

# CERTIFICATION CONCERNING DESIGN AND CONSTRUCTION OF ELECTRONIC SPEED MEASURING DEVICES

I, Raymond Fleming, do certify under penalty of perjury, under the laws of the State of Washington, in the County of Pierce, that the following is true and correct:

I am employed with Pierce County as a Communications Systems Technician, Speed Measuring Device (SMD) Specialist, and assigned as the custodian of the SMD records. I have been employed in this capacity since August 29<sup>th</sup>, 2016. Part of my duties include the maintenance and repair of all types of electronic radar speed measuring devices (SMD's) used by the Dupont Police Department.

The Dupont Police Department currently uses the following SMD's:

SMD TYPE:	MODEL:	<b>MANUFACTURE:</b>
Radar	Genesis II Select	Decatur Electronics
Radar	Genesis GHD	Decatur Electronics
Radar	Falcon HR	Kustom Signals
Radar	Golden Eagle II	Kustom Signals
Radar	Directional Golden Eagle II	Kustom Signals
Radar	Dual SL	Stalker Radar
Radar	Python	MPH Industries
Laser	Compact Speed Lidar	Dragoneye Technology
Laser	Stalker LR	Stalker Radar

I have the following qualifications with respect to the above stated SMD's:

I have twenty-five years combined military and civilian experience as a communications specialist in the maintenance and repair of electronics equipment and five years with Pierce County repairing, maintaining, and certifying SMD's for cities throughout the state. I received training from the following manufacturer as well as from the Pierce County Lead Systems Technician. On March 22, 2017 I successfully completed the MPH Industries course in operation and maintenance of Doppler traffic radar and traffic laser. On April 4th, 2019 I successfully completed the Laser Technology Inc, course for factory service training on the LTI Tru-Speed S series laser radar.

The Pierce County Radio Communications Division maintains manuals for all the above listed SMD's. I am personally familiar with those manuals and know how each of the SMD's are designed and operated. From March 22, 2017 to September 29, 2021. I performed the majority of the SMD testing. The units are evaluated and certified to meet or exceed existing performance standards.

The Pierce County Radio Communications Division maintains a testing and certification program for the Dupont Police Department wherein each SMD is inspected and checked every 24 months by the following means:

Radar SMD's utilize the Doppler effect to measure speed. Testing consists of using a precision signal generator to inject a signal into the SMD to simulate speeds of 35mph and 65mph for the stationary/moving radars. It also includes injection of a signal to simulate 35mph for stationary radar only. The signal must cause the SMD to display the exact speed,  $\pm 1$  mile per hour, in order to be certified for accuracy. I then measure the frequency of the tuning fork(s) assigned to each SMD to ensure that they are within  $\pm$  5Hz tolerance. I issue a certificate of accuracy for



both the SMD and the tuning fork(s). The original certificates are issued to the Dupont Police Department who in turn issues a copy to the court. I also retain a copy for my records along with the maintenance and service records for each SMD serviced.

Laser SMD's measure speed based on the velocity of light and a precision time base reference. Testing consists of three accuracy certification checks (1) Internal Self Test (2) Pulse Check to include pulse width, power output, pulse repetition rate, and double pulse (3) and a Distance Check to include; sight alignment, vertical, and horizontal beam width ≥ 200 feet. The checks ensure that the SMD is within tolerance and functioning properly. I then issue a certificate of accuracy for each SMD. The original certificates are issued to the Dupont Police Department who in turn issues a copy to the Court. I also retain a copy for my records along with the maintenance and service records for each SMD serviced.

All radar SMD's operated by the Dupont Police Department directly measure by digital message from the Doppler signal. They do not reconstitute the Doppler signal in any way, including the use of devices such as a phase lock loop (PLL), before the speed is measured.

Based upon my education, training and experience, and my knowledge of the radar SMD's listed above, it is my opinion that each of these electronic pieces of equipment is so designed and constructed as to accurately employ the Doppler effect in such a manner that it will give accurate measurements of the speed of motor vehicles when properly calibrated and operated by a trained operator or, in the case of laser SMD's, each of these pieces of equipment is so designed and constructed as to accurately employ measurement techniques based on the velocity of light in such a manner that it will give accurate measurements of the speed of motor vehicles when properly calibrated and operated by a trained operator.

I certify under the penalty of perjury, under the laws of the State of Washington, that the foregoing is true and correct.

Raymond Fleming

Communications Systems Technician/ Speed Measuring Device Specialist

Signed and dated at Tacoma, Washington

SUBSCRIBED AND SWORN TO BEFORE ME THIS

DAY OF

Notary Public in and for the State of Washington, County of Pierce.

Commission expires 11-15-2022



1422 112<sup>th</sup> Street East Tacoma, Washington 98445 (253) 798-7147

#### **CERTIFICATE OF CALIBRATION & ACCURACY**

I, Raymond Fleming do certify under the penalty of perjury, under the laws of the State of Washington, in the County of Pierce, that all applicable tests and measurements were made on the following Doppler Traffic Radar equipment: Manufacturer: **MPH Industries Date Certified:** 09/23/2021 Model: **Dupont PD** MPH Python Agency: Serial Number: PYT380000580 **Operating Frequency Band:** K The aforesaid radar meets and exceeds all manufacturer's specifications. TUNING FORK I, Raymond Fleming , do certify under the penalty of perjury, under the laws of the State of Washington, in the County of Pierce, that all applicable tests and measurements were made on the following Doppler Radar Tuning Forks: Tuning Fork Serial No.: 145620 Date Certified: 09/23/2021 Oscillation (Cycles per Second): 2292 **Dupont PD** Agency: Operating Frequency Band: K MPH: 33 When operated between the temperature of -22F to +140F no correction is required. TUNING FORK do certify under the penalty of perjury, under the laws of the State of Washington, in the County of Pierce, that all applicable tests and measurements were made on the following Doppler Radar Tuning Forks: **Tuning Fork Serial No.:** 145427 Date Certified: 09/23/2021 Oscillation (Cycles per Second): 5585 Agency: **Dupont PD Operating Frequency Band:** K MPH: **77** When operated between the temperature of -22F to +140F no correction is required. I certify under penalty of perjury, under the laws of the State of Washington, that the above statements are true and correct.

Dated and Signed at Tacoma, Washington 09/23



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Manufacturer:	Stalker Radar	_ Date Certified:	09/23/2021
Model:	Stalker Dual SL	Agency:	Dupont PD
Serial Number:	DD010837	_	
Operating Frequency Band:	Ка	<b>-</b>	
The aforesaid	radar meets and exceeds all m	anufacturer's specificat	ions.
	TUNING FOR	K	
, Raymond Fleming do certify County of Pierce, that all applicable te	y under the penalty of perjury, sts and measurements were ma	under the laws of the St ade on the following Dop	ate of Washington, in the pler Radar Tuning Forks:
Tuning Fork Serial No.:	248850	Date Certified:	09/23/2021
Oscillation (Cycles per Second):	2629	Agency:	Dupont PD
Operating Frequency Band:	Ка	_	
МРН:	25	_	
	<del></del>	<u> </u>	
When operated bet	ween the temperature of -22F t	o +140F no correction is	required.
	TUNING FOR	<b>K</b>	
	under the penalty of perjury, sts and measurements were ma		
County of Pierce, that all applicable te	sts and measurements were ma	nde on the following Dop	pler Radar Tuning Forks:
County of Pierce, that all applicable te Tuning Fork Serial No.:	sts and measurements were ma	Date Certified:	pler Radar Tuning Forks: 09/23/2021
County of Pierce, that all applicable te Tuning Fork Serial No.: Oscillation (Cycles per Second):	356228 4165	Date Certified:	pler Radar Tuning Forks: 09/23/2021
County of Pierce, that all applicable te Tuning Fork Serial No.: Oscillation (Cycles per Second): Operating Frequency Band:	356228 4165 Ka	Date Certified:	pler Radar Tuning Forks: 09/23/2021
Tuning Fork Serial No.:  Oscillation (Cycles per Second):  Operating Frequency Band:  MPH:	356228 4165 Ka	Date Certified: Agency:	pler Radar Tuning Forks:  09/23/2021  Dupont PD
County of Pierce, that all applicable te Tuning Fork Serial No.: Oscillation (Cycles per Second): Operating Frequency Band: MPH:	356228 4165 Ka 40 ween the temperature of -22F t	Date Certified: Agency:  0 +140F no correction is	pler Radar Tuning Fork  09/23/2021  Dupont PD  required.



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I, Raymond Fleming , do certify under the penalty of perjury, under the laws of the State of Washington, in the County of Pierce, that all applicable tests and measurements were made on the following Doppler Traffic Radar equipment: Manufacturer: Stalker Radar Date Certified: 09/23/2021 Model: Stalker Dual SL Agency: **Dupont PD** Serial Number: DD010836 **Operating Frequency Band:** Ka The aforesaid radar meets and exceeds all manufacturer's specifications. **TUNING FORK** <u>. d</u>o certify under the penalty of perjury, under the laws of the State of Washington, in the I, Raymond Fleming County of Pierce, that all applicable tests and measurements were made on the following Doppler Radar Tuning Forks: **Tuning Fork Serial No.:** 248857 Date Certified: 09/23/2021 Oscillation (Cycles per Second): 2616 Agency: **Dupont PD Operating Frequency Band:** Ka MPH: 25 When operated between the temperature of -22F to +140F no correction is required. **TUNING FORK** , do certify under the penalty of perjury, under the laws of the State of Washington, in the County of Pierce, that all applicable tests and measurements were made on the following Doppler Radar Tuning Forks: Tuning Fork Serial No.: 356230 **Date Certified:** 09/23/2021 Oscillation (Cycles per Second): 4162 **Dupont PD** Agency: **Operating Frequency Band:** Ka MPH: 40 When operated between the temperature of -22F to +140F no correction is required. I certify under penalty of perjury, under the laws of the State of Washington, that the above statements are true and correct. Dated and Signed at Tacoma, Washington 9/23/202/



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I, Raymond Fleming ,do certify un of Pierce, that all applicable tests and			
Manufacturer:	Kustom Signals, INC	Date Certified:	09/23/2021
Model:	Kustom Golden Eagle II	Agency:	Dupont PD
Serial Number:	XE25865		
Operating Frequency Band:	Ka		
The aforesaid	radar meets and exceeds all man	ufacturer's specificati	ons.
	TUNING FORK	10,750 X	Sal Set wheeler
I, <u>Raymond Fleming</u> , <u>d</u> o certif County of Pierce, that all applicable te	y under the penalty of perjury, ur ests and measurements were made		
Tuning Fork Serial No.:	56269	Date Certified:	09/23/2021
Oscillation (Cycles per Second):	3215	Agency:	Dupont PD
Operating Frequency Band:	Ка		
мрн:	30	4	
When operated bet	ween the temperature of -22F to →	-140F no correction is	required.
3 2000	TUNING FORK		
I, <u>Raymond Fleming</u> , <u>do</u> certify County of Pierce, that all applicable te	under the penalty of perjury, un sts and measurements were made		
Tuning Fork Serial No.:	56221	Date Certified:	09/23/2021
Oscillation (Cycles per Second):	5893	Agency:	Dupont PD
Operating Frequency Band:	Ka		
мрн:	55		
When operated bet	ween the temperature of -22F to +	-140F no correction is	required.
I certify under penalty of perjury, und	er the laws of the State of Washing	ton, that the above state	ments are true and correct.
Dated and Signed at Tacoma, Was	hington 09/23/702(	_ blong	SIGNED



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#### **CERTIFICATE OF CALIBRATION & ACCURACY**

, Raymond Fleming , do certify und f Pierce, that all applicable tests and			
Manufacturer:	Kustom Signals, INC	Date Certified:	09/23/2021
Model:	Kustom Golden Eagle II	Agency:	Dupont PD
Serial Number:	XE25862		
Operating Frequency Band:	Ка		
The aforesaid	radar meets and exceeds all man	ufacturer's specificat	ions.
	TUNING FORK		
Raymond Fleming , do certify ounty of Pierce, that all applicable te	y under the penalty of perjury, ur sts and measurements were made	nder the laws of the St e on the following Dop	ate of Washington, in the opler Radar Tuning Forks
Tuning Fork Serial No.:	289964	Date Certified:	09/23/2021
Oscillation (Cycles per Second):	3731	Agency:	Dupont PD
Operating Frequency Band:	Ка		
MPH:	35		
<del></del> -			
When operated bet	ween the temperature of -22F to	140F no correction is	required.
	TUNING FORK		
Raymond Fleming, do certify ounty of Pierce, that all applicable te	ounder the penalty of perjury, un sts and measurements were made		
Tuning Fork Serial No.:	290457	Date Certified:	09/23/2021
Oscillation (Cycles per Second):	5349	Agency:	Dupont PD
Operating Frequency Band:	Ка		
MPH:	50		
When operated between	ween the temperature of -22F to +	140F no correction is	required.
l certify under penalty of perjury, und	er the laws of the State of Washing	ton, that the above state	ements are true and correc
ated and Signed at Tacoma, Wasi	hington 09/73/2021	1/4 mm	1

DATED

SIGNED



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#### **CERTIFICATE OF CALIBRATION & ACCURACY**

I, Raymond Fleming, do certify under the penalty of perjury, under the laws of the State of Washington, in the County of Pierce, that all applicable tests and measurements were made on the following Doppler Traffic Radar equipment: Manufacturer: **Decatur Electronics** Date Certified: 09/23/2021 Model: Genesis II Select Agency: **Dupont PD** Serial Number: G2S-29400 **Operating Frequency Band:** Ka The aforesaid radar meets and exceeds all manufacturer's specifications. TUNING FORK , do certify under the penalty of perjury, under the laws of the State of Washington, in the County of Pierce, that all applicable tests and measurements were made on the following Doppler Radar Tuning Forks: **Tuning Fork Serial No.:** 49952 Date Certified: 09/23/2021 Oscillation (Cycles per Second): 3208 Agency: **Dupont PD Operating Frequency Band:** Ka MPH: 30 When operated between the temperature of -22F to +140F no correction is required. TUNING FORK I, Raymond Fleming <u>, do certify under the penalty of perjury, under the laws of the State of Washington, in the</u> County of Pierce, that all applicable tests and measurements were made on the following Doppler Radar Tuning Forks: **Tuning Fork Serial No.:** 49594 **Date Certified:** 09/23/2021 Oscillation (Cycles per Second): 5898 **Dupont PD** Agency: **Operating Frequency Band:** Ka MPH: 55 When operated between the temperature of -22F to +140F no correction is required. I certify under penalty of perjury, under the laws of the State of Washington, that the above statements are true and correct. Dated and Signed at Tacoma, Washington <u>09</u>



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Manufacturer:	Stalker Radar	Date Certified:	09/24/2021
Model:	Stalker Dual SL	Agency:	Dupont PD
Serial Number:	DD011834	_	
Operating Frequency Band:	Ка	_	
The aforesaid	radar meets and exceeds all m	anufacturer's specificat	ions.
	TUNING FOR	K	
Raymond Fleming . do certify county of Pierce, that all applicable te	under the penalty of perjury, sts and measurements were ma	under the laws of the Stade on the following Dop	ate of Washington, in the opler Radar Tuning Forks
Tuning Fork Serial No.:	250617	Date Certified:	09/24/2021
Oscillation (Cycles per Second):	2607	Agency:	Dupont PD
Operating Frequency Band:	Ka	_	
MPH:	25		
<u></u>	-		
When operated bety	ween the temperature of -22F to	o +140F no correction is	required.
	TUNING FOR	RK	
Raymond Fleming , do certify ounty of Pierce, that all applicable te	under the penalty of perjury, u sts and measurements were ma		
Tuning Fork Serial No.:	358293	Date Certified:	09/24/2021
		-	
Oscillation (Cycles per Second):	4158	Agency:	Dupont PD
Oscillation (Cycles per Second):  Operating Frequency Band:	4158 Ka	Agency:	Dupont PD
	<u></u>	Agency:	Dupont PD
Operating Frequency Band:	Ka	Agency:	Dupont PD
Operating Frequency Band: MPH:	Ka		
Operating Frequency Band: MPH:	Ka 40 ween the temperature of -22F to	o +140F no correction is	required.



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#### **CERTIFICATE OF CALIBRATION & ACCURACY**

I, Raymond Fleming, do certify under the penalty of perjury, under the laws of the State of Washington, in the County of Pierce, that all applicable tests and measurements were made on the following Doppler Traffic Radar equipment: Manufacturer: Stalker Radar Date Certified: 09/24/2021 Model: Stalker Dual SL Agency: **Dupont PD** Serial Number: D107395 Operating Frequency Band: Ka The aforesaid radar meets and exceeds all manufacturer's specifications. **TUNING FORK** <u>, do certify under the penalty of perjury, under the laws of the State of Washington, in the</u> County of Pierce, that all applicable tests and measurements were made on the following Doppler Radar Tuning Forks: **Tuning Fork Serial No.:** 257384 **Date Certified:** 09/24/2021 Oscillation (Cycles per Second): 2620 Agency: **Dupont PD Operating Frequency Band:** Ka MPH: 25 When operated between the temperature of -22F to +140F no correction is required. **TUNING FORK** I, Raymond Fleming <u>, do certify under the penalty of perjury, under the laws of the State of Washington, in the</u> County of Pierce, that all applicable tests and measurements were made on the following Doppler Radar Tuning Forks: **Tuning Fork Serial No.:** 364682 09/24/2021 **Date Certified:** Oscillation (Cycles per Second): 4169 Agency: **Dupont PD Operating Frequency Band:** Ka MPH: 40 When operated between the temperature of -22F to +140F no correction is required. I certify under penalty of perjury, under the laws of the State of Washington, that the above statements are true and correct. 



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I, Raymond Fleming, do certify un of Pierce, that all applicable tests and			
Manufacturer:	Kustom Signals, INC	Date Certified:	09/24/2021
Model:	Kustom Golden Eagle II	Agency:	Dupont PD
Serial Number:	XE25861		
Operating Frequency Band:	Ka		
The aforesaid	radar meets and exceeds all man	ufacturer's specificati	ons.
	TUNING FORK	6 30 366	
I, <u>Raymond Fleming</u> , <u>do certif</u> County of Pierce, that all applicable to	y under the penalty of perjury, un ests and measurements were made	der the laws of the St on the following Dop	ate of Washington, in the pler Radar Tuning Forks:
Tuning Fork Serial No.:	56268	Date Certified:	09/24/2021
Oscillation (Cycles per Second):	3216	Agency:	Dupont PD
Operating Frequency Band:	Ka		
мрн:	30		
When operated bet	ween the temperature of -22F to +	-140F no correction is	required.
	TUNING FORK		
I, <u>Raymond Fleming</u> , <u>do</u> certify County of Pierce, that all applicable te	under the penalty of perjury, und sts and measurements were made	ler the laws of the Sta on the following Dop	te of Washington, in the pler Radar Tuning Forks:
Tuning Fork Serial No.:	56501	Date Certified:	09/24/2021
Oscillation (Cycles per Second):	5893	Agency:	Dupont PD
Operating Frequency Band:	Ka		
мрн:	55		
When operated bet	ween the temperature of -22F to +	140F no correction is	required.
I certify under penalty of perjury, und	er the laws of the State of Washingt	on, that the above state	ments are true and correct.
Dated and Signed at Tacoma, Was	hington <u>09/24/202/</u> DATED	Mai	SIGNED



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Manufacturer:	Decatur Electronics	Date Certified:	09/24/2021
Model:	Genesis II Select	Agency:	Dupont PD
Serial Number:	G2S-28843	_	
Operating Frequency Band:	Ка	_	
The aforesaid	radar meets and exceeds all r	nanufacturer's specificat	ions.
	TUNING FOR	RK	
Raymond Fleming , do certify county of Pierce, that all applicable te	y under the penalty of perjury sts and measurements were m	, under the laws of the St ade on the following Dop	ate of Washington, in the opler Radar Tuning Forks
Tuning Fork Serial No.:	209836	Date Certified:	09/24/2021
Oscillation (Cycles per Second):	3729	_ Agency:	Dupont PD
Operating Frequency Band:	Ka	_	
МРН:	35	_	
When operated between	ween the temperature of -22F	to +140F no correction is	required.
	TUNING FO	RK	
Raymond Fleming . do certify ounty of Pierce, that all applicable te	under the penalty of perjury sts and measurements were m	, under the laws of the St ade on the following Dop	ate of Washington, in the pler Radar Tuning Forks
·	200024	D 4 G 410 1	09/24/2021
Tuning Fork Serial No.:	209924	Date Certified:	****
Tuning Fork Serial No.: Oscillation (Cycles per Second):	5362	_ Date Certified: Agency:	Dupont PD
_		<del>-</del>	Dupont PD
Oscillation (Cycles per Second):	5362	<del>-</del>	Dupont PD
Oscillation (Cycles per Second): Operating Frequency Band:	5362 Ka	<del>-</del>	Dupont PD
Oscillation (Cycles per Second): Operating Frequency Band: MPH:	5362 Ka	Agency:	
Oscillation (Cycles per Second): Operating Frequency Band: MPH:	5362  Ka  50  ween the temperature of -22F	Agency:  to +140F no correction is	required.



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<u>CERTIFICATE OF ACCURACY</u>						
I, Raymond S Fleming, do certify under the penalty of perjury, under the laws of the State of Washington, in the County of Pierce, that all applicable tests and measurements were made on the laser Speed Measuring Device (SMD) listed below. The SMD was found to meet or exceed all manufacturer's specifications.						
Laser SMD Inform	Laser SMD Information and Certification Summary					
Manufacturer:	Dragonl	Eye Technology, LLC.	Date Certified:	09/24/2	2021	
Model:	Laser Al	ly	Agency:	DuPon	t Police Department	
Serial Number:	13225					
Distance Tests						
Long Range		Expected: 204.5 ft	Tested: 204.4ft	[ ] N/A	[X] Pass [] Fail	
Operational Tests  Controls Operational						
RFI Indicator .				[ ] N/A	[X]Pass [] Fail	
Pulse Characteristic						
Pulse Frequency (Rep	Rate) .	Expected:<=390hz	Tested: 207.02 Hz	[ ] N/A	[X] Pass [ ] Fail	
Pulse Width	• •	Expected: 10 to 40nS	Tested: 21.88 nS	[ ] N/A	[X] Pass [] Fail	
Double Pulse	• •			[ ] N/A	[X] Pass [] Fail	
Beam Characteristics Tests						
Optical Power		Expected: <=300mW	Tested: 143.47 uW	[ ] N/A	[X] Pass [] Fail	
Horizontal Beam Wic	lth			[ ] N/A	[X]Pass [] Fail	
Vertical Beam Width	• •	• • • •		[ ] N/A	[X] Pass [] Fail	
Sight Alignment	• •		• • •	[ ] N/A	[X] Pass [ ] Fail	
I certify under penalty of perjury, under the laws of the State of Washington, that the foregoing is true and correct.						
Dated and Signed at Tac	Dated and Signed at Tacoma, Washington 09/24/2021 VULL SIGNED					