Form GSOP 1-PIN (04/98)

STATE OF CALIFORNIA
Department of General Services - Office of Procurement
PURCHASE ORDER

Purchase Order No.	Rev.	Date
62238		6/30/2008

Supplier No.	Solicitation No.	Delivery Date	FOB Point	Invoice Terms
678481	57111	90 Days ARO	Destination	

PYRAMID COMMUNICATIONS
ATTN: GARY HOFF
15182 TRITON LN #102
HUNTINGTONBEACH, CA 92649-1041
Attn: GARY HOFF

Phone: 714-901-5462

Ship To
CALIFORNIA HIGHWAY PATROL
IMD WAREHOUSE
3270 REED AVENUE
WEST SACRAMENTO, CA 95605
Attn: MARY LOU REILLY

Charge To
CALIFORNIA HIGHWAY PATROL
FISCAL MANAGEMENT SECTION
P.O. BOX 942901
SACRAMENTO, CA 94298-2901

Agency Billing	Agency Purchase Estimate	Purchase Estimate	Revision
08076	047E7097	67048	1

Agency Contact	Phone	Date Received
STEPHEN RAMIREZ	916-375-2990	

Item No.	Quantity	Unit	Commodity Code	Description	Unit Price	Extension
1	575	EA	5895-999-9999-8	COMMUNICATION EQUIPMENT (AS DESCRIBED) Brand: PURAMID Model: SVR - 900	2,575.0000	1,480,625.00

THE GENERAL PROVISIONS FOR NON-IT COMMODITIES ARE HEREBY INCORPORATED BY REFERENCE. THESE GENERAL PROVISIONS CAN BE OBTAINED BY PHONING (916) 375-4400 OR BY ACCESSING OUR WEBSITE AT:

www.documents.dgs.ca.gov/pd/modellang/GPnonIT0407.pdf

THE FOLLOWING INFORMATION IS PROVIDED FOR AGENCY USE ONLY:

PRIME CONTRACTOR: NS

TRANSMITTER RECEIVER RADIO MOBILE RELAY STATION:
VHF HIGH BAND AUTOMATIC VEHICULAR REPEATER SYSTEM
INCLUDING MOUNTING HARDWARE AND INTERFACE CABLES
IN ACCORDANCE WITH THE ATTACHED SPECIFICATIONS
FOR THE VHF HIGH BAND AUTOMATIC VEHICULAR REPEATER
RADIO, ISSUED ON APRIL 2001, OF (18) EIGHTEEN PAGES.

Total Value: 1,480,625.00

NOTE TO BIDDER:
QUANTITY INCREASE/DECREASE

THE CALIFORNIA HIGHWAY PATROL REQUESTS THAT THIS BID ALLOW UP TO 25% INCREASE OR DECREASE IN QUANTITY AT TIME OF AWARD AND UP TO 180 DAYS FROM AWARD, AT THE SAME BID PRICE.

Sales and/or use tax to be extra unless noted above

Buyer	Phone	BOC Number
GUS QUINTERO	916-375-4499	

STATE OF CALIFORNIA

Department of General Services - Office of Procurement

PURCHASE ORDER CONTINUATION

Form GSOP 2-PIN (04/98)

Purchase Order No.	*Revision*	*Date*	*Supplier No.*	*Supplier Name*
62238		6/30/2008	678481	PYRAMID COMMUNICATIONS

Item No.	*Quantity*	*Unit*	*Commodity Code*	*Description*	*Unit Price*	*Extension*

PURCHASE ORDER DELIVERY:
The initial fifteen (15) units delivered for this purchase order shall be inspected and tested for technical compliance and accepted by the State before the remaining units of this purchase order are delivered to the State.

INSPECTION, ACCEPTANCE, AND REJECTION:
For the purpose of Inspection, Acceptance, and Rejection, the contractor contractor shall ship fifteen (15) units within 90 calendar days after receipt of order.

Prior to shipping the equipment, the contractor shall provide the State with a list of the serial numbers of all equipment designated for fulfilling the purchase order. From this list, the State shall have the right to randomly select the equipment serial numbers that will be delivered to the State for inspection.

Within 30 calendar days of notification of successful completion of inspection or at the completion of the inspection period, whichever comes first, the contractor shall deliver the remaining equipment of the purchase order unless the contractor is notified of rejection during the inspection period.

FOB DESTINATION:
For the purpose of this order, only F.O.B. Destination will be accepted.

SHIPPING/DELIVERY:
All units purchased within a single order month shall be scheduled for delivery at least 90 days in advance in order to insure compatilibility and similarity between units. All assemblies shall be interchangeable with similar assemblies of other units of the same manufacturer and model.

PALLET SIZE REQUIREMENT:
Units shall be palletized and stacked no higher than 52 inches in height, including pallet. Units shall be placed on size 42" x 42" Size 2 pallets in accordance with the State of California Specification #3990-01A-01, dated January, 2001. If units are palletized in any other format, the shipment may be refused and returned "FREIGHT COLLECT" to the orignating supplier.

ELECTRICAL:
All electrical and mechanical equipment furnished shall comply with the California Administrative Code; Title 8 (Industrial Safety Orders), Title 24 (State Building Standards Law) and Title 17 (Public Health). All electrical equipment furnished shall be grounded, with any exceptions only as approved in the referenced applicable titles.

STATE OF CALIFORNIA

Department of General Services - Office of Procurement

PURCHASE ORDER CONTINUATION

Form GSOP 2-PIN (04/98)

Purchase Order No.	*Revision*	*Date*	*Supplier No.*	*Supplier Name*
62238		6/30/2008	678481	PYRAMID COMMUNICATIONS

Item No.	*Quantity*	*Unit*	*Commodity Code*	*Description*	*Unit Price*	*Extension*

WARRANTY:
Suppliers shall submit with their bid, a list of authorized warranty repair locations within California.

No shipping or handling charges shall be incurred to the CHP on warranty items.

OPERATOR AND SYSTEM ADMINISTRATION TRAINING:
The successful supplier shall provide technical training on initial set up use, and routine maintenance. Training shall be provided at the CHP Fleet Operations Section in West Sacramento, California.

PRODUCTION MODEL:
The bid model shall have been in full commercial production for a period of 12 months prior to the bid being submitted. No prototype models will be considered.

STANDARD EQUIPMENT:
Any standard equipment not specifically mentioned in the bid specification but listed in the manufacturer's standard literature shall be included.

This purchase order is being awarded on September 26, 2008 pursuant to Government Code Section 13332.17. Any encumbrances made pursuant to this purchase order shall be construed to have been made on the last day of the preceding fiscal year.

CHANGE ORDERS:
This Purchase Order may be amended, modified, or terminated at any time by mutual agreement of the parties in writing. Change orders amending, modifying or terminating the Purchase Order, including any modifications of the compensation payable, may be issued only by the State Procurement Officer. All such change orders shall be in writing and issued only upon written concurrence of the supplier. Termination, as that term is used in this section, does not include termination for default of the supplier.

This Purchase order has been registered into the state contact and procurement registration system (https://www.scprs.dgs.ca.gov/). The registration number is 02900908334891.

STATE OF CALIFORNIA SPECIFICATION

SPECIFICATION NUMBER AV-002 22 PAGES

VHF HIGH BAND
AUTOMATIC VEHICULAR REPEATER RADIO

ISSUED APRIL 2001

PREPARED BY:

DEPARTMENT OF GENERAL SERVICES
TELECOMMUNICATIONS DIVISION
601 SEQUOIA PACIFIC BLVD
SACRAMENTO, CA 95814-0282
(916) 657-9206

Specification Approved
Name
Date

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1 INTRODUCTION

1.1 GENERAL

1.1.1 THE CALIFORNIA DEPARTMENT OF HIGHWAY PATROL (CHP, ALSO REFERRED TO AS THE 'STATE') IS IN THE PROCESS OF PROCURING ADDITIONAL VHF HIGH-BAND AUTOMATIC VEHICULAR REPEATER (AVR) RADIOS. THE DESIGN AND OPERATION OF THIS RADIO SHALL BE SIMILAR TO THE STATE'S EXISTING AVR RADIO AND SHALL BE FUNCTIONALLY COMPATIBLE WITH THE STATE'S EXISTING AVR SYSTEM. THE STATE'S AVR SYSTEM CONSISTS OF THREE BASIC ELEMENTS. THE FIRST ELEMENT IS A VHF LOW-BAND GENERAL ELECTRIC (GE) RANGR RADIO WITH A S-810 CONTROL HEAD, THE SECOND ELEMENT IS A VHF HIGH-BAND MOTOROLA HT1000 PORTABLE RADIO, AND THE THIRD ELEMENT IS A VHF HIGH-BAND REPEATER RADIO WHICH WILL INTERFACE WITH THE VHF LOW-BAND RADIO. THIS SPECIFICATION IS FOR THE THIRD ELEMENT, A VHF HIGH-BAND REPEATER RADIO, ONLY. HOWEVER, IT SHALL BE PROVIDED COMPLETE WITH MOUNTING HARDWARE AND SHALL CONNECT DIRECTLY TO THE EXISTING AVR CONNECTOR OF THE VEHICLE'S RADIO CONTROL INTERFACE HARNESS. THE AVR IS TO PROVIDE COMMUNICATIONS CAPABILITY DURING THOSE TIMES THE ENFORCEMENT OFFICER IS WITHIN 1500' OF THE LOW-BAND RADIO. THE AVR RELAYS TRANSMISSIONS BETWEEN THE OFFICER'S HIGH-BAND PORTABLE AND THE LOW-BAND RADIO. THE HIGH-BAND RADIO LINK IS SIMPLEX AND IS PROTECTED BY ENCODE CTCSS (CONTINUOUS TONE CODED SQUELCH SYSTEM) TONES FOR TRANSMISSIONS FROM THE OFFICER.

1.2 DETERMINATION OF LOWEST BIDDER

1.2.1 DETERMINATION OF THE LOWEST BIDDER WILL BE BASED UPON THE PRICE BID TO SUPPLY ALL OF THE EQUIPMENT IDENTIFIED IN THE ATTACHED INVITATION FOR BID SOLICITATION.

1.3 STATE OPTIONAL REQUIREMENTS

1.3.1 REQUIREMENTS IDENTIFIED HEREIN AND ON THE BID SHEET AS BEING "STATE OPTIONAL" ARE FEATURES AND/OR ITEMS WHICH THE STATE MAY WISH TO PURCHASE. THE STATE RESERVES THE RIGHT TO MAKE DECISIONS ON WHICH OPTIONS TO PURCHASE, THE QUANTITIES PURCHASED, AND THE TIMING OF THE PURCHASE. SUPPLIERS ARE REQUIRED TO PROVIDE A RESPONSE TO THE TECHNICAL REQUIREMENTS AND TO PROVIDE A PRICE FOR ALL OPTIONS IDENTIFIED AS "STATE OPTIONAL". FAILURE TO DO SO MAY RESULT IN THE SUPPLIER BEING DISQUALIFIED. THE PRICE OF "STATE OPTIONAL" ITEMS WILL NOT BE CONSIDERED IN DETERMINING THE LOWEST BIDDER.

1.4 THE STATE HAS NOT FULLY EVALUATED THE EQUIPMENT LISTED BELOW FOR COMPLIANCE WITH THE REQUIREMENTS OF THIS SPECIFICATION. THIS LIST DOES NOT PRE-DEFINE THE EQUIPMENT AS BEING ACCEPTABLE OR COMPLIANT WITH THIS SPECIFICATION. ANY PROPOSED EQUIPMENT, WHETHER LISTED BELOW OR NOT, MUST COMPLY WITH ALL REQUIREMENTS OF THIS SPECIFICATION. THE EQUIPMENT MODELS LISTED BELOW ARE FOR INFORMATIONAL PURPOSES ONLY, TO ASSIST SUPPLIERS IN DETERMINING THE APPROXIMATE QUALITY LEVEL DESIRED BY THE STATE.

1.4.1 PYRAMID MODEL SVR-900

2 CHP RADIO SYSTEM OVERVIEW

2.1 THE CALIFORNIA HIGHWAY PATROL'S (CHP) MAIN STATEWIDE VOICE RADIO SYSTEM IS A LOW-BAND VHF SYSTEM USING A COMBINATION OF 39 MHZ, 42 MHZ, AND 45 MHZ FREQUENCY PAIRS IN A SEMI-DUPLEX CONFIGURATION. EACH PAIR IS ALSO KNOWN AS A MODE (OR COLOR) WHICH IS ASSOCIATED WITH TWO ("S" & "C") TRANSMIT CHANNELS AND TWO ("S" & "C") RECEIVE CHANNELS. THE MOBILE UNIT TRANSMITS ON "S" CHANNEL TO DISPATCH AND RECEIVES DISPATCH ON THE "C" CHANNEL. THE MOBILE UNITS COMMUNICATE CAR-TO-CAR ON THE MOBILE RECEIVE "C" CHANNEL. THE RADIO SYSTEM INFRASTRUCTURE IS CONFIGURED WITH REMOTE BASE STATIONS. THE RADIO SYSTEM IS CONTROLLED BY VARIOUS MEDIA (STATE MICROWAVE, TELEPHONE WIRELINES AND RADIO LINKS).

2.1.1 EACH MOBILE RADIO UNIT IS EQUIPPED WITH A SCAN FEATURE THAT WILL ALLOW THE MOBILE UNIT TO MONITOR THE "S" CHANNEL OF A NEARBY MOBILE UNIT. THE "S" CHANNEL RECEIVE FREQUENCY IS PROGRAMMED AS NON-PRIORITY WHILE THE "C" CHANNEL RECEIVE FREQUENCY IS PROGRAMMED AS THE PRIORITY RECEIVE CHANNEL. THE SCAN FEATURE LOOKS AT THE "S" CHANNEL RECEIVE FREQUENCY FIRST AND THEN THE "C" CHANNEL. THE SCAN FEATURE CONTINUOUSLY LOOKS BACK FOR PRIORITY "C" CHANNEL RADIO TRAFFIC.

2.1.2 IN ORDER FOR THE CHP ENFORCEMENT OFFICERS TO HAVE RADIO COMMUNICATION OUTSIDE OF THE VEHICLE, EACH ENFORCEMENT VEHICLE IS EQUIPPED WITH A LOW POWERED AUTOMATIC VEHICULAR REPEATER (AVR) RADIO TO EXTEND THE LOW-BAND MOBILE RADIO CAPABILITIES. THE OFFICER USES A PORTABLE RADIO TO CONTROL THE LOW-BAND MOBILE RADIO WHILE AWAY FROM THE VEHICLE. THE CONTROL CHANNEL IS A SIMPLEX 154 MHZ HIGH-BAND VHF FREQUENCY WITH CONTINUOUS TONE CODED SQUELCH SYSTEM (CTCSS). THE OFFICERS WILL USE THE SAME CONTROL CHANNEL WITHOUT CTCSS FOR ON-SCENE COMMUNICATION (PORTABLE TO PORTABLE). THE PURPOSE OF THE CTCSS IS TO CONTROL THE TRANSMIT FUNCTION FOR THE "S" & "C" CHANNEL SELECTION OF THE LOW-BAND RANGR MOBILE RADIO. THERE ARE TWO CTCSS TONES BEING USED.

2.1.3 THE AVR RADIO IS EQUIPPED WITH LOGIC CIRCUITRY TO PREVENT MULTIPLE LOW-BAND MOBILE RADIO TRANSMITTERS FROM BEING CONTROLLED BY A SINGLE PORTABLE RADIO AT THE SAME LOCATION. THE AVR IS ENABLED BY THE OFFICER WHEN THE CAR IS STATIONARY. THE OFFICER IS RESTRICTED FROM HAVING THE AVR ENABLED WHILE THE VEHICLE IS IN MOTION.

2.2 MOBILE RADIO EQUIPMENT OVERVIEW

2.2.1 THE CHP ENFORCEMENT VEHICLE IS EQUIPPED WITH A TRUNK-MOUNT GE EXECUTIVE II, MODEL RVR16HP, 300 MILLIWATT, 154 MHZ, CRYSTAL-CONTROLLED, AVR RADIO INTERCONNECTED WITH THE RANGR LOW-BAND RADIO. THE AVR CONNECTS TO THE RANGR VIA A CUSTOM-DESIGNED RADIO CONTROL HARNESS. THE AVR IS ACTIVATED AND DEACTIVATED BY PUSHING A BUTTON ON THE RANGR S-810 RADIO CONTROL HEAD.

2.2.2 THE CHP ENFORCEMENT VEHICLE IS EQUIPPED WITH A TRUNK-MOUNT GE RANGR, MODEL 19C852050P, 35-50 MHZ, 100 WATT,

SYNTHESIZED, RADIO AND CONTROLLED BY A GE RANGR MODEL S-810 RADIO CONTROL HEAD. THE RANGR S-810 CONTROL HEAD CONTROLS ALL OF THE RADIO FUNCTIONS AND FEATURES INCLUDING ALL EMERGENCY LIGHTS, SIREN, PUBLIC ADDRESS (PA) SYSTEM, CLEAR SPOT LIGHT, AND THE AVR RADIO. THE CONTROL HEAD FIRMWARE VERSION IS G26, REV. K.

2.2.3 THE CONTROL HEAD MICROPHONE IS A CUSTOM DESIGNED UNIT FOR CHP OPERATION. THE MICROPHONE'S PUSH-TO-TALK (PTT) SWITCH IS A ROCKER TYPE SWITCH TO ALLOW THE OFFICER TO SELECT EITHER THE "S" OR "C" CHANNEL TRANSMIT OPERATION. OPERATING THE MICROPHONE WILL PUT THE AVR RADIO INTO NON-PRIORITY MODE. ALSO, ON THE OPPOSITE SIDE OF THE MICROPHONE IS A PUSH-ON/PUSH-OFF BUTTON TO ENABLE/DISABLE THE PA SYSTEM. THE PA SYSTEM PTT IS THE "C" TRANSMIT SELECTION OF THE MICROPHONE'S ROCKER PTT SWITCH.

2.2.4 WHEN THE AVR IS ACTIVATED BY THE OFFICER, THE AVR EMITS A 700 MILLISECOND TONE BURST TO ALERT THE OTHER ACTIVATED REPEATERS AT THE SAME LOCATION OR CLOSE PROXIMITY THAT ANOTHER REPEATER HAS ACTIVATED. THE PURPOSE OF THIS TONE IS TO ALLOW THE LOGIC CIRCUITRY IN THE AVR(S) TO FUNCTION IN ORDER TO PREVENT THE ACTIVATION OF MULTIPLE LOW-BAND MOBILE RADIOS BY ONE PORTABLE RADIO. THE LOGIC CIRCUITRY ALSO HAS AN AUTOMATIC CORRECTION FEATURE TO RESOLVE MULTIPLE LOW-BAND MOBILE RADIO TRANSMISSION CONFLICTS.

2.2.5 THE SAME AVR CONTROL FREQUENCY IS USED THROUGHOUT THE STATE (WITH FEW EXCEPTIONS). THE AVR CONTROLS THE LOW-BAND MOBILE RADIO ON THE SELECTED LOW-BAND CHANNEL.

2.2.6 THE PORTABLE RADIO USED BY THE ENFORCEMENT OFFICER IS A MOTOROLA HT1000, MODEL H01KDC9AA3CN, 16 CHANNEL, 150-174 MHZ, SYNTHESIZED, PROGRAMMABLE RADIO. THE PORTABLE RADIO CHANNEL PERSONALITY FOR THE OPERATION OF THE AVR SYSTEM IS CONFIGURED WITH CTCSS ENCODE ONLY. THE TWO PORTABLE CHANNELS THAT ARE PROGRAMMED TO CONTROL THE AVR SYSTEM ARE SET FOR 2 1/2 WATTS OF RADIO FREQUENCY (RF) OUTPUT POWER TO MINIMIZE AVR CONFLICTS AT OTHER LOCATIONS. THE THIRD CHANNEL IN THE PORTABLE IS PROGRAMMED WITH THE CONTROL FREQUENCY WITHOUT CTCSS FOR USE AS AN ON-SCENE COORDINATION CHANNEL. THE ELIMINATION OF THE CTCSS ALSO ALLOWS THE OFFICERS TO CONTINUE TO MONITOR THE MAIN LOW-BAND RADIO SYSTEM. THE THIRD CHANNEL IN THE PORTABLE IS SET FOR 5 WATTS OF RF OUTPUT POWER.

2.2.7 THE MAJORITY OF THE ENFORCEMENT OFFICERS NORMALLY WEAR AND USE THE PORTABLE RADIO ON THEIR DUTY BELT. THE OFFICER OPERATES THE PORTABLE RADIO WITH A REMOTE SPEAKER MICROPHONE WITHOUT AN ANTENNA. SOME OFFICERS WILL USE THE PORTABLE RADIO WITHOUT A REMOTE SPEAKER MICROPHONE AND OPERATE THE PORTABLE RADIO AT FACE LEVEL.

3 OPERATIONAL REQUIREMENTS

3.1 BY PROPERLY SETTING CONTROLS ON THE MAIN LOW-BAND RADIO'S CONTROL HEAD AND ON THE PORTABLE, THE OFFICER CAN REMOTELY ACTIVATE THE REPEATER WHICH THEN ACTIVATES THE MAIN LOW-BAND

RADIO. THE ABILITY TO REMOTELY ACTIVATE THE MAIN RADIO ALLOWS THE OFFICER (VIA THE PORTABLE RADIO) TO BROADCAST VOICE OVER THE MAIN RADIO SYSTEM ON ONE OF THE TWO SELECTED TRANSMIT CHANNELS ("C" OR "S"). SELECTION OF REPEAT ON THE "C" OR "S" CHANNEL OF THE LOW-BAND RADIO IS DETERMINED BY THE CTCSS TONE DECODE FUNCTION OF THE RECEIVER OF THE REPEATER RADIO.

3.2 CONTROL OF THE HIGH-BAND REPEATER RADIO

3.2.1 WHENEVER THE GE S-810 CONTROL HEAD IS TURNED ON, THE REPEATER RADIO SHALL ALSO BE ON BUT NOT ACTIVATED. IT SHALL BE ABLE TO MONITOR FREQUENCIES AND DECODE CTCSS TONES. IT SHALL NOT REPEAT ANY TRAFFIC UNTIL IT HAS RECEIVED "VRS EN(ABLE)" SIGNAL (SEE SECTION 6.1.3.3) FROM THE GE S-810 CONTROL HEAD.

3.2.2 LOCAL CONTROL:

3.2.2.1 THE "RPT" FUNCTION CONTROL BUTTON LOCATED ON THE GE S-810 CONTROL HEAD WILL ENABLE THE REPEATER FUNCTION BY PROVIDING "VRS EN" SIGNAL TO THE AVR RADIO. THE "RPT" FUNCTION IS CONTROLLED BY A MICROPROCESSOR WITHIN THE S-810 CONTROL HEAD AND IS ACTIVATED VIA A PUSH-ON/PUSH-OFF BUTTON ON THE CONTROL HEAD.

3.2.3 REMOTE ON CONTROL:

3.2.3.1 THE AVR RADIO SHALL HAVE A REMOTE ACTIVATION FEATURE. THIS FEATURE ALLOWS THE OFFICER TO REMOTELY ACTIVATE THE AVR RADIO BY PUSHING THE PORTABLE RADIO'S PTT SWITCH THREE (3) TIMES ON THE "C" TRANSMIT CONTROL CHANNEL WITHIN A FIVE (5) SECOND INTERVAL. ON THE AVR RADIO, THE 'C SELECT' LINE IS ASSERTED LOW EACH TIME THE 'C' CHANNEL CTCSS (156.8 HZ) IS DETECTED. THE CONTROL HEAD COUNTS THE PTT(S) AND VERIFIES THE TIMING. IF CORRECT, THE CONTROL HEAD ASSERTS THE 'VRS EN' LINE HIGH AND TURNS ON THE CONTROL HEAD "RPT" BUTTON INDICATOR.

3.2.3.2 WHEN THE AVR RADIO IS ACTIVATED, THE LOW-BAND MOBILE RADIO'S RECEIVER IS AUTOMATICALLY PLACED IN THE "SCAN" MODE SO THAT INCOMING LOW-BAND RADIO TRAFFIC ON EITHER THE "S" CHANNEL OR THE "C" CHANNEL IS REPEATED. THE RANGR LOW-BAND RADIO'S "PRIORITY" CHANNEL FEATURE OF THE "SCAN" FUNCTION SHALL CONTINUE TO OPERATE, I.E., "C" CHANNEL RADIO TRAFFIC SHALL HAVE PRIORITY OVER "S" CHANNEL RADIO TRAFFIC.

3.2.4 THE TYPE 90 ENCODER IS ENABLED FOR APPROXIMATELY 30 MILLISECONDS AT THE END OF EACH PORTABLE-TO-BASE REPEAT TRANSMISSION. THIS COURTESY BEEP (OR TONE BURST) LETS THE OFFICER KNOW THAT HIS RADIO IS WORKING AND THAT HIS MESSAGE HAS BEEN TRANSMITTED TO THE BASE STATION. THE COURTESY BEEP FUNCTION HELPS TO MAINTAIN PRIORITY BY CONTINUOUSLY KNOCKING DOWN THE PRIORITY OF OTHER AVR

RADIOS. THE COURTESY BEEP FUNCTION SHALL BE CAPABLE OF BEING DISABLED.

3.3 IN THE REPEATER-TO-PORTABLE MODE, THE AVR RADIO IN CONJUNCTION WITH THE LOW-BAND RADIO (STATE PROVIDED) AND THE HIGH-BAND PORTABLE RADIO (STATE PROVIDED) SHALL OPERATE IN THE FOLLOWING MANNER (ASSUMING THE AVR IS IN "PRIORITY" STATE DISCUSSED BELOW).

3.3.1 WHEN THE LOW-BAND RECEIVER'S SQUELCH OPENS, THE LOW-BAND RECEIVE AUDIO PLUS A PUSH-TO-TALK (PTT) FUNCTION SHALL BE PASSED TO THE TRANSMITTER PORTION OF THE AVR RADIO.

3.3.2 THE AVR RADIO SHALL ACTIVATE ON 154.905 MHZ WITHOUT CTCSS ENCODING AND SHALL TRANSMIT THE AUDIO.

3.3.3 THE HIGH-BAND PORTABLE RADIO'S RECEIVER SHALL DETECT THE SIGNAL, OPEN ITS SQUELCH, AND PRESENT THE AUDIO TO THE OFFICER.

3.4 IN THE PORTABLE-TO-REPEATER MODE, THE AVR RADIO IN CONJUNCTION WITH THE LOW-BAND RADIO (STATE PROVIDED) AND THE HIGH-BAND PORTABLE RADIO (STATE PROVIDED) SHALL OPERATE IN THE FOLLOWING MANNER (ASSUMING THE AVR IS IN "PRIORITY" STATE DISCUSSED BELOW). THE OFFICER SHALL DECIDE HOW TO BEST COMMUNICATE WITH THE OTHER PARTY.

3.4.1 IF THE OTHER PARTY IS NEARBY AND ALSO OPERATING WITH A HIGH-BAND RADIO, THE OFFICER MAY SELECT THE 154.905 MHZ FREQUENCY WITH NO CTCSS ENCODING. IN THIS CASE, THE AVR RADIO SHALL NOT RECOGNIZE THE TRANSMISSION AS BEING VALID AND SHALL NOT RESPOND TO THE SIGNAL.

3.4.2 IF THE OTHER PARTY IS THE DISPATCHER, THE OFFICER WILL SELECT THE 154.905 MHZ FREQUENCY WITH CTCSS ENCODING OF 173.8 HZ TO TRANSMIT ON THE "S" CHANNEL.

3.4.3 IF THE OTHER PARTY IS ANOTHER CHP OFFICER SOME DISTANCE AWAY, THE OFFICER WILL SELECT THE 154.905 MHZ FREQUENCY WITH CTCSS ENCODING OF 156.8 HZ TO TRANSMIT ON THE "C" CHANNEL.

3.4.4 THIS MODE (PORTABLE-TO-REPEATER) HAS HIGHER PRIORITY THAN THE REPEATER-TO-PORTABLE MODE (SEE SECTION 4.1.3).

3.5 IN THE CASE OF THE CONDITIONS DESCRIBED IN SECTIONS 3.4.2 AND 3.4.3 ABOVE, THE AVR RADIO'S RECEIVER SHALL DETECT THE INCOMING 154.905 MHZ SIGNAL, DECODE THE CTCSS TONE, OPEN ITS SQUELCH, AND GENERATE AN "S SELECT" OR "C SELECT" (SEE SECTION 6.1.3.5) PUSH-TO-TALK FUNCTION TOWARD THE LOW-BAND RADIO.

3.5.1 THE AUDIO SHALL BE PRESENTED TO THE TRANSMITTER INPUT OF THE LOW-BAND RADIO.

3.5.2 IF THE CTCSS TONE WAS 173.8 HZ, THE LOW-BAND TRANSMITTER SHALL BE ACTIVATED ON THE "S" CHANNEL FOR COMMUNICATION WITH THE STATION (DISPATCH).

3.5.3 IF THE CTCSS TONE WAS 156.8 HZ, THE LOW-BAND TRANSMITTER SHALL BE ACTIVATED ON THE "C" CHANNEL FOR "CAR-TO-CAR" COMMUNICATION.

4 FUNCTIONAL REQUIREMENTS

4.1 THE AVR RADIO SHALL BE FUNCTIONALLY COMPATIBLE WITH THE EXISTING CHP MOBILE AVR SYSTEM. THE AVR RADIO SHALL INTERCONNECT AND OPERATE WITHOUT ANY MODIFICATION TO THE RANGR RADIO EQUIPMENT, ASSEMBLIES, RADIO CABLE HARNESS, AND/OR POWER, SIGNAL AND AUDIO LEVELS. THE AVR RADIO'S ACTIVATION AND DEACTIVATION SHALL BE DONE FROM THE RANGR S-810 RADIO CONTROL HEAD VIA THE DESIGNATED REPEATER BUTTON OR REMOTE ON FEATURE. THE AVR RADIO'S LOGIC CIRCUITRY AND OPERATION SHALL BE COMPATIBLE WITH THE OPERATION OF THE EXISTING CHP OWNED EXECUTIVE II MOBILE AVR RADIOS AND MOTORCYCLE AVR RADIOS. THE AVR RADIO SHALL BE CAPABLE OF BEING CONTROLLED BY THE CHP OWNED MOTOROLA HT 1000 PORTABLE RADIO, SET AT 2 ½ WATTS OF RF OUTPUT POWER WITH A FULLY CHARGED BATTERY, WITHIN A MINIMUM RANGE OF 1100 FEET AND NOT TO EXCEED 2000 FEET. THE AVR RADIO SHALL CONTROL THE OPERATION OF OTHER ACTIVATED AVR RADIOS WITHIN A RANGE OF 1200 FEET AND NOT TO EXCEED 1500 FEET ON NORMAL, OPEN, AND FLAT TERRAIN IN ORDER TO PREVENT MULTIPLE LOW-BAND RADIOS TRANSMITTING WITH ONE PORTABLE. THE SUPPLIER SHALL DELIVER THE AVR RADIO COMPLETE AS A "PLUG AND PLAY" WORKING UNIT WITH ALL MOUNTING HARDWARE.

4.1.1 REPEATER PRIORITIZING LOGIC: THE AVR RADIO SHALL CONTAIN A PRIORITIZATION SYSTEM TO PREVENT MORE THAN ONE AVR RADIO FROM TRANSMITTING AT THE SAME TIME. WHEN AN AVR RADIO IS ENABLED, IT WILL TRANSMIT A 700 MILLISECOND TYPE 90 TONE ON THE OPERATING FREQUENCY AND ENTER THE "PRIORITY" STATE. IN THE "PRIORITY" STATE, THE AVR RADIO SHALL ALWAYS LISTEN FOR THE TYPE 90 TONE ON THE OPERATING FREQUENCY, WHICH IT RECOGNIZES AS A REQUEST TO REPEAT AND GOES TO NON-PRIORITY.

4.1.1.1 IF AN AVR RADIO HEARS A 'REQUEST TO REPEAT', THE AVR ASSUMES THAT ANOTHER AVR HAS JUST BEEN ENABLED AND IS THE PRIORITY AVR. THEREFORE, ALL AVR(S) THAT HEAR THE 'REQUEST TO REPEAT' TYPE 90 TONE WILL IMMEDIATELY ASSUME THE "NON-PRIORITY" STATE. THE "NON-PRIORITY" AVR(S) WILL LISTEN UNTIL THERE IS NO PRIORITY AVR ON THE AIR, AND WILL THEN BEGIN TO REPEAT AND ASSUME THE "PRIORITY" STATE.

4.1.1.2 THE EXISTING AVR RADIO USES A RANDOM COUNTER TO ESTABLISH PRIORITY. THE COUNTER STARTS EACH TIME THE REPEAT CONDITION IS DETECTED. IF ANOTHER AVR BEGINS TO TRANSMIT BEFORE THE COUNTER COUNTS DOWN, THEN THE TRANSMITTING AVR WILL ASSUME THE "PRIORITY" STATE AND ALL OTHER AVR(S) WILL REMAIN QUIET. SINCE THE VALUE OF THE COUNTER IS INITIALIZED WHENEVER THE AVR IS TURNED ON, EACH INDIVIDUAL AVR RADIO WILL HAVE A DIFFERENT DELAY WHICH WILL CHANGE EACH TIME THE AVR IS POWERED UP.

4.1.1.3 THE TIME PERIOD (I.E., THE RANDOM COUNTER) FOR BECOMING THE NEW "PRIORITY" AVR RADIO IS RANDOM AND IS DETERMINED BY A RANDOM DELAY RANGING

FROM 400 MILLISECONDS TO 1.1 SECONDS. THIS RANDOM TIME STARTS AFTER CTCSS DETECTION.

4.1.1.4 SOME PRIORITY CONDITIONS CAN BE DUPLICATED BY OTHER SIMULTANEOUS TRANSMISSIONS. FOR EXAMPLE, WHEN AN ACTIVE MOBILE AND A PORTABLE-TO-PORTABLE TRANSMIT SIMULTANEOUSLY, THE PRIORITIZING SYSTEM SHALL NULLIFY THESE TO ELIMINATE UNDUE INTERFERENCE.

4.1.2 TYPE 90 TONE ENCODE/DECODE: A PROGRAMMABLE TYPE 90 TONE ENCODER/DECODER IS REQUIRED TO PERFORM THE FOLLOWING:

4.1.2.1 IT SHALL BE ABLE TO GENERATE A "REQUEST TO REPEAT" SIGNAL OF 847.5 HZ ± 1% FOR A PERIOD OF 700 MILLISECONDS WHENEVER THE REPEAT FUNCTION IS ENABLED FROM THE GE S-810 CONTROL HEAD OR REMOTELY ENABLED.

4.1.2.2 IT SHALL BE ABLE TO GENERATE A "COURTESY BEEP TONE" OF 847.5 HZ ± 1% FOR A PERIOD OF 30 MILLISECONDS. IT SHALL BE ENABLED AT THE END OF EACH "S" OR "C" CHANNEL TRANSMISSION. THIS COURTESY BEEP IS DECODED BY NON-PRIORITY AVR RADIOS WHICH KEEPS THEM IN A NON-PRIORITY STATE.

4.1.2.3 IT SHALL DETECT A "REQUEST TO REPEAT" SIGNAL WHICH IS AN ON-FREQUENCY SIGNAL WITH 847.5 HZ ± 3% TONE FOR A PERIOD OF 700 MILLISECONDS.

4.1.2.4 THE OUTPUT LEVEL OF THIS ENCODER SHALL BE CONTINUOUSLY ADJUSTABLE TO MODULATE THE CARRIER FROM ±1 KHZ TO ±5 KHZ AND FACTORY SET FOR ±3 KHZ.

4.1.3 PORTABLE INTERRUPT: DURING REPEATER-TO-PORTABLE TRANSMISSIONS, THE AVR TRANSMITTER SHALL UN-KEY FOR A PERIOD OF 50 (OR LESS) MILLISECONDS EVERY SECOND TO CHECK FOR PORTABLE RADIO TRANSMISSIONS AND THE OPERATION OF OTHER REPEATER SYSTEMS.

4.1.3.1 IF THE AVR RADIO DETECTS ANY TRAFFIC FROM A PORTABLE (I.E., TRAFFIC ON 154.905 MHZ), THE AVR RADIO SHALL IMMEDIATELY STOP TRANSMITTING.

4.1.3.2 IF THE AVR RADIO DETECTS TRAFFIC FROM A PORTABLE (I.E., TRAFFIC ON 154.905 MHZ WITH EITHER 173.8 HZ OR 156.8 HZ CTCSS TONE), THE AVR RADIO SHALL IMMEDIATELY STOP REPEATING REPEATER-TO-PORTABLE TRANSMISSIONS AND BEGIN PASSING PORTABLE TRAFFIC FOR THE LOW-BAND TRANSMITTER TO TRANSMIT.

4.1.3.3 IF THE AVR RADIO DETECTS OPERATION OF ANOTHER REPEATER SYSTEM (I.E., TRAFFIC ON 154.905 MHZ WITH NO CTCSS TONE AND TRAFFIC ON THE LOW-BAND CHANNEL), THEN THE AVR RADIO SHALL ASSUME SOME PRIORITIZING ERROR HAS OCCURRED RESULTING IN MORE THAN ONE AVR RADIO ATTAINING "PRIORITY" STATE IN THE SAME AREA. HAVING DETECTED THE

PRIORITIZING ERROR, THE AVR RADIO SHALL IMMEDIATELY ASSUME THE "NON- PRIORITY" STATE.

4.1.4 THE RECEIVER OF THE AVR RADIO SHALL BE ADEQUATELY PROTECTED FROM THE ANTENNA OF A 100 WATT LOW-BAND TRANSMITTER OPERATING LESS THAN ONE FOOT AWAY.

4.1.5 ADEQUATE FILTERING OF ALL I/O LEADS SO THAT THE EXISTING LOW-BAND RECEIVER SHALL NOT EXPERIENCE MORE THAN 1 DB OF AUDIO SINAD DESENSITIZATION.

4.1.6 ADEQUATE FILTERING OF THE "SWITCHED A+" LEAD (12 VOLT SUPPLY) TO PREVENT IGNITION NOISE OR ALTERNATOR WHINE BEING MIXED WITH TX OR RX AUDIO.

4.1.7 THE AVR RADIO SHALL BE PROTECTED AGAINST DAMAGE IN THE EVENT OF THE ACCIDENTAL APPLICATION OF A REVERSE POLARITY. THE BLOWING OF A FUSE WILL BE PERMITTED.

4.1.8 ALL CIRCUIT POWER SHALL BE DERIVED DIRECTLY FROM THE SWITCHED A+ LEAD OF THE GE S-810 CONTROL HEAD. THE USE OF OSCILLATOR CIRCUITS, STEP-UP TRANSFORMERS, OR RECTIFIERS TO INCREASE THE VOLTAGE FOR CIRCUIT POWER PURPOSES IS NOT PERMITTED. THE LIMIT ON THE CURRENT DRAW THROUGH THIS LEAD IS 2.0 AMPS DURING AVR RADIO TRANSMIT AND 0.5 AMPS DURING STAND BY.

5 MECHANICAL REQUIREMENTS

5.1 SIZE: THE AVR RADIO SHALL OCCUPY THE SAME OR LESS SPACE THAN THE EXISTING GE EXECUTIVE II AVR RADIO.

5.2 MOUNTING: CHP WILL MOUNT THE AVR RADIO NEXT TO THE GE RANGR LOW-BAND RADIO ON A CUSTOM FABRICATED MOUNTING BOARD. THIS MOUNTING BOARD WILL BE INSTALLED IN THE TRUNK OF THE ENFORCEMENT VEHICLE. THE AVR RADIO SHALL BE CONSTRUCTED/DESIGNED IN A WAY WHERE AS THE AVR RADIO DOES NOT REQUIRE DISASSEMBLING IN ORDER TO REMOVE THE AVR RADIO FROM THE VEHICLE. ALL MOUNTING BRACKETS/ASSEMBLIES SHALL BE CONSTRUCTED AS A SEPARATE COMPONENT AND NOT BE AN INTEGRAL PART OF THE AVR RADIO.

5.3 RF CONNECTION: THE AVR RADIO SHALL BE READY TO CONNECT TO THE VEHICLE ANTENNA CABLE. THE VEHICLE ANTENNA CABLE CONNECTOR IS A MALE GENDER UHF (PL 259).

5.4 ANTENNA: AN ANTENNA SYSTEM SHALL NOT BE PROVIDED.

5.5 ELECTRICAL CONNECTION: THE AVR RADIO SHALL MATE WITH THE EXISTING GE RANGR RADIO CONTROL INTERFACE HARNESS WITHOUT MODIFICATION.

5.6 HEAT DISSIPATION: EXTERNAL HEAT RADIATORS SHALL BE PROVIDED, IF NECESSARY, TO DISSIPATE THE HEAT OF INTERNAL COMPONENTS. FORCED AIR COOLING OF THE REPEATER RADIO IS NOT PERMITTED.

6 ELECTRICAL INTERFACE REQUIREMENTS

6.1 THE AVR RADIO SHALL INTERFACE DIRECTLY WITH THE EXISTING GE RANGR LOW-BAND RADIO CONTROL INTERFACE HARNESS.

6.1.1 A PIGTAIL ADAPTER CABLE IS NOT PERMITTED.

6.1.2 THE CURRENT GE EXECUTIVE II AVR RADIO USES A 28 PIN CONNECTOR (GE PART NUMBER 19C303775P1).

6.1.3 SIGNALING: THE AVR RADIO SHALL INTERFACE WITH TWO (2) POWER LEADS, TWO (2) AUDIO PAIRS AND SEVEN (7) CONTROL LEADS OF THE GE LOW-BAND RADIO. THEIR FUNCTIONS ARE DESCRIBED BELOW:

6.1.3.1 TWO POWER LEADS ARE IDENTIFIED AS "SWITCHED A+" AND "SWITCHED A-". THE AVR RADIO SHALL DRAW POWER FROM THESE TWO LEADS. IT IS SWITCHED ON WHENEVER THE GE S-810 CONTROL HEAD IS ON.

6.1.3.2 TWO AUDIO PAIRS ARE "VOL SQ HI/LO" AND "MIC HI/LO". THESE SHALL BE SHIELDED/COAXIAL CABLES. "VOL SQ HI/LO" SHALL BE CONNECTED TO THE AVR RADIO'S TRANSMIT AUDIO. "MIC HI/LO" SHALL BE CONNECTED TO THE AVR RADIO'S RECEIVE AUDIO. CONTINUOUS ADJUSTMENTS SHALL BE PROVIDED IN THE AVR RADIO TO SET THESE TWO LEVELS PROPERLY.

6.1.3.3 VRS EN: WHEN THIS LEAD GOES HIGH, IT SHALL ENABLE THE AVR RADIO. HOWEVER, EVEN WHEN THIS LEAD IS LOW, THE RECEIVER OF THE AVR RADIO SHALL BE ENABLED TO DECODE THE CTCSS TONES AND ACTIVATE "S SELECT" AND/OR "C SELECT" LEADS ACCORDINGLY (SEE SECTION 6.1.3.5).

6.1.3.4 RX MUTE: WHEN THIS LEAD GOES HIGH, IT SIGNALS THE AVR RADIO THAT A LOW-BAND MESSAGE IS RECEIVED AND KEYS THE AVR RADIO.

6.1.3.5 "S SELECT" AND "C SELECT": WHEN THE RECEIVER OF THE AVR RADIO DETECTS AN INCOMING 154.905 MHZ SIGNAL, WITH A 173.8 HZ CTCSS TONE, THE "S SELECT" LEAD SHALL GO LOW. WHEN THE RECEIVER OF THE AVR RADIO DETECTS AN INCOMING 154.905 MHZ SIGNAL, WITH A 156.8 HZ CTCSS TONE, THE "C SELECT" LEAD SHALL GO LOW.

6.1.3.6 MOB PTT: THIS LEAD SHALL GO LOW WHEN THE "VRS EN" IS HIGH AND EITHER "S SELECT" OR "C SELECT" IS ALSO LOW. WHEN BOTH "S SELECT" AND "C SELECT" ARE HIGH, THIS LEAD SHALL NOT GO LOW NOR KEY THE LOW-BAND RADIO. THIS LEAD WILL ALSO GO LOW WHEN THE LOW-BAND TRANSMITTER IS KEYED UP BY THE LOCAL MIC WHICH FORCES THE AVR INTO NON-PRIORITY. THIS SIGNAL IS ALSO CONNECTED TO THE "SCANNER MUTE" LINE.

6.1.3.7 VRS PTT: WHEN THE AVR RADIO RECEIVES A SIGNAL DECODED WITH THE PROPER CTCSS TONE, IT PRODUCES A LOGIC LOW ON THIS LEAD TO KEY THE LOW-BAND RADIO.

6.1.3.8 SCANNER MUTE: THE SCANNER MUTE OUTPUT FOLLOWS THE MOBILE PTT LEAD AS IT GOES LOW. SCANNER MUTE IS ISOLATED FROM THE MOBILE PTT VIA A DIODE. THIS SIGNAL ACTIVATES AN EXTERNAL

ANTENNA SWITCH BOX THAT DISCONNECTS THE SCANNER FROM THE LOW-BAND ANTENNA DURING LOW-BAND TRANSMISSIONS.

6.1.4 THE SUPPLIER SHALL SELECT PLUGS AND RECEPTACLES SUCH AS TO ENSURE THAT POSITIVE, RELIABLE CONNECTIONS ARE MAINTAINED WHEN THE AVR RADIO IS IN SERVICE.

6.1.5 NO CABLE OR WIRE EMANATING FROM THE AVR RADIO HOUSING, EXCEPT FOR THE TRANSMISSION LINE COAXIAL CABLE USED TO CONNECT TO THE ANTENNA, SHALL CARRY RADIO FREQUENCY ENERGY.

6.1.6 THE CONNECTION POINTS BETWEEN THE CABLES DISCUSSED IN THIS SPECIFICATION AND THE AVR RADIO SHALL BE PROPERLY DECOUPLED TO PREVENT ANY RADIO FREQUENCY ENERGY WHICH MAY BE INDUCED UPON THESE CABLES FROM INTERFERING WITH THE OPERATION OF THE AVR RADIO. SIMILARLY, OTHER EXTERNAL CABLES AND WIRES SHALL ALSO BE PROPERLY DECOUPLED.

6.1.7 THE AVR RADIO SHALL BE RESISTANT TO THE NORMAL VIBRATION AND HARMONICS, SHOCK, AND RADIO FREQUENCY INTERFERENCE THAT CAN BE ENCOUNTERED IN THE HARSH ENVIRONMENT OF A LAW ENFORCEMENT VEHICLE. THE AVR RADIO SHALL BE DURABLE TO WITHSTAND THE IMPACT FROM SMALL, LOOSE, LIGHT-TO-MEDIUM WEIGHT ARTICLES, SUCH AS HIGHWAY FUSES (FLARES) ETC., NORMALLY FOUND IN THE TRUNK OF A LAW ENFORCEMENT VEHICLE.

7 ELECTRICAL REQUIREMENTS

7.1 FREQUENCY RANGE: 150 TO 162 MHZ

7.2 TRANSMIT/RECEIVE FREQUENCY: FACTORY SET TO 154.905 MHZ

7.3 SYSTEM MODULATION: 16K0F3E

7.4 SYSTEM DEVIATION: ±5 KHZ

7.5 RF IMPEDANCE: 50 OHM, NOMINAL

7.6 TRANSMITTER AUDIO INPUT: FROM THE ASSOCIATED GE LOW-BAND RADIO,RECEIVER

7.7 RECEIVER AUDIO OUTPUT: TO THE ASSOCIATED GE LOW-BAND TRANSMITTER

7.8 RECEIVER AUDIO SQUELCH: CTCSS OPERATED

7.9 GE LOW-BAND TX FREQUENCY SELECTION: CONTROLLED BY THE CTCSS TONE OF THE RECEIVED HIGH-BAND SIGNAL VIA "S SELECT" AND "C SELECT" LEADS

7.10 PORTABLE INTERRUPT: 300 MILLISECONDS OR LESS DETECT TIME FOR FULL PERFORMANCE

7.11 CARRIER CONTROL TIMER: THIS IS REQUIRED TO PREVENT SYSTEM TIE-UP BY LIMITING BASE-TO-PORTABLE TRANSMISSION DURATION. IT SHALL BE REPROGRAMMABLE OVER A RANGE OF 0.5 TO 2 MINUTES. FACTORY PROGRAMMED TO TIME OUT AT ONE MINUTE.

7.12 THE RECEIVER SHALL BE OF THE SUPERHETERODYNE TYPE.

7.13 AUDIO FREQUENCY RESPONSE SHALL BE WITHIN +1,-3 DB OF THE STANDARD 6 DB PER OCTAVE DE-EMPHASIS CHARACTERISTIC FROM 300 TO 3000 HZ.

7.14 AUDIO DISTORTION USING A 1000 HZ TEST TONE SHALL BE LESS THAN 5%.

7.15 THE RECEIVER'S FREQUENCY SHALL BE SYNTHESIZED AND SHALL MAINTAIN A FREQUENCY STABILITY WITHIN ±10 PPM OVER AN ABIENT TEMPERATURE RANGE OF -30°C TO +60°C

7.16 MAJOR SELECTIVITY ELEMENTS SHALL BE INCORPORATED IN THE RECEIVER TO PROVIDE A SELECTIVITY CHARACTERISTIC OF AT LEAST –60 DB.

7.17 THE ACCEPTABLE RADIO FREQUENCY DISPLACEMENT OF THE RECEIVER SHALL BE A MINIMUM OF ±2.5 KHZ (MEASURED USING METHOD OUTLINED IN TIA/EIA-603, SECTION 2.1.5).

7.18 AN "ON-FREQUENCY" SIGNAL OF 0.45 MICROVOLTS OR LESS, WHEN INSERTED INTO THE ANTENNA PORT, SHALL PRODUCE A USABLE SENSITIVITY AS MEASURED BY THE EIA 12 DB SINAD TEST WHEN THE VARIABLE ATTENUATOR IN 7.19 IS SET TO 0DB.

7.19 THE RECEIVER SHALL INCORPORATE A VARIABLE RF INPUT ATTENUATOR TO PERMIT THE STATE TO ADJUST THE "EFFECTIVE" RECEIVE RANGE OF THE AVR RADIO. THE ATTENUATOR SHALL BE CONTINUOUSLY ADJUSTABLE OVER A MINIMUM RANGE OF 0-30 DB. THE RECEIVER RF ATTENUATOR SHALL BE INDEPENDENT OF THE TRANSMITTER RF POWER ATTENUATOR (SEE SECTION 8.1.1). FACTORY SET TO 0 DB.

8 ELECTRICAL PERFORMANCE

8.1 THE AVR RADIO'S TRANSMITTER SHALL MEET OR EXCEED THE FOLLOWING PERFORMANCE CRITERIA.

8.1.1 THE TRANSMITTER POWER OUTPUT SHALL BE CONTINUOUSLY ADJUSTABLE FROM 2 WATTS DOWN TO 250 MILLIWATTS, THEREBY PROVIDING FOR A WAY TO ADJUST THE "EFFECTIVE" TRANSMIT RANGE OF THE AVR RADIO. IF ATTENUATORS ARE USED, THEY SHALL BE INDEPENDENT OF THE ADJUSTABLE ATTENUATOR USED IN THE RECEIVER RF PATH (SEE SECTION 7.19). FACTORY SET TO 250 MILLIWATTS.

8.1.2 THE TRANSMITTER SHALL INCORPORATE AN INSTANTANEOUSLY ACTING DEVIATION LIMITER CIRCUIT TO PERMIT 100% MODULATION OF THE TRANSMITTER UNDER NORMAL CONDITIONS WHILE PREVENTING MODULATION IN EXCESS OF 100%.

8.1.3 THE DEVIATION LIMITER CIRCUIT SHALL INCLUDE A CONTINUOUSLY VARIABLE CONTROL TO PERMIT SETTING THE TRANSMITTER DEVIATION TO ANY VALUE BETWEEN ZERO AND ±5 KHZ, FACTORY SET FOR ±5 KHZ.

8.1.4 AUDIO HARMONIC DISTORTION SHALL BE LESS THAN 5% WITH A 1000 HZ TONE AT A LEVEL SUFFICIENT TO PRODUCE 40% MAXIMUM DEVIATION.

8.1.5 AUDIO FREQUENCY RESPONSE SHALL NOT VARY MORE THAN +1, -3 DB FROM A TRUE 6 DB PER OCTAVE PRE-EMPHASIS CHARACTERISTIC FROM 300 TO 3000 HZ AS REFERENCED TO THE 1000 HZ LEVEL.

8.1.6 THE TRANSMITTER'S FREQUENCY SHALL BE SYNTHESIZED AND SHALL MAINTAIN A FREQUENCY STABILITY WITHIN ±10 PPM OVER AN ABIENT TEMPERATURE RANGE OF -30°C TO +60°C.

8.1.7 FM NOISE AND RESIDUAL HUM SHALL BE AT LEAST 40 DB BELOW 60% DEVIATION AS MEASURED USING THE COMPANION RECEIVER RESPONSE METHOD.

8.1.8 CONDUCTED SPURIOUS AND HARMONIC EMISSIONS, TESTED AT FULL POWER, SHALL BE ATTENUATED BELOW THE MAXIMUM LEVEL OF THE CARRIER BY AT LEAST 50 DB.

8.1.9 THE TRANSMITTER SHALL PERFORM TO THE LIMITS SET HEREIN, INCLUDING DELIVERING FULL RF POWER OUTPUT, WITHIN 50 MILLISECONDS AFTER THE PTT FUNCTION IS ACTIVATED.

8.1.10 THE TRANSMITTER SHALL INCLUDE A CTCSS TONE GENERATOR WHICH SHALL BE CAPABLE OF GENERATING ANY SINGLE STANDARD EIA CTCSS TONE AND OF MODULATING THE TRANSMITTER IN ACCORDANCE WITH TIA/EIA-603. THE CTCSS TONE DEVIATION SHALL BE ADJUSTABLE FROM 300 TO 1200 HZ. FACTORY SET FOR ±600 HZ.

8.1.11 THE TRANSMITTER WILL INITIALLY BE OPERATED IN CARRIER MODE ONLY. THE INCLUSION OF THE CTCSS ENCODER IS FOR FUTURE MODIFICATION OF THE SYSTEM.

8.1.12 THE TRANSMITTER SHALL BE DESIGNED AND PACKAGED TO PREVENT MICROPHONICS.

8.2 THE AVR RADIO'S RECEIVER SHALL MEET OR EXCEED THE FOLLOWING PERFORMANCE CRITERIA.

8.2.1 THE RECEIVER SHALL HAVE A CONTINUOUSLY ADJUSTABLE CARRIER SQUELCH CONTROL THAT IS NOT EFFECTED BY VIBRATION, WHICH WILL ALLOW TECHNICIAN ADJUSTMENT OF THE CARRIER SQUELCH RANGE FROM OPEN SQUELCH (NOISE) TO SQUELCHING ON A 20 DB SINAD SIGNAL.

8.2.2 A CTCSS TONE SQUELCH CIRCUIT SHALL BE PROVIDED.

8.2.2.1 THE CTCSS TONE SQUELCH CIRCUIT SHALL RESPOND TO PRE-SELECTED CTCSS SIGNALS AND OPEN THE RECEIVER AUDIO. THE RECEIVER SHALL BE CAPABLE OF DECODING ANY TWO STANDARD EIA CTCSS TONES.

8.2.2.2 THE CTCSS TONE SQUELCH CIRCUIT SHALL BE DESIGNED TO DETECT A TONE THAT IS AS LOW AS ±400 HZ OF CTCSS DEVIATION.

8.2.3 THE RECEIVER SHALL BE TURNED-ON AND OPERATING AT FULL PERFORMANCE WITHIN 150 MILLISECONDS FOR CARRIER-SQUELCH OPERATION AND WITHIN 250 MILLISECONDS FOR CTCSS TONE-SQUELCH OPERATION AFTER AN ON-FREQUENCY SIGNAL HAS BEEN APPLIED.

8.2.4 THE INTERMODULATION SPURIOUS RESPONSE ATTENUATION AT THE USABLE SENSITIVITY LEVEL SHALL BE AT LEAST –60 DB.

9 STATE OPTIONAL ACCESSORY ITEMS

9.1 PROGRAMMING INTERFACE:

9.1.1 FOR USE WITH AN IBM MODEL "AT" OR COMPATIBLE PERSONAL COMPUTER WITH WINDOWS 95/98 OPERATING SYSTEM. TO PERMIT COMPLETE AND PARTIAL PROGRAMMING AND REPROGRAMMING OF THE AVR RADIO SPECIFIED HEREIN, AND FOR DETERMINATION OF THE INITIAL STATUS, COMPLETE WITH NECESSARY INTERFACE CABLES AND CONNECTORS.

9.2 SOFTWARE

9.2.1 SOFTWARE SHALL RUN UNDER WINDOWS 95 AND/OR 98, AND FOR USE WITH PROGRAMMING INTERFACE SPECIFIED HEREIN; SOFTWARE PROVIDED ON 3½ INCH DISKETTES AS INDICATED ON THE EQUIPMENT ORDER; COMPLETE WITH PROGRAMMING INSTRUCTIONS AND ALL INTERFACE CABLES.

10 PRE-AWARD TESTING, TESTING PROCEDURES AND STANDARDS

10.1 PRE-AWARD EQUIPMENT TESTING:

10.1.1 PRIOR TO AWARDING THE PURCHASE ORDER, THE EQUIPMENT PROVIDER SHALL PROVIDE 15 COMPLETE WORKING AVR RADIOS FOR EQUIPMENT EVALUATION WITHIN 30 DAYS AFTER THE REQUEST BY THE STATE. THE TESTING AND EVALUATION WILL TAKE PLACE IN THE SACRAMENTO AREA. THE EQUIPMENT EVALUATION WILL BE CONDUCTED BY THE STATE TO DETERMINE IF THE PROPOSED EQUIPMENT MEETS THIS SPECIFICATION. THIS EVALUATION WILL INCLUDE TESTING THE EQUIPMENT IN A CHP ENFORCEMENT VEHICLE TO COMPARE THE PROPOSED AVR RADIO TO THE OPERATION OF THE EXISTING STATE-OWNED EXECUTIVE II MOBILE AVR RADIOS AND THE MOTORCYCLE AVR RADIOS.

10.1.2 IF THE PROPOSED AVR RADIO DOES NOT MEET THE REQUIREMENTS OF THIS SPECIFICATION, THE EQUIPMENT PROVIDER WILL BE RESPONSIBLE FOR ALL COST TO MODIFY, REDESIGN, AND/OR PROVIDE ADDITIONAL PARTS, COMPONENTS, AND ASSEMBLIES IN ORDER TO BRING THE AVR RADIO IN COMPLIANCE.

10.2 ACCEPTANCE:

10.2.1 IN ORDER FOR THE STATE TO ACCEPT THE PROPOSED EQUIPMENT, THE AVR RADIO MUST MEET THIS SPECIFICATION, BE COMPATIBLE WITH THE EXISTING STATE-OWNED AVR RADIO, AND NOT HAVE ANY NEGATIVE IMPACT ON CHP ENFORCEMENT OPERATIONS.

10.3 STANDARDS: THE EQUIPMENT SHALL MEET OR EXCEED THE FOLLOWING RULES, STANDARDS, AND REGULATIONS.

10.3.1 FCC: ALL APPLICABLE FEDERAL COMMUNICATIONS COMMISSION (FCC) REQUIREMENTS FOR RADIOS AUTHORIZED TO OPERATE IN ACCORDANCE WITH PART 90 OF THE FCC RULES AND REGULATIONS.

10.3.2 EIA: ALL APPLICABLE MECHANICAL AND ELECTRICAL SPECIFICATIONS DEFINED IN THE ELECTRONIC INDUSTRIES ASSOCIATION (EIA) STANDARDS TIA/EIA-603.

10.3.3 VIBRATION: THE EQUIPMENT SHALL MEET OR EXCEED THE SPECIFICATIONS OF VIBRATION DEFINED IN TIA/EIA-603 AND IN U.S. FOREST SERVICE STANDARD M-1409 AFTER BEING SUBJECTED TO THE TEST METHODS DESCRIBED IN MIL STD 810E, METHOD 514.4, PROCEDURE I, CATEGORY 8, GROUND MOBILE. IN ADDITION, TX AUDIO DISTORTION, RX AUDIO DISTORTION, CTCSS TONE ENCODE DISTORTION, AND CTCSS DECODE SENSITIVITY WILL ALSO BE CHECKED DURING THE MIL-STD TEST.

10.3.4 SHOCK: THE EQUIPMENT SHALL MEET OR EXCEED THE SPECIFICATIONS DEFINED IN TIA/EIA-603 AFTER BEING SUBJECTED TO THE SHOCK TEST DEFINED IN THOSE STANDARDS AND AFTER BEING SUBJECTED TO THE TEST METHODS DESCRIBED IN MIL STD 810E, METHOD 516.4, PROCEDURE I, FUNCTIONAL SHOCK, AND PROCEDURE VI, BENCH HANDLING.

10.3.5 RAIN: THE EQUIPMENT SHALL MEET OR EXCEED THE SPECIFICATIONS OF HUMIDITY DEFINED IN TIA/EIA-603 AFTER BEING SUBJECTED TO THE TEST METHODS DESCRIBED IN MIL STD 810E, METHOD 506.3, PROCEDURE II, DRIP.

10.3.6 BLOWING DUST: THE EQUIPMENT SHALL MEET OR EXCEED THE SPECIFICATIONS DEFINED IN TIA/EIA-603 AFTER BEING SUBJECTED TO THE TEST METHODS DESCRIBED IN MIL STD 810E, METHOD 510.3, PROCEDURE I, BLOWING DUST. THIS REQUIREMENT MAY BE DELETED AT THE STATE'S DISCRETION.

10.3.7 SALT FOG: THE EQUIPMENT SHALL MEET OR EXCEED THE SPECIFICATIONS DEFINED IN TIA/EIA-603 AFTER BEING SUBJECTED TO THE TEST METHODS DESCRIBED IN MIL STD 810E, METHOD 509.3, PROCEDURE I, SALT FOG TEST. THIS REQUIREMENT MAY BE DELETED AT THE STATE'S DISCRETION.

10.3.8 TEMPERATURE: THE EQUIPMENT SHALL MEET OR EXCEED THE SPECIFICATIONS DEFINED IN TIA/EIA-603 FOR INTERMITTENT DUTY OVER THE TEMPERATURE RANGE OF -30°C TO +60°C.

10.3.9 ALTITUDE: THE EQUIPMENT SHALL MEET OR EXCEED THE SPECIFICATIONS DEFINED IN TIA/EIA-603 FOR ANY ALTITUDE IN THE RANGE OF 0 TO 15,000 FEET ABOVE MEAN SEA LEVEL (MSL). THIS REQUIREMENT MAY BE DELETED AT THE STATE'S DISCRETION.

10.3.10

11 TERMS AND CONDITIONS

11.1 SUBMITTAL WITH BID:

11.1.1 EQUIPMENT SAMPLES OR ADDITIONAL TECHNICAL DATA MUST BE SUBMITTED WITHIN FIFTEEN DAYS AFTER REQUESTED BY THE STATE.

11.1.2 EVIDENCE OF THE FOLLOWING MUST BE SUBMITTED WITHIN FIFTEEN DAYS, IF REQUESTED, BY THE STATE.

11.1.2.1 THE BIDDER IS REGULARLY ENGAGED IN THE MANUFACTURE OF EQUIPMENT OR MATERIAL SPECIFIED ON THIS ORDER (IF APPLICABLE).

11.1.2.2 THE BIDDER IS A DISTRIBUTOR QUOTING ON EQUIPMENT OR MATERIAL SPECIFIED ON THIS ORDER (IF APPLICABLE).

11.1.2.3 LIST OF CUSTOMERS FOR WHOM BIDDER HAS PREVIOUSLY SUPPLIED AND INSTALLED EQUIPMENT OR MATERIAL SIMILAR TO THAT SPECIFIED ON THIS ORDER AND WHERE SUCH EQUIPMENT OR MATERIAL HAS BEEN OPERATIONAL FOR AT LEAST ONE YEAR.

11.1.3 FAILURE TO PROVIDE THE ABOVE INFORMATION, IF REQUESTED BY THE STATE, MAY RESULT IN THE BID BEING CONSIDERED NON-RESPONSIVE AND NOT CONSIDERED FOR AWARD.

11.2 FISCAL YEAR FUNDING

11.2.1 THE INVITATION FOR BID IS ISSUED ON THE BASIS THAT FUNDS ARE EXPECTED TO BE APPROPRIATED BY THE STATE LEGISLATURE FOR THE FISCAL YEAR(S) APPROPRIATE TO THE TERM OF THIS PROCUREMENT.

11.2.2 THE PURCHASE ORDER, OR CONTRACT, SHALL BE VALID AND ENFORCEABLE ONLY IF SUFFICIENT FUNDS ARE MADE AVAILABLE BY THE BUDGET ACT(S) FOR THE APPROPRIATE FISCAL YEAR(S).

11.2.3 PURCHASE ORDER(S), OR CONTRACT(S) ARE SUBJECT TO ANY ADDITIONAL RESTRICTIONS, LIMITATIONS, OR CONDITIONS ENACTED BY THE STATE LEGISLATURE AND CONTAINED IN THE BUDGET ACT OF AND STATUTE ENACTED BY THE STATE LEGISLATURE WHICH MAY AFFECT THE PROVISIONS, TERMS, OR FUNDING OF THE PURCHASE ORDER, OR CONTRACT, IN ANY MANNER.

11.2.4 IT IS MUTUALLY AGREED THAT IF THE BUDGET ACT(S) FOR THE APPROPRIATE FISCAL YEAR(S) DOES NOT APPROPRIATE SUFFICIENT FUNDS FOR THIS PROCUREMENT:

11.2.4.1 THE PURCHASE ORDER, OR CONTRACT SHALL BE INVALID AND OF NO FURTHER FORCE OR EFFECT.

11.2.4.2 THE STATE SHALL HAVE NO LIABILITY TO PAY ANY FUNDS WHATSOEVER TO THE CONTRACTOR OR TO FURNISH ANY OTHER CONSIDERATIONS FOR THIS PROCUREMENT.

11.2.4.3 THE CONTRACTOR SHALL NOT BE OBLIGATED TO PERFORM ANY PROVISIONS OF THIS PROCUREMENT.

12 SHIPPING AND PACKAGING

12.1 THE SUPPLIER SHALL MARK THE OUTSIDE OF EACH EQUIPMENT PACKING CONTAINER WITH THE MAKE, MODEL NUMBER AND SERIAL NUMBER OF THE UNIT WITHIN, AND INDICATE THE STATE PURCHASE ORDER NUMBER ON THE PACKING SLIP FOR THE UNIT.

12.2 IF THE SHIPMENT OF THE EQUIPMENT EXCEEDS THE MAXIMUM LIMITS FOR THE GENERAL DELIVERY REQUIREMENTS OF PARCEL POST FOR THE UNITED PARCEL SERVICE, UNITED STATES POST OFFICE, FEDERAL EXPRESS, ETC., THE EQUIPMENT WILL NEED TO BE PALLETIZED AND SHIPPED BY A

COMMERCIAL FREIGHT TYPE CARRIER SERVICE. THE PALLET LOAD LIMIT SHALL NOT EXCEED 42" X 42" AND NOT STACKED MORE THAN 48" HIGH. ALL SHIPMENTS SHALL BE DELIVERED TO: CALIFORNIA HIGHWAY PATROL, SUPPLY SERVICES UNIT WAREHOUSE, 855 RIVERSIDE PARKWAY, SUITE 80, WEST SACRAMENTO, CA 95605.

STATE OF CALIFORNIA SPECIFICATION

PALLETS, WOODEN

1 SCOPE

This specification covers pallets intended for use with low lift pallet trucks or forklift trucks.

2 SPECIFICATION AND STANDARDS

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

3 REQUIREMENTS

3.1 Material

The pallets shall be constructed from nominal size standard or better (West Coast Lumber Inspection Bureau, Standard Grading Rules for West Coast Lumber) grade Douglas Fir, Hemlock, Larch or Hem-Fir. The stringers shall be S4S and the decking S4S or S1S2E (re-

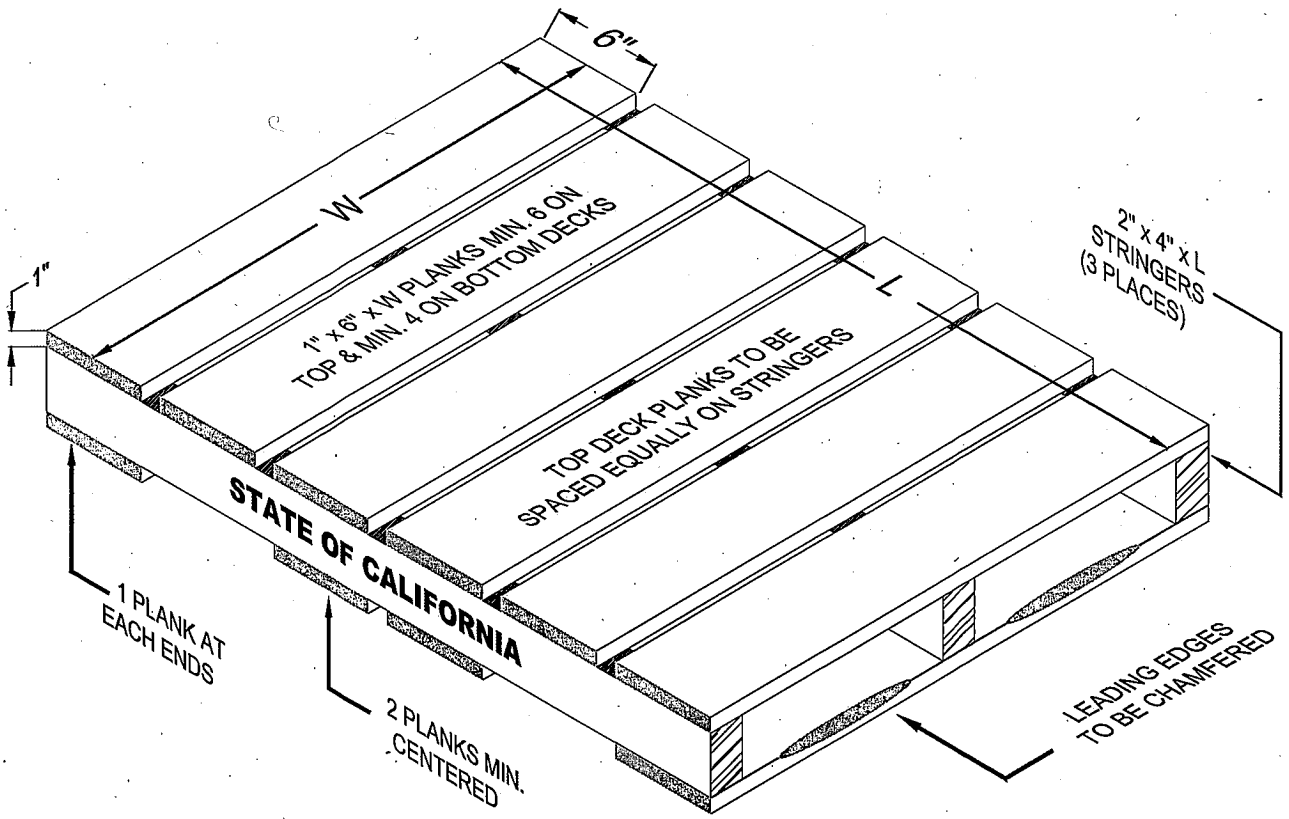

FIG. 1 - TYPE 2 WOODEN PALLET

sawed) with no edge knots. Sawed side is to be assembled to the inside of the pallets. Fastening shall be accomplished with 2¼ inch (+1/16 inch) 7 penny flat head drive screws (helical threaded nail) or 2¼ (+1/16 inch) #10 wire gauge annular ring nails as recommended in Specifications and Grades for Warehouse. Permanent or Returnable Pallets of West Coast Woods as published by the National Wooden Pallet and Container Association (Specifications and Grades, NWPCA).

3.2 Non-Standard Duty-Cycle Pallets

When specifically requested by the user, pallets may be manufactured using pine, oak or ash woods.

3.3 Construction

Pallet type and construction shall comply with Specifications and Grades, NWPCA. The pallets shall be Grade "Quality" (QAL).

The decking shall be secured with 3 nails or screws at each surface of contact with the stringer. Nails shall not be within ½ inch of deck-board edges or another nails.

All leading and outside edges of the bottom deck shall be chamfered. The chamfers shall be at least 12 inches long and shall be cut on an approximate 35 degree angle to the face so as to leave an edge adjacent to the chamfer not less than ¼ inch nor more than ½ inch from the outer

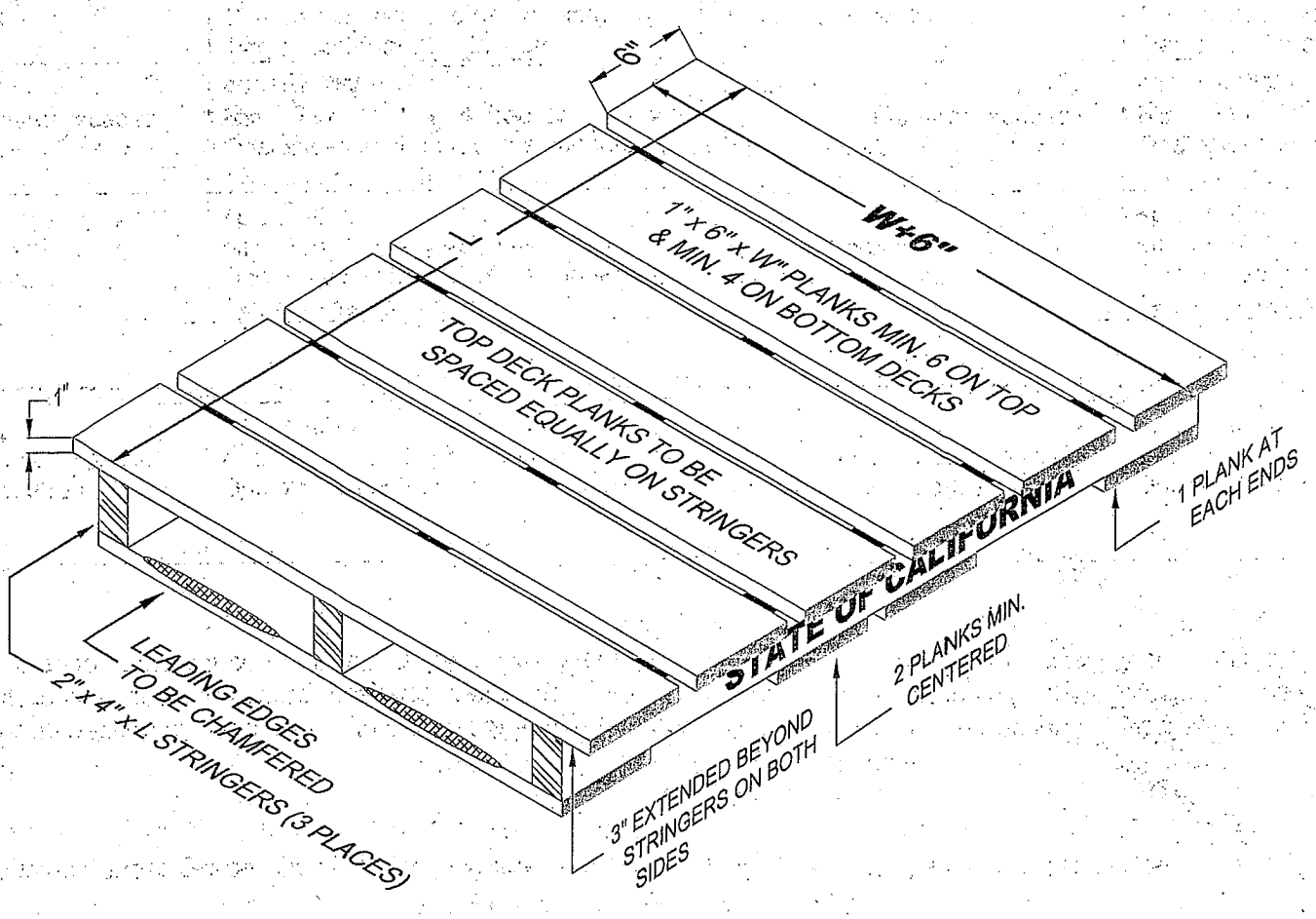

FIG. 2 - TYPE 4
SINGLE WING WOODEN PALLET

edge of the deck-board. The chamfer shall extend to within 3 inches of the stringers. Pallet configuration shall comply with illustration A.

COMMONLY USED PALLET TYPES & SIZE			
SIZE	TYPE	TOP DECK	BOTTOM DECK
1	2 (Fig. 1)	42"L x 36"W Six 1" x 6" x 36" deck-boards, spaced evenly along the pallet width	42"L x 36"W Min. Four 1" x 6" x 36" boards. One placed each end of the stingers Two at center of the stringers
2	2 (Fig. 1)	42"L x 42"W Six 1" x 6" x 42" deck-boards, spaced evenly along the pallet width	42"L x 42"W Min. Four 1" x 6" x 42" boards. One placed each end of the stingers Two at center of the stringers
3	2 (Fig. 1)	44"L x 44"W Six 1" x 6" x 44" deck-boards, spaced evenly along the pallet width	44"L x 44"W Min. Four 1" x 6" x 44" boards. One placed each end of the stingers Two at center of the stringers(Fig. 1)
4	2 (Fig. 1)	45"L x 36"W Six 1" x 6" x 36" deck-boards, spaced evenly along the pallet width	45"L x 36"W Min. Four 1" x 6" x 36" boards. One placed each end of the stingers Two at center of the stringers
5	2 (Fig. 1)	46"L x 44"W Six 1" x 6" x 44" deck-boards, spaced evenly along the pallet width	46"L x 44"W Min. Four 1" x 6" x 44" boards. One placed each end of the stingers Two at center of the stringers
6	2 (Fig. 1)	48"L x 48"W Six 1" x 6" x 48" deck-boards, spaced evenly along the pallet width	48"L x 48"W Min. Four 1" x 6" x 48" boards. One placed each end of the stingers Two at center of the stringers
Note: SIZE 1, TYPE 4 - has a single wing applied to top deck.			
1	**4 (Fig. 2)**	42"L x 36"W Six 1" x 6" x 36" deck-boards, spaced evenly along the pallet width with 3" wings extending beyond the stringers outboard faces	42"L x 30"W Min. Four 1" x 6" x 36" boards. One placed each end of the stingers, Two at center of the stringers

4 SAMPLING AND INSPECTION

This commodity will be sampled and inspected for compliance to this specification as deemed necessary. Sampling and inspection by attributes will be in accordance with ANSI/ASQ Z1.4 1993, Sampling Procedures and Tables for Inspection by Attributes. An inspection lot is defined as one delivery to one agency at one time.

4.1 Workmanship

The pallets shall be free from defects as outlined under Grade "Quality" (QAL) in the "Specifications and Grades", NWPCA.

5 MARKING

Each pallet shall be marked (two places), "**STATE OF CALIFORNIA**". Marking shall be easily readable, in black letters and on outboard faces of stringers.