

OPERATION MANUAL

TITAN

DIAMOND TRAFFIC PRODUCTS

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INTRODUCTION

Our goal is to design and manufacture the best manual counting board available to the traffic industry. In 1990, Traffic Data Systems produced the fully programmable TITAN. We want you to be able to operate this unit with minimum effort. And also have provided an organized, intuitive manual to explain the various features included in the TITAN intersection counter.

Designed with the customer's needs in mind, the TITAN 64 is a superior counter. This counter was developed to be user friendly and convenient to operate, requiring very little effort and time to maintain. A variety of features have been included to create a powerful traffic design tool to suit all departments large and small.

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TITAN 64-KEY TURNING MOVEMENT COUNTER
Operator's Manual

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- c) Phaeton's examination of such equipment discloses to Phaeton's satisfaction that defects were not caused by negligence, misuse, accident, or improper repair or alteration by the Buyer.

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SECTION 1: ABOUT THIS MANUAL

Our goal is to design and build the best manual turning movement board available to the traffic industry. And in 1990, Traffic Data Systems produced the fully programmable TITAN. We want you to be able to operate this unit with minimum effort. And to provide an organized, intuitive manual to explain the variety of features included in the TITAN intersection counter.

The following describes several conventions which have been used in this manual.

- . The TITAN Sign-on screen display is as shown below:

TDS	TITAN 64	V1.00
6/JAN/90	11:29	

Figure 1-1 Sign on Display Screen

- . Warning and cautions will be indicated by a special area:

```
*****
*                               *
*             *** WARNING ***   *
*                               *
*             SAVE CHANGES BEFORE PROCEEDING   *
*                               *
*****
```

Figure 1-2 Warning Messages

- . Special operating notes and hints are displayed below:

- NOTE -
Special Notes Box

Figure 1-3 Special Notes

We hope that these instructions are beneficial to you in learning to use the TITAN 64-key intersection counter. If you have any questions or comments, please contact us at (813)-577-4464.

SECTION 2: HARDWARE DESCRIPTION

The TITAN 64 is a multiple study programmable counter. It has the capability of doing twenty pre-programmable intersection turning movement, event (time stamping all key actuation) and FHWA classification studies. The TITAN's data is transferred to a host computer supported by the IDEAS software package. In programming the TITAN, the type of study, date and time, location and notes are entered and transferred to the host computer along with the units' serial number and operator name.

The TITAN can be programmed to fit the needs of the chosen study for that day, or pre-programmed for the entire week or month. The templates have printed icons to give the operator visual indication of the different movements available: straight, left turn, right turn, right turn on red, and differentiation between pedestrians, cars and trucks.

This section will describe the main features of the TITAN 64-key intersection counter board. The following section (Section 3) is an overview and brief explanation of the different types of studies available with a view of the templates used for each. This should aid the operator in the familiarization of the various study types.

Figure 2-1 on the following page 2-2 is an example of the Front View of the TITAN counter unit, showing the LCD Display, Function Keys, Data and Text Entry Keys, and Template Mounting Strip.

Figure 2-2 on page 2-3 illustrates the Top End View of the TITAN unit, showing the Communications Input, External Power Connector, and Display Adjust.

Figure 2-3 on page 2-3 is an illustration of the Communications Cable.

The Reset Button is located in the battery compartment on the back of the TITAN unit.

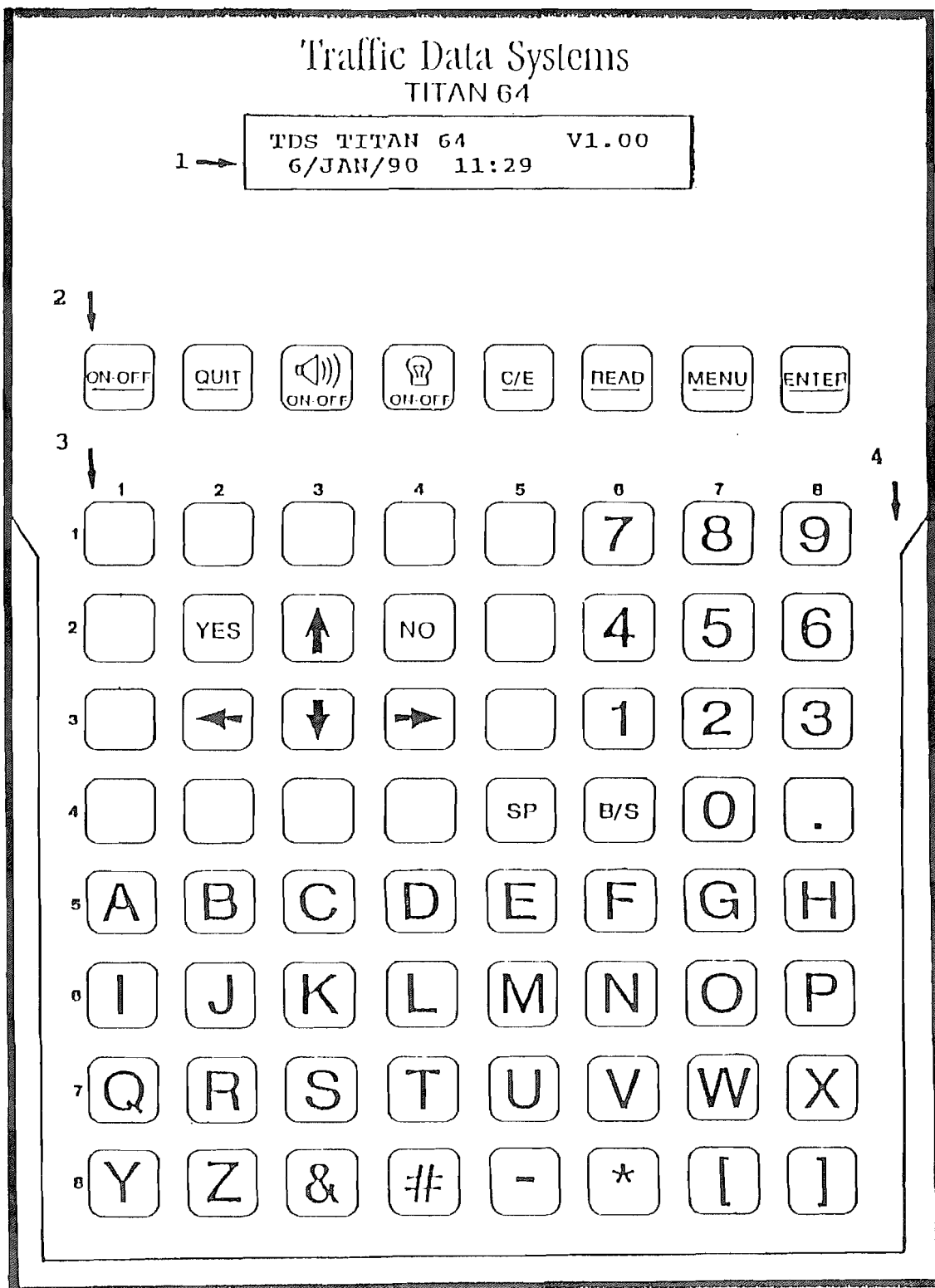


Figure 2-1 TITAN 64 Front View

- | | |
|------------------|-----------------------------|
| 1. Display | 3. Data and Text Entry Keys |
| 2. Function Keys | 4. Template Mounting Strips |

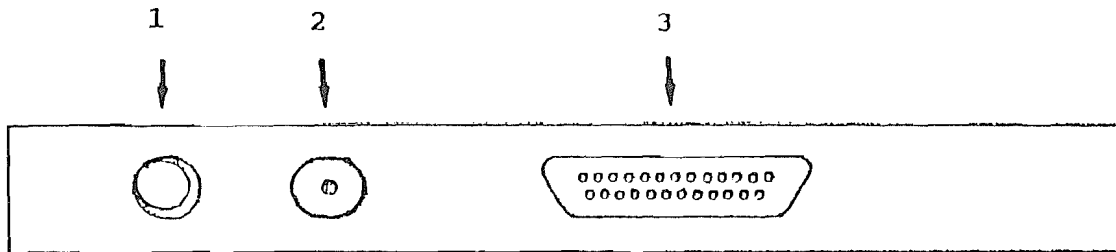


Figure 2-2 TITAN 64 Top End View

- | | |
|---------------------------|------------------------|
| 1. Display Adjust | 3. Communication Input |
| 2. Power Supply Connector | |

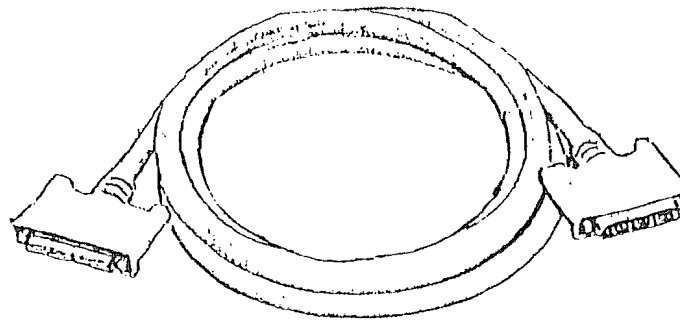


Figure 2-3 Communications Cable

SECTION 3: KEYBOARD AND DISPLAY

The following section will describe the operation of the keyboard for the TITAN 64-key counter. There are eight function keys and sixty-four data and text entry keys.

Figure 3-30 on page 3-13 will indicate the location of the function keys and data/text entry keys. The next section explains the purpose of each Function Key.

3.1 FUNCTION KEYS

- . ON/OFF Turns power to unit on or off. During a study this key also allows the operator to temporarily stop the count for lunch breaks etc.
- . QUIT Aborts the study or leaves the menu screens and returns to the normal Sign-on display. When a study is in progress, this key will end the study prematurely.
- . BACKLIGHT Toggles the display backlight on and off (with increased power consumption).
- . BEEPER Toggles the beeper on and off for normal beeps. Error and invalid beeps still occur.
- . C/E Clears last entry. The first key press clears the number to zero, the second key press restores the original number (before subsequent data entry).
- . READ Operator may use key to look at the current counts when given the interval and key.
- . MENU Calls the unit's MAIN MENU to the display.
- . ENTER Accepts the displayed data and steps to the next menu item.

The TITAN is easy to operate because of the intuitive menu choices available. Selection of these options is done by underlining the chosen feature with left and right arrow keys, then pressing "ENTER" to accept that particular choice.

The following sub-sections contain a more detailed description of the function keys listed above.

A. "ON/OFF" KEY

This function will allow the operator to turn the unit on or off to conserve battery life. When the "ON/OFF" key is pressed, the unit will power ON, and display the following:

```
SYSTEM LOADED.  
VERIFYING CHECKSUM...
```

Figure 3-1 Power On Screen

After the checksum verification is complete, the normal Sign-on screen will appear, such as below:

```
TDS    TITAN 64    V1.00  
6/JAN/90  11:29
```

Figure 3-2 Sign-on Display

During operation or while a study is in progress, when the "ON/OFF" key is pressed, the display will appear as follows:

```
ON/OFF  Turn Unit Off  
Yes  No
```

Figure 3-3 On/Off Screen

If "No" is selected, the display will return to the normal Sign-on, or study screen. If "Yes" is selected, the TITAN will enter the power-down, or shut-down mode. This will conserve battery power. When the operator wishes to continue the study, press the "ON/OFF" key and the study display will return and allow the operator to resume counting.

B. "QUIT" KEY

The "QUIT" function requires a Password to be entered. During a study, the operator may "Quit" or end the study prematurely. At the time the operator wishes to prematurely stop a study, simply press the "QUIT" key. Enter the user password. Then underline "Yes" with the left arrow key, then press "ENTER" at the following display:

```
QUIT Study
Yes  No
```

Figure 3-4 Quit Screen

Selecting "Yes" will abort the study and display the normal Sign-on screen. The "No" choice will go back to the study operation and display.

```
*****
*                                                                 *
*  WARNING: If "QUIT" is used during a study, the study        *
*           cannot be re-started unless it is programmed        *
*           again.                                              *
*                                                                 *
*****
```

C. "BACKLIGHT" KEY

Each key press toggles the backlight of the display ON and OFF.

```
*****
*                                                                 *
*  WARNING: Leaving the Backlight on for extended periods      *
*           of time will seriously affect battery life.        *
*                                                                 *
*****
```

D. "BEEPER" KEY

The beeper provides the operator a means to verify that a key was pressed, valid or invalid. The normal beep occurs with every key actuation and can be shut off with the "BEEPER" function key.

The list below describes the various beeps used in the TITAN 64:

Normal Beep	The normal beep occurs at the "Pre-study" screen and when any valid key is pressed during a study. The "Beeper" ON/OFF function key will only affect this beep.
Short Beep	The short beep occurs when a NON valid key is pressed.
Long Beep	The long beep occurs when an error message is displayed.

E. "C/E" KEY

The "Clear Last Entry" key allows the operator to clear the last entry made, by pressing the "C/E" key once. Pressing the key twice will replace the entry with the previously programmed data (before any changes had occurred) during programming. Also, while entering counts during a study, this key clears, or removes from memory, the last key pressed (which is the same as the last item counted).

F. "READ" KEY

This key will allow the operator to look at the counts for the study in progress. Pressing this key will display the following:

READ Current Interval <u>Yes</u> No
--

Figure 3-5 First "Read" Screen

If the current interval is to be read, the operator underlines "Yes", and Figure 3-6 is displayed. Otherwise, if "No" is selected, Figure 3-7 is displayed to allow the operator to choose the interval to read:

READ Interval Press Keys

Figure 3-6 Press Key Display

READ Interval	↔
12:00 <u>12:15</u> 12:30 12:45	

Figure 3-7 Choose Interval Screen

Use the left or right arrow keys to move the underline to the proper interval, then press "ENTER". For the following example we will use the 12:15 interval:

```
READ Interval
Press Keys
```

Figure 3-8 Press Key Screen

Press any of the valid data keys to obtain the count information from the TITAN'S memory. Each key pressed will display the key matrix number followed by the count for the chosen interval.

In this example, the "12:15" interval was chosen and key number "5.7" was pressed. The resulting Read screen is illustrated below:

```
READ Interval 12:15
Key 5.7 0023
```

Figure 3-9 Matrix Number with Count

To terminate the "READ" routine, press "QUIT" and the display will return to the count screen.

G. "MENU" KEY

The "MENU" function key is the means of calling the MAIN MENU to TITAN'S display. Unless the unit is within a study, this key will display the following when pressed:

```
MAIN MENU
PROG CHECK DATA SYS
```

Figure 3-10 Main Menu Display

If TITAN is performing a study at the time "MENU" is press, the following limited Menu will be display:

```
MAIN MENU
CHECK
```

Figure 3-11 Main Menu During a Study

The operation of the Main Menu and its sub-menus are described in further detail in the following section, Section 4.

H. "ENTER" KEY

This function key is used for all study parameter entries, and menu selection screens. When pressed, either the typed-in data is accepted into memory, or the operator is stepped through the menu system.

Aside from the function keys, there are "Data and Text Entry" keys. These keys are equally important because they are used to perform the traffic studies and they provide a keypad for typing in alphanumeric data.

The following section is a brief discussion on the Data and Text Entry keys. These keys will be used during most parameter entries. For the location of the Data and Text keys see Figure 3-30 on page 3-13.

3.2 DATA AND TEXT ENTRY KEYS

Notice that below the function keys there are 64 keys arranged in eight rows by eight columns. These rows and columns are marked with small identifying numbers along the top and left-hand sides of the keyboard. These small numbers are the identifying numbers for each key, which are referred to as the "key matrix numbers". For an example of these matrix numbers, see Figure 6-2, on page 6-4. They enclose the "Data and Text Entry keys". The Data and Text Entry keys' main purpose is to enter count data during a programmed study. The Data and Text entry keys also serve as the means for entering study and configuration parameters. The Data and Text Entry keys have been arranged in a manner as to provide simple and convenient text entry.

For alphabetical data entry, the lettered keys are located on the lower half of the keyboard. These have been configured to start at "A" and go straight through to "Z". We have included several characters for convenience, such as the number sign, and asterisk, etc.

In the upper left hand area of the keyboard there is a "Yes" key and a "No" key, with four arrow keys to help guide you through the menu selections. The left and right arrow keys, "←" and "→", will move the cursor through the menu choices. The up arrow key, "↑", will back-up to the previous menu, and the down arrow key "↓", works the same as the "ENTER" function key and accepts the selected data. The space and backspace keys have been included for editing purposes.

During the programming and configuring routines, you may need to enter numerical data to complete a study's header information and notes. The number pad is located in the top right area of the keyboard. It has been arranged to match the typical 10-key number pad used on most adding machines and calculators.

Figure 3-30 on page 3-13 depicts the arrangement of the TITAN keyboard.

3.3 DISPLAY SCREENS

The following is a brief description of the various display screens. When the unit is first turned on, the "System Loaded" screen appears as follows:

```
SYSTEM LOADED.  
VERIFYING CHECKSUM...
```

Figure 3-12 Checksum Verification Screen

When the checksum verification is complete, the normal Sign-on screen appears as below. This display may be accompanied by up to two of the four status messages (discussed in Section 3.4) at one time.

```
TDS  TITAN 64      V1.00  
6/JAN/90  11:29
```

Figure 3-13 Sign-on Display

When the "MENU" function key is pressed, the TITAN enters the menu system to allow the unit to be programmed. The sub-menu screens are similar to the Main Menu in Figure 3-10. The format of the menu screens appears as follows:

```
FUNCTION  Prompt  
Data.....
```

Figure 3-14 Typical Menu Display Format

The "function" describes which menu or sub-menu the TITAN display is working from. It is located in the upper left hand corner, in uppercase letters.

The "prompt" follows the function name by two spaces, with the beginning of each word capitalized. This line would give instructions on what data to enter, or there may be some sort of query or question, requesting a yes or no entry by the operator.

The "data" is displayed and or changed or entered in the lower left hand corner and can be twenty-four characters in length in parameters such as notes.

Once a pre-programmed turning movement count (Counts #1 through Count #4, Open Count, and the FHWA Classification Count) has been programmed, and has reached the Pre-study Delay time, the TITAN would like to know which group of keys are the "North Approach" group. In other words, the TITAN remembers the compass directions when collecting and transmitting count data. The selecting of the North Approach group of keys is only needed for the turning movement counts. Event, Gap and Headway, and Stop Delay studies do not require the north group direction entry, because these studies incorporate the time stamp.

Below are examples of the various studies and their display screens.

The following is the display for one of the pre-programmed turning movement studies, before it has begun:

N-0000	S-0000	ST 14:00
W-0000	E-0000	13:55

Figure 3-15 Turning Movement Display (waiting)

After the "North Approach" direction is chosen and verified (see Section 8.2.1 for instructions on entering counts), the TITAN will remain in the wait state illustrated above. As it reaches the study Start time, the unit is ready to begin counting and the screen will display the End time as follows:

N-0000	S-0000	ET 16:00
W-0000	E-0000	14:00

Figure 3-16 Turning Movement Display (started)

After some turning movement keys have been pressed the display will show the counts for each direction. Each key is saving the data for that key individually, by interval. The display is only combining the directions to indicate that keys are being pressed.

This display provides a quick reference for traffic flow by direction, it also serves as a means for the operator to check their entries thereby, increasing accuracy.

N-0123	S-0096	ET 16:00
W-0032	E-0001	14:05

Figure 3-17 Turning Movement Display (with counts)

The following display represents the FHWA Vehicle Classification with turning movement study:

N-0123	S-0096	ET 14:00
W-0032	E-0001	C02 12:55

Figure 3-18 FHWA Turning Movement (with counts)

Open Count Type studies display the following screen:

OPEN COUNT	ET 16:00
KEY 4.3 0037	13:05

Figure 3-19 Open Count Display (with counts)

Event, Gap and Headway Type studies display the following screen:

EVENT	ET 17:00
KEY 5.2 16:45:09.2	16:45

Figure 3-20 Event, Gap and Headway Display (with counts)

Refer to Figure 6-2 in Section 6, for a "Key number" assignment chart. These numbers are used in all Event and Open Count studies.

3.4 STATUS MESSAGES

The TITAN'S display screens have several status messages. These consist of low battery, low memory, communications connection, data transfer, start and end times for studies. The low battery, low memory, data transfer and communications messages will not be indicated during programming, they appear with the normal Sign-on display.

The status message for low battery will be indicated by the addition of the following screen:



Figure 3-21 Battery Low Indicator

This status message indicates that the internal batteries need to be replaced. It is displayed as "Bat", and is positioned in the lower right hand corner of the display.

The status message for low memory will appear as follows:



Figure 3-22 Low Memory Indicator

The memory low message indicates that the memory is getting full and needs to be cleared. This is displayed as "Mem" and is positioned seven characters from the lower right hand corner of the display. This message will appear when memory is at 90% of capacity.

The memory and battery messages will not appear during programming or while conducting a study. Both of the status messages are indicated with the Sign-on screen when the unit is first turned on as illustrated below:

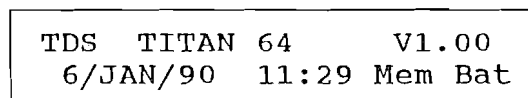


Figure 3-23 Sign-on Display with

The status message for communications connection will be indicated by the addition of the following screen:



Figure 3-24 Communications Connection Indicator

The communications status message indicates that the TITAN 64 is properly connected to the computer's communications port. This message is displayed as "Com" and is positioned in the lower right hand corner of the display.

The status message for data transfer will be indicated by the addition of the following screen:

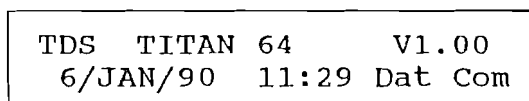


```
Dat
```

Figure 3-25 Data Transfer Indicator

This indicates that the TITAN 64 is in the process of downloading its data to the computer. This message appears as "Dat" and is positioned to the left of the "Com" indicator seven characters from the lower right hand corner of the display.

The communication connection and data transfer messages will not appear during programming or while conducting a study. Both of the status messages are indicated with the Sign-on screen when the unit is connected to the computer and transferring the data in TITAN's memory. This display is illustrated below:



```
TDS TITAN 64 V1.00
6/JAN/90 11:29 Dat Com
```

Figure 3-26 Sign-on Display during Communications

If the unit is connected to the computer, only the "Com" indicator will show on the display when a proper connection is obtained. After the computer initializes the transfer of data, the "Dat" indicator will appear.

While the TITAN is waiting for a study to begin, the display will note this with the Wait message. The current time will be displayed on the bottom right, and the programmed start time will appear on the top right. Below is an example of the Wait indicator which is displayed before all studies begin:



```
ST 14:00
13:55
```

Figure 3-27 Wait Message

After programming the TITAN for a study soon to begin, the display will appear like the figure below:

xxxxxxxxxxxxxxxx	ST 14:00
xxxxxxxxxxxxxxxx	13:55

Figure 3-28 Waiting Display

The current time is still displayed on the bottom right and the Start time of the study is displayed on the top right. The "xxxxxx" will be filled in with the Count or Event information that pertains to that particular study type.

When the study begins, the display will show the programmed End time for the current study. This is displayed with all study types. Here is an example of the End time indicator:

xxxxxxxxxxxxxxxx	ET 16:00
xxxxxxxxxxxxxxxx	14:01

Figure 3-29 End Time Display

The current time is still displayed on the bottom right and the time the study will end is displayed on the top. The keys needed for the particular study type are active and will display according to the specific study type. As the keys are pressed the counts will be displayed and recorded into the counter's memory.

3.5 DISPLAY ADJUST

Since Liquid Crystal Displays react differently to changing light angles and types, you may find the need to adjust the display for optimal clarity. We have mounted a manual "Display Adjust" to the top end of the unit, where the other external connectors are located.

Turn the display knob pictured in Figure 3-31 on page 3-14 to adjust the contrast of the display. Adjust the display until clear and sharp lettering is obtained.

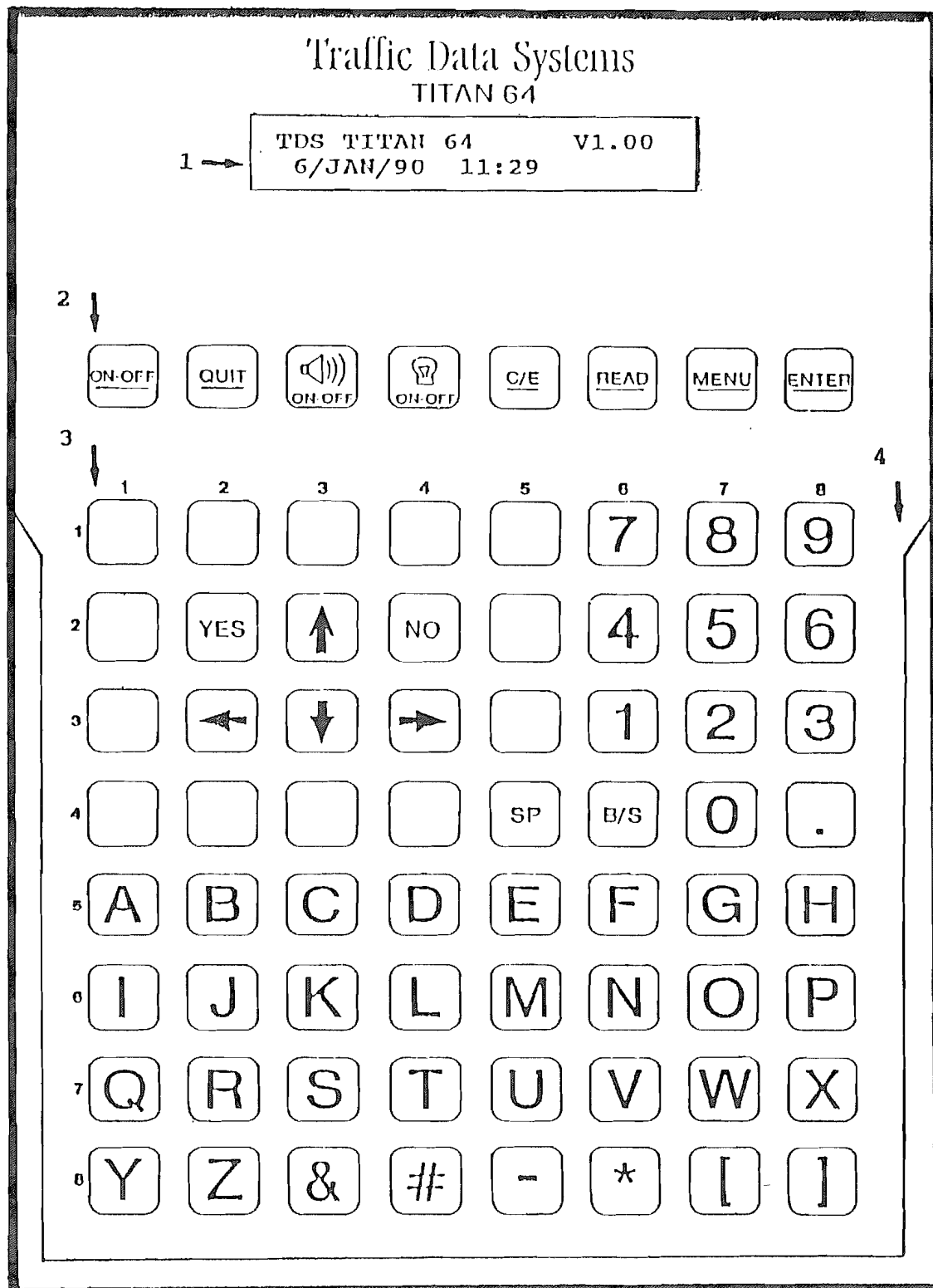


Figure 3-30 TITAN 64 Front View

- | | |
|------------------|-----------------------------|
| 1. Display | 3. Data and Text Entry Keys |
| 2. Function Keys | 4. Template Mounting Strips |

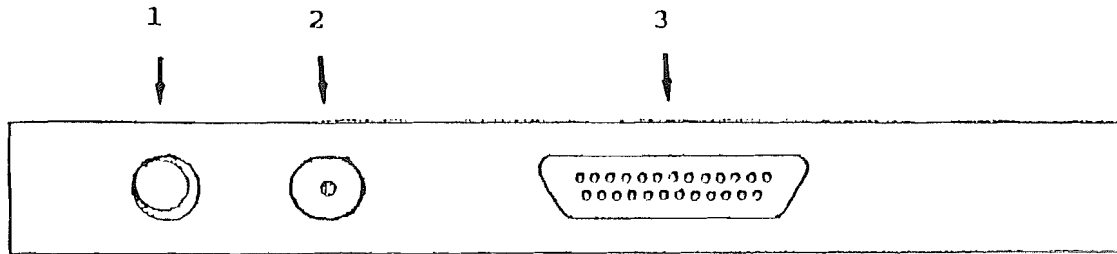


Figure 3-31 TITAN 64 Top End View

- | | |
|---------------------------|------------------------|
| 1. Display Adjust | 3. Communication Input |
| 2. Power Supply Connector | |

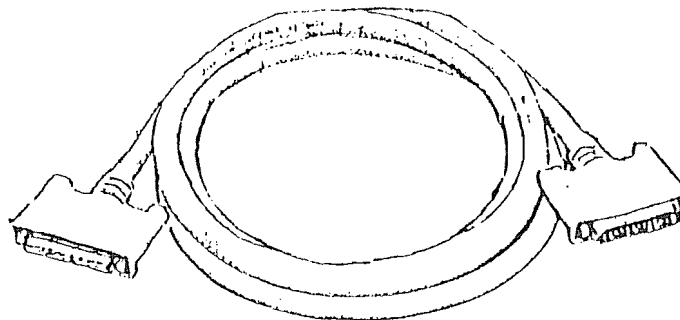


Figure 3-32 Communications Cable

SECTION 4: MENU SYSTEM OVERVIEW

The best place to start with a menu driven system, is to understand what options are available, and their purpose. This section will cover the menu choices available and briefly explain the associated sub-menus. After reading this overview, one may need no further instruction.

It is quite simple to set parameters and enter data into TITAN'S memory. For the menu screens, underline the appropriate selection with the left or right arrow key, and press "ENTER". For data entry such as time or notes, simply type in text with the "Data/Text Entry Keys" then press "ENTER" to accept.

When a "Yes" or "No" selection is required, both the "Yes and "No" will be displayed on the bottom line of the display. The default selection will be underlined. The left and right arrow keys will move the underline to the left or right. The "Yes" or "No" keys will also move the underline to the corresponding position. When the desired choice is underlined, the "ENTER" key is pressed to accept the answer and advance to the next menu item.

4.1 GETTING STARTED

To begin operation of the TITAN counter, turn the unit "ON" with the "ON/OFF" button located in the upper left-hand corner with the other function keys. The "System Loaded" screen will appear as follows:

SYSTEM LOADED. VERIFYING CHECKSUM...

Figure 4-1 Checksum Verification Screen

Once the checksum is verified, the normal Sign-On Display screen will appear:

TDS	TITAN 64	V1.00
6/JAN/90	11:29	

Figure 4-2 Normal Sign-On Display

If a count study is waiting to begin, the following will display:

N-0000	S-0000	ST 14:00
W-0000	E-0000	13:55

Figure 4-3 Count Study Display

If an event study is waiting to begin, the following display will appear:

EVENT	ST 14:00
Key 2.4	13:54:06.0 13:55

Figure 4-4 Event Study Display

4.2 MAIN MENU

To enter the menu system for programming and viewing of previously entered programs or configuration parameters, press the "MENU" function key. This calls the Main Menu up to the display. Below is an example of the Main Menu:

MAIN MENU
<u>PROG</u> CHECK DATA SYS

Figure 4-5 Main Menu Display

Use the right or left arrow keys to underline the desired option. When the appropriate option has been underlined, simply press "ENTER" to perform the chosen operation.

Below is a brief description of the Main Menu choices and their purpose. It is recommended that the operator read through this section to provide a basis for him/her to begin operation of the TITAN counter. With minimal time spent on this section, the user should be able to operate the counter with ease. The menus and their procedures are designed to require very little instruction.

Main Menu Selections:

- . PROG This selection is used to program the TITAN counter for event and count studies. Programming the TITAN requires a password.
- . CHECK Use this function to check previously programmed studies for verification of proper parameter entry. No password is necessary.
- . DATA The "DATA" option allows the user to erase all studies in memory, or only the completed studies in memory. This feature requires a password.
- . SYS To configure the unit's time, date and other necessary parameters, or to perform diagnostic tests, use this menu choice. A password is required to program a new password.

4.3 PROGRAM MENU

The program menu is going to be the most used menu selection. This routine sets the study parameters and allows for the operation of the TITAN unit to obtain traffic data. To use this function the correct password must be entered.

From the unit's Main Menu, underline "PROG" and then press "ENTER". The screen will now ask for a "Password" to be entered. The password consists of up to eight alphanumeric characters, and is set in the "CONFIG" routine, under "SYS" of the Main Menu. As each character in the password is being entered, an asterisk will appear. When the correct "Password" has been entered, the following message appear:

PROGRAM Memory Usage 0% Total

Figure 4-6 Memory Usage Message

Press the "ENTER" key and the next screen will prompt the user for a "Study Number" between one and twenty. If several studies have already been programmed, then the display will default to the next available "Study Number". If the entered number is already in use, the display will indicate that the unit expects to edit this previously programmed study. Otherwise, with the entry of a new "Study Number", the operator will be asked which "Type" of study he or she would like to produce.

After the "Study Type" has been chosen, there are three screens for notes. The first is "Observer Name", then "Site Location" and third is "Site Notes". All of which accept alphanumeric data and wait for "ENTER" to be pressed to accept the typed in data. For count studies, "Interval Length" is chosen. "Interval Length" is not necessary for event, gap and headway studies. The next step in the program routine is to enter the "Start Time", "Start Day" and "Start Month". The current year is automatically used. "End Time", "End Day" and "End Month" entry follows.

Finally, the operator will be asked if they wish to enter a "Peak Interval" with a different "Interval Length". If "No" is answered at this screen, the unit will display Figure 4-7 below. If "Yes" is answered to the peak interval question, the "Start Time", "Interval Length" and "End Time" is required. Use "ENTER" to accept the selected data in these screens.

PROGRAM More Studies Yes <u>No</u>

Figure 4-7 Program More Studies Question

After the program has been set-up, the operator will be asked if they wish to program more studies. If "No" has been answered to the "Program More Studies" question, the display will return to the normal Sign-on screen. For step by step instructions on programming the TITAN, see Section 7.

4.4 CHECK OPTION

This choice allows the operator to verify the study parameters entered into the TITAN counter. Even during a study the user may view the current study, or any other studies previously programmed.

No password is required for this routine.

To review programs already entered into memory, underline the word "CHECK" from the Main Menu and press "ENTER". The "ENTER" key, or the down arrow key "↓", will guide the operator through the program parameters which parallel that of the "PROGRAM" sequence. In other words, the steps taken to program the TITAN, are identical to the screens that the "CHECK" function steps through for the operator to view.

4.5 DATA SELECTION

The "DATA" selection is used to clear memory. A correct password must be entered to proceed with erasing studies.

The following is an example of the enter password screen:

```
DATA  Enter Password
*****
```

Figure 4-8 Enter Password

After entering the proper password, TITAN will prompt the operator for which types of studies to be deleted. The operator may wish to erase **all** studies or only studies which have been **completed** (and hopefully uploaded to host computer).

```
DATA  Clear
Completed All
```

Figure 4-9 Data Clear - Completed of All

Underline appropriate selection and press "ENTER" to proceed.

The following warning message will appear:

DATA WARNING If cleared
Data cannot be recovered

Figure 4-10 Data Warning Message

When "ENTER" has been pressed, the following screen will appear to verify that indeed, the operator intends on removing the data and is sure about it:

DATA Clear - Sure?
Yes No

Figure 4-11 Data Clear - Completed or All

```
*****
*                                                                 *
*  WARNING: Once "YES" is chosen at this screen, data in      *
*                memory cannot be recovered.                  *
*                                                                 *
*****
```

4.6 SYSTEM MENU

The "SYS" selection is the "SYSTEM MENU". This choice allows the operator to configure and test the TITAN counter. Access to the "SYSTEM MENU" is done by underlining "SYS" in the Main Menu (see Figure 4-5 on page 4-2)

To get into the sub-menu of the "SYSTEM MENU", underline "SYS" and press "ENTER". The following screen will be displayed:

SYSTEM MENU
CONFIG TEST

Figure 4-12 System Menu Screen

If the TITAN unit has just arrived the user should first "CONFIGURE" the counter and set several parameters before using TITAN to gather traffic data. These parameters consist of the current date and time, the times for Pre-study delay and Display Timeout, and the user password.

To "CONFIGURE" the TITAN counter, underline "CONFIG" as illustrated above in Figure 4-12, then press "ENTER". Refer to the next section, Section 5, for step-by-step instructions on configuring the TITAN counter to best suit your department's needs.

For "INTERNAL DIAGNOSTIC" testing of the TITAN unit, underline "TEST" as illustrated above in Figure 4-12 and press "ENTER". Select the desired routine of the following: Memory Test, Serial Port and Keyboard Tests. For more detailed information about the test functions included in the TITAN counter, refer to Section 10.

SECTION 5: CONFIGURING TITAN

The first step to beginning use of the TITAN intersection counter is to set the configuration parameters. To start this process, turn the unit on with the "ON/OFF" function key. After the System Loaded screen, the following Sign-on display will appear:

TDS	TITAN 64	V1.00
6/JAN/90	11:29	

Figure 5-1 Sign-On Display

Press the "MENU" function key to call-up the TITAN'S Main Menu. The display will look as the figure below:

MAIN MENU			
PROG	CHECK	DATA	<u>SYS</u>

Figure 5-2 Main Menu Screen

From this Main Menu many operations may be accessed. To continue with the configuration of the unit, underline "SYS" using the left or right arrow keys, then press "ENTER". The screen will now be in the "SYSTEM" menu as illustrated below:

SYSTEM MENU	
<u>CONFIG</u>	TEST

Figure 5-3 System Menu Screen

"SYS" is abbreviated for "SYSTEM" and provides the "TEST" and "CONFIG" options. To continue, underline "CONFIG", as shown in the figure above, with the left or right arrow keys, then press "ENTER". The first screen in the Configuration routine will appear as below:

CONFIG	Time
15:00	

Figure 5-4 First Configuration Screen

This Configuration Menu is designed to guide the operator through a set of screens. These screens consist of the current time, day, month and year, display timeout choice, pre-study delay time and password programming. Once this data has been correctly entered, it will remain in TITAN'S memory until the unit is reconfigured. The operator may need to reconfigure if power or internal software has been interrupted (i.e. lithium battery changes and version upgrades to the internal software).

5.1 SETTING CLOCK

The setting of the current time is the first "CONFIG" screen. The initial display shows the current time as the "CONFIG" menu is begun. The internal real time clock is in 24:00 military time. All time entries must be made in this military time format for proper operation.

The first configuration screen is illustrated below:

```
CONFIG  Time
  9:15
```

Figure 5-5 Set Time Display

As a number key is pressed, the time data clears to zero and the number appears in the furthest right-hand position. Following numbers will continue to appear in this right-hand position until the complete time has been entered. The figure below illustrates the display as the number "1", and then "0" is pressed:

```
CONFIG  Time
  00:10
```

Figure 5-6 Set Time Display

If the current time is 10:30 A.M., press numbers "3" and then "0". The display will now appear as follows:

```
CONFIG  Time
  10:30
```

Figure 5-7 Set Time Display

Press "ENTER" to accept this new time. Seconds will automatically be set at zero when the "ENTER" key is press. When the first configuration screen is complete, the second screen which sets the day of the month will appear.

5.2 SETTING DATE

Setting the date directly follows the setting of the time. After the time data entry is complete, the operator will be prompted to enter the current "Day of the Month". This display is as follows:

```
CONFIG  Day of the Month
15
```

Figure 5-8 Set Day of Month Display

Again, the numbers are entered in calculator style, where the key presses appear from right to left. If the day is to be changed to "9", press the number "9" key and then "ENTER". If the day is to be changed to "23", press the "2", then "3" and then "ENTER".

The first step to date entry is complete. After "ENTER" has been pressed for the day of the month, the "Month" list will be displayed. Simply underline the correct Month with the left or right arrow keys and press "ENTER" to accept. This Month list scrolls around in a circle, as all months together would not fit within the display.

Below is an example of the screen for setting the current month:

```
CONFIG  Month      ↔
JUL AUG SEP OCT NOV DEC
```

Figure 5-9 Set Month Display

As the right arrow is pressed twice, the following will appear:

```
CONFIG  Month      ↔
SEP OCT NOV DEC JAN FEB
```

Figure 5-10 Set Month Screen

Continue to scroll through the months with the left or right arrow keys until the correct month is underlined. When this is accomplished, press "ENTER" to accept the chosen month.

The final step for entering the date is to enter the current "Year". The numbers for the year are entered identical to that explained above for Day of the Month. Simply press the number keys corresponding to the year, then press "ENTER" to accept. The figure below depicts this screen:

```
CONFIG Year
89
```

Figure 5-11 Set Year Screen

To change the year to "90", press number "9" and then "0". The display appears as below:

```
CONFIG Year
90
```

Figure 5-12 Set Year Screen

Press "ENTER" to accept the year data, then the "Display Time Out" screen described below will follow.

5.3 DISPLAY TIME OUT

The "Display Time Out" feature allows the operator to select a particular amount of time between 0 and 60 minutes for which the display will remain on after any key actuation. If "0" is chosen, the display will never "time out" and remain on until the unit's power is turned off with the "ON/OFF" function key. The following figure illustrates the selections available. Underline the desired "time out" selection with the left or right arrow keys, then press "ENTER". Below is an example of this screen:

```
CONFIG Display Timeout ↔
0  1  2  5  10  15 30
```

Figure 5-13 Display Time Out Selection Screen

All of the Display Time Out selections do not fit on the display screen. The choice of 60 minutes is also available. Press the right arrow key twice to underline the 60 minute display time out. Once the desired time is underlined, use the "ENTER" to accept the selection.

5.4 PRE-STUDY DELAY TIME

The "Pre-study Delay Time" controls how long before a study starts that the Pre-study Display will turn on. In other words, the normal Sign-on will be displayed until 10 minutes (as indicated in the figure below) before the study begins. Then the display will show either a Count 1 through Count 4, Open Count or Event type display. After a short beep to notify the user that the TITAN is about to begin a programmed study, the display will alternate between the two Pre-study Display screens to await a key press during this "Pre-study Delay Time".

Below is an illustration of the sixth configuration screen which sets the "Pre-study Delay Time":

CONFIG Pre-Study Delay						
1	2	5	<u>10</u>	15	30	60

Figure 5-14 Display Timeout Selection

To change the "Pre-study Delay Time", press the left or right arrow key until the desired delay time is underlined, then press "ENTER".

5.5 PROGRAMMING USER PASSWORD

The seventh configuration screen will present the operator with the option to enter a user password. TITAN 64 is shipped with a "master" password. This password is used to enter or change the "user" password. The "user" password is the password programmed for use by whomever may be operating the TITAN 64 counter unit. Here is an example of that screen:

CONFIG Change Password	
Yes	<u>No</u>

Figure 5-15 Change Password Screen

If the user password has already been programmed and does not need changing, underline "NO" with the left or right arrow key, then press "ENTER". This selection will keep the previously programmed user password.

To program a new user password, or replace the previous user password in TITAN'S memory, underline "YES" with the left arrow key, then press "ENTER". The following screen will appear on the display:

```
CONFIG  Enter Password
```

Figure 5-16 Enter Password Screen

As each character is typed in, an asterisk will appear. After typing either the "Master" password or the "User" password correctly, and then pressing "ENTER", the display will appear as below:

```
CONFIG  New Password
*****
```

Figure 5-17 Correct Password Display

To keep the original password, simply press "ENTER" at the screen above in Figure 5-17.

To change the password, simply enter the new password with the "Data/Text Keys". Up to eight alphanumeric characters may be used. Then press "ENTER" to accept this new user password. As a shortcut, the "Enter" key itself, may be used as a password. The operator will be asked to verify this new password before it commits the data to memory. The screen will appear as in the figure below:

```
CONFIG  Verify Password
*****
```

Figure 5-18 Password Verification Screen

Again, as each character is typed, an asterisk appears. Type the new password again to verify that it is correct, and press "ENTER". The TITAN is now programmed with a new user password.

This concludes the configuring of the TITAN 64 counter. The operator may now proceed with programming and performing traffic studies.

SECTION 6: TEMPLATE DESCRIPTION

The TITAN 64-key counter has been designed to allow for simple operation in conducting the various study types available. The following pages will explain and illustrate the templates used with these studies. It is recommended that the operator become familiar with these templates, the associated study types and their use with the TITAN counter.

6.1 TEMPLATE INSTALLATION

The installation of the templates is quite simple. First align the Template with the strips on each side of the front of the TITAN unit, then slide template down over the keyboard. Take care not to damage the retaining strips for the template. For example, do not place heavy objects on top of the unit, this could bend the template frame and damage the function and data text keys.

Figure 6-3 on page 6-5 illustrates the template strips used to install the templates onto the TITAN unit. These strips may also be referred to as the template frame.

6.2 COUNT #1 TEMPLATE

Count #1 is a 16-key basic turning movement study utilizing Template #1. This study counts left turn, right turn, straight through and pedestrians for each direction.

For an illustration of Template #1 see page 6-6, Figure 6-4.

6.3 COUNT #2 TEMPLATE

Count #2 is a 28-key turning movement count. This study utilizes Template #2 and counts left turn, right turn, and straight through, for each direction, with distinction between cars, trucks and pedestrians.

On page 6-7 in Figure 6-5, is an illustration of Template #2.

6.4 COUNT #3 TEMPLATE

Count #3 is a 36-key turning movement count utilizing Template #3. This study counts left turn, right turn, straight through and right turn on red for each direction, with distinction between cars, trucks and pedestrians.

See page 6-8, Figure 6-6 for an illustration of Template #3.

6.5 COUNT #4 TEMPLATE

Count #4 is a 56-key turning movement study which utilizes Template #4. It allows for right turn, left turn, straight through and right turn on red counts for each direction with distinction between cars, small trucks, large trucks and pedestrians.

The illustration of Template #4 is on page 6-9 in Figure 6-7.

6.6 FHWA CLASSIFICATION TEMPLATE

The FHWA Vehicle Classification study utilizes the FHWA Classification Template. It counts 15 different class types from motorcycles and cars to seven or more axle vehicles with multiple trailers, in 16 movements which is all four directions including right turn, left turn, straight through and right on red.

On page 6-10 in Figure 6-8 is an example of the FHWA Vehicle Classification Template.

Below is a diagram showing the various class types used by the Federal Highway Administration. This has been included as an aid to the operator.

Classification abbreviations used:

FHWA vehicle classifications are as follows:

- | | | | |
|----|-------|---|-----------------------------------|
| 1 | Cycle | - | Motorcycles |
| 2 | Autos | - | Passenger cars |
| 3 | 2A-4T | - | Two axle, 4 tire single units |
| 4 | Buses | - | Buses |
| 5 | 2A-6T | - | Two axle, 6 tire single units |
| 6 | 3A-SI | - | Three axle single units |
| 7 | >3 -S | - | Four or more axle single units |
| 8 | <5A-T | - | Four or less axle single trailers |
| 9 | 5A-ST | - | Five axle single trailers |
| 10 | >5A-T | - | Six or more axle single trailers |
| 11 | <6A-M | - | Five or less axle multi-trailers |
| 12 | 6A-MT | - | Six axle multi trailers |
| 13 | >6A-M | - | Seven or more axle multi-trailers |
| 14 | Other | - | Unassigned (user defined) |
| 15 | Other | - | Unknown (not classified) |

Figure 6-1 FHWA Vehicle Classification

6.7 OPEN COUNT

This count study does not utilize a template. It allows for the entire keyboard to be used. Removable labels can be used to assign specific movements to each of the keys. This is one reason there are no icons or overlay template. The other reason is that this keyboard is a text entry keyboard also.

All keys are counted in this study and are identified by the "key matrix" numbers which are the vertical and horizontal numbering of the data and text keyboard. A chart depicting the key number assignments can be found on the following page in Figure 6-2.

For example, Key 1.1 is the first key in the upper left-hand corner. Key 2.1 is the key directly below. Therefore, the horizontal numbers on the left side of the data keys are first, with the vertical numbers across the top being second in identifying the data keys.

On page 6-5 in Figure 6-3 is an example of the full keyboard which is used in the open count study.

6.8 EVENT STUDY

Event studies are recorded as a key press accompanied by a time stamp of the exact time (to a tenth of a second) that the key was pressed. One way they differ from count studies is that they do not use intervals. The host software is capable of putting event studies into intervals if the need arises.

The TITAN keyboard is a 8 column by 8 row switch matrix. Each switch is assigned a number corresponding to the row and column, which is referred to as a "key matrix" number. For example, the button in row 5, column 3 is call "Key 5.3". The table in Figure 6-2 on the following page, represents the matrix and the assigned key numbers used by the Open and Event type studies.

When "key 5.3" is pressed, the exact time is recorded. Remember that each key is saved separately. When the data is transferred, the keys are listed separately.

Unlike the turning movement studies described in this section, events do not require special templates to mask unused keys. Events are customized to meet the requirements of the study being made. Removable labels can be used to assign specific movements to each key. For your convenience, a Headway & Gap template has been designed to interface with IDEAS software in printing Headway and Gap reports and other Event templates may be available at a later date. However, the templates used for Count studies could be used if events are to be gathered using one of the standard templates for signal timing, etc.

This section is not designed to recommend specific event studies, only to explain the event study theory and its overlay. The event study was included in the TITAN counter to allow for the flexibility to design studies which best accommodate the department's particular needs.

6.9 EVENT - HEADWAY AND GAP TEMPLATE

The Headway and Gap study utilizes the Headway and Gap Template. Gap studies are taken from the back of one vehicle to the front of the following vehicle. Headway studies are taken from the front of one vehicle to the front of the following vehicle.

An example of the Headway and Gap Template is on page 6-11 in Figure 6-9.

The following chart represents the "key matrix" number chart for the data keys which are used in all Event and Open Count studies:

1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8
2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8
3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8
4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8
5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8
6.1	6.2	6.3	6.4	6.5	6.6	6.7	6.8
7.1	7.2	7.3	7.4	7.5	7.6	7.7	7.8
8.1	8.2	8.3	8.4	8.5	8.6	8.7	8.8

Figure 6-2 Row/Column Key Matrix Number Chart

Instructions for performing all of the studies discussed above can be found in Section 8.

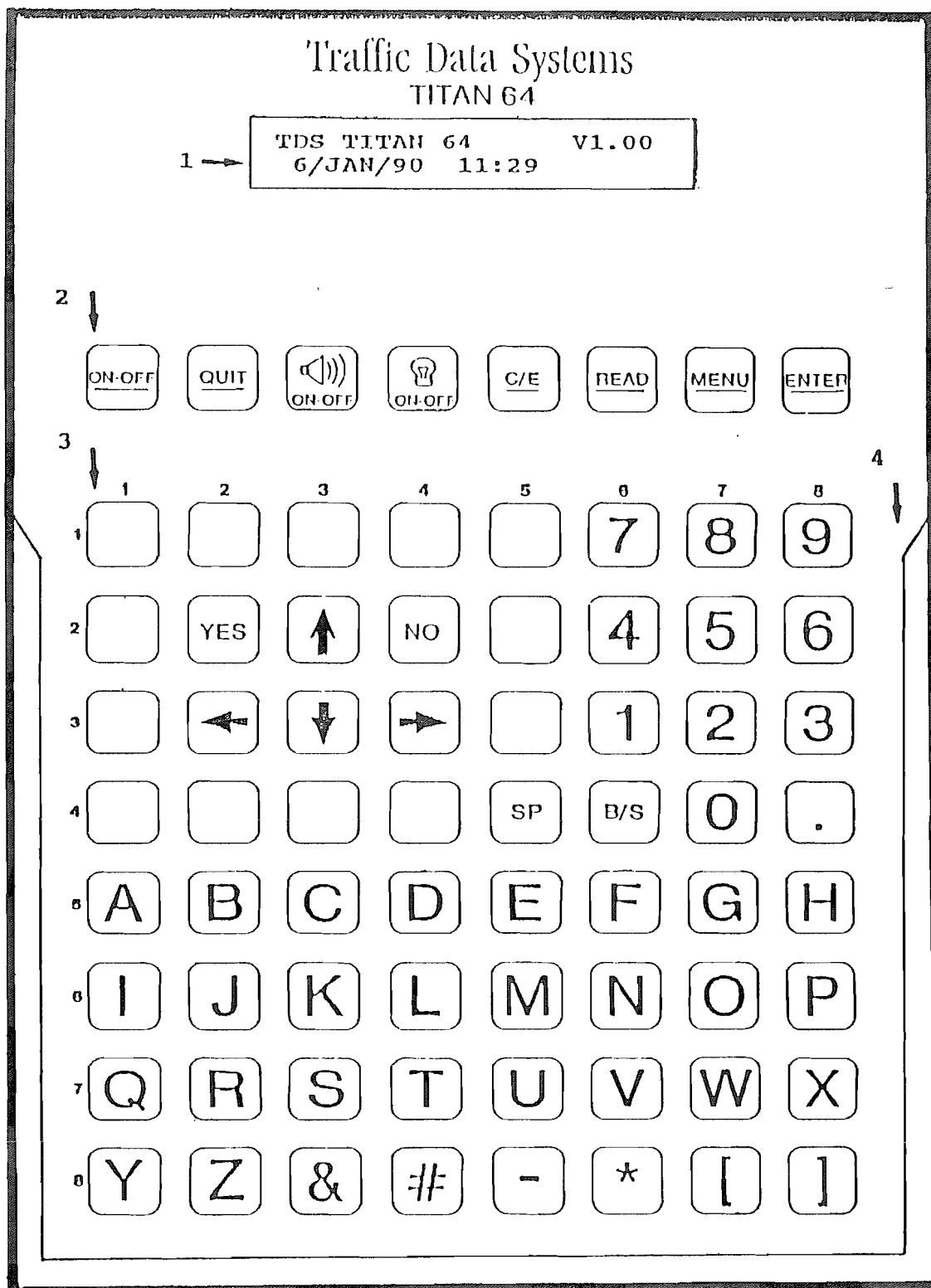


Figure 6-3 TITAN 64 Front View

- | | |
|------------------|-----------------------------|
| 1. Display | 3. Data and Text Entry Keys |
| 2. Function Keys | 4. Template Mounting Strips |

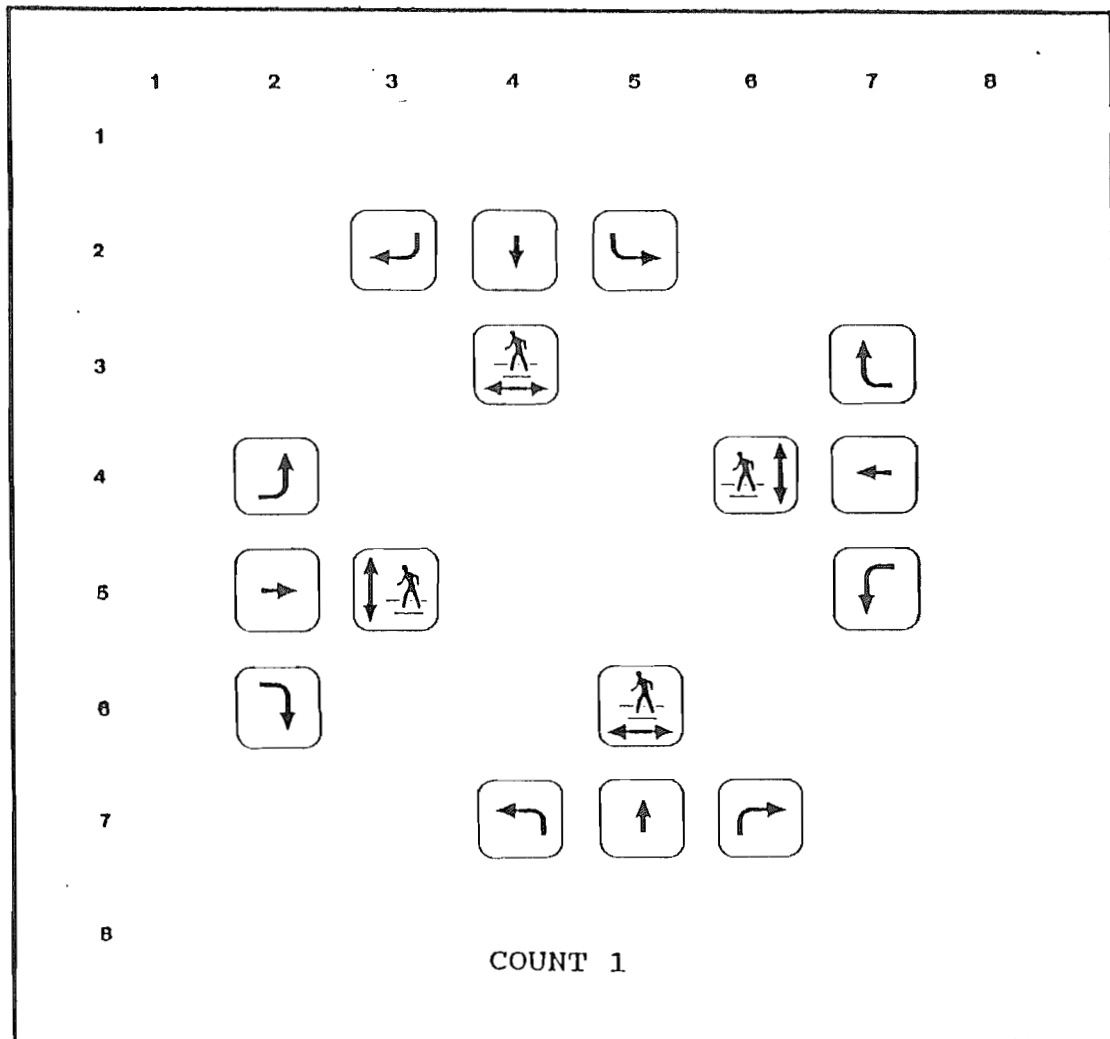


Figure 6-4 Template #1

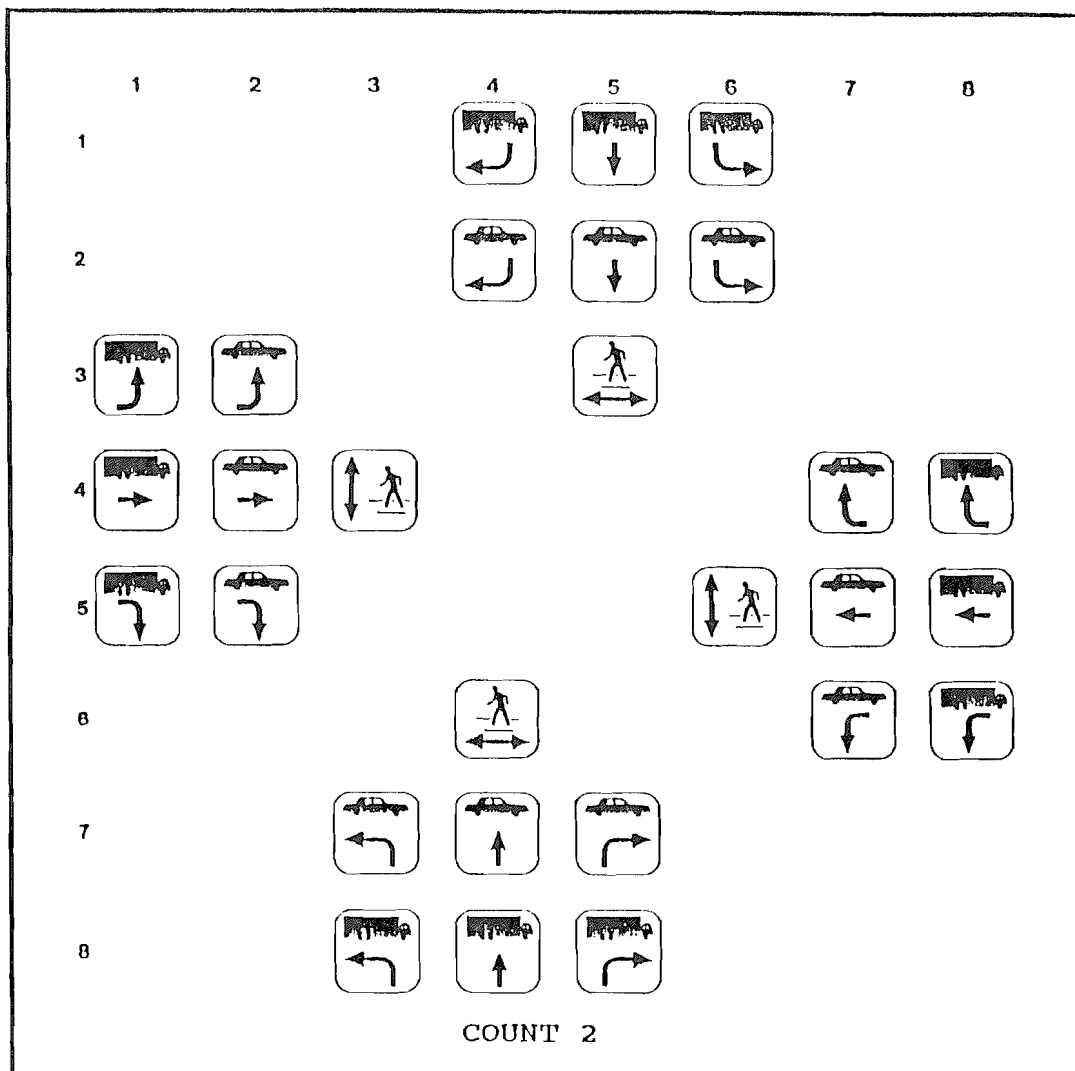


Figure 6-5 Template #2

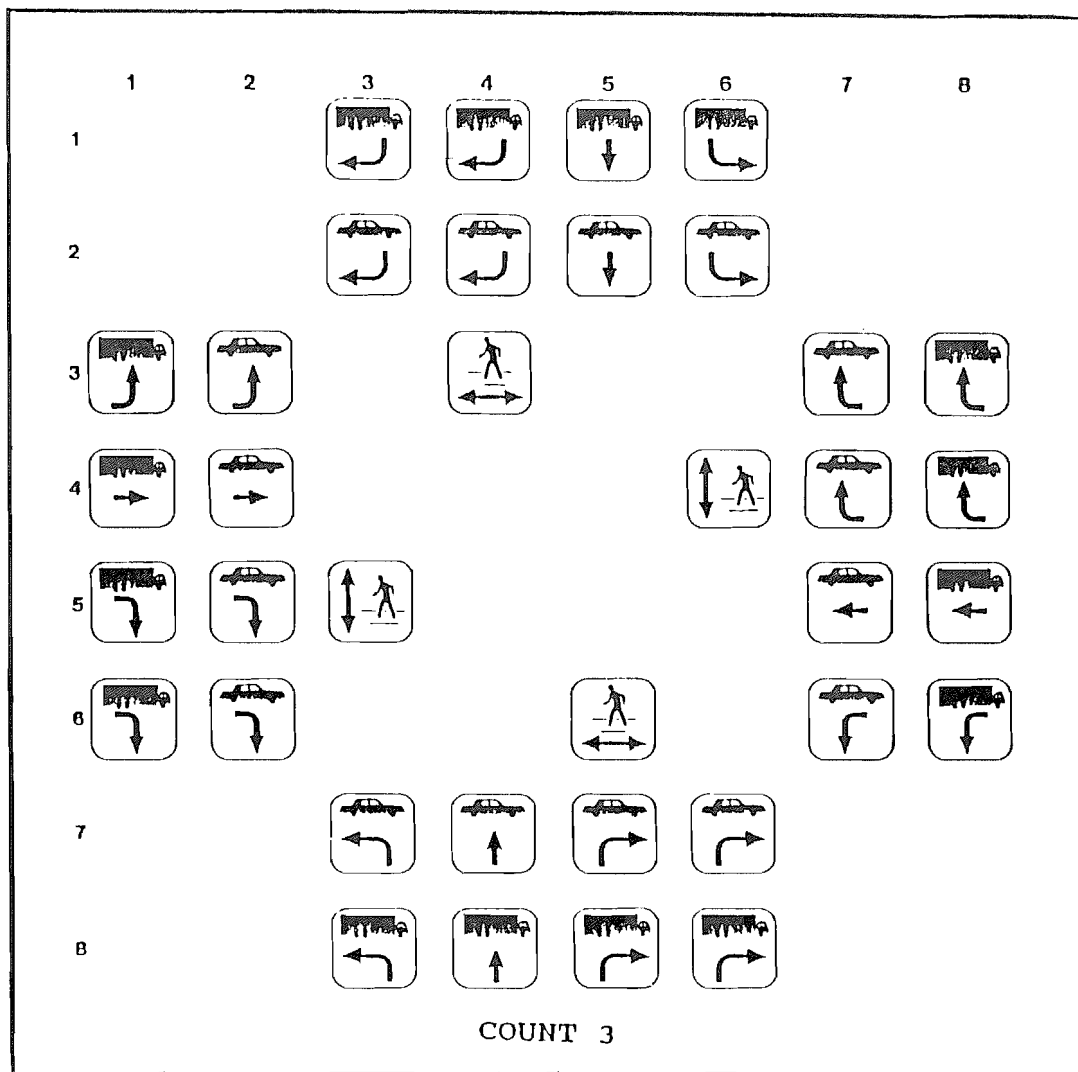


Figure 6-6 Template #3

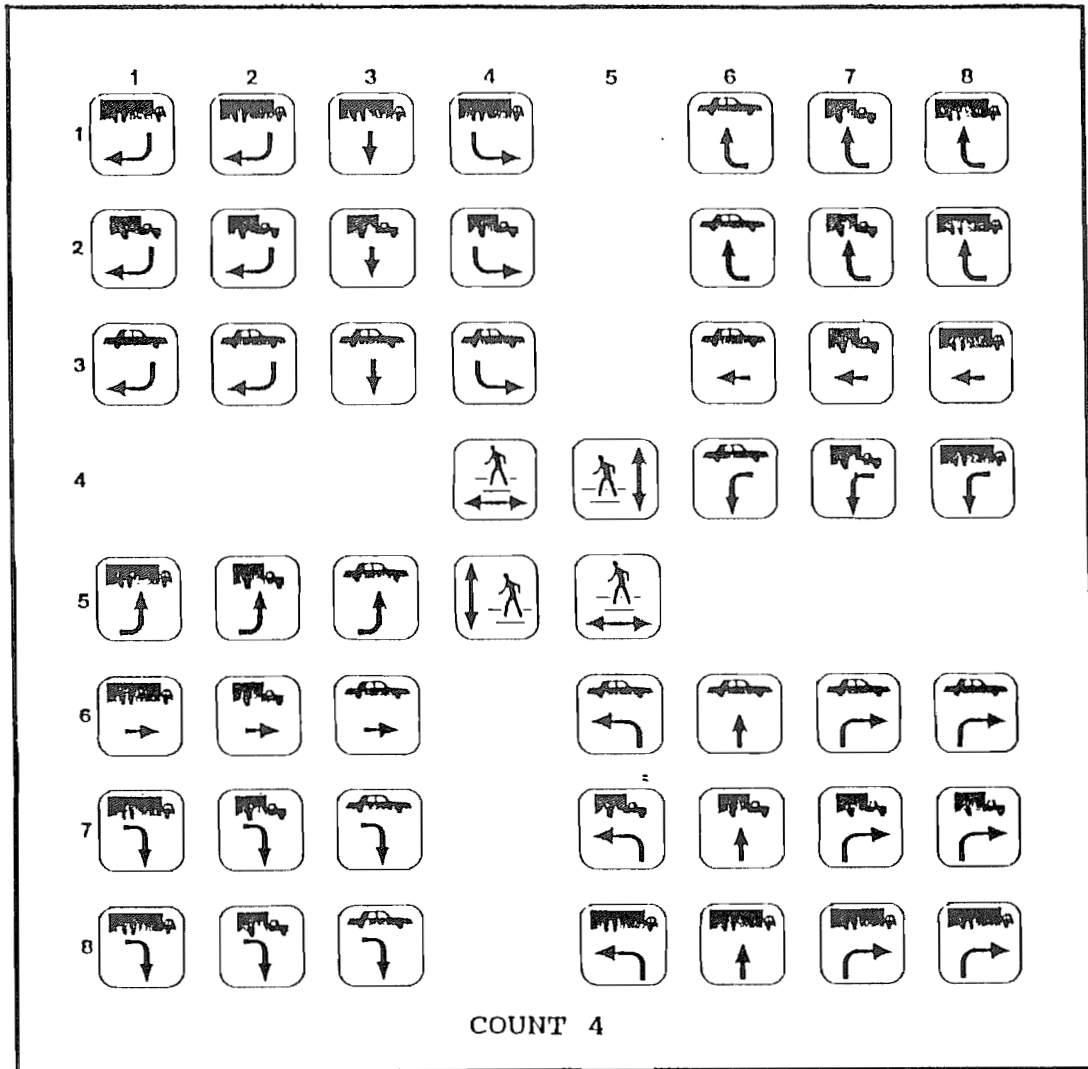


Figure 6-7 Template #4

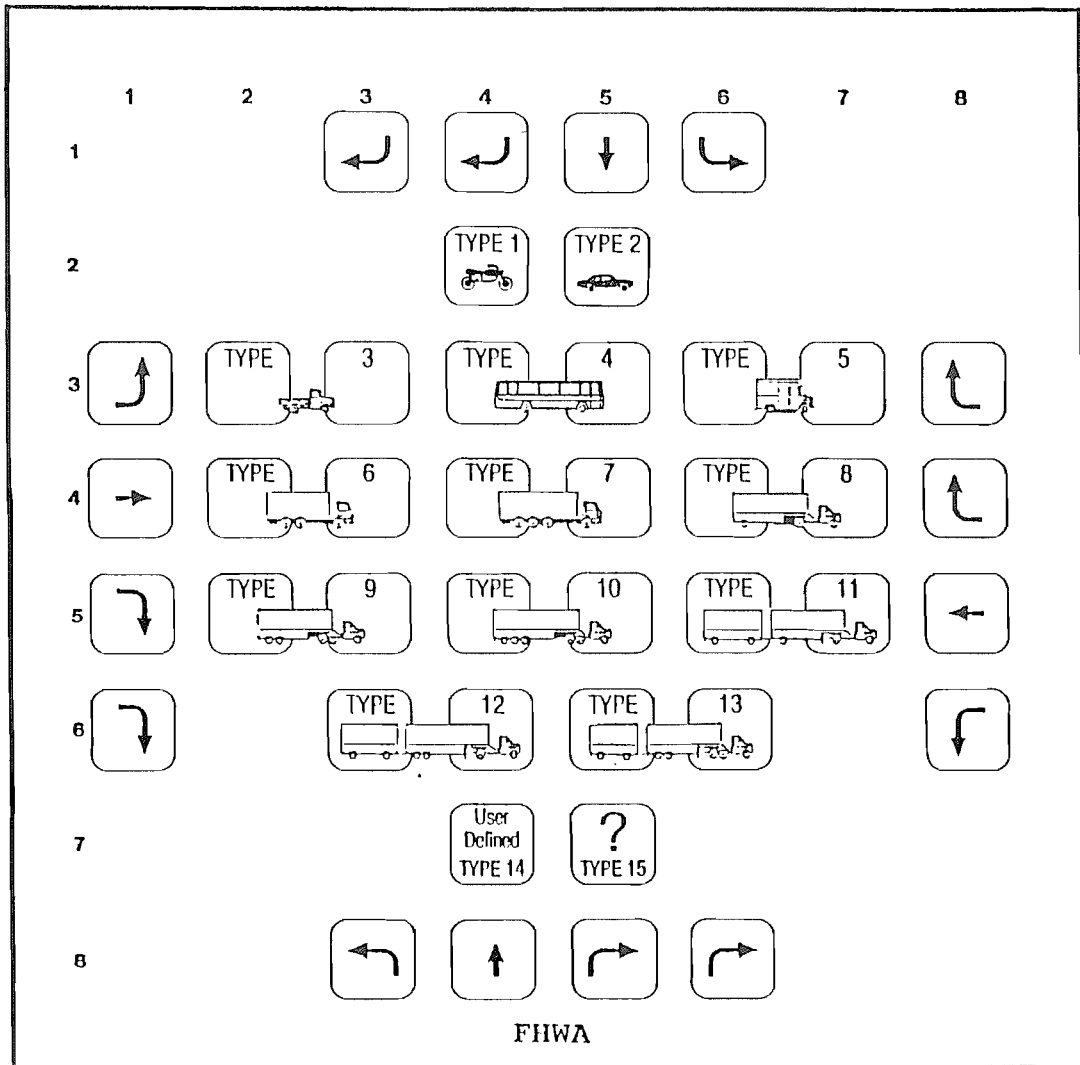


Figure 6-8 FHWA Template

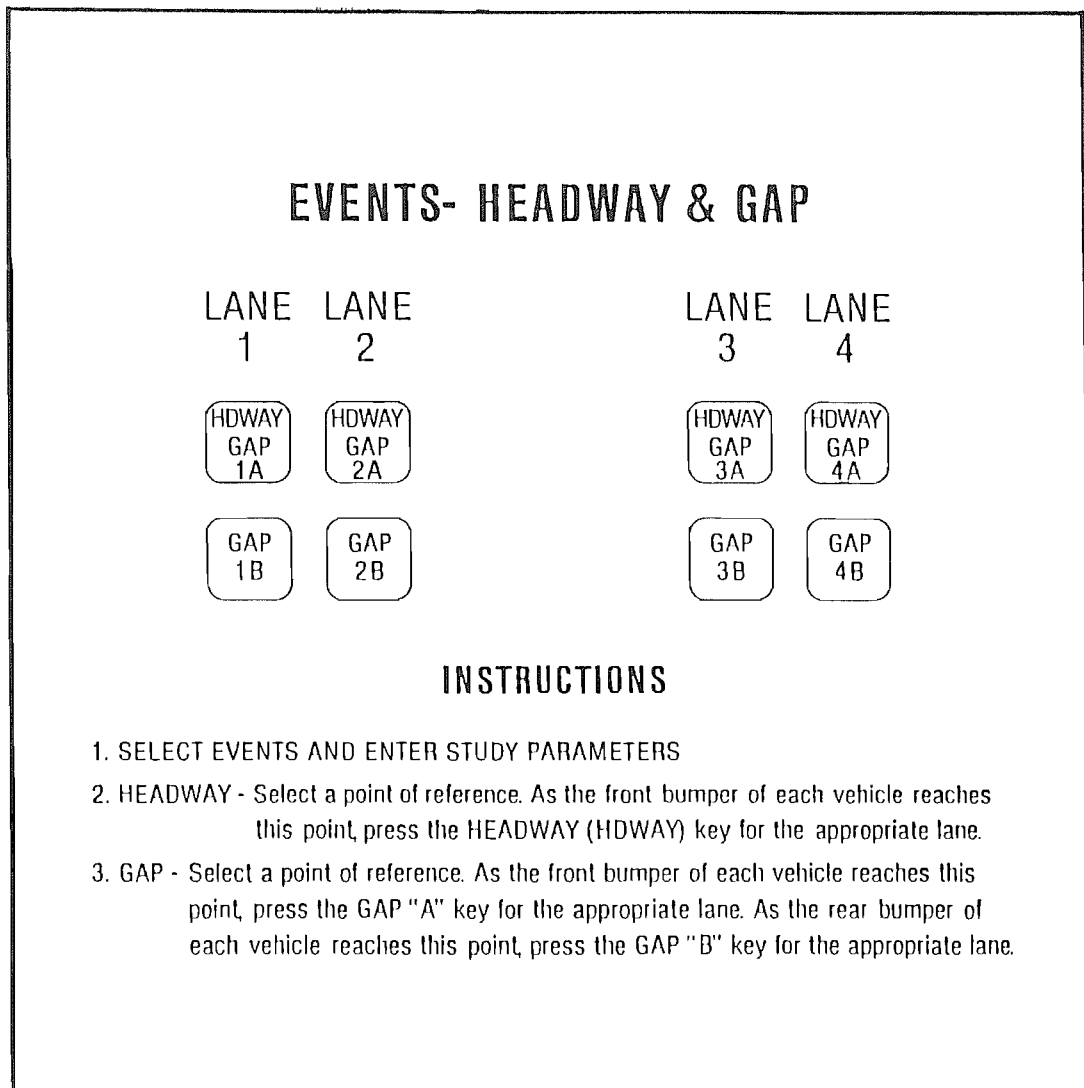


Figure 6-9 Headway and Gap Template

SECTION 7: PROGRAMMING STUDIES

This section will cover programming studies in the TITAN. This is the first step to gathering data. In order to effectively use the TITAN, the operator should become familiar with the studies available.

7.1 DESCRIPTION OF STUDY TYPES

The best place to begin is a brief explanation of the various study types. The seven study types are as follows:

- . COUNT #1 16-Key Turning Movement Study. A basic turning study consisting of each direction, right turn, left turn, straight through and pedestrians.
- . COUNT #2 28-Key Turning Movement Study. This study counts left turn, right turn, and straight through, for each direction with distinction between cars, trucks, and pedestrians.
- . COUNT #3 36-Key Turning Movement Study. Count #3 is a study that counts left turn, right turn, straight through, and right turn on red for each direction, with distinction between cars, trucks and pedestrians.
- . COUNT #4 56-Key Turning Movement Study. Allows data collection for right turn, left turn, straight through and right turn on red for each direction with distinction between cars, small trucks, large trucks and pedestrians.
- . FHWA 15-Class FHWA Vehicle Classification Study. For each direction, this study counts all 15 different class types. There is provisions for one user defined class and one unknown class.
- . OPEN COUNT Open Count Study counts all keys, within a given interval. The output data includes the "key matrix number" (i.e. Key 1.1 is the top most left-hand key) with a total count per interval.

- . EVENT Event studies use each key on the keyboard as if it were an open count. They differ in the output data, because the "key matrix number" is accompanied with the exact tenth of a second the key was pressed. Therefore there is no need for intervals. Studies may be customized using removable labels to identify the keys.

- . HEADWAY STUDY Headway studies measure the space between the front of one vehicle to the front of the following vehicle. The template for this study is combined with Gap studies.

- . GAP STUDY Gap studies measure the space between vehicles. Gaps are taken from the back of one vehicle to the front of the following vehicle. The template for this study is combined with Headway studies.

Examples of the template overlays can be found on pages 6-5 through 6-11 in the Template Descriptions in Section 6.

7.2 PROGRAMMING PROCEDURE

To begin the programming process, the TITAN 64 display should be in the Main Menu. Turn the unit on with the "ON/OFF" function key. Then press the "MENU" function key. The following Main Menu display will appear:

MAIN MENU
<u>PROG</u> CHECK DATA SYS

Figure 7-1 Main Menu Display

Underline "PROG" with the left or right arrow keys and press "ENTER". The first programming screen will appear as below:

PROGRAM Enter Password

Figure 7-2 Enter Password Screen

Enter the alphanumeric password and press "ENTER". For information on programming the user password, see Section 5. Asterisks will be displayed as each character is being typed. Up to eight characters may be entered. If the password is correct (either the "master" password or the "user" password) then the following display will appear:

```
PROGRAM  Memory Usage
0%  Total
```

Figure 7-3 Memory Usage Message

Press any key to obtain the first programming screen, illustrated below:

```
PROGRAM  Which Study
01
```

Figure 7-4 Program Which Study Screen

The above display is asking the user which study, out of 20, is to be programmed. This will always default to the next available program number (new study). The number can only be changed to an existing study or left on the new study. If the number for an existing study is entered, all of the screens will be displayed as the figure below, with "Edit" showing that this study was a previously programmed study and is now being edited. Figure 7-5 is an example of the "Edit" indicator. Otherwise the display will indicate that it is programming a new study as in Figure 7-6:

```
EDIT-1  Study Type
OPEN  COUNT1  COUNT2
```

Figure 7-5 Edit Indicator

```
PROGRAM-1  Study Type
OPEN  COUNT1  COUNT2
```

Figure 7-6 Program Indicator

At this screen select one of the study types. As in several other menu selections, all of the available choices do not fit inside the display and therefore must scroll off to the side.

If you press the right arrow key two times, the display would look like this:

```
PROGRAM-1  Study Type
COUNT2  COUNT3  COUNT4
```

Figure 7-7 Study Type Selection Screen

Press the right arrow key twice again, and this is the end of the study type selection list:

```
PROGRAM-1  Study Type
COUNT4  FHWA  EVENT
```

Figure 7-8 Program Indicator

Notice that the underline is now under the FHWA study selection. Since the list loops back around, if the right arrow key is pressed twice again, the list will underline "OPEN".

Use the left or right arrow keys to underline the appropriate "Study Type" and press "ENTER" to accept. For count types one through four, and the FHWA type, certain keys will be locked out. These keys do not need to be counted, and will help to control the accuracy of the operator.

- SPECIAL NOTE -

If a study parameter has been entered incorrectly,
Use the up arrow key (↑) to go back and re-enter
the parameter data correctly.

After the "Study Type" has been selected and entered, a 24 character, alphanumeric "Observer Name" may be entered. In the following screens, type in the data, and then press "ENTER" to accept. The first screen is illustrated below:

```
PROGRAM-1  Observer Name
XXXXXXXXXXXXXXXXXXXXXXXXXX
```

Figure 7-9 Observer Name Entry

When the "ENTER" has been pressed, the second screen will appear for "Site Location":

```
PROGRAM-1  Site Location
XXXXXXXXXXXXXXXXXXXXXXXXXXXX
```

Figure 7-10 Site Location Entry

Enter the text for the site location as instructed above. And the "Site Notes" entry will appear as in Figure 7-11 as below:

```
PROGRAM-1  Site Notes
XXXXXXXXXXXXXXXXXXXXXXXXXXXX
```

Figure 7-11 Site Notes Entry

After typing in the data, and pressing "ENTER" for the note screens explained above, the "Interval Length" must be chosen. This is not necessary for event studies, only count studies will show this screen and prompt the operator to select an interval length. The display will appear as below:

```
PROGRAM  Interval Length
1  2  5  10  15  30  60
```

Figure 7-12 Interval Length Selection

Use the left or right arrow key to underline the proper interval length, then press "ENTER" to accept. The "Start Time" entry screen will appear as follows:

```
PROGRAM-1 Start Time
08:30
```

Figure 7-13 Start Time Entry

For all study types the start and end times and dates must be entered. The current time, day and month will be displayed. If the default time is used, the study will begin at the next interval.

After the operator has typed in the "Start Time" with the numerical keys, the "Start Day" will appear as illustrated on the following page.

```
PROGRAM-1 Start Day  
14
```

Figure 7-14 Start Day Entry

Use the numeric keys to type in the start day, then press "ENTER". Then, to complete the start date, the "Start Month" must be selected. This screen is as follows:

```
PROGRAM-1 Start Month ↔  
JUN JUL AUG SEP OCT NOV
```

Figure 7-15 Start Month Selection

Use the left or right arrow key to underline the appropriate month, then press "ENTER". Remember that the list will scroll off of the screen since all of the selections do not fit on the display. Now the end time and date screens will need to be completed. The "End Time" display is as shown in Figure 7-16 below:

```
PROGRAM-1 End Time  
16:30
```

Figure 7-16 End Time Entry

With the numeric keys, type in the end time and press "ENTER". The "End Day" is now required. This next screen is illustrated in the figure below:

```
PROGRAM-1 End Day  
14
```

Figure 7-17 End Day Entry

End time and date entry is similar to start time and date. So, again, use the numeric keys to enter the correct end day and press "ENTER". The "End Month" selection screen will appear:

```
PROGRAM-1 End Month ↔  
JUN JUL AUG SEP OCT NOV
```

Figure 7-18 End Month Selection

Use the left or right arrow key to underline the correct end month and press "ENTER". The start and stop dates and times are complete.

7.2.1 PEAK INTERVALS

The TITAN has a unique feature that offers a "Peak Interval" within the programmed study times. A peak interval is where a smaller interval length may be used, within a study. For example, say the department requires an eight hour study of a particular intersection, in one hour intervals. But during the period of 15:00 to 17:00 (3:00 P.M. to 5:00 P.M.), it would be convenient to have the intervals broken down into five minute intervals. The report for this study will have more detailed information during the "Peak Period". The following screen examples will use these times.

Below is the screen that follows the end month selection, it allows for programming a different peak interval length. The program peak interval display appears as follows:

```
PROGRAM-1  Peak Int. 1
Yes  No
```

Figure 7-19 Peak Interval Choice

Answer "Yes" if there is to be a peak interval programmed within the study. This next screen will offer selection of any interval less than the main interval. Figure 7-20 will appear to choose a peak interval length:

```
PROGRAM-1  Peak Int. 1
1  2  5  10  15  30
```

Figure 7-20 Peak Interval Length Selection

Once the correct interval length is underlined, press "ENTER". The following two screens will program the start (Figure 7-21) and stop (Figure 7-22) times of the "Peak Interval".

```
PROGRAM-1  Peak Start 1
15:00
```

Figure 7-21 Peak Start Entry

```
PROGRAM-1  Peak End  1
17:00
```

Figure 7-22 Peak End Entry

Use the numeric keys to type in the start and end times for peak interval number 1. Then press "ENTER" following the entry of each screen, to accept the time and interval data for the Peak Interval. The operator will be prompted to answer the question on programming a second peak interval. Up to three peak intervals may be programmed within one count study. If "Yes" is underlined and entered, the screens above (Figures 7-20 through 7-22) will appear with the indication of the appropriate peak program number visible after the words "Peak Int." as illustrated in the display below:

```
PROGRAM-1  Peak Int. 2
Yes  No
```

Figure 7-23 Program Another Peak Interval Question

If "No" is underlined and entered, the programming process is complete and the display will show the screen below:

```
PROGRAM  More Studies
Yes  No
```

Figure 7-24 Program More Studies Question

This screen will appear allowing the operator to program more studies. If "No" is selected, the display will return to the normal Sign-on screen. If "Yes" is selected, the TITAN will go through the programming sequence again, from the beginning screen asking which study to program.

7.2.2 COUNT #1 THROUGH COUNT #4

Programming regular count studies, which have been pre-defined by the TITAN and are accompanied with matching templates, is done using the Study Type Selection screen described in Section 7.2, Figures 7-6 through 7-8. In the Study Type Selection screen simply underline the appropriate count number and press "ENTER". Choose Count #1, #2, #3, or #4 and be sure the template used in the field matches the count programmed on the TITAN. For example, if you select Count #2 as the Study Type, use template #2 while performing the count.

For more information on the templates and the specific turning movements included, please refer to Section 6.2 through 6.5.

7.2.3 FHWA CLASSIFICATION STUDY

To perform the "FHWA" count study, at the Study Type Selection screen underline "FHWA" with the arrow keys and press "ENTER". This study utilizes a template equipped with graphic icons to help the operator. See Section 7.2, Figures 7-6 through 7-8 for instructions on selecting a study type.

For further detail on the FHWA study, please refer to Section 6.6.

7.2.4 OPEN COUNT STUDY

Open count studies are defined as a study where all keys may be used to count anything the user decides is important. It allows the entire keyboard to be used for customized user-defined studies. Removable stick-on labels can be used to identify the keys for the operator. The computer software will write reports that list the keys by their "key matrix number", followed by the count per interval.

This count study does not utilize a template. It allows for the entire keyboard to be used. Since removable labels can be used to assign specific movements or items to each of the keys, there are no icons needed on an overlay. The open keyboard is illustrated in Figure 7-28, page 7-12.

All keys are counted in this study and are identified by the vertical and horizontal numbering of the Data and Text keyboard. The "key matrix number" is the row and column numbers located on the left-hand and top edges of the Data and Text entry keys. The row number is used first with the column number following a period to separate the two. A diagram of the key matrix numbers can be found on page 7-11 in Figure 7-27.

To program for the "Open" study type, underline the word "OPEN" in the Select Study Type screen illustrated below and in Figure 7-6 through 7-8 on pages 7-3 and 7-4.

PROGRAM-1	Study Type
EVENT	<u>OPEN</u> COUNT1

Figure 7-25 Study Type Selection Screen

For more detail on Open studies please refer to Section 6.7.

7.2.5 EVENT STUDY

This study also does not utilize a template. It allows for the entire keyboard to be used. Since removable labels can be used to assign specific movements or items to each of the keys, there are no icons on this overlay.

All keys are time stamped in this study and are identified by the horizontal and vertical numbering of the Data and Text keyboard. The "key matrix number" is the row and column numbers located on the left-hand and top edges of the Data and Text entry keys. The row number is used first with the column number following a period to separate the two. Figure 7-27 on page 7-11 represents a grid showing the assignment of the key matrix numbers.

For example, Key 1.1 is the first key in the upper left-hand corner. Key 2.1 is the key directly below. The output data from the computer will list the key matrix number, with the exact time the key was pressed.

To program for the "Event" study type, underline the word "EVENT" in the Select Study Type screen illustrated in Figure 7-6 through 7-8 on pages 7-3 and 7-4.

For more information on event studies, please refer to Section 6.9.

7.2.6 HEADWAY AND GAP STUDY

To program for the "Headway and Gap" study types, underline the word "EVENT" in the Select Study Type screen illustrated in Figure 7-6 through 7-8 on pages 7-3 and 7-4.

7.3 EDITING STUDY PARAMETERS

Use check to verify which Study Number and specific parameter needs to be changed. To "Edit" the programmed study parameters for correction or even to simply change a particular field, simply choose "PROG" from the Main Menu and enter the password. Enter the "Study Number" which needs to be edited. The screens used in "Program" will appear in the same sequence for "Edit". The following display shows the "Edit" indicator:

EDIT-1	Study Type
OPEN	<u>COUNT1</u> COUNT2

Figure 7-26 Edit Indicator

Refer to Section 7.2 and follow the same procedure in program while editing a programmed study.

The following chart represents the "key matrix" number chart for the data keys which are used in all Event and Open Count studies:

1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8
2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8
3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8
4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8
5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8
6.1	6.2	6.3	6.4	6.5	6.6	6.7	6.8
7.1	7.2	7.3	7.4	7.5	7.6	7.7	7.8
8.1	8.2	8.3	8.4	8.5	8.6	8.7	8.8

Figure 7-27 Row/Column Key Matrix Number Chart

Instructions for performing all of the studies discussed above can be found in Section 8.

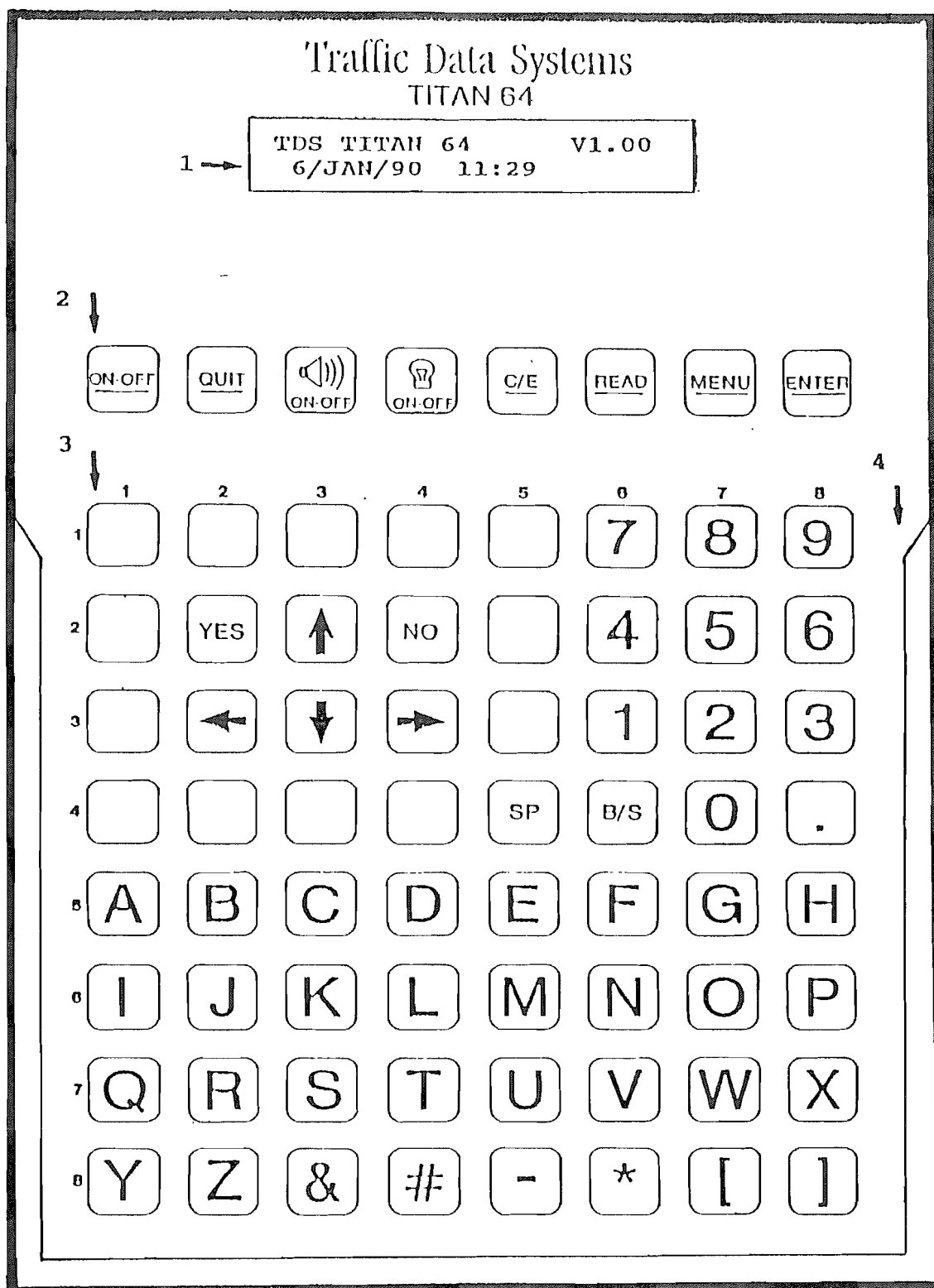


Figure 7-28 TITAN 64 Front View

1. Display
2. Function, Keys

3. Data and Text Entry Keys
4. Template Mounting Strips

SECTION 8: PERFORMING STUDIES

Operating instructions for entering counts with the various study types, is covered in this section. It would aid the operator to follow along with the examples in this section using the TITAN unit.

8.1 BEGINNING THE STUDY

The first step to operating the TITAN counter unit, is to turn the power on with the "ON/OFF" function key. After the System loaded display times out, the normal sign-on screen will appear. For each study type, program the counter as instructed in Section 7. Set the study Start time to begin several minutes ahead of the current time. Study types have been divided into six groups; Count #1 through Count #4, FHWA Classification study, Open Count study, Event study and Event - Headway and Gap studies.

TITAN will turn itself on according to the "Pre-study Delay" time that has been configured into its memory. For details on setting the pre-study delay time, refer to Section 5.4. Configure the Pre-study Delay time to be 10 minutes if the operator wishes to use the TITAN unit to follow along with the examples of this section.

8.2 ENTERING COUNTS

For the pre-programmed count studies, Count #1 through Count #4, enter counts by simply pressing the key with the associated icon. Unused keys are masked off and inactive. A short beep will sound if an inactive key is pressed. The operator could then attempt to press the correct key, which will increase the accuracy of the study. The count data is recorded by interval for each active key (number of active keys vary between studies).

Entering counts for the FHWA Vehicle Classification study is similar to the count studies described above. Simply press the appropriate vehicle type, then the turning movement made by that particular vehicle. Turning movement keys have arrows indicating the type of turn, this works similar to an "Enter" key.

The default classification for TITAN is Automobiles, or class #02. When automobiles are counted, simply press the turning movement key the vehicle made. TITAN will automatically list that vehicle as an "Automobile". This Class #02 default feature will assist the operator in performing the FHWA Vehicle Classification study.

All keys are active for Open count studies, and are identified by the user with removable stick-on labels. Each key is its own counter which uses the key matrix number referred to in previous sections. This study records the key matrix numbers with a count, for each interval.

Event studies are similar to the Open count study because in both study types, all keys are active and no template is required. But event studies do not use intervals, they record a time stamp with each key matrix number. Removable stick-on labels may also be used in the event study to identify the keys.

Headway and Gap studies are a part of the Event routine. This study uses time data to calculate the headway and the gaps in traffic. Instructions for performing these two studies are also included on the Gap and Headway template.

The following sub-sections will explain the operation for each study type. For information on the templates, see Section 6.

8.2.1 COUNT #1 THROUGH COUNT #4

For all count studies, which include Count #1 through #4, the following operations hold true.

When the TITAN unit has reached the Pre-study Delay time, the display will alternate between the two screens below:

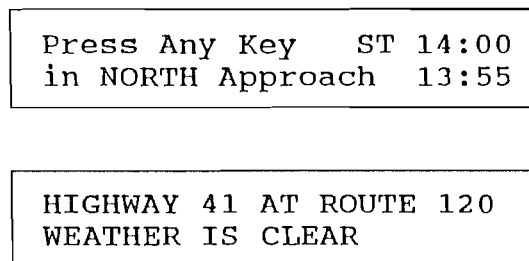


Figure 8-1 Pre-study Display Screens (alternating)

Press any key in the group of keys which represents the traffic approaching "FROM THE NORTH" direction. This is "Compass North" which is NOT the same as "Northbound". For example, if the operator is facing North, the "NORTH APPROACH" group of keys would be located in the top half of the keyboard. If the operator is facing East, the "NORTH APPROACH" group of keys would be on the left half of the keyboard. And so on, as if the keyboard is a compass which requires the operator to input the location of North.

If a mistake is made entering the "NORTH APPROACH", or "From North" group of keys, do not worry. The IDEAS software package includes a routine to switch the count data to the correct direction. Be sure to remember which direction was supposed to be "From North".

The first key pressed in any direction group displays the following:

Press 2nd Key	ST 14:00
in NORTH Approach	13:55

Figure 8-2 North Group Verification Screen

If the second key pressed is not in the same group as the first key, the display will return to that illustrated in Figure 8-1. When the operator has pressed a key which is in the same group, that group will be set as the "North Approach" group of keys.

The following screen with the Wait indicator will appear:

N-0000	S-0000	ST 14:00
W-0000	E-0000	13:55

Figure 8-3 Turning Movement Display (waiting to begin)

Entering counts for Count #1, #2, #3 and #4 are the same. These are all turning movement counts, which require the operator to simply press the key identifying the vehicle and the movement. Each key is identified with graphic icons on the matching templates. Press the key which corresponds to the vehicle type and the turning movement made by that vehicle. For more information on the templates, please review Section 6.

Once the turning movement count has begun, the screen displays the programmed End Time in the upper right hand corner, with the current time on the bottom. There are totals for each compass direction to assure the operator that the key pressed is recorded in the correct direction. After each interval ends, the counts will go to zero. Remember that the display adds the counts together for each direction, but each key is being saved separately.

The following display shows the screen after the study has begun and counts have been entered:

N-0123	S-0096	ET 16:00
W-0032	E-0001	14:55

Figure 8-4 Turning Movement Display (with counts)

8.2.2 FHWA CLASSIFICATION STUDY

Entering counts for the FHWA Vehicle Classification study is similar to the count studies described above. First enter and verify the "NORTH APPROACH" group of keys. The period of time before the pre-study screens described above in Section 8.2.1 appear will depend on the "Pre-study Delay" time configured for the TITAN.

When the study has begun, press the appropriate vehicle type, then the turning movement made by that particular vehicle. Turning movement keys have arrows indicating the type of turn, this works similar to an "Enter" key.

As mentioned earlier in this section, the default classification for TITAN is Automobiles, or class #02. When automobiles are counted, simply press the turning movement key which the vehicle made. TITAN will automatically list that vehicle as an "Automobile". This Class #02 default feature will assist the operator in performing the FHWA Vehicle Classification study.

There are 15 class types; thirteen have been defined by the Federal Highway Administration, the fourteenth type is "user-defined" (may count whatever is desired), and the fifteenth is the "Unknown" type (unidentified by the operator). For a definition of Classification Numbers refer to Figure 6-1 in Section 6.

The FHWA display screen shows totals for each direction plus classification numbers for each class type. The class number is displayed to the left of the current time, following the letter "C" on the bottom line. The numbers can be noted after pressing a particular classification key. But, once a turning key has been pressed (one of the arrow which record the count), the display will default to "C02". This is a convenient tool for the operator in the field. Since most vehicles are cars, the turn-type or enter arrow key can be used alone, without continuously pressing the "Class #02" key first. Therefore, with cars, only the turn-type key or enter arrow key needs to be pressed to record a counts for class #2 vehicles.

Below is an example of the FHWA Classification study after it has begun and counts have been entered:

N-0123	S-0096	ET 16:00
W-0032	E-0001	C12 14:55

Figure 8-5 FHWA Classification Screen (with counts)

Notice the class is showing "12". This shows after the "Class 12" key was pressed, but before the turn-type (or enter arrow) key had been pressed to complete the count. If a turn-type key had been pressed, "C02" would be displayed where "C12" is located.

8.2.3 OPEN COUNT STUDY

This study allows the user to define what subjects are to be counted. The Pre-study display will appear according to the delay time set, but differ from the studies described above in that there is no "NORTH APPROACH" group selection required.

Below is an illustration of the two screens the TITAN'S display will alternate between during the Pre-study Delay time:

T.D.S. TITAN 64 V1.00 6-JAN-90 13:55
HIGHWAY 41 AT ROUTE 120 WEATHER IS CLEAR

Figure 8-6 Pre-study Display Screens (alternating)

Press any key to prepare the counter to begin the study. The display will change to show the Wait indicator, the key number pressed and the current count for that key. This screen also allows for the operator to check the keys before actual count entries are made.

In this example, key matrix number "3.6" was pressed once. The following is an illustration of the Open count Pre-study screen:

OPEN COUNT ST 14:00
KEY 3.6 0001 13:55

Figure 8-7 Open Count Display (waiting to begin)

For the Open Count study, there is no template needed. For this study and the Event study, the user can define the keys with removable stick-on labels. To enter counts simply press the key which corresponds to the vehicle type, turning movement, or any other entity which required counting.

All keys are counted in the Open count study. Each key is its own counter and will record the key matrix number plus the count for each interval. The key matrix number chart can be found in Figure 6-2, in Section 6.

Once the count has begun, the screen displays the programmed End Time in the upper right hand corner, with the current time on the bottom. There are totals for every key matrix number pressed, for each interval, this may assure the operator that the key pressed is correct, therefore decreasing the chance for operator error. After each interval ends the last key pressed still appears, but the count will go to zero.

The following display shows the Open count screen after it has begun and several counts have been entered:

OPEN COUNT	ET 16:00
KEY 4.3 0037	14:55

Figure 8-8 Open Count Display (with counts)

8.2.4 EVENT STUDY

This study also requires no North Approach selection, such as the other count studies listed above. The Pre-study display will appear according to the delay time set.

Below is an illustration of the two screens the TITAN'S display will alternate between during the Pre-study Delay time:

T.D.S. TITAN 64	V1.00
6-JAN-90	13:55

HIGHWAY 41 AT ROUTE 120
WEATHER IS CLEAR

Figure 8-9 Pre-study Display Screens (alternating)

Once a key has been pressed (similar to the Open study), the screen will display the key number pressed and the time stamp (the exact tenth of a second the key was pressed). This screen also allows the operator to check key presses before the study actually begins.

In this example, key matrix number "1.6" was pressed at 13:55:09.5. The following is an illustration of the Event Pre-study screen:

EVENT COUNT	ST 14:00
KEY 1.6	13:55:09.5 13:55

Figure 8-10 Event Display (waiting to begin)

Unlike the turning movement studies described earlier in this section, Events and Open studies do not require special templates to mask unused keys. Events, like the Open count, are customized to meet the requirements of the study being made. Removable labels can be used to assign specific movements or vehicle types to each key. However, the templates could be used if events are to be gathered using one of the standard templates for signal timing, etc. In Headway and Gap studies the "Event - Headway and Gap" template is used.

In the Event study, such as the Open count, all keys are counted and are identified by the vertical and horizontal numbering of the data and text keyboard. The key matrix number chart can be found in Figure 6-2, in Section 6.

When "key 5.3" is pressed, the exact time is recorded. Remember that each key is saved separately. When the data is transferred, the keys are listed separately, with the time stamp of the key pressed.

Below is an example of the Event display after the study has begun and counts have been entered:

EVENT COUNT	ET 16:00
KEY 5.3	14:55:20.5 14:55

Figure 8-11 Event Display (with counts)

This section is not designed to recommend specific Event studies, or Open studies, only to explain the Event and Open study theory and their operation. The Event study, just as the Open count study, was included in the TITAN counter to allow for the designing of customized studies to better accommodate the department's particular needs.

8.2.5 HEADWAY STUDY

Headway studies are timing studies which take the "gap" information from the front of one vehicle to the front of the following vehicle. The TITAN will do a one, two, three or four lane headway study.

This study is part of the Events routine, and is programmed as an Event study. The same screens described above in Events, will appear during the Headway study. All keys are active, but only the keys represented by icons on the template will be received by the host computer. Be sure to use the Headway and Gap template in the field.

To enter counts for this study, select a point of reference such as a line on the pavement or a pole, etc. As the front bumper of each vehicle reaches this point, press the HEADWAY or "HDWAY" key for the appropriate lane (lane 1,2,3 or 4). Continue this until the study is complete.

The Headway study screens are identical to the Event study screens. All keys are active, but only the keys represented by icons will be read by the computer. Please refer to Section 8.2.4 on the previous two pages.

8.2.6 GAP STUDY

Gap studies are timing studies which take the "gap" information from the back of one vehicle to the front of the following vehicle. The TITAN will do a one, two, three or four lane gap study.

This study is part of the Event routine, and is programmed as an Event study. The same screens described above in Events, will appear during the Gap study. All keys are active, but only the keys represented by icons on the template will be received by the host computer. Be sure to use the Headway and Gap template in the field.

To enter counts for this study, select a point of reference such as a line on the pavement or a pole, etc. As the front bumper of the first vehicle reaches this point, press the "GAP-A" key for the appropriate lane (lane 1,2,3 or 4). As the rear bumper of each vehicle reaches this point, press the "GAP-B" key for the appropriate lane. Continue this until the study is complete.

The Gap study screens are identical to the Event study screens. All keys are active, but only the keys represented by icons will be read by the computer. Please refer to Section 8.2.4 on the previous two pages.

8.3 QUITTING TEMPORARILY

To halt a study temporarily, press the "ON/OFF" key. When the "ON/OFF" key is pressed, the unit will display the following screen:

```

ON/OFF  Turn Off
Yes  No

```

Figure 8-12 On/Off Screen

If "No" is selected, the display will return to the study screen. If "Yes" is selected, the TITAN will enter the power-down, or shut-down mode. This will conserve battery power. When the operator wishes to continue the study, press the "ON/OFF" and the study display will return and allow the operator to resume counting. The operator will not be able to enter any data during this period, but the study is only paused. When the operator returns to the study site, press the "ON/OFF" key and resume counting. The display will return as it appeared before the unit was turned off.

8.4 ENDING THE COUNT

There are two ways to end the study currently in progress. The first is to run the study for its full duration. When the unit has reached the programmed End Time it will automatically display the normal sign-on screen, then time out. The second way to stop the study is to end it prematurely with QUIT.

During the study, if the operator wishes to prematurely end the study in progress, simply press the "QUIT" key and enter the password. Then underline "Yes" with the left arrow key, then press "ENTER" at the following display:

```

QUIT  Study
Yes  No

```

Figure 8-13 Quit Screen

Selecting "Yes" will abort the study and display the normal sign-on screen, and then time out. The "No" choice will go back to the study operation and display the operator was viewing before the "QUIT" key was pressed.

```

*****
*                                                                 *
*  WARNING: Quitting the study will erase all data.             *
*          The study cannot be re-started unless it             *
*          is programmed again.                                   *
*                                                                 *
*****

```

SECTION 9: DATA MANIPULATION

Data may have one of two operations performed. The first is to transfer the accumulated field data to a host computer for editing, analyzing and report printing. The other operation is to clear the data from memory, once it has served its purpose.

After the unit's System Loading screen has disappeared, the TITAN sign on screen will display as shown below:

TDS TITAN 64	V1.00
6/JAN/90	11:29

Figure 9-1 Sign on Display Screen

9.1 TRANSFERRING DATA TO COMPUTER

In preparation of transferring data to the computer, first connect the "External Power Supply" whenever possible. If the batteries are slightly low, there is a possibility of communications errors occurring. Second, attach the Serial Communications Cable to the "Communications Input" or Serial Port on the TITAN 64 (located on the top end of the unit), to the Communications Port on the computer (usually Com1).

It is advised that the only time the communications cable is attached to the TITAN, is during uploading data, or downloading a new program. There is a slightly higher current draw when the cable is attached to TITAN.

Turn the TITAN unit "ON" and select "TITAN 64 UPLOAD" on the "Communications Menu" in the IDEAS software of the host computer. This Communications Menu is illustrated below:

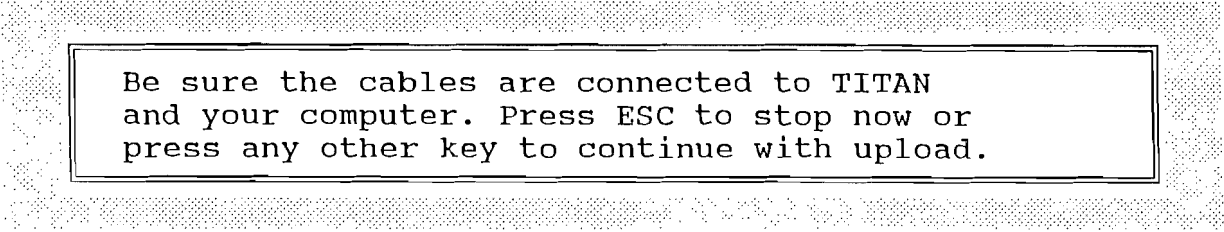
IDEAS communications menu.
↑ ↓, or first character, then enter.

TITAN 64	Load studies from the TDS TITAN 64.
TMC/48	Load studies from TMC/48.
PROGRAM TITAN 64	Put a new program into TITAN 64.
HELP	Help on setup and execution.
QUIT	Exit communications and go to main menu.

Figure 9-2 Communications Menu

For information on installing and operating the IDEAS program, refer to the IDEAS Software manual.

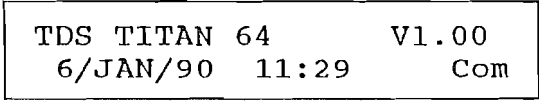
After the cables are properly connected, use the <UpArrow> or <DownArrow> keys, or the letter <T>, to highlight "TITAN 64" in the Communications Menu (illustrated in Figure 9-2). Then press <ENTER> to perform the chosen operation. The following screen will appear:



```
Be sure the cables are connected to TITAN
and your computer. Press ESC to stop now or
press any other key to continue with upload.
```

Figure 9-3 Connection Verification Message

If the cables are properly attached, the TITAN display screen will appear as follows to verify a successful communications connection:

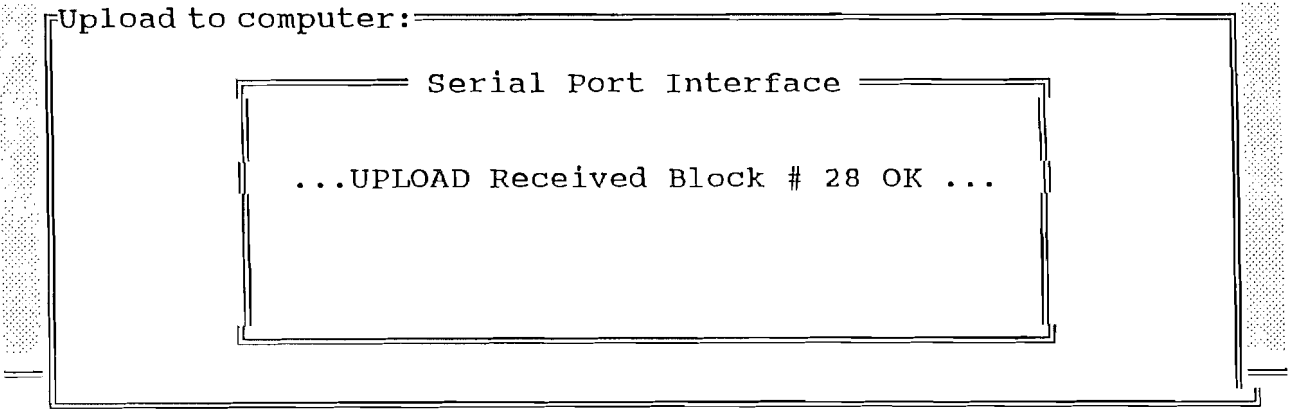


```
TDS TITAN 64      V1.00
6/JAN/90 11:29    Com
```

Figure 9-4 Sign on Display Screen

When the counter is ready, the cable and power supply are connected, and the commands have been entered as described above, press <ENTER>, or any other key besides <ESC> at the window in Figure 9-3 to begin retrieving the data.

As the studies are being entered into the computer, the message in the smaller window will continuously update. The computer display will appear as below:



Upload to computer:

Serial Port Interface

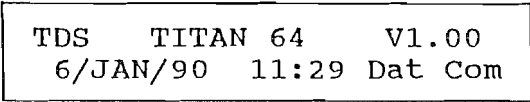
...UPLOAD Received Block # 28 OK ...

Figure 9-5 Input in Progress Screen

As the studies are being entered into the computer, the message in the smaller window will continuously update. The PC display will first indicate that IDEAS is looking for TITAN on COM 1.

The software automatically searches for the active communications port.

After data transfer has begun, the TITAN display will appear as follows:

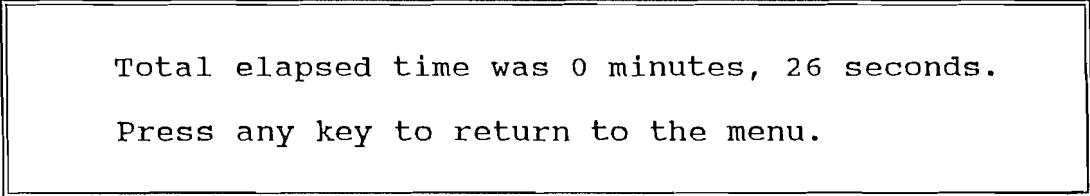


```
TDS    TITAN 64    V1.00
      6/JAN/90  11:29 Dat Com
```

Figure 9-6 TITAN Data Transfer Screen

Notice the "Dat" and "Com" status indicators below the version number of the TITAN. These appear when the TITAN data is in the process of being transferred to the PC.

When all upload blocks have been successfully received, the following message will appear:

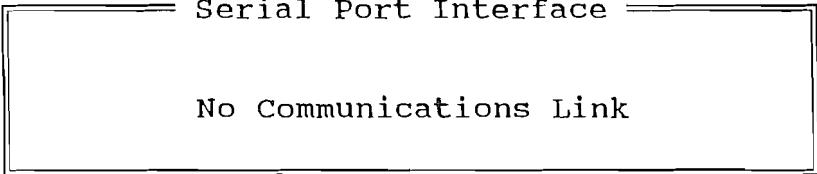


```
Total elapsed time was 0 minutes, 26 seconds.

Press any key to return to the menu.
```

Figure 9-7 Successful Upload Message

If there was a problem with the upload, it would most likely be accompanied by the following error message:



```
Serial Port Interface
```

```
No Communications Link
```

Figure 9-8 Link Error Message

If this error message should occur, the problem is in the connection between the computer and the TITAN unit. Check the cable connections and try again.

Once the display has confirmed that the studies were uploaded successfully, you will be asked if you want to make changes to the header information.

The display will appear as below:

```
Descriptions of study data.

Study ID: ID # 00004      Serial Number: 4
Location: Count Study #4
Notes   : this study is "new"
Study Type :      4
Description:      C,SmT,LaT,P-rt/red

Interval Length: 10 min      Intervals: 45

Start Date: 04/04/90  Start Time: 04:00:00
End Date  : 04/04/90  End Time  : 11:30:00

Operator: cc                      Right on Red: RtRed
Weather : dark                   Pedestrians: Peds

North Description: From North
South Description: From South
East Description  : From East
West Description  : From West
Changes to make? Y/N
```

Press 'Y' or 'N' to continue or F1 for descriptions.

Figure 9-9 Study Descriptions Entry Screen

This descriptions screen will appear for **each** uploaded study. Enter <Y> to make changes or add information such as the lane headings, additional location notes, weather, etc. then press <F9> to permanently save the information. If no changes are to be made at this time, press <N>.

If the operator does not want to save the study, press <ESC> instead of the directions in the paragraph above.

After each study has been answered as instructed above, the program will return to the Communications Menu for further operations.

9.2 CLEARING DATA FROM COUNTER

The "DATA" selection from the Main Menu is used to clear memory. After turning the unit's power on with the "ON/OFF" function key, press the "MENU" function key and underline "DATA", then press "ENTER". A correct password must be entered to proceed with erasing studies.

The following is an example of the first screen for data requiring the operator to enter password screen:

```
DATA  Enter Password
*****
```

Figure 9-10 Enter Password

After entering the proper password, TITAN will prompt the operator for which types of studies to be deleted. The operator may wish to erase **all** studies or only studies which have been **completed** (and hopefully uploaded to host computer).

```
DATA  Clear
      Completed All
```

Figure 9-11 Data Clear - Completed or All

To erase only the Completed studies, underline "Completed" and press "ENTER" to proceed. To erase All of the studies, underline "All" and press "ENTER" to proceed.

The following warning message will appear:

```
DATA  WARNING If cleared
      Data cannot be recovered
```

Figure 9-12 Data Warning Message

When "ENTER" has been pressed, the following screen will appear to verify that indeed, the operator intends on removing the data and is sure about it:

```
DATA  Clear - Sure?
      Yes  No
```

Figure 9-13 Data Clear - Completed or All

If "YES" is underlined with the left arrow key, and "ENTER" is pressed, all data in memory will be cleared.

```
*****
*
*  WARNING: Once "YES" is chosen at this screen, data in
*           memory cannot be recovered.
*
*****
```

SECTION 10: INTERNAL DIAGNOSTICS

The TITAN counter unit is designed to provide maximum assurance to the operator that all features and functions work properly. It is quite simple to perform diagnostic testing on the TITAN unit. The first step is to turn the power on with the "ON/OFF" function key. After the System Loaded screen disappears, the display will show the normal sign-on illustrated below:

```
TDS TITAN 64          V1.00
  6/JAN/90   11:29
```

Figure 10-1 Sign on Display Screen

After the unit's Sign-on display appears, press the "MENU" function key. The Main Menu will show on the display screen:

```
MAIN MENU
PROG  CHECK  DATA  SYS
```

Figure 10-2 Main Menu Display

Select "SYS" using the left or right arrow keys to underline "SYS", then press "ENTER". The following System menu will appear:

```
SYSTEM MENU
CONFIG  TEST
```

Figure 10-3 System Menu Display

10.1 MEMORY TEST

The internal test routines are a function within the "SYSTEM" menu called "TEST". Press the right or left arrow key to underline the word "TEST" and press "ENTER". The display will query for the "Memory Test as follows:

```
TEST  Memory
Yes   No
```

Figure 10-4 Memory Test Screen

UPGRADING TITAN'S OPERATING SYSTEM

The TITAN 64 has a built-in feature allowing for it's internal operating system to be upgraded through the PC. For future enhancements to the counter version, Traffic Data Systems will simply send a floppy disk through the mail. Use this floppy to update the TITAN 64 to a newer version number. This eliminates the time, effort and expense of sending equipment back and forth for version upgrades.

Connect the Communications Cable illustrated on page 3-14 to the TITAN and the computer. Then attach the Power Supply.

The file TITAN.BIN should be in the program directory. If it is not, find the floppy disk sent by Traffic Data Systems for upgrading the TITAN. Copy the file "TITAN.BIN" into the "TITAN" directory. For example, first insert the floppy disk into drive "A:". Then change to the "TITAN" directory and type "Copy a:\titan.bin" at the DOS prompt.

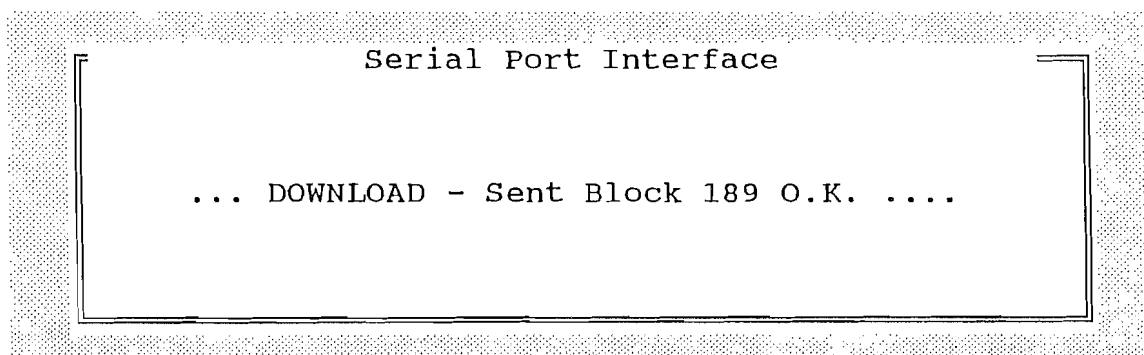
To download this new program to TITAN, run IDEAS highlight "PROGRAM TITAN 64" with the <UpArrow> or <DownArrow> keys or the letter <P>, then press <ENTER>. The unit will automatically turn off.

Turn the unit back "On" immediately. As information is going to the TITAN, its display will appear as illustrated below:

TDS	TITAN 64	B1.00
.....		

Figure A-1 TITAN Data Transfer Screen

The periods will continue to appear across the bottom of the display until the process is complete. At the same time the computer display will appear as follows:



Serial Port Interface

... DOWNLOAD - Sent Block 189 O.K.

Figure A-2 Download Message Window

When the process is complete, the window depicted below will appear:

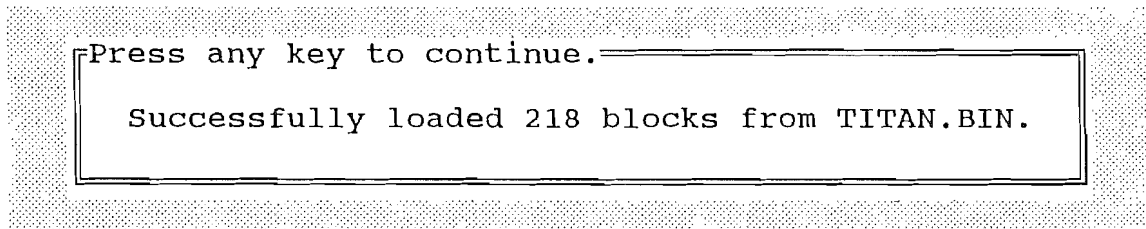


Figure A-3 Download Successful Message

Press any key to continue. The Communications Menu will appear for further selections on the PC.

When this is complete, the TITAN 64 has a new operating system, and can be used to perform studies.

To perform the memory test simply underline "YES", as in Figure 10-4 on the previous page. Then press "ENTER". If a memory test is not required, underline "NO" and press "ENTER".

The non-destructive memory test will run on the unit. If the test failed, the display would indicate a memory location and value, as shown in Figure 10-6. Figure 10-5 is an example of the display as the memory test is passed without problems:

```
TEST  Memory
Memory OK
```

Figure 10-5 Memory Test Passed

```
TEST  Memory
Failed at 10EF = FF
```

Figure 10-6 Memory Failed with Location and Value

10.2 SERIAL PORT TEST

Once the memory test is complete, or if "NO" was selected to the display in Figure 10-4, the example below is displayed:

```
TEST  Serial Port
Yes  No
```

Figure 10-7 Serial Port Test Screen

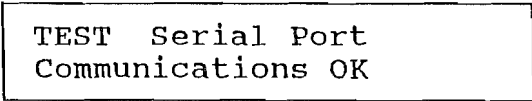
This allows the TITAN to be checked for valid serial communications on the serial interface connector. This test requires a special plug to be connected to the serial interface connector before this test is run. If "YES" is entered, the following display occurs:

```
TEST  Plug Inserted?
Yes  No
```

Figure 10-8 Plug Inserted Question

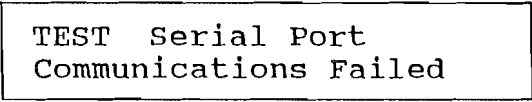
If the serial plug is inserted into the serial port connector, the test will report pass or failure on the RS232 interface as well as the handshake lines.

The following two display screens illustrate the pass and fail, respectively:



TEST Serial Port
Communications OK

Figure 10-9 Serial Port Test Pass -



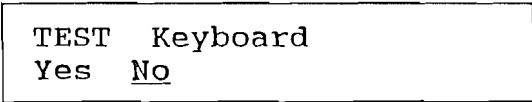
TEST Serial Port
Communications Failed

Figure 10-10 Serial Port Test Failed

****note serial plug draws current. use only when communicating do not leave connecte****

10.3 KEYBOARD TEST

This feature will allow the operator to test each key for proper operation. After the Serial Port testing is complete, or "NO" was entered at the question in Figure 10-7 on the previous page, the Keyboard Test question will present itself. The display appears as follows:



TEST Keyboard
Yes No

Figure 10-11 Keyboard Test Question Screen

To perform the keyboard test, underline "YES" and press "ENTER" and the test will run. Each key press will display a unique code which consists of the key matrix number, and the text type or other character.

When "ENTER" is pressed, the testing routines will have been complete, and the display will return to the normal Sign-on as in Figure 10-1.