

CERTIFICATE CONCERNING DESIGN AND CONSTRUCTION OF ELECTRONIC SPEED MEASURING DEVICES

I, Lesieli Casale, do certify under penalty of the laws of the State of Washington that the following is true and correct:

I have been employed as a technician by American Traffic Solutions for 3 years. I became a speed validation technician in 2023 and have over 100 hours performing speed validation tests. I am nationally certified as a RADAR and LIDAR operator. The City of Kirkland currently uses the AutoPatrolTM 3D radar fixed speed safety camera system, an electronic speed measuring device provided through a contract with American Traffic Solutions, Inc. ("ATS"). Part of my duties include monitoring regular testing of the AutoPatrol 3D radar fixed speed safety camera systems used by the City of Kirkland.

ATS contracted with the City of Kirkland to provide an Automated Speed Enforcement ("ASE") system designed to record the speed of a vehicle and obtain photographs or other recorded images of the vehicle and the vehicle's registration plate while the vehicle is traveling in excess of speed limits in certain safety zones within posted limits.

The ASE program includes the use of the AutoPatrol 3D radar fixed speed safety camera systems at the following locations within the City of Kirkland:

Location Code	Location Description	Lanes Monitored
KRKF001	NB 132ND AVE NE @ MUIR ELEMENTARY/KAMIAKIN MIDDLE	1
KRKF002	SB 132ND AVE NE @ MUIR ELEMENTARY/KAMIAKIN MIDDLE	1
KRKF003	EB 80TH ST @ ROSE HILL ELEMENTARY	1
KRKF004	WB 80TH ST @ ROSE HILL ELEMENTARY	1
KRKF005	SB 724 STATE ST @ LAKEVIEW ELEMENTARY SCHOOL	1
KRKF006	WB 10600 NE 68TH ST @ LAKEVIEW ELEMENTARY SCHOOL	1
KRKF007	NB 12637 84TH AVE NE @ SANDBURG ES / FINN HILL MS / THOREAU ES	1
KRKF008	SB 14006 84TH AVE NE @ SANDBURG ES / FINN HILL MS / THOREAU ES	1

The AutoPatrol 3D radar fixed speed safety camera system operates by measuring vehicle speed, as well as position relative to the radar to calculate and differentiate multiple vehicles in the radar beam. The speed of a moving vehicle is measured by Doppler radar. Doppler radar is a generally accepted technology used for measuring speed. The AutoPatrol 3D radar technology is used throughout the US and Europe as well as other countries and is approved by the Swiss national metrology institute- METAS.

The AutoPatrol 3D radar fixed speed safety camera system uses a tracking radar sensor for measuring vehicle speeds and detecting speed violations. The AutoPatrol 3D radar is aligned at a fixed angle across the road. The AutoPatrol 3D radar emits a horizontal beam over the road surface as represented by the illustration below. The tracking radar can simultaneously detect multiple vehicles and measure their speed, distance, angle and movement within the radar beam. The radar tracks multiple vehicles by reconstructing vehicle movement from

the measured object speed, angle and distance values. If a vehicle passes a defined trigger line, the radar outputs the vehicle's speed and lane information. The camera connected to the tracking radar uses this information to determine if there is a speed violation and to capture photographs showing the measured speed and lane on the databar of the captured images.



The tracking radar utilizes the Doppler Effect for speed determination. If an electromagnetic wave is emitted at a moving object, then the wave is reflected back from the moving object. The frequency of the wave received back by the radar shifts based on the speed of the moving object and its direction of travel. The tracking radar continuously determines this frequency shift of each object to calculate the object's speed. The tracking radar consists of two receiving antennas integrated into a single radar sensor. This configuration allows the radar to measure the distance and angle of the vehicle relative to the position of the radar sensor. Illustration A and B show the measurement principle in simplified form. The radar sensor emits a radar beam (illustration A). The radar beam is reflected by the vehicle (illustration B). The two receivers receive the reflected radar beam. The radar sensor evaluates the return frequency, as well as the phase difference of the reflected radar beam from both of the receivers. With the aid of these values the radar sensor calculates the vehicle position.



Prior to operation each day, the system performs a system self-test. This self-test performs an electronic tuning fork test to produce a specific frequency and returns an associated speed value. Only if the return value meets the acceptance criteria to show that the system is operating correctly will the system enter measure mode. Unless a self-test is successful, the system will not enter measure mode and no violations will be captured. Additional information stored as metadata within each image includes coordinates of the vehicle position at the time of capture. This information is extracted and utilized through a secondary speed verification process to provide yet another means to validate offender speed and position based on the two images obtained and image analytics. In addition to the internal system checks and the manufacturer calibration certification, the 3D radar system is subject to routine and independent calibration check of the speeds produced by the system at least annually by a qualified technician.

Each day the computer which controls the fixed speed safety camera system is rebooted. The reboot is initiated each day and each time the computer is rebooted an internal check is performed on all operations of each fixed speed safety camera system, including the clocks, sensors, camera and speed calculating hardware and software, in order to verify that all operations are functioning correctly. When the internal check detects a problem with one of the operations on a given fixed speed safety camera system, then that particular fixed speed safety camera system is inactivated and a request for service is relayed to ATS support personnel. This means that violations cannot be issued until any internal problem is fixed.

Speed validation tests are regularly performed on each installed and operable AutoPatrol 3D radar fixed speed safety camera system. The test is conducted by having a LIDAR Operator obtain true measurements of up to five vehicles per lane in the ascending and/or descending direction. The speed of the vehicle is captured by the LIDAR Operator and then relayed via cellular to an ATS Technician. The ATS Technician then compares the vehicle speed measured by the AutoPatrol 3D radar fixed speed safety camera system to the speed measured by the LIDAR Operator to ensure the accuracy of the AutoPatrol 3D radar fixed speed safety camera system. ATS maintains the results of each test in a Validation Report. The speed validation for each system was performed on the following date and the systems at each location were found to be in proper working order:

Location	Location Description			
Code				
KRKF001	NB 132ND AVE NE @ MUIR ELEMENTARY/KAMIAKIN MIDDLE	6/11/2024		
KRKF002	SB 132ND AVE NE @ MUIR ELEMENTARY/KAMIAKIN MIDDLE	6/11/2024		
KRKF003	EB 80TH ST @ ROSE HILL ELEMENTARY	6/11/2024		
KRKF004	WB 80TH ST @ ROSE HILL ELEMENTARY	6/11/2024		
KRKF005	SB 724 STATE ST @ LAKEVIEW ELEMENTARY SCHOOL	6/11/2024		
KRKF006	WB 10600 NE 68TH ST @ LAKEVIEW ELEMENTARY SCHOOL	6/11/2024		
KRKF007	NB 12637 84TH AVE NE @ SANDBURG ES / FINN HILL MS / THOREAU ES	6/11/2024		
KRKF008	SB 14006 84TH AVE NE @ SANDBURG ES / FINN HILL MS / THOREAU ES	6/11/2024		

Preventative maintenance, including visual inspections, is regularly performed on the AutoPatrol 3D radar fixed speed safety camera systems. Preventative maintenance activities include: cleaning of the cameras and housing, general site inspection of environment and road conditions, inspection of poles, bases and enclosures, and inspection of system cables and connections. The location and date that preventative maintenance is performed is recorded in the Preventative Maintenance Log, which along with the Validation Report(s) referenced above, is attached hereto.

I am a custodian, or otherwise qualified witness, as to the attached records. I make this declaration based on personal knowledge, and if called and sworn as a witness, I could and would testify as set forth in the following paragraph.

Attached as Exhibits are: Exhibit A - Speed Validation Reports, Exhibit B - Preventative Maintenance Logs, and Exhibit C - Annual System Verification Certificate for all AutoPatrol 3D radar fixed speed safety camera systems installed and used by the City of Kirkland. All documents and materials included as Exhibit A, Exhibit B and Exhibit C are authentic and are what they purport to be, and accurately describe the matters set forth therein. All such records are business records in that they are: (1) records kept in the ordinary course of business; (2) created at or near the time of the transactions or events reflected therein by, or based on information from, a person with knowledge of the transaction or events; and (3) kept as part of a regular business activity.

Based upon my education, training, experience, and knowledge of the AutoPatrol 3D radar fixed speed safety camera system, it is my opinion that the system is so designed and constructed as to accurately employ measurement techniques based on a division of distance over time in such a manner that it will give accurate measurements of the speed of motor vehicles.

I, Lesieli Casale, certify (or declare) under penalty of perjury under the laws of the State of Washington that the foregoing is true and correct.

Dated this 9th day of July 2024 in Mesa, AZ

Lesieli Casale

Lesieli Casale, Speed Validation Technician



Speed Validation Report Client: Kirkland, WA

FILED

Validation Date: June 11, 2024

- KRKF001 NB 132ND AVE NE @ MUIR ELEMENTARY/KAMIAKIN MIDDLE
 - o Radar Serial Number: 590-112/61693
- KRKF002 SB 132ND AVE NE @ MUIR ELEMENTARY/KAMIAKIN MIDDLE
 - o Radar Serial Number: 590-113/61397
- KRKF003 EB 80TH ST @ ROSE HILL ELEMENTARY
 - o Radar Serial Number: 590-113/64176
- KRKF004 WB 80TH ST @ ROSE HILL ELEMENTARY
 - o Radar Serial Number: 590-112/62298
- KRKF005 SB 724 STATE ST @ LAKEVIEW ELEMENTARY SCHOOL
 - o Radar Serial Number: 590-113/65925
- KRKF006 WB 10600 NE 68TH ST @ LAKEVIEW ELEMENTARY SCHOOL
 - o Radar Serial Number: 590-113/65963
- KRKF007 NB 12637 84TH AVE NE @ SANDBURG ES / FINN HILL MS / THOREAU ES
 - Radar Serial Number: 590-113/67020
- KRKF008 SB 14006 84TH AVE NE @ SANDBURG ES / FINN HILL MS / THOREAU ES
 - o Radar Serial Number: 590-113/68181

Equipment:

Pro-Lite Plus Hand held Lidar Serial Number: LP05509

Certification Date: October 27, 2023

Lidar Operator: Charles Goodrich

RLC Operator: Catherine Koselka-Thompson

RLC Operator: Patricia Hernandez

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

KIRKLAND MUNICIPAL COURT



A speed validation test was conducted for the sites listed above. The Lidar Operator, obtained true measurements of five vehicles per lane in the ascending and/or descending direction. Those speeds were obtained using a Kustom Signals Pro-Lite+ hand held Lidar instrument. The speed of the vehicle is captured by the Lidar Operator and then relayed via cellular to the RLC Technician. The RLC Technician is monitoring the vehicle speed at the Fixed Speed Camera system simultaneously to ensure the accuracy of the system. The speed validation tests performed on the above-listed dates confirmed the accuracy of the Fixed Speed Camera systems at each location.

I, Lesieli Casale, certify that the information contained in this report is true and accurate.

lesieli Casale Signed: =

Date: July 9, 2024 Mesa, Arizona American Traffic Solutions Speed Integrity Team



Certificate of Achievement
Opeed Integrity Technician Has successfully completed the 16 hour course for Speed Integrity Technician
This course encompasses all the necessary tasks required to perform the duties as a Speed Integrity Technician. Through this course each participant is required to display the proper competency through written and practical examinations. In addition, this course certifies each participants as a Lidar operator.
Presented to: Charles Goodrich
This Day: March 29, 2016
ATS American Matthew Gioia Traffic Solutions Policy Traffic Laser/Radar Instructor
P(b): Community of Automative F1.11 American Traffic Solutions, Inc., 7681 East Gray Road, Scottedate, AZ 85260 Continues 2 40x 0-6813-0249 01
Cortificate of Achievement

Certificate of A	Achievement					
Speed Integrity Has successfully completed the course	<i>Technician</i> se for Speed Inegrity Technician					
This course encompasses all the necessary tasks required t Through this course each participant is required to display the Technology. In addition, this course certifies each participan	This course encompasses all the necessary tasks required to perform the duties as a Speed Integrity Technician. Through this course each participant is required to display the proper competencies in Radar and Laser Technology. In addition, this course certifies each participants as a Radar and Lidar operator.					
Presented to: Catherine Koselk	a					
This Day: August 21st, 2019	Tel Yol					
American Traffic Solutions	Tylor Yochim Radar Instructor					
RBLD Certificate of Achievement, VIII American Traffic Solutions, Inc., 7681 East	Gray Road, Scottsdale, AZ 85260 Centificate # VCO-0821-AZ-02					



Certificate of Ad	chievement
Speed Integrity I	Technician
Has successfully completed the course for	Speed Inegrity Technician
This course encompasses all the necessary tasks required to per Through this course each participant is required to display the pro Technology. In addition, this course certifies each participants as	form the duties as a Speed Integrity Technician. per competencies in Radar and Laser a Lidar operator.
Presented to: Patricia Hernandez	
January 12, 2023	
This Day:	Type Vol
American Traffic Solutions*	Tylor Yochim Radar Instructor
RDLD Certificate of Achievement VI 0 American Traffic Solutions, Inc., 7681 East Gray Ro	ad, Scottsdale, AZ 85260 .Certificate # VCC-1022-AZ-07



24 Factory Authorized	PB Electronics 8 W Peaceful Ct., Shepherd 502 543-7032 <u>www.pbele</u> Calibration Center for Stalke	Inc. sville, KY 40165 <u>ctronics.com</u> r, MPH, Kustom, Decatur and LTI
	Certificate of Cali	bration
Manufacturer: Kustom	Model: Pro-Lite	Serial Number: LP05509
hereby certify that this Spee peration under my supervisi	ed Measuring Device has been o ion. This Speed Measuring Dev	hecked for accuracy and correctness of ice is certified accurately within +/- 0.5 mph
hereby certify that this Spee peration under my supervisi stationary mode using equ he laser transmitter of this o levices as established by th CC License number PG-18	ed Measuring Device has been c ion. This Speed Measuring Dev ipment traceable to National Ins device has been tested and foun e Federal Communications Corr -12552 Technician Sig	thecked for accuracy and correctness of ice is certified accurately within +/- 0.5 mph titute of Standards and technology. d to be within specified range for Laser amission and IACP. nature Magazine State mature State mature Magazine State mature



VERRA MOBILITY
Kustom Signals Pro-Lite+ Lidar Speed Measurement Tool
DATE: June 11, 2024
Start of shift "Self-Diagnostic test" time:10:19 AM
Start of shift Distance check:100'lidar
End of shift "Self-Diagnostic test" time: 11:48 AM
End of shift Distance check:100'
City and State:Kirkland, WA
Lidar Serial Number:LP05509
Certification Date:October 27 th , 2023
OPERATOR:Charles Goodrich
I, <i>Charles Goodrich</i> , certify that the Kustom Signals Pro-Lite+ Lidar speed measurement device was setup, tested, and operated in accordance with the manufactures specifications to include its self- diagnostic check.
Further, I certified that the self-check distance was completed and accurate.
Signature: Change Marchander Date: June 11, 2024





Date			6/11/2024			
Time			10:53 AM			
Site ID			KRKF001			
Location			Kirkland, WA			
			NB 132ND AVE NE @ MUIR ELEMENTARY/KAMIAKIN			
Address				MIDD	LE	
Posted Spee	Posted Speed Limit			20MPH		
Trigger Spee	d Limit		26MPH			
Speed Type				Scho	ol	
Lidar Technie	cian			Charles G	oodrich	
AutoPatrol To	echnician		Catherine Thompson			
Lidar Serial N	lumber		LP05509			
Radar Serial	Number		590-112/61693			
Detection Ty	pe		Autopatrol-Radar			
Measure Mod	Measure Mode Capture			Yes		
Photo enforcement signs present			Yes	;		
Pass/ Fail				Pas	S	
Ascending of	r Descendin	g	Descending			
City Lane	Times	Lidar Speeds	s AP Speeds Delta Comments			
1	10.53.50	26	26	0		
1	10.54.07	26	26	0		
1	10.54.42	29	29	0		
1	10.55.22	28	27	-1		
1 10.55.43 18			19	1		





Date			6/11/2024			
Time			10:56 AM			
Site ID			KRKF002			
Location			Kirkland, WA			
			SB 132ND AVE N	E @ MUIR E	LEMENTARY/KAMIAKIN	
Address				MIDDL	E	
Posted Spee	Posted Speed Limit			20MPH		
Trigger Spee	d Limit	Service Service	26MPH			
Speed Type				Schoo	bl	
Lidar Techni	cian			Charles Go	odrich	
AutoPatrol T	echnician		Catherine Thompson			
Lidar Serial N	lumber		LP05509			
Radar Serial	Number		590-113/61397			
Detection Ty	pe			Autopatrol	Radar	
Measure Mode Capture			Yes			
Photo enforcement signs present			Yes			
Pass/ Fail				Pass		
Ascending o	r Descendin	g		Descend	ling	
City Lane	Times	Lidar Speeds	AP Speeds	Delta	Comments	
1	10.56.57	19	20	1		
1	10.57.03	28	27	-1		
1	10.57.13	23	23	0		
1	10.57.13	22	23	1		
1 10.57.34 27			26	-1		





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Date				6/11/2024		
Time			10:24 AM			
Site ID			KRKF003			
Location			Kirkland, WA			
Address			EB 80TH ST @ ROSE HILL ELEMENTARY			
Posted Speed Limit			20MPH			
Trigger Speed Limit				26MPI	4	
Speed Type		A Participant		Schoo	bl	
Lidar Technie	cian			Charles Go	odrich	
AutoPatrol To	echnician		(Catherine Th	ompson	
Lidar Serial N	lumber		LP05509			
Radar Serial	Number	and the second state	590-113/64176			
Detection Ty	ре		Autopatrol-Radar Yes Yes Pass			
Measure Mod	le Capture					
Photo enforc	ement signs	s present				
Pass/ Fail						
Ascending o	r Descendin	g		Descend	ling	
City Lane	Times	Lidar Speeds	AP Speeds	Delta	Comments	
1	10.24.08	34	33	-1		
1	10.25.55	22	21	-1		
1	10.26.16	26	25	-1		
1	10.30.39	18	19	1		
1 10.33.06 23			23	0		





			All the second se	The second s	
Date				6/11/20	24
Time			10:33 AM		
Site ID			KRKF004		
Location			Kirkland, WA		
Address			WB 80TH ST @ ROSE HILL ELEMENTARY		
Posted Speed Limit			20MPH		
Trigger Speed Limit			26MPH		
Speed Type	and the second second			Schoo	bl
Lidar Technic	cian			Charles Go	odrich
AutoPatrol To	echnician		C	Catherine Th	ompson
Lidar Serial N	lumber		LP05509		
Radar Serial	Number		590-112/62298		
Detection Ty	pe		Autopatrol-Radar		
Measure Mod	Measure Mode Capture			Yes	
Photo enforc	Photo enforcement signs present			Yes	
Pass/ Fail				Pass	
Ascending of	r Descendin	g		Descend	ling
City Lane	Times	Lidar Speeds	AP Speeds	Delta	Comments
1	10.33.02	25	24	-1	
1	10.34.27	31	30	-1	
1	10.34.30	32	33	1	
1	10.35.27	28	28	0	
1 10.37.21 24			24	0	





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Date			6/11/2024			
Time			11:39 AM			
Site ID			KRKF005			
Location			Kirkland, WA			
Address			SB 724 STATE ST @ LAKEVIEW ELEMENTARY SCHOOL			
Posted Spee	d Limit		20MPH			
Trigger Spee	d Limit			26M	ЪН	
Speed Type				Scho	ool	
Lidar Techni	cian			Charles G	oodrich	
AutoPatrol T	echnician			Patricia He	rnandez	
Lidar Serial N	lumber		LP05509			
Radar Serial	Number		590-113/65925			
Detection Ty	ре		Autopatrol-Radar			
Measure Mode Capture				Yes	S	
Photo enforc	noto enforcement signs present			Yes	S	
Pass/ Fail			Pass			
Ascending or Descending			Descer	nding		
City Lane	Times	Lidar Speeds	AP Speeds	Delta	Comments	
1	11.39.01	24	24	0		
1	11.39.56	29	29	0		
1	11.39.59	31	31	0		
1	11.40.25	27	26	-1		
1 11.40.33 26			26	0		





Date			6/11/2024				
Time				11:42	AM		
Site ID				KRKF	006		
Location				Kirkland	I, WA		
			WB 10600 NE 6	8TH ST @ LA	KEVIEW ELEMENTARY		
Address				SCHO	OL		
Posted Spee	d Limit		20MPH				
Trigger Spee	d Limit		26MPH				
Speed Type			School				
Lidar Technie	cian		Charles Goodrich				
AutoPatrol Technician			Patricia Hernandez				
Lidar Serial Number			LP05509				
Radar Serial Number			590-113/65963				
Detection Type				Autopatro	I-Radar		
Measure Mode Capture				Yes			
Photo enforcement signs present				Yes	i		
Pass/ Fail				Pas	S		
Ascending o	r Descendin	g		Descen	ding		
City Lane	Times	Lidar Speeds	AP Speeds	Delta	Comments		
1	11.42.22	25	25	0			
1	11.43.03	29	30	1			
1	11.43.14	28	29	1			
1	11.43.21	29	30	1			
1	11 43 30	29	30	1			





Date				6/11/2024				
Time				11:17	7 AM			
Site ID				KRKI	-007			
Location				Kirklan	d, WA			
Address			NB 12637 84TH AVE NE @ SANDBURG ES / FINN HILL MS / THOREAU ES					
Posted Spee	d Limit		20MPH					
Trigger Spee	d Limit			26M	PH			
Speed Type				Sch	ool			
Lidar Technician			Charles Goodrich					
AutoPatrol Technician			Patricia Hernandez					
Lidar Serial Number			LP05509					
Radar Serial Number			590-113/67020					
Detection Type				Autopatro	ol-Radar			
Measure Mode Capture				Ye	S			
Photo enforcement signs present				Ye	S			
Pass/ Fail				Pa	SS			
Ascending of	Descendin	g		Desce	nding			
City Lane	Times	Lidar Speeds	AP Speeds	Delta	Comments			
1	11.17.14	30	31	1				
1	11.19.02	29	29	0				
1	11.21.05	26	26	0				
1	11.23.17	29	30	1				
1	11.25.22	26	26	0				





Date			6/11/2024				
Time	Contraction of the second			44.44	AM		
Time				KDKE008			
Site ID				KRKF	-008		
Location				Kirklan	d, WA		
Address			SB 14006 84TH A	AVE NE @ SAN THORE	IDBURG ES / FINN HILL MS / AU ES		
Posted Spee	d Limit			20M	PH		
Trigger Spee	d Limit		26MPH				
Speed Type			School				
Lidar Technie	cian		Charles Goodrich				
AutoPatrol Technician			Patricia Hernandez				
Lidar Serial Number			LP05509				
Radar Serial Number				590-113	/68181		
Detection Type				Autopatro	ol-Radar		
Measure Mode Capture				Ye	S		
Photo enforcement signs present				Ye	S		
Pass/ Fail				Pas	SS		
Ascending o	r Descendin	g		Descei	nding		
City Lane	Times	Lidar Speeds	AP Speeds	Delta	Comments		
1	11.11.35	29	29	0			
1	11.12.16	31	31	0			
1	11.13.29	25	26	1			
1	11.14.00	27	26	-1			
1	11.14.45	27	27	0			



Report No.: 1910-071EA-286

Revision:

N/C

Radar Sensor Calibration Verification Certificate of Calibration

FILED

Model: RRS24F-ST3

JUL 18 2024 MUNICIPAL COURT

Part Number / Serial Number: 590-113/65925 Ex. 590-XXX / 6XXXX

Description: **Radar Characteristics Validation** In compliance with: RRS24F-ST3 Radar Sensor Calibration Verification Procedure Documentation (5030-0150)

> Date of Issue: February 14, 2024

Owner of EUT:

Verra Mobility 1150 N. Alma School Rd Mesa, AZ 85201

Attention of:

Engineering Department Phone: (480) 443-7000

	Test Facility				
Test Laboratory	Keystone Compliance, LLC				
Address	131 North Columbus Innerbelt				
City, State, Zip Code	New Castle, PA 16101				
Phone	(724) 657-9940				
Email	emcteam@keystonecompliance.com				
Web Site	www.keystonecompliance.com				

	Test Personnel
Name	Camren Morgan
Title	EMC Test Engineer
Signature	Erun drug

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Report No.: 1910-071EA-286

Revision: N/C

Radar Sensor Calibration Verification Certificate of Calibration

Model: RRS24F-ST3

Part Number / Serial Number: 590-113/65925 Ex. 590-XXX / 6XXXX

Date of Issue: February 14, 2024

The frequency measurements performed and recorded within this report demonstrate that the JENOPTIK RR24F-ST3 radar has an accuracy of less than or equal to 0.62 mph in the range of 6.21 mph to 62.14 mph and an accuracy of 0.62 mph to 1.86 mph in the range of 62.14 mph to 186.41 mph. This is equal to or better than +/-1 mph accuracy up to 100 mph, as specified by the manufacturer.

FSK Frequency Set 1								
Nominal Frequency (GHz)	Measured Frequency (GHz)	Amplitude (dBm)	Frequency Deviation (MHz)	Limit (MHz)	Results			
$f_0 = 24.08$	24.0786	15.8108307	-1.40	+/- 48.2	PASS			
f ₁ = 24.08725	24.086075	16.1454464	-1.17	+/- 48.2	PASS			
$f_2 = 24.089$	24.087699	17.4500784	-1.30	+/- 48.2	PASS			
$f_3 = 24.09$	24.088674	17.872436	-1.33	+/- 48.2	PASS			

FSK Frequency Set 2								
Nominal Frequency (GHz)	Measured Frequency (GHz)	Amplitude (dBm)	Frequency Deviation (MHz)	Limit (MHz)	Results			
$f_0 = 24.12$	24.118249	16.8162451	-1.75	+/- 48.2	PASS			
f ₁ = 24.12725	24.125725	16.5628585	-1.53	+/- 48.2	PASS			
$f_2 = 24.129$	24.127351	17.5154845	-1.65	+/- 48.2	PASS			
$f_3 = 24.13$	24.128326	17.7138494	-1.67	+/- 48.2	PASS			

FSK Frequency Set 3								
Nominal Frequency (GHz)	Measured Frequency (GHz)	Amplitude (dBm)	Frequency Deviation (MHz)	Limit (MHz)	Results			
$f_0 = 24.16$	24.158876	16.7146396	-1.12	+/- 48.2	PASS			
$f_1 = 24.16725$	24.166025	17.2672417	-1.22	+/- 48.2	PASS			
$f_2 = 24.169$	24.167651	18.6378726	-1.35	+/- 48.2	PASS			
$f_3 = 24.17$	24.16895	18.867236	-1.05	+/- 48.2	PASS			

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Report No.: 1910-071EA-280

Revision:

N/C

Radar Sensor Calibration Verification Certificate of Calibration

Model: RRS24F-ST3

FILED

JUL 18 2024

Part Number / Serial Number: 590-113/65963 Ex. 590-XXX / 6XXXX

KIRKLAND MUNICIPAL COURT

Description: **Radar Characteristics Validation**

In compliance with: RRS24F-ST3 Radar Sensor Calibration Verification Procedure Documentation (5030-0150)

> January 15, 2024 Date of Issue:

Owner of EUT:

Verra Mobility 1150 N. Alma School Rd Mesa, AZ 85201

Attention of:

Engineering Department Phone: (480) 443-7000

Test Facility				
Test Laboratory	Keystone Compliance, LLC			
Address	131 North Columbus Innerbelt			
City, State, Zip Code	New Castle, PA 16101			
Phone	(724) 657-9940			
Email	emcteam@keystonecompliance.com			
Web Site	www.keystonecompliance.com			

	Test Personnel				
Name	Camren Morgan				
Title	EMC Test Engineer				
Signature	enn ànz				

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Report No.: 1910-071EA-280

Revision: N/C

Radar Sensor Calibration Verification Certificate of Calibration

Model: RRS24F-ST3

Part Number / Serial Number: 590-113/65963 Ex. 590-XXX / 6XXXX

Date of Issue: January 15, 2024

The frequency measurements performed and recorded within this report demonstrate that the JENOPTIK RR24F-ST3 radar has an accuracy of less than or equal to 0.62 mph in the range of 6.21 mph to 62.14 mph and an accuracy of 0.62 mph to 1.86 mph in the range of 62.14 mph to 186.41 mph. This is equal to or better than +/- 1 mph accuracy up to 100 mph, as specified by the manufacturer.

FSK Frequency Set 1								
Nominal Frequency (GHz)	Measured Frequency (GHz)	Amplitude (dBm)	Frequency Deviation (MHz)	Limit (MHz)	Results			
$f_0 = 24.08$	24.078275	17.1728307	-1.72	+/- 48.2	PASS			
f ₁ = 24.08725	24.085424	17.4764474	-1.83	+/- 48.2	PASS			
$f_2 = 24.089$	24.087376	18.5680744	-1.62	+/- 48.2	PASS			
$f_3 = 24.09$	24.088351	18.679435	-1.65	+/- 48.2	PASS			

FSK Frequency Set 2								
Nominal Frequency (GHz)	Measured Frequency (GHz)	Amplitude (dBm)	Frequency Deviation (MHz)	Limit (MHz)	Results			
$f_0 = 24.12$	24.118575	19.4972441	-1.43	+/- 48.2	PASS			
f ₁ = 24.12725	24.125725	19.5668565	-1.53	+/- 48.2	PASS			
$f_2 = 24.129$	24.127351	20.5734825	-1.65	+/- 48.2	PASS			
f ₃ = 24.13	24.128651	21.0518474	-1.35	+/- 48.2	PASS			

FSK Frequency Set 3						
Nominal Frequency (GHz)	Measured Frequency (GHz)	Amplitude (dBm)	Frequency Deviation (MHz)	Limit (MHz)	Results	
$f_0 = 24.16$	24.158226	18.7486366	-1.77	+/- 48.2	PASS	
$f_1 = 24.16725$	24.165702	19.1802437	-1.55	+/- 48.2	PASS	
$f_2 = 24.169$	24.167326	20.6308766	-1.67	+/- 48.2	PASS	
$f_3 = 24.17$	24.168301	20.793231	-1.70	+/- 48.2	PASS	

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			KIRKLAND
VERRA MOBILITY	PREVENTIVE MAINTENANCE CHECKLIST		
Date & Time: 06/15/2024 15:31:00 Site ID: KRKF005	KF005 Location: SB 724 STATE ST @ LAKEVIEW ELEMENTARY SCHOOL		
Product: AutoPatrol	Technician Name: Thomas Yuen See Associated Ticket:		
Item		Status	Note/Action (If Status N/A, please specify)
1. Clean dirt, grime, and graffiti off enclosure and glass.			
1.1. Clean Graffiti.		N/A	
Check physical integrity. Check paint/housing for graffiti and (or) other vand	dalism.		
1.2. Clean Glass:		Pass	
Clean and inspect all glass and enclosures.			
1.3. Clean Enclosure (Interior):		N/A	
Clear vents/fans of obstruction. Remove dust and dirt by vacuum/wiping.			
1.4. Check Enclosure:		N/A	
If enclosure moved during cleaning, tighten base.			
2. Perform a general site inspection to include environmental and road con	iditions.		
2.1. PLP/Loop Loop:			
Check for exposed or cut loop wiring, and epoxy wear and tear.			
2.2. Power & Grounding:		N/A	
Inspect all power and grounding connections.			
2.3. Radar:		N/A	
Inspect radar and cables. Visually inspect antenna.			
2.4. WVDs:			
Check for popped out pucks, visible cracks, or other noticeable damage.			
3. Inspect poles, bases, and enclosures.			

	 	
3.1. Pole: Check sturdiness. Check hurricane collar and confirm screws are tight.	N/A	
3.2. Base: Check for cracks. Ensure bolts (and latch bolt) are tight and secure inside base.	N/A	
3.3. Enclosure: Confirm straps are tight and secure against pole. Tighten if loose.	N/A	
4. Inspect cables and connections.		
4.1. Cables: Check all cables for visible wear or damage.	N/A	
4.2. Connections: Check for exposed wires on pole connecting to radar, camera enclosure, and strobe.	N/A	

5. Take (and attach) photo of enclosure, pole, and photo enforcement sign(s) for presence and damage.

5.1. Enclosure:



5.2. Pole:



5.3. Photo Enforcement Sign(s):



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	PREVENTIVE MAINTENANCE CHECKLIST			
Date & Time: 06/15/2024 15:35:00 Site ID: KRKF006 Location: WB 10600 NE 68TH ST @ LAKEVIEW ELEMENTARY SCHOOL				
Product: AutoPatrol Technician Name: Thomas Yue	n	See Associated Ticket:		
Item	Status	Note/Action (If Status N/A, please specify)		
1. Clean dirt, grime, and graffiti off enclosure and glass.				
1.1. Clean Graffiti.				
Check physical integrity. Check paint/housing for graffiti and (or) other vandalism.				
1.2. Clean Glass:				
Clean and inspect all glass and enclosures.				
1.3. Clean Enclosure (Interior):				
Clear vents/fans of obstruction. Remove dust and dirt by vacuum/wiping.				
1.4. Check Enclosure:	N/A			
If enclosure moved during cleaning, tighten base.				
2. Perform a general site inspection to include environmental and road conditions.				
2.1. PLP/Loop Loop:				
Check for exposed or cut loop wiring, and epoxy wear and tear.				
2.2. Power & Grounding:	N/A			
Inspect all power and grounding connections.				
2.3. Radar:				
Inspect radar and cables. Visually inspect antenna.				
2.4. WVDs:				
Check for popped out pucks, visible cracks, or other noticeable damage.				
3. Inspect poles, bases, and enclosures.				

3.1. Pole:	N/A	
Check sturdiness. Check hurricane collar and confirm screws are tight.		
3.2. Base: Check for cracks. Ensure bolts (and latch bolt) are tight and secure inside base	N/A	
	h	
3.3. Enclosure:	N/A	
Confirm straps are tight and secure against pole. Tighten if loose.		
4. Inspect cables and connections.		
4.1. Cables:	N/A	
Check all cables for visible wear or damage.		
4.2. Connections:	N/A	
Check for exposed wires on pole connecting to radar, camera enclosure, and strobe.		

5. Take (and attach) photo of enclosure, pole, and photo enforcement sign(s) for presence and damage.

5.1. Enclosure:



5.2. Pole:



5.3. Photo Enforcement Sign(s):