

COPY

**STALKER DSR TRAFFIC RADAR
OPERATORS MANUAL
NEW ZEALAND POLICE
DECEMBER 2003**

INTRODUCTION

STALKER DSR

The Stalker DSR used by New Zealand Police differs from that normal *DSR* manufactured by Applied Concepts Inc USA for Police agencies and therefore manuals produced by Applied Concepts for *DSR* are not applicable for NZ Police *DSR* units.

This *DSR* radar device has been modified to suit the strict operating conditions required by NZ Police, certain functions have been disabled and others have been removed and enhancements made to the software.

The operating range of this unit has been substantially reduced by 1000 metres to prevent spurious readings from distance targets that may not be observed by the operator.

The Stalker *DSR* is a Ka-band Direction Sensing Radar and may be operated with one or two antennas. The unique Direction Sensing ability of the *DSR* allows the radar to automatically (without the traditional "slower key") determine the correct speed of all same lane targets. In addition, the *DSR* can be operated in stationary mode measuring:

- 1) targets approaching (closing) on the radar,
- 2) targets moving receding (away) from the radar, or
- 3) both closing and away targets.

Utilizing a state-of-the-art Digital Signal Processor (DSP), *DSR* 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.

DSR operates in Ka-band at 34.7 GHz NZPD specification for operating frequency 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 Voice Enunciators, Track-thru-Lock speed, Fastest Speed Tracking, Direction Sensing, and the Doppler audio capability assist the operator in positive target identification and provide operating convenience.

Tuning fork tests are completely different than older radar units, with the *DSR* radar units due to the direction sensing circuits, the operator must place the *DSR* into Test Mode/ Fork to permit tuning fork confirmation tests.

THEORY OF OPERATION

STATIONARY MODE - All traffic radar use the Doppler frequency shift technique to measure the speed of moving vehicles. This technique is based on the Doppler Theory, 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 (Doppler) to obtain the target speed.

Prior to the introduction of the *DSR*, 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 has to rely on visual observation to determine target direction.

DSR is the first practical radar to use a dual channel antenna design. Each antenna actually has two sets of microwave circuits and two sets of amplification/digitizing circuits. The two microwave circuits are designed to provide two simultaneous Doppler signals with a 90° phase difference depending on direction.

Both channels of digitized Doppler information are sent to the DSP (Digital Signal Processor) circuit in the counting unit. A high-speed DSP circuit then performs a Complex Fast Fourier Transform computation simultaneously on each channel to obtain relative direction for each target.

OPPOSITE LANE MOVING MODE - In opposite lane moving mode, two (2) signals must be processed to determine target speed. The first signal, patrol speed, results from the radar signal reflecting from road surface in front of the patrol. Since the Doppler shift is proportional to the relative velocity between the radar and the passing reflecting objects, the Doppler shift of this signal will be proportional to the speed of the patrol vehicle. The second signal, closing speed, results from the radar signal reflecting from an approaching or retreating opposite lane moving target and then returning to the patrol vehicle. The Doppler shift of this signal will be proportional to the sum of the patrol speed and target speed, or closing speed. To determine the target speed *DSR* subtracts the patrol speed from the closing speed.

FRONT PANEL DISPLAYS ON THE DSR READOUT UNIT

SAME LANE MOVING MODE

In same lane moving mode, two (2) signals must be processed to determine target speed. The first signal, patrol speed, results from the radar signal reflecting from road surface. Since the Doppler shift is proportional to the relative velocity between the radar and the passing reflecting objects, the Doppler shift of this signal will be proportional to the speed of the patrol vehicle.

The second signal, difference speed, results from the radar signal reflecting from an approaching or retreating same lane moving target and then returning to the patrol vehicle. The Doppler shift of this signal will be proportional to the difference speed between the patrol and target vehicles. If the target vehicle is moving faster than the patrol vehicle, the difference speed will be added to patrol speed to obtain target speed. If the target vehicle is moving slower than the patrol vehicle, the difference speed will be subtracted from the patrol speed to obtain target speed.

Prior to the introduction of the *DSR*, a radar operator had to observe the relative speed of the target vehicle and "tell the radar" whether to add or subtract the difference speed from the patrol speed as described above. Conventional same lane radar requires the operator to obtain the "correct speed" by the "correct position" of the "Slower" key on the remote control.

The unique Direction Sensing ability of the *DSR* allows the radar to automatically (without the traditional "slower key") determine the correct speed of all same lane targets in the radar beam.

FASTEST MODE

DSR offers a feature called *Fastest Speed Tracking*. *Fastest* is a field selectable feature and can be disabled, if desired.

The addition of the *fastest* 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 truck. The *fastest* sports car, although clearly speeding, previously could not be measured because the strongest truck target captures the target display window. The *DSR*, in this example, will display the speed of the strongest truck in the target window, while the speed of the *fastest* sports car will appear in the middle *fastest* window. Tracking of both targets may be performed simultaneously.

TARGET WINDOW: The left, three-digit orange LED window is the target window. This window displays the speed of the strongest targets entering the radar beam. While in stationary mode, the target window will show the speed of the strongest stationary closing target (SC) or the strongest stationary away target (SA) or the strongest bi-directional targets (S_) relative to the radar. In opposite lane moving mode, the target window will show the speed of the strongest opposite lane approaching target or the strongest opposite lane receding target. In same lane moving mode, the target window will show the speed of the strongest same lane targets (front or rear).

MIDDLE WINDOW: The middle, three-digit red LED window is a dual-purpose window. First, it is used for locking the strongest target shown in the left window. While not containing a "locked" speed, the middle window is used to display the fastest target in the radar beam. The LOCK and FAST icons are used to indicate the current use of the window.

The middle window is used to store target speeds that the operator chooses to "lock" using the LOCK key. The presence of the LOCK icon indicates that the middle window contains a "locked" target speed. Every speed lock will be followed immediately by a 3-word voice enunciator that indicates *antenna/radar mode/direction*.

Examples:

STATIONARY/CLOSING,



STATIONARY/AWAY

STATIONARY/CLOSING

When no LOCK target is present, the middle window is used to track the fastest target in the radar beam. This is indicated by the presence of the FAST icon.

PATROL WINDOW: The right, three-digit green LED window is the patrol window. In moving mode, the operator should always verify that the patrol window is tracking the patrol vehicle's speedometer. After locking a target speed, the patrol window may be "blanked" by pressing the P.S. BLANK key. Restore the patrol speed by pressing the P.S. BLANK key a second time.

- XMIT:** The XMIT icon indicates that *DSR* is transmitting.
- FRONT:** The FRONT icon indicates the front antenna is selected for use. The icon will light with a steady indication if the antenna is operational, or a blinking indication if the antenna is missing or inoperative.
- REAR:** The REAR icon indicates the rear antenna is selected for use. The icon will light with a steady indication if the antenna is operational, or a blinking indication if the antenna is missing or inoperative.
- FORK:** The FORK icon indicates that the radar is in tuning fork mode. Immediately following the Internal Circuit Test (activated with the TEST key), the TEST Icon lights for 30 seconds.
- SAME:** The SAME icon indicates that the radar is in same lane mode. Conversely, opposite lane mode is indicated by the absence of the SAME icon.
- LOCK:** An illuminated LOCK icon indicates that the operator has locked a target speed in the middle window. Every speed lock will be followed immediately by a 3-word voice enunciator that indicates *antenna/radar mode/direction*.
- RFI:** The RFI icon indicates the presence of an interfering signal. Operation is inhibited during an RFI indication.
- Lo V:** The Lo V icon illuminates when the input voltage falls below 9.0 volts. Operation is inhibited while this icon is displayed, but normal operation will resume automatically when the input voltage is restored to a normal voltage.
- FAST:** An illuminated FAST icon, above the middle window, indicates that the middle window will display a *fastest* speed target if one is found.
- Power On:** The green soft key button to the right side of the readout is the power on/off button, by depressing the button the DSR will power on or off.

VOICE ENUNCIATORS The  key is used in conjunction with SQL key to adjust the volume of the voice enunciators. Press the  key followed by the SQL key to make the display step through: u 0, u 1, u 2, and u 3. u 0 is off and u 3 is loudest.



The Voice Enunciators announce the description of the target that was just locked.



Every LOCK will be followed immediately by a 3-word voice enunciator that indicates *antenna/radar mode/direction*. The following table fully describes the voice enunciators.

VOICE ENUNCIATOR	MEANING
FRONT/STATIONARY/CLOSING	The locked target is a stationary mode target approaching the front of the patrol vehicle
FRONT/STATIONARY/AWAY	The locked target is a stationary mode target moving away from the front of the patrol vehicle
REAR/STATIONARY/CLOSING	The locked target is a stationary mode target approaching the rear of the patrol vehicle
REAR/STATIONARY/AWAY	The locked target is a stationary mode target moving away from the rear of the patrol vehicle
FRONT/OPPOSITE/CLOSING	The locked target is an opposite moving mode target approaching the front of the patrol vehicle
REAR/OPPOSITE/AWAY	The locked target is an opposite moving mode target moving away from the rear of the patrol vehicle
FRONT/SAME/CLOSING	The locked target is a front slower same lane target being overtaken by the patrol vehicle
FRONT/SAME/AWAY	The locked target is a front faster same lane target moving away from the patrol vehicle
REAR/SAME/CLOSING	The locked target is a trailing faster same lane target approaching the rear of the patrol vehicle
REAR/SAME/AWAY	The locked target is a trailing slower same lane target traveling behind the patrol vehicle

AUDIBLE INDICATORS

The volume of all of the sounds made by the *DSR* can be adjusted as described below.

TARGET DOPPLER AUDIO The  key is used to adjust the volume the Target Doppler audio up or down. Press the  key to make the display step through Aud 0, Aud 1, Aud 2, Aud 3 and Aud 4. Aud 0 is off and Aud 4 is the loudest.

RADAR BEEP TONES - The  key is used in conjunction with P.S. BLANK key to adjust the volume of the beep tones. Press the  key followed by the P.S. BLANK key to make the display step through: b 0, b 1, b 2, and b 3. b 0 is off and b 3 is loudest.

Different beep tones are used when switching between the front and rear antenna. A 1-beep tone corresponds to the front antenna, while a 2-beep tone corresponds to the rear antenna.

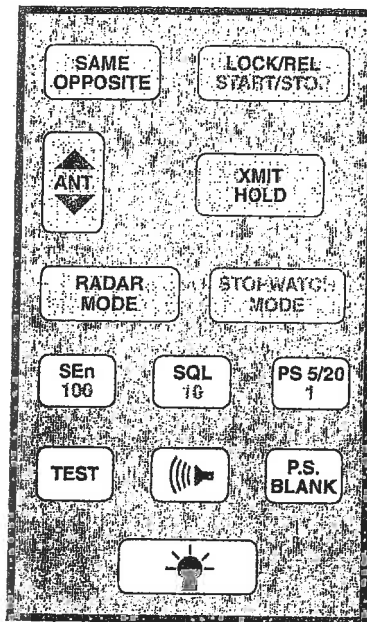
Different beep tones are used to indicate different Radar Modes. A 2-beep increasing beep tone indicates Stationary Away (SA). A 2-beep decreasing beep tone indicates Stationary Closing (SC). A 3-beep increasing/decreasing beep tone indicates bi-directional stationary (S₂). A single beep tone indicates moving mode.

A 4-beep "happy" tone indicates the successful completion of a self-test operation. A 15-beep tone indicates a failed self-test.

AUTOMATIC SELF-TEST An automatic self-test (indicated by a 4-beep "happy" tone) is performed every 10 minutes while *DSR* is transmitting. Switching antennas will reset the 10-minute timer.

NOTE: If for any reason "FAIL" comes up on your *DSR* Radar, the unit must be turned OFF and then back ON to reset the FAIL mode. As an example, if you did not properly attach the antenna cable and the word "FAIL" appeared, it would be necessary to correct this problem, to properly connect the cable, then turn the power OFF and then back ON. The word FAIL should not reappear.

REMOTE CONTROL FUNCTIONS




SAME/OPPOSITE: Key is used to alternate between same lane moving mode and opposite lane moving mode. SAME icon toggles on and off to indicate same lane mode.

LOCK/REL: When in Radar Mode, the LOCK/RELEASE key is a dual function key. This key alternates between the lock and the release functions. LOCK is used to transfer the contents of the target window to the lock window. RELEASE clears the locked contents of the lock window and the patrol window.




Every speed lock will be followed immediately by a 3-word voice enunciator that indicates *antenna/radar mode/direction*.

During lock, the patrol window will lock the present patrol speed and the LOCK icon will light. The target window and Doppler audio remain active after locking.

ANT: The ANT key is used to switch between the front and rear antenna, unless the radar was factory set for only one antenna. The FRONT or REAR icon will light. The display unit can sense the presence or absence of the front or rear antenna. A steady icon indicates an operational antenna and cable, while a blinking icon indicates a missing antenna and/or cable, or a malfunction of the antenna unit.

- XMIT/HOLD:** The XMIT/HOLD key toggles between XMIT (transmit) and HOLD (standby). The XMIT icon will light for transmitting and extinguish for hold.
- RADAR MODE:** The RADAR MODE key toggles between the four operating radar modes. They are: 1) moving [], 2) stationary closing (SC), 3) stationary away (SA), and 4) bi-directional stationary (S_) modes. A speed or a [] in the patrol window indicates moving. Different audio tones are used to indicate different Radar Modes.
- STOPWATCH MODE:** This mode has been removed on New Zealand models as it is not required.
- SEn:** The SEn key is used to adjust the range up or down at any time. Maximum range (sensitivity) is SEn 4, minimum range (sensitivity) is SEn 1. The range (or sensitivity) must be set for same lane moving mode and opposite lane moving mode separately. While in each mode, (same lane and opposite lane), indicated by the presence or absence of the SAME icon, set each sensitivity as described above.
- SQL:** The SQL key toggles the squelch override on and off. In the normal position, audio will be heard only when a target is being tracked.
- In addition the SQL key is used in conjunction with the  key to adjust the volume of the voice enunciators – see below.
- PS 5/20:** The PS 5/20 key is used to select a low-end patrol speed of either 5 or 20 mph. For NZ Police models this is set for 32 Km/h only and is not selectable.

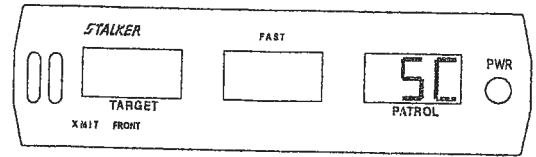


This is a dual function key. With a single depression, the  key activates the keyboard back light for six (6) seconds. Two rapid depressions of the  key activate the display unit's brightness control. Additional depressions of the  key toggle the display intensity through six levels of brightness, ranging from bri 1 (low) to bri 6 (high).

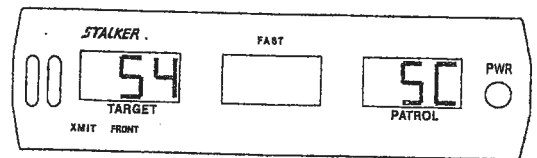
OPERATING THE STALKER DSR

Stationary Mode Speed Measurement

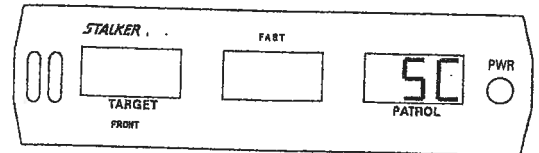
Select one of the three stationary modes by pressing the MODE key on the remote control. Select either: 1) stationary closing (SC), 2) stationary away (SA), and 3) bi-directional stationary (S_) modes. For example select (SC) for stationary closing. Next select the front antenna by pressing the ANT key. To transmit, press the XMIT/HOLD key. The XMIT icon should appear on the display unit indicating that a radar signal is being transmitted.



If a target is in range, such as one traveling 54Km/h, the speed will appear in the target window of the display unit and a Doppler audio tone, which is proportional to the target speed, will be heard from the speaker. The target speed is continually measured and displayed, and the Doppler audio tone is heard as long as the target is present.



Hold mode can be selected by pressing the XMIT/HOLD key on the remote control. In hold mode, The XMIT icon will be off and no signal will be transmitted, preventing detection by radar detectors.



To select one of the other two stationary modes, press the MODE key on the remote control and select either: 1) stationary away (SA) or 2) bi-directional stationary (S_) mode.

Example of stationary away (SA). ONLY targets moving away from the radar will be displayed.

Example of bi-directional stationary (S_). All targets moving in the radar beam will be displayed. Even though the radar is in bi-directional mode, target direction is still known. After every target lock, the voice enunciator will announce the direction of the target.

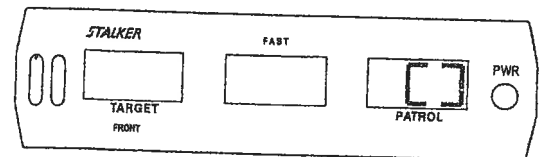
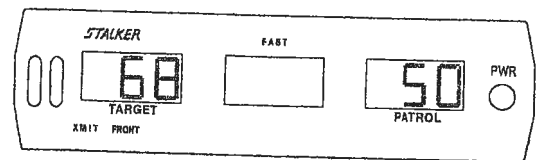
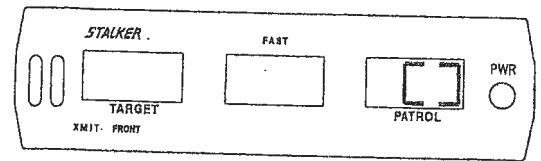
The only difference between the three stationary modes is the direction of travel of the displayed targets.

OPPOSITE MOVING MODE SPEED MEASUREMENT

Select moving mode by pressing the MODE key on the remote control. When *DSR* is in moving mode, the patrol window will contain either the patrol speed or a []. The [] indicates that *DSR* is in moving mode, but has no ground speed. Select opposite lane mode by pressing the SAME/OPPOSITE key until the SAME icon is not visible. To transmit, press the XMIT/HOLD key. The XMIT icon should appear on the display unit indicating that the radar is transmitting. Be sure the patrol speed corresponds to the vehicle speedometer. The speed of an approaching target will appear in the target window and a Doppler audio tone will be heard from the speaker. Example in which the patrol speed is 50 and the approaching target speed is 68.

The target speed is continually measured and displayed and the Doppler audio tone is heard while the *DSR* is in transmitting mode and a target is present.

Hold mode can be selected by pressing the XMIT/HOLD key on the remote control. In hold mode, the XMIT icon will be off and no signal will be transmitted. This prevents detection by radar detectors. When in hold, *DSR* remembers the last patrol speed and looks for that speed first when changing from hold back to transmit.



SAME LANE MOVING MODE SPEED MEASUREMENT

To transmit, press the XMIT/HOLD key. Select moving mode by pressing the MODE key, then select same lane mode by pressing the SAME/OPPOSITE key. Same lane mode is selected when the SAME icon is visible. Note: When Same Lane is selected, the sensitivity is automatically reduced internally by software.

If a same lane target is in the radar beam, its speed will appear in the target window and the difference speed audio will be heard from the speaker. The target speed is obtained by adding the difference speed to the patrol speed. Example of a patrol speed of 58 and a same lane target in front of the patrol vehicle traveling at 68.

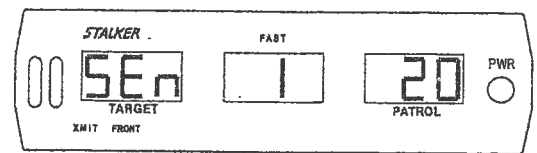
The target speed is continually measured and displayed and the Doppler audio tone is heard while the *DSR* is in transmitting mode and a target is present.

LOW-END PATROL SPEED SELECTION



The P.S. 5/20 on NZ Models has been removed and preset for 32Km/h only.

RANGE (SENSITIVITY) ADJUSTMENT

The range (or sensitivity) of *DSR* is adjusted by pressing the SEn key. This key cycles through the four (4) sensitivity levels; SEn 1, SEn 2, SEn 3, and SEn 4. In each case, the center display refers to the current sensitivity setting. The shortest range is SEn 1 and the longest range is SEn 4. The range (or sensitivity) must be set for same lane moving mode and opposite lane moving mode separately. While in each mode, (same lane and opposite lane), indicated by the presence or absence of the SAME icon, set each sensitivity as described above.

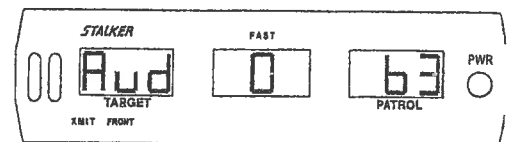
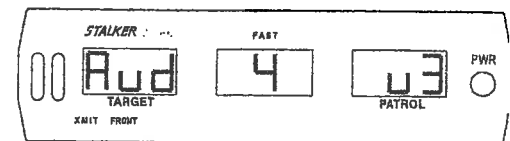


DOPPLER AUDIO

The  key is used to adjust the volume of the Target Doppler audio up or down. Press the  key to make the display step through Aud 0, Aud 1, Aud 2, Aud 3 and Aud 4. Aud 0 is off and Aud 4 is max.

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.

In opposite lane moving mode, *DSR* compensates for patrol speed variations when generating the Doppler audio. Since the audio tones do not vary with patrol speed, the operator soon learns to correlate the Doppler audio with the target speed. This eliminates the need of constantly watching the display to determine target speed. In same lane moving mode, *DSR* generates difference audio instead of the true audio described above. The difference audio gives a direct indication of the difference in speed between the patrol vehicle and the target vehicle.



VOICE ENUNCIATORS

The $\llbracket \gg$ key is used in conjunction with SQL key to adjust the volume of the voice enunciators. Press $\llbracket \gg$ followed by SQL to make the display step through: u 0, u 1, u 2, and u 3. u 0 is off and u 3 is loudest.

BEEP TONES

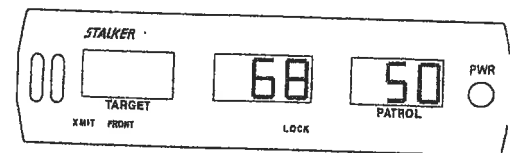
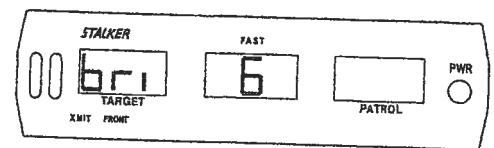
The $\llbracket \gg$ key is used in conjunction with P.S. BLANK key to adjust the beep tones. Press $\llbracket \gg$ followed by P.S. BLANK to make the display step through: b 0, b 1, b 2, and b 3. b 0 is off and b 3 is loudest.

DISPLAY LIGHTING

The display unit can be adjusted for brightness by using the \star key. A single depression of the \star key activates the keyboard backlight for 6 seconds. Two rapid depressions of the \star key activate the display unit's brightness control, and additional depressions of the \star key toggle the display intensity through six levels of brightness, ranging from low (bri 1) to high (bri 6)

Patrol Speed Blanking

After locking a target and patrol speed the patrol speed window may be "blanked" by pressing the P.S. BLANK key. The patrol speed can be restored by pressing the P.S. BLANK key a second time. When the lock window is not occupied by a "locked" target speed, the P.S. BLANK key is used to blank the patrol window and re-acquire patrol speed.



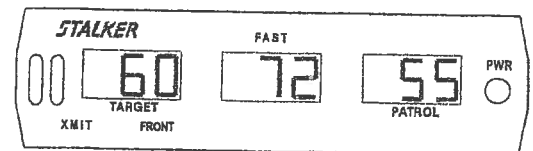
FASTEST SPEED TRACKING THEORY

The following examples are *Fastest* targets under various conditions. In addition to the speeds displayed in each window, carefully note the icons illuminated.

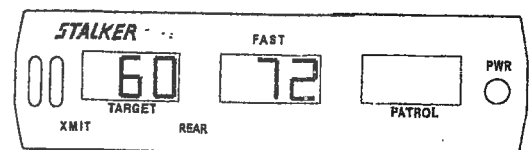
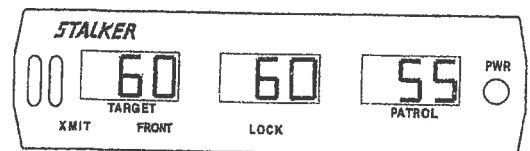
Fastest mode allows DSR to track a smaller high-speed target that was previously undetectable because a stronger target shielded the weaker (smaller) target from normal (strongest target) speed measurement. The classic example is where a speeding sports car passes a slower moving truck. The *Fastest* sports car, although clearly speeding, could not be measured because the strongest truck target captured the target display window. DSR with *Fastest* capability, however, will display the speed of the strongest target (the truck) in the target window, while the speed of the *Fastest* target (the sports car) will appear in the middle *Fastest* window.

DSR simultaneously tracks both targets: however, the target window is always reserved for the strongest target and the *Fastest* window is reserved for the *Fastest* target. When the *Fastest* target becomes the strongest target, the *Fastest* target's speed will transfer to the strongest target window. The *Fastest* target's speed can be locked only when it becomes the strongest target. The tracking history is required for evidence when two vehicles are in the beam.

A Patrol vehicle is cruising at 55 Km/h. Two opposite lane targets are approaching from the front - a 60 Km/h truck and a 72 Km/h sports car behind the truck. The 60 Km/h strongest out-front target (the truck) appears in the target window and the 72 Km/h *Fastest* target (the sports car) appears in the middle window. The *Fastest* target cannot be locked unless it becomes the strongest target and appears in the left window.



The 60 Km/h strongest target can be locked, by pressing the LOCK key and the voice enunciator will announce *Front/Opposite/Closing*. Note how the middle window changes from a *Fastest* window to a Lock window. The FAST icon has been replaced by the LOCK icon. The middle window is therefore defined by the icon that is associated with it.



INTERFERENCE FROM OTHER TRANSMITTERS

Strong signals from nearby radio transmitters may interfere with operation of *DSR*. The RFI indicator signals that an interference source has been detected. 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.

POWER SUPPLY

A low voltage condition from the vehicle's electrical system will cause a Lo V indication and will inhibit speed-readings. The cigarette-plug in NZ patrol vehicles are supplied from a shielded cable directly from the vehicles battery, this should eliminate any problems from vehicle electrical noise.

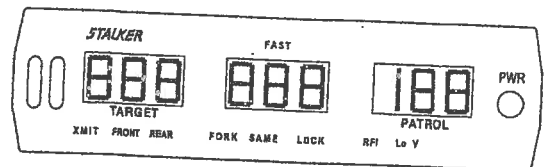
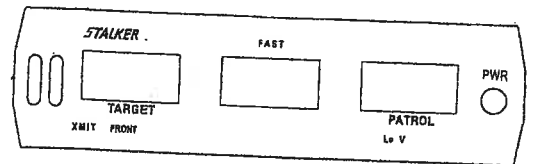
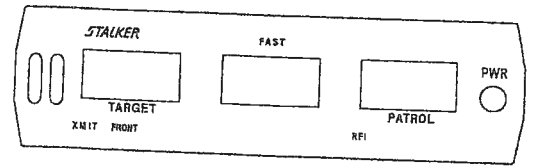
No Power

If the radar will not power on, check the fuse in the power cable. Unscrew the silver tip on the end of the cigarette plug and remove the fuse. If the fuse is blown, replace with a new fuse and test the radar.

If the power cable fuse is okay, check the fuse in the vehicle's radar fuse holder situated beside the battery, if the fuse is also okay, place the radar in a different vehicle or try a different radar in your vehicle.

POWER-ON SELF-TEST

Each time the unit is powered on, an automatic self-test is performed to verify that the unit functions. The display indicates 888 888 188 during the test. A 4-beep "happy" tone indicates the successful completion of this test. If a problem is detected, FAIL will be displayed along with a 15-beep tone. Immediately after power-on, and while all display segments are illuminated.



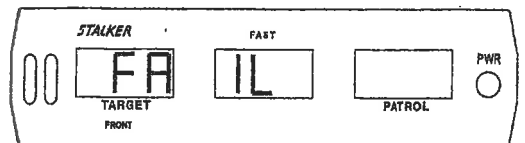
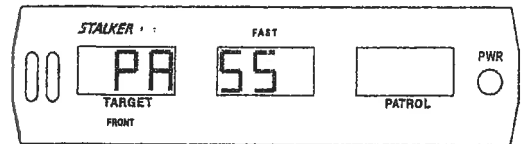
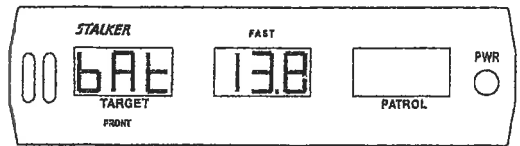
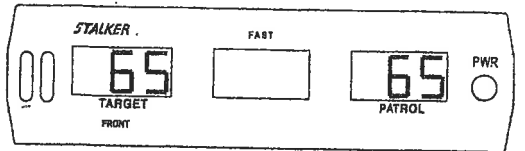
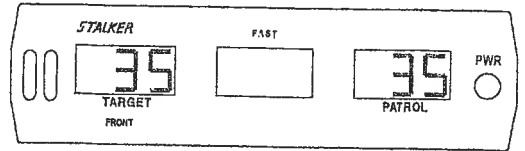
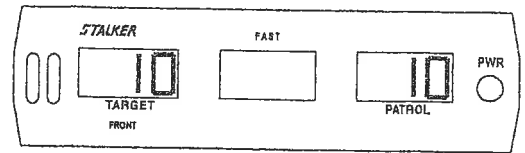
INTERNAL CIRCUIT TEST

An internal circuit test can be performed at any time by pressing the TEST key. This performs a diagnostic check on the display/counting unit, the selected antenna, and antenna cable. Since only the selected antenna is tested, it is necessary to perform this test twice -- once with the front antenna selected, and once with the rear antenna selected.

The display/counting unit will first perform a processor check, memory check, and crystal accuracy check. This will be followed by the display of speeds 10, 35, and 65 and end with a display of the display/counting unit internal operating temperature in degrees (e.g., 35 °C) and input battery voltage (e.g., bAt 13.8)

A comprehensive test is also performed on the selected antenna by the display/counting unit to ensure the integrity of the selected antenna cable and antenna electronics. After all the tests are completed, PASS along with a 4-beep "happy" tone indicates successful test completion. FAIL along with a 15-beep tone indicates a failed self-test.

A fail status may result if you have the antenna socket pins incorrectly aligned to the socket, remove the plug and re align without using any pressure.



AUTOMATIC SELF-TEST

An automatic self-test (indicated by a 4-beep "happy" tone) is performed every 10 minutes while DSR is transmitting. Switching antenna will reset the 10-minute timer

TUNING FORK TESTS

STATIONARY MODE TUNING FORK TEST

Tuning fork test can only be performed during the 30-second interval that follows the Internal Circuit Test. Press the TEST key and wait for the FORK icon to illuminate following the Internal Test Sequence.

Two (2) tuning forks are supplied with the DSR. The tuning forks are calibrated for 40 Km/h and 64 Km/h.

To perform the tuning fork test:

Press the PWR key

Press the MODE key and select any of the three stationary modes

Press the ANT key to select the front antenna

Press the XMIT key to enter transmit mode

Press the TEST key and wait for the FORK icon to be illuminated following the internal test sequence.

Flick the 40Km/h Tuning Fork with your finger nail. Quickly hold the tuning fork approximately 50mm in front of the antenna, with the narrow edge of the fork facing the antenna. The Target window should indicate 40 Km/h.

Repeat the above test with the 64Km/h Tuning Fork. Select the rear antenna, if purchased, and repeat both tuning fork tests.

A 1 Km/h difference between the stamp speed indicated on the tuning fork and the reading from the radar is permitted, as forks differ slightly due to temperature.

OPPOSITE LANE MOVING MODE TUNING FORK TEST

The following tuning fork test can only be performed during the 30-second interval that follows the Internal Circuit Test. Press the TEST Key and wait for FORK Icon to illuminate following the Internal Test Sequence.

Two (2) tuning forks are supplied with the DSR. The tuning forks are calibrated for 40 Km/h and 64 Km/h.

To perform the tuning for test:

Press the PWR key

Press the MODE key to select moving mode

Press the SAME/OPPOSITE key to select opposite lane mode

Press the ANT key to select the front antenna

Press the XMIT key to enter transmit mode

Press the TEST key and wait for the FORK icon to be illuminated following the internal test sequence.

Tap lightly both tuning forks against each other. Quickly hold the lower speed fork approximately 50mm in front of the antenna, with the narrow edge of the fork facing the antenna. The Patrol window should indicate 40Km/h. Now move the higher speed fork in front of the antenna with the narrow edge facing the antenna. The target window should register 24Km/h, which is the difference in speed of the two forks.

SAME LANE MOVING MODE TUNING FORK TEST

Tuning fork test can only be performed during the 30-second interval that follows the Internal Circuit Test. Press the TEST key and wait for the FORK icon to illuminate following the Internal Test Sequence.

Two (2) tuning forks are supplied with the DSR. The tuning forks are calibrated for 40 Km/h and 64 Km/h.

To perform the tuning fork test:

Press the PWR key

Press the MODE key to select moving mode

Press the SAME/OPPOSITE key to select same lane mode

Press the ANT key to select the front antenna

Press the XMIT key to enter transmit mode

Press the TEST key and wait for the FORK icon to illuminate following the internal test sequence.

Tap each tuning fork against each other. Quickly hold the higher speed fork approximately 50mm in front of the antenna, with the narrow edge of the fork facing the antenna.

The Patrol window should indicate 64Km/h. Move the lower speed fork in front of the antenna with the narrow edge facing the antenna. The Target window should register 104Km/h, which is the sum of the speed of the two forks.

Repeat the above test with the rear antenna selected, if installed.

MOVING-VEHICLE TEST (GROUND SPEED CONFIRMATION)

A moving-vehicle test should be performed to confirm the performance and accuracy of the radar unit. See Code of Operation in Module DUT 244 re Patrol Speed Confirmation.

To perform the moving vehicle test:

Press the PWR key

Press the MODE key and select any moving mode

Press the ANT key to select the front antenna

Press the XMIT key to enter transmit mode

While driving a patrol vehicle with a Calibrated Speedometer along a straight portion of road, compare the readings between the DSR and the patrol vehicles speedometer the readings of both units should be within 3Km/h after making any allowance for speedometer accuracy as indicated on the Speedometer Certificate of Accuracy.

This 3 Km/h tolerance allows for updating of 1 Km/h in both the radar and the speedometer displays plus a further 1 Km/h allowance of driver of the patrol to maintain a constant speed during this test.

The accuracy of the DSR is +/- 0.64 Km/h as confirmed by the Measurement Standard Laboratory of NZ after their extensive testing.

TROUBLESHOOTING

PWR KEY DOES NOT FUNCTION

Make sure all cables are mated correctly with their connectors. Check the vehicle cigarette-plug connector for dirty contacts. Check for a blown fuse in the DSR cigarette-plug.

Check the supply fuse to the cigarette plug, this located near the vehicles battery in a separate fuse holder.

Try radar in another vehicle to confirm it works in one but not the other.

LOW OR NO SPEAKER VOLUME

Press the (⏮) key on the remote control to adjust the volume. Aud 1 (lowest level) to Aud 4 (highest level).

RADAR HAS SHORT RANGE

Set range (sensitivity) control to SE4 (longest range).

Note: Opposite direction mode and same direction mode sensitivity settings need to be set dependently.

RADAR HAS TROUBLE MAINTAINING PATROL SPEED

Ensure the antenna is mounted on the approved antenna mounting bracket installed in the patrol vehicle on the right hand side and pointing slightly down toward the ground: Make sure the wipers are not in the radar beam path. Make sure the windshield does not have painted sun mesh around the perimeter this will absorb the radar energy reducing range.

RADAR DISPLAYS LO V ICON

Make sure the cigarette-plug is securely installed and the contacts are clean.

Check by re-starting patrol that the vehicle battery is not flat.

RADAR FLASHES HOT IN DISPLAY

The radar is overheating and has exceeded the the operating specifications during this time the DSR will not produce speed reading, run the air-conditioning unit to reduce the internal temperature inside the vehicle. This status will appear after the vehicle has been left unattended say at court the sun for some time.

Once the vehicle has cooled down switch the *DSR* off and on again this should reset the radar.

FAILS ON START UP

Check that the antenna cable is correctly aligned to the antenna socket, remove antenna cable and check line up of keyways on plug to socket.

RADAR DOUBLES PATROL SPEED

The patrol speed window indicates double the speedometer readings, check the position of the antenna it may be facing up and not towards the ground, this may also occur after moving quickly away from a stationary position, switch the Xmit off wait 5 seconds and power back on again.

REMOTE HAND CONTROL

Can not change operations over with hand control, check that the 2 AA batteries are not flat.

It only works sometimes, as the remote control is an infrared light device it may be that too much sun is in the path between the radar and hand control, re position the hand control try again.

SERVICING OF DSR RADAR

There is no requirement by the manufacturer or NZ Police for routine maintenance of a radar device, service is only required if the unit becomes faulty.

Normal operational repairs and maintenance costs for units supplied after December 2003 will be paid for by Police Calibration Services.

However where radars units have been subjected to damage through misuse, this includes broken cables and loss of associated parts these costs will be met by the District.

GENERAL

AUTHORISED SERVICE AGENT

Stalker DSR radar devices must only be serviced by the factory authorised service agent

Microwave Services Ltd
7 Kaiwahara Road
Wellington
Phone: 04 472 3651

the turn around time should be no more than 5 days.

USAGE

All radar units supplied after December 2003 are leased, a sticker is attached to the set indicating this fact, as these radar have been supplied by Road Policing Support, Office of the Commissioner under the 2010 Road Safety Initiatives scheme,

Failure to use the radar for periods of time may result in the unit being impounded and relocated to another District.

OFFICIAL INFORMATION REQUESTS.

This is the only document related to Stalker DSR radar units used by NZ Police, the training Module DUT 244 is be read in conjunction with this manual and both of these documents are not restricted and may be supplied to any person on request.

If the person making the request requires maintenance records for the radar the member completing the OIA request should contact with Microwave Services Ltd who hold these records, and will supply them.

TRAINING.

Once a member has passed both practical and the theory sections of NZ Police training module DUT244 no further training is required.

HELP

If you require any other information refer to

Police Calibration Services

Phone Ext. 42308

42201

42356

or External 04 2389508.

CERTIFICATES OF ACCURACY

These are forwarded from PCS to the District Inspector of Road Policing copies should be obtained at District level.

CALIBRATION

As with all NZ Police radar units these will be recalled every 12 months for annual calibration or after service by the agent.

MOUNTING OF RADAR UNITS

All radar units must be mounted the approved NZ Police brackets to prevent personal injury in the event of a road crash, brackets that come with a normal vehicle fit out are approved.

Front antenna brackets should be on the right hand side by the A pillar to prevent fan noise and produce a clear view to the driver of the left side of the vehicle.

CAUTION FLAT BATTERY

Reports have been received that when jump starting a patrol car from a secondary cars battery the radar has burnt out even though the radar was turned off, to prevent this damage remove the cigarette power supply plug prior to jump start your vehicle.

RADIO INTERFERENCE

In some Police Districts have experienced activation of the mute on their cars radio telephone when the radar unit is on, the normal cause for this fault is that the antenna plug ring is loose or the cable has been broken by staff pulling the cable out of the readout, without pushing the black button down.

Refer this fault to Police Calibration Services for assistance.

**The World Leader in
Speed Measurement**

August 20th, 2001

To Whom It May Concern:

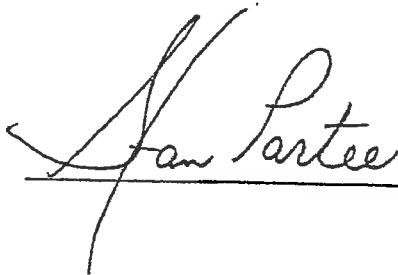
This letter is to confirm that the Stalker models supplied to the New Zealand Police Department are special models with unique settings, and therefore our standard operator manuals are not applicable to the New Zealand Police Department.

These Stalker models include, but are not limited to the following:

Stalker Dual
Stalker DSR
Stalker Lidar

Sincerely,

Stan Partee, President



A handwritten signature in cursive script that reads "Stan Partee". The signature is written in black ink and is positioned above a horizontal line that extends to the right.

applied concepts, inc.
<http://www.stalkerradar.com>

730 F Avenue, Plano, Texas 75074 1-800-STALKER (972) 398-3750 FAX (972) 398-3751

