



FULL-RANGE SYSTEM
RFA-414, RFA-514, RFA-614

Owner's Manual



Dear Customer,

Congratulations on your purchase of the world's finest brand of car audio components. At Rockford Fosgate we are committed to musical reproduction at its best, and we are pleased you chose our product. Through years of engineering expertise, hand craftsmanship and critical testing procedures, we have created a wide range of products that reproduce music with all the clarity and richness you deserve.

For maximum performance we recommend you have your new Rockford Fosgate product installed by an Authorized Rockford Fosgate Dealer, as we provide specialized training through Rockford Technical Training Institute (RTTI). Please read your warranty and retain your receipt and original carton for possible future use.

To add the finishing touch to your new Rockford Fosgate image, order your Rockford accessories, which include everything from T-shirts and jackets to hats and sunglasses.

To get a free brochure on Rockford Fosgate products and Rockford accessories, please call 602-967-3565 or FAX 602-967-8590. For Canada, call Korbon Trading at 416-567-1920. For International orders, FAX 001-1-602-967-8132 or call 001-1-602-967-3565.

PRACTICE SAFE SOUND™

CONTINUOUS EXPOSURE TO SOUND PRESSURE LEVELS OVER 100dB MAY CAUSE PERMANENT HEARING LOSS. HIGH POWERED AUTOSOUND SYSTEMS MAY PRODUCE SOUND PRESSURE LEVELS WELL OVER 130dB. USE COMMON SENSE AND PRACTICE SAFE SOUND.

The serial number can be found on the outside of the box. Please record it in the space provided below as your permanent record. This will become useful in recovering your product if it is ever stolen and serve as verification of your factory warranty.

Serial Number: _____

Model Number: _____

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SPECIFICATIONS

RFA-44	Diameter:	4" (101.6mm)
	Power Handling:	30 Watts
	Impedance:	4 ohms
	Frequency Response:	94 - 7,000Hz
	Sensitivity:	86dB
	Resonance:	94Hz
	Mounting Depth:	1-27/32" (46.8mm)
RFA-54	Diameter:	5-1/4" (133.4mm)
	Power Handling:	50 Watts
	Impedance:	4 ohms
	Frequency Response:	44 - 6,000Hz
	Sensitivity:	86dB
	Resonance:	44Hz
	Mounting Depth:	2-5/8" (66.7mm)
RFA-64	Diameter:	6-1/2" (165.1mm)
	Power Handling:	80 Watts
	Impedance:	4 ohms
	Frequency Response:	39 - 6,000Hz
	Sensitivity:	89dB
	Resonance:	39Hz
	Mounting Depth:	3-3/32" (78.6mm)
ND4 Tweeter	Power Handling:	50 Watts
	Impedance:	4 ohms
	Frequency Response:	3,000Hz - 20,000Hz
	Sensitivity with input of 1 Watt measured at 1 meter:	91dB
2X-4 Crossover	Crossover Network:	2nd Order Symmetrical Linkwitz-Riley alignment
	Crossover Frequency:	4,000Hz Low Pass 4,000Hz High Pass
	Impedance Circuits	
	Tweeter Resonance:	1,500Hz
	High Frequency (Zobel):	10kHz
	Crossover Slope:	12dB/octave
	Tweeter Level Matching:	-3dB
	Active Tweeter Protection	
	Circuitry:	100 Watts

Specifications are subject to change.

PUNCH AUDIO*phile* SYSTEM CONTENTS

The Punch AUDIO*phile* System contains:

- 1 pair of 2X-4 crossovers
- 1 pair of AUDIO*phile* mid-range/woofers
- 1 pair of ND4 neodymium tweeters with flush mount cup
- 1 pair of surface mounting plates
- Speaker grilles
- Assorted hardware
- 16 gauge Perfect Interface hook-up wire

INTRODUCTION

This manual provides information on the features and installation of the Punch AUDIO*phile* Full Range System. We suggest you save this manual for future reference.

We strongly recommend you have your Authorized Rockford Fosgate Dealer install the Punch AUDIO*phile* System. If you do choose to install the system yourself, please be sure to read the entire manual before beginning.

DESIGNS AND FEATURES

This section describes the design and features of each component in the Punch AUDIO*phile* System.

2X-4 High Pass and Low Pass Crossover

The 2X-4 Crossover is designed to be the “link” between the ND4 neodymium tweeters, and RFA-44, 54 and 64 midrange/woofer speakers. This compact 2-way crossover is designed to conform to the following criteria:

- 2-Way Crossover network centered at 4 kHz.
- Uses Linkwitz-Riley 2nd order transfer function (12 dB/octave).
- Additional tweeter filtering uses a series notch filter centered at 1500 Hz to minimize the tweeter’s resonance peak.
- Also included is impedance compensation equalization (Zobel network). This flattens out the gradual impedance rise above 10 kHz.
- Tweeter protection provided through a special compression circuit.

This compression technique in the crossover uses an array of two lamps wired in parallel, whose function is to monitor the input power to the tweeter. When it sees a threatening increase in input voltage, it will increase the resistance. This technique is fast, and virtually undetectable to the listener. Other manufacturers’ tweeter protection is done via circuit breakers. This method drastically reduces tweeter output, which is very noticeable and distracting for the listener.

- Small size is accomplished by using inductors wound on specially designed ferrite bobbins.

Input and Output Connectors

Attaching wires to the 2X-4 is accomplished with the use of silver plated “screw-lok” terminals to secure both the input and output speaker wires. The 2X-4 accepts wire sizes up to 12 gauge.

Mounting the 2X-4

The 2X-4 is mounted to relatively flat surfaces with sheet-metal screws inserted into the mounting holes on either side of the enclosure.

PUNCH AUDIO*phile* MID-RANGE/WOOFERS

	<p>The Punch AUDIO<i>phile</i> drivers are designed for optimum smooth frequency response. This goal, as with all Rockford Fosgate products, is achieved by utilizing “high quality, high-end” component parts.</p>
Cone Body	<p>The “felting stocks” and geometry of the cone body were selected to provide the smoothest, or flattest, well-extended high frequency response. In addition, these “precision mass controlled” rigid paper cone bodies are properly terminated with “highly compliant” nitrile rubber edges.</p>
Flat Spider Design	<p>The system’s linear compliance is balanced through the use of a “proprietary” flat spider design for “symmetrical control” of the voice coil and cone excursion. The linear suspension of rubber edges coupled with flat spiders and the use of long 2-layer voice coils results in drivers which exhibit low Total Harmonic Distortion (THD) figures.</p>
Voice Coil	<p>To ensure a well controlled high frequency output up to the 4 kHz transition point of the ND4 tweeter, small voice coil diameters and vented pole pieces are used. Venting both reduces back pressure in the voice coil cavity to reduce “air-rush” noise, as well as allowing for the circulation of “cooling” air in the voice coil circuit. To further reduce heat build-up in the voice coil and increase long-term power handling, the pole piece and field plate surfaces are supplied with a black heatsink finish.</p>
Dust Cap	<p>The pre-treated cloth dust caps are specially chosen so as not to interfere with the natural response of the cone and motor combination. They are sonically neutral and will not radiate or add undesirable resonance in or out of the driver passband.</p>
Powder Coating Finishes	<p>Powder coating has long been the industry standard for durability in protective metal finishes. As an additional benefit, powder coating is the only finishing process that is “earth friendly.” It releases no toxic chemicals into our air and water supplies.</p>

PUNCH AUDIO*ophile* ND4 NEODYMIUM TWEETER

	The ND4 Neodymium Tweeter is designed for optimum smooth frequency response.
Neodymium Magnets	The high ionic compound of neodymium enables a smaller tweeter magnet assembly to be used as opposed to the much larger ferrite magnets that are commonly used in speaker manufacturing.
Ferrofluid Cooling	The tight tolerances of the neodymium tweeter call for ferrofluid as the ideal cooling agent, thereby giving the tweeters increased efficiency and power handling.
Flush Mount/ Surface Mount	The design of the ND4 Neodymium Tweeter enables you to incorporate the tweeter in either a flush mount or surface mount installation.
Replaceable Dome	The voice coil in the neodymium tweeter is replaceable if it should ever fail. Please contact your Authorized Rockford Fosgate Dealer for more information.

SPEAKER PLACEMENT FOR PROPER SOUND STAGING

To create an accurate listening environment one must first have a basic understanding of sound reproduction. Rockford Fosgate recommends creating a FRONT STAGE with ambience or REAR FILL. The main goal is to create a three dimensional sound stage that exhibits width, height and depth. In the ideal listening environment the main source of sound is in the front of the listener. This helps to create a front stage. A front stage describes the system's ability to reproduce the presence of a stage from in FRONT of the listener. Ambience or rear fill is the result of sound reflecting off the rear walls and other surfaces before traveling back to the listener.

A solid front stage with a good image is one of the most difficult tasks to achieve in an automobile. No car reflects the optimum listening environment. This makes proper

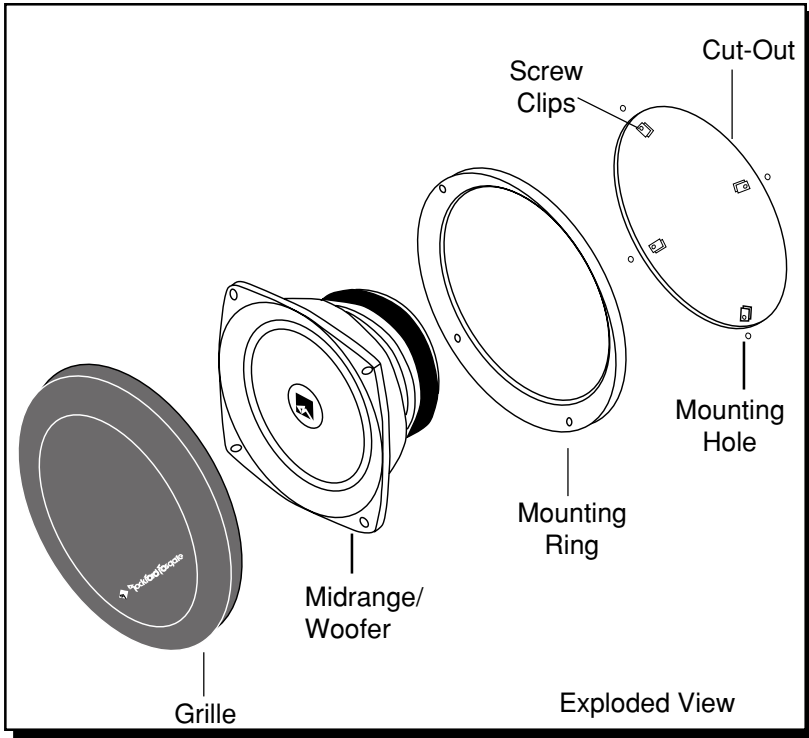
sound staging very difficult to achieve. Most speakers tend to be placed where they will easily fit, as opposed to where they will sound good. Speaker mounting varies from car to car. The two basic rules for mounting midrange/woofers and tweeters are:

1. Keep the speakers close together
2. Keep them as far forward as possible.

Sound waves reflect from walls and other surfaces the same way light reflects from a mirror. In the ideal listening environment the enclosed space traps the sound, forcing it to return to the listener over and over again in a rapidly, decaying sense of reflections, known as “reverberation.” Ideally, these reflections give the listeners a sense that a live performance is taking place, thereby making the car seem more spacious. This effect makes them feel immersed in the music, adding warmth and fullness to the tonal quality of the instruments.

The following diagrams show some examples of how to mount the tweeter, midrange/woofers and wire the Punch *AUDIOphile* system.

MOUNTING THE RFA-44, 54 AND 64 MID-RANGE/WOOFERS

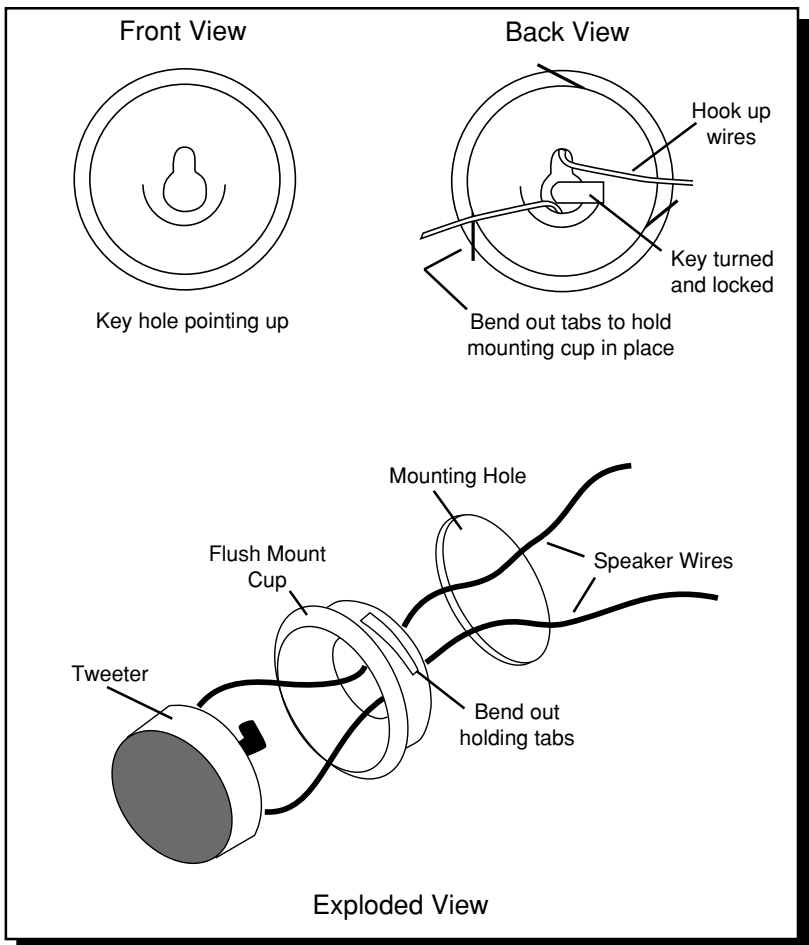


1. Cut the proper size hole for the midrange/woofer.
 - For the RFA-44, cut a 4" (101.6mm) diameter hole
 - For the RFA-54, cut a 4-15/16" (125.4mm) diameter hole
 - For the RFA-64, cut a 5-27/32" (148.4mm) diameter hole
2. Place the mounting ring over the mounting hole and mark the location of the mounting holes.
3. Remove the ring. Drill the holes for the screw clips using an 1/8" bit.
4. Route the wire through the hole.
5. Install the screw clips over the holes. Place the mounting ring over the hole.
6. Attach the wires and be sure to observe proper speaker polarity.
7. Place the speaker into the hole and screw into place.
8. Press the speaker grille into the mounting ring.

FLUSH MOUNTING THE ND4 TWEETER

The following instructions explain how to flush mount the ND4 Tweeters.

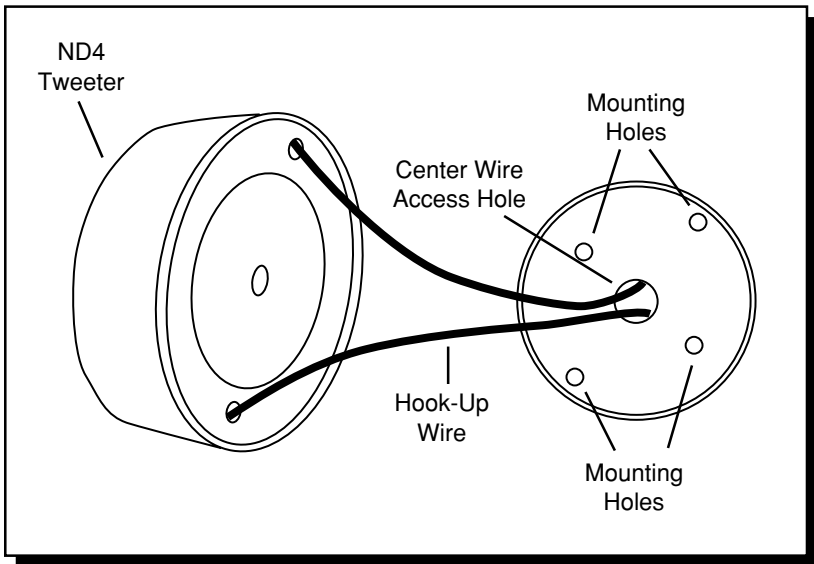
1. Cut a 2-1/8 inch (54mm) diameter mounting hole.
2. With the key hole pointing up, insert the flushmount cup into the mounting hole. Bend back the retaining tabs to secure in place. With the wires inserted through the key hole, insert the tweeter into the bracket and turn clockwise to lock it in place. Note: Be sure to observe proper speaker polarity.



SURFACE MOUNTING THE ND4 TWEETER

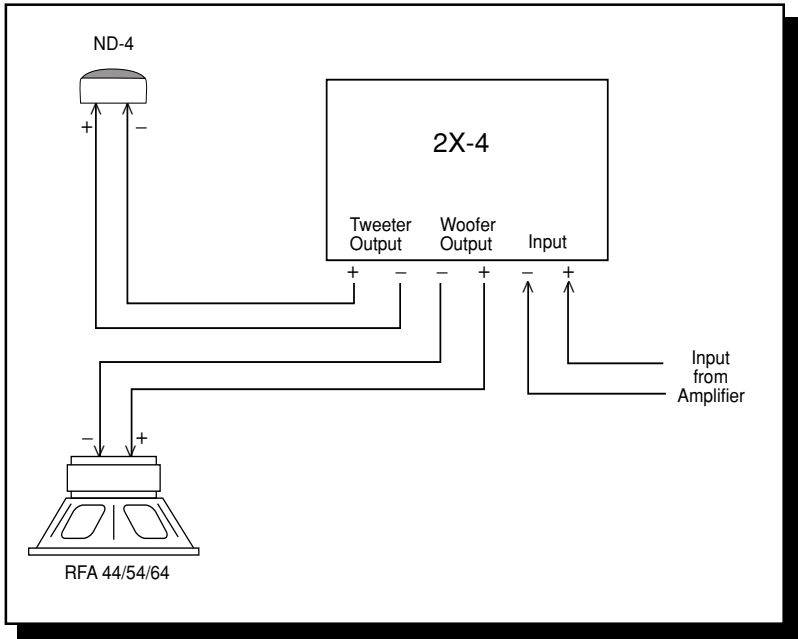
The following instructions explain how to surface mount the ND4 Tweeters.

1. Place the mounting plate on a surface that the tweeter will be mounted onto. Mark two (2) opposing mounting holes and the center wire access hole.
2. Drill a 1/4 inch (6.4mm) hole for the wire access. Drill two (2) 1/8 inch (3mm) holes for the mounting screws.
3. Route the hook up wire through the center hole.
4. Place the mounting plate in position by threading the hook-up wires through the center hole. Mount the mounting plate down using the provided screws.
5. Attach the hook-up wire to the tweeter.
Note: Be sure to observe proper speaker polarity.
6. Snap the tweeter onto the mounting plate.



WIRING THE PUNCH AUDIO*phile* System

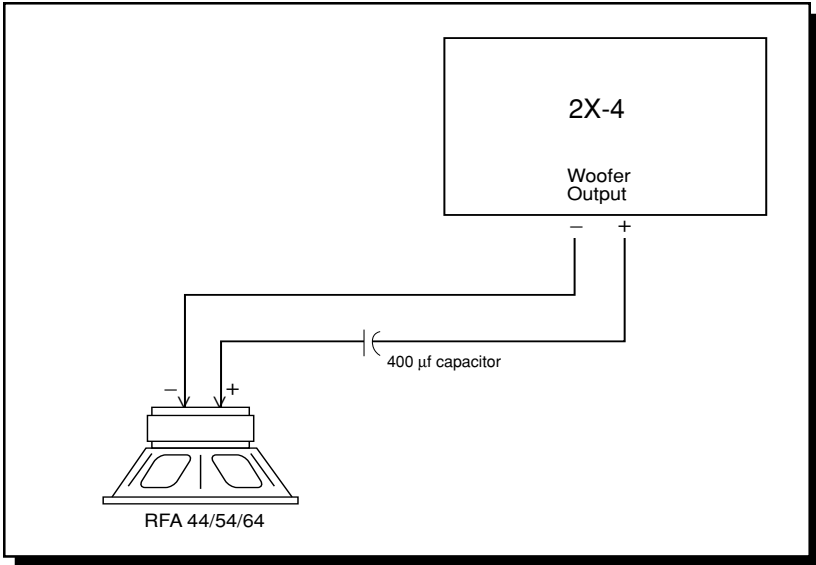
The following diagrams show some examples of how to wire the Punch AUDIO*phile* system.



Note: With 12 dB per octave (second order filters) an out of phase condition can exist within the passband. To correct this situation the tweeters must be wired out of polarity. We recommend hooking it up out of polarity first and then listening to the system. Next, reverse the polarity and listen again. Select the one that sounds best. The polarity reversal can occur at either the tweeter or crossover, whichever is most convenient.

BANDPASSING THE WOOFER

To bandpass the midrange/woofer, it is necessary to add a 400 μ f capacitor in series with the woofer.



WARRANTY INFORMATION

Rockford Fosgate warrants all loudspeakers to the original purchaser for a period of two (2) years parts and labor, providing the product was purchased from an Authorized Rockford Fosgate Dealer. Speakers found to be defective during the warranty period will be repaired or replaced (with a product deemed to be equivalent) at Rockford Fosgate's discretion. Repaired or replaced speakers will cover the balance of the original warranty period only. Warranty applies only to original purchaser and is non-transferable. Warranty does not cover abuse or installation error. If a determination is made that the product has been abused or is out of the warranty period, it will be repaired, exchanged, and billed. Parts not covered under warranty will be repaired or replaced and billed. For speaker boxes, please return the speaker only. Serial number must be intact to obtain warranty. Speakers must be returned prepaid to Grand Rapids, Michigan.

GENERAL

Electronics and speaker warranties do not cover any appearance item, any cost or expense related to the removal or reinstallation of the product, any accessory used in conjunction with the product, damage to the product resulting from alteration, accident, misuse or abuse, or improper installation. This warranty does not apply if the parts or labor, which would otherwise be provided without charge under this warranty, are obtained from any source other than Rockford Fosgate or an Authorized Rockford Fosgate Service Center.

The warranty is the only express warranty and does not create any implied warranties. Rockford Fosgate limits its obligations under any implied warranties under state laws to a period not to exceed the written warranty period. Some states do not allow limitation on how long an implied warranty lasts, so the above limitation may not apply. This warranty applies only to products sold in the United States of America or its possessions. For warranty outside the U.S.A., please contact the nearest Authorized Rockford Fosgate Dealer. This warranty gives the consumer specific legal rights, and the consumer may have other rights which vary from state to state.

A defective product must be shipped prepaid to the Authorized Rockford Fosgate Dealer from which the consumer purchased the product or to the address below, in the original factory carton or equivalent. Any shipping loss or damage will be borne by the consumer or the consumer's shipper. **A consumer/dealer returning a product to the factory should call (800) 669-9899 for a Return Authorization Number.** All shipments shall be clearly marked with the Return Authorization Number on the outside of the shipping carton.

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