### CERTIFICATE CONCERNING DESIGN AND CONSTRUCTION OF ELECTRONIC SPEED MEASURING DEVICES

I, Nathan Dumler, 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 2 years. I became a speed validation technician in 2018 and have over 1000 hours performing speed validation tests. I am nationally certified as a RADAR and LIDAR operator. The City of Kirkland currently uses the AutoPatrol<sup>TM</sup> 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 132 <sup>nd</sup> Ave NE @ Muir Elementary/Kamiakin Middle	1
KRKF002	SB 132 <sup>nd</sup> Ave NE @ Muir Elementary/Kamiakin Middle	1
KRKF003	EB 80 <sup>th</sup> St @ Rose Hill Elementary	1
KRKF004	WB 80 <sup>th</sup> St @ Rose Hill Elementary	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 Code	Location Description	Date of Test
KRKF001	NB 132 <sup>nd</sup> Ave NE @ Muir Elementary/Kamiakin Middle	3/18/2021
KRKF002	SB 132 <sup>nd</sup> Ave NE @ Muir Elementary/Kamiakin Middle	3/18/2021
KRKF003	EB 80 <sup>th</sup> St @ Rose Hill Elementary	3/18/2021
KRKF004	WB 80 <sup>th</sup> St @ Rose Hill Elementary	3/18/2021

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

Dated this <u>25th</u> day of <u>April</u>. 2021 in <u>Mesa, AZ</u>

nothon Dumlen

Nathan Dumler, Speed Validation Technician



## Speed Validation Report Client: Kirkland, WA

### Validation Date January 22, 2021

- KRKF001 NB 132<sup>nd</sup> Ave NE @ Muir Elementary/Kamiakin Middle
  Radar Serial Number: 590-112/61344
- KRKF002 SB 132<sup>nd</sup> Ave NE @ Muir Elementary/Kamiakin Middle
  Radar Serial Number: 590-112/65874
- KRKF003 EB 80<sup>th</sup> St @ Rose Hill Elementary
  - o Radar Serial Number: 590-112/61399
- KRKF004 WB 80<sup>th</sup> St @ Rose Hill Elementary
  - o Radar Serial Number: 590-112/60129

### Equipment:

Pro-Lite Plus Hand held Lidar Serial Number: LP03606 Certification Date: February 3, 2021 Lidar Operator: Charles Goodrich RLC Operator: Pasquale Mosso

A speed validation test was conducted for the sites listed above. The Lidar Operator, Charles Goodrich, 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, Pasquale Mosso. 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, Nathan Dumler, certify that the information contained in this report is true and accurate.

hon Sumler

Date: April 25th, 2021 Mesa, Arizona American Traffic Solutions Speed Integrity Team

FILED APR 2 7 2021 KIRKLAND MUNICIPAL COURT



Certificate of Achievement
Speed 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
American Traffic Solutions      Matthew Goia        Police: Traffic Laser/Radar Instructor        RSLD Centricates of Administration (VFD)
Certificate of Achievement
Speed Integrity Technician Has successfully completed the course for Speed Inegrity 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 competencies in Radar and Laser Technology. In addition, this course certifies each participants as a Lidar operator.
Presented to: Pasquale Mosso
Presented to: Pasquale Mosso This Day: August 01, 2018
Presented to: Pasquale Mosso This Day: August 01, 2018 American Traffic Solutions" Tylor Yochim Radar Instructor



# SOUTHERN CALIFORNIA RADAR/LASER CERTIFICATION LABORATORY

P.O. Box 2397 Borrego Springs, CA 92004 619-922-3504

I certify that the Kustom Pro-Lite+, Serial Number LP03606 was tested on February 3, 2021, and was calibrated to be within the Manufacturers specifications for accuracy.

- This unit meets or exceeds the NHTSA standards for accuracy.
- · This unit is on the IACP Conforming Product List.
- This units tests meet the standard set forth in cvc 40802().

Test Results						
Test	Min	Max	Read	Pass		
Visual/Function	-	-	Inspect	Yes		
Range @ 100 ft.	5	+.5	100.0	Yes		
Beam Width	-	.003	.0013	Yes		
Acquisition Time @ 60MPH	-	.3Sec	.18Sec	Yes		
35MPH	-2 MPH	+1MPH	35MPH	Yers		
50MPH	-2 MPH	+1MPH	50MPH	Yous		
65MPH	-2 MPH	+1MPH	65MPH	Yes		
Pulse Width		<100nS	22.4nS	V 638		
PRF	200	200	200	Yes		
Sight Accuracy	N/A	003	.001	Yes		
Oscillator Frequency	19.9980 MHz	20.0020 MHz	19.999 MHz	Yes		
Beam Power Total/7mm	-	175uW 26uW	151 uW 15.5uW	Yes Ves		

The own was downingly (click in access on any "417 b) and Managements in an animal scale and approximate particularly designed and bark contained provided reasonance and an activity of the statistical Threads placed all applications must be baren. The Othersel of the American has an exclusion of the American

I certify (or declare) under the penalty of perjury under the laws of the state of California that the foregoing is true and correct.

Date: February 3, 2021 By: William F. Dunable, MS/CIS, FCC Lic. # PG-11SD-2354

Serving Law Enforcement Since 1995 www.SoCalRadar-laserCertificationLab.com





# SELF-ACCURACY TEST Kustom Signals Pro-Lite+ Lidar Speed Measurement Tool

DATE:	3/18/2021		_	
Start of shift "Se	lf Diagnostic test"	time:	10:00 AM	
Start of shift Dis	tance check:	100'	lidar	
End of shift "Sel	f Diagnostic test"	time:	11:AM PM	
End of shift Dist	ance check:	100'		
City and State: _	Kirkland, WA_			
Lidar Serial Nur	nber:	LP03	606	
Certification Da	te:Febr	ruary 3 <sup>rd</sup> ,	2021	
OPER ATOR:	Charles	Goodrich		

I, *Charles Goodrich*, 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: Con Man Date: 3/18/2021





# Speed Validation Worksheet

Date			3/18/2021				
Time			10:22am				
Site ID			KRKF003				
Location				Kirkland	, WA		
Address			EB 80th	St @ Rose	Hill Elementary		
Posted Spec	ed Limit			20MP	Н		
Trigger Spe	ed Limit			26MP	Н		
Speed Type			Fixe	d Speed/ Se	chool Zone		
Lidar Techn	ician			Charles Go	odrich		
AutoPatrol 1	echnician			Pasquale N	Nosso		
Lidar Serial	Number		LP03606				
Radar Seria	Number		590-112 / 61399				
Detection T	Detection Type			Autopatrol-Radar			
Measure Mo	ode Captur	e	Yes				
Photo enfor	cement sig	ins present	Yes				
Pass/ Fail				Yes			
Ascending of	or Descend	ing		Descend	ding		
		revised 06/04/15 SIT I	M.G. proprietary and	confidential			
City Lane	Times	Lidar Speeds	AP Speeds	Delta	Comments		
1	10:25:53	30	29	0			
1	10:27:09	29	29	0			
1	10:27:26	31	31	2			
1	10:31:31	23	22	-1			
1	10:31:45	24	25	1	and the second		





# Speed Validation Worksheet

Date			3/18/2021				
Time			10:35am				
Site ID			KRKF004				
Location			Kirkland, WA				
Address		Contraction of the second	WB 80th St @ Rose Hill Elementary				
Posted Spee	ed Limit			20MP	н		
Trigger Spe	ed Limit			26MP	Н		
Speed Type			Fixe	d Speed/ So	chool Zone		
Lidar Techn	ician			Charles Go	odrich		
AutoPatrol T	echnician			Pasquale N	losso		
Lidar Serial	Number		LP03606				
Radar Serial	Number		590-112 / 60129				
Detection T	Detection Type			Autopatrol-Radar			
Measure Mo	de Captur	e	Yes				
Photo enfor	cement sig	ns present	Yes				
Pass/ Fail				Yes			
Ascending o	or Descend	ing	Descending				
		revised 06/04/15 SIT I	M.G. proprietary and	confidential			
City Lane	Times	Lidar Speeds	AP Speeds	Delta	Comments		
1	10:37:54	29	30	1			
1	10:38:59	20	21	-1			
1	10:39:40	26	26	0			
1	10:40:23	20	21	0			
1	10:41:05	24	25	-1			



**Preventive Maintenance Checklist** 

Time:



# FILED APR 2 7 2021 KIRKLAND MUNICIPAL COURT

 $\square$ 

Date: 03/18/2021

Vendor: NSA

Site ID: KRKF003

Location: 80th St @ Rose Hill Elementary

Escalate to ATS:

The individual identified represents and warrants that he or she has personal knowledge of the information provided herein, that the information is true and correct as of the date set forth herein, and that the

information as set forth may be relied upon as a business record produced in the normal course of a regularly conducted business conducted business activity as a regular practice.

**Technician Name: Charles Goodrich** 

Item	Status	Note/Action
1.1 Clean dirt, grime, and graffiti off enclosure and clean glass.		
Clean Glass: If glass is cracked on the enclosure, immediately stop work and contact your manager or the ATS Field Service Manager via phone call to report the issue.	NA	
Clean graffiti: If cleaning is expected to take more than 15 minutes, immediately stop work and contact your manager or the ATS Field Service Manager via phone call to report the issue.	NA	
Clean Enclosure: If enclosure moves while cleaning glass, immediately stop work and contact your manager or the ATS Field Service Manager via phone call to report the issue.	NA	
1.2 Perform a general site inspection to include environmental and road conditions. If fails, open a new repair ticket		
WVDs: check for any pucks popped out of the road or any visible cracks.	NA	
PLP/LL: check for exposed loop wire, cut loop wire, and wear and tear on epoxy.	NA	
1.3 Inspect poles, bases, enclosures. If any repair work is necessary that will take longer than 15 minutes to complete, immediately stop work and contact your manager or the ATS Field Service Manager via phone call to report the issue.		
Ensure pole is sturdy. Check hurricane collar and ensure screws are tight.	NA	
Ensure base does not have any cracks. Ensure bolts ae tight inside the base and also the latch bolt.	NA	
Ensure enclosure is well strapped to the pole and is not loose. Tighten if loose.	NA	
1.4 Inspect cables and connections. If any repair work is necessary, immediately stop work and contact your manager or the ATS		
Field Service Manager via phone call to report the issue.		
Check for any wear or damage.	NA	
Check for exposed wires on pole connecting to radar cables, camera enclosure, and strobe.	NA	THIS DOCUMENT IS MAINTAINED AS A PUBLIC RECORD IN
		ACCORDANCE WITH RCW 5.44

Pole at a distance



Clean enforcment sign



#### Pole close up



Clean enclosure







FILED
APR 27 2021
KIRKLAND MUNICIPAL COURT

**Preventive Maintenance Checklist** 

Time:

Date: 03/18/2021

Vendor: NSA

Site ID: KRKF004

Location: 80th St @ Rose Hill Elementary

Escalate to ATS:

The individual identified represents and warrants that he or she has personal knowledge of the information provided herein, that the information is true and correct as of the date set forth herein, and that the

information as set forth may be relied upon as a business record produced in the normal course of a regularly conducted business conducted business activity as a regular practice.

**Technician Name: Charles Goodrich** 

Item	Status	Note/Action
1.1 Clean dirt, grime, and graffiti off enclosure and clean glass.		
Clean Glass: If glass is cracked on the enclosure, immediately stop work and contact your manager or the ATS Field Service Manager via phone call to report the issue.	NA	
Clean graffiti: If cleaning is expected to take more than 15 minutes, immediately stop work and contact your manager or the ATS Field Service Manager via phone call to report the issue.	NA	
Clean Enclosure: If enclosure moves while cleaning glass, immediately stop work and contact your manager or the ATS Field Service Manager via phone call to report the issue.	NA	
1.2 Perform a general site inspection to include environmental and road conditions. If fails, open a new repair ticket		
WVDs: check for any pucks popped out of the road or any visible cracks.	NA	
PLP/LL: check for exposed loop wire, cut loop wire, and wear and tear on epoxy.	NA	
1.3 Inspect poles, bases, enclosures. If any repair work is necessary that will take longer than 15 minutes to complete, immediately stop work and contact your manager or the ATS Field Service Manager via phone call to report the issue.		
Ensure pole is sturdy. Check hurricane collar and ensure screws are tight.	NA	
Ensure base does not have any cracks. Ensure bolts ae tight inside the base and also the latch bolt.	NA	
Ensure enclosure is well strapped to the pole and is not loose. Tighten if loose.	NA	
1.4 Inspect cables and connections. If any repair work is necessary, immediately stop work and contact your manager or the ATS Field Service Manager via phone call to report the issue.		
Check for any wear or damage.	NA	
Check for exposed wires on pole connecting to radar cables, camera enclosure, and strobe.	NA	THIS DOCUMENT IS MAINTAINED AS A PUBLIC RECORD IN
		ACCORDANCE WITH RCW 5.44

Pole at a distance



Clean enforcment sign



#### Pole close up



Clean enclosure





## Compliance Testing, LLC

Previously Flom Test Lab EMI, EMC, RF Testing Experts Since 1963

## System Verification Test Report

Prepared for: American Traffic Solutions

Model: RRS24F-ST3 (-40 to +70)

#### Serial Number: 590-113 / 61399

#### **Description: Radar Beam Characteristics**

То

#### Jenoptik Multi-Radar System Verification Procedure Base Frequency Test

Date of Issue: 12/10/2020

On the behalf of the applicant:

American Traffic Solutions 1150 N Alma School Rd Mesa, AZ 85201

Prepared by Compliance Testing, LLC 1724 S. Nevada Way Mesa, Arizona 85204 (480) 926-3100 phone / (480) 926-3598 fax <u>www.compliancetesting.com</u> Project No: p20c0001

Todd Lasher Project Test Engineer

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

tol-free: (866) 311-3268 fax: (480) 926-3598

http://www.ComplainceTecturg.com ນາກ່ອງມີcomplainceTecturg.com

FILED

APR 27 2021

KIRKLAND MUNICIPAL COURT



## Compliance Testing, LLC

**Previously Flom Test Lab** EMI, EMC, RF Testing Experts Since 1963 Imp // www.ComplemeTexing.com

mos gnitteTetrickqmo3@otni

#### **Test Results Summary Table**

The frequency measurements performed by Compliance Testing, LLC and reported within this report demonstrate that the Jenoptik RRS24F-ST3 radar system has an accuracy of less than or equal to 0.62 mph in the range 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.

#### **Test Frequency Set 1**

Nominal Frequency (GHz)	Measured Frequency (GHz)	Amplitude (dBm)	Frequency Deviation (MHz)	Limit (MHz)	Results
$F_0 = 24.08$	24.07835	7.722	1.65 +/- 0.03	+/- 48.2	Pass
F <sub>1</sub> = 24.08725	24.08560	8.409	1.65 +/- 0.03	+/- 48.2	Pass
F <sub>2</sub> = 24.089	24.08730	9.619	1.70 +/- 0.03	+/- 48.2	Pass
F <sub>3</sub> = 24.09	24.08835	9.867	1.65 +/- 0.03	+/- 48.2	Pass

#### **Test Frequency Set 2**

Nominal Frequency (GHz)	Measured Frequency (GHz)	Amplitude (dBm)	Frequency Deviation (MHz)	Limit (MHz)	Results
$F_0 = 24.12$	24.11840	8.129	1.60 +/- 0.03	+/- 48.2	Pass
F <sub>1</sub> = 24.12725	24.12570	8.804	1.55 +/- 0.03	+/- 48.2	Pass
F <sub>2</sub> = 24.129	24.12745	10.130	1.55 +/- 0.03	+/- 48.2	Pass
F <sub>3</sub> = 24.13	24.12845	10.220	1.55 +/- 0.03	+/- 48.2	Pass

#### **Test Frequency Set 3**

Nominal Frequency (GHz)	Measured Frequency (GHz)	Amplitude (dBm)	Frequency Deviation (MHz)	Limit (MHz)	Results
F <sub>0</sub> = 24.16	24.15860	7.891	1.40 +/- 0.03	+/- 48.2	Pass
F <sub>1</sub> = 24.16725	24.16580	8.265	1.45 +/- 0.03	+/- 48.2	Pass
F <sub>2</sub> = 24.169	24.16765	9.784	1.35 +/- 0.03	+/- 48.2	Pass
F <sub>3</sub> = 24.17	24.16860	9.880	1.40 +/- 0.03	+/- 48.2	Pass



## Compliance Testing, LLC

Previously Flom Test Lab EMI, EMC, RF Testing Experts Since 1963

## System Verification Test Report

**Prepared for: American Traffic Solutions** 

Model: RRS24F-ST3

#### Serial Number: 590-112 / 60129

#### **Description: Radar Beam Characteristics**

То

#### Jenoptik Multi-Radar System Verification Procedure Base Frequency Test

Date of Issue: 11/11/2020

On the behalf of the applicant:

American Traffic Solutions 1150 N Alma School Rd Mesa, AZ 85201

Prepared by Compliance Testing, LLC 1724 S. Nevada Way Mesa, Arizona 85204 (480) 926-3100 phone / (480) 926-3598 fax www.compliancetesting.com Project No: p20b0001

Todd Lasher Project Test Engineer

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

tol-free: (866) 311-3268 fax: (480) 926-3598

http://www.ComplenceTecting.com http://www.ComplenceTecting.com

> FILED APR 2 7 2021 KIRKLAND MUNICIPAL COURT



### Compliance Testing, LLC Previously Flom Test Lab

EMI, EMC, RF Testing Experts Since 1963 http://www.ComplemeTexprog.com

mos grittesTecnelqmoS@stni

#### **Test Results Summary Table**

The frequency measurements performed by Compliance Testing, LLC and reported within this report demonstrate that the Jenoptik RRS24F-ST3 radar system has an accuracy of less than or equal to 0.62 mph in the range 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.

#### **Test Frequency Set 1**

Nominal Frequency (GHz)	Measured Frequency (GHz)	Amplitude (dBm)	Frequency Deviation (MHz)	Limit (MHz)	Results
F <sub>0</sub> = 24.08	24.07865	8.039	1.35 +/- 0.03	+/- 48.2	Pass
F <sub>1</sub> = 24.08725	24.0858	8.688	1.45 +/- 0.03	+/- 48.2	Pass
F <sub>2</sub> = 24.089	24.08765	9.675	1.35 +/- 0.03	+/- 48.2	Pass
F <sub>3</sub> = 24.09	24.08865	9.936	1.35 +/- 0.03	+/- 48.2	Pass

#### **Test Frequency Set 2**

Nominal Frequency (GHz)	Measured Frequency (GHz)	Amplitude (dBm)	Frequency Deviation (MHz)	Limit (MHz)	Results
F <sub>0</sub> = 24.12	24.1183	7.53	1.7 +/- 0.03	+/- 48.2	Pass
F <sub>1</sub> = 24.12725	24.12555	8.491	1.7 +/- 0.03	+/- 48.2	Pass
F <sub>2</sub> = 24.129	24.12735	9.544	1.65 +/- 0.03	+/- 48.2	Pass
F <sub>3</sub> = 24.13	24.12835	9.823	1.65 +/- 0.03	+/- 48.2	Pass

#### **Test Frequency Set 3**

Nominal Frequency (GHz)	Measured Frequency (GHz)	Amplitude (dBm)	Frequency Deviation (MHz)	Limit (MHz)	Results
F <sub>0</sub> = 24.16	24.1586	7.653	1.4 +/- 0.03	+/- 48.2	Pass
F <sub>1</sub> = 24.16725	24.16585	8.694	1.4 +/- 0.03	+/- 48.2	Pass
F <sub>2</sub> = 24.169	24.16765	9.954	1.35 +/- 0.03	+/- 48.2	Pass
F <sub>3</sub> = 24.17	24.1687	9.984	1.3 +/- 0.03	+/- 48.2	Pass