

Congratulations, you have just purchased one of the most refined products Clarion has ever produced. The PFW/PXW line of subwoofers offers benchmark levels of performance, reliability and style.

To achieve the maximum possible performance from this speaker, we highly recommend that an Authorized Clarion Dealer construct an application specific enclosure that maximizes the space in your vehicle, while offering the best possible performance from this product.

This manual contains all the information required to design your own enclosure with appropriate computer modeling software as well as several highly effective applications, including the intended purpose of each. If you have any hesitation or concern regarding the construction of these enclosures, please consult your authorized Clarion Dealer.

## Content

1. Thiel Small Parameters.....	3
2. Mounting Information .....	4
3. Subwoofer Break-In Period .....	4
4. Subwoofer Enclosure Applications .....	5
PFW1051 Single 4 Ohm Voice Coil	
Shallow Mount 10" Subwoofer.....	5
PXW1051/PXW1052 Dual Voice Coil	
10" Subwoofer .....	6
PXW1251/PXW1252 Dual Voice Coil	
12" Subwoofer .....	7
PXW1552 Dual Voice Coil	
15" Subwoofer .....	9
5. Subwoofer Application Comparison .....	10
6. Calculating Enclosure Volume .....	11
7. Wedge Style Enclosure.....	12
8. Limited Warranty Information.....	13

## 1. Thiel Small Parameters

Model:	PFW1051	PXW1051	PXW1052	PXW1251	PXW1252	PXW1552
Fs (Hz)	41.29	30.86	33.56	30.7579	34.27	23.28
Qms	6.593	6.4737	6.206	6.759	7.15	5.927
Vas (Litres)	27.22	32.95	30.17	67.732	62.76	193.07
Vas (Ft <sup>3</sup> )	0.961	1.164	1.065	2.392	2.216	6.818
Mms (grams)	84.76	126.95	117.21	142.59	123.99	269.16
Xmax	5.5 / 0.217	12 / 0.472	12 / 0.472	12 / 0.472	12 / 0.472	12.5 / 0.621
Sd (m <sup>2</sup> )	0.330	0.0333	0.0333	0.0504	0.0504	0.0884
Qes	0.541	0.5556	0.5498	0.692	0.726	0.6018
Re (Ser/Par)	3.3019	6.47 / 3.86	6.93 / 1.91	3.83 / 1.12	7.19 / 1.98	7.09 / 1.95
Le (Ser/Par)	2.921	4.93 / 1.23	7.87 / 1.96	4.84 / 1.2	7.21 / 1.79	9.22 / 2.27
Z (Ser/Par)	3.926	4.64 / 7.77	8.31 / 2.29	4.60 / 1.34	8.63 / 2.37	8.51 / 2.34
BL (Ser/Par)	11.59	13.68 / 16.93	17.64 / 8.78	13.34 / 6.67	17.59 / 8.53	22.9 / 11.3
Qts	0.50	0.471	0.505	0.545	0.57	0.546
SPL 1W-1M	84.4	84.4	84.7	87.2	87.4	88.1
Prms	300	500	500	500	500	700
Subwoofer Vd	0.045 ft <sup>3</sup>	0.12 ft <sup>3</sup>	0.12 ft <sup>3</sup>	0.15 ft <sup>3</sup>	0.15 ft <sup>3</sup>	0.21 ft <sup>3</sup>

## 2. Mounting Information

Model:	PFW1051	PXW1051	PXW1052	PXW1251	PXW1252	PXW1552
Outside Diameter •	10-17/32"	10-17/32"	10-17/32"	12-15/32"	12-15/32"	15-29/32"
Subwoofer Basket Diameter	8-15/16"	9-1/32"	9-1/32"	10-29/32"	10-29/32"	14"
Mounting Depth ••	2-3/4"	5-7/16"	5-7/16"	6-1/8"	6-1/8"	7"
Total Height	3-5/8"	6-3/16"	6-3/16"	7"	7"	7-13/16"

### NOTES:

- This is the exact outside diameter of the subwoofer including the rubber mounting gasket. For flush mount applications Clarion recommends adding 1/8" to 1/4" to this dimension to facilitate access to the mounting screws beneath the gasket.
- This is the exact mounting depth of the driver, and does not include provisions for air flow from the vented pole piece. Clarion recommends at least 1" of clearance behind the driver to facilitate air flow and proper cooling.

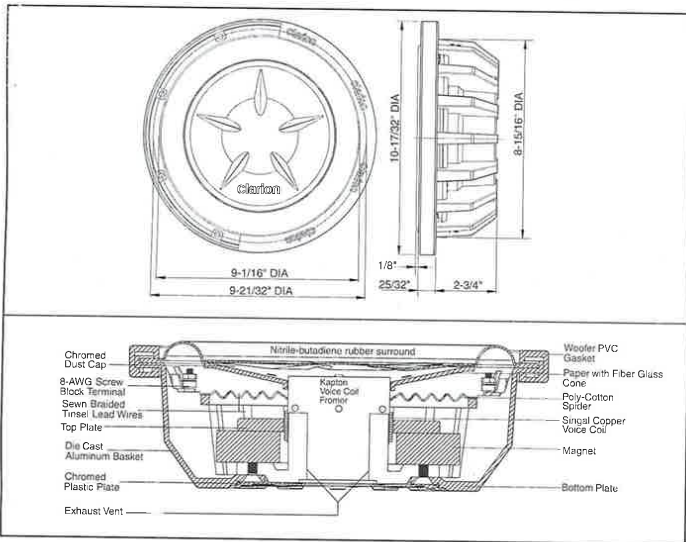
## 3. Subwoofer Break-In Period

All new subwoofers require some time to break-in. Depending on the application and usage, this may take between one to three weeks. To accelerate this process, you can connect the subwoofer to an amplifier and play at 35Hz sine-wave through them at a level of 10Vrms (8Vrms for PFW1051) for a period of four to six hours. If you have any questions or concerns, please do not hesitate to contact your authorized Clarion Dealer.

# 4. Subwoofer Enclosure Applications

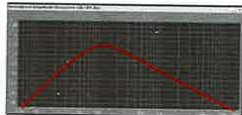
## PFW1051

Single 4 Ohm Voice Coil Shallow Mount 10-inch Subwoofer



### SEALED ENCLOSURE - SOUND QUALITY

Net Internal Air Volume: 0.45 ft<sup>3</sup>  
 F3 Frequency: 70.37 Hz  
 Total System Q: 0.689



### VENTED ENCLOSURE - STREET

Net Internal Air Volume: 1.0 ft<sup>3</sup>  
 Vent Dimension: 2.5" ID x 8-3/4" Long  
 F3 Frequency: 41.21 Hz



### DUAL DRIVER VENTED ENCLOSURE - 2 X PFW1051 - STREET

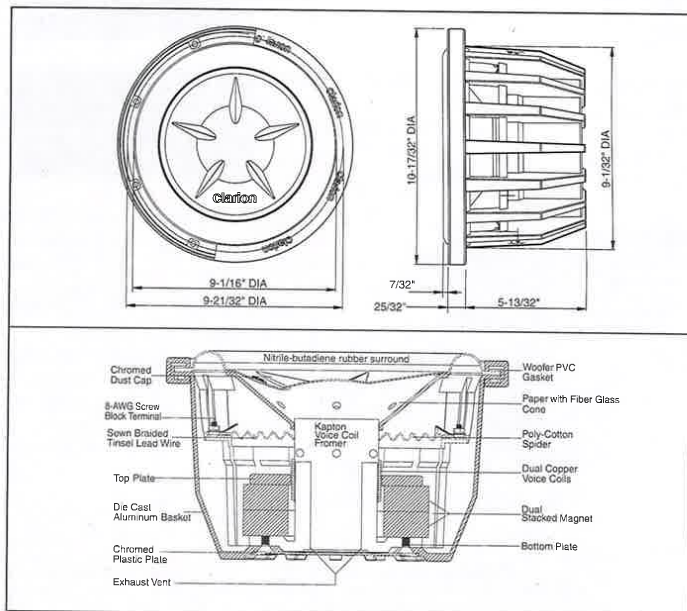
Net Internal Air Volume: 2.0 ft<sup>3</sup>  
 Vent Dimension: 2 x 2.5" ID x 8-1/4" Long  
 F3 Frequency: 41.39 Hz



PFW/PXW

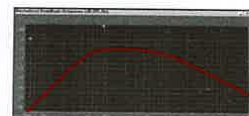
## PXW1051/PXW1052

Dual Voice Coil 10" Subwoofer



### SEALED ENCLOSURE - SOUND QUALITY

Net Internal Air Volume: 0.5 ft<sup>3</sup>  
 F3 Frequency: 52.12 Hz  
 Total System Q: 0.719



### VENTED ENCLOSURE - SOUND QUALITY

Net Internal Air Volume: 1.0 ft<sup>3</sup>  
 Vent Dimension: 2.5" ID x 11-1/8" Long  
 F3 Frequency: 31.02 Hz



### VENTED ENCLOSURE - SPL

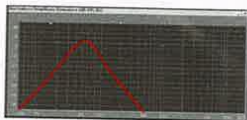
Net Internal Air Volume: 1.0 ft<sup>3</sup>  
 Vent Dimension: 3" ID x 7-3/4" Long  
 F3 Frequency: 35.5 Hz  
 Subsonic Filter Frequency: 30 Hz



PFW/PXW

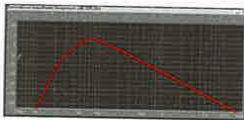
**BANDPASS ENCLOSURE - SPL**

Net Sealed Air Volume: 0.75 ft<sup>3</sup>  
Net Vented Air Volume: 0.8 ft<sup>3</sup>  
Vent Dimension: 4" ID x 10-5/8" Long  
F3 Frequency: 39.7 Hz

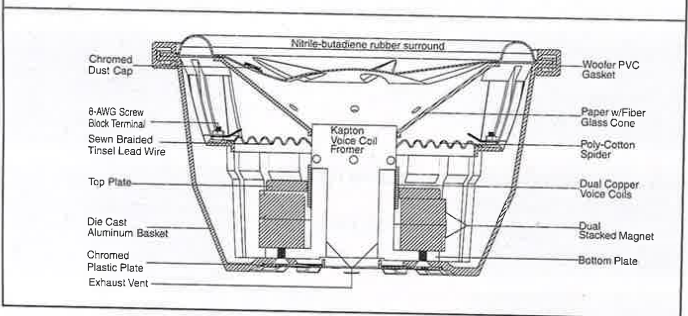
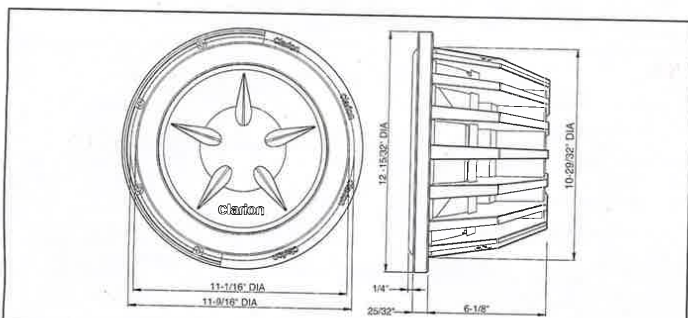


**DUAL DRIVER VENTED ENCLOSURE - STREET**

Net Internal Air Volume: 2.0 ft<sup>3</sup>  
Vent Dimension: 3" ID x 6-7/8" Long  
F3 Frequency: 31.12 Hz  
Subsonic Filter Frequency: 25 Hz



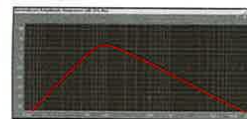
**PXW1251/PXW1252  
Dual Voice Coil 12" Subwoofer**



PFW/PXW

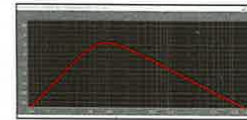
**SEALED ENCLOSURE - STREET**

Net Internal Air Volume: 0.8 Ft<sup>3</sup>  
F3 Frequency: 53.07 Hz  
Total System Q: 0.922



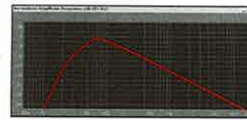
**SEALED ENCLOSURE - SOUND QUALITY**

Net Internal Air Volume: 1.5 Ft<sup>3</sup>  
F3 Frequency: 47.72 Hz  
Total System Q: 0.79



**VENTED ENCLOSURE - STREET**

Net Internal Air Volume: 1.7 ft<sup>3</sup>  
Vent Dimension: 3" ID x 6-1/2" Long  
F3 Frequency: 35.6 Hz  
Subsonic Filter Frequency: 30 Hz



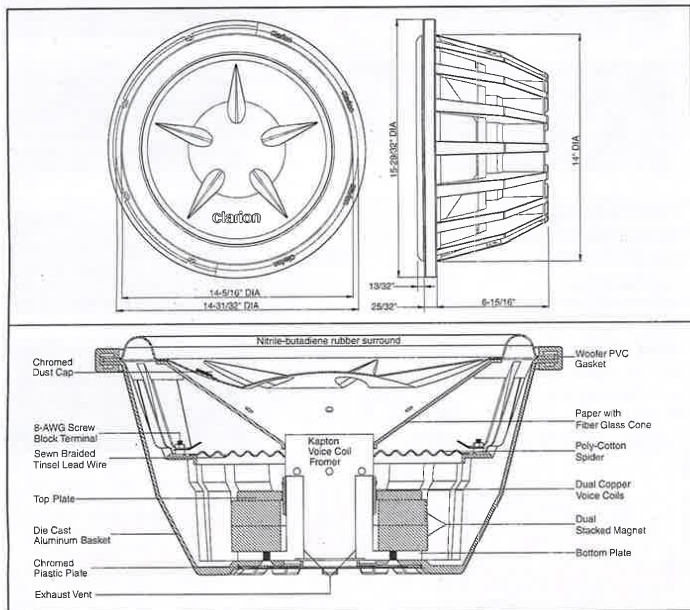
**DUAL VENTED ENCLOSURE - SPL**

Net Internal Air Volume: 3.5 ft<sup>3</sup>  
Vent Dimension: 2 x 3" ID x 5-5/8" Long  
F3 Frequency: 35.1 Hz  
Subsonic Filter Frequency: 30 Hz



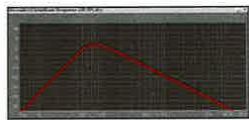
PFW/PXW

**PXW1552**  
Dual Voice Coil 15" Subwoofer



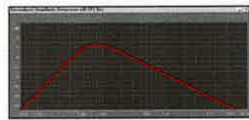
**SEALED ENCLOSURE - STREET**

Net Internal Air Volume: 1.5 Ft<sup>3</sup>  
F3 Frequency: 43.63 Hz  
Total System Q: 0.915



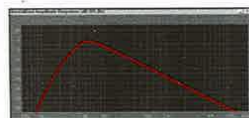
**SEALED ENCLOSURE - SOUND QUALITY**

Net Internal Air Volume: 2.0 Ft<sup>3</sup>  
F3 Frequency: 40.08 Hz  
Total System Q: 0.84



**VENTED ENCLOSURE - STREET/SPL**

Net Internal Air Volume: 3.5 Ft<sup>3</sup>  
Vent Dimension: 4" ID x 6-7/8" Long  
F3 Frequency: 29.9 Hz  
Subsonic Filter Frequency: 23 Hz



PFW/PXW

**PFW ENCLOSURE DESIGN NOTE:**

When constructing an enclosure for the PFW1051, please ensure the subwoofer is mounted in so the cone does not come into contact with any object (back of seat) when in use. This may require the installation of a grill or recessing the subwoofer into the enclosure. The subwoofer may be damaged if it comes into contact with any surface while in operation.

**ENCLOSURE DESIGN NOTES:**

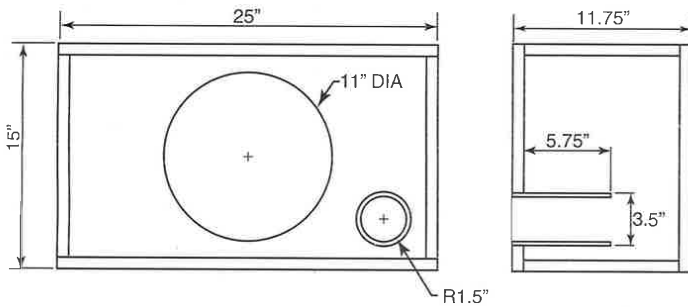
- All enclosures should be constructed of 3/4" MDF. Particle board is not suitable for an enclosure and may result in the subwoofer system offering poor performance or the driver may be damaged.
- All panel joints should be sealed with appropriate caulking (latex or rope caulk). Do not use Silicone.
- All joints must be secured with screws or nails.
- Any panel exceeding 4 square feet in area (2'x2' or 1'x4' for example) should be braced internally for resistance to flexing
- All enclosure volumes are net and do not include the displacement of the subwoofer, ports or bracing. Please include these items in your enclosure calculations
- Clarion does not recommend the use of passive crossover networks with our subwoofers (inductors, chokes). Use an amp with an electronic crossover for the subwoofer to achieve optimum performance.
- Where noted, please use a subsonic filter to protect your Clarion subwoofer from over-excursion situations that may cause damage.
- All specifications are subject to change without prior notice.

**5. Subwoofer Application Comparison**

Enclosure Type	Sealed	Vented	Bandpass
Power Handling	Good at all Frequencies	Good above Tuning Frequency	Good near Tuning Frequency
Linearity	Excellent	Good	Poor
Dynamic Performance	Excellent	Good	Poor
Efficiency	Good	Very Good	Excellent
Subsonic Output	Excellent	Good	Good
Midbass Output	Excellent	Very Good	Poor
Enclosure Size	Small	Medium	Large

PFW/PXW

## 6. Calculating Enclosure Volume



To calculate the volume of an enclosure, measure the outside dimensions (Length, Width and Height), subtract the thickness of the material then multiply the three numbers together to get the volume in cubic inches. To convert to cube feet, divide this number by 1728.

We will use the 1.7 Cubic foot vented enclosure for the PXW1251/PXW1252 as an example.

Net Internal Air Volume: 1.7 ft<sup>3</sup>

Vent Dimension: 3" ID x 6-1/2" Long

Driver Volume (Vd) = 0.15ft<sup>3</sup>

Eg: Material Thickness: 0.75"

External Length: 11.75" Internal Length: 11.75 - (2 x 0.75") = 10.25"

External Width: 25" Internal Length: 25 - (2 x 0.75") = 23.5"

External Height: 15" Internal Height: 15 - (2 x 0.75") = 13.5"

Equation: (10.25" x 23.5" x 13.5") ÷ 1728 = 1.882 ft<sup>3</sup>

To calculate the area of a cylinder (for a vent), the equation is:

Radius x Radius x 3.1416 x length

Eg: Vent Diameter: 3.5" OD, R=1.75" Vent Length: 5.75"

Equation: ((1.75" x 1.75" x 3.1416) x 5.75) ÷ 1728 = 0.032 ft<sup>3</sup>

### Total Enclosure Calculations

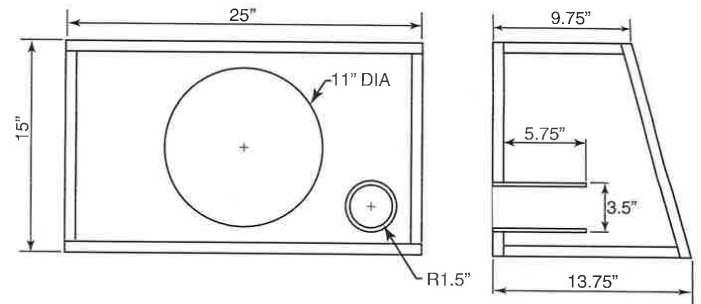
To perform a complete enclosure calculation: You must subtract any objects that would consume air volume from the enclosure.

Net Enclosure Volume:

Gross Volume - Port Volume - Driver Volume (Vd) = Net Volume

Equation = 1.882 - 0.032 - 0.15 = 1.7 ft<sup>3</sup>

## 7. Wedge Style Enclosure



For wedge style enclosures, you need to find the average depth of the angled panel. In the case of the example below, add 9.75" to 13.75" and divide by 2 to get 11.75". The calculations then become the same as for a rectangular enclosure.

Average External Depth Equation: (9.75" + 13.75") ÷ 2 = 11.75"

Internal Depth Equation: 11.75" - (2 x 0.75") = 10.25"

You can substitute this into the original enclosure volume calculation as the depth.

Equation: (10.25" x 23.5" x 13.5") ÷ 1728 = 1.882 ft<sup>3</sup>

## 8. Limited Warranty Information

For USA and Canada only

Except as noted, Clarion products purchased from an authorized Clarion Dealer are warranted against all defects in materials and workmanship for a period of one (1) year from date of original purchase.

The following Clarion products noted below \*\* are warranted against all defects in materials and workmanship for a two (2) year period from the date of original purchase when purchased from AND installed by an authorized Clarion dealer.

\*\* DRZ9255 DXZ865MP DXZ765MP DXZ665MP DXZ465MP DFZ675MC DPX11500 DPX1800 DPX2250

All Clarion cables, wires and other accessories if purchased from an authorized Clarion Dealer are warranted against all defects in materials and workmanship for ninety (90) days from the date of original purchase.

**ALL PURCHASES OF CLARION PRODUCTS FROM NON-AUTHORIZED CLARION DEALERS ARE SUBJECT TO FURTHER WARRANTY RESTRICTIONS AS DESCRIBED BELOW.**

The conditions of this Limited Warranty and the extent of responsibility of Clarion Corporation of America ("Clarion") under the Limited Warranty are as follows:

- 1. PROOF OF DATE OF PURCHASE FROM AN AUTHORIZED CLARION DEALER WILL BE REQUIRED FOR WARRANTY SERVICE OF THIS PRODUCT. IN THE CASE OF THE TWO (2) YEAR LIMITED WARRANTY FOR THE CLARION PRODUCTS NOTED ABOVE, PROOF OF DATE OF PURCHASE AND PROOF OF INSTALLATION BY AN AUTHORIZED CLARION DEALER IS REQUIRED. INFORMATION ABOUT CLARION AUTHORIZED WARRANTY SERVICE CENTERS MAY BE OBTAINED BY CONTACTING CLARION AT THE ADDRESS LISTED BELOW.**
2. This Limited Warranty will become void if service performed by anyone other than an approved Clarion Warranty Service Center results in damage to the products.
3. This Limited Warranty does not apply to any product which has been subject to misuse, neglect or accident, or which has had the serial number altered, defaced or removed, or which has been connected, installed, adjusted or repaired, other than in accordance with the instructions furnished by Clarion.
4. This Limited Warranty does not cover car static or other electrical interferences, tape head or laser pick-up cleaning or adjustments, or labor costs for the removal or reinstallation of the unit for repair.
5. The sole responsibility of Clarion under this Limited Warranty shall be limited to the repair of the product or replacement of the product, at the sole discretion of Clarion.
6. Product must be shipped in its original carton or equivalent carton, fully insured, with shipping charges prepaid. Clarion will not assume any responsibility for any loss or damage incurred in shipping.
7. CLARION PRODUCTS PURCHASED FROM A SOURCE OTHER THAN AN AUTHORIZED CLARION DEALER, INCLUDING ANY AND ALL PURCHASES VIA THE INTERNET FROM A NON INTERNET AUTHORIZED CLARION DEALER, SHALL NOT BE COVERED BY ANY CLARION LIMITED WARRANTY TO THE EXTENT ALLOWED BY APPLICABLE LAW. IN THE EVENT AND TO THE EXTENT APPLICABLE LAW PROHIBITS ELIMINATION OF WARRANTIES UNDER THESE CIRCUMSTANCES, THE APPLICABLE LIMITED WARRANTY PERIOD SHALL BE DEEMED TO BE FIFTEEN (15) DAYS FROM THE DATE OF ORIGINAL PURCHASE.
8. ALL IMPLIED WARRANTIES EXCEPT TO THE EXTENT PROHIBITED BY APPLICABLE LAW SHALL HAVE NO GREATER DURATION THAN THE WARRANTY PERIOD SET FORTH ABOVE: UNDER NO CIRCUMSTANCES SHALL CLARION BE LIABLE FOR ANY LOSS OR DAMAGE, DIRECT OR CONSEQUENTIAL, ARISING OUT OF THE USE OR INABILITY TO USE THE PRODUCT, BECAUSE SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS OR EXCLUSIONS OR LIMITATIONS OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, THE ABOVE LIMITATIONS OR EXCLUSIONS MAY NOT APPLY TO YOU.
9. **THIS LIMITED WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.**
10. The laws of the state of California shall govern and control this Limited Warranty, its interpretation and enforcement.
11. Should you have any difficulties with the performance of this product during the warranty period, please call Clarion or visit our web site for a listing of Authorized Warranty Service Centers in your area. You may also contact Clarion Customer Service at the address listed below for any service you may need with Clarion products.

In U.S.A.  
Clarion Corporation of America  
Attn: Customer Service Manager  
661 W. Redondo Beach Blvd.  
Gardena, CA. 90247-4201  
1-800-GO-CLARION (310)327-9100  
[www.clarion.com](http://www.clarion.com)

In Canada  
Clarion Canada, Inc.  
Warranty Service Center  
2239 Winston Park Drive  
Oakville, Ontario L6H 5R1  
(905)829-4600

NOTES: