



Cascade Engineering Services, Inc.

6640 185th Ave NE, Redmond, WA 98052
T.425.895.8617, F.425.702.9358

FILED

JAN - 4 2019
KIRKLAND
MUNICIPAL COURT



CERTIFICATE #: 00195366

CERTIFICATE OF CALIBRATION

STANDARD CALIBRATION

CLYDE HILL POLICE DEPARTMENT

9605 NE 24TH ST. CLYDE HILL, WA 98004

This certifies that the instrument listed herein was calibrated by Cascade Engineering Services' Calibration Laboratory, which is fully accredited in accordance with the recognized International Standards ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories. Cascade Engineering Services' Calibration Laboratory also meets the requirements of ANSI/NCSL Z540-1-1994 and any additional program requirements in the field of calibration. Standards used to perform this calibration are certified by or traceable to NIST, natural physical constants, consensus standards or derived by the ratio type of calibrations. All calibrations are performed to manufacturer's specifications unless otherwise noted. Standard Calibration, while still traceable, does not meet all requirements for an Accredited Calibration per ISO/IEC 17025:2005, that is "As Found" data for equipment in tolerance and Measurement Uncertainties are not recorded. This certificate shall not be reproduced, except in full, without prior written approval of the laboratory.

DESCRIPTION:		SPEED MEASURING DEVICE	
ASSET #:	KK12693	SERIAL NUMBER:	KK12693
MANUFACTURER:	KUSTOM	MODEL NUMBER:	TROOPER
DEPARTMENT:	N/A	PATROL CAR #:	N/A
ENVIRONMENT:	20.0 °C/40.0 %RH	BASIC ACCURACY:	REFERENCE CAL PROCEDURES
CAL INTERVAL:	12 MONTHS	DUE DATE:	November 27, 2019

EQUIPMENT CONDITION AS RECEIVED

Initial testing found this equipment to be "IN TOLERANCE", as defined by the basic accuracy stated above.

EQUIPMENT CONDITION AS DELIVERED

At the completion of the calibration, measured values were "IN TOLERANCE", as defined by the basic accuracy stated above.

TUNING FORK(S) SUPPLIED WITH THIS DEVICE

DESCRIPTION	SERIAL NUMBER	RATED SPEED	FREQUENCY
TUNING FORK ONE	32536	35 M.P.H.	2544 Hz
TUNING FORK TWO	31231	65 M.P.H.	4732 Hz

Antenna 1 SN: CC13284, Frequency: 24.176 GHz

STANDARD(S) USED FOR CERTIFICATION

I.D.	MODEL	MANUFACTURER	DESCRIPTION	DUE DATE
MET1231	VOCAR HR	DB INNOVATIONS	HAND HELD RADAR CERTIFICATION SYSTEM	08/24/2019
MET1232	VOCAR HR WAND	DB INNOVATIONS	VOCAR HR WAND	08/24/2019

PROCEDURE(S) USED FOR CERTIFICATION

DOCUMENT ID	DESCRIPTION	REV	REV DATE
SMD101	DOPPLER RADAR / LIDAR CALIBRATION PROCEDURE	A	06/01/2006

CERTIFICATION NOTES

I certify (or declare) under penalty of perjury under the laws of the State of Washington that the above information is true and correct

PERFORMED BY Nicolas Mowry
SENIOR METROLOGIST, NICOLAS MOWRY

LOCATION: Kirkland, Wa
CALIBRATION DATE: Tuesday, November 27, 2018



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**CERTIFICATION CONCERNING DESIGN AND CONSTRUCTION OF
ELECTRONIC SPEED MEASURING DEVICES**

IRLJ RULE 6.6 EFFECTIVE 1/3/2006

I, Nicolas T. Mowry, 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 Metrology Technician. I have been employed in such a capacity since 2016. Part of my duties includes supervising the maintenance and repair of all electronic and laser speed measuring devices (SMD's) used by CLYDE HILL POLICE DEPARTMENT.

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

I maintain the following qualifications with respect to SMD(s): I have commercial experience in electronics and in the repair and calibration of Doppler and Lidar SMD's since the beginning of 2016. I have a Bachelors of Science degree in physics from the University of Washington. I am experienced and competent in the principles and fundamental requirements of calibration from DC to Microwave frequencies.

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 CLYDE HILL 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 (i.e. 3.5 feet in diameter at 1000 feet). Since the speed of light is a known fixed value, the distance of the target is determined by calculating how long it takes for the signal to travel to the target and back. This series of measurements allows the SMD to calculate the speed of the target by measuring the distance the signal took to travel to the target and back. 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 CLYDE HILL 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 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, CLYDE HILL POLICE DEPARTMENT currently utilizes the following Laser SMD(s):

KUSTOM 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
PL19672	PRO LASER III	N/A	N/A	N/A	N/A	01/29/2018	12 MONTHS	01/29/2019	NICOLAS T MOWRY

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

KUSTOM 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
FF12050	FALCON	HANDHELD	N/A	15424	N/A	11/08/2018	12 MONTHS	11/08/2019	NICOLAS T MOWRY
EE26477	KR-10SP	CC25224	N/A	46115	44542	04/03/2018	12 MONTHS	04/03/2019	NICOLAS T MOWRY
T3306/T3306K	TALON	HANDHELD	N/A	40141	N/A	11/08/2018	12 MONTHS	11/08/2019	NICOLAS T MOWRY
KK37897	TROOPER	CC37517	N/A	3303	3136	11/08/2018	12 MONTHS	11/08/2019	NICOLAS T MOWRY
KK2711	TROOPER	CC13283	N/A	55529	51537	11/27/2018	12 MONTHS	11/27/2019	NICOLAS T MOWRY
KK12693	TROOPER	CC13284	N/A	32536	31231	11/27/2018	12 MONTHS	11/27/2019	NICOLAS T MOWRY

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

11/27/2018 by Nicolas T. Mowry

I have satisfactory evidence that the person described in this document:

- (a) is personally known to me; OR (b) is identified upon oath or affirmation of credible witness personally know to me; OR
- (c) is identified on the basis of Identification documents.



Handwritten signature of William Quoc Ang in black ink.

William Quoc Ang
Notary Public in and for the State of Washington,
Residing in Seattle, WA
My appointment expires January 29, 2022

Handwritten signature of Nicolas T. Mowry in black ink.

Certified by: Nicolas T. Mowry
Place: Redmond, WA