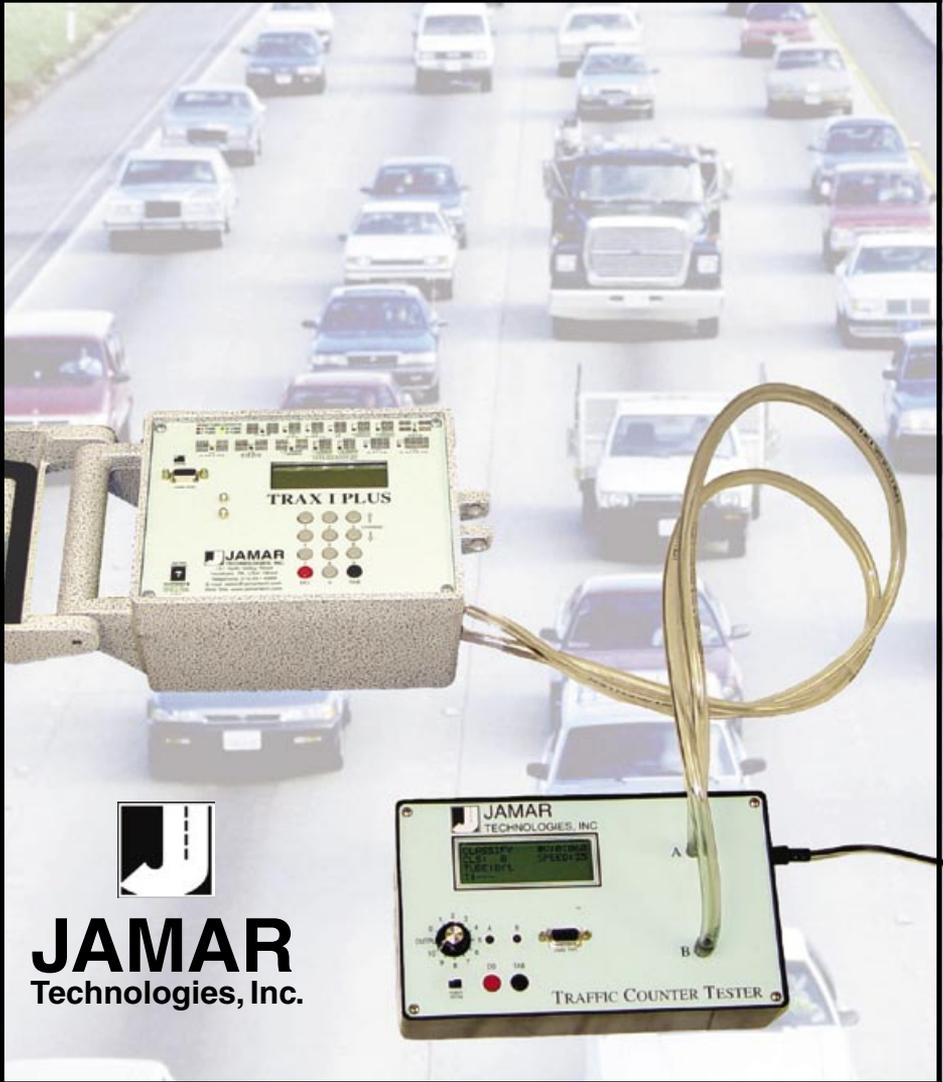# Traffic Counter Tester

JAMAR
Technologies, Inc.

User's Manual

LIMITED WARRANTY

JAMAR Technologies, Inc. warrants the Traffic Counter Tester against defects in material and workmanship for a period of one (1) year limited warranty on parts and labor from the date of purchase. For information on extended warranty call 1-800-776-0940.

JAMAR Technologies, Inc. warrants each new instrument manufactured by the company to be free from defective material and workmanship and agrees to remedy any such defect. At its option, it may furnish a new part in exchange for any part of any instrument of its manufacture which, under normal installation, use and service discloses such defect. The instrument must be returned to our factory or authorized service agent intact, for examination, with all transportation charges prepaid.

This warranty does not extend to any products which have been subject to misuse, neglect, accident, vandalism or incorrect wiring not our own. This warranty does not extend to products which have been repaired or altered outside our factory or authorized service agent.

In no event shall JAMAR Technologies, Inc. be liable for any damages arising from the use of this product including damages arising from the loss of information.

This warranty is in lieu of all other warranties expressed or implied and no representative or person is authorized to assume for us any other liability in connection with the sale or use of our products.

JAMAR Technologies, Inc. reserves the right to make improvements on the product and/or specifications at any time without notice.

Questions concerning this warranty or any JAMAR Technologies, Inc. product should be directed by mail or telephone to:

<div align="center">

JAMAR Technologies, Inc.
1500 Industry Road, Suite C
Hatfield, PA 19440
215-361-2244

</div>

If you have any questions about the use of the Traffic Counter Tester, please call the following number:

215-361-2244
Monday - Friday   8:00 AM to 5:00 PM Eastern time

You may also contact us by e-mail at:

sales@jamartech.com

Address any correspondence to:

JAMAR Technologies, Inc.
1500 Industry Road, Suite C
Hatfield, PA 19440

Quick Setup Guide for the Traffic Counter Tester

1. Attach the air tubes to the air switch ports on the Traffic Counter Tester (TCT) and plug the power supply connector into it. **Note:** Only use the power supply provided with the TCT. Substitutes may cause damage.

2. Plug the power supply into an electrical outlet (110V@60Hz) and turn on the TCT by sliding the power switch to the ON position. **Caution**: Be sure to connect to the TCT <u>before</u> plugging into the outlet.

3. At this point, the unit should be on, and the LCD should display the following:

```
A,B              #V:00000
CLS:  2          SPEED:35
TUBE: 2 ft
T:----           STOPPED
```

4. Press TAB until **SET SPEED** is displayed at the top left corner of the display (this should take 4 presses). The TCT is now in SET SPEED mode. This mode sets the vehicle speed for modes A,B; A to B, B toA; and Classify. Pressing DO in this mode will increase the speed by 5 MPH. The speed can be set from 5 to 80 MPH. Speeds in the range of 35 MPH to 55 MPH are recommended.

5. Press TAB until **SET TUBE** is displayed. This mode sets the distance between the road tubes. Pressing DO in this mode will cycle the road tube distance through the following options: 4 inches, 2 ft., 4 ft., 8 ft. and 16 ft. If *USER* is displayed as the tube spacing, then the tube spacing has been overridden by software, as is discussed in chapter 4. Set the tube spacing in the TCT to match the tube spacing in the counter you are testing. This may require that the spacing in the counter be adjusted.

6. Press TAB again, and **SET TIME** will be displayed. This mode sets the length of time that a test will run. The options are 15 min., 30 min., 45 min., 1 hr., 2 hr., 5 hr., 24 hr., and "—-". When a test is started, it will run for the length of time specified and then stop. If "—-" is selected, the test will run indefinitely, and must be stopped by pressing DO.

7. Set the **Output Dial** to a value of 10. This dial adjusts the strength of the air pulse that is generated. This can be used to test the functionality of the air switches in the counter. A more in-depth discussion on this can be found in chapter 3.

8. The TCT is now ready for use. The chosen settings have been saved, and will remain set in the future. Additional information on using the supplied software to configure tube spacing and classification can be found later in this manual.

Operating modes

A,B
Simulates a Class 2 vehicle with 9' wheelbase. For speeds of 35 MPH and above, 1 vehicle will be simulated every second. For speeds below 35 MPH, the time between vehicles will increase to allow the counter to recognize the new vehicle. Vehicles travel in the direction of A to B.

A to B, B to A
Simulates a Class 2 vehicle with 9' wheelbase. For speeds of 35 MPH and above, 1 vehicle will be simulated every second. For speeds below 35 MPH, the time between vehicles will increase to allow the counter to recognize the new vehicle. Vehicles alternate directions. The vehicle count will increment after every second vehicle, to show the total for each direction. **Note:** The tube spacing for this mode is fixed to 4.5 inches.

Classify
Simulates each of the FHWA classes traveling at the selected speed. Vehicles will be simulated at a rate of 1 vehicle every 6 seconds, or 10 vehicles per minute. The classification scheme to be simulated can be modified through the serial port. The default scheme simulates all 13 FHWA scheme F classes, with classes 2 and 3 repeated for a total of 15 vehicles. Vehicles travel in the direction of A to B.

Speeds
Simulates a Class 2 vehicle with 9' wheelbase traveling at speeds from 35 to 80 MPH. Vehicles will be simulated at the rate of 1 vehicle every six seconds, with each vehicle increasing speed by 5 MPH. Vehicles travel in the direction of A to B.

Table of Contents

Chapter 1

Introduction to the Traffic Counter Tester

What is the Traffic Counter Tester?

The JAMAR Traffic Counter Tester (TCT) is a tool used to test automatic road tube counters/classifiers by simulating vehicles passing over a pair of road tubes. It is capable of simulating a variety of vehicle classes (including all those in the FHWA Scheme F) traveling at speeds from 5 MPH to 80 MPH. The TCT is designed to work with a wide range of road tube counters/classifiers, including, but not limited to, those manufactured by JAMAR, GK, ITC, Streeter, Diamond, Peek and Timemark.

Note: The TCT is designed to test counters/classifiers. It is not designed to simulate all possible road tube configurations that could be used in the field. Specifically, it is not designed to simulate short tube-long tube setups, such as the L2, L11 and L12 layouts that can be used with TRAX counters.

The TCT was designed to allow you to test the accuracy of your road tube counters in the office before placing them in the field to collect important data. This unit will allow you identify potential problems before they occur in the field, saving time and money.
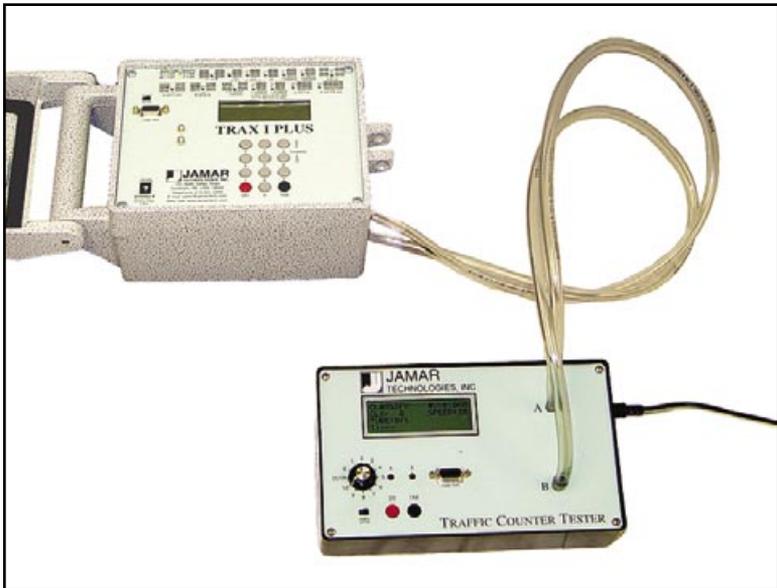
Chapter 2

Operation of the Traffic Counter Tester

Using the Traffic Counter Tester

The front panel of the TCT has several key components that must be identified. The first of these is the power switch. The power switch is located on the lower left corner of the front panel. Sliding this switch to the right will turn the tester on, and sliding it to the left will turn the tester off. The next components that must be identified are the two air hose nozzles on the right side, labelled A and B. These are the output of the TCT, and are used to connect it to a counter. The third item is the LCD panel at the upper left. This panel displays the current configuration of the TCT, information about the last vehicle to pass, as well as the current operating mode.

There are two push-button switches located at the bottom of the front panel. These buttons, labeled TAB and DO, are used to step through each operating mode, as well as to activate a mode. There are two LEDs located above the switches, labelled A and B. These LEDs correspond to the output nozzles, and give a visual indication of the air pulse. To the left of the LEDs is the Output dial. This dial controls the intensity of the air pulses generated by the TCT. The final component on the front panel is the nine-pin serial connector located to the right of the LEDs. This connector allows the TCT to be reconfigured from the WinTCT software, which is described in chapter 4.

Setting Up the Traffic Counter Tester

First, attach the air tubes to the nozzles on the TCT, making sure that each tube is the same length. At this point, it may be useful to mark the tube for channel A with a piece of electrical tape to aid in identifying the two channels. Next, plug the TCT power supply into an electrical outlet (110V@60Hz) and connect it to the TCT.

Caution: Only use the power supply provided with the TCT. Substitutes may damage the unit. Be sure to connect to the TCT before plugging into the outlet.

Once the power supply has been connected, turn on the TCT by sliding the power switch to the ON position. At this point, the unit should be on, and the display should show the following:

```
A,B           #V:00000
CLS:  2       SPEED:35
TUBE: 2 ft
T:----        STOPPED
```

Connect the air tubes to the air switch inputs on traffic counter that you are going to test. If you are testing a four tube counter, the pair of splitters supplied with the tester should be connected to the end of the air tubes. The Output dial, which is used to adjust the strength of the air pulse generated, should be set to 10. Refer to chapter 3 for more information on the Output dial.

Operating Modes

The TCT can simulate two channel volume data in one direction (A,B), two channel volume data in two directions (A to B, B to A), class data and speed data. To choose the mode you would like to simulate, press the TAB key until the desired mode is shown at the top left of the display then press the DO key.

A,B

This mode simulates a Class 2 vehicle with 9 ft. wheelbase. For speeds of 35 MPH and above, 1 vehicle will be simulated every second. For speeds below 35 MPH, the time between vehicles will increase to allow the counter to recognize the new vehicle. Vehicles travel in the direction of A to B.

A to B, B to A

This mode simulates a Class 2 vehicle with 9 ft. wheelbase. For speeds of 35 MPH and above, 1 vehicle will be simulated every second. For speeds below 35 MPH, the time between vehicles will increase to allow the counter to recognize the new vehicle. Vehicles alternate directions. The vehicle count will increment after every second vehicle, to show the total for each direction. **Note:** The tube spacing for this mode is fixed to 4.5 inches.

Classify

This mode simulates a variety of classes of vehicles traveling at the selected speed. Vehicles will be simulated at a rate of 1 vehicle every 6 seconds, or 10 vehicles per minute. The default scheme simulates all 13 Federal Highway Administration scheme F classes, with classes 2 and 3 repeated for a total of 15 vehicles. Refer to the Appendix for more information on the FHWA class scheme. Vehicles travel in the direction of A to B.

The classification scheme to be simulated can be modified by using the WinTCT software to upload a new scheme into the unit. When an uploaded Class table is being used by the TCT, the display on the unit will add the letter 'u' next to the class number that is shown during the test. Refer to chapter 4 for more information on the WinTCT software.

Speeds

This mode simulates a class 2 vehicle with 9 ft. wheelbase traveling at speeds from 35 to 80 MPH, in 5 MPH increments. Vehicles will be simulated at the rate of one vehicle every six seconds, with each vehicle increasing speed by 5 MPH. Vehicles travel in the direction of A to B.

Set Up Modes

Before you begin to simulate traffic with the TCT, there are three setup modes that should be adjusted to your specifications.

Set Speed

The Set Speed mode is used to set the speed of the vehicles to be simulated. This setting is shown on the second line of the display to the right. To set a speed, press the TAB key until

SET SPEED	#V:00000
CLS: 2	**SPEED:35**
TUBE: 2 ft	
T:----	STOPPED

Set Speeds is shown at the top left of the display. Then press the DO key to increase the speed of the vehicles by 5 MPH. The speed can be set from 5 to 80 MPH. Speeds in the range of 35 MPH to 55 MPH are recommended for normal use. **Note:** This setting does not affect the SPEEDS operating mode.

Set Tube

The Set Tube mode is used to program the TCT for the tube spacing you would like to simulate. This setting is shown on the third line of the display to the left. To set the tube spacing,

SET TUBE	#V:00000
CLS: 2	SPEED:35
TUBE: 2 ft	
T:----	STOPPED

press the TAB key until Set Tube is shown at the top left of the display. Then press the DO key to cycle the road tube distance through 4 inches, 2 ft., 4 ft., 8 ft. and 16 ft.

 It is possible to use a custom tube distance through use of the WinTCT software, which is discussed in chapter 4. When a custom setting is being used, in addition to the standard listings there will be a *USER* listing that will be set for the distance you uploaded to the TCT. **Note:** This setting does not affect the A to B, B to A operating mode, which uses a default setting of 4.5 inches.

Set Time

The Set Time mode is used to set the length of time that a test will run. This setting is shown on the fourth line of the display to the left. To set the time, press the TAB key until Set Time is

```
SET TIME            #V:00000
CLS:  2             SPEED:35
TUBE: 2 ft
T:----              STOPPED
```

shown at the top left of the display. Then press the DO key to cycle through the options of 15 min., 30 min., 45 min., 1 hr., 2 hr., 5 hr., 24 hr., and "—-". When a test is started, it will run for the length of time specified and then stop. The option "—-" is used to specify continuous operation.

Set Default

The Set Default mode is used to restore the setting in the TCT to the factory defaults. To restore the defaults, press the TAB key until Set Default is shown at the top left of the display. Then

```
SET DEFAULT         #V:00000
CLS:  2             SPEED:35
TUBE: 2 ft
T:----              STOPPED
```

press the DO key and you will be asked if you want to reset the TCT to factory defaults. Select Continue to reset the TCT or Cancel to return to the main menu without resetting to the defaults.

Chapter 3

Certifying Counters with the Traffic Counter Tester

Certifying Counters with the TCT

Once you are familiar with the how the TCT is setup and operates, you can begin to use it to certify the accuracy of the counters you are using to collect data in the field. The tests described in the steps below will enable you to determine how accurate your equipment is, and whether or not a counter is in need of service.

Step 1 - Set the Time and Speed

Set the time on the TCT to 15 minutes by pressing the TAB key until Set Time is shown on the display, then pressing the DO key until 15 min. is listed. Next, set the speed to the typical speed expected for the upcoming study, normally between 35 to 55 mph, by pressing the TAB key until Set Speed is shown on the display, then pressing the DO key until the speed you want is listed.

Step 2 - Test the Air Switch Sensitivity

To test the sensitivity of the air switch, set the Output dial to 0. Set the counter you are testing to display each axle hit as it occurs and start a count. Start the TCT in A,B mode by pressing DO when A,B is listed on the display. Slowly turn up the Output dial until the axle hits begin to register on the counter. Continue to increase the output until the air switches are recording every pulse. For most air switches, this should be between *3 and 5*. Record the value of the dial to track the quality of the air switches over time.

If the value at which the air switches are recording all pulses is low, the air switch may be too sensitive, and may double count for heavy vehicles. If it is too high, the counter may miss vehicles. If the output value is high, inspect the nozzles on the counter for an obstruction. If the nozzle is not clear, remove the air switch and clean the nozzle. Re-test to see if this has corrected the problem. **Note:** If a T connector is used to connect the tester to a 4 channel (or larger) counter, then the required Output setting will be higher.

Step 3 - Test Volume

Reset the Output dial to 10. Reset the counter being tested for a volume count and restart the TCT in A,B mode. The counter and the TCT should increment their count at the same rate. After the 15 minutes has ended and the TCT has stopped, both the counter and the TCT should display the same count values.

Next, test the A to B, B to A mode. If your counter does not have the capabilities for a bi-directional count with a tube spacing of 4.5 inches, or it has been deemed unnecessary to certify this mode, then proceed to step 4. Otherwise, set the counter to operate in this mode, and start a count. Start the TCT in A to B, B to A mode. The TCT will simulate a 9 foot vehicle in alternating directions. The count on the display will be updated after every second vehicle. After the 15 minutes has ended, both directions should have the same value as is shown on the TCT display.

Step 4 - Test Class
Reset the Output dial to 10. To test the classification mode of your counter (if it has the capabilities to do so), set the TCT to CLASSIFY mode and setup the counter to classify with two road tubes. After ensuring that the counter and the TCT are set to the same tube spacing, start the count and the TCT. The class of the vehicles that are then shown on the counter should match the TCT.

Step 5 - Test Speeds
Reset the Output dial to 10. To test the counter's ability to measure speeds, set the TCT to SPEEDS mode and setup the counter to measure speeds. After ensuring that the tube spacings are the same on the counter and TCT, start the count and the TCT. The speed of the vehicles that are then shown on the counter should match the TCT. After the TCT has stopped, use your analysis software to verify the results. Each speed (in steps of 5 mph) should have the same number of counts, with the possibility of the higher speeds being low by 1 or 2 depending on your speed groupings. The total number of vehicles recorded should match the number on the TCT.

If you encounter a discrepancy during any of these steps, double check your setup to be sure the tubes you are using for the testing are the same length. Also check that the Output dial is set to the proper level and that there is no blockage in the counter's nozzles. Once you have verified your setup, retest the counter. If the same discrepancy occurs, the counter many need to be serviced.
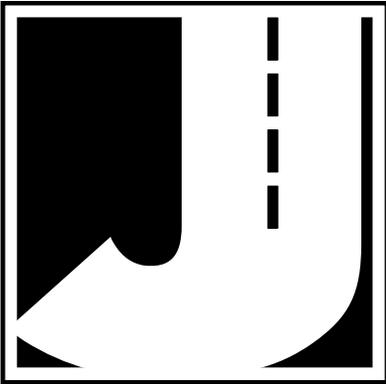
Chapter 4

WinTCT:
Software for the
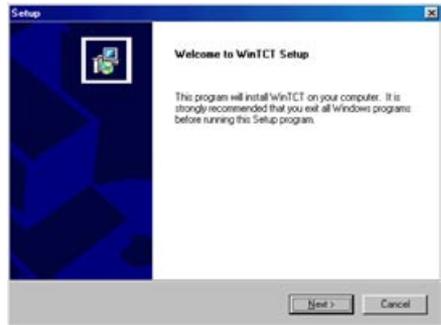# Traffic Counter Tester

Introduction to WinTCT

WinTCT, the software for the Traffic Counter Tester, allows the TCT to be customized by uploading schemes using the serial port on the TCT's front panel. With WinTCT it is possible to set up the TCT to use a custom tube distance, as well as to simulate a custom set of vehicles.

Important: It is not necessary to use the WinTCT software in order to use the TCT. The software is available for those users who need to use custom tube distances or custom classification schemes. If you would like to use this program, it can be downloaded from the Software Downloads section of the JAMAR web site, **www.jamartech.com**.

Installing WinTCT

WinTCT can be downloaded from the Software Downloads section of our web site, www.jamartech.com. Once the installation file is downloaded, double click on it and the installation for the program will begin.

The Welcome screen reminds you to be sure all other programs are closed before proceeding with the installation. During the installation, files used by the program will be placed on the computer, including some Windows system files. If other programs are open and using some of the files that need to be installed, an error can occur during the instal-

lation process. When you are ready to proceed, click on the Next button.

The Software License screen allows you to review the license agreement that must be accepted in order to use the program. Please review this agreement before selecting one of the options. You must accept the agreement in order to proceed with the installation or otherwise use the program. If you agree to the license, click Yes.

The Choose Destination Location screen is used to select the directory in which WinTCT will be installed. The default location is C:\Program Files\JAMAR\WinTCT. Once the directory has been set, click Next to continue and the program files will begin to be copied onto your computer.
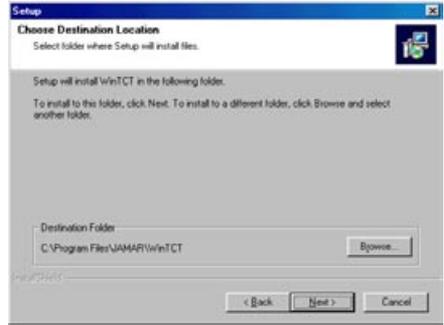
Once the files have been copied onto the computer, the Setup Complete screen will appear.

Click Finish to exit the installation. Once the software has been installed, the program can be accessed by clicking on the Windows Start button, going to Programs, choosing Jamar, then WinTCT.
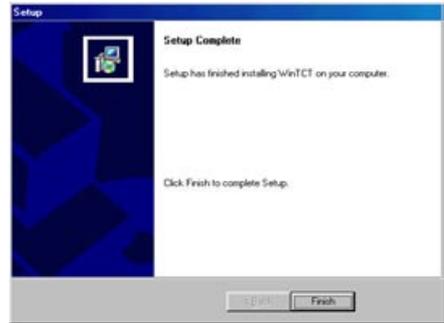
When you start WinTCT for the first time, you will be prompted to select the Com Port to be used for uploading. You must correctly identify the port you will be using in order to successfully upload from your computer. However, you can change the port selected at a later time through the File menu in the program.
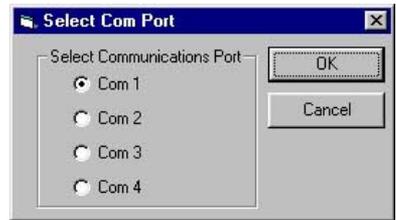
Using WinTCT

The WinTCT program can be used to modify the Tube Spacing or the Vehicle Classification scheme that the TCT will use when conducting its tests. The Units field is used to tell WinTCT whether the values being entered are in Feet or Meters. Any uploads done using meters will be converted to feet by the TCT.
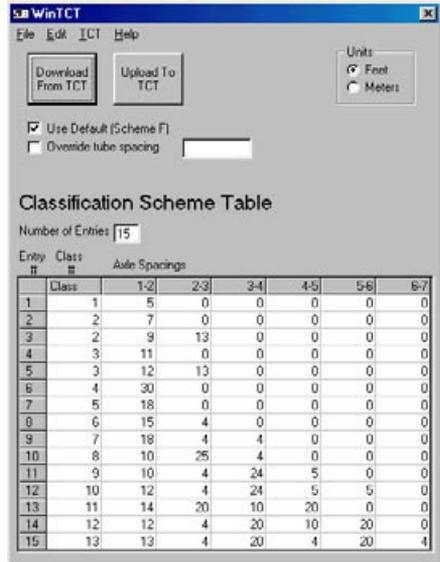
Modifying Tube Spacing

The TCT has five default tube spacings (4 inches, 2 ft., 4 ft., 8 ft. and 16 ft.) that can be set for doing a test. However, WinTCT allows you to program the TCT to simulate a

spacing anywhere from 0 to 35 feet (0 to 10.67 meters) in 0.01 increments. To do this, enter the distance desired in the "Override tube spacing" box, and click the check box. When this box is checked, any uploads will use the new tube distance. This can then be used in the TCT by going to Set Tubes and selecting 'User' from the list of options. Refer to page 2-5 for more information.

Modifying Vehicle Classification Scheme

The table on the bottom half of the WinTCT window is used to modify the specifications of the vehicles to be simulated. The table has 7 columns. The first column is used to specify the class number to be displayed on the TCT for that vehicle. Columns 2 through 7 are used to give the distances between successive axles, in feet or meters depending on what has been selected in the Units field. The largest axle spacing that can be used is 30 feet (9.14 meters). Vehicles with from 2 to 7 axles can be entered for simulation. To enter a vehicle with less than 7 axles, fill in the unused axles to the right with zeros.

When selecting axle spacings, it is important to pay attention to the speed at which you will be testing. Most traffic counters cannot detect road tube hits that are faster then 30 ms apart. In some counters, this time is even higher. So, the faster a vehicle is traveling, the farther apart two axles that are in

The image above contains the following WinTCT window content:

WinTCT

File Edit TCT Help

Download From TCT   Upload To TCT

Units: ○ Feet ○ Meters

☑ Use Default (Scheme F)
☐ Override tube spacing

Classification Scheme Table

Number of Entries: 15

Entry #	Class #	Class	1-2	2-3	3-4	4-5	5-6	6-7
1	1	5	0	0	0	0	0	
2	2	7	0	0	0	0	0	
3	2	9	13	0	0	0	0	
4	3	11	0	0	0	0	0	
5	3	12	13	0	0	0	0	
6	4	30	0	0	0	0	0	
7	5	18	0	0	0	0	0	
8	6	15	4	0	0	0	0	
9	7	18	4	4	0	0	0	
10	8	10	25	4	0	0	0	
11	9	10	4	24	5	0	0	
12	10	12	4	24	5	5	0	
13	11	14	20	10	20	0	0	
14	12	12	4	20	10	20	0	
15	13	13	4	20	4	20	4	

close proximity must be in order for the counter to distinguish between them. To determine the minimum spacing required for a given speed, the following equation can be used:

Spacing = Time * Speed(in mph) *1.467

The following table should work for most counters:

Speed (mph)	Required Spacing
1-29	1 foot
30-49	2 feet
50-69	3 feet
70-90	4 feet

The number of entries from the classification scheme that will be used to upload to the TCT is specified in the Number of Entries box. This number can range from 1 to 15. If a number less than 15 is entered, the entries that will not be included in the upload will appear grayed out in the Classification Scheme table.

If you have created a scheme you would like to use later, the scheme can be saved by selecting Save from the File menu. A file with a .cls extension will be created and can then be retrieved by selecting Open from the File menu.

To reset the vehicle table to the default FHWA scheme F setting, click the "Use Default (Scheme F)" check box. If this box is checked when the table is uploaded to the TCT, the default table will be used.

When an uploaded Class table is being used by the TCT, the display on the unit will add the letter 'u' next to the class number that is shown during the test.

Uploading to the TCT

To upload the settings you have programmed in WinTCT into the TCT, you will need: 1) the WinTCT software, 2) an open serial (Com) port on your computer, 3) a JAMAR universal cable.

Connect the universal cable to a serial port on your computer. Most serial ports are a 9 pin plug, and there may be more than one on the computer. The ports may be labeled on the computer itself with COM 1 listed as 1 or A and COM 2 listed as 2 or B.

Once the cable is plugged into the computer, plug the other end into the TCT. When connecting to a computer's Com port, there are several things you must keep in mind.

1) You must correctly identify what port you are plugging the cable into. The 9 pin connectors used for serial ports are also used for serial or parallel printers, mice, plotters, video cards and other devices. Just because your cable fits into a connector on your computer does not mean it is a serial port. Consult your computer instruction manual if you have any questions on which ports are serial ports on your computer.

2) Many computers have more than one serial port. You will need to know which serial port you are plugging the universal cable into. Serial ports are designated as COMx where x is a number from 1 to 16. You will need to know this number to download the unit.

3) Some devices that are plugged into a computer's serial port will not allow the Traffic Counter Tester to download its data properly. These are devices that require a program (called a device driver) to be running in the computer at all times. These device drivers are very self-centered, and think that all the data coming into the serial port is for them. Digital cameras, mice, digitizer boards, PDAs and light pens are all devices that require these device drivers to be running. If you have to unplug a device from the serial port to plug the Scanner in, or if you are using a switch box, be sure that the device does not have a driver running in memory.

4) If you have a conflict with another device on a serial port, or if your computer does not have a serial port, you can use a USB port by using a USB to Serial Converter. These devices allow serial peripherals, like JAMAR equipment, to interface with a USB port. There are several of these devices

available on-line and at computer stores. Go to the hardware support section of our web site (www.jamartech.com) for a link to one of these devices that we have tested and found to work well.

Once you have plugged the TCT into a serial port, and you know the port number, you are ready to upload from the WinTCT program. If you need to change the Com Port that has been selected in WinTCT, go to the File menu and choose Select Com Port. A window with a list of ports will appear. Select the port that you have connected the TCT to, and click OK. If the selected port is in use or does not exist in the computer's configuration, an error message will appear, and you will be asked to try another port.
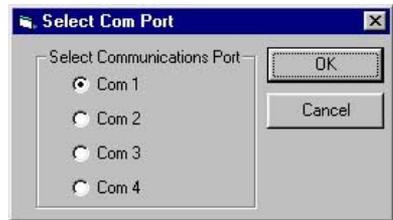
To upload to the TCT, click the Upload To TCT button, or choose PC->TCT from the TCT menu. You will be asked to confirm the upload before it begins. Click OK to upload, or Cancel to abort the upload. To download settings from the TCT itself, click the Download From TCT button, or choose TCT->PC from the TCT menu.

The TCT menu also contains the entry Re-Initialize TCT. When selected, this will reset the TCT counter to the factory default settings.
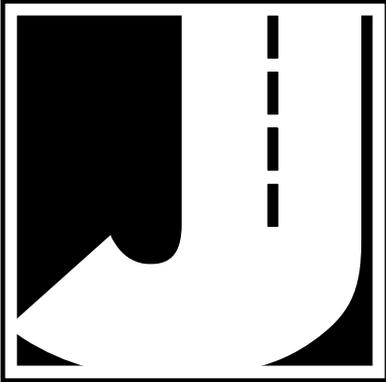
Appendix

FHWA Type F Vehicle Classification Scheme

Class 1 - **Motorcycles.** This class includes all two- or three-wheeled motorized vehicles. These vehicles typically have a saddle-type of seat and are steered by handlebars rather than a steering wheel. This includes motorcycles, motor scooters, mopeds, motor-powered bicycles and three-wheel motorcycles.

Class 2 - **Passenger cars.** This class includes all sedans, coupes and station wagons manufactured primarily for the purpose of carrying passengers, including those pulling recreational or other light trailers.
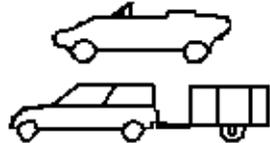
Class 3 - **Pickups, Vans and other 2-axle, 4-tire single unit vehicles.** This class includes all two-axle, four tire vehicles other than passenger cars, which includes pickups, vans, campers, small motor homes, ambulances, minibuses and car-ryalls. These types of vehicles which are pulling recreational or other light trailers are included.
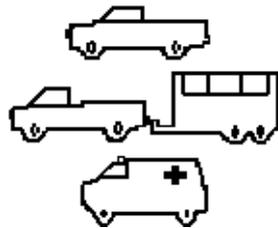
Class 4 - **Buses.** This class includes all vehicles manufactured as traditional passenger-carrying buses with two axles and six tires or three or more axles. This includes only traditional buses, including school and transit buses, functioning as passenger-carrying vehicles. All two-axle, four tire minibuses should be classified as Class 3. Modified buses should be considered to be trucks and classified appropriately.
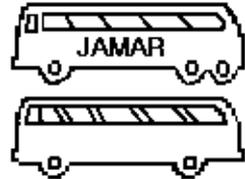
Class 5 - **Two-Axle, Six-Tire Single Unit Trucks.** This class includes all vehicles on a *single frame* which have *two axles and dual rear tires*. This includes trucks, camping and recreation vehicles, motor homes, etc.
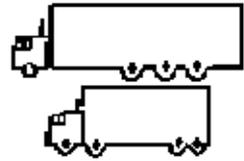
Class 6 - **Three-Axle Single Unit Trucks.** This class includes all vehicles on a *single frame* which have *three axles*. This includes trucks, camping and recreation vehicles, motor homes, etc.
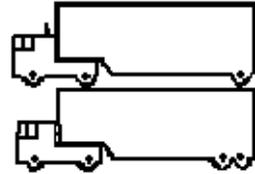
Class 7 - <u>**Four or More Axle Single Unit Trucks.**</u>
This class includes all vehicles on a *single frame*
with *four or more axles*.

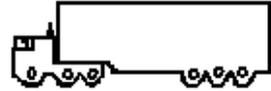**Class 8** - <u>**Four or Less Axle Single Trailer Trucks.**</u>
This class includes all vehicles with *four or less axles*
consisting of *two units*, in which the pulling unit is a
tractor or single unit truck.

Class 9 - <u>**Five-Axle Single Trailer Trucks**</u>. This class
includes all *five-axle* vehicles consisting of *two units* in
which the pulling unit is a tractor or single unit truck.

Class 10 - <u>**Six or More Axle Single Trailer Trucks**</u>.
This class includes all vehicles with *six or more axles*
consisting of *two units* in which the pulling unit is a
tractor or single unit truck.

Class 11 - <u>**Five or Less Axle Multi-Trailer
Trucks**</u>. This class includes all vehicles with
five or less axles consisting of *three or more
units* in which the pulling unit is a tractor or
single unit truck.

Class 12 - <u>**Six-Axle Multi-Trailer Trucks**</u>.
This class includes all *six-axle* vehicles con-
sisting of *three or more units* in which the
pulling unit is a tractor or single unit truck.

Class 13 - <u>**Seven or More Axle Multi-Trail-
er Trucks**</u>. This class includes all vehicles
with *seven or more axles* consisting of *three
or more units* in which the pulling unit is a tractor or single unit truck.

We are pleased that you have chosen the Traffic Counter Tester for your testing needs. We have strived to develop a unit that is easy to use, yet highly accurate. The Traffic Counter Tester has undergone extensive testing to verify the accuracy of its operations, and each unit is tested before it leaves our facility. However, just like other complex electronic devices, problems can occur. We always suggested that users verify the continuing accuracy of any device they use. Verification should be performed on an annual basis to assure proper operations and results.

Should you detect any problems with any of our products, please notify JAMAR Technologies immediately and discontinue use of the unit until we have verified its operation.

JAMAR
Technologies, Inc.
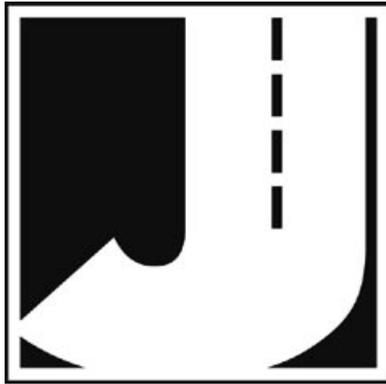
www.jamartech.com • sales@jamartech.com
1500 Industry Road, Suite C, Hatfield, PA, USA 19440