Cascade Engineering Services, Inc.
12026 115th Ave NE, Suite 102, Kirkland, WA 98034
T.425.895.8617, F.425.702.9358

FILED
DEC 7 2016
KIRKLAND
MUNICIPAL COURT

METROLOGY

CERTIFICATE #: 00150432

CERTIFICATE OF CALIBRATION

STANDARD CALIBRATION

CLYDE HILL POLICE DEPARTMENT

9605 NE 24TH ST. ,

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 #:**	
ENVIRONMENT:	21.0 °C/41.4 %RH	**BASIC ACCURACY:**	REFERENCE CAL PROCEDURES
CAL INTERVAL:	12 MONTHS	**DUE DATE:**	August 03, 2017

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.

TUNNING 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: 24.182 GHz

STANDARD(S) USED FOR CERTIFICATION

I.D.	MODEL	MANUFACTURER	DESCRIPTION	DUE DATE
MET1231	VOCAR HR	DB INNOVATIONS	HAND HELD RADAR CERTIFICATION SYSTEM	05/25/2017
MET1232	VOCAR HR WAND	DB INNOVATIONS	VOCAR HR WAND	05/25/2017

PROCEDURE(S) USED FOR CERTIFICATION

DOCUMENT ID	DESCRIPTION	REV	REV DATE
SMD101	DOPPLER RADAR / LIDAR CALIBRATION PROCEDURE	NEW	

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 Charles M. Brown
CALIBRATION TECHNICIAN: CHARLIE BROWN

LOCATION: Kirkland, Wa
CALIBRATION DATE: Wednesday, August 03, 2016

THIS LABORATORY IS A2LA ACCREDITED TO ISO/IEC 17025:2005 (GENERAL REQUIREMENTS FOR THE COMPETENCE OF TESTING AND CALIBRATION LABORATORIES), CERTIFICATE #: 2560.01

THIS DOCUMENT IS MAINTAINED
AS A PUBLIC RECORD IN
ACCORDANCE WITH RCW 5.44

Cascade Engineering Services, Inc.

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CERTIFICATION CONCERNING DESIGN AND CONSTRUCTION OF ELECTRONIC SPEED MEASURING DEVICES

IRLJ RULE 6.6 EFFECTIVE 10/31/2000

I, Charles N. Brown do certify under penalty of perjury under the laws of the State of Washington that the following is true and correct:

I, Charles N. Brown am employed with Cascade Engineering Services, Inc. (CES) Metrology and Electronic Repair Services, as a Senior Metrology Technician, specialized in Speed Measuring Device (SMD) technology, and assigned as co-custodian of SMD records. I have been employed in such a capacity for 32 years. Part of my duties include supervising others in the maintenance and repair of all electronic Doppler and Laser speed measuring devices (SMD's) utilized by the CLYDE HILL POLICE DEPARTMENT. The CLYDE HILL POLICE DEPARTMENT uses the SMD(s) listed in the table below.

I maintain the following qualifications with respect to SMD(s): Twelve years military experience in electronics, which included the repair and calibration of airborne and ground radar systems. I have over 15 years experience in the repair and calibration of Doppler and Lidar SMD's. I have successfully completed factory training in the repair and service of Laser Speed Detection systems by LTI, Inc. Graduate of Washington Technical Institute. I have successfully completed courses in the repair and calibration of measuring instruments. I am experienced and competent in the principles and fundamental requirements of calibration from DC to Microwave frequencies.

CES Metrology Laboratory is audited periodically by American Association for Laboratory Accreditation (A2LA) to ensure and maintain our ISO/IEC 17025:2005 accreditation and certification, (No. 2560.01), for technical competence. The CES laboratory is an authorized service center for all makes and models of SMD(s) used by the CLYDE HILL POLICE DEPARTMENT. Our laboratory maintains manuals specific to these SMD(s), which are available for public inspection upon request. I am personally familiar with those manuals and am personally familiar with the design, construction and operation of each of the SMD(s) listed below. Each of these SMD(s) are so designed and constructed to accurately and reliably employ the Doppler Radar principle or the measurement techniques based on the velocity of light as a constant, as the case may be, in such a manner that each of them will give accurate and reliable measurement of the speed of motor vehicles when used by a trained operator. Each of the SMD's were calibrated and tested under my direction on the Calibration Date(s) indicated in the table below. The unit(s) were serviced to meet or exceed existing performance standards.

The CES laboratory tests all Doppler SMD's used by the CLYDE HILL POLICE DEPARTMENT at least every two years, as recommended by the manufacturer, as follows: The Vocar HR, handheld Radar certification system, Serial number VHR0510120 is used to calibrate Doppler SMD devices. The Vocar HR is calibrated annually by the manufacturer. The Vocar HR 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 ft). Since the speed of light is a known 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 traveled in time (usually less than a second for a veritable display). 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 the CLYDE HILL POLICE DEPARTMENT, at least every two years, as recommended by the manufacturer, as follows: The Laser Speed Measurement Simulator (LSMS SN: SS000043) is used 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 (SN: OH000030). 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 Lidars output power is tested using an Ophir Nova Display SN. 70228, with a PD300-SH power head, SN. 68814.

Based upon my education, training, experience, and knowledge of the SMD(s) listed below, it is my opinion that each of these electronic pieces of equipment is so designed and constructed as to accurately and reliably employ the Doppler effect in such a manner that it will produce measurements of the speed of motor vehicles when properly calibrated and operated by a trained operator accurate to within plus (+) or minus (-) one (1) mile per hour or, in the case of the Laser/Lidar SMD(s), each of these pieces of equipment is so designed and constructed as to accurately and reliably employ measurement techniques based on the velocity of light in such a manner that it will produce measurements of the speed of motor vehicles when properly calibrated and operated by a trained operator accurate to within plus (+) or minus (-) one (1) mile per hour.

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

KUSTOM Manufacturer's the following SMD(s)

ID/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
PL19672	PRO LASER III	N/A	N/A	N/A	N/A	06/16/2016	12 MONTHS	06/16/2017

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

KUSTOM Manufacturer's the following SMD(s)

ID/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
EE26477	KR-10SP	CC25224	N/A	45637	43464	11/29/2016	12 MONTHS	11/29/2017
FF12050	FALCON	HANDHELD	N/A	15424	N/A	10/27/2016	12 MONTHS	10/27/2017
KK12693	TROOPER	CC13284	N/A	32536	31231	08/03/2016	12 MONTHS	08/03/2017
KK2711	TROOPER	CC13283	N/A	55529	51537	10/27/2016	12 MONTHS	10/27/2017
KK37897	TROOPER	CC37517	N/A	3303	3136	11/01/2016	12 MONTHS	11/01/2017
T3306/T3306K	TALON	HANDHELD	N/A	40141	N/A	08/03/2016	12 MONTHS	08/03/2017

Charles N. Brown

Certified by: Charles N. Brown
Place: Redmond, WA

November 29, 2016
Date

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