STALKER® II SDR

Stationary Directional Radar



Metric Operator's Manual

PROPRIETARY – COPYING AND REPRODUCING RESTRICTED

applied concepts, inc.

2609 Technology Drive
Plano, TX 75074
Phone (972) 398-3780
Fax (972) 398-3781

Toll Free Sales 1-800-STALKER
Toll Free Service 1-877-STALKER
sales@stalkerradar.com
www.stalkerradar.com

011-0067-xx Rev T

Dear Valued Radar Customer:

Thank you for choosing the ***STALKER*** Radar System. We sincerely appreciate you purchasing the ***STALKER*** and giving us the opportunity of serving you and your department. You will find the ***STALKER*** to be an invaluable tool in controlling speed violators and making your streets and highways safer. Most importantly, we care about you, our customer, and want you to be completely satisfied. Our success as a company depends upon your satisfaction and experience with the ***STALKER*** Radar.

Applied Concepts, Inc. believes that the ***STALKER*** offers more than superior performance and versatility. ***STALKER*** is backed 100% with reliable, professional, and experienced sales and service support, ready to assist you at your request. We also offer the longest warranty in the industry, with nationwide factory authorized repair centers to assure you of fast and efficient service.

We wish you the greatest success in your speed enforcement program. Please do not hesitate to let us know if there is anything we may do to add to your product satisfaction. Thanks again!

Sincerely,

Applied Concepts, Inc.

STALKER **II SDR** is covered by one or more of the following United States Patents:
5,525,996 5,528,245 5,570,093 5,691,724 6,198,427 B1
6,646,591 B2 7,068,212 B2

In addition, other United States Patents are pending.

©2006, 2008 Applied Concepts, Inc. All rights reserved.

STALKER is a registered trademark of Applied Concepts, Inc.

Notice of Trade Secret. This Operator's Manual contains trade secret and protected information that is exempted from public and/or unauthorized disclosure under various state laws, federal laws, and the definition of trade secret under the Restatement of Torts.

Unauthorized or public disclosure of this Operator's Manual may cause substantial competitive injury or harm to Applied Concepts, Inc. APPLIED CONCEPTS, INC. SPECIFICALLY ASSERTS ALL OF ITS APPLICABLE PRIVILEGES AND EXCEPTIONS TO PROTECT ITS TRADE SECRETS AND PREVENT UNAUTHORIZED PUBLICATION AND DISCLOSURE OF THE OPERATOR'S MANUAL.

Standard of Care. You agree not use this Operator's Manual for any purpose other than in connection with police radar enforcement. You agree that the standard of care which you shall use in preventing disclosure of the Operator's Manual to third parties shall be at least the same care that you would take in preserving the confidentiality of your own sensitive information and classified documents. You also agree to exercise reasonable care in overseeing those with access to the Operator's Manual, and shall limit such access to only those of who have a need to know.

TABLE OF CONTENTS

INTRODUCTION 1
HOW TRAFFIC RADAR WORKS 1
INSTALLATION 2
- Battery Handle Installation 2
- Power Cable Installation 2
- Battery Charger Installation 2
- Cordless Remote Control Installation (optional) 2
- Dash Mount Installation (optional) 2

ACCESSORIES 3
- Battery Handle 3
- Power Cable 3
- Battery Charger Operation 3
- Hand Controller 3

DISPLAY OPERATION 4
- Display Rear Panel 4

LCD ICON INDICATOR DEFINITION 4
DISPLAY MESSAGES IN THE MESSAGE WINDOW 5
DISPLAY MESSAGES IN THE SPEED WINDOWS 5
STALKER II OPERATOR SETTINGS 7
- Faster Target Display On / Off 7
- Sensitivity (Range) Adjustment 7
- Audio Squelch ON / OFF 8
- Doppler Audio 8
- Beep Tones 8
- Stopwatch Mode ON / OFF 8

ADJUSTING THE STALKER II 9
- Display Backlighting 9
- Software Version 9
- Transmitter Frequency 9

STATIONARY MODE DIRECTION SETTINGS 10
USING THE STOPWATCH MODE 11
HOW FASTER SPEED TRACKING HELPS THE PATROL OFFICER 13
INTERFERENCE SOURCES AND REMEDIES 13
- Interference From Other Transmitters 14

LOW SUPPLY VOLTAGE 14
WHY TESTING IS IMPORTANT 15
HOW TO INITIATE A SELF-TEST 15
IS MICROWAVE RADIATION DANGEROUS? 16
STALKER II MICROWAVE EMISSIONS 17
REQUIRED MAINTENANCE 17
TROUBLESHOOTING 17
WARRANTY 18

INTRODUCTION

The ***STALKER II*** is a Ka-band **D**irection **S**ensing **R**adar designed to allow the speed enforcement officer maximum flexibility. The unique Direction Sensing ability of the ***STALKER II*** allows the radar to automatically determine the correct speed of all targets. In addition to *Fast Speed* display, the ***STALKER II*** offers *Fast Speed* locking-for both closing targets and away targets.

Utilizing a state-of-the-art Digital Signal Processor (DSP), ***STALKER II*** provides a level of performance, convenience, and accuracy previously unavailable. The DSP performs the critical filtering and timing functions required for speed measurement in its software, as opposed to its hardware. This provides less unit-to-unit variation, more reliable performance, and easier maintenance. One of the unique features of the ***STALKER II*** is that it can be upgraded in the future by simply installing new software, preventing obsolescence!

STALKER II operates in Ka-band from 33.4 to 36.0 GHz and provides a hold mode. Both Ka-band operation and the hold feature reduce the possibility of detection by radar detectors. Target-speed locking with Track-thru-Lock speed, Fast Speed Tracking, Target Direction Arrows, and Target Doppler Audio capability assist the operator in positive target identification and provide operating convenience.

HOW TRAFFIC RADAR WORKS

All traffic radar uses the Doppler frequency shift technique to measure the speed of moving vehicles. This technique is based on the Doppler Principle, which states that a radar signal reflected from a moving target will experience a frequency shift that is proportional to the speed of the target relative to the radar. Circuitry in the traffic radar then processes the reflected signal to obtain the frequency shift and translate this frequency shift to speed.

In stationary mode, the transmitted signal strikes a moving target and is reflected back to the antenna. The traffic radar then measures the frequency shift to obtain the target speed.

Prior to the introduction of the ***STALKER DSR*** line of products, traffic radar could not sense the direction of vehicles in the radar beam. In conventional traffic radar, targets both closing and moving away generate the same Doppler frequency shift, and it is not possible to distinguish between them. Therefore, a stationary radar always reads the speed of all vehicles in its beam (both closing and moving away) and the operator had to rely on visual observation to determine target direction. Now, the ***STALKER II*** has the ability to filter out Doppler signals from targets moving in the opposite direction of the targets being tracked.

Fast Mode - STALKER II offers a feature called *Fast Speed Tracking*. *Fast Mode* display can be easily turned ON/OFF in the Operator Menu. See Page 7.

The addition of the *fast mode* allows the ability to track small high speed targets that normally could not be tracked because a stronger target shields the weaker target from normal speed measurement. The classic example is where a speeding sports car passes a slower moving eighteen wheeler. The *faster* sports car, although clearly speeding, previously could not be measured because the strongest truck target captures the target display window. ***STALKER II***, in this example, will display the speed of the strongest truck in the target window, while the speed of the *faster* sports car will appear in the middle *fast* window. Tracking of both targets may be performed simultaneously.

INSTALLATION

The ***STALKER II*** Ka-Band radar can be operated hand-held, motorcycle mounted, or dash mounted. A motorcycle mount and a dash mount are available. ***STALKER II*** can be powered from two different power sources: 1) Battery Handle or 2) 12VDC Cigarette Plug Power Cable.

Battery Handle Installation

ATTENTION: The battery must be charged prior to initial use.

The ***STALKER II*** Battery Handle is recommended when trigger activated transmit mode is used and when the operator desires to use the radar hand-held. Attach the Battery Handle to the body by inserting the top front tip of the Battery Handle into its mating lip on the radar body and rotating the back of the Battery Handle up until seated. Next, rotate the thumb latch to engage the ramping slot in the back of the Battery Handle. The radar is now ready for use.

Power Cable Installation

There are several power cables available and they all supply power through the data connector on the right side of the radar. Remove the data connector dust cover and then insert and twist-to-lock the power cable connector to the radar connector. The cigarette plug may plug into any 12VDC power receptacle.

Battery Charger Installation

This Battery Charger may be powered either from 120 VAC house current using the wall adapter supplied, or from a 12VDC vehicle electrical system by using the optional cigarette plug cable. To use the charger, plug either the wall adaptor or the optional cigarette plug cable into the 12 V AC/DC jack on the charger and plug the other end into a wall outlet or cigarette plug receptacle. Install a battery on the charger by inserting it into the mating battery connector in a manner similar to STALKER II. The charging cycle will be automatically started when the battery is connected, and the green indicator should glow indicating that the battery is being quick charged.

Cordless Remote Control Installation (optional)

The *only* installation required for the ergonomic remote control is to install the batteries. Remove the battery compartment cover, and install the batteries paying attention to the polarity markings. Replace the battery cover until it snaps in place. Velcro may be applied to the back of the remote control unit to attach it to the dash or other locations. Also, a microphone lug (supplied) can be attached to the back of the ergonomic remote control to allow installation into a microphone holder. An optional lanyard is also available.

Dash Mount Installation (optional)

The dash mount uses windshield suction cups to secure the front of the mount, and either bungee cords or Velcro to secure the rear of the mount. Some new car dashes may require special mounting hardware or modifications. Check with the factory if help is needed. Install the dash mount in a convenient location that does not obscure the view of the road. Make sure the radar beam is approximately level, points straight ahead, and is not blocked by objects such as windshield trim or windshield wipers. Ensure after mounting, that the mount will not be dislodged during high-speed maneuvers.

ACCESSORIES

STALKER II can be powered from two different power sources: 1) Battery Handle or 2) One of several Power Cables. The ***STALKER II*** Ka-Band radar can be operated hand-held, motorcycle mounted, or dash mounted. A motorcycle holster and various dash mounts are available and are optional. Check with your salesman for further information.

Battery Handle

ATTENTION: The battery must be charged prior to initial use. Batteries are shipped in a partial state of charge to help extend battery life.

The ***STALKER II*** Battery Handle is recommended when trigger activated transmit mode is used and when the operator desires to use the radar hand-held. Attach the Battery Handle to the body by inserting the top front tip of the Battery Handle into its mating lip on the radar body and rotating the back of the Battery Handle up until seated. Next, rotate the thumb latch to engage the ramping slot in the back of the Battery Handle. The radar is now ready for use.

Power Cable

There are several power cables available and they all supply power through the data connector on the right side of the radar.

ACI Part Number	Description
155-2232-00	12VDC Power Cable with a cigarette plug only
155-2232-01	12VDC Power Cable with both a cigarette plug and a serial port connector

Battery Charger Operation

The Battery Handle Charger is used to charge the battery handle used with ***STALKER II***. This charger may be powered either from 120 VAC house current using the wall adapter supplied, or from a 12VDC vehicle electrical system by using the optional cigarette plug cable. To use the charger, plug either the wall adaptor or the optional cigarette plug cable into the 12 V AC/DC jack on the charger and plug the other end into a wall outlet or cigarette plug receptacle. Since the charger monitors the battery temperature to prevent damage to the battery, the battery must not be hot or cold while charging. Install a battery on the charger by inserting it into the mating battery connector in a manner similar to attaching it to the ***STALKER II*** radar body. The charging cycle will be automatically started when the battery is connected, and the green indicator should glow indicating that the battery is being quick charged. Quick charging should take 2-3 hours to complete. After quick charging is complete, the green indicator should extinguish. After the green indicator extinguishes, the battery is still being "topped off". The battery should remain on the charger the entire 3 hours to ensure the battery reaches a full state of charge. For longest battery life and best service, batteries should only be charged in an environment where the temperature is between 0°C and 40°C (32°F and 104°F).

NOTE: *The charger senses battery temperature to terminate the charging cycle. As a result, it may refuse to charge a battery that is hot. If this occurs, allowing the battery to cool for a few minutes should correct the problem.*

NOTE: *Battery performance and longevity will be greatly reduced if it is exposed to temperatures over52° C (125° F).*

NOTE: *Batteries do NOT need to be fully discharged prior to charging. The battery will last longer if recharged frequently.*

Hand Controller

An optional Hand Controller (200-0671-00) is available for the ***STALKER II***. The remote is normally used with the moving model of the ***STALKER II***, but it can also be used with the stationary model.

DISPLAY OPERATION

Display Rear Panel



The ***STALKER II*** display unit presents the radar operator with a clear and logically organized picture of how the unit is operating and the targets that it is tracking. The operator knows in a glance the speed of the target, its direction of travel, and its position relative to the patrol car. The display backlight can be toggled on and off by pressing the **LIGHT** key. Other features include:

LCD ICON INDICATOR DEFINITION

XMIT:

The **XMIT** icon indicates that unit is transmitting

CHG:
↑ or ↓
(TO THE RIGHT OF A SPEED WINDOW)

The **CHG** icon is used to indicate that the battery handle is being charged
A ↑ or ↓ shown to the right of any of the two speed windows indicates the direction of travel for the target displayed in that window. Every strong target or fast target displayed in one of the two speed windows, will have a direction arrow associated with it. The direction of the ↑ is defined by the table below.

ARROW INDICATOR DEFINITION

TARGET DIRECTION	ARROW
CLOSING	↓
AWAY	↑

Power Modes

The radar has four power modes:

1. Transmit mode – all circuits operating with or without backlight on
2. Standby mode - all circuits operating except the gunn oscillator. Trigger operation will again initiate transmitting. After 10 seconds in Standby mode, the unit will go into Sleep mode only if it is powered by a battery handle.
3. Sleep mode - all circuitry off except the display driver and LCD. Pressing any key except POWER will return the radar to Standby mode. Operating the trigger will place the unit into Transmit mode. After 30 minutes in Sleep mode, the automatic shutdown feature, if enabled, will turn the unit off.
4. Off.

DISPLAY MESSAGES IN THE MESSAGE WINDOW

BATT:	A flashing BATT message indicates a nearly exhausted battery.
MENU:	A MENU message is displayed after the **MENU** key is pressed and indicates that the radar is in MENU mode.
TEST:	A TEST message indicates that a test sequence is in process.
FAWY:	Press the **DIRECTION** key to change the stationary target direction. FAWY showing in the message window indicates that the radar is set to track targets moving away from the radar.
FCLO:	Press the **DIRECTION** key to change the stationary target direction. FCLO showing in the message window indicates that the radar is set to track moving targets closing on the radar.
FBTH:	Press the **DIRECTION** key for ½ second to change the target direction to simultaneously track both strong and faster closing and away targets. FBTH will show in the message window.
MTR TIME KPH	The sequence of messages displayed in Stopwatch mode.
LOCK:	A LOCK message indicates that a strong target has been locked. The LOCK message will alternate with the operating mode in the message window.

DISPLAY MESSAGES IN THE SPEED WINDOWS

PASS:	A PASS message indicates that a test sequence has been successfully completed.
FAIL:	A FAIL message indicates that a circuit malfunction has been detected, in which case speed readings are inhibited and the unit should be removed from service and repaired. FAIL will remain in the speed windows until reset by being powered off.
ULO:	A ULO message in the Patrol Window indicates the input voltage is too low. Operation is inhibited while the ULO message is displayed.
rFI:	An rFI message in the Target Window indicates the presence of an interfering signal. Operation is inhibited during an rFI indication.

SWITCHES (BOLD MEANS BACKLIT)

1. Trigger (XMIT/HOLD)(In Con mode only, freezes strong & faster speed windows on release)
2. **MENU | STA/MOV**
3. **▲ / TEST**
4. **LIGHT / ▼**
5. **LOCK/REL**
6. **BOTH / DIRECTION**
7. **POWER**

All Rear Panel Switches are mechanical and backlit (like the ergonomic remotes)

SWITCH DEFINITION

TRIGGER:

Setup Menu selectable:

1. (COn in OPTIONS MENU) - The trigger is pulled to continuously transmit. A displayed target speed is "frozen" in the stong window when the trigger is released. The faster target window is also frozen.
2. (SS in OPTIONS MENU) - Start/Stop transmit. Constant transmit is started by a trigger depression and released by another trigger depression.
3. (Loc in OPTIONS MENU) - The trigger is a lock (but not a release) key. Each time the trigger is pressed, the target speed is transferred to the locked speed window, replacing a previously locked speed, if present.

When Loc mode is selected for the trigger, the transmitter is automatically turned on.

When COn or SS mode is slected, the transmitter is automatically put into hold

MENU | STA/MOV:

The **MENU | STA/MOV** key is a single-function key on the stationary radar. Press and hold (for ½ sec) the **MENU** key to enter the OPERATOR MENU. Press the **MENU** key to step between the various options while in the OPERATOR MENU or OPTIONS MENU.

The ▲ and ▼ keys are used with the **MENU** key to change options from the OPERATOR MENU or OPTIONS MENU.

The **STA/MOV** function is not available on the stationary radar.

▲/TEST:

A triple-function key.

The ▲ key is used with the **MENU** key to change options from the OPERATOR MENU or OPTIONS MENU.

The ▲ key is also used in stopwatch mode (along with the ▼ key) to set the length of the measurement distance.

The **TEST** key performs a diagnostic check on the radar. It will complete a display segment test, processor check, memory check, and crystal check. PASS or FAIL is indicated in the message window after all tests have been completed.

LIGHT/▼:

A triple-function key.

The **LIGHT** key toggles the LCD backlight and the keyboard backlight on and off.

The ▼ key is used with the **MENU** key to change options from the OPERATOR MENU or OPTIONS MENU.

The ▼ key is also used in stopwatch mode (along with the ▲ key) to set the length of the measurement distance.

LOCK/REL:

To LOCK the strongest target speed, press **LOCK/REL** once to transfer the contents of the target speed window to the lock speed window. Press again to RELEASE (clear) the lock speed window.

BOTH / DIRECTION:

The **BOTH / DIRECTION** key is a dual function key. While in stationary mode, press the **BOTH** key for ½ second to select both direction mode. BOTH will be displayed in the message window. Both closing stationary targets and away stationary targets may be tracked. To leave both direction mode, press the **BOTH / DIRECTION** key to select stationary closing or stationary away targets.

The **DIRECTION** key can be used to toggle between closing stationary targets and away stationary targets. Either FCLO or FAWY will be displayed in the message window.

POWER:

Toggles main power ON and Off

STALKER II OPERATOR SETTINGS

OPERATOR MENU OPERATION ON *STALKER II* – Setting up the radar unit is fast and easy, and is accomplished using the keypad. Press the **MENU** key for ½ second to enter the OPERATOR MENU and to step through the six settings. The ▲ and ▼ keys change the value. To exit the OPERATOR MENU, press the trigger. The factory default, for each setting, is indicated by the bold underlined setting.

OPERATOR MENU

		FEATURE Step down by pressing MENU key	SETTINGs Change using the ▲ and ▼ keys
Menu Step ORDER	Description	LOCK/FAST WINDOW	Patrol Window (**bold** indicates factory default)
1	Faster On/Off	FAS	**On**, OFF
2	Sensitivity	SEn	0, 1, 2, 3, **4**
3	Squelch	SQL	**On**, OFF
4	Audio Volume	AUd	**1**, 2, 3, 4
5	Beep Volume	bEE P	0, **1**, 2, 3
6	Stopwatch	StO P	On, **OFF**

Operator Menu Options — SII Display Unit

Faster Target Display On / Off

Pressing and holding the **MENU** key once initiates the first option in the Operator Menu, turning Faster Target Display On or OFF. (Fig. 2) Press the trigger to exit the Operator Menu.

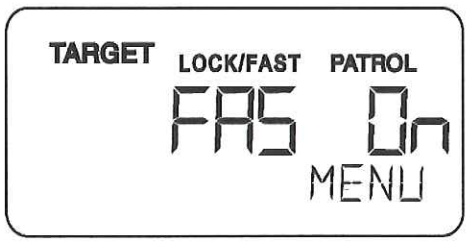


Fig. 2

Sensitivity (Range) Adjustment

The sensitivity of ***STALKER II*** is adjusted by pressing the **MENU** key a second time. The ▲ and ▼ keys then cycle through the five (5) sensitivity levels: SEn 0, SEn 1, SEn 2, SEn 3, and SEn 4 (Fig. 3 shows sensitivity level 4, the factory default setting). In each case, the right-hand display refers to the current sensitivity setting. Sensitivity varies from SEn 0 (0 range) to SEn 4 (maximum range). Press the trigger to exit the Operator Menu.

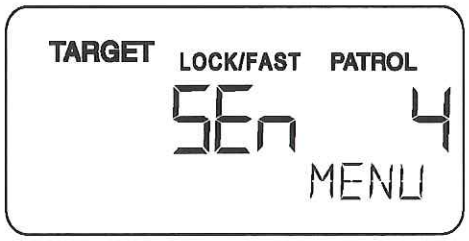


Fig. 3

(Figures 4 & 5 omitted from this edition.)

Audio Squelch ON / OFF

The audio squelch of *STALKER II* is adjusted by pressing the **MENU** key a third time. (Fig. 6) The ▲ and ▼ keys toggle the squelch override on and off. In the normal position, audio will be heard only when a target is being tracked. Press the trigger to exit the Operator Menu.

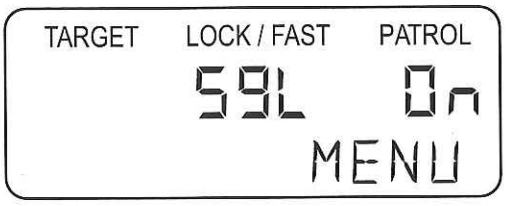


Fig. 6

Doppler Audio

The Doppler audio of *STALKER II* is adjusted by pressing the **MENU** key a fourth time. (Fig. 7) Use the ▲ and ▼ keys to step the display through AUd 1, AUd 2, AUd 3, and AUd 4. AUd 1(Fig. 7) is softest and AUd 4 (Fig. 8) is loudest.

When a target is being tracked, a Doppler audio tone can be heard from the speaker. The pitch of this tone is a precise indication of target speed. The tone quality is useful for judging possible interfering or multiple targets.

Press the trigger to exit the Operator Menu.

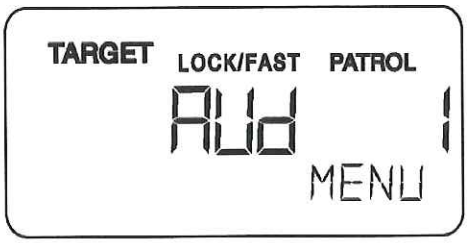


Fig. 7

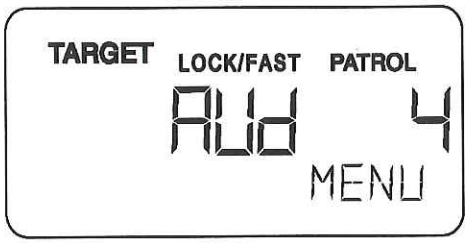


Fig. 8

Beep Tones

The beep tones volume of *STALKER II* is adjusted by pressing the **MENU** key a fifth time. (Fig. 9) Use the ▲ and ▼ keys to step through: 0, 1, 2, and 3. The beep tone is off when set to 0 and loudest when set to 3.

Press the trigger to exit the Operator Menu.

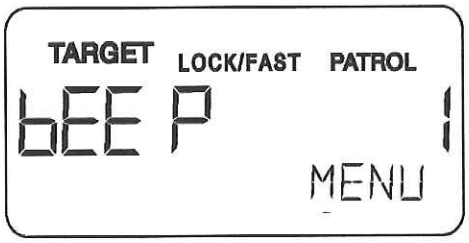


Fig. 9

Stopwatch Mode ON / OFF

The stopwatch mode of *STALKER II* is entered by pressing the **MENU** key an sixth time. The ▲ and ▼ keys are then used to switch between On and OFF. Fig. 10 shows the Stopwatch Mode in its OFF setting, the factory default.

Press the trigger to exit the Operator Menu and enter Stopwatch Mode.

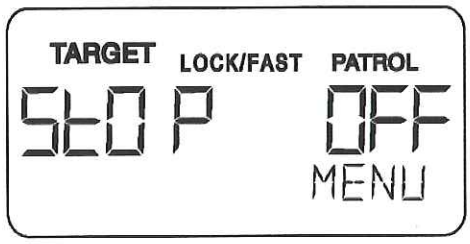


Fig. 10

Display Backlighting

The display LCD backlight can be toggled on and off by pressing the rear panel **LIGHT** key.

Software Version

During "Power On", while all segments are illuminated, press the **TEST** key to display the installed software version. Fig. 13 indicates that software version 1.0.0 is installed. Check with the factory for the availability of an updated software version, if desired.

Transmitter Frequency

Immediately below the software version, the nominal transmitter frequency is displayed (Fig. 14). A transmitter frequency of 34.7 GHz is indicated.

(Figures 11 & 12 omitted from this edition.)

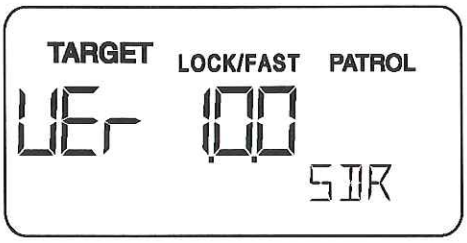


Fig. 13

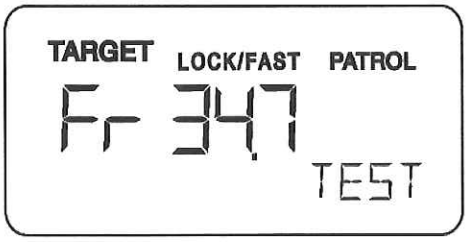


Fig. 14

STATIONARY MODE DIRECTION SETTINGS

Stationary Target Direction

Targets closing and moving away can be monitored individually or simultaneously. To activate either target direction, press the **BOTH DIRECTION** key on the ***STALKER II*** rear panel. The corresponding direction will illuminate in the Message Window. To activate the both target directions, press and hold the **BOTH DIRECTION** key. FCLO, FAWY, or FBTH display icons will be illuminated. Fig. 15 illustrates the Closing target direction as active.

Fig. 16 illustrates the Away target direction is selected.

Fig. 17 illustrates when both Closing and Away target directions are selected.

Having FBTH in the message window indicates that Both-Direction Mode is selected.

To exit Both-Direction Mode, press the **DIRECTION** key on the rear panel.

The ***STALKER II*** can be switched into transmit mode by pulling the trigger. Fig 18 illustrates the ***STALKER II*** in transmit mode. In hold mode, the **XMIT** icon will be off (Fig. 19) and no signal will be transmitted, preventing detection by radar detectors.

SII Display Unit

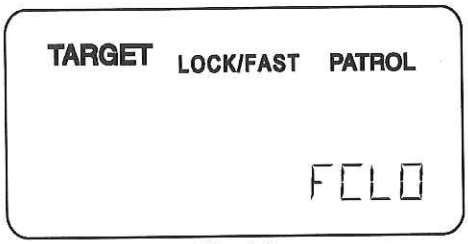


Fig. 15

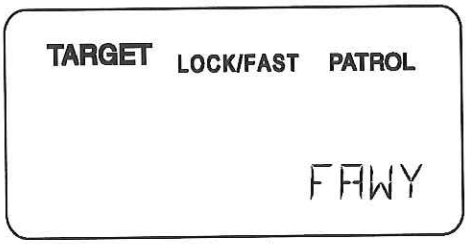


Fig. 16

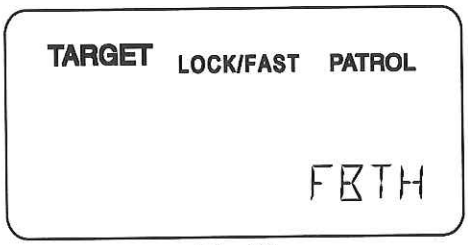


Fig. 17

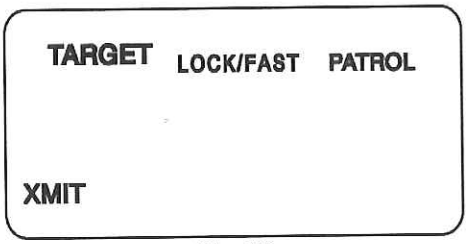


Fig. 18

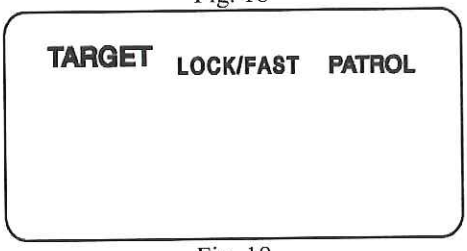


Fig. 19

(Figures 20 & 21 omitted from this edition.)

USING THE STOPWATCH MODE

STALKER II offers Stopwatch mode. Stopwatch mode is used to measure target speeds using the traditional time-distance method. All of the timing and computing is performed in the ***STALKER II***. The length (in meters) of the measurement zone must first be entered into the LCD using the ▲ and ▼ keys. The maximum length of the measurement zone is 9999 meters.

The electronic timer is started by pressing the trigger when the target vehicle enters the measurement zone and stopped by pressing the trigger again when the target vehicle exits the measurement zone. The time to traverse the measurement zone is measured and displayed on the LCD. After the completion of each start/stop timing interval, the LCD displays the calculated target speed in the patrol window.

Stopwatch Principle

The ***STALKER II*** calculates speed by measuring how much time it takes the vehicle to pass through the pre-set distance and then calculates and displays the speed in KPH. The known distance is divided by the measured time and multiplied by a conversion factor to obtain target speed.

Example: 1/2 kilometer (500 meters) of distance over 30 seconds of time = 60 km/h

The speed (km/h) formula is: $\text{km/h} = 3.6 \times \frac{\text{Distance (in meters)}}{\text{Time (in seconds)}}$

To easily convert meters/sec into km/h, there is a 3.6 conversion factor that is used. Multiplying meters/sec by the 3.6 conversion factor will provide speed in kilometers per hour.

No hard and fast rule can be established concerning the minimum distance over which a vehicle should be monitored. However, several factors enter into the equation which does establish the fact, that the farther the distance, the less the chance of impact of an error. Three factors that can influence the calculation include:

1. Human error in activating the trigger
2. The distance measured
3. The speed of the vehicle

Human error can occur by the operator not pressing the trigger at the precise time that the vehicle enters and exits the measurement zone.

If too short of distance is entered, it increases the chance for error. We recommend a minimum of 200 meters.

The greater the speed, the longer the measurement distance should be to reduce the possibility of an error. For example, if you are mostly measuring high speeds you should measure using a longer distance than if measuring slow speeds.

Stopwatch Mode Operation

1. Enter Stopwatch Mode using the ***STALKER II*** rear panel by pressing and holding the **MENU** key, then pressing the **MENU** key five more times to get to the Stopwatch Mode. Use the ▲ and ▼ keys to set StO P to On. Fig. 23 shows the Stopwatch Mode in its ON setting. Press the trigger to exit Setup Mode and enter Stopwatch Mode (shown in Fig 24b). The 440 meter display will normally be a different number – depending upon its previous setting.
2. Change the measurement zone distance using the ▲ and ▼ keys.
3. While observing the target vehicle traverse the measurement zone, start timing by pressing the trigger once upon entry and stop timing by pressing the trigger again upon exit. Fig. 24c illustrates the timing function in the Stopwatch mode.
4. The computed speed will be computed and shown in the patrol window. Fig. 25 is an example of a 440-meter measurement zone, an 11.9-second measurement interval, and a 133 km/h computed speed.

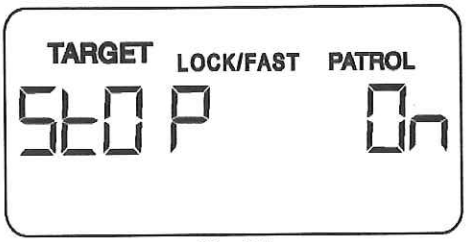


Fig. 23

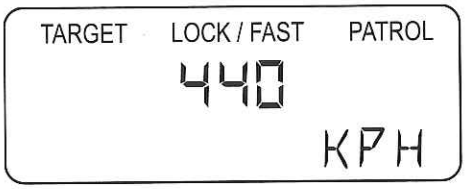


Fig. 24b

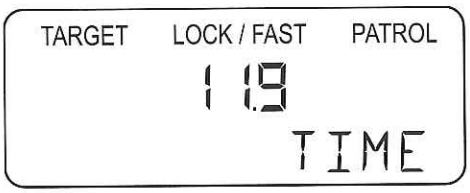


Fig. 24c

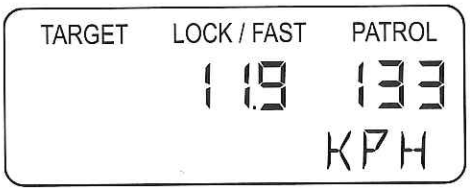


Fig. 25

Exit Stopwatch Mode

To exit Stopwatch mode, press the **MENU** key. The ***STALKER II*** will revert to Radar mode again.

HOW FASTER SPEED TRACKING HELPS THE PATROL OFFICER

Faster mode allows ***STALKER II*** to track a smaller high-speed target that was previously undetectable because a stronger target shielded the weaker (smaller) target from normal (strongest target) speed measurement. The classic example is where a speeding sports car passes a slower moving eighteen wheeler. The *Faster* sports car, although clearly speeding, could not be measured because the strongest truck target captured the target display window. ***STALKER II*** with *Faster* capability, however, will display the speed of the strongest target (the truck) in the target window, while the speed of the *Faster* target (the sports car) will appear in the middle *Faster* window, provided the sports car is the Next Strongest, Faster vehicle. The Stalker II SDR will not display the speed of the highest speed vehicle unless it is the next strongest signal and faster than the strongest signal.

STALKER II simultaneously tracks both targets: however, the target window is always reserved for the strongest target and the *Faster* window is reserved for the *Next Strongest, Faster* target. When the *Faster* target becomes the strongest target, the *Faster* target's speed will transfer to the strongest target window.

(Figures 29 & 30 omitted from this edition.)

INTERFERENCE SOURCES AND REMEDIES

A variety of sources, both natural and man-made, can cause misleading indications or poor performance. The operator should note the symptoms described below, and take steps to avoid the problem, or ignore the misleading indications.

Terrain

Radar signals will not pass through most solid objects, including tree foliage. Make certain the path between the radar and target vehicle is unobstructed. A glass window is a partial reflector of radar. Therefore, some reduction in range will be experienced when aiming through patrol vehicle windows.

Rain

Rain absorbs and scatters the radar signal. This reduces the range and increases the possibility of obtaining readings from the speed of the raindrops.

Electrical Noise

Electrical noise sources include neon signs, radio transmitters, power lines, and transformers. These influences may cause reduced range or intermittent readings. When these interferences are present, the RFI indicator should come on and suppress all readings.

Vehicle Ignition Noise

An extremely noisy vehicle electrical system may cause erratic operation. If this condition occurs, it is recommended that a two conductor shielded (fused) cable be run directly from the vehicle battery to the cigarette lighter plug on the dash. This should eliminate any problems from vehicle electrical noise.

Interference From Other Transmitters

Strong signals from nearby radio transmitters may interfere with operation of ***STALKER II.*** When this happens the unit signals that an interference source has been detected (Fig. 32). Speed readings are inhibited when this occurs to prevent the possibility of false readings. The interference source may be the vehicle's two-way radio, another nearby transmitter, or an illegal radar-jamming device.

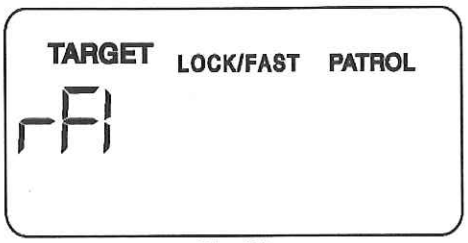


Fig. 32

LOW SUPPLY VOLTAGE

A low voltage condition from the vehicle's electrical system will cause the **U Lo** display to illuminate (Fig. 33), and will inhibit speed readings. An extremely noisy vehicle electrical system may result in false readings or erratic operation. If this condition occurs, a two-conductor, shielded (fused) cable should be connected directly from the vehicle battery to the cigarette-plug on the dash. This should eliminate any problems from vehicle electrical noise.

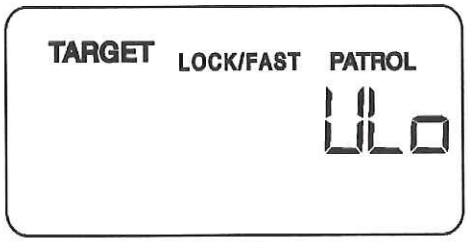


Fig. 33

WHY TESTING IS IMPORTANT

In order to meet legal requirements for admissibility of radar speed measurements and verify full operating performance, the following test procedures are recommended. If the unit fails any of the tests, it should be removed from service until the cause of the problem is corrected.

HOW TO INITIATE A SELF-TEST

Self Testing Modes — **SII Display Unit**

Power-On Self-Test

Each time the unit is powered on, an automatic self-test is performed to verify that the unit functions. All displays indicate 8.8.8 (Fig. 34) during the test. A 4-beep "happy" tone indicates the successful completion of this test. If a problem is detected, FA IL will be displayed along with a 20-beep tone. Immediately after power-on, and while all display segments are illuminated, pressing the **TEST** key will display the software version and operating frequency.

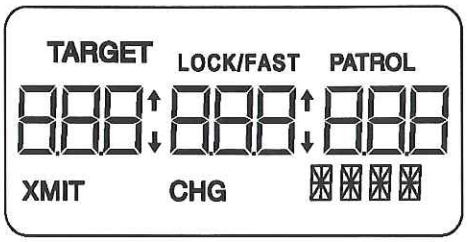


Fig. 34

Internal Circuit Test

An internal circuit test can be performed at any time by pressing the **TEST** key. This performs a diagnostic check on the radar (Fig. 35).

The unit performs a segment test, processor check, memory check, and crystal accuracy check.

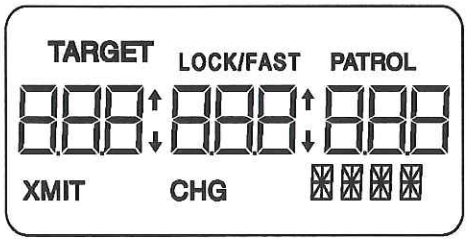


Fig. 35

After all the tests are completed, PASS (Fig. 36) along with a 4-beep "happy" tone indicate successful test completion. FA IL along with a 20-beep tone indicates a failed self-test.

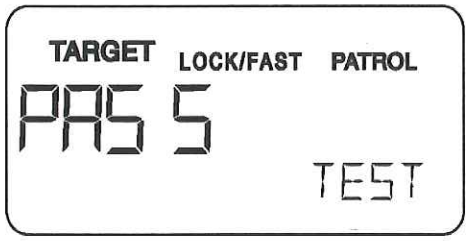


Fig. 36

(Figure 37 is not included in this edition.)

Automatic Self-Test

An automatic self-test (indicated by a 4-beep "happy" tone) is performed every 14-15 minutes.

IS MICROWAVE RADIATION DANGEROUS?

The following section has been supplied courtesy of the Food and Drug Administration (FDA).

UPDATE ON POSSIBLE HAZARDS

OF TRAFFIC RADAR DEVICES

July 20, 1992

TO: CITY, COUNTY, STATE, AND FEDERAL POLICE OFFICIALS

Recent stories in the news media have focused attention on the possibility that the traffic radar devices used by police officers might increase their risk of cancer, particularly testicular cancer. The Food and Drug Administration (FDA) has prepared the following information to inform police officers about what is known--and what remains unknown--about this question. **We urge you to make this Update available to the officers under your jurisdiction. Feel free to photocopy this Update as needed.**

What kind of radiation is emitted by traffic radar units?

These devices emit microwave radiation similar to the type produced inside microwave ovens, but at a power level more than 10,000 times lower. The radiation travels from the front of the radar device in a narrow, cone-shaped beam, although some of it may be reflected back from hard surfaces such as metal and glass. The amount of radiation decreases rapidly with distance from the source, so that the farther the devices are kept from the body, the lower the exposure.

Is there any experimental evidence that the levels of microwave radiation from a traffic radar device can be dangerous?

Although it is known that very high levels of microwave radiation can be harmful, there is no firm experimental evidence at present that the much lower levels of radiation emitted by traffic radar devices can be hazardous. There are some animal studies that suggest that low levels of radar can cause biological changes, but it is not known whether these results apply to humans. Also, most of these studies were done with a different type of microwave radiation than that produced by traffic radar devices.

What about the cancers that have occurred in police officers who used traffic radar devices for long periods of time?

It is true that some officers who have used these devices have experienced cancer. But it is important to understand that these types of cancers also occur among people who **haven't** used radar devices. That's why it is not possible to tell whether any individual officer's cancer arose because of the radar, or whether it would have happened anyway. **The key question is whether the risk of getting a particular form of cancer is greater among people who work with the radar devices than among the rest of the population.** And the only way to answer that question is to compare the cancer rates among radar- using police officers with people who don't work with radar, or with the cancer rates that would be expected in the general population.

FDA has made a preliminary comparison between the number of cancers reported in police officers who use traffic radar devices and cancer rates in the general population. Based on case reports we have so far, the comparison does not appear to show a greater cancer rate among the police, but it is too soon to conclude that there is no risk.

What's FDA doing to address the question of cancer risk?

FDA will continue to evaluate the research performed by microwave scientists around the world to see if their results apply to traffic radar devices. In addition, FDA will work with police organizations to collect more data about the cancer experience of police officers, to see whether they are developing more than the expected number of cancers. To assist us in this effort, any known cases of cancer in police officers using radar should be reported to FDA by calling 1-800-638-6725. Be sure to provide as much information as possible, including the type of radar unit used, how long the individual worked with radar devices, and the specific type of cancer.

In the meantime, what can be done to reduce the risk, if there is one?

Although it is not known for sure whether traffic radar devices can produce health problems, police officers can take some simple steps which will sharply reduce their exposure to the low-level microwave radiation which these devices emit.

1. Always point the device away from your body, or your partner's body, while it is turned on.
2. Mount fixed radar antennas so that the beam is not pointed at any occupant of the patrol car.
3. Whenever possible, turn off a hand-held unit when it is not in use. If your unit has a "standby" mode, always use it when not measuring the speed of a vehicle. Never rest the unit against your body when it is turned on.
4. When it is on, try to avoid pointing the device toward metal surfaces inside your car, such as the floor or a door, to avoid microwave reflection. (Measurements have shown that the radiation reflected from nonmetallic surfaces, such as glass in the car's windows, is much less intense than that reflected from metal surfaces.)

Again, there is no proof at this point that traffic radar devices can be harmful to the police officers who use them. Future information may reveal that these devices are indeed harmless. But until the question is settled, taking the simple precautions outlined above should reduce any possible risk. In the meantime, FDA will continue to provide updates as more information becomes available.

STALKER II MICROWAVE EMISSIONS

The ***STALKER II*** Radar operates with a nominal power output of 15 mw and a maximum of 50 mw of power output and emits low level, non-ionizing radio frequency electromagnetic radiation. The American National Standards Institute (ANSI) has the responsibility for establishing standards with respect to human exposure to radio frequency electromagnetic radiation. The current ANSI C95.1 standard in effect, for frequencies from 1500 MHz to 100,000 MHz, specifies a maximum exposure power density of 5.0 mw/cm² (.005 Watt/cm²) on any part of the body. The ***STALKER II*** has a maximum power density of 2.0 mw/cm² that is well below the ANSI standard.

REQUIRED MAINTENANCE

No user maintenance is required on the ***STALKER II***. However, if any problems are experienced during testing procedures or normal operation, the unit should be taken immediately to your department's radar specialist to determine the extent of the problem. If a malfunction has occurred, the unit will require servicing. Normal care should be taken by the user in handling the ***STALKER II*** to preserve the life and usefulness of the equipment.

TROUBLESHOOTING

POWER ***button does not function***

Check with two different power sources and two different handles. Check the vehicle power cable for dirty contacts. Check for a blown fuse in the ***STALKER II*** power cable.

Low or no speaker volume

Press the **MENU** key four times then adjust the volume with ▲ and ▼ keys. Aud 1 (lowest level) to Aud 4 (highest level).

Radar has short range

Set range (sensitivity) control to SEn 4 (longest range).

Radar displays ULo ***(low voltage)***

Make sure the power cable is securely installed and the contacts are clean and/or the battery is fully charged.

WARRANTY

Manufacturer warrants this traffic speed radar to the original purchaser to be free of defects. At its discretion, the manufacturer agrees to repair or replace all radar components that fail due to defective materials or workmanship for a period of two (2) years from the date of purchase.

Manufacturer warrants the battery handle to the original purchaser to be free of defects. At its discretion, the manufacturer agrees to repair or replace the battery handle if it fails due to defective materials or workmanship for a period of six (6) months from the date of purchase.

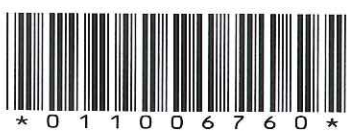
During the warranty period, there will be no charge for repair labor or parts. Purchaser shall return the failed unit to the factory or authorized service center, freight prepaid. The manufacturer will pay return shipping.

This warranty applies only to internal electronic components and circuitry. Warranty excludes normal wear-and-tear such as frayed cords, broken connectors, scratched or broken cases, or physical abuse. Manufacturer reserves the right to charge for defects and/or damages resulting from abuse or extraordinary environmental damage to the unit during the warranty period at rates normally charged for repairing such units not covered under warranty.

Seller warrants the radar devices manufactured by Applied Concepts, Inc. are designed to perform the function of determining the speed of motor vehicles. The foregoing warranty is exclusive, in lieu of all other warranties, of quality, fitness, or merchantability, whether written, oral, or implied.

As a further limit on warranty, and as an expressed warning, the user should be aware that harmful personal contact may be made with seller's radar devices in the event of violent maneuvers, collisions, or other circumstances, even though said radar devices are installed and used according to instructions. Applied Concepts, Inc. specifically disclaims any liability for injury caused by the radar devices in all such circumstances.

Note: We have several Factory Authorized Service Centers located throughout the country. For the Service Center nearest you, call the factory at 1-800-***STALKER*** (1-800-782-5537).


01100676O