Parameter 83: TIME FORMAT MODE

This parameter controls if your using 12 hour or 24 hour (military time) clock settings. If you are using 12 hour mode then you must also indicate whether you are currently in AM or PM.

To change or view the time format enter 83 followed by the Print Select Key. Enter 0,1 or 2 followed by the TARE key to change the mode. The values are shown below.

- Enter 0 for 24 hour mode
- Enter 1 for 12 hour mode AM
- Enter 2 for 12 hour mode PM

You may press CLEAR at any time to cancel.

Battery Replacement on the M2000

The M2000 uses a 3V Lithium Battery to run the real time clock and backup the indicators memory. Power is drawn from the battery only when the indicator is disconnected from the 12V supply. So if the indicator is in regular use, then the battery should have a long lifespan.

Testing Battery (calibration mode)

Parameter 244 in calibration can be used to take a measurement of the 3V lithium battery. Voltage levels are in mV and can be interpreted below.

3000 (3V) and above considered good
2700 (2.7V) and above considered acceptable
2600 (2.6V) and below considered as low – replace battery

Replacing Battery

The back cover of the indicator has to be removed to replace the battery. Once removed you will see in the left corner a coin size battery in a battery holder. Using your fingers grab each edge of the battery and gently pull on an angle removing the battery from the holder.

Replace the battery with a type **RENATA CR2450N 3V 540mAh lithium battery** or equivalent. This battery should be available at an electronics store like Radio Shack.

Note: Never use metal objects such as screwdrivers to remove the battery. This can result short-circuiting the battery and damaging the indicator and is dangerous.

Printing with the M2000

Tickets can be created and edited in the M2000. The M2000 can hold several different ticket formats for different applications. Tickets are stored and called by ticket numbers. Ticket numbers *can be anywhere between 200 and 299* and is assigned by the indicator when you create a new ticket.

You can have several tickets in the ticket buffer. To recall a ticket you must enter the ticket number followed by the Print/Select key. For example to print ticket 201 enter 201 followed by the print select. Ticket 201 will be printed. The indicator always remembers the last ticket number printed. So if you press Print/Select again the last ticket number used is printed. If you want to change the ticket to 205 enter 205 followed by the print select key and the indicator will now print ticket 205 until it is changed. Default ticket numbers can be assigned automatically when the indicator powers up.

Note: It is important to note that in order to print tickets that COM ports on the M2000 must be set up to do so. See parameters 34 and 35 is the section on serial communications. The factory default is COM1 setup for printing at 9600 baud.

Note: If you try and print and there is motion, or the scale is overweight then a message will scroll across the display "Cannot Print". It is important to understand that if you are in Channel 1 and Channel 3 is overweight, or not connected to a load cell then you still will get the cannot print message even if you are not on Channel 3. Make sure that unused channels are disabled in Calibration using parameter 98.

To edit or create a new ticket you must be in calibration mode.

Calibration parameters used for ticket editing

The following calibration parameters are used for working with tickets:

84 Add a new ticket
If you are creating a new ticket from scratch then press parameter 84 followed by the print select key. The indicator will search for the next available empty ticket number. This number will be displayed on the display as TICXXX, where XXX is the new ticket number. Make note of this number, as you will need this number to recall the ticket later. The indicators display will switch to the ticket editor.

85 Edit exiting ticket
If you want to make changes to an existing ticket press 85 followed by the print select key. You will be prompt with the message “TIC”. Enter the ticket you want to edit. If the ticket exits the display will go into ticket edit mode.

86 Number of tickets
Press 86 followed by the print select key will display the number of tickets in the buffer.

87 Display Memory
This function displays how much of the ticket memory has been used for tickets. The M2000 has 2Kbytes for tickets.

88 Clear Ticket Memory
This parameter totally wipes the ticket memory. All ticket data will be lost.

89 Delete Ticket
To delete a ticket press 89 followed by the print select key. The display will prompt you with “TIC”. Enter the ticket that you want to delete followed by the print select key.

91 Assign PRINT/SELECT key
This parameter allows you to select which ticket will be the default ticket when the indicator powers up. So when Print is pressed for the first time the ticket number that is set in this parameter will be used to print the ticket.

92 Assign IN key
The IN key on the keypad can be assigned a ticket number. Normally this intended for a ticket for a truck in sequence.

93 Assign OUT key
The OUT key is the same as the IN key and can be assigned a ticket number. This key is normally used for truck out sequence.

95 Assign Barcode Scanner key
If you are using a barcode scanner with the M2000 you have the option of printing a ticket when a scanner scans a barcode. Assign the ticket number you want to print or enter 0 to disable printing.

The Ticket Editor

The ticket editor is used to modify your ticket data. Ticket data is composed of standard ASCII characters used to define the characters printed on the printer. Control function codes are embedded in the ticket strings to send control codes to the printer.

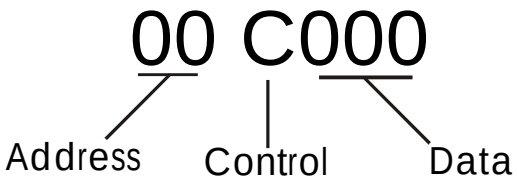
Because all character entry is ASCII, any escape control function for your printer can be generated. Special printer control codes for example for a paper cutter on a printer, or switching to a different color ribbon can be implemented. Your printer user manual should have a table of escape codes in the back of the manual.

The M2000 also has a library of commonly used escape codes for your printer to choose from.

Editing Tickets

To create a new ticket enter parameter 84 while in calibration mode. The indicator will search for the next available ticket number and flash briefly the ticket number that you will be using. The display will then go into ticket editor mode.

When you are in the ticket editor the display will change to the format below:



The first 2 digits represent the address, or character position in your ticket string. It is a 2-digit address that rolls over to zero again if your ticket exceeds 99 characters. It is only used as a reference for when you are scrolling through your ticket string. Your ticket can be longer than 99 characters.

The ‘C‘ character in the middle of the display is the “control code” indicator and may or may not be displayed. If a ‘C’ or ‘P’ character is displayed then this indicates that the data value shown is a Control Code. A ‘C’ code represents an *indicator specific* control code. A ‘P’ code is a *printer specific* control code. More on Control Codes will be discussed later.

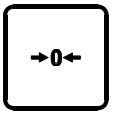
The last 3 digits is the data display field. Whatever value is displayed here represent your ASCII character. If there is a ‘C’ or ‘P’ character displayed in front of the data field then the value shown here is a control code and not a printable ASCII character.

Keys used by the ticket editor

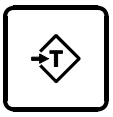
Entering into ticket editor mode is done using Parameter 84 or 85.

The following keys are used to edit a ticket:

Move to the left in the ticket string.
Pressing the ON/OFF key scrolls the display one character to the left. If the address display shows 00 then you are at the beginning of the ticket.



Move to the right in the ticket string.
Pressing the ZERO key scrolls the display once to the right. If you are at the end of the ticket, then “END” will be displayed.



This key is used in conjunction with the above two keys. Pressing the key once followed by one of the above keys will jump to the next LF character. Pressing the key twice will jump to the beginning or end of the ticket.

Functions as an ENTER key for entering data. All data entry must terminate by the print select key.

This important key is used to toggle between normal ASCII entry mode and Control Code mode. Pressing the decimal once will display the ‘C’ control code. Pressing it again will display ‘P’ and pressing the decimal key for the third time will return you back to ASCII entry mode. You may press the CLEAR key at any time to abort command mode and return the display back to its previous state. After you have pressed the decimal key you then enter the numeric value followed by the PRINT/SELECT key. You have now entered a control code.

More on Control codes

As mentioned the above control codes are entered using the decimal key prior to entering a code number. Control codes represent functions such as printing time and date, or weight on a ticket. When the indicator sees a control code in the ticket string while printing, a specific indicator control function is performed.

A table listing of control codes follows shortly. When editing a ticket any value with a preceding 'C' character means it is a control code or 'C' code.

How to exit the ticket editor

To exit the ticket editor use control code C99 (decimal followed by 99 print/select) to return back to calibration mode. If you want to exit abandoning changes use C98. Tickets are not permanently saved until you exit calibration mode and return back to weighing mode.

How to delete a character in the editor

To delete a character entry in the ticket editor use control C1 (decimal 1 print/select) to delete a character.

How to overwrite a character

To overwrite a character entry use C2 (decimal 2 print/select). The editor will replace the entry with zeroes signaling for you to enter in the new value. Note that when you press print/select to enter the new value the editor will not increment to the next location automatically.

How to insert a character in the editor

You can insert a character any time. The editor is always in insert mode. To insert a new entry in between other characters, simply position the editor where you want to insert a character in the ticket and type in a new character. The character that was displayed on the display prior to you inserting a new character is pushed forward one in the ticket to make room for the new character entry.

Example:
You have a ticket with the letters ABDEF. You want to insert the letter C. Move the editor to point to D and type in the letter C. The ticket will now be ABCDEF. *Note: the above example shows letters, you would actually be seeing ASCII numeric values in the editor.*

How to Jump to the beginning or end of the ticket

Double press the TARE key followed by the direction you want to jump. Use the ON/OFF key to jump the beginning and the ZERO key to jump to the end of the ticket.

If you only press the TARE key once you will jump forward or backwards to the next LINE FEED character (character 10).

Indicator Specific Function Codes

The following codes in the table below are used in tickets to execute indicator specific print functions. Not all codes print at all, some perform internal operations inside the indicator.

To enter an indicator specific control code press the decimal key (you will see the 'C' character appear) followed by the numeric code from the table below. Press the PRINT/SELECT key to accept the code. You may also press CLEAR to cancel the code entry.

Ticket Specific Control Codes	
20	**Print time (HH:MM:SS)** Print the time from the internal real time clock
21	**Print Date (YY:MM:DD)** Print the date from the real time clock

22	**Clear ACC1 register** Internal accumulator1 register for accumulating weight. This will be cleared to 0.
23	**Add Displayed Weight to total of ACC1** Add whatever weight is on the display to the accumulator1 register. This can be GROSS or NET weight depending what mode the indicator is in.
24	**Print ACC1 register** Print the value in the accumulator register.
25	**Add Gross Weight to total ACC1 weight** Same as parameter 23 but the GROSS weight is added to the accumulator1 regardless if the indicator is in NET mode or not.
85	**Store ACC1 register to Truck IN loop** This function is used for truck in/truck out weighting. Store weight in ACC1by ID number to memory. This function prompts the user to enter an ID number from the keypad. The ID is checked and an error is given if there are duplicate ID numbers. When a duplicate ID number is found the ticket aborts. Use parameter 86 below to retrieve the stored weight.
86	**Truck OUT loop using ACC1 register for outbound weight** Recall weight by ID from memory when a truck leaves the facility. This function searches the memory for a truck by it's ID number

	entered using parameter 85 above. This function prompts the user to enter an ID number. It then searches the memory for a matching ID. When an ID match is found the weight is retrieved. If the ID number cannot be found in memory then an error is given and the ticket aborts. After the weight is retrieved the ID number is deleted and its weight is deleted from memory. After the weight has been retrieved from memory the function compares the retrieved inbound weight with the outbound weight currently stored in ACC 1; If the inbound weight is less than the outbound weight it becomes the tare weight and the outbound weight becomes the gross weight. If the inbound weight is greater than the outbound weight it becomes the gross weight and the outbound becomes the tare weight. After this function is called you can use functions 74,75,76 to print gross, tare and net weights.

26	**Clear ticket counter register to 0** There is an internal counter that can be incremented. This can be serializing tickets, and counting axels. This function clears the counter to zero.
27	**Increment Ticket Counter by 1** Increments the internal counter by 1
28	**Print ticket counter count value** Prints the 3 digit internal counter value.

30	**Print gross weight (Ch 1)**
31	**Print gross weight (Ch 2)**
32	**Print gross weight (Ch 3)**
33	**Print tare weight (Ch 1)**
34	**Print tare weight (Ch 2)**
35	**Print tare weight (Ch 3)**
36	**Print net weight (Ch 1)**
37	**Print net weight (Ch 2)**
38	**Print net weight (Ch 3)**
39	**Print total of all active channels** **Whatever channels are active will be summed and printed.**

50	**Turn Unit printing OFF** Whenever a weight is printed the units kg or lbs will follow the weight depending on the units of weight being printed. This functions turns unit printing off.
51	**Turn Unit printing ON** Only required to be used if unit printing was turned off earlier. Unit printing is on by default.

70	**Truck IN loop** This function is used for truck in/truck out weighting. Store weight by ID number to memory when a truck enters the facility. This function prompts the user to enter an ID number from the keypad. The ID is checked and an error is given if there are duplicate ID numbers. When a duplicate ID number is found the ticket aborts. The weight in stored together with the entered ID number and time and date. Use parameter 71 below to retrieve the stored weight.
71	**Truck OUT loop** Recall weight by ID from memory when a truck leaves the facility. This function searches the memory for a truck by it ID number entered using parameter 70 above. This function prompts the user to enter an ID number. It then searches the memory for a matching ID. When an ID match is found the weight is retrieved. If the ID number cannot be found in memory then an error is given and the ticket aborts. After the weight is retrieved the ID number is deleted and its weight is deleted from memory. After the weight has been retrieved from memory the function compares the retrieved inbound weight with the outbound weight currently on the scale. If the inbound weight is less than the outbound weight it becomes the tare weight and the outbound weight becomes the gross weight. If the inbound weight is greater than the outbound weight it becomes the gross weight and the outbound becomes the tare weight.

	After this function is called you can use functions 74,75,76 to print the gross, tare and net weights.
72	**Add a truck ID number and weight to database** This function is similar to function 70, but stores the weight permanently in FLASH memory. Up to 150 trucks can be stored.
73	**Recall truck ID from database** This function searches the FLASH memory for a matching ID number. The weight is then retrieved and stored in the inbound weight register. The ID number is not deleted from the database. The outbound weight register gets updated with the current weight on the display.
74	**Print Truck loop GROSS weight** Prints the gross weight from the truck loop database. Note that this weight is updated after parameter 71 is called.
75	**Print Truck loop TARE weight** Prints the tare weight from the truck loop database. Note that this weight is updated after parameter 71 is called.
76	**Print Truck loop NET weight** (truck loop Gross – truck loop NET) Note that this weight is updated after parameter 71 is called.
77	**Print Tare weight time stamp** When a truck weight is stored to the database using parameter 70, the time and date is stored with it. You can use this function to print the time stamp when the truck weighed in.
78	**Print Gross weight time stamp** Same as parameter 77 but prints the current time and date for the final outbound transaction.
79	**Print the current ticket ID** Prints the number in the ID register that was entered for truck in or out.

100	**Reassign Ticket number to Print/Select key** This is a powerful feature that allows you to reassign another ticket to the Print/Select key. An example of this is in axle weighing. The first key press prints the header and time/date and the first axle. After that a new ticket is assigned to the Print/Select key so that every subsequent key press prints only axles. The next ASCII value following this command code is the ticket number to reassign to. Invalid ticket numbers are ignored.
101	**Reassign Ticket number to IN key** Same function as parameter 100 but reassigns a ticket number to the IN key.
102	**Reassign Ticket number to OUT key** Same function as parameter 100 but reassigns a ticket number to the OUT key.
103	**Call and Return to another Ticket number** Jumps to another ticket number. This is handy for example if you have one ticket assigned to print the company header time and date. You can call this ticket from another ticket every time you need to repeat the function. When the end of the called ticket has been reached it returns to the ticket it was called from and that ticket continues where it left off. The next ASCII value following this command code C103 is the ticket number to jump to. Invalid tickets numbers are ignored.

* Not available on this version of software. To be added soon.

200	**Copy Displayed Weight to ACC1** What ever weight is on the display is copied to ACC1.
201	**Copy Gross Weight to ACC1** Same as 201 but only the gross weight is copied regardless if the display is in net.

220	**Clear ACC2 register** Internal accumulator2 register for accumulating weight. This will be cleared to 0.
230	**Add Displayed Weight to total of ACC2** Add whatever weight is on the display to the accumulator2 register. This can be GROSS or NET weight depending what mode the indicator is in.
240	**Print ACC2 register** Print the value in the accumulator register.
250	**Add Gross Weight to total ACC2 weight** Same as parameter 230 but the GROSS weight is added to the accumulator2 regardless if the indicator is in NET mode or not.

251	**ACC4=ACC1+ACC2**
252	
253	**ACC4=ACC1/ACC3** If ACC3 is zero then the division is aborted and ACC2 remains unchanged.
254	**ACC4=ACC1-ACC3**
255	**Print ACC4 register** Print the weight value in the accumulator register.
256	**Print ACC4 as an integer number (not formatted as weight)** Same as 255 but prints the register as it with no weight formatting. Use this code when you are printing none weight specific numbers.

257	**Clear ACC4 to 0**
258	**Decrement ACC4 by 1**
259	**Increment ACC4 by 1**
260	**Copy ACC1 to ACC4**
261	**Copy ACC2 to ACC4**
262	**Copy ACC3 to ACC4**
263	**Copy ID register to ACC4**
264	**Copy Ticket Counter to ACC4**
*265	**Copy Inbound Weight register to ACC4**
*266	**Copy Outbound Weight register to ACC4**
267	**Copy ACC6 to ACC4**
268	**Copy KEY to ACC4**
269	**Copy ACC4 to KEY**
270	**Copy ACC4 to ACC1**
271	**Copy ACC4 to ACC2**
272	**Copy ACC4 to ACC3**
273	**Copy ACC4 to ID register**
274	**Copy ACC4 to ACC6**
275	**Initialize ACC4 with values 0-999** Use this code to load a value into the accumulator. The next data entry after C275 is the value loaded. If you need to enter a value larger than 999 then use code 276.
276	**Initialize value in ACC4** This function allows you to embed values within the ticket. After command C275 the indicator looks for ASCII characters that represents numbers. The only legal ASCII values are 48 to 49 (0-9). The first non numeric ASCII character that is encountered terminates the number entry. Example you want to enter the value 1000 into ACC4. So the data entry into the ticket editor would be ‘C275’, ‘49’,’48’,’48’,’48’.

279	**Take a percentage of ACC1 and copy the result to ACC3.** The percentage value is determined by ACC6. Example ACC1 is 1000 and ACC6 is 80. ACC3 will then hold the value of 800 which is 80% of 1000. The value is rounded to the nearest division (1,2,5). If ACC6 is above 99 (>99%) then this function is not performed.

*280	**Store ACC4 to the Loop Database with reference to the ID register and the KEY register** Take the weight in ACC4 and store it in the loop database. The ID number in the ID register is used as the reference. If the ID number already exists then an error will be reported.
*281	**Store ACC4 to the Loop Database with reference to the ID register and the KEY register (over write mode)** Same as parameter 280 but does not check if the ID number already exists. If the number exists then overwrite with the new value in the ACC4 register.
*282	**Recall Loop Database value to ACC4** Searches the database using the record number in the ID register and the KEY register. If the ID number does not exist then an error message is generated and the ticket aborts.

*284	**Print all Weights in Loop Database** This function prints all the weights in the Loop selected by the KEY. If KEY=0 they all used records in the database are printed. Changing the KEY allows you print selected records. The format printed is: <ID number><TIME/DATE><WEIGHT> TIME/DATE is the time stamp of when the weight was recorded. A tape printer is recommended for this function. Pressing the CLEAR key will abort this function and return back to weighing mode.
*285	**Print all Weights in Loop Database (no TIME/DATE)** Same as 285 without TIME and DATE
*287	**Calculate Average Weight** This function scans through the Loop Database and calculates the average weight of all the weights it finds under the KEY. The average weight is placed in ACC4.
*288	**Search for Largest Weight** Same as 287 but searches for the largest weight and stores it in ACC4.
*289	Search for Smallest Weight Same as 287 but searches for the smallest weight and stores it in ACC4.

*290	**Change the database KEY to 0** The database KEY is used to created multiple tables referenced by a KEY number. When the KEY is zero then the key is disabled and the database is treated as one large database table. Changing the KEY allows you to change tables. KEYS can have a value of 1-9 to select a different table. For example lets say you are weighing cattle on a farm. The cows weights are stored in the database reference to an ID number on the cows ear tag with a KEY set to 1. Three months later he wants to weigh the herd again to see how much they have increased in weight. The farmer still wants to keep his old weights to compare against. The KEY number is changed to 2. This allows all the ID tags to be reentered into the database as a separate table not interfering with the cattle weight using KEY=1.
*291	**Change the database KEY to 1**
*292	**Change the database KEY to 2**
*293	**Change the database KEY to 3**
*294	**Change the database KEY to 4**
*295	**Change the database KEY to 5**
*296	**Change the database KEY to 6**
*297	**Change the database KEY to 7**
*298	**Change the database KEY to 8**
*299	**Change the database KEY to 9**

300	**Send Text to Display** This is a powerful feature that allows text to be sent to the 6 digit LED display. This is used to send prompts to the user, and is usually used in conjunction with keypad entry. Six characters must follow after this command including spaces. ASCII codes allowed are 65-90 (A-Z) and 49-59 (0-9) and 32 (space). Avoid using characters 'M','W' and 'X' as they cannot be displayed clearly.
301	Reset Display This may be required when using 300. This function clears the display returns back to weight display mode.

*400	**Keyboard Entry to ACC3** Wait for a keyboard entry and copy the weight value entered to ACC3. It is recommended that a user prompt be sent to the display using code 300 above. PRINT/SELECT acts as the enter key. Pressing CLEAR will abort the entry and return to weighing mode.
401	**Keyboard Entry to ACC3** Same as 400 but is used for entering integer values not related to

	weight.
402	**Keyboard Entry to ID register** Same as 401 above but copies the keypad entry to the ID register.
403	**Sound a beep** Sound a beep to the speaker
404	**Sound a double beep** Sound two quick beeps to the speaker
405	**Pause for 1 sec** Pause and do nothing for 1 second

*500	**Store Set points to Loop Database** This function stores Set Points 1-6 to the database. It uses the ID register as a reference to store the set-points as a set of 6 records. The KEY register is used to separate the 6 set-points. This is done automatically for you. Different set-point setups can be stored for different products.
*501	**Recall Set points from Loop Database** Load Set points using the ID register. All 6 set-points are loaded from the Database.

Control Codes for printer formatting.

Control codes for printers work exactly the same way as control codes for indicator specific functions. The difference is that the code represents a control function for a specific printer. An example of this would be changing the font size of the characters or sending a command to print in underline mode. A print control code is displayed as a 'P' character followed by a control code value. A table of control code values follows shortly. Entering a printer control is done by pressing the *decimal key twice* followed by a print code number. Pressing print/select enters the code into the ticket string.

Several different print control codes are available for different printers. If a specific control does not exist for your printer you can always create the ASCII escape codes for the function your want to perform. Escape codes for a printer are usually found in the back of the printer's manual.

The following tables below list the controls codes for different printers. There is also a table for dedicated common scale strings.

Printer codes for EPSON TM-U200D/U200PD Tape printer	
100	**Emphasized mode ON**
101	**Double Height ON**
102	**Double Width ON**
103	**QUAD ON**
104	**Underline ON**
105	**Underline OFF**
106	**Set to 9x9 font**
107	**Set to 7x9 font**
108	**Reset to NORMAL character mode**
109	**Set Line Spacing to 1/6inch default**
110	**Set Line Spacing to n/144 of an inch** n is entered as a parameter following the control code
111	**Double Strike mode ON**
112	**Double Strike mode OFF**
113	**Set justification n** n is entered as a parameter following the control code
114	**Print and feed n lines** n is entered as a parameter following the control code
115	**Turn upside down printing ON**
116	**Turn upside down printing OFF**

Printer Codes for EPSON TM-U295/U295P Slip Printer	
201	**Double Height ON**
202	**Double Width ON**
203	**QUAD ON**
204	**Underline ON**
205	**Underline OFF**
206	**Set to 5x7 Font size**
207	**Set to 7x7 Font size**
208	**Return to Normal character mode**
214	**Print and Feed n lines** n is entered as a parameter following the control code
215	**Turn upside down mode printing ON**
216	**Turn upside down mode printing OFF**
217	**Paper Release**

Printer Codes for Epson compatible line printers	
300	**Emphasized mode ON**
301	**Emphasized mode OFF**
302	**Double Strike ON**
303	**Double Strike OFF**
304	**Underline ON**
305	**Underline OFF**
306	**Expanded mode ON**
307	**Expanded mode OFF**
308	**Italics ON**
309	**Italics OFF**
310	**1/8th line spacing**
311	**7/72nd line spacing**
312	**1/16th line spacing (default)**
313	**n/72 line spacing** n is entered as a parameter following the control code
314	**n/216 line spacing** n is entered as a parameter following the control code
315	**Set the form length in n lines** n is entered as a parameter following the control code
316	**Set the form length in n inches** n is entered as a parameter following the control code
317	**Set the right margin n** n is entered as a parameter following the control code
318	**Set the left margin n** n is entered as a parameter following the control code
319	**Set letter quality mode ON**
320	**Turn letter quality mode OFF**

Printer Codes for IBM Proprinter compatible line printers	
400	**Emphasized mode ON**
401	**Emphasized mode OFF**
402	**Double Strike Mode ON**
403	**Double Strike OFF**
404	**Underline ON**
405	**Underline OFF**
406	**Expanded mode ON**
407	**Expanded mode OFF**
410	**1/8th line spacing**
411	**7/72nd line spacing**
412	**1/6th line spacing**
413	**n/72 line spacing** n is entered as a parameter following the control code
414	**n/216 line spacing** n is entered as a parameter following the control code
415	**Set Form Length in Lines** Lines is entered as a parameter following the control code
416	**Set Form Length in Inches** Length is entered as a parameter following the control code
418	**Set Left Margin** Margin is entered as a parameter following the control code
419	**Turn Letter Quality Mode ON**
420	**Turn Letter Quality Mode OFF**

Printer Codes for ELTRON graphic thermal printers	
500	**Initialize special printer driver to support ELTRON printers** This code must be the first code in any ticket that will print to Eltron printers. This code tell the M2000 to use the ELTRON printer driver. Without P500 tickets will not print correctly.
501	**Set the Horizontal start position (X) in dots (default X=50)** Thermal Printers use an X,Y coordinate system. Text and barcodes are printed at the position that X and Y are pointing to. The X position follows as the next entry after this command.
502	**Set the Vertical start position (Y) in dots (default Y=50)** Thermal Printers use an X,Y coordinate system. Text and barcodes are printed at the position that X and Y are pointing to. The Y position follows as the next entry after this command
503	**Set the rotation of printing (default no rotation)** This command sets how the printer is going to print text or barcodes. The next value after command 503 sets the rotation value. 0 = no rotation (default) 1 = 90 degrees 2 = 180 degrees 3 = 270 degrees
504	**Set the font selection (default 4)** This function sets the fonts to be printed. The next value sets the font selection and is between 1-5. The type of fonts depends on the printer model you are using. Consult manual. 1 = 8x12 dots @ 203dpi or 12x20 dots @ 300dpi 2 = 10x16 dots @ 203dpi or 16x28 dots @ 300dpi 3 = 12x20 dots @ 203dpi or 20x36 dots @ 300dpi 4 = 14x24 dots @ 203dpi or 24x44 dots @ 300dpi 5 = 32x48 dots @ 203dpi or 48x80 dots @ 300dpi
505	**Control the font size (default 3)** This parameter controls how big the fonts are to be. The value that follows this parameter scales the font size larger.
506	**Set the print density (darkness of printing)** This values controls how dark you want to print. Values are 0-15. You only need to use this command if the printer's default is too dark to light. The next entry sets the value.
507	**Print graphic LOGO** This command prints a graphic image stored in the printer. The graphic format is PCX and must be uploaded to the printer's memory from a PC computer. Once the graphic is loaded into the printer it is permanently stored and can be printed using P507. Consult the printer's manual for more information.

508	**Box Draw** Draws a box of any size. The following 4 values follow the parameter: StartX, StartY, EndX, EndY. Use the line thickness parameter to set the line thickness. *Example: to draw box from the top left corner of 30,30 to the bottom right corner of 800,520 enter* ***P508,30,30,800,520***
509	**Draw Vertical Line** Draw a vertical line. The following 3 values follow the parameter: StartX, StartY, LineLength in dots.
510	**Draw Horizontal Line** Draw a horizontal line. The following 3 values follow the parameter: StartX, StartY, LineLength in dots. *Example: to draw a line starting at 30,84 and is 770 dots long enter* ***P510,30,84,770***
511	**Set Line Thickness is dots (default is)** Set the line thickness for line drawing and box drawing
512	**Add to Vertical start position** This parameters adds a value to the vertical start position. The value that follows this parameter is added to the Y value of the X,Y coordinate system.
514	**Select Barcode Type (default Code 39)** If you plan to print barcodes you must select the type of barcode you will use. Consult the ELTRON printer's manual for the table of bar code formats supported. Barcode types are selected from a table. The values following the parameter are ASCII characters that are either one or more characters long. Here is a short list of Bar Codes types to select from: Code 39 std. or extended **"3" (default)** Code 39 with check digit **"3C"** Code 93 **"9"** Code 128 auto ABC modes **"1"** Codabar **"K"** EAN8 **"E80"** EAN13 **"E35"** Interleaved 2 of 5 **"2"** Postnet 5,6,8 digit **"P"** UCC/EAN 128 **"1E"** UPC **"UA0"** The above letters in quotes are to follow the parameter to select the proper bar code. Code 39 is the factory default. See the example below.

	Example to select bar code printing of type UPC enter: **P541, 85,80,48** *where 85 is the ASCII code for **U** and 80 is **A** and 48 is **0**.* *To change the barcode to Code 39 enter*: **P541,51** *where 51 is the ASCII character for **3**.* Consult the printer's manual for full table of different bar codes that you can choose from and their limitations.
515	**Disable Human Readable Code** This parameter disables the text that is normally printed under the barcode.
516	**Set Narrow Width (default 3)** Set the narrow bar width in dots. Valid values are 2-10. See printer's user manual for more information. This is a function of the type of bar code you are printing. The value following this parameter sets the width.
517	**Set Wide Width (default 7)** Set the wide bar width in dots. Valid values are 2-30. See printer's user manual for more information. This is a function of the type of bar code you are printing. The value following this parameter sets the width.
518	**Set Bar Height (default 200)** The value following this parameter sets the height of the bar code in pixels.
519	**Print Bar Code** Any text that is in the string register is sent to the printer as a barcode. This is where the barcode is generated. Use C codes to build the string in the string register. If a barcode scanner is connected to the M2000 then what ever is scanned last is in the string register.
520	**Execute Print** This should be the last command in the ticket. This tells the printer that the print image is complete and to print it to paper.

Printer Codes for Predefined Strings	
901	**“Gross “**
902	**“Tare “**
903	**“Net “**
904	**“Total “**
905	**“Customer Number “**
906	**“Truck ID: “**
907	**“Inbound Weight ”**
908	**“Outbound Weight ”**
909	**“Scale Weight ”**
910	**“Head Count ”**
911	**“Average Weight “**
912	**“Weigh Draft “**
913	**“Axle “**
914	**“Total Axle Weight “**
915	**“Inbound ID: ”**
916	**“Outbound ID: ”**

Table of ASCII characters

The table below shows the decimal values for ASCII characters. These values are used for entering characters into the ticket editor. For example the letter 'A' would be entered into the ticket editor as the numeric value 65.

ASCII	Decimal Value
Space	32
!	33
"	34
#	35
$	36
%	37
&	38
'	39
(	40
)	41
*	42
+	43
,	44
-	45
.	46
/	47
0	48
1	49
2	50
3	51
4	52
5	53
6	54
7	55
8	56
9	57
:	58
;	59
<	60
=	61
>	62
?	63

ASCII	Decimal Value
@	64
A	65
B	66
C	67
D	68
E	69
F	70
G	71
H	72
I	73
J	74
K	75
L	76
M	77
N	78
O	79
P	80
Q	81
R	82
S	83
T	84
U	85
V	86
W	87
X	88
Y	89
Z	90
[	91
\	92
]	93
^	94
_	95

ASCII	Decimal Value
'	96
a	97
b	98
c	99
d	100
e	101
f	102
g	103
h	104
i	105
j	106
k	107
l	108
m	109
n	110
o	111
p	112
q	113
r	114
s	115
t	116
u	117
v	118
w	119
x	120
y	121
z	122
{	123
|	124
}	125
~	126

Special ASCII characters
Carriage Return =13
Line Feed =10

Example 1: gross, tare and net

Lets take a look of a simple application of creating a ticket to print the company name gross, tare and net.

This is a simple ticket that will be assigned to the print select key.

To start the ticket editor use parameter 84 in calibration mode to create a new ticket. Let assume that this will be ticket number 200. Remember tickets can be assigned between 200 and 300. The company name on the ticket will be “Western Scale”.

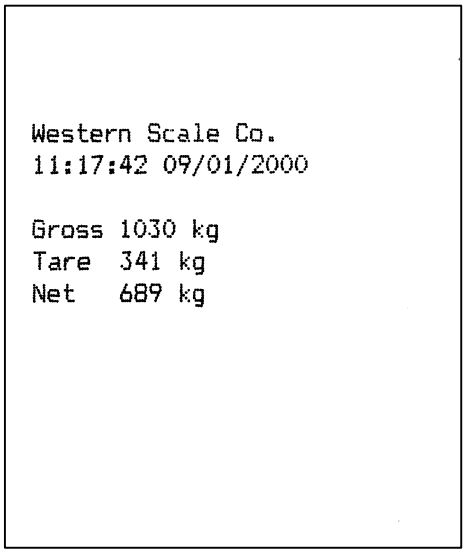
Lets lay out the ticket below on a line by line basis. We will use an Epson tape printer.

13 CR send a carriage return and line feed to start with to the printer (just a habit)
10 LF
87,101,115,116,101,114,110, 32, 83,99,97,108,101, 32 ,67,111,46 “Western Scale Co.”
13 CR
10 LF
C20 print the time
32
C21 print the date
13 CR
10 LF
10 LF
71,114,111,115,115,32 “Gross ”
C30 print gross weight
13 CR
10 LF

84,97,114,101,32,32 “Tare “
C33 print tare weight
13 CR
10 LF

78,101,116,32,32,32 “Net “
C36 print net weight

13 CR
10 LF



The **bold** numbers above are entered in the ticket editor one number at a time. Remember when there is a ‘C’ in front of the number it is a control code and is entered by pressing

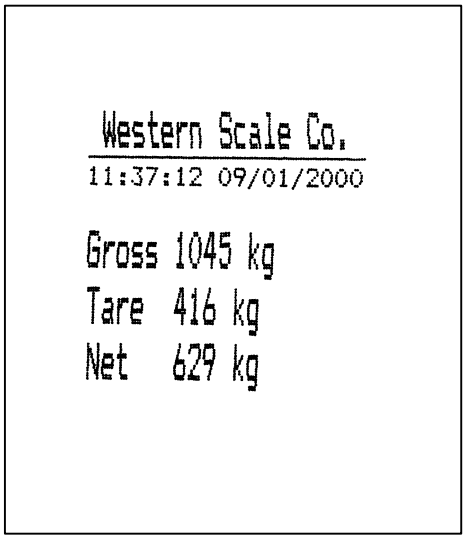
the decimal key prior to entering the number. For example C20 will print the time on the printer. When you have exited calibration mode you can call your ticket by entering 200 followed by the print/select key. To avoid having to key the ticket number every time you want to print you can assign ticket 200 to the print select key using parameter 91 in calibration.

Example 2: gross, tare and net (improved)

Lets improve on the ticket we did in example 1 and take advantage of the special printer code fonts for the Epson tape printer. You will also notice below that we did not type in "Gross", "Tare" and "Net" but used predefined strings called through **P** codes.

The improved ticket looks like this:

13 CR send a carriage return and line feed to start with to the printer (just a habit)
10 LF
P100 set the printer to emphasized mode (darker letters)
P101 turn on the double height for larger fonts
P104 turn on underline mode
87,101,115,116,101,114,110, 32, 83,99,97,108,101, 32 ,67,111,46 "Western Scale Co."
P108 reset the printer fonts
13 CR
10 LF
C20 print the time
32
C21 print the date
13 CR
10 LF
10 LF
P101 turn on the double height for larger fonts
P901 send the string "Gross " to the printer
C30 print gross weight
13 CR
10 LF



P902 send the string "Tare " to the printer
C33 print tare weight
13 CR
10 LF

P903 send the string "Net " to the printer
C36 print net weight
P108 reset the printer fonts
CR carriage return
P114 form feed multiple lines
9 number of lines for form feed is 9

This ticket looks dramatically better and was a bit easier to enter. Notice the extensive use of P codes. These codes call routines that send control codes to the printer to change fonts and modes of operation of the printer. There are tables of P codes for different printers in the previous section. There is also a table of commonly used strings that will save you in typing the entire string. Remember P codes are entered by pressing the decimal key twice before entering the number.

Example 3: A simple Truck IN/Truck Out ticket

This example will make extensive use of C codes to implement a truck in and truck out program. A company called “John’s Gravel Co.” sells gravel by the truckload. Trucks come in empty and are weighted. John’s Wife uses the numbers on the license plate as the truck I.D to identify the trucks coming and going.

The truck drives on to the scale and the ‘IN’ key is pressed followed by PRINT/SELECT key. The indicator prompts for an ID number and the tare weight is recorded along with the ID number.

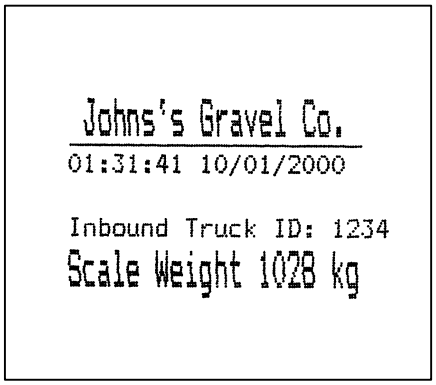
The truck is then loaded and is weighted to get the final gross weight. A ticket is printed showing gross, tare and net.

In this example we will take advantage of the IN key and the OUT key. These keys can be assigned to tickets. For this example we will the IN key for the truck in sequence and the OUT key for when the truck weighs out with a full load.

In this example we are creating ticket 200 for inbound and ticket 201 for outbound. We are using an Epson tape printer.

Ticket 200 truck in loop:

13 CR send a carriage return and line feed to start with to the printer (just a habit)
10 LF
P100 set the printer to emphasized mode (darker letters)
P101 turn on the double height for larger fonts
P104 turn on underline mode
74,111,104,110,115,96,115, 32 ,71,114,97,118,101,108, 32, 67,111 “John’s Gravel Co.”
P108 reset the printer fonts
13 CR
10 LF
10 LF
C20 print the time
32
C21 print the date
13 CR
10 LF
C70 call truck in function and ask operator for truck ID
note: if an invalid ID or if CLEAR is pressed the tickets
P115 print string “Inbound Truck ID:” to printer
C79 print truck ID number
13 CR
10 LF



P101 turn on the double height for larger fonts
P909 send the string “Truck Weight”
C30 print the gross weight of the truck on the scale
P108 reset the printer fonts
13 CR
P114 form feed multiple lines
9 number of lines for form feed is 9

The above ticket handles the truck in part. Now we will create the truck out part.

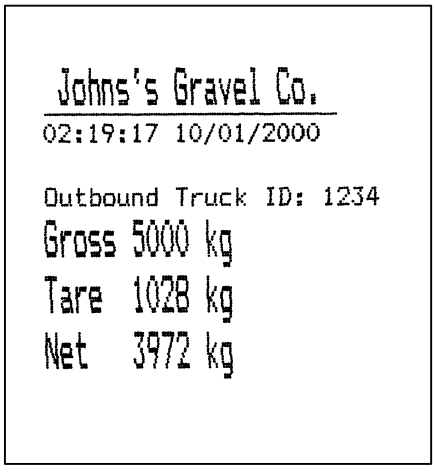
Ticket 201 truck out loop:

13 CR send a carriage return and line feed to start with to the printer (just a habit)
10 LF
P100 set the printer to emphasized mode (darker letters)
P101 turn on the double height for larger fonts
P104 turn on underline mode
74,111,104,110,115,96,115, 32 ,71,114,97,118,101,108, 32, 67,111 “John’s Gravel Co.”
P108 reset the printer fonts
13 CR
10 LF
C20 print the time
32
C21 print the date
13 CR
10 LF
10 LF
C71 call truck out function and ask operator for truck ID
note: if an invalid ID or if CLEAR is pressed the tickets aborts here
C916 print string “Truck ID:” to printer
C79 print truck ID number

13 CR
10 LF
P101 double height ON

P901 send the string “Gross ” to the printer
C74 print trucks gross weight
13 CR
10 LF

P902 send the string “Tare “ to the printer
C75 print trucks tare weight
13 CR
10 LF



P903 send the string “Net “ to the printer
C76 print trucks net weight
13 CR
10 LF

P108 reset printer font
13 CR
10 LF

P114 form feed 5 lines
5 number of lines

Now that we have finished the truck in ticket and truck out ticket we will exit calibration and try them. Type 200 followed by the print/select key and enter an ID number. The inbound ticket will be printed. Add some weight to the scale and type 201 followed by the print select key. The indicator will prompt you for the outbound ID number. Enter the same number as you entered for inbound. The indicator will now print the gross, tare and net for the weighing transaction.

To avoid having to type 200 and 201 every time assign 200 to the IN key using parameter 92 and ticket 201 to the OUT key using parameter 93.

In this example the truck inbound loop printed a ticket for the truck driver. In some cases a ticket would not be required to be printed for the inbound truck. You could just edit ticket 200 and remove the ticket printing text and codes.

Another importing thing to mention is that the ticket header time and date is entered twice for this application. You could create a separate ticket (202) that just prints the company name along with time and date. Use C code C103 to call that ticket from tickets 200 and 201. This cuts down on the amount of retyping you have to do.

In the truck out sequence we used C codes C74,C75,C76 to print the gross tare and net weights calculated from the weight captured in the truck in function. When the truck out function C71 is called it looks up the tare weight stored previously using the C code C70. When the truck ID number is found it is then deleted from memory. Noticed that we used P codes to print “gross”, “tare” and “net” strings rather than spelling them out manually.

See the next example for an improved ticket design.

Example 4: An improved truck in/truck out

This example is identical to example 3. If you look at example 3 you will notice that you had to repeat the company's name and time and date for both the inbound and outbound tickets. This example shows how to eliminate this.

This example uses 3 tickets. Ticket 203 will be used for the sole purpose of printing the companies name and time and date. This ticket will be called from the other two tickets. This example uses C code C103 to jump to another ticket from within a ticket.

Lets have a look at all three tickets again (200,201,203):

Ticket 200 truck in loop:

C103 jump to another ticket (203) and print it
203 ticket 203 is called to print the ticket header, time and date

C70 call truck in function and ask operator for truck ID
note: if an invalid ID or if CLEAR is pressed the tickets
P115 print string "Inbound Truck ID:" to printer
C79 print truck ID number
13 CR
10 LF

P101 turn on the double height for larger fonts
P909 send the string "Truck Weight"
C30 print the gross weight of the truck on the scale
P108 reset the printer fonts
13 CR
P114 form feed multiple lines
9 number of lines for form feed is 9

The above ticket is identical to the ticket in example 3, but we stripped away the company name and the time and date.

Ticket 201 truck out loop:

C103 jump to another ticket (203) and print it
203 ticket 203 is called to print the ticket header, time and date

C71 call truck out function and ask operator for truck ID
note: if an invalid ID or if CLEAR is pressed the tickets aborts here
C916 print string "Truck ID:" to printer
C79 print truck ID number

13 CR
10 LF
P101 double height ON

P901 send the string "Gross " to the printer
C74 print trucks gross weight
13 CR
10 LF

P902 send the string "Tare " to the printer
C75 print trucks tare weight
13 CR
10 LF

P903 send the string "Net " to the printer
C76 print trucks net weight
13 CR
10 LF

P108 reset printer font
13 CR
10 LF

P114 form feed 5 lines
5 number of lines is 5

Once again the above ticket is the same as in example 3. We print the company name from ticket 203.

Ticket 203 Company name, time and date.

The ticket below prints the company name and time and date.

13 CR send a carriage return and line feed to start with to the printer (just a habit)
10 LF
P100 set the printer to emphasized mode (darker letters)
P101 turn on the double height for larger fonts
P104 turn on underline mode
74,111,104,110,115,96,115, 32 ,71,114,97,118,101,108, 32, 67,111 "John's Gravel Co."
P108 reset the printer fonts
13 CR
10 LF
C20 print the time
32
C21 print the date
13 CR
10 LF
10 LF

Using the C code C103 is very useful for these types of situations. Whenever you have multiple tickets that print the same thing twice (company name time and date) it is recommended that you create a dedicated ticket for this.

Example 5: Axle Weighing

This ticket was designed for safety inspectors that check axle weights on trucks using an axle scale. Once again we use an Epson tape printer. This ticket program is split over three different tickets that perform different functions.

The inspector starts the weighing process by using the IN key. This prints the ticket header and clears the accumulator registers. When the trucks axle is positioned over the scale the PRINT/SELECT key is pressed to capture and print the axle weight. This is repeated for each axle on the scale. When the truck is finished being weighed then the OUT key is used to complete the ticket and print the total axle weights.

The tickets are defined and their keys are assigned:

IN key is assigned to ticket 200 and is used to start the axle weighing process
PRINT/SELECT key is assigned to ticket 201 and is used to weigh an axle
OUT key is assigned to ticket 202 and is used to end the axle weighing sequence

Ticket 200 start of axle weighing

This ticket prints the site location time/date and clears the accumulators used to total axle weights and axle counts.

13 CR
10 LF
P100 emphasized mode on
P101 double height ON
P104 underline ON
80,114,105,110,103,101, 32 "Prince "
71,101,111,114,103,101 ,32, 83,111,117,116,104, 32 "George South"
87, 101,105,103,104, 32, 83,99,97,108,101, "Weight Scale"
P108 reset printer fonts
13 CR
10 LF
C20 print time
32 space
C21 print date
C22 Clear the ACC1 register (total axle weights)
C257 Clear the ACC4 register (axle count)
C259 increment axle counter to 1
13 CR
10 LF

Ticket 201 print an axle number and axle weight

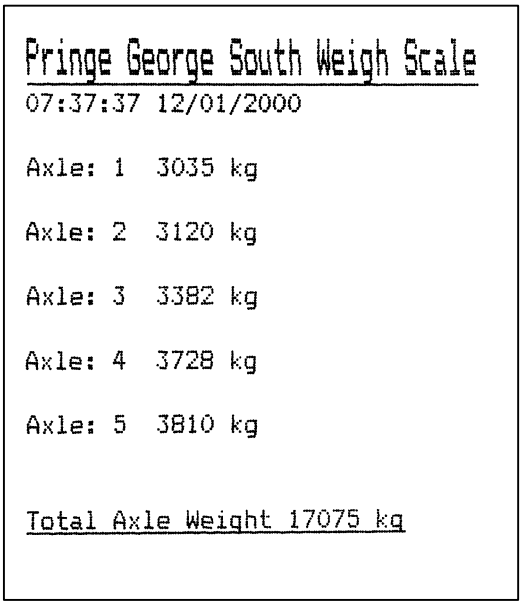
This Ticket Prints the Axel # and Axle Weight and adds the weight to the accumulator.

13 CR
10 LF
P913 send the string “axle: “ to the printer
C256 print the acc4 as integer number (axle count)
32,32 “ “ add some spaces
C30 print gross weight channel 1
C25 add gross weight to ACC1
C259 increment the axle count in ACC4
13 CR
10 LF

Ticket 202 finish axle weighing, print total axle weights

Print the total axels and finish off the ticket

10 LF
10 LF
P104 underline ON
P100 emphasized mode on
P914 send the string “Total Axle Weight “ to the printer
C24 print the total axle weight
P108 reset printer fonts
13 CR
P114 form feed 9 lines
9 number of lines



Example 5: A multifunction ticket application

This ticket program is an advanced example of what can be done with the M2000 ticket system. This example incorporates reassigning functions within the ticket, sending messages to the display and prompting the user for data input.

A cattle farmer has a truck scale that serves two purposes and he wants separate tickets for two completely different weighing applications. Farmer Scott uses the scale in a truck in/out fashion to weigh trucks delivering cattle feed to his farm. He weighs the truck entering the farm and then weighs it empty leaving the farm. He uses the net weight of the truck to make sure he is getting the amount of feed he ordered.

The truck scale is fenced in. He can close gates on each end of the scale. This is used to weight lots of cattle before shipping them onto trucks. Cattle are herded onto the scale and the gates are closed. A scale weight is captured. The indicator then asks for a head count of the number of cattle on the scale. From that information the indicator prints a ticket showing the scale weight the number of head of cattle and the cattle average weight. It also prints the cattle's shrinkage weight. Shrinkage is the weight taking into account the there will water loss from the cattle (from natural causes) and they will weigh less when they reach their final destination.

This is an advance program requiring 8 tickets. Not all the tickets actually print to the printer. Tickets 200 to 203 perform internal operations on the indicator. Think of these tickets as small modules that perform different tasks. We will summarize the tickets created below:

Ticket 200: switch the indicator to truck weighing mode.
The operator calls this ticket by typing 200 print/select when he wants to switch to truck weighing mode. This ticket assigns ticket 204 to the IN key and ticket 205 to the OUT key. Nothing is printed. A quick message "TRUC" is flashed to the display to indicate that we are in Truck weighing mode.

Ticket 201:switch the indicator to cattle weighing mode
The operator calls this ticket by typing 201 print/select when he wants to switch to cattle weighing mode. This ticket assigns ticket 206 to the IN key and ticket 207 to the OUT key. Nothing is printed. A quick message "CATTLE" is flashed to the display to indicate that we are in Cattle weighing mode.

Ticket 202: change the shrinkage value in percent
The operator calls this ticket by typing 202 print/select when he wants to enter a new shrinkage value (in percent) to the indicator. The indicator displays the message "SHRINC" to prompt the operator to enter the shrinkage value.

Ticket 203: print the customers name and time and date
This ticket is created as a sub routine to be called from other tickets. This saves us from having to retype the customers name every time we need to print to the printer. This ticket is called from the 3 tickets below. All it does is print the customers name, time and date.

Ticket 204: Truck In loop (assigned to IN key).
Capture the inbound truck weight and store it with a truck ID number. A ticket is printed.

Ticket 205: Truck Out loop (assigned to OUT key).
Capture the outbound truck weight. Get the tare weight using the an ID number and print gross, tare and net.

Ticket 206: cattle In function (assigned to IN key)
This ticket captures the weight on the scale and prints the header and scale weight.

Ticket 207: Cattle Out function (assigned to OUT key)
This ticket asks the user to enter the number of cattle head on the scale and prints the average weight and shrinkage weight.

Now that we have given a quick overview of the tickets lets look at the tickets source entry below.

Ticket 200 Select Truck In/Out Weighing

This ticket reassigns keys for truck in/out functions

C403 sound a beep
C300 send text to display
32,84,82,85,67,32 " TRUC "
C101 assign IN key
204 ticket 204 (now ticket 204 has been reassigned to IN key)
C102 assign OUT key
205 ticket 205 (now ticket 205 has been reassigned to OUT key)
C405 pause 1 sec
C301 reset display

Ticket 201 Select Cattle In/Out Weighing

This ticket reassigns keys for cattle in/out functions

C403 sound a beep
C300 send text to display
67,65,84,8476,69 "CATTLE"
C101 assign IN key
206 ticket 206 (now ticket 206 has been reassigned to IN key)
C102 assign OUT key
207 ticket 207 (now ticket 207 has been reassigned to OUT key)
C405 pause 1 sec
C301 reset display

Ticket 202 Set Shrinkage Value

This ticket is used to enter the shrinkage value in percent

C300 send text message to display
83,72,82,73,78,67 " SHRINC "
C403 sound a beep
C401 wait for keypad entry of shrinkage and store head count to ACC3
C262 copy ACC3 to ACC4
C274 copy ACC4 to ACC6 to set up the shrinkage
C301 reset display to weight

Ticket 203 Print Header and Time/Date

This ticket is used every time we have to print the customer's name, time and date. This ticket is called from other tickets, and saves us for having to retype the customer name several times. Also if a name change is required then it only has to be changed once in this ticket.

13 CR
10 LF
P100 emphasized mode on
P101 double height ON
P104 underline ON
83,99,111,116,116, 32 "Scott "
67,97,116,116,108,101, 32 "Cattle"
67,111,109,112,97,110,121, 32 ,76,84,68,46 "Company LTD."
P108 reset printer fonts
13 CR
10 LF
C20 print time
32 space
C21 print date

13 CR
10 LF

Ticket 204 Truck Inbound Sequence

This ticket prompts for a truck ID number and records the weight of the truck under that ID number. A ticket id is then printed for the inbound weight.

C70 call the truck inbound loop function to get user ID
Note: that if a bad ID is entered the ticket aborts, if the ID is OK then the ticket continues below.

C103 make a call function to another ticket
203 ticket 203 is called to print the ticket header, time and date
P906 send string "Truck ID:" to printer
C79 send truck ID number

13 CR
10 LF
P101 double height ON

P907 send string "Inbound Weight: " to printer
C30 print gross weight
P108 reset printer font
13 CR
10 LF

P114 form feed 9 lines
9 number of lines

Ticket 205 Truck Outbound Sequence

This ticket prompts for a truck ID number and searches for the inbound weight of the truck under that ID number. The trucks gross, tare and net weights are printed.

C71 call the truck outbound loop function to get user ID
Note: that if a bad ID is entered the ticket aborts, if the ID is OK then the ticket continues below.

C103 make a call function to another ticket
203 ticket 203 is called to print the ticket header, time and date

C906 send string "Truck ID:" to printer
C79 send truck ID number

13 CR
10 LF
P101 double height ON

P901 send the string "Gross " to the printer
C74 print trucks gross weight
13 CR
10 LF

P902 send the string "Tare " to the printer
C75 print trucks tare weight
13 CR
10 LF

P903 send the string "Net " to the printer
C76 print trucks net weight
13 CR
10 LF

P108 reset printer font
13 CR
10 LF

P114 form feed 5 lines
5 number of lines

Ticket 206 Cattle IN sequence

This ticket prints the customer's name, time and date. It also prints the weight of the cattle that are on the scale. The cattle weight is stored for later use.

C103 make a call function to another ticket
203 ticket 203 is called to print the ticket header, time and date

13 CR
10 LF
P101 double height ON
P909 send "Scale Weight " string to printer
C30 print gross weight
P108 reset printer font
C200 copy gross weight to ACC1
13 CR
10 LF

Ticket 207 Cattle OUT sequence

This ticket prompts the user for the head count of how many head of cattle that are on the scale. The ticket then prints the head count, the average head weight and shrinkage weight of the cattle on the scale.

13 CR
10 LF

C300 send text message to display
32,72,69,65,68,32 " HEAD "
C403 sound a beep
C401 wait for keypad entry of head count and store head count to ACC3
P910 send the string "Head Count" to the printer
C262 copy ACC3 to ACC4
C256 print ACC4 that holds a copy of the head count
13 CR
10 LF

P911 send the string "Average Weight " to the printer
C253 ACC4=ACC1/ACC3 divide ACC1 with head count stored in ACC3
C255 print weight in ACC4
13 CR
10 LF

83,104,114,105,110,107,97,103,101,40 "Shrinkage("
C267 copy ACC6 to ACC4 (ACC6 holds the percent value)
C256 print ACC4 as integer
37,41,58,32 "%): "
C279 calculate the ACC6 percent of ACC1 and store result in ACC3
C254 ACC4=ACC1-ACC3 calculate final shrinkage weight
C255 print the shrinkage weight stored in ACC4

13 CR
10 LF

P114 form feed 5 lines
9 number of lines

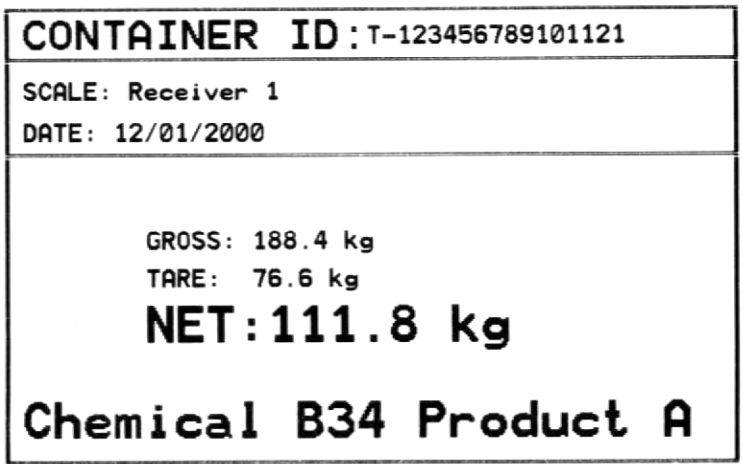
Example 6: Thermal Printer and Bar Code Scanner.

Graphic Thermal printers are completely different from traditional dot matrix printers. A thermal printer generates a bit image in memory and then prints it. Thermal printers use X and Y coordinates to position text, line drawing and barcodes. There are no such things as carriage return or line feeds. This might take a little getting used to. The M2000 hides a lot of the complexities of using thermal printers through predefined P code functions. The application below will show an example of a thermal printer used together with a bar code scanner.

A chemical company receives large totes of chemical “X” for a special process. The chemicals are weighed on a pallet jack. The chemical bin codes are in bar code form on the side of the tote. The operator scans the barcode on the tote with a scanner and a thermal printer prints a sticker that is applied to the side of the tote. The sticker contains the weight and the bin code numbers that were obtained from the barcode.

The ticket below will be created as ticket 200. The ticket is printed either by pressing the print key, or when the scanner scans a barcode. Parameter 95 is used to assign ticket 200 to the scanner. Anytime the operator scans a bar code the indicator will automatically print a ticket.

An example of the ticket is shown below. Notice the line drawing in the ticket. Line drawing is done by sending box and line drawing commands to the printer. These commands are shown in the ticket source on the following 2 pages which shows you exactly how this ticket was created.



Ticket source below for the ELTRON thermal printer. The table of P codes supporting the ELTRON printer is located earlier in this section.

P500 enable print driver for ELTRON printer (first thing that must be done)

P508 draw a rectangle
30,30,800,520 top left corner of rectangle is 30,30 lower right corner is 800,520

P501 move to coordinate 50,43
50,43

P504 select font
3 font type is 12x20

P505 font size is 2
2

67,79,78,84,65,73,78,69,82,32,73,68,58,32 "CONTAINER ID: "

P501 move to coordinate 413,50
413,50

P504 select font
4 font type is 14x24

P505 font size is 1
1

C305 send string captured by scanner to printer

P510 draw horizontal line at 30,84 and is 770 dots long
30,84,770

P501 move to coordinate 50,110
50,110

P505 font size is 1
1

83,67,65,76,69,58,32 "Receiver 1: "

P501 move to coordinate 50,155
50,155

P505 font size is 1
1

68,65,84,69,58,32 "DATE: "

C21 print the date

P510 draw horizontal line at 30,187 and is 770 dots long
30,187,770

P501 move to coordinate 180,270
180,270

71,82,79,83,83,58,32 "GROSS: "
C30 print gross weight

P501 move to coordinate 180,310
180,310

84,65,82,69,58,32,32 "TARE :"
C33 print tare weight

P505 font size is 2
2

P501 move to coordinate 180,350
180,350

78,69,84,58 "NET: "
C36 print net weight

P501 move to coordinate 180,350
50,453

P504 select font
4 font type is 14x24

67,111,97,116,105,110,103,32 "Chemical "
80,97,110,32 "B34 "
89,105,101,108,100,32 "Product A"

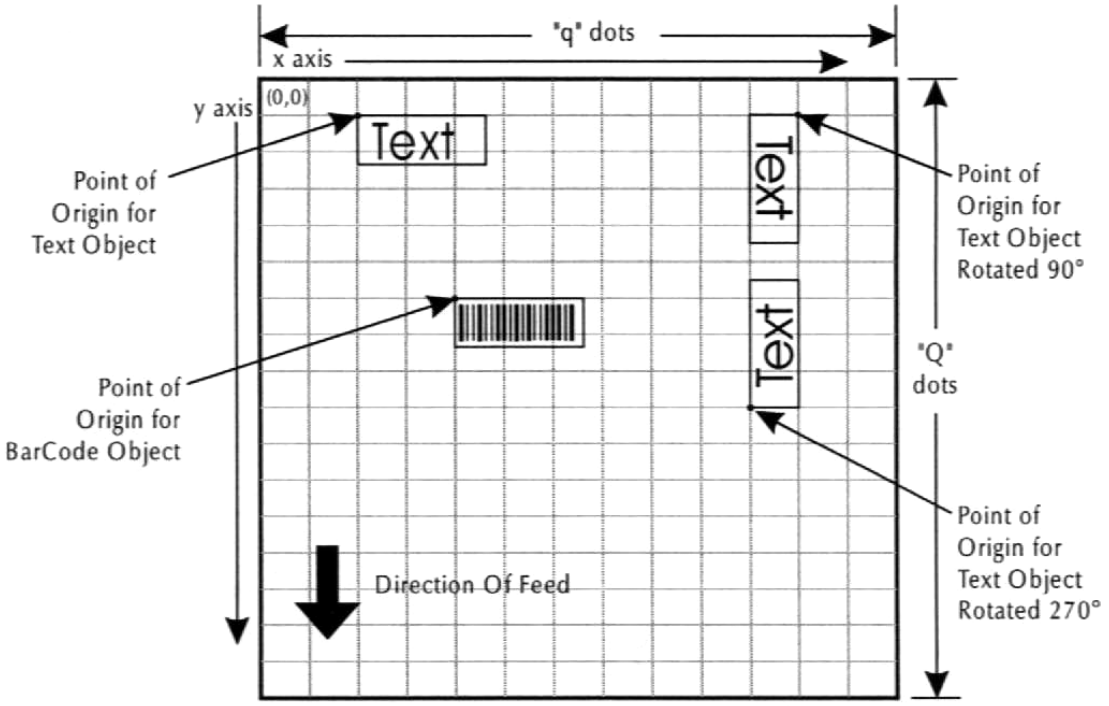
P520 send command to printer to print the label (required at end of ticket)

Some advice when working with thermal printers is to carefully plan out the ticket. Trial and error is time consuming. Because you are using an X,Y system you must position the text with precise coordinates. Take a ruler and measure starting points of text. The upper left hand corner of the ticket is 0,0. If you know the dots per inch (dpi) then you can calculate the X,Y positions.

For example if the dpi is 300 then 1 inch is 300. If you want to place text starting at half an inch to the right and 1 inch from the top then X=150 and Y=300. The printer's manual will state the resolution, which is usually 203dpi or 300dpi.

Remember carriage return and line feeds are not recognized by the thermal printer and should not be used. You must change the Y coordinate for every new line you want to print on. How much you increase Y by is a function of the font type and the font size.

Example: If you are using a font type of 14x20 and a font size of 2 then the final font size is 28x40dots. This means that the Y-axis should be incremented at least by 45 which is the equivalent of sending a LF character.



Example 7: Axle Scale with Truck in/ Truck out

A customer has an axle scale and wants to weight the individual axles on the truck and store the total weight using an ID number. This procedure is done both when the truck enters and leaves the facility. At the end of the transaction the driver will have a ticket showing the gross, tare and net weights.

This application requires some careful thought on the optimal procedure for weighing the axles.

To start axle-weighing press 200 followed by the print/select key. This prints the time and date and clears the axle weight accumulator. From here on the operator simply pressed the print/select key to record an axle weight. An axle weight is printed along with the axle number.

When the user has finished weighing all the axles on the truck he can then press the IN key for an inbound transaction or the OUT key for an outbound transaction. The user is then prompted for a truck ID number to either store or recall the total truck axle weights. The OUT key will also print the gross tare and net weights.

IN key is assigned to ticket 202 and is used to start the axle weighing process
PRINT/SELECT key is assigned to ticket 201 and is used to weigh an axle
OUT key is assigned to ticket 203 and is used to end the axle weighing sequence

We are using an EPSON tape printer for this ticket.

Ticket source definition

Four tickets will be used for this application and they are discussed below:

Ticket 200
This ticket will be used for the axle weighing procedure. It prints the time and date and the company name. Clears the accumulators to zero and prepares the axle weighing procedure. This ticket starts the axle weighing process. You must enter 200 print/select to start axle weighing.

Ticket 201
This ticket is assigned to the print/select key. Every time you press the Print/Select key an axle weight will be recorded and printed.

Ticket 202
This ticket is assigned to the IN key and is used to record the truck IN weight. Pressing the IN key will total all the axle weights and store them under an ID number. So after you are done with axle weighing (started by ticket 200), you would then finish the axle weighing for the inbound truck by pressing the IN key followed by print select.

Ticket 203
This ticket is assigned to the OUT key and completes the weighing transaction. It totalizes the outbound axles weights and then prompts the user to enter an ID number to retrieve the stored TARE weight. It finishes the ticket off by printing the gross tare and net weights.

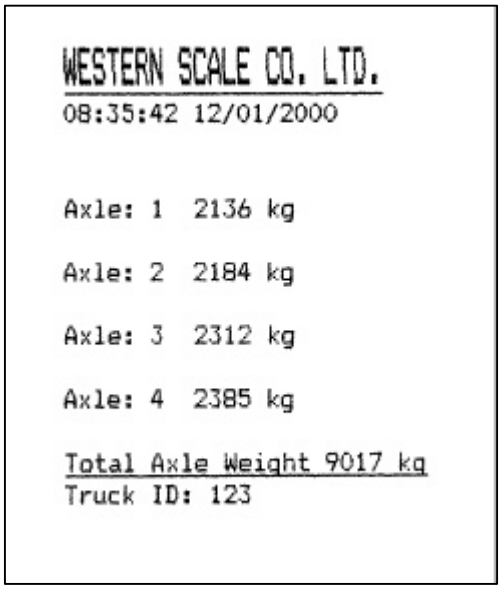
Ticket 200: Start the axle weighing

13 CR
10 LF
P100 emphasized mode on
P101 double height ON
P104 underline ON
87,69,83,84,69,82,78, 32 "WESTERN"
83,67,65,76,69, 32,67,79,46, 32,76,84,68,46 "SCALE CO. LTD."

P108 reset printer fonts
13 CR
10 LF

C20 print time
32 space
C21 print date
C22 Clear the ACC1 register (total axle weights)
C257 Clear the ACC4 register (axle count)
C259 increment axle counter to 1
13 CR
10 LF
C100 Assign Print/Select key to ticket 201
201 ticket 201

13 CR
10 LF



Ticket 201: Prints the Axel # and Axle Weight

13 CR
10 LF
P913 send the string “axle: “ to the printer
C256 print the acc4 as integer number (axle count)
32,32 “ “ add some spaces
C30 print gross weight channel 1
C25 add gross weight to ACC1
C259 increment the axle count in ACC4
13 CR
10 LF

Ticket 202: Store total inbound axle weights

After the axles weighing is complete for the inbound truck, the weight can be stored with an ID number. This ticket is assigned to the IN key and stores the total axle weight to an ID number and prints the total axle truck weight along with the ID number. If you enter a used ID number, or an invalid one then the ticket aborts with nothing printed.

C85 Call the truck in loop function and store the total axle weight in ACC1
(Note: if an invalid or used ID number is entered the ticket aborts here)
13 CR
10 LF
P104 underline ON
P100 emphasized mode on

P914 send the string “Total Axle Weight “ to the printer
C24 print the total axle weight
10 LF
13 CR
P108 reset printer fonts

P906 send the string “Inbound ID”
C79 print the truck ID number that the weight was stored under

10 LF
13 CR
P114 form feed 9 lines
9 number of lines

Ticket 203 Recall stored axle weights and print gross, tare and net

C86 Call the truck out loop function and retrieve the stored IN weight
(Note: if an invalid or unused ID number is entered the ticket aborts here)
13 CR
10 LF
P104 underline ON
P100 emphasized mode on

P914 send the string "Total Axle Weight " to the printer
C24 print the total axle weight
10 LF
13 CR

P108 reset printer fonts
P916 send the string "Outbound ID"
C79 print the truck ID number that the weight was stored under
10 LF
13 CR
10 LF

P101 double height ON
P901 send the string "gross weight"
C74 print the truck loop GROSS weight
10 LF
13 CR

P902 send the string "tare weight "
C75 print the truck loop TARE weight
10 LF
13 CR

P903 send the string "net weight "
C76 print the truck loop NET weight

P108 reset printer fonts
10 LF
13 CR
P114 form feed 9 lines
9 number of lines