DPSST POLICE TRAFFIC
RADAR & LIDAR OPERATOR'S COURSE

RADAR/LIDAR
AGENCY PRACTICAL EXERCISES

STUDENT NAME: _____

INSTRUCTIONS:

Complete all applicable exercises on pages 1-9 under the supervision of your RADAR/LIDAR Instructor or an FTO who is already a certified RADAR/LIDAR Operator.

* If you only took the RADAR Operator course only perform the RADAR exercises.
* If you only took the LIDAR Operator course then only perform the LIDAR exercises.
*If your class included both RADAR & LIDAR you will need to complete all of the exercises.

Once the exercises have been completed, please submit the Certification of Completion (online). Upon verification that all required components have been completed an Operators Card will be emailed to you. Please follow the directions carefully on the certificate page. Failure to do so may delay the processing of the DPSST issued RADAR/LIDAR Operator card and the DPSST generated F6 for completion of the RADAR/LIDAR series.

If you are unable to complete an exercise, note the circumstances next to that exercise number and keep the information for your records.

Keep pages 1-9 for your reference and records.

PRACTICAL EXERCISES – PAGE 1

RADAR/LIDAR OPERATORS VISUAL ESTIMATION LOG

STATIONARY RADAR				MOVING RADAR				LIDAR			
VEHICLE	EST. SPEED	ACTUAL SPEED	MPH OFF	VEHICLE	EST. SPEED	ACTUAL SPEED	MPH OFF	VEHICLE	EST. SPEED	ACTUAL SPEED	MPH OFF
1				**1**				**1**			
2				**2**				**2**			
3				**3**				**3**			
4				**4**				**4**			
5				**5**				**5**			
6				**6**				**6**			
7				**7**				**7**			
8				**8**				**8**			
9				**9**				**9**			
10				**10**				**10**			
11				**11**				**11**			
12				**12**				**12**			
13				**13**				**13**			
14				**14**				**14**			
15				**15**				**15**			
TOTAL MPH OFF				**TOTAL MPH OFF**				**TOTAL MPH OFF**			
DIVIDED BY 15 EST.			**15**	**DIVIDED BY 15 EST.**			**15**	**DIVIDED BY 15 EST.**			**15**
AVERAGE MPH EST WITHIN				**AVERAGE MPH EST WITHIN**				**AVERAGE MPH EST WITHIN**			

PRACTICAL EXERCISES – PAGE 2

SET UP AND TEST RADAR UNIT

RADAR MAKE:_____ **MODEL:**_____

SERIAL # _____ **BAND:**_____

A. SET UP

F.T.O./INSTRUCTOR INITIALS

Student demonstrated the proper external inspection of the RADAR unit. _____

Student demonstrated the proper ABC's of RADAR installation _____

B. ACCURACY CHECKS

Student demonstrated the proper internal accuracy checks. _____

Student demonstrated the proper external accuracy checks. _____

SET UP AND TEST LIDAR UNIT

LIDAR MAKE:_____ **MODEL:**_____

SERIAL # _____

A. SET UP

F.T.O./INSTRUCTOR INITIALS

Student demonstrated the proper external inspection of the LIDAR unit. _____

B. ACCURACY CHECKS

Student demonstrated the proper internal accuracy checks. _____

Student demonstrated the proper external accuracy checks. _____

PRACTICAL EXERCISES – PAGE 3

A. TUNING FORKS

Hold and oscillating (struck) tuning fork approximately three feet from the face of the traffic RADAR antenna. Is there an appropriate display on the readout and in the appropriate display window?

_Yes__No

Slowly move the oscillating tuning fork towards the face of the RADAR antenna. Approximately how close does the tuning fork have to be from the RADAR antenna before an appropriate reading appears and in the proper window?

_Inches

Holding an oscillating tuning fork approximately one inch in front of the RADAR antenna, slowly move the fork away from the face of the antenna. Approximately how far away from the antenna face can an appropriate reading be obtained?

_Inches or Feet

Are the two above measurements approximately the same?

_Yes__No

Were the readings displayed the same?

_Yes__No

If your answer to either of these questions is "NO", then explain why there would be a difference:_____

_____

_____

_____

_____

Holding an oscillating tuning fork approximately one foot in front of the antenna face, slowly move it to the side out of the "main lobe" of the RADAR beam. Approximately how many degrees can the tuning fork be moved to the side and still obtain a reading?

_ Degrees

Can a reading be obtained from using the "side lobes"?
_Yes__No

PRACTICAL EXERCISES – PAGE 4

B. ANTENNA ALLIGNMENT

1. Vertical Alignment

Aim the RADAR antenna so that it is parallel or level with the surface of the roadway. Approximately how far down the roadway can the unit now first detect a full-sized passenger vehicle?

_____ Feet

Now aim the antenna upward approximately 20 degrees from the surface of the roadway. Approximately how far down the roadway can the unit now first detect a full-sized passenger vehicle?

_____ Feet

2. Horizontal Alignment

This exercise requires the use of both the RADAR unit and a motor vehicle. The RADAR instrument is to be placed in the **"Stationary"** mode and aimed straight down the roadway. The motor vehicle is to be accelerated to 50 mph using the vehicles speedometer. At this point record the speed-reading displayed on the RADAR.

_____ MPH

Now repeat the exercise with the antenna aimed to the side approximately 10 degrees. What is the reading displayed by the RADAR?

_____ MPH

Now repeat the process angling the RADAR antenna to the side at intervals of 10 degrees until the RADAR antenna is aimed at 90 degrees to the directions you are driving. While driving at 50 mph, what is the speed being displayed by the RADAR?

20 degrees_____MPH	60 degrees_____MPH
30 degrees_____MPH	70 degrees_____MPH
40 degrees_____MPH	80 degrees_____MPH
50 degrees_____MPH	90 degrees_____MPH

PRACTICAL EXERCISES – PAGE 5

C. BATCHING EFFECT (Moving mode only)

NOTE: Because of the stress placed on a vehicle and safety concerns, be sure this exercise is done in a controlled environment with no other traffic in the area.

Rapidly accelerate the patrol vehicle and continuously monitor the speedometer of the patrol vehicle. Note if there is a difference in speeds between the vehicle's speedometer and the "Patrol Speed" of the RADAR. Try and record the difference in speed-readings at 5 MPH intervals from 0 MPH to 40 MPH. It may be helpful to have a partner in the vehicle with you to assist.

Speedometer	RADAR	Speedometer	RADAR
5 MPH	_____	25 MPH	_____
10 MPH	_____	30 MPH	_____
15 MPH	_____	35 MPH	_____
20 MPH	_____	40 MPH	_____

While batching can occur under heavy deceleration, you are not asked to duplicate this effect due to safety concerns. If batching did occur under rapid deceleration of the patrol vehicle, what would be the expected effect on the target vehicle speed read-out?

Would the displayed target speed be_____**HIGHER or**_____**LOWER** than the true target speed?

EXPLAIN WHY:_____

_____

_____

D. SHADOWING EFFECT (moving mode only)

Shadowing may occur when the RADAR's "Patrol" speed is taken off of a large vehicle while overtaking it instead of the roadway directly in front of the patrol vehicle. Attempt to create a "Shadowing" effect by overtaking a large vehicle (semi, bus, etc.)

Was the displayed target speed_____**HIGHER or**_____**LOWER** than the true target speed?

EXPLAIN WHY:_____

_____

_____

PRACTICAL EXERCISES – PAGE 6

E. SCANNING

With the RADAR turned **"ON"**, scan or point the antenna at or across the readout panel or control box**. NOTE:** This may be accomplished with a two-piece RADAR unit, however a hand-held unit will demonstrate this effect if aimed at another RADAR display module.

Record the speed-reading obtained._____MPH.

What did the audio Doppler sound like? _____
_____

F. PANNING RADAR

Using a hand-held RADAR unit or holding the antenna of a two-piece RADAR unit, pan or move the antenna in a rapid or slow horizontal movement with the unit turned on and transmitting.

Try several times and document any speed-readings that occur.

_MPH _____MPH _____MPH

PANNING LIDAR

Using a LIDAR unit pan or move the beam in a rapid or slow horizontal movement with the unit turned on and transmitting.

Try several times and document any speed-readings that occur.

_MPH _____MPH _____MPH

G. POWER SURGE

With the RADAR unit turned off or the power cord unplugged, activate the transmit switch and then apply power by turning the unit on or plugging it in.

Try several times and document any speed-readings that occur.

_MPH _____MPH _____MPH

PRACTICAL EXERCISES – PAGE 7

H. AUDIO USE

Describe the sound of the audio as a target vehicle approaches and then suddenly decelerates in speed. Does the sound frequency *increase* or *decrease*, and how would you characterize or describe the sound? _____

Does a truck and motorcycle have the same audio sound if both are traveling at the same speed?

_____Yes_____No

Is it possible to audibly listen to the movement of a flag or a person walking in the RADAR beam using the Audio?

_____Yes_____No

IF YES, DESCRIBE THE SOUND:_____

I. CITIZENS BAND RADIO EFFECT (Optional exercise)

With the assistance of another, have a CB radio "keyed up" while its antenna is inside of the RADAR/LIDAR beam. Move the CB in and out of the RADAR beam while keeping it keyed up. Observe the results, if any, on the RADAR readout.

RESULTS:_____

PRACTICAL EXERCISES – PAGE 8

J. WHISTLING ON A CITIZENS BAND RADIO (Optional exercise)

Have an assistant whistle into the keyed microphone of a CB radio while its antenna is inside the RADAR/LIDAR beam. Observe the results, if any, on the RADAR readout.

RESULTS:_____

K. POLICE BAND RADIO EFFECT

While operating the RADAR/LIDAR as it tracks a target vehicle, key up the police radio in the same vehicle the RADAR unit is in.

RECORD THE EFFECT, IF ANY:_____

L. INTERFERENCE READINGS

With the RADAR antenna being used as a hand held, check around the interior of the patrol vehicle in an attempt to discover areas that will cause interference or "Ghost Readings". Vary the vehicles engine speed; operate the heater and defroster fan at different speed settings, etc. Check for interference from electronic devices suck as digital speedometers, clocks, cell phones, etc. Observe the readout module for any displays and record them, together with your determination as to the device identified as the cause of the reading(s).

OBSERVATIONS:_____

PRACTICAL EXERCISES – PAGE 9

M. SWEEP EFFECT LIDAR

Try aiming the LIDAR beam down the side of a vehicle and create a sweep effect. It might be helpful to use a long vehicle such as a bus, semi trailer, van, etc. Try several times and record your observations.

OBSERVATIONS:_____

N. BEAM OBSTRUCTION LIDAR

Pan the LIDAR beam across an object that momentarily obstructs the beams path. Note what happens and note what the size of the object needs to be in order to cause interference.

OBSERVATIONS:_____