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1. **SCOPE**

1.1 This document describes and establishes technical specifications, performance requirements and test procedure for motorcycle to be used in high-speed traffic and law enforcement work by State of California.

1.2 Motorcycle offered in compliance with these specifications shall be manufacturer's police model that is designed and manufactured for performance, service life and safety required during operation of the unit.

1.3 Section 2 defines applicable standards, Section 3 defines Technical Specifications and Section 4 defines Performance Requirements and Test protocols.

2. **APPLICABLE SPECIFICATIONS / STANDARDS / CODES**

2.1 Specifications and standards referenced in this document in effect on the opening of the Invitation for Bid, form a part of this specification.

2.2 Fully equipped unit under test (UUT) shall comply with all applicable including but not limited to;

a) California Vehicle Code (CVC),

b) Code of Federal Regulations, Title 49, "Federal Motor Vehicle Safety Standard" (FMVSS)

c) California Code of Regulations, Title 13, "Motor Vehicles" rules and regulations.

d) Society of Automotive Engineers (SAE) standards

3. **TECHNICAL SPECIFICATIONS**

3.1 **GENERAL**

Unit shall;

3.1.1 be of latest year model.

3.1.2 be two-wheeled.

3.1.3 have a wheelbase of 58" to 65".

3.1.4 be labeled in compliance with Federal and State vehicle regulations.

3.2 **ENGINE**

Shall have a minimum of;

3.2.1 980 cubic centimeters displacement.

3.2.2 2 cylinders.

3.2.3 70 horse power (HP).

3.2.4 5 gallons of fuel tank capacity.

Shall have;

3.2.5 fuel injection.

3.2.6 capability to operate knock free at all engine and or vehicle speeds with manufacturer's recommended fuel rating.

3.3 **POWER TRAIN**

3.3.1 Hand operated clutch shall be located on left handlebar.

3.3.2 Transmission shall have foot shift lever, ≥ 5 speeds and not interfere with normal foot position.

3.3.3 Neutral position Indicator shall be visible from seated position.

3.3.4 Shift pattern shall be as follow;

a) Neutral located between 1st and 2nd gear.

b) Shift down from neutral to 1st gear.

c) Shift up from neutral to 2nd, 3rd, 4th, etc.

3.4 **CHASSIS**

Brakes shall meet following requirements.

3.4.1 Be hydraulic, have rear independent controls, and have Anti-Lock Brake System (ABS).

3.4.2 Front brake be right handlebar operated, dual disc type to provide deceleration without loss of control.

3.4.3 Rear brake shall be disc type, right foot operated and allow full travel of pedal during brake application without lifting heel from non-skid footrest.

Frame shall meet following requirements.

3.4.4 Rear swinging arm type hydraulic shock shall have provision for adjustment to weight.

3.4.5 Front hydraulic pre-load shock shall not be gas pressure adjustable.

3.4.6 Load-carrying capacity shall be a ≥350 Lbs including all mounted equipment of ≥40Lbs.

3.5 **ELECTRICAL SYSTEM**

Chassis Electrical System shall meet following requirements.

3.5.1 Overload/short protected electrical system shall be 12VDC.

3.5.2 With UUT idling alternator shall provide output at the battery ≥13VDC and current required to operate all electrical equipment simultaneously.

3.5.3 Battery(ies) shall be maintenance free type with a minimum total rating of ≥ 25 amp/hr.

3.5.4 Right handlebar located starter switch shall be prevented from operating by safety mechanism when clutch is engaged.

3.5.5 Starter shall be type 12V motor and one way clutch engagement.

Lighting System shall meet following requirements.

3.5.6 Headlight shall have high beam indicator light readily visible to the rider. High/low beams shall be controlled by a switch on the handlebar.

3.5.7 Turn signals shall be visible from front, rear, sides and mounted at following locations:

a) 2 on the front.

b) 2 on the rear.

c) 2 on the side above the rear utility boxes.

3.5.8 Turn signal switch for left and right signals shall be located on the handlebars and shall be push to lock on type with indicator light on the dash panel, which will operate when the turn signals are in operation.

3.5.9 Rear and side rear turn signal lights shall be wired to a switch with indicator light to permit rear and side rear signal lights to flash together, independent of the front signal lights and to operate with ignition switch in either "On" or locked "Accessory" position.

3.5.10 Signal flash rate shall be ≥60 and ≤120 per minute.

3.5.11 2 blue identification lights (reference: Truck-Lite #10A/equivalent) shall be mounted one on each side of the license plate, and connected with the taillight circuit.

3.5.12 Rear installed light emitting diode (LED) auxiliary brake light;

a) shall be activated with brake light,

b) shall operate at low intensity when taillight is illuminated

c) shall function as a supplementary brake light flashing several times prior to burning steady.

Emergency Lighting Package shall meet following requirements.

3.5.13 LED pursuit lights shall be installed in the following configuration:

a) 2 front forward facing mounted to fairing: Right flashing blue, left continuously illuminated red.

b) 2 front side facing: shall be flashing red.

c) 2 rear side facing shall be flashing blue.

d) 2 rear facing: right duplex (duplex: 2 LED sections per housing) flashing blue and left duplex flashing amber.

3.5.14 2 front forward facing LED pursuit lights shall be positioned ≥8" from vertical centerline and at or above the horizontal centerline of the headlight. 2 rear facing duplex LED pursuit lights shall be mounted above or below the rear taillight assembly.

3.5.15 Emergency lighting;

a) Shall operate with the ignition switch in any position.

b) Dash panel shall have red indicator for forward facing and amber indicator for rear facing LED pursuit lights status.

c) Installed and functional pursuit light location must be in compliance with FMVSS.

d) Flash rate of pursuit lights shall be adjustable from 60 to 120, and be preset to 75 fpm, alternating with left to right as the primary pattern with the engine at idle.

3.5.16 Secondary "intersection clearing" pattern of 120 fpm, alternating left to right, shall be pre-programmed to be activated through the siren function when siren tone is changed. Secondary pattern will display for 7 seconds, then resume primary pattern.

3.5.17 Pursuit light switch shall be mounted on the right side handle bar and shall have to ability to control front and rear light packages independently.

Horn shall meet following requirements.

3.5.18 Located on left handlebar, horn shall be compliant with SAE J377 requirements.

Switches shall meet following requirements.

3.5.19 Ignition switch, headlight switch, rear flashing warning light switch, and all other switch locations not specifically described, shall be mounted to be conveniently accessible by the rider in sitting position.

3.5.20 Switches for control of all emergency equipment (siren, pursuit lights, etc.) shall be located on the handlebar and accessible without removing hands from the grips.

3.5.21 Ignition, headlight, and taillight switches shall be designed and wired to permit the engine to run without the headlight and taillights on.

3.5.22 If unit is equipped with running lights, the running lights shall be designed to permit the engine to run without the running lights on.

3.5.23 Dash panel and instrument lights shall be hooded or otherwise designed to prevent glare onto the windshield and be visible in direct sunlight.

3.6 HANDLEBARS

3.6.1 Handlebars shall be non-painted, either of corrosion resistant finish or chrome plated, and with adjustment, if any, unrestricted by any accessory equipment, wiring or fairing.

3.6.2 Straight-line distance from handlebar end to end: ≥31" and ≤34".

3.6.3 Handlebar grips shall be of firm, dark colored plastic and/or rubber, which will not discolor hands.

3.6.4 Right handlebar located throttle control shall not exhibit slack or play and shall provide adjustable drag to permit setting throttle at any position without returning to idle when hand is released.

3.6.5 Handlebar control levers shall contain ball type knobs on their outer ends to minimize the possibility of the hand slipping off the lever.

3.6.6 Unit shall be equipped by vendor with CHP supplied radio control head system on the center of the handlebars, gas tank console, or fairing. Mounting of the radio control head, speaker and microphone shall not obstruct visibility of indicators or accessibility of controls, tachometer speedometer, or switches and shall be readily accessible when seated on the unit.

3.7 TIRES AND WHEELS

Tires shall meet following requirements.

3.7.1 Tubeless tires to meet speed and load ratings for the motorcycle as specified.

3.7.2 Tire sidewall bead shall not dismount from the interior shoulder of the rim.

3.7.3 Each tire and wheel assembly shall be balanced.

3.7.4 Lateral and radial run-out shall be within the factory recommended tolerances.

3.7.5 Tires supplied must be readily available through motorcycle manufacturer's distributors.

Wheels shall meet following requirements.

3.7.6 Alloy type front/rear wheels shall be designed to prevent tire separation from rim.

3.7.7 Rim shall be equipped with an interior shoulder that does not permit dismounting of the sidewall bead from the shoulder and subsequent movement of the sidewall into center recess of the rim or to the outside of the rim when tire is run flat.

3.8 **REAR VIEW MIRRORS:**

3.8.1 Rear view mirror shall comply with all FMVSS requirements.

3.8.2 One FMVSS compliant rear view mirror shall be provided on each side.

3.9 **SPEEDOMETER**

3.9.1 Speedometer shall be calibrated for accuracy of ±2 mph at speeds of 15 to 100 mph.

3.9.2 Dial face shall be marked ≥120 mph.

3.9.3 Face markings shall be graduated in increments of ≤2 mph with bold face increment every 10 mph.

3.9.4 Speedometer indicator needle tip shall extend to increment markers but shall not cover more than a 2 mph section of the scale.

3.9.5 Digital speed readout of stated accuracy is acceptable without complying with 3.9.2, 3.9.3 and 3.9.4.

3.9.6 Speedometer shall be illuminated when headlight is turned on.

3.9.7 An odometer, a trip odometer and tachometer shall be supplied.

3.10 **PROTECTION BARS**

3.10.1 Front (engine guard) and rear (utility storage box) protection bars shall be provided.

3.10.2 Rear protection bars shall be mounted to the unit frame or as part of the utility storage box brackets.

3.10.3 During unit down, bars shall provide adequate clearance for rider's feet and legs.

3.10.4 Shall have the ability to support weight of a fully equipped unit.

3.11 **FAIRING**

3.11.1 Windshield shall be manufactured from clear, scratch resistant material and provide full vision.

3.11.2 Windshield shall be adjustable or of tallest height offered by manufacturer.

3.11.3 Fairing shall have accommodation for headlight and pursuit lamps.

3.12 **SEAT:** Seat shall be foam-padded, covered with black leather or vinyl material and provide lumbar support.

3.13 **SIDE STAND**

3.13.1 Shall have a ≥2½ square inches of surface on the ground when extended,

3.13.2 Shall be mounted on left side,

3.13.3 Shall be designed to be lowered and retracted with foot when seated on the unit.

3.13.4 Shall be designed so that it will not strike ground during hard left turns when retracted.

3.13.5 Shall not be foldable / retractable with unit's weight on it.

3.13.6 Shall not cause motorcycle to have a lean > 15^{o} from vertical when stand is extended and front wheel is in a straight-ahead position.

3.14 **FOOTRESTS**

3.14.1 Unit shall be equipped with footrests (pegs) and/or foot boards designed to fold in the event of contact with the ground.

3.14.2 Footrests and/or footboards shall be replaceable or provided with replaceable stoppers/skid plates.

3.15 **SIREN / PUBLIC ADDRESS SYSTEM**

3.15.1 Electronic motorcycle (Certified Class "A", CA Title 13 Compliant) siren/public address (PA) system shall be provided and installed by vendor prior to delivery (Reference: Public Safety Equipment/Code 3 model 3950 siren amplifier or equivalent & Code 3 model 206 speaker or equivalent).

3.15.2 Amplifier and speaker driver shall be rated at ≥100 watts.

3.15.3 PA control system shall be interfaced with an Ericson / GE "Rangr" model S815 radio control head.

3.15.4 Controls shall be provided to enable operation of siren in Momentary, Wail or Yelp mode.

3.15.5 Vendor to provide/install Relays, pin/socket connectors, and wiring to permit operation as described.

3.16 **MUFFLER (S)**

3.16.1 Muffler(s) shall conform with California Vehicle Code sound restrictions.

3.16.2 Muffler(s) shall be positioned to provide clearance for utility storage boxes on each side of the rear wheel and the possible mounting of an electronic siren amplifier under or in front of one of the boxes.

3.16.3 Unit shall have a maximum of 2 mufflers with a maximum of 3 header pipes into each.

3.16.4 Muffler(s) shall be of corrosion resistant or chrome finish.

3.17 **KEYS:** Minimum of 2 sets of keys shall be provided for each unit at time of delivery. For example a set may include 1 master and additional keys for specific functions.

3.18 **COLOR**

3.18.1 Unit shall be painted a combination of manufacturer's gloss black (reference: Ditzler #DQE-9000 or equivalent) and manufacturer's gloss bright white (reference: Ditzler #DQE8000 or equivalent).

3.18.2 Paint scheme shall meet agency specified requirements and be compliant with California Code of Regulations Title 13, Division 2, Chapter 5, Article 5, Section 1141 requirements as exhibited in Attachment 2 on page 16.

3.18.3 Given below are historical paint scheme requirements for CHP.

a) Frame shall be black.

b) Fenders – front – all white (Not including front fender mounting and rear mud guard), rear fender – all white or all black.

c) For fairing mounted CHP star insignia, the main white panel section shall be large enough to permit installation of the CHP 5"star insignia without touching border/pinstripe(s).

d) For fairing mounted star insignia, gas tank(s), if visible from exterior, shall be all white.

e) For tank area mounted CHP star insignia, the gas tank(s) shall be black with white side panels contoured to shape of tank(s) with approximately ⅛" black border stripe around the white panel.

f) Panel shall be large enough to permit installation of the CHP 5" star insignia within the white panels without touching the border stripe.

g) Fairing shall be white with perimeter black border(s) contoured to the shape of the fairing and black pinstripe shall be used to provide contrast to major panel sections.

h) CHP 5" star insignia referenced above shall be fully visible when viewed from eye level standing to the side of the unit.

i) Insignia may be placed on the fairing, the gas tank, or the ticket book box depending upon unit configuration.

j) All vendor-installed components shall meet color and quality requirements of factory finish.

k) Paint scheme is subject to approval by purchasing agency.

3.19 **RADIO CONTAINMENT BOX (FOR CHP ONLY)**

3.19.1 Unit shall feature a radio storage box to accommodate installation of CHP communications equipment, including bracket(s) for a low-band radio antenna.

3.19.2 Radio storage box and/or low-band antenna mounting bracket(s) may be integral or separate and shall be mounted over the rear tire and/or fender.

3.19.3 Radio storage box shall be designed to accommodate installation of following items:

a) Ericson / General Electric "Rangr" radio.

b) Ericson / General Electric model 349A9916P1 repeater.

c) Siren amplifier provided/mounted in accordance with Siren Section of this specification.

d) Applied Concepts "Stalker Dual" logic unit and radar amplifier.

3.19.4 Radio storage box shall be equipped with brackets and/or mounting plates for secure mounting of above listed equipment. Vendor shall install CHP provided radio and repeater mounting plates.

3.19.5 Antenna shall not obstruct rider visibility or mounting/dismounting of motorcycle.

3.20 **EQUIPMENT INSTALLATION**

3.20.1 Agency shall provide and vendor shall install the following items:

a) Radio and repeater cables.
b) Repeater antenna. Installation to include solder and test antenna wire connection.
c) Repeater antenna cable.
d) 3 way 30 Amp fuse holder (Radio:20Amp, Repeater:2Amp, and Control head:5Amp).
e) Radio control head power cable.
f) Flashlight / baton holder.
g) Ticket book box and related hardware.
h) Main power source 30 amp in-line fuse.
i) Radar antenna cable.
j) Radar display cable.
k) Radar remote cable.
l) Radar controller power lead (lead "A").
m) Radar display power lead (lead "B").

3.20.2 Vendor shall provide and vendor shall install the following items:

a) Install a low-band radio antenna that meets performance requirements. Installation to include and mounting bracket(s), solder and test antenna wire connection.
b) Low-band radio antenna cable.
c) Siren amplifier and speaker.
d) Radio control head mounting stud assembly (bracket to be provided by agency).
e) Siren speaker mounting bracket and related hardware.
f) Mounting brackets for display, front and rear radar antennas.
g) Speaker(s)

3.21 **UTILITY STORAGE BOXES**

3.21.1 1 law enforcement type utility storage box shall be installed on each side of rear wheel and/or fender.

3.21.2 Boxes shall;

a) be black in color and of rigid construction.
b) be of equal exterior sizes.
c) be sealed against moisture and dirt.
d) feature locks and sturdy lid hinge.
e) be of adequate strength for loading up to 15 pounds of material in each side

3.22 **EMERGENCY TOOL KIT:** Each unit shall be delivered with manufacturer approved emergency tool kit.

3.23 **ELIMINATIONS**

3.23.1 Name plates, medallions, or insignia shall not be installed on fuel tank(s) or front fender.

3.23.2 No holes shall be left as a result of these deletions.

3.23.3 Emblems installed in locations that could come in contact with rider shall be flush mounted.

4.0 PERFORMANCE REQUIREMENTS

Note: Testing will cease immediately and Unit Under Test (UUT) will be disqualified if at any time testing reveals a stability or handling characteristic that is determined to potentially jeopardize test rider safety.

4.1 GENERAL

4.1.1 This document identifies the test methodologies and the criteria used in making a determination of the compliance of a police style motorcycle.

4.1.2 Testing may be observed by bidder and/or manufacturer from a location specified by DGS.

4.1.3 UUT shall be furnished with;

a) Full tank of fuel with manufacturer's recommended octane rating.

b) CHP radio, repeater, antenna(s), specialized lighting, electronic siren, functional radar unit for electrical and radio testing only.

c) 30 Lbs of total weight equally distributed in the saddle bags during the duration of the test.

4.2 TESTING

Seq. #	Description	Section	Test #
1	Maneuverability	4.3	1
2	Speed and Acceleration, Acceleration (A) ¼ Mile Standing Start	4.4	2
3	Speed and Acceleration, Acceleration (B), ¼ Mile Flying Start	4.4	2
4	Speed and Acceleration, Acceleration (C), ½ Mile Standing Start	4.4	2
5	Braking, General	4.5	1
6	Braking, ABS Activation	4.5	2
7	Stability and Handling, Collision Avoidance	4.6	2
8	Stability and Handling, High Speed Performance	4.6	1
9	Speed and Acceleration, Acceleration (D), 2 Mile standing start	4.4	2
10	Speed and Acceleration, Sustained High Speed	4.4	1
11	Flat Tire	4.7	1
12	Electrical Testing	4.9	
13	Radio Testing	4.10	1, 2, 3

4.3 MANEUVERABILITY

Test 1: Circle Test

a) Rider shall not use brakes or put foot on the ground while conducting this test.

b) Test shall be performed both in clock and counter-clock directions.

c) UUT shall operate with tires in contact with ground through 180^{o} and 360^{o} turn with a diameter of ≤ 18'.

Acceptance criteria:

Any of the following conditions shall be a ground for "non-compliance";

- **o** Tire spin.
- **o** Unable to complete circle motion in specified diameter.
- **o** Use of brake or setting foot on ground anytime during testing.

4.4 SPEED AND ACCELERATION

Test 1: Sustained High Speed (on level surface)

a) UUT shall sustain high-speed with wide open throttle for a minimum distance of 5 miles in highest gear.

b) Turn UUT off for 30 seconds and restart.

Acceptance criteria:

- **o** Speedometer shall provide clear and steady readability at all speeds.

- Completely functional UUT at conclusion of the test.
- UUT shall start without delay following 30 second shutdown.

Test 2: Acceleration (on level surface)

a) ¼ mile standing start.
b) ¼ mile flying start.
c) ½ mile from standing start.
d) 2 miles from standing start.

Acceptance criteria:

- ¼ mile standing start: Speed attained shall be ≥ 85 mph in ≤ 15 seconds.
- ¼ mile flying start: Flying start from 50 mph and accelerate to ≥ 90 mph.
- ½ mile from standing start: Speed attained shall be ≥ 90 mph.
- 2 miles from standing start: Speed attained shall be ≥ 100 mph.

4.5 BRAKING

Test 1: Brake Test

a) Brake tests will be performed on a level, dry, paved surface.
b) 2 complete stops by each test rider will be performed from 70 mph without engaging the anti-lock brake system (ABS).
c) UUT is required to come to a complete stop while moving in a straight line.
d) There will be a 2 minute interval between stops. This shall be followed by 1 full ABS application to a complete stop from 60 mph.

Acceptance Criteria:

- ≥ of 22 fps^2 of deceleration.
- Complete stop in ≤ 239 feet.
- During each braking test, motorcycle shall stop while tracking in a straight line without buffeting, oscillation, chassis movement, wobble, weave, handlebar shaking, sway or feeling of looseness.
- Brakes shall not fade during each test.

Test 2: Antilocking Brake System (ABS) activation

a) 2 tests shall be performed to activate ABS while transitioning a change in roadway surface type.
b) UUT is required to transition, while in ABS mode;
   - from a flat, level, dry paved surface to a wet concrete surface
   - from a flat, level, dry paved surface to a dry dirt surface.
c) Each rider shall repeat ABS activation test 2 times.
d) Just prior to the roadway transition point at ≥ 55 mph speed, a brake application sufficient to cause the ABS system to activate shall be made.

Acceptance Criteria:

- ABS system shall operate to prevent wheel lock-up to a complete stop.
- UUT shall track in a straight line without buffeting, oscillation, chassis movement, wobble, weave, handlebar shaking, sway or feeling of looseness.

4.6 STABILITY AND HANDLING

- Stability of a motorcycle is defined as the movement of a motorcycle operating as designed under all speeds, lean angles, turns, roadway surfaces, acceleration, deceleration, and braking.
- Stability is not limited to suspension but is to include wheels, tires and frame.
- Movement of the UUT shall correct itself without delay or acceleration, deceleration, the changing of lean angle or any other corrective input from the rider.

Test 1: High Speed Performance

a) Prior to performing the test, 2 warm-up laps will be ridden by each test rider.

a) 5 laps will be performed by each test rider for testing purposes.

Acceptance Criteria:

- UUT failing to meet speeds as follow for each turn per "Exhibit A" shall be considered "non-compliant".
  - Turn 1: Exit speed ≥ 90 mph during each run.
  - Turn 2: Exit speed ≥ 85 mph during each run
  - Turn 3: Exit speed ≥ 100 mph during each run.
- UUT shall not continuously scrape, drag or rest upon the roadway during turns.
- Instability shall correct immediately, without, acceleration, deceleration, changing of lean angle, or any other corrective input from the rider.
- UUT's tendency to track in straight line without buffeting, oscillation, chassis movement, wobble, weave, handlebar shaking, sway or other feeling of looseness will be evaluated for duration of the test.

Test 2: Collision Avoidance (to be performed ≥ 2 times and ≥ 2 riders)

a) Collision avoidance will be evaluated on a flat, level, dry, paved surface.

b) 2 complete collision avoidance exercises will be performed by each test rider from 65mph.

c) Rider will make an aggressive brake application (threshold braking) for a distance of approximately 115', release the brakes, followed immediately by an aggressive lane change to the right/left within 10'.

d) At conclusion of lane change, rider will then make an aggressive brake application to a stop.

Acceptance Criteria:

- UUT shall maintain stability without buffeting, oscillation, chassis movement, wobble, weave, handlebar shaking, sway or other feeling of looseness.

4.7 FLAT TIRE

Test 1: Flat tire test

a) Both new tires, pre-mounted and balanced wheel assembly, shall be tested separately.

b) Replace rear tire with a new tire.

c) Decrease rear tire pressure at a rate of 25% of recommended pressure and perform test (f).

d) Replace rear tire with original tire used for testing and front tire with a new tire.

e) Decrease front tire pressure at a rate of 25% of recommended pressure and perform test (f).

f) UUT shall be operated with one tire flat for the following; (a) ½ mile, (b) Speed at 55 mph and (c) ≤ 8 lane changes,

Acceptance Criteria:

- Tire bead shall remain seated on the rim.
- UUT and wheels shall not exhibit any undue movement throughout the test procedure.

4.8 TESTING AND PERFORMANCE REQUIREMENTS FOR ELECTRICAL AND RADIO TESTING

4.8.1 UUT shall be equipped with following equipment:

a) Low-band radio, approximately 40 Watts RF output power; Ericsson / General Electric "Rangr", or equivalent, with vendor supplied antenna.

b) Low power (approximately 0.45 Watts RF output power) VHF hi-band vehicular repeater; Ericsson / General Electric model 349A9916P1 low power, or equivalent.

c) Radar system; Applied Concept "Stalker Dual" compact style radar system, with, display head, logic unit, radar amplifier and 2 "mini" antennas, or equivalent system.

d) Public Safety Equipment (speaker/siren equipment); "Code 3" model 3950 siren amplifier with Federal Signal Corporation Model MS-100 speaker, or equivalent system.

4.8.2 For those tests which are to be performed with the engine running, the motorcycle engine shall be operated at the following 2 speeds:

a) Idle Speed: Factory recommended engine idle speed.

b) High Speed: Unloaded engine at 2500 RPM.

4.8.3 If any modifications to vendor's proposed UUT are made at the test site and on the day of the test, they shall be made prior to commencement of the session of Radio EMI/RFI Testing.

4.8.4 All electronic and or electrical equipment of the UUT shall be shielded and grounded, as a standard measure intended to minimize RFI/EMI in the range of 35-50 and 138-174 MHz.

4.8.5 Electronic and/or electrical equipment installed on the UUT shall have sufficient suppression of conducted and/or radiated electromagnetic energy to prevent performance degradation below the standards presented in this specification.

4.8.6 All Radio tests shall be conducted by the State of California, Department of General Services, Telecommunications Division using State supplied radio equipment.

4.9 **ELECTRICAL TESTING**

a) When UUT is turned off, battery shall function for 20 minutes simultaneously running taillight, blue ID lights, rear flashers, headlamp, & radios on standby. Unit shall restart as normal following this test.

b) Electronic ignition shall not degrade the effective sensitivity of the following radios more than 1.5 dB:

I. 40 W, 35-50 MHz radio system installed on unit.

II. 450 mW, 150-174 MHz radio system installed on unit.

III. 6 W, 138-174 MHz portable radio, operated within 3' of any part of the unit.

Note: For electrical conductivity, ½" wide ground straps for antenna mounting bracket may be added to the frame of the unit. All ground straps shall be color matched to surrounding.

c) Siren shall not exhibit a delay when turned on.

d) When UUT is running in idle, all lights, radios, and siren shall be able to function simultaneously without depleting the battery.

4.10 **RADIO TESTING:** Vendor supplied motorcycle antennas and antenna brackets shall be submitted to CHP with their mounting instructions and shall be evaluated by the State for acceptance as follows:

a) Antenna configuration.

b) Adequate mounting spaces between the antenna coil and the radio box cover, and between the antenna mounting assembly and the motorcycle tail lights.

c) Audible antenna wind noise.

d) Deterioration of the antenna components.

e) Contacts with rider during maneuvers, mounting, and dismounting.

Baseline Test: Baseline Radio/Antenna System Performance Test:

The following measurements shall be performed for both the UUT and the reference CHP Motor Unit (RU), with engine off and battery voltage of RU and the UUT ≥ 12.5VDC at all times during all the tests.

a) Basic sensitivity of each receiver.

b) RF output power of each transmitter into a dummy load.

c) RF output power and return loss of each transmitter into vehicle antenna.

d) Voltage of vehicle battery.

e) Receiver basic sensitivity of the UUT shall be within ± 3.0 dB of the RU.

f) RF output power of the UUT into a dummy load shall be within ± 5.0 Watt of the RU.

g) Return loss of RU and UUT shall be at least 14 dB.

Test 1: Motorcycle Antenna Return Loss (ARL)

For this measurement, test equipment type and configuration shall be as shown in Figure "A", utilizing a return loss bridge and spectrum analyzer, or an equivalent test unit (a network analyzer, for instance). UUT should be separated from the test equipment by a horizontal distance of at least 20 feet. Refer to (Figure "A",

Continued) for a graphical presentation of the return loss requirement

Acceptance criteria:

- ARL: ≥ 14dB with a minimum bandwidth of 1MHz at 42.5MHz ± 0.5MHz.
- ARL Stability: ≥ 14dB with a minimum bandwidth of 1MHz at 42.5MHz ± 0.5MHz.
- ARL across the band shall remain ≥ 14dB and its resonant frequency shall stay within 42.5MHz ± 0.5MHz when a motorcycle operator weighing ≥ 180 lbs. walks within a 10' radius of the motorcycle, mounts, dismounts and sits on the motorcycle with both hands on the handlebars.

Test 2: Receive System Sensitivity (12 dB SINAD method)

a) For this measurement, test equipment type and configuration shall be as shown in Figure "B".

b) The test signal shall be generated from a location approximately 500 feet, in a horizontal plane, from the motorcycle being tested.

c) The Performance Baseline for this test shall be determined by measuring the effective sensitivity of the RU (12 dB SINAD measurement). The performance of the UUT shall be adjusted for the difference in basic sensitivity between the RU and the UUT. Note: The bidder should be prepared to meet a performance level for this parameter of at least –95 dBm.

d) Location of test signal, and location/orientation of the motorcycles shall be same for each test.

Acceptance criteria:

- System Sensitivity:
  - UUT (engine off) ≤ (Performance Baseline + 1.5 dB)
- Conducted and/or Radiated Noise:
  - UUT (engine idle) ≤ (Performance Baseline + 3.5 dB)
  - UUT (high speed) ≤ (Performance Baseline + 3.5 dB)

Test 3: Antenna Pattern

a) Test is to determine conformity of horizontal radiation pattern of the UUT and its antenna with the RU.

b) Transmitting and receiving signal strength measurements shall be taken in a horizontal plane, at 22.5° increments in a 360° radius, beginning at 0° and continuing clockwise, where 0° is directly in front of and in line with the horizontal plane of the motorcycle being tested.

c) For transmitting signal strength measurement, test equipment type/configuration is shown in Figure "C".

d) For receiving signal strength measurement, test equipment type/configuration is shown in Figure "B".

Acceptance criteria: For the UUT to be acceptable, it shall exhibit following results;

- Less than 25% of radials tested shall have signal reception and transmission degradation > 2dB of that measured for the RU.
- No more than 2 adjacent radials shall have a signal degradation > 2 dB of the RU, for the transmit and receive antenna pattern tests, respectively.

  Note: For this test, measurements of the performance of the UUT shall be adjusted for the difference in basic sensitivity and transmitter power between the RU and the UUT

FIGURE A
ANTENNA TEST SETUP

FIGURE A (CONTINUED)
ANTENNA TEST SETUP

ANTENNA RETURN LOSS STABILITY

(RETURN LOSS MUST STAY OUTSIDE THE SHADED AREA UNDER ALL CIRCUMSTANCES)

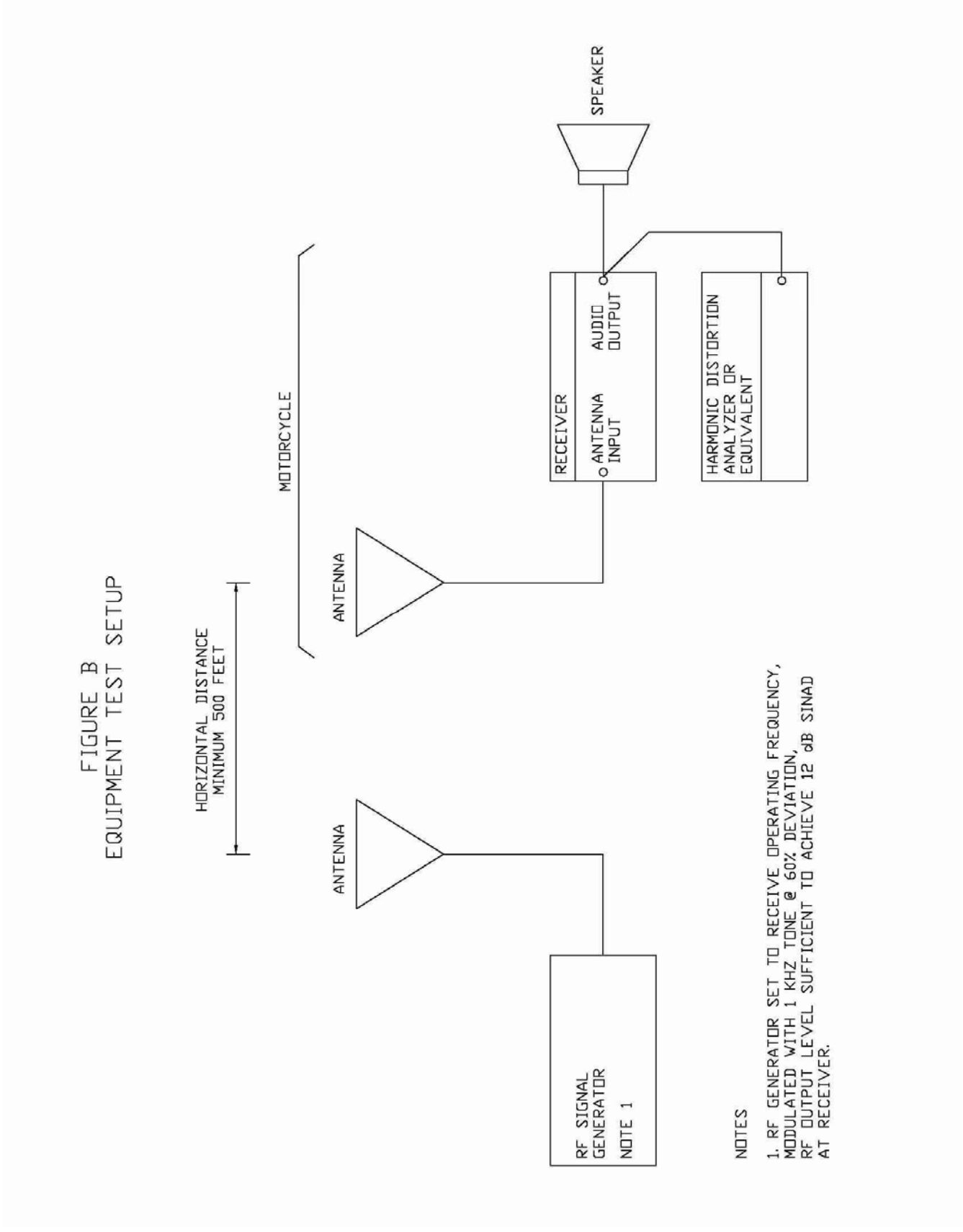
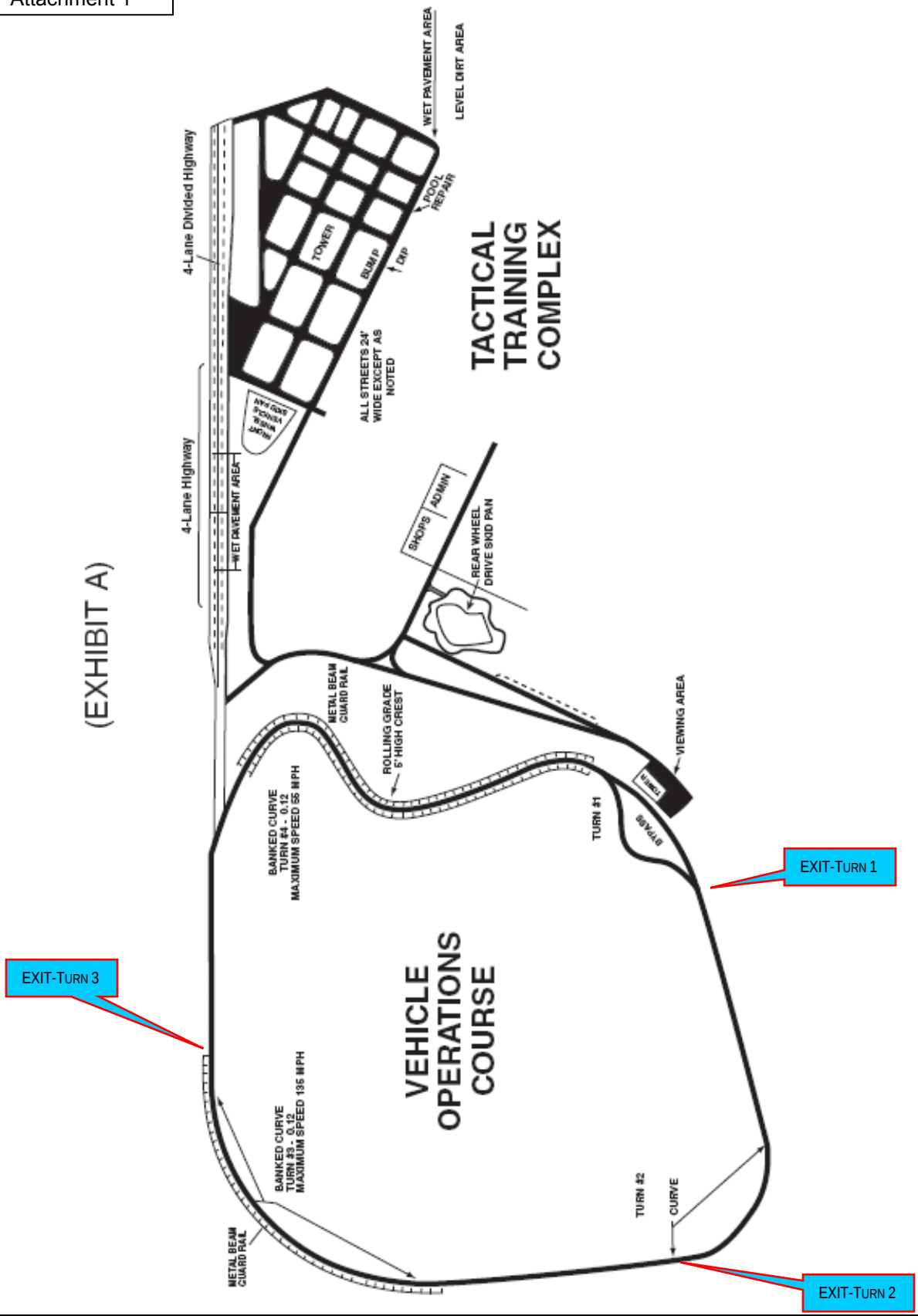


FIGURE B
EQUIPMENT TEST SETUP

Attachment 1



Attachment 2

CALIFORNIA CODE OF REGULATIONS

13 CA ADC § 1141

13 CCR s 1141
Cal. Admin. Code tit. 13, s 1141

BARCLAYS OFFICIAL CALIFORNIA CODE OF REGULATIONS

TITLE 13. MOTOR VEHICLES
DIVISION 2. DEPARTMENT OF THE CALIFORNIA HIGHWAY PATROL
CHAPTER 5. SPECIAL VEHICLES
ARTICLE 5. COLOR OF TRAFFIC LAW ENFORCEMENT VEHICLES

Register 2007, No. 5 s 1141. Color Requirements.

Each motor vehicle shall have an exterior finish, exclusive of wheels, trim, and identification indicia, as follows:

(a) Vehicles Except Motorcycles.

Vehicles, except motorcycles, shall be painted:

(1) Entirely white; or

(2) White, except that an area not less than and including the front door panels shall be black; or

(3) Black, except that an area not less than and including the front door panels shall be white; or

(4) Any other color that contrasts sharply with white, providing an area not less than and including the front door panels is white and the indicia or names of governmental entities operating the vehicles are displayed on the front door panels.

(b) Stripes. Painted stripes, if used, shall be no wider than 6 inches.

(c) Motorcycles. Each motorcycle shall have one of the following finishes:

(1) Entirely white; or

(2) The sides of the tank and fenders shall be white or the fenders may be entirely white or entirely black; the remaining portions of the motorcycle, which normally receive a painted or enameled finish, shall be black, white, or a combination of black and white, except that these surfaces may have a sharply contrasting accent color overlaying the predominant black and/or white background.

<General Materials (GM) - References, Annotations, or Tables>

Note: Authority cited: Section 2402, Vehicle Code. Reference: Section 40800, Vehicle Code.

HISTORY

1. Amendment filed 4-8-77; designated effective 5-9-77 (Register 77, No. 15).
2. Editorial correction adding NOTE filed 4-28-83 (Register 83, No. 18).
3. Amendment of subsections (b) and (c)(2) filed 8-31-93; operative 10-1-93 (Register 93, No. 36).

13 CCR s 1141, 13 CA ADC s 1141 1CAC
13 CA ADC s 1141

END OF DOCUMENT