AR18S AR28S AR38S AR48S AR58S

INSTRUCTIONS FOR INSTALLATION AND USE

Congratulations on your choice of a pair of AR BOOKSHELF loudspeaker systems. We hope you will enjoy them for many years to come. Please take a little time to read through these instructions before connecting your loudspeakers. We feel confident that this will enable you to effortlessly achieve the superb performance inherent in their design.

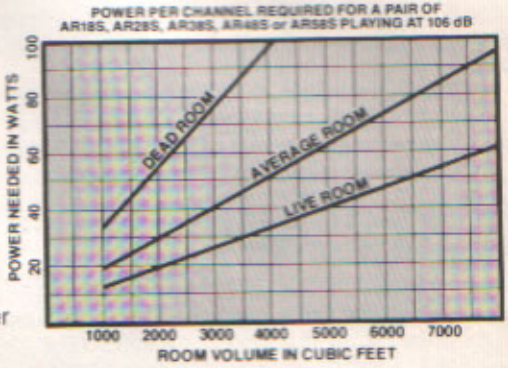
UNPACKING

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.

AMPLIFIER OR RECEIVER — RECOMMENDATIONS AND POWER HANDLING

In order to make the assessment of suitable amplifier power requirement for the AR18S, AR28S, AR38S, AR48S and AR58S straightforward, we give below a graph showing the interaction of room size, room characteristics and amplifier power requirement. To determine the specific sonic character of your room, listen carefully to someone speaking or clap your hands in that room. If the voice sounds dull and muffled, or if when you clap your hands the sharp sound seems lifeless, you probably have a "dead" room. If the voice sounds 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. An "average" room, of course, lies between the two and exhibits no such characteristics.

The graphs show the power necessary to achieve loud peak volume levels (106 dB S.P.L.) with average program material. It should be noted that there are certain situations and types of program material which may require greater amplifier output capability than that indicated. This can be so on program sources such as some of the new audiophile recordings which exhibit greatly enhanced dynamic range. Alternatively, if high levels are not desired, a smaller amplifier will be satisfactory.



The maximum power handling of the AR18S, AR28S, AR38S, AR48S and AR58S is given in the specifications for normal speech or music input material in non-commercial applications. This does not imply continuous input of test signals, nor the use at continuous abnormally high output levels such as in discotheque type use. It should be noted here that severe clipping of the waveform can greatly increase the thermal stress placed on loudspeakers and should thus be avoided. For this reason it is better to choose an amplifier with available power greater than that strictly necessary, rather than an amplifier that barely meets the requirements, as then the likelihood of overload and thus clipping will be reduced.

The AR18S, AR28S, AR38S, AR48S and AR58S are designed to operate with amplifiers having a damping factor of 10 or higher. All other parameters remaining identical, very high damping factors will not in any way affect the low frequency performance of the loudspeakers.

CONNECTING THE LOUDSPEAKERS

Each of your AR Bookshelf speakers is equipped with an input terminal plate recessed into the rear of the enclosure. Connection to the speaker system itself is made through a pair of spring loaded terminals, color coded red and black for "+" and "−" identification respectively.

The correct wire will generally be available from your dealer (or any large electronics supply house) at reasonable cost. The insulation should be removed from this wire at the speaker end to expose between ¼" and ⅜" of the flexible core. The strands of the exposed core should then be firmly twisted together, the spring terminal depressed, the wire inserted into the terminal hole right up to the insulation, and the terminal released. Care should be taken that no loose strands of wire are left exposed that may short out across the terminals as this would give problems with the amplifier.

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 size 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	18AWG
25 to 40 feet	16AWG
40 to 60 feet	14AWG
above 60 feet	12AWG

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 to 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 red terminal on each speaker input to the corresponding (left and right) amplifier's speaker output terminal labelled 8 OHMS, POS, "+" or color-coded red. Connect the black terminal on each speaker input 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 red terminals on both speakers be attached to corresponding contact points at the amplifier or receiver outputs (e.g., screw terminals or binding post 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 black terminal to the red terminal, and vice-versa). Switch the wires a sufficient number of times to determine which connection results in a maximum bass. This will be the in-phase connection and should be made permanent.

PLACING THE AR18S, AR28S, AR38S, AR48S or AR58S LOUDSPEAKERS IN YOUR ROOM AND ROOM ACOUSTICS

AR bookshelf loudspeakers were designed to yield a smooth frequency response when they are placed back against a wall on a shelf or other flat surface such that the middle of the cabinet is approximately level with the listener's ear. A smooth response with extra bass results if they are placed back against a wall at floor level. Heights between these recommendations may not yield optimum results and should be experimented with if such positioning is desired. Each system should, if possible, be placed at least two feet away from the nearest side wall. However, it may be placed closer than this to a sidewall and even in some cases across a corner; the result of such placement is bass boost which can normally be corrected by use of the bass control on your receiver or amplifier.

Optimum stereo imagery is obtained when the loudspeakers are placed such that they stand upright with the wooden panel on the front at the bottom. In this position the drive units will be in a vertical array and will thus remove any image-blurring interference effects in the horizontal plane. If this type of positioning is not possible and the speakers have to be laid on their sides, then they should be positioned such that the wooden panel is at the left hand end of the left speaker and at the right hand end of the right speaker. When mounted in such a fashion, a matched pair of speakers results with optimum high frequency performance in the listening area between the speakers.

It is suggested, if at all possible, that you place your two speakers asymmetrically in your room to insure the smoothest low 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 up to a point where you become aware of two separate 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 this distance of the speaker from room surfaces. If flexibility of positioning exists, it is worth trying out different positions as a smoother response may well result. While doing this, bear in mind the use of the bass control discussed earlier to compensate low frequency response if the speaker is away from all walls or, alternatively, if it is close to a corner.

The simple suggestions above make it reasonably easy to find the best positioning of your loudspeakers for stereo. Keep in mind that your own taste and furnishings, plus the recommendations for placement to achieve smoothest bass response — rather than any set of 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.

IN CASE OF DIFFICULTY — SERVICING

If your loudspeakers do not operate properly, please reread the instructions in this manual to make sure you are operating the system correctly in every way and, if necessary, check the manuals of your other equipment. If you are then unable to find the reason why your loudspeakers are not operating properly, please follow the instructions below.

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 rear side of the enclosure. 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 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 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 returned for service is 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. AR's packaging was not designed for this method of shipment. We shall not assume any responsibilities if this method of shipment is used.

THE AR FULL 5-YEAR WARRANTY

Warranty Coverage

The workmanship and performance in normal use of Acoustic Research speakers are warranted for five years from the date of purchase. The warranty covers parts, repair labor, and surface freight costs to and from the factory or nearest Authorized Service Agency. New packaging, if needed, is also free.

Name and Address of Warrantor

Teledyne Acoustic Research, 10 American Drive, Norwood, Massachusetts 02062

What Acoustic Research Will Do

Acoustic Research will repair the product or, at its option, replace the product. The liability of Acoustic Research will be limited to the purchase price of the product, and they will not be liable for any consequential damages.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

Time for Performance
After being notified of the defect, malfunction, or failure to conform to the warranty, Acoustic Research will arrange for the return of the product to the factory or nearest Authorized Service Agency. This procedure will be initiated within fifteen business days following the receipt of notice, and Acoustic Research will repair any defects found to exist or replace the product within thirty days of the time the product arrives at the factory or nearest Authorized Service Agency.

Warranty work will be performed at the AR factory and Authorized Service Agencies during normal business hours. Check with your local Authorized Service Agency for its exact times.

To Obtain Warranty Service
In order to obtain warranty service, address written notice of the supposed defect to Teledyne Acoustic Research, 10 American Drive, Norwood, MA 02062. At the same time, give the serial number of the unit and state whether or not you have kept all the original packing material, in case it should be necessary to ship the unit to the factory or an Authorized Service Agency.

Alternatively, you may contact a local or convenient Authorized Service Agency directly. A list of all Service Agencies authorized to perform in-warranty service on AR products is packed with each unit. This list is also available upon request directly from Acoustic Research.

In either case, however, you must furnish written evidence of the date of first purchase in order to obtain warranty service.

Party To Whom Warranty Is Extended
To any owner.

When the Warranty Begins
The five-year period begins on the date that the product is delivered to the first purchaser, which will be the date shown on the sales slip.

Legal Rights
This warranty gives you specific legal rights, you may also have other rights which vary from state to state. You also have implied warranty rights, including an implied warranty of merchantability, which means that your product must be fit for the ordinary purposes for which such goods are used. In the event of a problem with warranty service or performance, you may be able to go to a Small Claims Court, a State Court, or a Federal District Court. This statement is required by federal law in the United States and may not necessarily be descriptive of legal rights in other countries.

Ownership Survey Card
Please use the ownership survey card packed with each unit to inform Acoustic Research that you have purchased one of its products. We would appreciate your providing us with as much information as you care to and mailing the card to us at your earliest convenience. It is not necessary to return the ownership survey card to validate the warranty.

Exceptions and Exclusions
Normal use in the Acoustic Research warranty does not include feeding constant power levels to the loudspeakers of such magnitude that overheating, thermal overload, and damage to the voice coils are caused, improper installations (such as outdoors exposed to the elements) or abnormal operation (as in extremely high level discotheque applications).

The warranty does not cover damages caused in shipping (except when the product is being shipped to have warranty work performed), abuse, misuse, accidents, or neglect. The warranty also does not cover malfunctions caused by (1) unauthorized rewiring of the speaker, or (2) repairs performed by one other than the factory or an Authorized Service Agency. Servicing made necessary by the installation of loudspeaker drivers other than the exact type originally supplied with the speaker system is also excluded from the warranty.

Equipment on which the serial numbers have been altered, defaced or purposely removed are not covered by the warranty unless the owner can establish the date of purchase in spite of the absence of the original serial number.

NOTE: A label on the outside of each carton lists steps to be followed in order to gain redress from the shipping company in the event of damages caused in shipment.

SPECIFICATIONS

AR18S

SPECIFICATIONS
AR18S.
System Type:
Bookshelf acoustic suspension 2 way system with drive units in a vertical array.
Drive Units:
200mm (8") acoustic suspension woofer. 32mm (1¼") liquid cooled cone highrange driver.
Voltage Sensitivity:
2.83 volts produces 88 dB SPL at 1 meter on axis.
Efficiency:
1 watt produces 88 dB SPL at 1 meter on axis.
Power Requirement:
See chart on page 1.
Power Handling Ability:
May be used with amplifiers rated* up to 100 watts per channel.

*Amplifiers being driven into clipping no more than 10% of the time on normal speech and music source material in non-commercial applications.
System Frequency Response:
−3 dB (half power) points at 62 Hz and at 22000Hz.
System Low Frequency Performance:
−3 dB at 62 Hz with an effective Q at resonance of 1.0.
Impedance:
8 ohms nominal (5.5 ohms minimum)
Crossover Network:
Woofer has 12 dB/octave mechanical crossover.
Highrange has a first order electrical network plus mechanical slope to give a total of 18 dB/octave.
Crossover Frequency:
2000 Hz.
Cabinet Internal Volume:
9.86 liters (.35 cu ft).
Cabinet Dimensions:
419*244*167 mm deep (16½*9⅝*6-9/16" deep).
Cabinet Finish:
Walnut grain vinyl veneer.
Weight:
Packed in carton (2 speakers): 13.4 kg (29.5 lbs).
Unpacked (1 speaker): 5.9 kg (13 lbs).

AR28S

SPECIFICATIONS
AR28S.
System Type:
Bookshelf or floor standing acoustic suspension 2 way system with drive units in a vertical array.
Drive Units:
200mm (8") acoustic suspension woofer. 25mm (1") liquid cooled dome highrange driver.
Voltage Sensitivity:
2.83 volts produces 88 dB SPL at 1 meter on axis.
Efficiency:
1 watt produces 87 dB SPL at 1 meter on axis.
Power Requirement:
See chart on page 1.
Power Handling Ability:
May be used with amplifiers rated* up to 100 watts per channel.

*Amplifiers being driven into clipping no more than 10% of the time on normal speech and music source material in non-commercial applications.
System Frequency Response:
−3 dB (half power) points at 50 Hz and at 24000 Hz.
System Low Frequency Performance:
−3 dB at 50 Hz with an effective Q at resonance of 0.85.
Impedance:
6 ohms nominal (4.5 ohms minimum)
Crossover Network:
Woofer has a 12 dB/octave mechanical crossover.
Highrange has a second order electrical network for 12 dB/octave slope.
Crossover Frequency:
2000 Hz.
Cabinet Internal Volume:
18.1 liters (.64 cu ft)
Cabinet Dimensions:
544*298*199mm deep (21-7/16*11¾*7-27/32" deep).
Cabinet Finish:
Walnut grain vinyl veneer.
Weight:
Packed in carton (2 speakers): 24.5 kg (54 lbs).
Unpacked (1 speaker): 10.9kg (24 lbs).

AR38S

SPECIFICATIONS
AR38S.
System Type:
Bookshelf or floor standing acoustic suspension 2 way system with drive units in a vertical array.
Drive Units:
250mm (10") acoustic suspension woofer. 32mm (1¼") liquid cooled cone highrange driver.
Voltage Sensitivity:
2.83 volts produces 88 dB SPL at 1 meter on axis.
Efficiency:
1 watt produces 88 dB SPL at 1 meter on axis.
Power Requirement:
See chart on page 1.
Power Handling Ability:
May be used with amplifiers rated* up to 100 watts per channel.

*Amplifiers being driven into clipping no more than 10% of the time on normal speech and music source material in non-commercial applications.
System Frequency Response:
−3 dB (half power) points at 45 Hz and at 22000 Hz.
System Low Frequency Performance:
−3 dB at 45 Hz with an effective Q at resonance of 1.15.
Impedance:
8 ohms nominal (5.3 ohms minimum)
Crossover Network:
Woofer has 12 dB/octave mechanical crossover augmented by an electrical notch filter.
Highrange has a first order electrical network plus mechanical slope to give a total of 18 dB/octave.
Crossover Frequency:
2000 Hz.
Cabinet Internal Volume:
37.1 liters (1.31 cu ft)
Cabinet Dimensions:
610*343*275 mm deep (24*13½*10-13/16" deep).
Cabinet Finish:
Walnut grain vinyl veneer.
Weight:
Packed in carton: 16.6 kg (36.6 lbs).
Unpacked: 14.4 kg (31.7 lbs).

SPECIFICATIONS

AR48S

SPECIFICATIONS
AR48S.
System Type:
Bookshelf or floor standing acoustic suspension 3 way system with drive units in a vertical array.
Drive Units:
250mm (10") acoustic suspension woofer.
100mm (4") acoustic suspension midrange with a mechanically inert diaphragm of GPS. Unit in its own sub-cavity.
25mm (1") liquid cooled dome highrange driver.
Voltage Sensitivity:
2.83 volts produces 88 dB SPL at 1 meter on axis.
Efficiency:
1 watt produces 87 dB SPL at 1 meter on axis.
Power Requirement:
See chart on page 1.
Power Handling Ability:
May be used with amplifiers rated* up to 100 watts per channel.

*Amplifiers being driven into clipping no more than 10% of the time on normal speech and music source material in non-commercial applications.
System Frequency Response:
–3 dB (half power) points at 45 Hz and at 24000 Hz.
System Low Frequency Performance:
–3 dB at 45 Hz with an effective Q at resonance of 1.15.
Impedance:
6 ohms nominal (4.8 ohms minimum)
Crossover Network:
Woofer and midrange use a series network which is combined with a second order parallel network on the upper end of the midrange.
High range has a second order parallel network for a 12 dB/octave slope.
Network uses air core chokes with low loss copper conductor and high grade bipolar electrolytic capacitors.
Crossover Frequency:
400 Hz and 2500 Hz.
Cabinet Internal Volume:
37.5 liters (1.32 cu ft).
Cabinet Dimensions:
635*354*275mm deep (25*13-15/16 *10-13/16" deep).
Cabinet Finish:
Walnut grain vinyl veneer.
Weight:
Packed in carton: 19.5 kg (43 lbs).
Unpacked: 17.2 kg (38 lbs).

AR58S

SPECIFICATIONS
AR58S.
System Type:
Bookshelf or floor standing acoustic suspension 3 way system with drive units in a vertical array.
Drive Units:
One 300 mm (12") acoustic suspension woofer.
One 38 mm (1½") liquid-cooled dome midrange driver with semi-horn.
One 19 mm (¾") liquid-cooled dome highrange driver.
Voltage Sensitivity:
2.83 volts produces 90 dB SPL at 1 meter on axis.
Efficiency:
1 watt produces 87 dB SPL at 1 meter on axis.
Power Requirement:
See chart on page 1. nimum.
Power Handling Ability:
May be used with amplifiers rated* up to 200 watts per channel.

*Amplifiers being driven into clipping no more than 10% of the time on normal speech and music source material in non-commercial applications.
System Frequency Response:
–3 dB (half power) points at 37 Hz and at 25000 Hz.
System Low Frequency Performance:
–3 dB at 37 Hz with an effective Q at resonance of 0.6.
Impedance:
4 ohms nominal (3.2 ohms minimum).
Crossover Network:
Woofer has a modified half section network for improved impedance characteristics and optimal network to driver matching. Midrange has half section networks modified for optimal driver to circuit matching. Highrange has half section network. Only the best components are used: air-core chokes wound with solid copper conductor, high grade bipolar electrolytic capacitors, non inductive high power ceramic resistors.
Crossover Frequency:
700 Hz and 7500 Hz.
Cabinet Internal Volume:
43.9 liters (1.54 cu. ft.).
Cabinet Dimensions:
689" x 354" x 275"mm deep
(27⅛ x 13 $^{15}/_{16}$ x 10 $^{13}/_{16}$" deep).
Cabinet Finish:
Oiled walnut veneer.
Weight:
Packed in carton: 25.5 kg (57lbs).
Unpacked: 24.5 kg (52 lbs).

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