Cascade Engineering Services, Inc.
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METROLOGY

CERTIFICATION CONCERNING DESIGN AND CONSTRUCTION OF ELECTRONIC SPEED MEASURING DEVICES

IRLJ RULE 6.6 EFFECTIVE 1/3/2006

I, John R. Gray, do certify under penalty of perjury, under the laws of the state of Washington as follows:

I am employed with Cascade Engineering Services, Inc. (CES) Metrology and Electronics Repair Services, as a Senior Metrology Technician. I have been employed in such a capacity since 2008. Part of my duties include calibration, maintenance and repair of all electronic doppler radar and laser speed measuring devices (SMD's) used by ELLENSBURG POLICE DEPARTMENT.

All SMD's currently used by ELLENSBURG POLICE DEPARTMENT are listed in Exhibit "A".

I maintain the following qualifications with respect to SMD(s): More than 14 years of commercial experience in electronic test and measurement calibration and repair. I have successfully completed training courses in Doppler Radar & Lidar theory. I have over two years of experience in the repair and calibration of Doppler and Lidar SMD's. I am experienced and competent in the principles and fundamental requirements of test equipment calibration.

The CES laboratory maintains manuals for all of the SMD's listed in Exhibit "A". I am personally familiar with those manuals and how each of the SMD's are designed and operated. On the date indicated in Exhibit "A" testing of the SMD's was performed using CES procedures under the direction of an authorized SMD expert. The results were evaluated and certified to meet or exceed existing performance standards and entered into the CES certification management database. CES laboratory maintains a testing and certification program that requires each SMD to be tested and certified for accuracy at least once every two years.

The CES laboratory tests all Doppler SMD's used by ELLENSBURG POLICE DEPARTMENT, as recommended by the manufacturer, as follows: The Vocar HR, handheld Radar certification system is used to simulate speeds at 5 mph increments from 20 mph to 140 mph to verify accuracy in stationary and moving mode. Measurements are taken of the SMD transmit frequency, antenna/receiver sensitivity and any accompanying tuning forks are also tested for accuracy. All other operational functions of the SMD system are then tested for proper performance.

The Laser SMD's transmit a series of highly focused light wave pulses each time the trigger is pulled and utilizes two laws of physics; time and distance. Since the speed of light is a known fixed value, the range of the target is determined by calculating how long it takes for the light pulses to travel to the target and back. This series of measurements allows the SMD to calculate the speed of the target using an algorithm which processes the range calculations into speed measurements. The displayed speed is accurate to within plus (+) or minus (-) one (1) mile per hour.

The CES laboratory tests all Laser / Lidar SMD(s) used by ELLENSBURG POLICE DEPARTMENT, as recommended by the manufacturer, as follows: The Laser Speed Measurement Simulator (LSMS) is utilized to simulate a moving target. This is accomplished by detecting the optical output pulses of the laser device and generating artificial return pulses. Different speed values and ranges are simulated by varying the time delays between the input pulses and the return pulses. The LSMS consists of a Digital Delay Generator (DDG), and an optical interface unit. The DDG produces precise time delays. The optical interface unit converts the optical energy of the laser instrument into electrical signals which are supplied to the DDG. The optical interface unit also converts the electrical signals received from the DDG into optical energy which is then transmitted to the Lidar. The Lidar's output power is tested using an Ophir Nova Display, with a PD300-SH power head.

On the date indicated in Exhibit "A", each SMD was tested by myself or a trained technician listed therein and under my direction. All Technicians listed on Exhibit "A" received training in the proper use and operation of SMD test equipment and performance testing procedures used to test Laser and Doppler SMDs. After successfully completing training the technician is certified by myself and receives authorization allowing them to enter the results from the tests into the certificate management database. Individual Performance and Certification tests are entered into the certificate management database under the penalty of perjury by entering an authorized user id and password to authenticate it.

Exhibit "A"

This agency, ELLENSBURG POLICE DEPARTMENT currently utilizes the following Doppler SMD(s):

KUSTOM SIGNALS, INC. manufacturer's the following SMD(s):

I.D./Serial Number	Model Number	Antenna 1 S/N	Antenna 2 S/N	T.F. 1 S/N	T.F. 2 S/N	Cal. Date	Cal. Interval	Due Date	Technician
FF12396	FALCON	HANDHELD	N/A	24639	N/A	03/15/2023	12 MONTHS	03/15/2024	JOHN R GRAY
FF12385	FALCON	HANDHELD	N/A	748500	N/A	03/15/2023	12 MONTHS	03/15/2024	JOHN R GRAY

MPH manufacturer's the following SMD(s):

I.D./Serial Number	Model Number	Antenna 1 S/N	Antenna 2 S/N	T.F. 1 S/N	T.F. 2 S/N	Cal. Date	Cal. Interval	Due Date	Technician
PYT546005120	PYTHON II	PYT315013698	PYT315018527	857240	071109	03/15/2023	12 MONTHS	03/15/2024	JOHN R GRAY
PYT546004243	PYTHON II	PYT315012003	PYT315018529	307534	307560	03/15/2023	12 MONTHS	03/15/2024	JOHN R GRAY
PYT846003563	PYTHON III	PYT855004681	N/A	077371	077383	03/15/2023	12 MONTHS	03/15/2024	JOHN R GRAY
PYT546004242	PYTHON III	PYT315012002	N/A	978326	978335	03/15/2023	12 MONTHS	03/15/2024	JOHN R GRAY
PYT846006198	PYTHON III	PYT315013697	N/A	2302	2196	03/15/2023	12 MONTHS	03/15/2024	JOHN R GRAY
PYT546004244	PYTHON III	PYT315012004	N/A	290101	290554	03/15/2023	12 MONTHS	03/15/2024	JOHN R GRAY

Based upon my education, training, and experience and my knowledge of the 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 the laser SMDs, 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.

Exhibit "A" derives information from the certificate management database. See Exhibit "A" for details about individual SMD certifications.

State of Washington
County of King
Signed or attested before me on

03.21.23 **by John R. Gray**
I have satisfactory evidence that the person described in this document: (a) is personally known to me; OR (b) is identified upon oath oraffirmation of credible witness personally know to me; OR (c) is identified on the basis of Indentification documents.

Certified by: John R. Gray
Place: Redmond, WA

William Quoc Ang
Notary Public in and for the State of Washington,
Residing in Seattle, WA
My appointment expires January 29, 2026

WILLIAM QUOC ANG NOTARY PUBLIC STATE OF WASHINGTON COMMISSION EXPIRES 1-29-26 197746