

# AR18, AR25, AR14

## INSTRUCTIONS FOR INSTALLATION AND USE

### INSPECTING FOR DAMAGE

Although the cartons and packing materials of your loudspeakers were designed to protect them from the roughest handling in shipping, abuse or severe drops may cause injury to the cabinets or speaker elements. Therefore, while you are unpacking your loudspeakers inspect them for physical damage to the enclosure, and loose rattling parts. AR's careful attention to quality control insures that your loudspeakers left AR in perfect condition, so if any damage is evident, you should notify the store where you purchased them immediately of any damage evident and request instructions on how to proceed.

### INSTALLING AND REMOVING THE GRILLE PANEL

Your loudspeakers were shipped with their acoustically transparent foam grille panels already mounted on them. These grilles are removable. The grille is secured to the enclosure by special Velcro hook fasteners. To remove the grille pinch the foam firmly at the top, in the center, and pull outward. The tearing sound you will hear is normal and is caused by the hook fasteners releasing the foam. To replace the grille, first note the location of the special Velcro fasteners on the speaker front panel, carefully center it on the speaker and press firmly on the surface of the foam directly above the locations of the Velcro. Be careful not to press any area of the foam that is directly above any driver. Some of the cone drivers on AR loudspeakers can be damaged if excessive force is applied to their cones while replacing the foam grille. Note also that the inside surface of all the speaker grilles has mating cutouts to clear each driver when the grille is in place. Always replace the grille panel so that the largest cutout is directly in front of the woofer.

### AMPLIFIER RECOMMENDATIONS AND POWER HANDLING

Elsewhere in these instructions you will find full technical specifications of your speakers including efficiency and power handling. An approximate idea of amplifier power requirements may be found by dividing the volume of your room (in cubic feet) by 50. This will give the power per channel in watts necessary to play music in an average room and be able to generate pretty loud peak levels (about 108 dB) from the stereo pair. Rooms that are not "average" may require different power levels: a "live" room with hard furnishings may require less power whereas a "dead" room with plush furnishings may require more power.

Maximum safe amplifier size for your systems is also given in the specifications. It should be noted that this is for conventional voice or music input material. It does not imply the continuous input of sinusoidal or other such test signals, nor does it imply

turning the level up so high that the amplifier is driven into severe clipping. Acoustic Research designs its speakers to reproduce all kinds of music. However, they cannot generate constant deafening volume levels associated with discotheques in very large rooms and/or in very noisy environments. If damage is sustained due to this type of usage it is not covered by the warranty.

### CONNECTING THE LOUDSPEAKERS

Your loudspeakers are supplied with an input terminal plate recessed into the rear panel of the speaker enclosure. Connection to the speaker itself is made through two knurled-nut binding post terminals labeled "+" and "-". You will not need tools if you are using ready-made cables with tinned wire ends or spade lugs. The correct wire and spade lugs will generally be available from your dealer (or any large electronics supply house) at reasonable cost.

When making connections to the loudspeakers from the amplifier, it is very important to use the correct type and size of wire in order to avoid unnecessary loss of amplifier power in the cable and reduction of amplifier damping factor.

The following table gives recommended sizes of stranded wire for varying lengths of run from amplifier to loudspeaker, the sizes being such that no degradation in performance will ensue. Larger gauges than those recommended for a given length are an acceptable alternative.

Length of Wire from Amplifier to Speaker	Gauge of Stranded Wire
up to 25 feet	20 AWG
25 to 40 feet	18 AWG
40 to 60 feet	16 AWG
above 60 feet	14 AWG

When connecting your loudspeakers to the amplifier, be certain to observe phasing so that you will generate the correct acoustic image in stereo and prevent cancellation of low frequencies. To connect your loudspeakers to the amplifier and be sure that all the connections result in an in-phase condition, first determine the coding used in your wire to identify the conductors. All wire is supplied with a means of identifying the conductors. Some wire is furnished with a ridge or flat along the edge of the insulation of one of the conductors. Other wires have a colored-thread tracer inside the insulation or internal color coding (one conductor is copper, the other silver). Once you have determined the code used in the wire you are using to interconnect your speakers to your amplifier, it will be easy to identify the same conductor at each end of the wires.

Connect the "+" binding post on each speaker to the corresponding (left and right) amplifier's speaker output terminal labelled 8 ohms, POS, "+", or color-coded red. Connect the "-" binding post on each speaker to the corresponding (left and right) amplifier's speaker output terminal labelled NEG, C, COM, COMMON, "-", G, GROUND, or color-coded black.

## ENSURING THAT YOUR LOUDSPEAKERS ARE IN PHASE WITH EACH OTHER

The most important point in phasing loudspeakers is that they both be connected identically at both ends of the cable—that is, that the conductors connected to both of the "+" binding posts on both speakers be attached to corresponding contact points at the amplifier or receiver outputs (e.g., screw terminals or binding posts labelled 8 OHMS, "+", or color-coded red).

If you wish to verify that your loudspeakers are in phase, once the connections have been made, place the loudspeakers about two inches apart, facing each other. Play a recording with extended bass response at normal volume with the amplifier or receiver mode switch in the mono or A+B position. Note the amount of bass present in the music material and reverse the leads to one of the speakers (that is, switch the wire connected to the knurled-nut terminal on the loudspeaker input marked "-" to the terminal marked "+", and vice-versa). Switch the wires a sufficient number of times to determine which connection results in maximum bass. This will be the in-phase connection and should be made permanent.

## LOUDSPEAKER PLACEMENT AND ROOM ACOUSTICS

Your loudspeakers were designed to yield flat power output in an average room when placed on a shelf or against a wall. Very often, in rectangular rooms, the most natural sounding and unobtrusive placement for a speaker is on a wall, 3 to 5 feet from the floor, away from the corner, with the cabinet in a vertical or horizontal position. However, depending on your particular room and its furnishings you may be able to place the loudspeakers in seemingly extreme positions (near the ceiling, for instance) with excellent results.

Although loudspeakers should be at approximately the same height and on the same wall, it is not required that they be placed symmetrically in the room. In fact, it is suggested, if at all possible, that you place your two speakers asymmetrically in your room to ensure the smoothest frequency response and to minimize the effect of standing waves in your room. Whenever loudspeakers are placed symmetrically in a room, strong reflections from room surfaces (walls, floor and ceiling) at certain frequencies reach the listening position in a phase different from that of the direct output from the speakers and reinforcement and partial cancellation of energy will result. The exact frequencies at which this phenomenon occurs will depend on the distances between the speakers, the listener and the reflective surfaces, but is always a low-frequency phenomenon.

There is no special formula to determine minimum and maximum separation of the loudspeakers, but two general observations may help you decide on an initial placement for your speakers. The minimum separation of the speakers will be determined by their distance from your favorite listening position. The width of the stereophonic "stage" will broaden as the speakers are moved apart up to a point where you become aware of two sepa-

rate sound sources—with no blend of the speakers and a "hole-in-the-middle." If you are in doubt, a distance of six feet between speakers is a good one to begin with and, in most situations, will prove optimal as long as the listening area is centered between the speakers and its distance from the speakers is greater than three feet.

Although almost any speaker location will not critically affect stereo reproduction, the overall sound of any system can be influenced by variations in loudspeaker positioning. Therefore, it is very worthwhile to experiment with different placements. This is especially true if a particular location in a room causes "triggering" of an undesirable room resonance or "standing wave", imparting a hollow or boomy coloration to bass frequencies. When experimenting, the simple rule of thumb to keep in mind is that very low bass frequencies, the proportion of which determine the overall "weight" and balance of any loudspeaker's sound, are substantially affected by the distance of the speaker from room surfaces. Bass flows fairly evenly in all directions from any speaker. If you place the speaker well away from all walls, bass boost may be required; if it is close to the floor-wall boundary (especially if in or near a corner) then bass cut may give best results. If flexibility of positioning exists, it is worth trying out different positions as a smoother response may well result.

The simple suggestions above make it reasonably easy to find the best positioning of your loudspeakers for stereo. Keep in mind that your own tastes and furnishings plus the recommendations for placement to achieve smoothest bass response—rather than any set or arbitrary requirements—determine the best arrangement. Listen long enough to decide which placement is most preferable and when you have made a decision, move the speakers a foot or two to make certain no further improvement is possible. The idea is to achieve a smooth transition from bass through midrange to treble without preponderance or accentuation of the bass. Smooth frequency response generates the least "listening fatigue" which will result in the most enjoyable, most natural performance.

## ADJUSTING HIGHRANGE CONTROLS

Your speakers are supplied with level-control switches for adjustment of their highranges. The switch is located on the input terminal plate recessed into the rear panel of the speaker enclosure. The positions of the switch are labeled (depending upon model) "0" and "-3" dB or "0", "-3" and "-6" dB and indicate the relative output level of the highrange driver. The level controls are designed to permit adjustment of the sonic balance of the speakers so that they match your individual environment and are meant as important adjuncts to the tone controls in your receiver or amplifier. Therefore, make certain when setting these switches initially that your amplifier tone controls are placed in the "flat" or "0" position, and that the "loudness" control is off.

In most rooms in which there is normal acoustical absorption and treble diffusion effected by drapes, shelves, book cases, furniture, etc., and where associated equipment and source material of very high quality are being used, the switches should be placed in the "0" position.

In rooms that are paneled, where hard surfaces abound, or in sparsely furnished rooms, or if very bright sounding source material is normally used, you may find that the "-3" or "-6" positions of the switches will result in best overall music balance.

It is easy to determine the specific sonic character of your room. If your voice sounds dull and muffled or if you clap your

hands and the sharp sound seems lifeless, you probably have an over-damped, acoustically dead room. If your voice sounds very reverberant (much like singing in the shower) and your hand clap causes flutter echo (a "tick-tick-tick" sound caused by the mid and high frequencies being reflected by hard, parallel surfaces), you probably have a very live room. The norm, of course, lies between these two extremes.

To liven a dead room, all that is required is to open drapes and expose some window glass. A few glass picture frames around the room and a hard-surfaced coffee table will also liven it up substantially.

To tame an over-reverberant room, a few throw rugs on the floor and a bookshelf or drapes on the wall will serve to break up most flutter echo situations. Always try to place shelves, etc., asymmetrically so that bare wall on one side faces a drape or shelf on the other. The idea is to have a hard surface face a "softer", less reflective surface across the room.

The correct setting of the highrange switches in your particular environment is that which will result in the best balance from bass through midrange to treble without a preponderance of any part of the range being evident.

In adjusting the level controls on your speakers, choose high quality recordings with which you are familiar. Voice, both male and female, has large midrange content and is useful for ensuring that the transition from woofer to highrange is smooth. Strings, solo violin, brass, brushes on drums, cymbals, and such like all have plenty of high frequency content and will act as a good check that the balance is correct throughout the frequency range.

In many instances, the speaker switches for highrange control may not be at the same setting in both channels. That is, one speaker's highrange control may be optimally set at, say, "-3" dB, while the other might require a "0" dB, or "-6" dB position. This type of occurrence is perfectly normal and is due to the differences in the immediate acoustical environment to the speaker. For example, one speaker may be placed close to a drape while the other speaker may be next to a wall with little absorptive material.

## SERVICE

If your loudspeaker should develop a fault, whenever possible please contact the dealer from whom the system was purchased to arrange for verification of the defect, replacement if your unit is brand new, or shipping if it requires repairs. If your dealer is not within the immediate area or cannot inspect your unit for any reason, write directly to the Customer Service Department, Teledyne Acoustic Research, 10 American Drive, Norwood, MA 02062,

describing the trouble and any tests you have made, with as much detail as possible, giving the name of your dealer, date of purchase and the serial number of your loudspeaker. You will find the serial number on the decal attached to the front panel of the enclosure, under the grille. Alternatively, you may take your loudspeakers directly to the regional AR Factory Authorized Service Agency. A list of these was packed with your loudspeakers and is available upon request from the AR Customer Service Department. AR will make every effort to remedy any problem you may be experiencing at minimum inconvenience to you.

Do not ship your loudspeaker or any of its parts to the Acoustic Research factory without requesting and receiving a Return Authorization Form and Special Shipping Label prior to shipment.

Freight charges must be prepaid when a loudspeaker is shipped to AR for repairs. If the repairs are covered by the warranty, all surface freight expenses will be reimbursed upon completion of the repair and submission of both the green Freight Refund copy of the Return Authorization Form and original freight bill.

It is the responsibility of the sender to see that the loudspeaker, or any of its parts returned for service, are properly packed. Damage to loudspeakers in shipment due to incorrect packing will not be recognized by the carrier as an insurance claim, and the sender will be charged for any parts and labor required to return the unit to proper operating condition. To ensure freedom from damage in shipment, the loudspeaker must be packed as it was when it left the AR factory. If you no longer have the original factory carton and packing materials, you may obtain a replacement by making a written request to the AR Customer Service Department. There will be a charge for the carton which must be paid in advance, and which will be reimbursed to you if the repair is made under warranty.

Do not ship loudspeakers, regardless of circumstances, via Parcel Post within the continental United States. Their packaging was not designed for this method of shipment. We shall not assume any responsibility if this method of shipment is used.

## STATEMENT OF PRODUCT ASSURANCE

Each AR speaker system is individually tested to professional standards within  $\pm 1$  dB of stated specifications.

The entire system is fully warranted to maintain this performance for five years from date of purchase, as per AR warranty card.

Foam grille panels meet the flammability requirements as per UL® specifications 1270.

Warranty details are available from your AR dealer.

# SPECIFICATIONS

## AR18

**Drive units:**  
200 mm (8 in) acoustic suspension woofer, 32 mm (1 1/4 in) pressure highrange

**Crossover frequency:**  
2000 Hz

**Impedance:**  
8 ohms nominal

**Control:**  
2-position switch for highrange level control

**Efficiency:**  
1 watt will produce 86 dB SPL on axis at 1 meter

**Power handling ability\*:**  
May be used with amplifiers capable of delivering up to 100 watts continuous power per channel being driven to clipping 10 percent of the time, on normal music source material

**Crossover network:**  
Network using bi-polar electrolytic capacitor; acoustic output of highrange driver is controlled by a switchable resistive network

**System low-frequency response:**  
-3 dB at 62 Hz

**Effective system Q:**  
1.0

**Cabinet finish:**  
Walnut grain vinyl veneer

**Cabinet volume:**  
9.77 liters (0.35 cu ft)

**Cabinet dimensions:**  
244 mm x 419 mm x 159 mm deep  
(9 5/8 x 16 1/2 x 6 1/4 in)

**Weight:**  
Packed in carton (two speakers)  
13.8 kg (30 1/2 lb),  
unpacked (each speaker) 6.1 kg (13 1/2 lb)

## AR25

**Drive units:**  
200 mm (8 in) acoustic suspension woofer, 32 mm (1 1/4 in) pressure highrange

**Crossover frequency:**  
2000 Hz

**Impedance:**  
8 ohms nominal

**Control:**  
2-position switch for highrange level control

**Efficiency:**  
1 watt will produce 86 dB SPL on axis at 1 meter

**Power handling ability\*:**  
May be used with amplifiers capable of delivering up to 100 watts continuous power per channel being driven to clipping 10 percent of the time, on normal music source material

**Crossover network:**  
Network using bi-polar electrolytic capacitor; acoustic output of highrange driver is controlled by a switchable resistive network

**System low-frequency response:**  
-3 dB at 50 Hz

**Effective system Q:**  
1.0

**Cabinet finish:**  
Walnut grain vinyl veneer

**Cabinet volume:**  
19 liters (0.67 cu ft)

**Cabinet dimensions:**  
298 mm x 544 mm x 195 mm deep  
(11 3/4 x 21 1/2 x 7 21/32 in)

**Weight:**  
Packed in carton (two speakers) 22.7 kg (50 lb),  
unpacked (each speaker) 11 kg (24 lb)

## AR14

**Drive units:**  
250 mm (10 in) acoustic suspension woofer, 25 mm (1 in) dome highrange

**Crossover frequency:**  
1300 Hz

**Impedance:**  
8 ohms nominal

**Control:**  
3-position switch for highrange contour control

**Efficiency:**  
1 watt will produce 86 dB SPL on axis at 1 meter

**Power handling ability\*:**  
May be used with amplifiers capable of delivering up to 100 watts continuous power per channel being driven to clipping 10 percent of the time, on normal music source material

**Crossover network:**  
Half-section LCR network on each driver using air-core chokes, bi-polar electrolytic capacitors and highpower noninductive resistors; acoustic output of highrange driver is controlled by switchable contouring network

**System low-frequency response:**  
-3 dB at 44 Hz

**Effective system Q:**  
1.15

**Cabinet finish:**  
Oiled walnut veneer

**Cabinet volume:**  
41.9 liters (1.48 cu ft)

**Cabinet dimensions:**  
354 x 635 x 273 mm deep  
(13 15/16 x 25 x 10 3/4 in)

**Weight:**  
Packed in carton 18.1 kg (40 lb),  
unpacked 15.9 kg (35 lb)

Specifications subject to change without notice.

\*These statements of power handling capability are based on the use of contemporary amplifiers of good design, stable operation and instantaneous recovery from overload and which are able to deliver very-short-duration peaks of approximately 2.5 times their rated continuous power into the normal, reactive, 4-ohm load of a loudspeaker. It should be noted here that severe clipping (exceeding 10 percent of the time) of any amplifier, of large or small output power capability, greatly increases the thermal stress placed on the

loudspeakers and should be avoided under any conditions.

The data given above is predicated on the playback of music material having a peak-to-average ratio between 10 and 15 dB ("live" music waveforms generally have a peak-to-average ratio of 15 dB), so that when peaks of, say, 100 watts are fed to the speaker the average level of the signal will not exceed 10 watts long-term average. These statements of power-handling capability, particularly peak power-handling capability, are not meant to

describe operation during playback of highly compressed rock recordings in which the peak-to-average ratio rarely exceeds 5 dB. In these instances, when peaks of 100 watts are being fed to the speaker, the average level of the waveform will frequently exceed 30 watts—a level of such magnitude that the drivers will be unable to dissipate the heat generated in the voice coils for any length of time and consequent thermal damage to the drivers will result. This type of damage is not covered by the warranty.



**TELEDYNE ACOUSTIC RESEARCH**

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**Truth in Listening**