Installation and Operation Guide

NEO 329F4 & NEO 3210F4

CLARK Absolute Tactile Sound Transducers are wide frequency range, electro-mechanical devices engineered to produce synchronous tactile and audio sound when correctly mounted to most surface mediums. The resulting sound is determined by the inherent resonant qualities of the mass and amount of power supplied to the transducer. To achieve the highest quality tactile response, some simple considerations in the application and design of the medium should be considered.

APPLICATIONS

The CLARK Absolute Tactile Sound Transducers have been successfully installed in or on:

- F-14, F-15, F-16 and small aircraft flight simulators; Bradley Tank and Apache Helicopter gunnery Turret simulators.
- Dance Floors and Home Theater Floors
- Home Patio Decks
- Hot Tubs, Bath Tubs and Swimming Pools
- Inside Boat Hulls and,
- A wide variety of Furniture

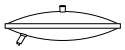
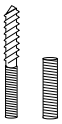
BEST USES

In most applications, the transducers should be centrally located in the medium (the deck, the chair, the floor, etc.) to evenly distribute the tactile effect. When two units are used to provide stereo separation, they should be spaced an equal distance from each other and the edges or walls of the medium. A bridge, joist or frame member that is central to the overall structure is preferred. The best material for bridging and carrying transduction waves is wood. Experience has shown that the more rigid the medium's structure, the better the sound transduction.

WHAT TO AVOID

Care should be taken to avoid dampening the tactile vibrations. Any energy absorbing materials such as cushions, padding, carpets will negatively affect the amount of tactile sound presented to the user. These materials can be overcome by increasing the amount of power to the transducers, but it is recommended to keep these to a minimum.

WHAT'S INCLUDED

- ☞ 1 Transducer 
- ☞ 1 3/8″ - 16 Female Fastener (pre-attached)
- ☞ 1 3/8″ - 16 Hanger Bolt
- ☞ 1 3/8″ - 16 X 1¼″ Threaded Stud 
- ☞ 2 Jam Nuts 
- ☞ 1 Warranty Card: please fill out and mail to us as soon as possible.

MOUNTING

The transducers are supplied with a 3/8″ female fastener imbedded in the active side of the transducer body. For most applications the included hanger bolt is used to pass the transduction waves from the transducer into the medium, which is usually a wood joist or bridge. First, drill a 1/4″ hole in the wood and screw in the hanger bolt. Once it is secure, screw one nut on the machine bolt end. Next, screw on the transducer until resistance is felt (approx. 5 or 6 times) and then tighten the nut back against the transducer. ☞ **DO NOT OVERTIGHTEN.** ☞ **DO NOT USE THE TRANSDUCER TO TIGHTEN THE NUT.**

Lock washers are typically not required, but may be added. Finally wire the transducer (shown in the wiring section, page 5), turn on the amp and ***enjoy the revolution.***

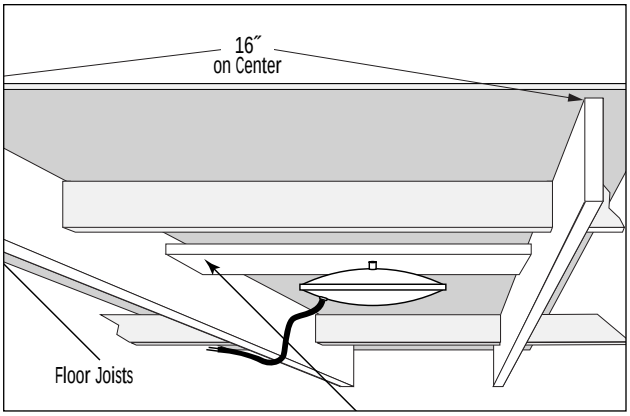
FLOOR & DECK INSTALLATION:

Some of the less difficult and best quality installations of the CLARK Absolute Tactile Sound Transducers are in floors and decks in your home. The transducers may be mounted effectively in both indoor and outdoor locations.

FLOORS

When installing onto a floor, access may be from the basement or ceiling below the targeted floor. Once access is available, create a 2″ x 6″ bridge to gap the floor joists. Install the board parallel and flush to the floor using adhesives and screw fasteners. An extremely secure bridge is necessary for the best transduction. Screw the hanger bolt directly into the bridge and attach one nut onto the machine screw end. Next, screw on the transducer until first resistance is felt and tighten the nut back against the transducer.

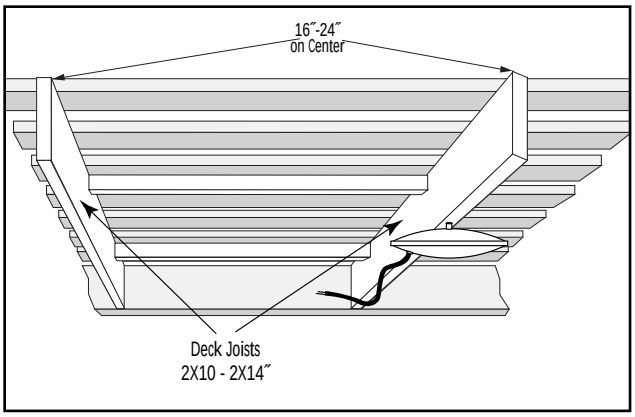
DO NOT OVERTIGHTEN. **DO NOT USE THE TRANSDUCER TO TIGHTEN THE NUT.**



Wire the transducer through a hole made near the edge of the floor surface. Make sure the speaker cable is secure at all points and not buzzing when the transducer is turned on. Understand the structure of your floor and remember, padding, carpet and cushions will reduce the tactile effects so plan accordingly.

DECKS

The transducer may be mounted in outdoor locations much the same way as indoor installations. The best deck application is using two transducers located an equal distance from each other and each of the deck edges. On wooden decks, the hanger bolt may be mounted directly to the bottom of the center joist or a bridge may be used between joists. For most decks, a bridge is not necessary, but you can cut and install a 2″ x 6″ bridge between two center joists much the way you would in a floor installation. Cut the bridge to size and use wood screws and adhesives to make sure it is secure to the joists and the deck surface. This will allow stronger transmission of tactile sound waves through the deck.



Next, wire the transducers by soldering the leads to the speaker cable. Make the connections water-tight with electrical tape or molded plastic connectors. Make sure the wires are secured to the deck so they do not buzz when they vibrate. Turn on your amp and notice the brilliance in sound reproduction which emanates from each board, producing a powerful, yet full range of acoustics.

FURNITURE & CAR SEAT INSTALLATION:

FURNITURE

In many instances, furniture application is desired to better surround the person in tactile sound in a deep chair or couch. Often times it is difficult to get permission to install anything in an apartment, much less something which will transduce sound throughout the building.

The Clark Absolute sound transducers have been installed into numerous pieces of furniture, all resulting in good tactile sound quality. Again, furniture that is sturdy and supportive as opposed to that with large cushions or pillows will normally provide better results. The most reactive piece of furniture is the basic wooden chair. A chair or couch with arm rests is preferred since much of the tactile sensation is more clearly realized in the hands and arms. When used in recliners, make sure that the transducer and it's installation does not interfere with the mechanical structures of the chair.

Installation can be as simple as drilling a 1/4″ hole in the bottom of a wooden chair, screwing in the supplied hanger bolt, attaching the transducer and tightening the jam nut. Conversely, installation in other furniture may involve more time and effort to achieve optimum results.

SOME GENERAL GUIDELINES:

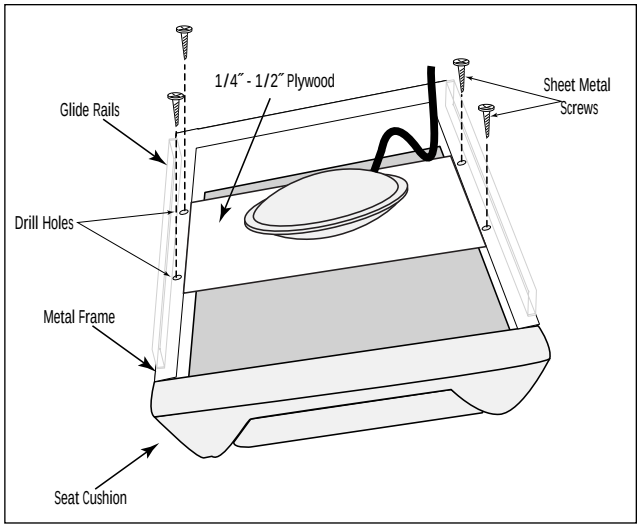
As a general rule, most furniture has an underlying wooden frame that supports the cushions and/or springs. The transducer should be mounted directly to one of the frame members or to a bridge which is rigidly secured to the frame. The more centrally located the frame member, the better the distribution of tactile sound. For best results, the transducer should be parallel to the ground (horizontal) so that the motion is up and down as opposed to sideways.

Some furniture has a "box" type frame that does not allow the hanger bolt to be securely attached and may not allow the transducer to be mounted with the top fastener pointing straight up and down. This is one application for a bridge, typically a 2″x4″ cut to span two frame members or connect two sides of the box frame. The transducer is then mounted to the 2″x4″ in the standard manner. Some experimentation may be required to determine the optimum mounting position.

CAR SEATS

Install the tactile sound transducers much the same as you would a chair or other piece of furniture. First remove the track bolts from the seat track to the floor of the car. Find a sturdy frame member on the bottom of the seat to drill and screw in the hanger bolt. If none can be found, secure a 1/2″ plywood bridge to the frame joists and screw in the hanger bolt and then the transducer. Make sure all connections are sturdy and the transducer is centrally located and not in the way when the seat track is reattached. Alternatively, the bridge can be place between the wire cushion grid and the cushions without screwing the bridge in place.

☞ An in-depth installation guide for automobile applications is available from Clark Synthesis.



PLATFORM CONSTRUCTION & INSTALLATION:

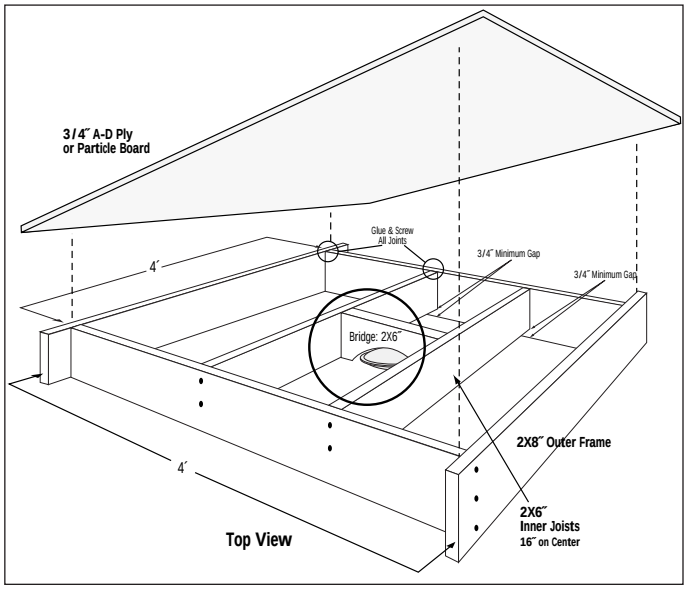
This section details the design and construction of a platforms (risers, false floors, etc.) recommended for optimum performance of the CLARK Absolute tactile sound transducer.

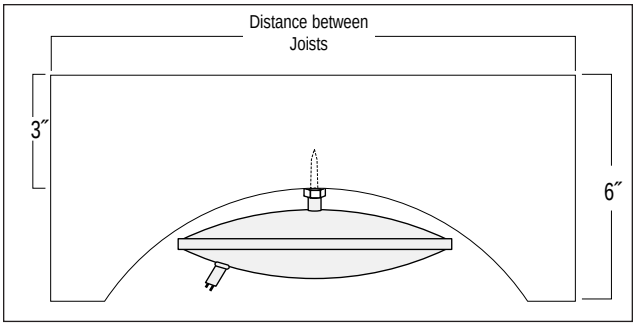
Whether constructing a platform or fitting transducers onto an existing one, it is best to space the transducers evenly with the same distance between them as to the edge of the constructed surface. If using only one transducer, please center it as much as possible to achieve the best tactile effect.

CONSTRUCTION:

When constructing your platform, suspend the center to allow tactile vibrations to pass throughout the center/seating surface area. In some cases, minor modifications can be made to adapt to different room characteristics. Shown is a 4′ x 4′ platform but you can make any size as long as the joists are 24″ or 16″ on center. Although this is not intended to be a structural element, it is best for rigidity and tactile wave transmission.

Construct the platform using a 2″ x 8″ outside joists and 2″ x 6″ inside joists to allow the center portion to be suspended above the concrete. Top flooring surface should be interior grade plywood. Where possible use construction glue and screw fasteners as opposed to nails. Loose fitting joints may cause unwanted vibrations or buzzing noises, particularly between the joist and the floor surface.

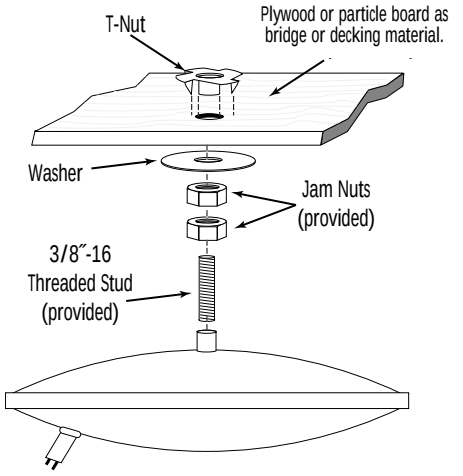




Fasten the transducer to a 2″ x 6″ bridge built in the center of the inner joists. The bridge should be well secured with a 3″ minimum circular cut curve deep enough to fit the transducer. Screw the hanger bolt directly into the bridge so the transducer will be hanging horizontally (parallel to the flooring surface) when installed. Screw one nut on the bolt and then the transducer until first tension is felt. Then tighten the nut back against the transducer. ***DO NOT OVER-TIGHTEN. DO NOT USE THE TRANSDUCER TO TIGHTEN THE NUT.***

Next, wire the transducer (see wiring; page 5) and secure the floor surface making sure it is not only in contact with the joists, but to the bridge as well. Use of adhesive here is highly recommended.

After everything is dry and , turn on the amp and adjust the gain to your liking. You will feel the tactile sound emanating from the platform surface as well as from any furniture secured or firmly resting on the surface. Building a tactilized platform or false floor to put your furniture on will not only give you tactile sensations in your feet but also your entire body through the furniture.



Alternative method using a T-Nut. May be used as a bridge or to directly couple the Transducer to the decking material.

WIRING & AUDIO CONNECTIONS:

The transducer is supplied with 12″ wire leads with tinned ends. This facilitates most installations but larger leads are available from the factory. Electrical connections may be made by soldering or using wire nuts to fasten the leads to speaker wire. In any permanent installation, a soldered connection is strongly recommended as wire nuts may have a tendency to vibrate loose.

WIRE RUNS:

Many different types of speaker cables are available, but the "in wall" shielded type is recommended. Cable size should be calculated for run length; the longer the run, the larger the cable (the smaller the American Wire Grade number). A minimum of 18 AWG is recommended. Care should be taken to insure that unshielded speaker wire does not come in contact with or is in close proximity to a 120 volt electrical cable. This will prevent any unwanted 60 cycle "hum" from being transmitted to the transducers.

POLARITY:

The positive (+) lead is identified by raised ribbing on the insulation jacket. The negative (-) lead has a smooth insulation jacket.

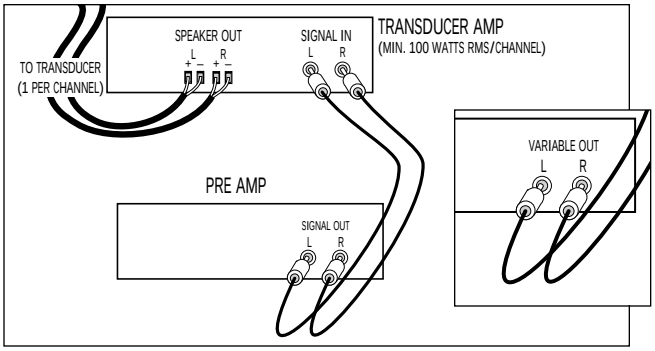
AUDIO CONNECTIONS:

Wiring the transducer is essentially the same as wiring speakers. Make sure all audio components are switched off before making wire connections. Solder the positive (+) lead, identified by raised ribbing on the insulation jacket, to positive (+) wire, usually indicated by a black or white bar, and the negative (–) lead, smooth insulation jacket, to the negative (–) wire. Use speaker cable gauge of your choice, 16 AWG or thicker is recommended.

Primary Installations: To operate the TSTs, a bi-amp system is recommended; a primary and a secondary (tactile/TAC) amplifier. The transducer(s) are wired into the "speaker out" on the TAC amp, similar to speaker hook ups. From the primary amp to the signal in on the TAC amp, you have two options: Tape Out and Variable Out.

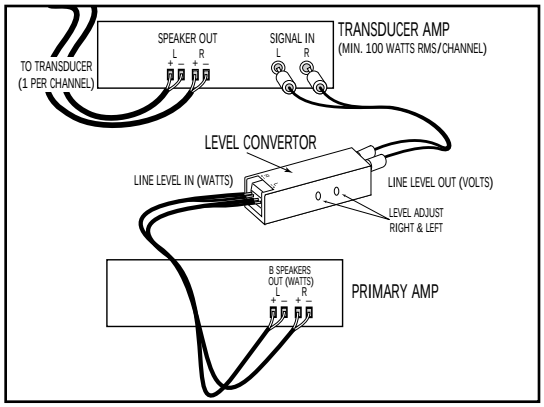
Option 1: Tape Out is the most common, but the signal to the TAC amp is not variable, therefore when the volume is raised on the primary amp, the transducers will remain at the same level.

Option 2: Variable Out (not available on all amps) overcomes this problem and the volume on the transducers will increase with the speakers.



In either case, the transducers require a stronger signal than do the speakers to drive the entire mass which they are attached.

Mono-bridging: To increase the power to a single transducer, the Right and Left channel should be summed (mixed together) to provide full audio signal to the TAC amp. The TAC amp may then be mono-bridged to provide a higher output wattage to the TSTs. Refer to your amplifier manual for details on mono-bridging.



Option 3: If increased signal strength in the transducers is required to better balance the system, a Line Level Convertor (LLC) may be used. The Line Level Converter boosts the signal to the TAC amp, therefore allowing speaker amps to run with gain all the way up.

Once connected as in the figure above, adjust the gain levels on the side of the LLC to your desired balance of tactile versus speakers. Then adjust your main amp volume and the tactile effect should increase and decrease at a higher level proportionate to the speakers. Now the main amp volume controls the entire system. Line Level Converters are available in most fine audio retailers or can be purchased from CLARK Synthesis for $35. Please call for details. Once all connections are secure and the gain controls set to the desired levels, sit back and enjoy being tactilized by your new Clark Absolute Sound System.

OTHER INSTALLATIONS:

HOT TUBS

Locate an area on the outside wall of the tub, preferably adjacent to a seating surface and clear of hoses. Remove a small section of foam insulation to expose the raw Fiberglass or plastic. If there is no inherent place to drill, the hanger bolt can be secured into a square block of 2″x4″ by first gluing it to the side of the tub. Check with hot tub manufacturer as to the ideal glue or adhesive to use. Water tight electrical connections are recommended.

SWIMMING POOLS

Please contact Clark Synthesis for information regarding our ***AQUACOUSTICS* SERIES** underwater speakers.

MISCELLANEOUS

CLARK SYNTHESIS tactile sound transducers have been successfully installed in F-15, F16 and Bradley tank simulators, theater seats, waterbeds, massage chairs and tables, walls, air conditioning ducts, steel "I" beams, boat hulls, buoys, dance floors, drum risers, and of course home theater floors and seats. A complete Home Theater is also available from Clark Synthesis including Video Projector, Clark Speakers, Clark Tactile Amp, and Clark transducers. Call for details.

Disclaimer–The manufacturer and distributors will not accept any liability for loss, damage or injury resulting either directly or indirectly from the use, misuse, or installation of this product.

Warranty–CLARK SYNTHESIS *NEO* Series Tactile Sound Transducers are warranted to be free from defects in material and workmanship for one year from the date of purchase. If you find your unit to be defective, return it with proof of purchase date to CLARK SYNTHESIS and it will be replaced at the manufacturer's option. This warranty does not cover units that have been abused or tampered with.

SPECIFICATIONS:

CLARK ABSOLUTE 329/3210 Tactile Sound Transducers

POWER RATING:
200 watts RMS continuous, 400 watts instantaneous peaks. (Tactile sound can be achieved in some installations at wattage as low as 1 watt).

FREQUENCY RESPONSE:
5Hz to 20KHz audible, 21KHz to 200KHz inaudible.

TRANSDUCTION FORCE:
1.2 pounds per watt.

MAGNET ASSEMBLY:
20 ounces neodymium: CNC machined pole pieces.

HEAT TRANSFER FLUID:
Ferrofluidics.

IMPEDANCE:
4 Ohm, Dupont® MTB Kapton® former, high density winding.

DIMENSIONS:
8 inch diameter/2 inch height.

QUICK TROUBLESHOOTING

NO TACTILE EFFECT

1. Check all power connections.
2. Make sure cables are correctly installed between out put source and Tactile amplifier.

BUZZING OR RATTLING SOUNDS

1. Make sure jam nut on hanger bolt is securely fastened onto the transducer.
2. Check fasteners and structure of the medium on which the transducer is attached to make sure there are no loose joints.

INADEQUATE TACTILE EFFECT

1. Adjust input gain control to a higher setting.

CLARK Synthesis
TACTILE SOUND

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