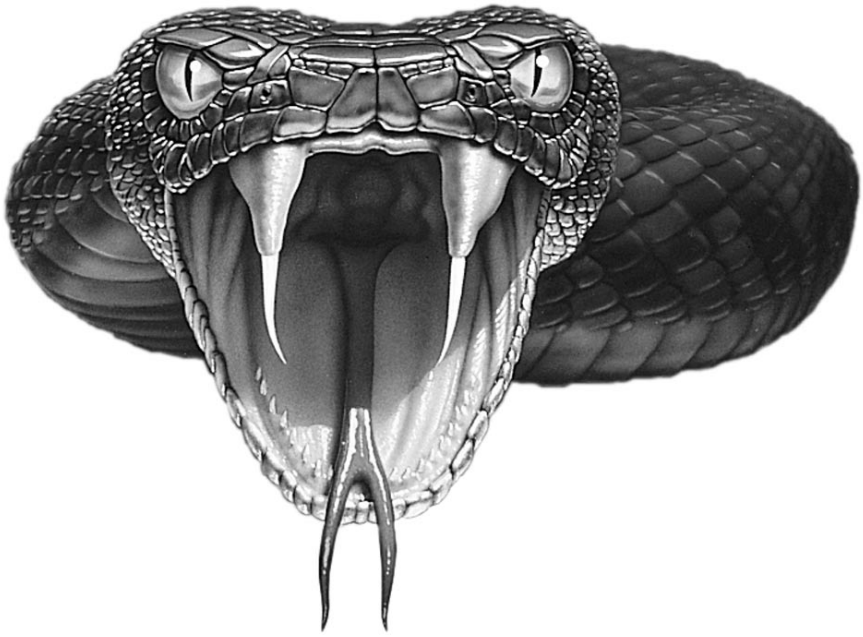
VIPER®



420 ESP

Installation Guide

12/99 to 11/01

Bitwriter™, Code Hopping™, DEI®, Doubleguard®, ESP™, FailSafe®, Ghost Switch™, Learn Routine™, Nite-Lite®, Nuisance Prevention Circuitry®, NPC®, Revenger®, Silent Mode™, Soft Chirp®, Stinger®, Valet®, Vehicle Recovery System®, VRS®, and Warn Away® are all Trademarks or Registered Trademarks of Directed Electronics, Inc.

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primary harness (H1), 12-pin connector

primary harness wiring diagram

H1/1	ORANGE	(-) 500 mA ARMED OUTPUT
H1/2	WHITE	(+)/(-) SELECTABLE LIGHT FLASH OUTPUT
H1/3	WHITE/BLUE	(-) 200 mA CHANNEL 3 PROGRAMMABLE OUTPUT
H1/4	BLACK/WHITE	(-) 200 mA DOMELIGHT SUPERVISION OUTPUT
H1/5	GREEN	(-) DOOR TRIGGER INPUT, ZONE 3
H1/6	BLUE	(-) INSTANT TRIGGER INPUT, ZONE 1
H1/7	VIOLET	(+) DOOR TRIGGER INPUT, ZONE 3
H1/8	BLACK	(-) CHASSIS GROUND INPUT
H1/9	YELLOW	(+) SWITCHED IGNITION INPUT, ZONE 5
H1/10	BROWN	(+) SIREN OUTPUT
H1/11	RED	(+) CONSTANT POWER INPUT
H1/12	RED/WHITE	(-) 200 mA CHANNEL 2 OUTPUT

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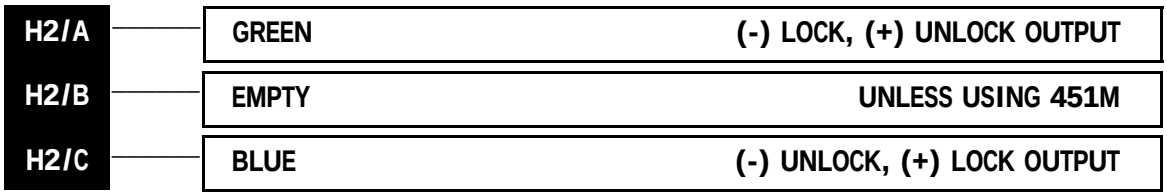
door lock harness (H2), 3-pin connector



This system can control two common power door lock types without any additional parts! With certain vehicles, or if an actuator is to be installed, either a p/n **451M** Door Lock Relay Satellite or two relays will be required.

> ***IMPORTANT!*** *If you mistake a Type C direct-wired system for a Type A positive-pulse system, the module will be damaged!*

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plug-in harnesses

super bright LED, 2-pin white plug

The super bright LED operates at 2V DC. Make sure the LED wires are not shorted to ground as the LED will be damaged. Multiple LED's can be used, but they must be wired in series. The LED fits into a 9/32 inch mounting hole. Be sure to check for clearance prior to drilling the mounting hole.

valet®/program switch, 2-pin blue plug

The Valet®/Program switch should be accessible from the driver's seat. It plugs into the blue port on the side of the unit. Since the system features Valet® by using the remote transmitter, the switch can be well hidden. Consider how the switch will be used before choosing a mounting location. Check for rear clearance before drilling a 9/32-inch hole and mounting the switch.The GRAY wire in the two-pin plug may also be used as a (+) ghost switch input and can be connected to any (+) switch in the vehicle. (See *Feature Descriptions* section of this guide.)

programmer interface, 3-pin black plug

The black three pin port is provided for personal computer programming of the unit. When using the DEI Bitwriter (P/N **998T**) or optional PC Interface Module (P/N **996T**) it is possible to configure any and all of the programmable functions. The PC Interface Module works with an IBM compatible PC. (The 998T does not require the IBM compatible PC.) For more information please refer to the guide packaged with the programmer. This port can also be used to interface the Valet® Car★Com (DEI P/N **820T**) with the security system.

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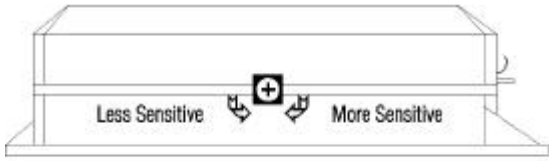
on-board dual stage shock sensor



DRW-52

There is a dual-stage shock sensor inside the control unit. Adjustments are made via the rotary control as indicated in the diagram. Since the shock sensor does not work well when mounted firmly to metal, we do not recommend screwing down the control module. The full trigger of the on-board shock sensor reports Zone 2. See the *Table of Zones* section of this guide.

> ***NOTE:*** *When adjusting the sensor, it must be in the same mounting location that it will be after the installation is completed. Adjusting the sensor and then relocating the module requires readjustment.*

optional sensor harness, 4-pin connector

The four-pin sensor harness is optional, and is not included with this unit.

RED, BLACK

These wires supply constant 12 volts and ground to the optional sensor.

BLUE, GREEN

These wires are multiplex inputs. If a (-) input of less than 0.8 seconds is supplied to either wire, the Warn-Away response will occur. A (-) input of longer than 0.8 seconds to either wire will initiate the triggered sequence and report Zone 4.

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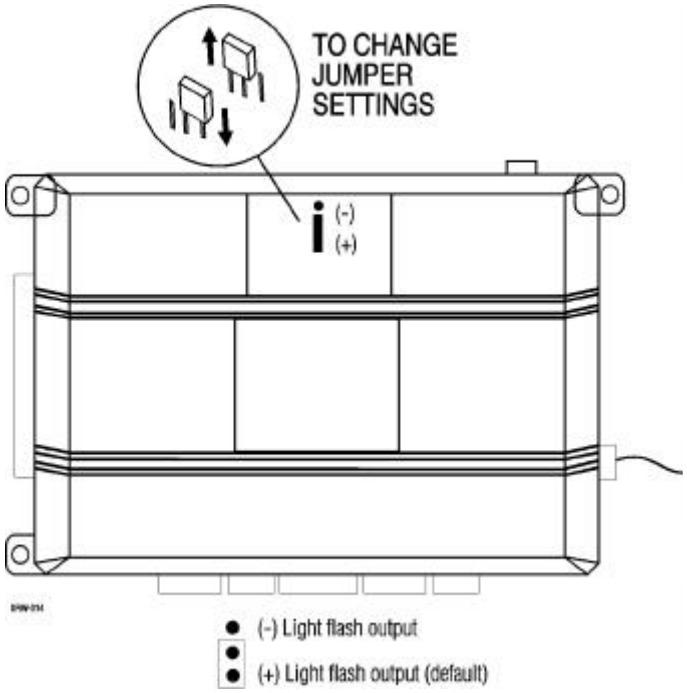
internal programming jumper

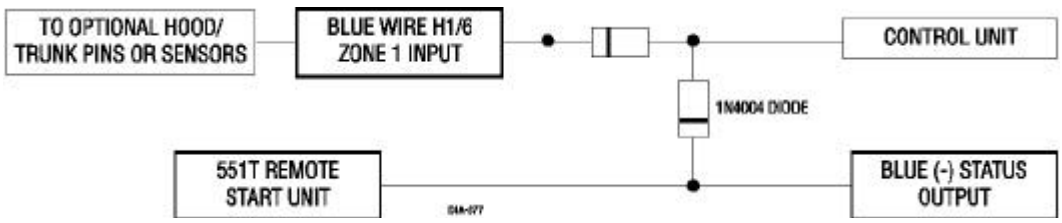


light flash jumper

This jumper is used to determine the light flash output. In the (+) position, the on-board relay is enabled and the unit will output (+)12V on the WHITE wire, H1/2. In the (-) position, the on-board relay is disabled. The WHITE wire, H1/2, will supply a 200 mA (-) output suitable for driving factory parking light relays.

bypassing sensor inputs

There are times when you need to temporarily bypass all sensor inputs to the unit, such as when remote starting the vehicle. Anytime an auxiliary channel output is used, all inputs are bypassed for 5 seconds. During the 5 second bypass period, ground can be supplied to the H1/6 Blue wire without triggering the unit. When the 5 second bypass period ends, if the unit sees ground on the H1/6 Blue wire, all trigger inputs except the door trigger input will remain bypassed until 5 seconds after ground is removed from the BLUE wire. This can be done using the status output of a 551T remote start unit as shown below:



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system features learn routine™

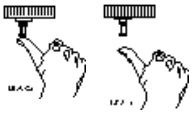
The System Features Learn Routine™ dictates how the unit operates. Due to the number of steps, they have been broken up into two menus. It is possible to access and change any of the feature settings using the Valet®/Program switch. However, this process can be greatly simplified by using the optional DEI Bitwriter or Personal Computer Interface, P/N **996T**. Any of the settings can be changed and then assigned to a particular transmitter, up to four, a feature called Owner Recognition. Each time that particular transmitter is used to disarm the system, the assigned feature settings will be recalled. Owner Recognition is only possible when programming the unit via the **996T** or the **998T** DEI Bitwriter.

Using the optional DEI Bitwriter or PC Interface, the learn routine may be locked. Make sure the learn routine is unlocked before programming features. If the siren generates one long chirp when attempting to program the unit, the learn routine is locked and must be unlocked using the DEI Bitwriter or PC before proceeding.

1. **Open a door.**(The H1/5 GREEN wire or the H1/7 VIOLET wire must be connected.)

2. **Ignition.** Turn the ignition on, then back off: (The H1/9 YELLOW wire must be connected.)

3. **Select a Menu.** Press and **HOLD** the Valet®/Program button: (The Valet®/Program button must be plugged into the blue port.) After three seconds the siren will chirp once indicating entry to the Basic Features Menu #1. If this is the menu you wish to access, release the button and go on to step 4. If the button is not released, you will jump to the Advanced Features Menu #2 and the siren will chirp twice. Once you have selected the desired menu, release the Valet®/Program button and then go to step four.



4. **Select a Feature.** Press and release the Valet®/Program button the number of times corresponding to the step you wish to change. For example, to access the third feature, press and release three times. Then press the button once more and **HOLD** it. The siren will chirp the number of times equal to the step you have accessed.

5. **Program the Feature.** While **HOLDING** the Valet®/Program button, you can toggle the feature on and off using the remote transmitter. Pressing Button I will select the one chirp or default setting. Pressing Button II will select the two chirp setting. (See *Transmitter/Receiver Learn Routine* section of this guide.)

NOTE: *The Valet® pulse count feature (2-5) and the Channel three timed output (2-9) have five possible settings each. Pressing channel 2 will toggle through all the possible settings.*

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6. R**elease the Valet®/Program button.**

once a feature is programmed

- Other features can be programmed within the same menu.
- Another menu can be selected.
- The learn routine can be exited if programming is complete.

to access another feature in the same menu

1. Press and release the Valet®/Program switch the number of times necessary to advance from the feature you just programmed to the next one you want to program.
2. Then press the Valet®/Program switch once more and **HOLD** it.

For example, if you just programmed the third feature in the menu and you would like to program the seventh feature in the menu, you would press and release the Valet®/Program switch four times and then press it once more and **HOLD** it. The siren would chirp seven times to confirm access to the seventh feature.

to select another menu

1. Press and **HOLD** the Valet®/Program switch.
2. After three seconds, the unit will advance to the next menu and the siren will chirp, indicating which menu has been accessed.

For instance, if you just programmed some features in Menu #1 (Basic Features) and you desire to program a feature in Menu #2, you press and **HOLD** the Valet®/Program button. After three seconds, the siren chirps twice indicating access to Menu #2.

to exit the learn routine

To exit the learn routine, do one of the following:

1. Close the open door.
2. Turn the ignition on.
3. No activity for longer than 15 seconds.
4. Press the Valet®/Program switch too many times.

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system features menus

Items in **bold** text have been programmed to the two chirps setting at the factory.

menu #1 - basic features

FEATURE NUMBER	ONE-CHIRP SETTING (DEFAULT)	TWO-CHIRP SETTING
1-1	**Active arming**	Passive arming
1-2	**Chirps on**	Chirps off
1-3	**Ignition-controlled door locks on**	Ignition-controlled door locks off
1-4	**Active locking only**	Passive locking
1-5	**Panic with ignition on**	No panic with ignition on
1-6	**0.8 second door lock pulses**	3.5 second door lock pulses
1-7	**Forced passive arming on**	Forced passive arming off
1-8	Automatic engine disable on	**Automatic engine disable off**
1-9	**Armed When Driving (AWD)**	Vehicle Recovery System (VRS®)
1-10	**Code Hopping™ On**	Code Hopping™ off

menu #2 - advanced features

FEATURE NUMBER	ONE-CHIRP SETTING (DEFAULT)	TWO-CHIRP SETTING
2-1	**Siren**	Horn honk
2-2	**30-second siren duration**	60-second siren duration
2-3	**Nuisance Prevention Circuitry™ ON**	Nuisance Prevention Circuitry™ OFF
2-4	**Progressive door trigger**	Instant door trigger
2-5	**Valet switch input: 1 pulse**	Valet switch input: 2-5 pulses
2-6	**Door trigger error chirp ON**	Door trigger error chirp OFF
2-7	**Ignition-controlled domelight ON**	Ignition-controlled domelight OFF
2-8	**Single unlock pulse**	Double unlock pulse
2-9	**Channel 3: Validity**	Channel 3: latched/latched, reset with ignition/30-second timed/ second unlock output

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feature descriptions

The features of the system are described below. Features that have additional settings that can be selected only when programming with the PC interface or Bitwriter are indicated by the following icon:

menu #1 - basic features

1-1 ACTIVE/PASSIVE ARMING: When active arming is selected, the system will only arm when the transmitter is used. When set to passive, the system will arm automatically 30 seconds after the last door is closed. To alert the consumer of passive arming, the siren will chirp 20 seconds after the door is closed. This provides the consumer with an audible warning prior to the system actually arming. At the 30 second mark, the system will arm but the siren will not chirp.

1-2 Chirps ON/OFF: This feature controls the chirps or voice messages (if using the 516M voice module) that confirm the arming and disarming of the system.

1-3 IGNITION CONTROLLED DOOR LOCKS ON/OFF: When turned on, the doors will lock three seconds after the ignition is turned on and unlock when the ignition is turned off. The TechSoft Programmer or the **998T** Bitwriter™ will display separate steps for ignition lock and ignition unlock. They can be programmed on or off independently.

1-4 ACTIVE/PASSIVE LOCKING: If passive arming is selected in step 1-1, then the system can be programmed to either lock the doors when passive arming occurs, or only lock the doors when the system is armed via the transmitter. Active locking means the system will not lock the doors when it passively arms. Passive locking means that the system will lock the doors when it passively arms.

> ***NOTE:*** *Remember, when passive arming is selected, the unit will chirp 20 seconds after the last door is closed. The system does not actually arm or lock the doors until 30 seconds after the door has been closed.*

1-5 PANIC WITH IGNITION ON: This step controls whether or not the Panic Mode is available with the ignition on. In some states, there are laws prohibiting a siren from sounding in a moving vehicle. This feature makes the system compliant with these regulations.

1-6 DOOR LOCK PULSE DURATION: Some European vehicles, such as Mercedes-Benz and Audi, require longer lock and unlock pulses to operate the vacuum pump. Programming the system to provide 3.5 second pulses, will accommodate the door lock interface in these vehicles. The default setting is 0.8 second door lock pulses.

1-7 FORCED PASSIVE ARMING ON/OFF: To use this feature, passive arming must be selected in step 1-1. When turned on, forced passive arming will ensure that the system will passively arm, even if a zone is left open or invalid. Forced passive arming occurs one hour after the ignition is turned off.

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1-8 AUTOMATIC ENGINE DISABLE (AED) ON/OFF: AED is a full-time, passive starter disable that works independently of the security system. When turned on, the orange, ground-when-armed output (H1/1) will go active 30 seconds after the ignition is turned off. The LED will flash at half its normal rate when the ignition is turned off to indicate that AED is active and will interrupt the starter in 30 seconds. AED does not occur in Valet® mode and can be bypassed using the emergency override procedure. The transmitter can be used to disarm AED; however, the system must be armed and then disarmed with the transmitter, in order to disarm AED.

1-9 ARMED WHILE DRIVING/VEHICLE RECOVERY SYSTEM: In the default setting (Armed While Driving), the system can be armed with the ignition on. When armed, the ground-when-armed is not active and the sensors are bypassed. The door triggers will remain active. If programmed to the Vehicle Recovery System (VRS®) setting, VRS will be activated.

1-10 CODE-HOPPING™ ON/OFF: The system uses a mathematical formula to change its code each time the transmitter and receiver communicate. This makes the group of bits or "word" from the transmitter very long. The longer the word is, the easier it is to block its transmission to the unit. Disabling the Code-Hopping™ feature lets the receiver ignore the Code-Hopping™ part of the transmitted word. As a result, the unit may have better range with Code-Hopping™ off.

menu #2 - advanced features

2-1 SIREN/HORN HONK: The system can be programmed to output pulses instead of a continuous output when the system is triggered. This is useful to honk the factory horn in applications where a siren is undesirable. Remember that the unit is only capable of supplying 1 amp of current. A relay will be required to interface with most factory horn systems.

2-2 SIREN DURATION 30/60 SECONDS: It is possible to program the unit to sound for 30 or 60 seconds during the triggered sequence. Some states have laws regulating how long a security system can sound. When using the TechSoft Programmer or Bitwriter™, the siren can be programmed to sound for any length of time ranging from 1 to 180 seconds. Use the right and left arrows or the + and - keys on your keyboard to change the siren duration in 1 second intervals. Holding down the key will rapidly increase or decrease the setting. The desired siren duration can also be directly entered by using the number keys on your computer's keyboard. When using the Bitwriter, pressing the SELECT button will adjust the siren duration.

2-3 NUISANCE PREVENTION® CIRCUITRY (NPC™) ON/OFF: NPC™ stops repeated triggering of the same zone. If one zone is triggered three times in one hour, that zone is bypassed for one hour, starting from the time of the third trigger. During that hour, if the system detects a trigger on that zone again, the system resets the one hour timer. If one hour passes and the zone has not triggered again, the zone is activated and can trigger the system again. NPC™ only monitors sensor inputs, and does not bypass the door trigger or the ignition trigger at any time. If NPC™ is turned off, the system will respond to repeated triggers on the sensor inputs and will do so indefinitely. Some states have laws regulating how many times a security system can trigger before it is considered a nuisance and the vehicle is towed away.

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2-4 PROGRESSIVE DOOR TRIGGER ON/OFF: The system responds to a door trigger input with a progressive response. When the door is opened with the system armed, the siren will chirp 10 times prior to the full triggered sequence. The door trigger is still treated as an instant trigger and closing the door quickly will not prevent a full triggered sequence from occurring. If the progressive door trigger is programmed off, the full siren output will occur the moment the door is opened.

2-5 VALET PULSE COUNT 1 to 5 PULSES: The system can be programmed to count the number presses of the valet switch before disarming the security system or VRS®. The factory default setting is one pulse. The unit can be set for 2 to 5 pulses using the two-chirp setting to select the pulse count.

> ***GHOST SWITCH OPTION:*** *For added security, the GRAY wire on the two-pin Valet®/Program can be connected to any switch in the vehicle that provides a positive (+) momentary pulse.*

2-6 DOOR TRIGGER ERROR CHIRP ON/OFF: With the door trigger error chirp programmed off, the system will not report an invalid zone on arming when the door trigger wire is active. This eliminates the extra chirps that occur when interfacing with vehicles that have exceptionally long dome light delay circuits.

2-7 IGNITION-CONTROLLED DOMELIGHT SUPERVISION ON/OFF: If turned on, the system will turn on the domelight for 30 seconds when the ignition is turned off. The optional domelight supervision feature must be installed.

2-8 DOUBLE PULSE UNLOCK ON/OFF: Some vehicles require two pulses on a single wire to unlock the doors. When the double pulse unlock feature is turned on, the BLUE H2/C wire will supply two negative pulses instead of a single pulse. At the same time, the GREEN H2/A wire will supply two positive pulses instead of a single pulse. This makes it possible to directly interface with double pulse vehicles without any extra parts.

2-9 CHANNEL 3 VALIDITY/LATCHED/LATCHED RESET WITH IGNITION/30 SECOND TIMED/SECOND UNLOCK OUTPUT: Channel 3 can be programmed for these output configurations. The unit is set to the default validity output. To change the configuration, use the two-chirp setting to toggle to the different configurations.

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transmitter/receiver learn routine™

The system comes with two transmitters that have been taught to the receiver. The receiver can store up to four different transmitter codes in memory. Use the following learn routine to add transmitters to the system or to change button assignments if desired.

When the learn routine has previously been programmed using an optional hand-held system programmer (**p/n 998T**) or PC Interface module, it may have been locked. Before proceeding with reprogramming the learn routine, it must be unlocked by using either **p/n 998T** or the PC Interface module - this cannot be done manually with the Valet switch. If the learn routine is locked, transmitters cannot be programmed to the system.

1. **Open a door.** (The H1/5 GREEN wire or the H1/7 VIOLET wire must be connected.)

2. **Key.** Turn the ignition on. (The YELLOW wire, H1/9 must be connected.)

3. **Select the receiver channel:** Press and release the Valet®/Program button the number of times necessary to access the desired channel.

NOTE: *If adding a remote, a button must be taught to the unit in the Channel 1 or Channel 4 position prior to programming other channels, unless programming to one of the Auto Learn Configurations.*

Press and **HOLD** the Valet®/Program button once more. The siren will chirp and the LED will blink the number of times corresponding to the channel that is accessed.

CHANNEL NUMBER	FUNCTION	WIRE COLOR
1	Arm/Disarm/Panic	
2	Silent Mode™/Remote Valet®/Trunk Release	RED/WHITE
3	Remote Start or other accessories	WHITE/BLUE
4	Arm only	
5	Disarm only	
6	Panic only	
7	Auto Learn Standard Configuration 4-button transmitter*	
8	Auto Learn Single Button Arm/Disarm Configuration(optional 471T)*	
9	Delete all transmitters	

***NOTE:** For Auto Learn Configurations, see Transmitter Configurations section of this guide.*

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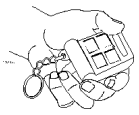

4. **Press the transmitter button:** While **HOLDING** the Valet®/Program switch, press the button from the transmitter that you wish to assign to the selected channel. The unit will chirp indicating successful programming. It is not possible to teach a transmitter button to the system more than once.

Channels #4-6: Channels 4 through 6 are used to assign the arm, disarm and panic functions to separate buttons on the remote control. Teaching a button to Channel 4 erases all information about that remote from memory. Any auxiliary functions that are desired will have to be reprogrammed. Similarly, if the remote is set up to use the separate arm, disarm and panic channels and a button from that remote is entered into channel one, the remote will be erased from memory, and the system will only recognize the button that was entered into channel one.

Channel #9: If any transmitter button from a known transmitter is programmed to Channel 9, all transmitters will be erased from memory and will revert to the default feature settings (see the *Features Menu* section of this guide). This is useful in cases where the one of the customer's transmitters is lost or stolen. This will erase any lost or stolen transmitters from the system's memory. It can also be used to start from scratch if the transmitter buttons were programmed incorrectly.

5. **Release:** Once the code is learned, the Valet®/Program button can be released.

to exit learn routine

Learn Routine™ will be exited if:

- Ignition is turned off.
- Door is closed.
- Valet®/Program button is pressed too many times.
- More than 15 seconds elapse between steps.

One long chirp indicates that Learn Routine™ has been exited.

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transmitter configurations

Using the Auto Learn functions in the Transmitter/Receiver Learn Routine, the transmitters can be programmed either with the standard single button arm/disarm configuration (default) or with the expanded configuration, which requires an optional 4-button transmitter.

Standard expanded 4-buttons configuration

Your system has an expanded configuration that can be fully utilized from your four-button transmitter. In the expanded configuration, your system will operate similarly to many factory keyless entry systems that use separate remote transmitter buttons for the arm, disarm, panic and auxiliary output functions:

 . . . . . operates . . . . . Arm only

 . . . . . operates . . . . . Disarm only

. . . . . operates . . . . . Channel 2

 . . . . . operates . . . . . Panic

 and  . . operate . . . . . Channel 3

Optional single button arm/disarm configuration

When programmed for single button arm/disarm configuration, the transmitter buttons are assigned to the following functions, an optionnal two-buttons 471T transmitter is required to do that configuration:

 . . . . . operates . . . . . Arm/Disarm/Panic

 . . . . . operates . . . . . Channel 2

 and  . . . operates . . . . . Channel 3

NOTE: *If a 2-button transmitter is programmed with the expanded configuration, the Panic feature and Channel 2 output can no longer be controlled by the transmitter.*

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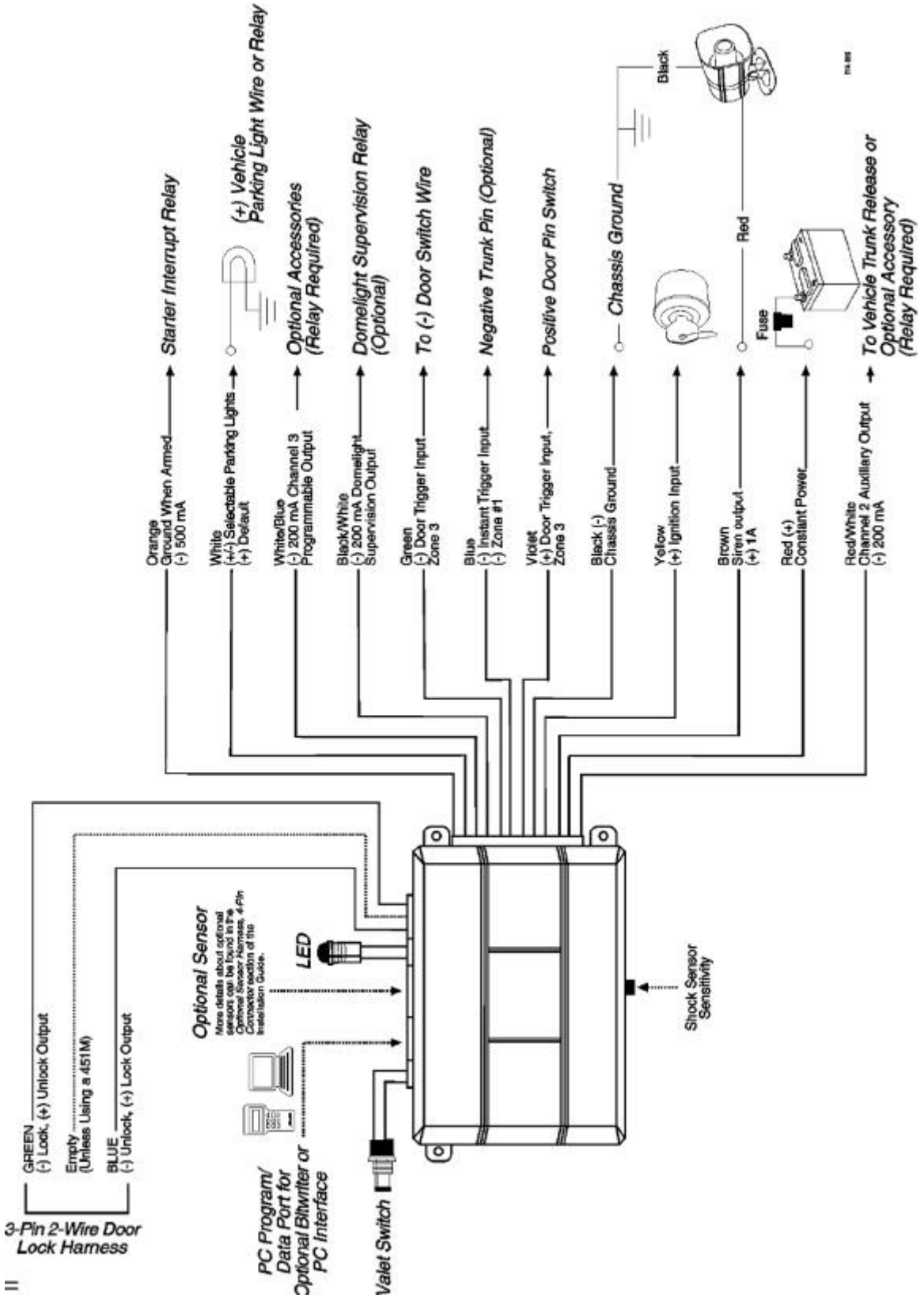
wiring quick reference guide



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