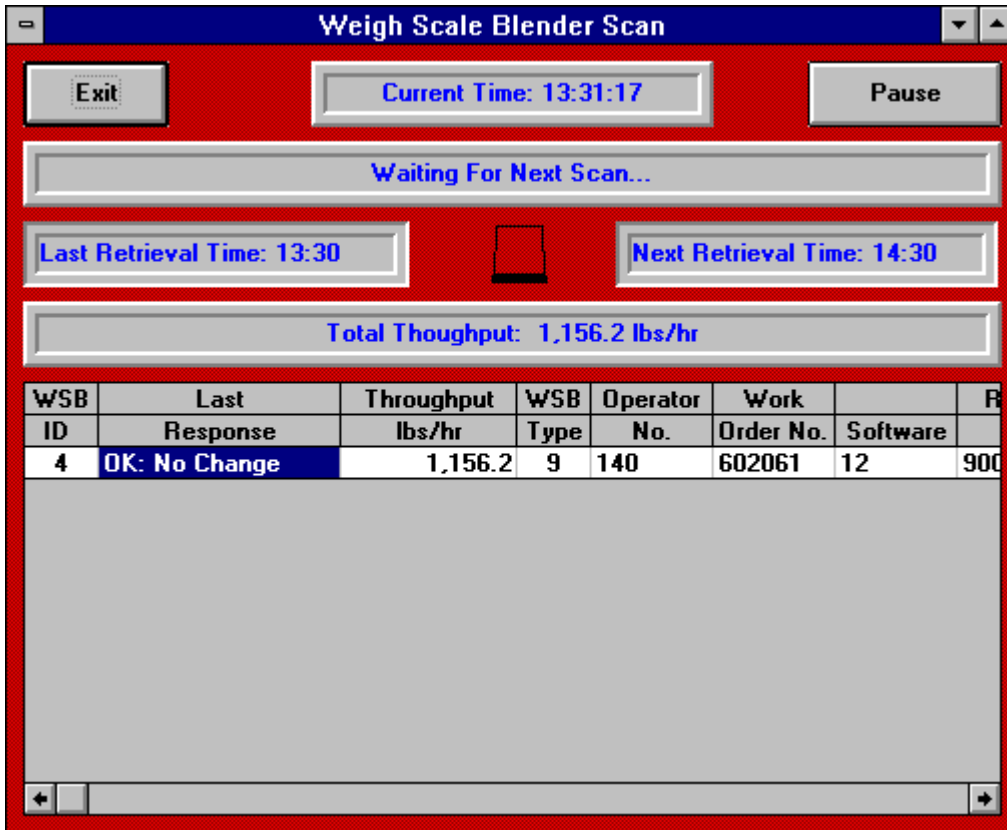
## Check Out Procedure

All Weigh Scale Blender Controllers must be powered on for the cable connections to that unit to be checked. The controllers do not have to be running, but the power switch must be in the on position.

- On every controller that you wish to check:
  - Place STOP END-OF-CYCLE switch down,
  - Have POWER turned ON,
  - Be sure that this controller is listed in the SETUP file

Select “Constant Scan” from the WSB Menu to begin continuous scan.

The Constant Scan screen looks like this:



A list of each unit scanned is displayed. If all WSB units are connected properly and are turned on and all WSB units have unique numbers, scanning will progress rapidly through all controllers, and continuously without interruption.

## Error Messages

If scanning does not progress smoothly, an error message will appear indicating which blender did not scan correctly. If none of the blenders scan correctly, check for invalid COM port settings and that the MLAN box is plugged into the correct port.

If at least one blender scans correctly, but others don't, check for loose connections at the WSB end. Also, check to make sure that the WSB ID numbers in the SETUP section match the actual ID numbers set on the controller.

REMEMBER: Only devices listed in the SETUP section are scanned. Be sure all units are listed.

## Summary

Once you are comfortable that data is being gathered correctly from all units, you will want to begin to incorporate the other features of the system. Entering **retrieval times** will allow you to study how much production you get during each shift or during any other time period you select. Entering the **materials** combined with the **recipes**, will allow you to track all materials used. After several days of gathering data, running the various reports will demonstrate exactly what information is available.

If your particular requirements are not met with this system, call us and tell us what you need. This software is being developed further every day and your input will add to its versatility.

## VII. Operation

### Overview

The Maguire Local Area Network (MLAN) is the name we give to the software written exclusively for the MAGUIRE Weigh Scale Blenders. MLAN enables your IBM PC or compatible computer to communicate with one or more WSB controllers. MLAN provides **two-way communication**, both **downloading** and **retrieval** of information from WSB controllers for:

- PRECISE WEIGHT of all materials processed
- SETTINGS
- RECIPE number
- WORK ORDER number
- OPERATOR number

MLAN organizes and tracks your **material usage**, allowing you to gather accurate information according to the following factors:

- TIME range; e.g. by day, or shift, or for any time range you specify
- MACHINE number
- WORK ORDER number
- OPERATOR number
- RECIPE number

MLAN allows you to maintain a **raw materials** database, and then build recipes from this database for all of the products you manufacture.

MLAN produces **reports** to show totals for each **material** used, according to selected dates, broken down by date, time, machine number, work order number, operator number, and recipe number.

MLAN programs are **menu** driven, and very user friendly. The package is ready to go with very little training or start up time required.

## **Brief Explanation of Options**

**EXIT** - will exit the program.

**WSB / Scan Once all WSBs** - to retrieve from ALL units one time right now.

**WSB / Scan All WSBs Continuously** - to continuously scan ALL blenders. This is what you want running most of the time. You **MUST** be in this program to retrieve data.

**WSB / Examine Settings** - to look at ONE unit to see how it is set.

**Recipes / Edit** - to build and edit the RECIPE file.

**Recipes / Download Settings** - to download information to ONE unit.

**Recipes / Print** - to print out a list of RECIPES.

**Recipes / Materials / Edit** - to build and edit a list of MATERIALS.

**Recipes / Materials / Print** - to print out a list of MATERIALS.

**Setup / General Settings** - to configure your system when it is first set up.

**Setup / Retrieval Times / Edit** - to set time periods for gathering tools.

**Setup / Retrieval Times / Print** - to print out a list of RETRIEVAL TIMES.

**Utilities / Initialize** - to reinitialize data files. This **DELETES** all data in the particular file, you usually do not want to do this. Be very careful and make backups first.

**Utilities / Initialize / Setup File** - to reinitialize setup information, such as COM port, active blenders, date format, software type, etc.

**Utilities / Initialize / Material File** - to reinitialize the material database.

**Utilities / Initialize / Recipe File** - to reinitialize the recipe database.

**Utilities / Initialize / Retrieval Times File** - to reinitialize the retrieval times database.

**Utilities / Initialize / Totals File** - to reinitialize the totals file database. This is the file that stores all of the totals used for the material usage reports.

**Utilities / Purge Old Totals** - to selectively purge out old totals from the totals database. You may want to do this after some amount of time. Be careful not to purge current data. Make backups first.

**Reports / Dump Totals File** - to print a report of the records in the totals database.

**Reports / Communication Errors** - to print a report of the communication errors that may have occurred during the monitoring of the blenders.

**Reports / Material Usage By / Material Only** - to print a material usage report broken down by material only.

**Reports / Material Usage By / WSB ID #** - to print a material usage report broken down by Weigh Scale Blender ID #.

**Reports / Material Usage By / Operator #** - to print a material usage report broken down by Operator #.

**Reports / Material Usage By / Work Order #** - to print a material usage report broken down by Work Order #.

**Reports / Material Usage By / Recipe #** - to print a material usage report broken down by Recipe #.

**Reports / Material Usage By / Time** - to print a material usage report broken down by time range.

**Reports / Material Usage By / Time / WSB ID #** - to print a material usage report broken down by time range and Weigh Scale Blender ID #.

**Reports / Material Usage By / Time / Operator #** - to print a material usage report broken down by time range and Operator #.

**Reports / Material Usage By / Time / Work Order #** - to print a material usage report broken down by time range and by Work Order #.

**Reports / Material Usage By / Time / Recipe #** - to print a material usage report broken down by time range and Recipe #.

**Reports / Material Usage By / Date / Time** - to print a material usage report broken down by date and time range.

**Reports / Material Usage By / Date / Time / WSB ID #** - to print a material usage report broken down by date and time range and Weigh Scale Blender ID #.

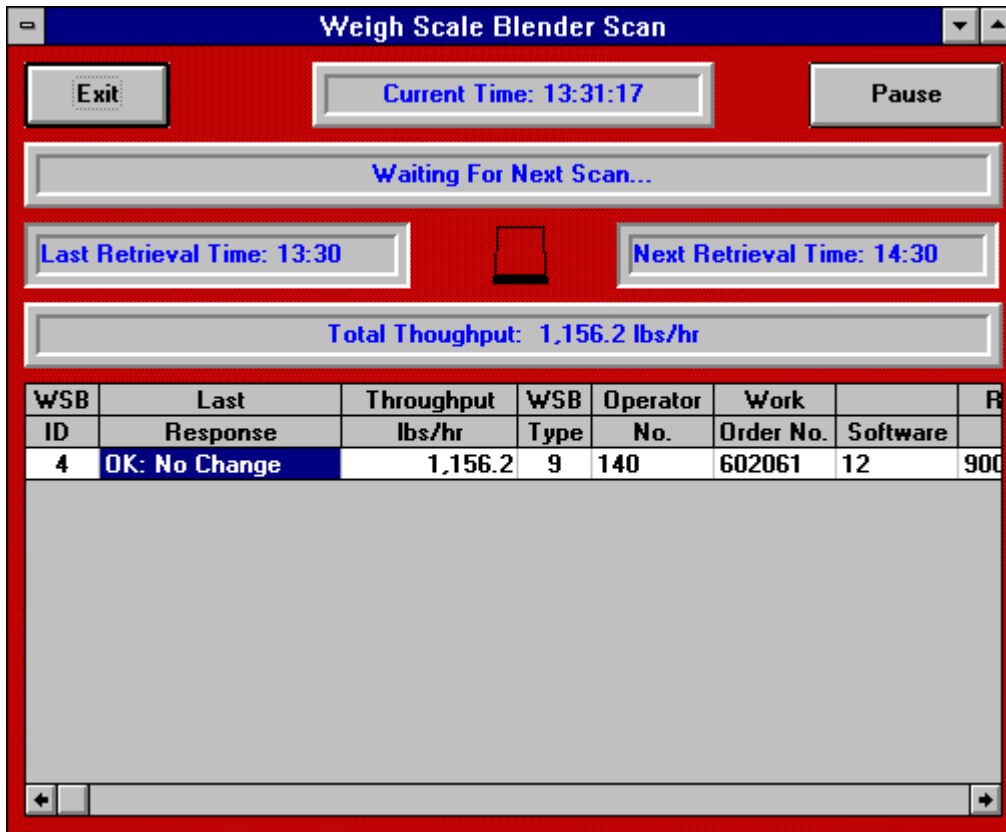
**Reports / Material Usage By / Date / Time / Operator #** - to print a material usage report broken down by date and time range and Operator #.

**Reports / Material Usage By / Date / Time / Work Order #** - to print a material usage report broken down by date and time range and by Work Order #.

**Reports / Material Usage By / Date / Time / Recipe #** - to print a material usage report broken down by date and time range and Recipe #.

## Constant Scan of Weigh Scale Blenders

The screen will look like this:



The system retrieves data **automatically** in this mode. Retrievals occur only when this option is running. Keep this option running **all of the time** for the most accurate logging of information. The pause button stops the scanning process without exiting the scan routine. Each WSB unit is constantly accumulating total usage information for all components when it blends. The **constant scan** program retrieves these totals whenever one of the following conditions occurs:

- When a TIME stored in the time file has been reached. In this case, information from all WSB units is gathered.
- When a SETTING has changed and additional usage has occurred.
- When a different RECIPE number has been entered.
- When a different WORK ORDER number has been entered.
- When a different OPERATOR number has been entered.

Note: Retrieval does not occur if the TOTALS stored in the controller have not been incremented. In other words, if the Weigh Scale Blender has not blended any materials since the last retrieval.

### **CAUTION: When Running Other Menu Selections**

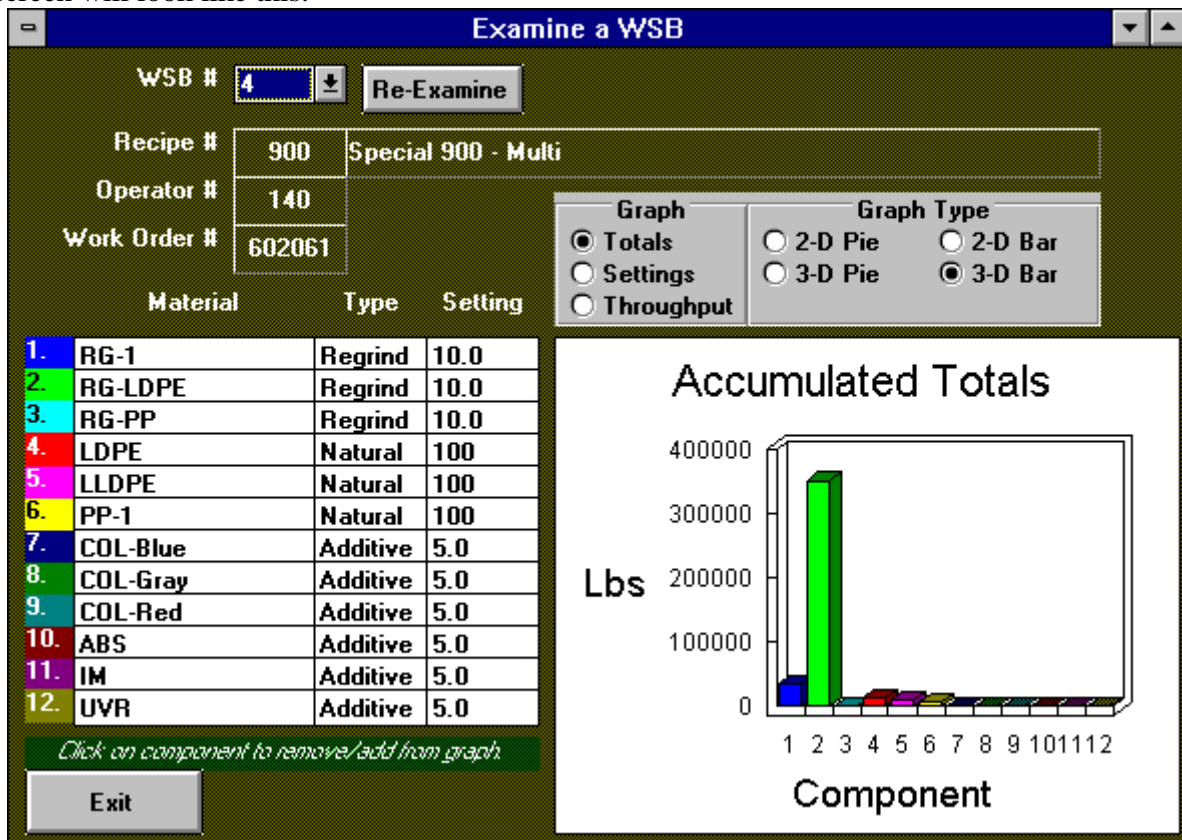
When the constant scan routine is not running, **scanning does not take place**. All controllers, however, will continue to gather data and maintain running totals of information. When you do return to the CONSTANT SCAN program, the conditions listed above will be checked and data will be

gathered if at least one condition is met. If the program is not left in scan mode, you may lose the exact totals that existed at the exact time that the condition changed. Overall totals are not affected they are just documented incorrectly.

**For example:** If a WORK ORDER number change was made at 2pm, but you failed to retrieve the data until 3pm, then 1 hour of production will be incorrectly assigned to the previous work order number and not included in the new work order number. The totals are not lost; they are simply assigned incorrectly. Overall production totals are not affected.

## Examine a WSB

The screen will look like this:



The complete list of WSB units will be displayed in a drop down list. Select the WSB that you wish to examine. This option automatically retrieves information ONE TIME from one WSB unit. The Throughput, Settings, Recipe, Work Order, Operator, and Weight totals are retrieved. Three different display modes exist: totals, settings, and throughput. The totals display mode displays the current cumulative totals for the machine. The settings display mode displays the current material settings as a percentage of the total mix. The throughput display mode displays each material usage in terms of units (lb, kg, etc.) per hour.

## Materials

The screen will look like this:

Code	Description
COL-Black	Color-Black 25/1
COL-Blue	Color - Blue 25/1
COL-Gray	Color - Gray 25/1
COL-Green	Color - Green 25/1
COL-Red	Color - Red 25/1
COL-Yellow	Color - Yellow 25/1
IM	Impact Modifier
LDPE	Low Density Polyethylene
LLDPE	Linear Low Density Polyethylene

This option is for ADDING or CHANGING the MATERIALS file. This database should contain every material that you may possibly use in your plant.

**Code:** is the unique name that you give this material. This is an alphanumeric field with a maximum of 10 characters.

**Description:** is to help you identify this material. This is an alphanumeric field with a maximum of 40 characters. This entry is optional.

**Manufacturer:** is for your own information. This is an alphanumeric field with a maximum of 40 characters. This entry is optional.

Recipes that specify material names are restricted to selecting from materials that are contained in this database. If a recipe uses a material that you have not yet identified, make an entry in the database named something general like REGRIND, NATURAL, MATERIAL, COLOR, or UNKNOWN, and then specify this material in the recipe.

**REMEMBER:** All entries in a recipe must be found in the Material file.

## Recipes

The screen will look like this:

Code	Type	Recipe Name
101	12	PolyBag 2521 - Gray
301	12	PolyBag 4500 - Red
302	12	PolyBag 4500 - Yellow
303	12	PolyBag 4500 - Blue
304	12	PolyBag 4500 - Black
401	12	Closure 1200 - Red
402	12	Closure 1200 - Yellow
403	12	Closure 1200 - Green
404	12	Closure 1200 - Blue
700	12	PolyBag 7000 - Black
800	12	PolyBag 8000 - Green
900	12	Special 900 - Multi

	Material	Type	Setting
1.	RG-1	Regrind	10.0
2.	RG-LDPE	Regrind	10.0
3.	RG-PP	Regrind	10.0
4.	LDPE	Natural	100
5.	LLDPE	Natural	100
6.	PP-1	Natural	100
7.	COL-Blue	Additive	05.0
8.	COL-Gray	Additive	05.0
9.	COL-Red	Additive	05.0
10.	ABS	Additive	05.0
11.	IM	Additive	05.0
12.	UVR	Additive	05.0

This option is for ADDING and CHANGING RECIPES. You should add materials first before building recipes, since the recipes consist of various materials.

FOUR software allows only 3 components to be entered. These are regrind, color, and additive. Natural does not need a setting since natural always consists of the entire mix less the portion designated as the other components. However, you will specify what the natural component is, but you will not give it a setting.

TWELVE software allows entry of up to TWELVE component settings.

The SETUP file contains the list of valid component numbers based on your particular hardware configuration. This list restricts the recipe program to only component numbers that are valid.

NOTE: When you get started building recipes, you will discover that you must have some materials listed in the material database from which to choose. Recipes can only be constructed from materials in the MATERIALS file. To make the job of getting started a little easier, you could place a few generic materials in the MATERIALS file. For example: enter three materials called “additive”, “regrind”, and “natural.” Then if you wish to enter a setting for an additive into a recipe but do not know exactly what color it will be at this time, you may just call it ADDITIVE.

**REMEMBER:** Without a material in the MATERIAL list, you will not be able to enter a setting into the RECIPE file.

## Download Settings / Recipes to a WSB

The screen will look like this:

The screenshot shows a software interface for downloading settings to a WSB. At the top, it displays 'WSB # 4' and 'Recipe Type: 12'. Below this, there are two columns of settings: 'Current Recipe #' (900) and 'New Recipe #' (900). The recipe name is 'Special 900 - Multi'. Further down, 'Current Operator #' is 140 and 'New Operator #' is 110. 'Current Work Order #' is 602061 and 'New Work Order #' is 602456. A central area features a '> Copy >>' button between two identical tables labeled 'Current Recipe' and 'New Recipe'. Each table has columns for Material, Type, and Setting, with 12 rows of data. At the bottom, there are three buttons: 'Exit', 'Send to WSB', and 'Show Recipes'.

<i>Current Recipe</i>			<i>New Recipe</i>		
Material	Type	Setting	Material	Type	Setting
1. RG-1	Regrind	10.0	1. RG-1	Regrind	10.0
2. RG-LDPE	Regrind	10.0	2. RG-LDPE	Regrind	10.0
3. RG-PP	Regrind	10.0	3. RG-PP	Regrind	10.0
4. LDPE	Natural	100	4. LDPE	Natural	100
5. LLDPE	Natural	100	5. LLDPE	Natural	100
6. PP-1	Natural	100	6. PP-1	Natural	100
7. COL-Blue	Additive	5.0	7. COL-Blue	Additive	5.0
8. COL-Gray	Additive	5.0	8. COL-Gray	Additive	5.0
9. COL-Red	Additive	5.0	9. COL-Red	Additive	5.0
10. ABS	Additive	5.0	10. ABS	Additive	5.0
11. IM	Additive	5.0	11. IM	Additive	5.0
12. UVR	Additive	5.0	12. UVR	Additive	5.0

The complete list of WSB units will be displayed in a drop down list. Select the WSB to which you wish to download a recipe. The current settings for the unit you have selected are displayed in the “current” column. The display provides for 12 components regardless of the number you are running. You may alter the current settings and send them back to the controller without selecting a recipe, by means of the “Copy” button. Alternatively, you may select a new recipe from the recipe file and compare the new recipe with current setting information before downloading. You may alter the new recipe settings before they are downloaded. Note that changed settings are not saved in the recipe file. Press the “Show Recipes” Button to display a list of recipes.

**CAUTION:** When a recipe is downloaded to a controller that has FOUR software, the thumbwheels will become DISABLED. They can only be re-enabled at the controller by using the password and the “set” key. For more information, see the WSB Manual.

## Retrieval Times

The screen will look like this:

Time	Description
12:30 AM	Start of 3rd shift and Beginning of Day
8:30 AM	Start of 1st shift
4:30 PM	Start of 2nd shift

This option is for adding or changing retrieval times. Data will be retrieved from ALL WSB units at the times that are listed in this file. Totals for material usage may then be summarized for the time periods between these listed times.

Times should be entered in standard AM/PM format. Military times are NOT used. Enter the time, then use the SPACE bar to toggle between AM and PM. For NOON, enter 12:00 PM.

MIDNIGHT, 12:00 AM, is present in the list as a default time. You do not have to keep it, but you do need to have at least one time in the file at all times. Since reports are run from one selected date to another, it is necessary to retrieve data at least once a day to keep totals properly assigned to the correct date. Therefore, there always needs to be at least one time in the time list. It follows, for the same reason, that all reports will break production at the first time of the day. For example, if the first time in the list is 6:00 am, then all material used from Midnight to 6:00 am will be assigned to the previous day. This gives the ability to indirectly set your end of day at 6:00 am, for example, instead of midnight—the default.

## Reports

A sample report selection screen may look like this:

**Weigh Scale Blender Communications**

Exit WSB Recipes Setup Utilities Reports

Begin Report Cancel

Send Output To  
 Window  Printer  File

Limit Report By

Start Date 9/13/95  Limit Materials

Stop Date 9/15/95  WSB # 4

Recipe # 401

Selected	Time	Description
Selected	12:30 AM	Start of 3rd shift and Beginning of Day
Selected	8:30 AM	Start of 1st shift
Selected	4:30 PM	Start of 2nd shift

Selected	Material	Description
Selected	COL-Blue	Color - Blue 25/1
Selected	COL-Gray	Color - Gray 25/1
Selected	COL-Green	Color - Green 25/1
Selected	COL-Red	Color - Red 25/1
Selected	COL-Yellow	Color - Yellow 25/1

All reports are based upon the data collected by the MLAN “Constant Scan” routine which is placed in the TOTALS file. This file is then used to produce all of the reports. The reports are limited to information that can be derived from this data. For you to obtain meaningful reports, the times file must be set up to retrieve information at times that are meaningful to your operation, and the scan program must be left on and should be running at all times. You will probably want to pause the scan operation during report generation to speed up the report process.

MLAN produces reports showing separate totals for all materials blended between two dates broken down by date, time period, machine number, operator number, recipe number, and/ or work order number. All reports may be limited to certain a date range, time periods, and/ or a specific machine number. Some reports may also be limited to a specific operator number, recipe number, and/ or work order number.

**OUTPUT DEVICE:** Reports can be output to a Window, Printer, or File

- Select **Window** to output the report to the SCREEN.
- Select **Printer** to output to a PRINTER.
- Select **File** to output the report to a disk file. A file name will be requested.

**Start Date / Stop Date:** All material usage reports request a start date and stop date. Enter dates in the format specified in the setup screen, such as MM/DD/YY. All reports are limited to information between and including these two dates.

**WSB #:** All material usage reports default to including all WSBs. Selecting the **WSB #** check box and entering a blender number will limit the report to just that blender number.

**Materials:** All material usage reports are broken down by each type of material processed. By default all materials will be included in the report. Select **Limit Materials** to limit the report to one or more materials.

NOTE: Reports can only identify materials if:

- a recipe number was stored in the controller at the time the blend was run, and
- a recipe exists for this number in the computer at the time the report is run.

If a recipe number was not stored, material used will be specified as HOPPER 1, HOPPER 2, HOPPER 3, etc. The recipe number is used to reference the recipe file and, from there, cross reference the material file to identify exactly what materials were run. This is the key to accurate inventory tracking and control.

**Recipe #:** Recipe related material usage reports default to include all recipes. Selecting the **Recipe #** check box and entering a recipe number will limit the report to that specific recipe number.

**Operator #:** Operator related material usage reports default to include all operator numbers. Selecting the **Operator #** check box and entering an operator number will limit the report to that specific operator number.

**Work Order #:** Work order related material usage reports default to include all work orders. Selecting the **WORK ORDER #** check box and entering a work order number will limit the report to that specific work order number.

**Time Related Reports:** When a time related report is requested, the times list will appear. You must indicate the times you wish to select for the report. Times are selected by clicking on the time, to select all times click on the column header. Deselecting times is done in the same manner.

The times listed are retrieval times that were previously set up in the times file. When a report is run with all times selected, then the totals that you get will be for all time periods between all of the times listed. When only a few times are selected, totals are larger, reflecting the longer time periods between the selected times.

For example: Selecting only 1 time period will give totals that represent a full 24-hour time period. Likewise, selecting times that mark the end of each shift will give the totals for each shift.

Sample report (output to window)

Date	Time Range	Recipe #	Material Name	Totals (Pounds)
09/13/1995	00:30 - 08:30	401	CCL-Red	184.7
			PP-1	4,619.3
			RG-PP	1,201.1
			<i>Sub Total</i>	<b>6,005.1</b>
<i>Sub Total for 00:30 - 08:30</i>				<b>6,005.1</b>
09/13/1995	08:30 - 16:30	401	CCL-Red	92.2
			PP-1	2,306.3
			RG-PP	599.7
			<i>Sub Total</i>	<b>2,998.2</b>

## Purge Totals

This option is for **REMOVING RECORD**(s) from the totals file. The Purge Total screen will look like this:

**Purge Totals**

Exit      Advanced Purge

Purge All Error Records

Enter date before which all records should be purged.

Purge End Date    10/13/95      Purge Records Now

There are two modes of operation: purging communication error records and purging records. At any time, communication error records may be purged by activating the **Purge All Error Records** button.

The other mode is purging of totals records. The records are selected by entering a **Purge End Date**. The purge end date is the date before which all records will be purge. For example, if the date entered was January 1, 1996, all records in 1995 or earlier would be deleted but not the records from January 1, 1996 or later. The actual deletion of the records happens by clicking on the **Purge Records Now** button. At this point you can enter a different date to select more records or exit from this option.

**FIELDS:**

**Purge All Error Records:** Permanently deletes all communication error records from the totals file.

**Purge End Date:** The date before which all records will be purge. The date format is dependent on the current setting found on the Setup File, e.g. MM/DD/YY.

**Advance Purge:** Displays the advance purge screen (see below).

**Exit:** Exit from the purge totals option.

**Purge Totals [Advanced]**

The Purge Totals [Advanced] screen will look like this:

**Limit Purge By**

Start Date: 09/15/95     WSB #: 4     Work Order #: 509141  
 Stop Date: 09/17/95     Recipe #: 800     Operator #: 251

Selected	Date	Time	Id	Kind	Type	Work Order	Operator	Recipe	Cyc
	09/15/1995	16:37	4	2	12	509141	251	800	1
	09/16/1995	00:30	4	2	12	509141	251	800	1
	09/16/1995	08:30	4	2	12	509141	251	800	1
	09/16/1995	10:30	4	2	12	509141	251	800	1
<b>Selected</b>	09/16/1995	12:30	4	2	12	509141	251	800	2
	09/16/1995	14:30	4	2	12	509141	251	800	2
	09/16/1995	16:30	4	2	12	509141	251	800	2
	09/17/1995	00:30	4	2	12	509141	251	800	2

Buttons: Load Totals, Reload With Next Totals, Purge Selected Records

This option offers a more controlled method of removing records from the totals file. There are two modes of operation: selecting/deleting or displaying/selecting/deleting.

Both methods start by establishing the record selection and retrieval criteria. The first criterion is the start date and stop date (if blank the start date defaults to the date of the first record in the file and stop date to the last record in the file). The optional criteria are the WSB #, Recipe #, Operator #, and/or Work Order #.

The next step is to choose whether or not the records should be displayed. If you choose not to display the records, the next step is to select the records by using the **Select Records** button. You may then delete the records by using the **Purge Selected Records** button. At this point you could select more records or exit from this option.

If you choose to display the records, the next step is to load the records in the grid by clicking on the **Load Totals** button. Records are marked for deletion by clicking on the record in the grid. To select all records, click on the column header. You may unmark a record by clicking on the record a second time. If the record you want does not appear in the grid, you may choose a new start date or walk through the file by using the **Reload With Next Totals** button. This button will load the grid starting from the last record currently in the grid. Note, this button is enabled only if the grid is filled to its capacity. Once you have selected the records, they may be deleted by clicking on the **Purge Selected Records** button. At this point you could select more records or exit from this option.

## **FIELDS:**

**Display Records:** If checked, records from the totals file are retrieved and placed into a grid.

**Start Date / Stop Date:** The totals are selected/retrieved from the requested start date to the stop date. The start date defaults to the date of the first record of the totals file. The stop date defaults to the date of the last record in the totals file. The date format is dependent on the current setting found on the Setup File, e.g. MM/DD/YY.

**WSB #:** If checked, the selected records are limited to records with a WSB ID number that matches the number entered.

**Recipe #:** If checked, the selected records are limited to records with a recipe number that matches the number entered.

**Operator #:** If checked, the selected records are limited to records with an operator number that matches the number entered.

**Work Order #:** If checked, the selected records are limited to records with a work order number that matches the number entered.

**Select Record:** In non-display mode, selects records to be deleted based on the following criteria:

- Start Date
- Stop Date

- WSB #, if checked
- Recipe #, if checked
- Operator #, if checked
- Work Order #, if checked

**Load Totals:** Retrieves records, starting with the first record after the start date, until one of the following is true:

- All records are loaded into the grid.
- The grid is filled to capacity.

**Reload With Next Totals:** Retrieves records, starting with the last record currently in the grid, until one of the following is true:

- All records are loaded into the grid.
- The grid is filled to capacity.

The last record in the grid will now become the first record in the grid. (Note, this button is enabled only if the grid is filled to its capacity.)

**Purge Selected Records:** Permanently deletes all selected records.

**Exit:** Exit from the purge totals option.

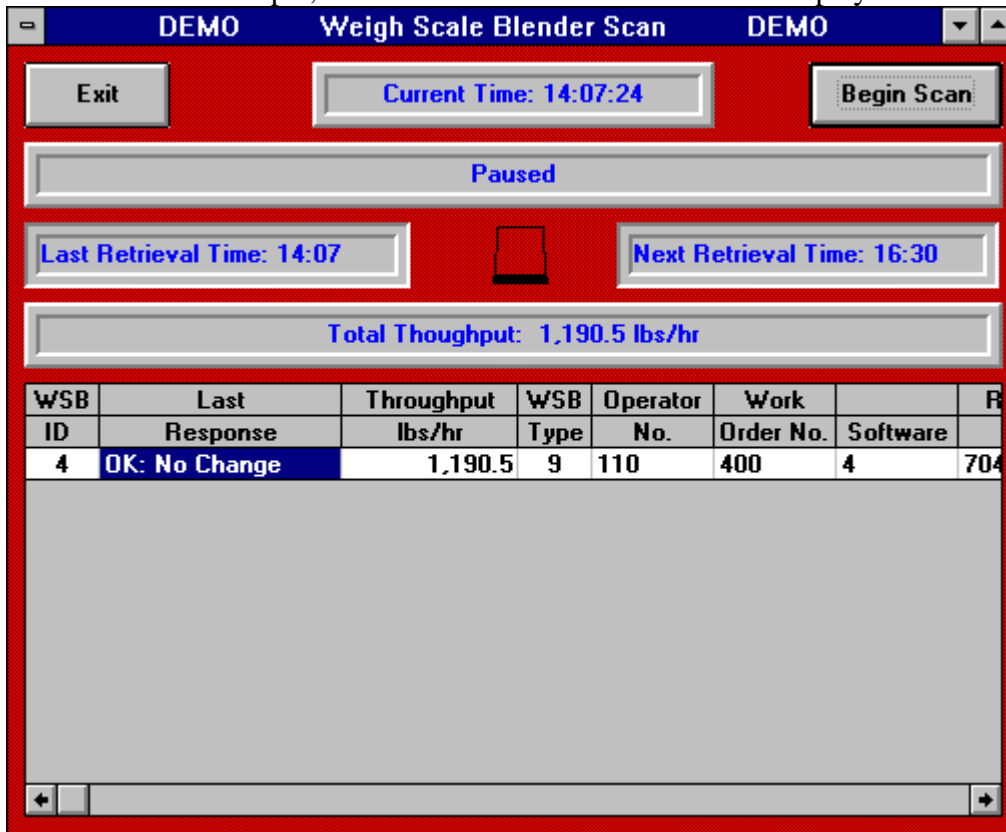
## VIII. Command Line Parameters

The following command line parameters change the behavior of the program.

- |                    |   |
|--------------------|---|
| <b>/Debug</b>      | Turns on the debug flag. Only to be used during program testing. Note, this option may not be available in all versions.  |
| <b>/Version</b>    | Displays the program version number and copyright information.  |
| <b>/Demo</b>       | Puts the program in demonstration mode. Demonstration mode simulates all controllers and uses a different set of files than the regular mode.   |
| <b>/CopyToDemo</b> | Copies the regular file set to the demonstration mode file set and puts the program in the demonstration mode. Note, this command is a <b>ONE WAY</b> copy. <b>NO</b> method is provided to copy the domestication mode file set to the regular file set. |

## Demonstration Mode

The first noticeable difference in demonstration mode is that the all screens have the word “DEMO” displayed in their title. For example, the demo screen of constant scan is displayed below.



Another difference in the demonstration mode is that this mode uses a different set of files than the regular mode. WSB ID numbers ranging from 1 to 100 are assumed to be 4 component software and 101 to 200 are assumed to be 12 component software. WSB ID numbers 201 to 254 are invalid and currently result in a communication error when scanned.

All communication with a blender is simulated. The simulated blender makes one batch per minute, and rate (cycle time) is fixed. The throughput of a simulated blender is 12,000 g/hr for blenders weighing in tenths of grams (100 and 200 Series) and 540000 g/hr for blenders weighing in grams (400, 900, and 1800 Series).

Recipe related information is stored for each simulated blender. The simulated blender tracks the recipe, recipe number, operator number, work order number, and totals for each component. Additionally, it automatically updates blender totals when the totals are requested and stores them in an extra database file.

## IX. MLAN Files

This section is intended to provide a better understanding of the information that is stored in each file. The data files are Microsoft Access 2.0 database files. This means that with a little knowledge of Microsoft Access you can use it to convert the data to another format.

### WINWSBS.MDB - The Setup File

The SETUP file stores the following information:

Communication Port:	COM1, COM2, COM3, COM4
Weigh Unit:	Pounds, Kilograms, Grams, Ounces
Software:	Four, Twelve, Both
Weigh Scale ID #:	Numbers from 1 to 254
Components:	Hoppers 1 through 12
Date Format	MM/DD/YY, DD/MM/YY, YY/MM/DD

### TOTALS.MDB - The Totals File

Material usage information is retrieved at certain specific times.

1. Whenever a time specified in the time file is reached, all controllers are polled for information.
2. Whenever a **setting**, **work order number**, **operator number**, or **recipe number** changes on any single WSB controller, that controller is polled for information.

When a retrieval is requested, a series of totals is sent back to the computer. These are cumulative weight totals for each component. This information is saved to the totals file.

These totals are always growing unless you intentionally reset this data to zero. Interim totals for a single time period since the last retrieval are calculated by subtracting previous from current totals. This method of maintaining constantly growing totals assures that a single lost data line will not result in permanently lost information and subsequently inaccurate totals over an extended time period.

There is never any need to clear totals to zero. When they overflow their register, the software detects this and makes the proper calculations to maintain accurate information. The totals will grow to 429,496,729.6 grams (or 4,294,967,296 grams, depending on the blender type) before overflowing to zero. Each recorded line of information retrieved contains the following information:

Current date	Date at moment of retrieval
Current time	Time at moment of retrieval
WSB ID number	3 digit permanent WSB ID number
Blender WEIGHT type	1 digit; 2 or 9 (1/10 or full gram weight)
SOFTWARE type	4 or 12 (four or twelve component)
WORK ORDER number	6 digit work order number
OPERATOR number	3 digit operator number
RECIPE number	3 digit recipe number, if any is loaded
Cycles	Number of cycles dispensed

For each component:

TYPE	1 character (R, N, C, or A). Four component software will show R, N, C, A for components 1, 2, 3, and 4. Twelve software will have R, N, or A.
SETTING	3 digit current setting.
USAGE WEIGHT	Grams of materials used, this component.

The CURRENT DATE and time are determined and assigned according to the date and time of the computer, not the individual WSB controllers.

The WSB ID number is a unique 3-digit number (001 to 254) that has been entered into the memory of each WSB controller. This number must also be listed in the setup file of the computer.

The blender WEIGHT mode number is either 2 or 9. All 100 and 200 series models will send back a 2. These models use load cells that read weights in tenths of grams. All 400, 900, and 1800 series models will send back a 9. These models use load cells that read weights in full grams.

SOFTWARE type is either 4 or 12. A four indicates that four component software is being used by the controller. A twelve indicates twelve component software is installed.

The WORK ORDER number may be downloaded from the computer or entered at the controller using the keypad. This 6-digit number is a part of all lines of data retrieved. Reports can summarize material used according to work order number.

The OPERATOR number may be downloaded from the computer or entered at the controller using the keypad. This 3-digit number is a part of all lines of data retrieved. Reports can summarize material used according to operator number.

The RECIPE number allows you to cross reference material usage information to a materials file for automatic and accurate inventory control. The recipe number is a 3-digit number that is stored in the recipe database.

The MATERIAL USAGE (weight) numbers are stored as grams or tenths of grams and are converted to pounds (or kilograms) when printed or displayed. Gram storage of numbers assures maximum accuracy and minimum error from rounding.

## **MATERIAL.MDB - The Materials File**

The MATERIALS file contains:

Code Name	10 character material identification name
Description	40 character descriptive name
Manufacturer	40 character supplier name
Recipes	number of recipes that this material appears in

This file holds all of the various materials that are available for blending and that may become part of a recipe. All recipes are built using materials that reside in this list. Note, the total number of materials is limited to 2000.

### **RECIPE.MDB - The Recipe File**

The RECIPE file contains:

Recipe #	3 digit identification number (100 to 999)
Name	40 character descriptive name
Recipe type	four component of twelve component
For each component:	
TYPE	TYPE designation (R, N, A) is required by 12 software. Four software specifies (R, N, C, A)
SETTING	3-digit setting required by the WSB
MATERIAL	10-character material name necessary for correct inventory control

This file contains all the Material Blend RECIPES that you are going to run. Other blends are possible by entering settings individually but if you store a blend recipe for future retrieval, then it is stored here. As a recipe is built, all materials specified must reside in the MATERIALS file.

### **RTIMES.MDB - The Retrieval Times File**

This file contains:

RETRIEVAL TIME	2 integers, one for hours, one for minutes. Range is 01:00 to 12:59; time when a retrieval should occur
AM or PM	1 character flag
DESCRIPTION	40 characters, optional -for identification only