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AUDIOLINK SERIES INSTALLATION INSTRUCTIONS MODELS AA-20/AA-40 PAGING AND COMMERCIAL PA AMPLIFIERS

Use this product according to this instruction manual. Please keep this instruction manual for future reference.

GENERAL APPLICATION INFORMATION:

Wheelock's AudioLink Series Model AA-20 and AA-40 Amplifier are output rated at 20 watts RMS and 40 watts RMS respectively.

These amplifiers afford a choice of four different inputs: two low impedance microphone inputs, one telephone paging input, and one high impedance auxiliary input. Three input channels allow these inputs to be used actively at one time: one microphone input, a choice of a telephone paging input or a second microphone input, and an auxiliary input. Note that the auxiliary input (i.e., background music, tone generator, etc) may be automatically soft muted whenever a telephone page is generated or a microphone is used. After completion of the page, the music will rapidly return to its original level. This function is switch selectable.

A built-in limiter circuit compensates for the varying voice levels and paging styles of the people who have access to telephone paging or a microphone. The limiter maintains rated output without distortion. This function is switch selectable.

The amplifiers feature tamper-resistant individual input volume controls, as well as a master volume control, individual treble and bass controls, a low-cut horn protect switch, one input selector switch, a power on indicator, a limiter ON-OFF switch, a music mute ON-OFF switch, a peak level indicator, and a line output jack.

Both models operate from 115 volts, 60Hz as well as 230 volts, 50Hz, switch selectable, and have a power consumption of 65 watts (AA-20) and 115 watts (AA-40). The units have a thermal breaker in the power transformer as well as a thermal cut-off and current limiting for overload protection on the output. The thermal breaker in the transformer is automatically resettable.

NOTE: All **CAUTIONS** and **WARNINGS** are identified by the symbol \triangle . All warnings are printed in bold capital letters.

CAUTION: In the event the transformer's thermal breaker does not reset, have the trouble investigated by an authorized service technician or return unit to the factory.

\triangle WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.

UNPACKING:

The amplifier was carefully checked before leaving the factory. Inspect shipping container and unit carefully for indication of improper handling. If the unit has been damaged, make an immediate claim to the carrier.

MOUNTING INSTRUCTIONS:

The amplifiers are designed for either shelf or wall mounting. For surface wall mounting, use the 2 keyhole slots in the chassis cover. Be sure to use hardware suitable for the mounting surface. Do not block air flow to top, front, back or bottom. Blocking the air flow will cause automatic thermal shutdown.

CAUTION: These devices are not intended for use in hazardous locations as defined by the National Electrical Code (NEC) and by the National Fire Protection Association (NFPA).

A WARNING: DO NOT USE THIS UNIT IN LIFE-SAFETY APPLICATIONS. THIS UNIT IS UL 813 LISTED AND CUL LISTED FOR COMMERCIAL AUDIO ONLY.

POWER AND GROUNDING:

The 115 VAC line cord has a three-prong plug which should be plugged into a three wire grounded electric outlet. It is very important to maintain the amplifier ground for safe and trouble-free operation. If there is no grounded electric outlet, use a 2 prong to 3 prong plug adapter, with grounding lead, and connect the grounding lead to a metallic bond on the outlet; (i.e. the screw which secures the outlet's wall plate).

VOLTAGE SELECTION:

Factory set @ 115VAC for U.S. market; units for export are set @ 230VAC. Make absolutely certain that the voltage selection switch, located on the side of the amplifier, is set for the intended line voltage (i.e., 115VAC or 230VAC). Improper voltage selection can result in permanent damage to, or failure of, the unit.

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TECHNICAL SPECIFICATIONS:

i	# PARAMETERS	AA-20		AA-40		TOLERANCE	COMMENTS		
1	Power Output @ 1KHz	20 Watts RMS		40 Watts RMS		±1dB	115VAC 60Hz ±5% 230VAC 50Hz ±5%		
2	Total Harmonic Distortion		less than			+1%	Same as above @ Rated Output		
3	Outputs	8 OH	MS, 25V		100V	±1.5dB	Bal. or Unbal.		
4	Line Output		1.1	V		±20%	$R_L = 150 \text{ OHMS}$		
	INPUTS	TELEPHONE	MIC 1/MIC 2		AUX				
5	Impedance	600 OHMS	600 OHMS		12K OHMS		@ 1kHz		
6	Sensitivity	-20dBM (77.5mV - -16 +20)	1mV		220mV	TEL ±2dB MIC ±.5mV AUX ±20%, -50%	To Produce Rated Output		
7	Frequency Response	300Hz-5kHz	50Hz-1	15kHz	50Hz-15kHz	±3dB	Ref. 1kHz @ 1W 25kHz MAX.		
8	Signal to Noise Ratio	65dB	600		70dB	-4dB +10dB	Not Weighted		
9	Type of Input	Transformer Isolated/Bal.	Balano Unbal	anced	Unbalanced				
10	Controls					ASTER VOLUME, MUTE ON/OFF SW.	Front Panel Mount		
		LO CUT SWITCH					Front Panel Mount		
11	Indicators <u>Green</u> LED - Power ON <u>Red</u> LED - Peak Level						Front Panel Mount		
12	Protection				aker, no-load, low	-load, short circuit and upply regulators.			
i	# PARAMETERS	AA-20		AA-40		TOLERANCE	COMMENTS		
13a	Treble Control	-10.5dB TO +10.5dB @ 12kHz				±4dB			
13b	Bass Control	+10.5dB TO -10.5dB @ 100Hz				$\pm 4 dB$			
14	Lo-Cut Switch	-6dB @ 250Hz				+1dB, -2dB			
15	Automatic Limiter For Paging	±4dB output le even while	exceedin		ithout clipping, input level up to		Paging Inputs		
16	Automatic Mute Operation	Output le	vel 1 wat	t for 40d	B muting	Min.	Mute of music output while page is activated		
17	Regulation	No load to f	full load o	output le	ss than 2dB		Stability of amp. with or without load		
18	RFI Protection	RFI test: use CH - mir			ut in same room amplifier.		No Pickup		
19	Consumption @ FRO				115 Watts	±5%	@ 115VAC, 60Hz, ±5%		

CAUTION: Disconnect power prior to connecting or disconnecting to either the inputs or the outputs. Failure to disconnect power when connecting or disconnecting inputs or outputs could cause internal damage.

<u>Telephone Paging Input (Figure 1)</u>: Connect telephone wires to the input screw terminals marked TIP and RING. Set TEL/MIC 1 Switch (on front panel) to TEL position. For Tip and Ring connections to various types of telephone paging access, see Figures 7A, B & C. **NOTE**: This input is a transformer isolated, line level input and may be used for applications other than telephone paging (i.e. tone signaling).

<u>Microphone Inputs (Figure 1)</u>: Connect balanced low-impedance microphone wires to the input screw terminals marked LO-Z. The shield must be connected to the GND screw terminals. An unbalanced microphone may be connected to the same screw terminals. However, one of the two LO-Z terminals for that input must be connected to the adjacent screw terminal marked GND. Install a jumper wire, between one LO-Z screw terminal and the GND screw terminal.

NOTE: To avoid noise pick-up, the microphone input cable should be a shielded cable, with the shield connected to the input GND terminal.

MIC 2 is a low impedance (LO-Z) microphone input channel. TEL/MIC 1 is a switch selectable telephone paging, or low impedance (LO-Z) microphone input channel.

Input Connections

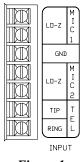


Figure 1.

Auxiliary Input (Figure 2):

To connect an FM tuner, CD player, tape player, tone generator, or any other line level program source (i.e., mic/line mixer) to the AUX input jack on the side panel, use a single conductor shielded cable terminated in a standard RCA type phono plug.

AUX input is a high impedance (HI-Z) input channel.

Aux High Impedance (Hi-Z) Input

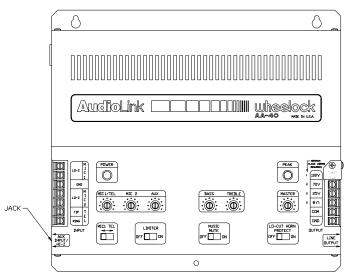


Figure 2: (AA-40 Shown - AA-20 Similar)

OUTPUT CONNECTIONS: (Figures 3 & 4) Referring To Figure 3: Connect output wires from the speaker load to the COM screw terminal and the selected constant voltage terminal, (i.e. 25V, 70V or 100V). The constant voltage distribution method facilitates the use of multiple speakers in parallel with a single amplifier. Note that each speaker must have its own 25V or 70V or 100V line-matching transformer. Select the wattage tap on the line matching transformer of each speaker, for the desired power.

An 8 ohm speaker load may be connected to the COM and the 8 ohm terminal. An 8 ohm speaker or an 8 ohm total speaker load rated for at least the amplifier's output should be used. (Example: An 8 ohm, 20 watt horn for the AA-20.)

PROPER WIRE SIZE/LENGTH

To minimize power loss in the system cabling, use a wire gauge suitable for the power being distributed and the length of cable. Use the following table as a guide:

	LOW	/ IMPEDA	NCE	70 VOLT SPEAKER LINE							
	SPEAKER LINE			NOMINAL POWER IN THE LOAD							
AWG SIZE	4 OHMS	8 OHMS	16 OHMS	5W	10W	15W	30W	50W	100W	200W	AWG SIZE
10	120	240	480	30,000	15,000	9,900	5,000	3,000	1,500	730	10
12	75	150	300	19,000	9,100	6,200	3,100	1,900	940	460	12
14	50	95	190	12,000	5,600	3,800	1,900	1,200	600	280	14
16	30	60	120	7,500	3,600	2,400	1,200	750	370	180	16
18	20	40	75	4,700	2,300	1,500	750	470	230		18
20	15	25	50	3,000	1,400	960	480	300	150		20
22	10	15	30	1,800	900	600	300	190	95		22
				LENGTH IN FEET							

2 WIRE COPPER CABLE LENGTHS FOR SPEAKER LINES AT 0.5dB LOSS IN SPL (12.5% POWER LOSS IN WATTS)

NOTES: (1) For 25 volt line divide all 70 volt lengths by 8. (2) For 100 volt line multiply all 70 volt lengths by 1.42. (3) To allow for future expansion, and distribution cable line loss, it is recommended that the total system wattage should not exceed 85% of the amplifier's rated output (i.e. 17 watts for the AA-20 and 34 watts for the AA-40). (4) The total system wattage requirement is the summation of the wattage tap selections of all system speakers and horns.

CAUTION: Per the National Electrical Code, Class 1 wiring should be used for the 100V output. Class 2 wiring is acceptable for all other outputs.

WARNING: THE COVER FOR THE 100V AUDIO OUTPUT TERMINAL MUST BE ATTACHED AT ALL TIMES. THE POWER **CORD MUST BE DISCONNECTED BEFORE** CONNECTING TO THE 100V TERMINAL. THE COVER MAY BE REMOVED TO CONNECT A WIRE TO THE TERMINAL, BUT IT MUST BE REATTACHED AFTER CONNECTING THE WIRE. FAILURE TO MAINTAIN THE TERMINAL COVER IN PLACE COULD EXPOSE YOU AND/OR OTHERS TO ELECTRICAL SHOCK WHICH COULD RESULT IN SERIOUS **INJURY OR DEATH.**

Output Connections

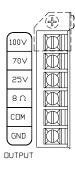
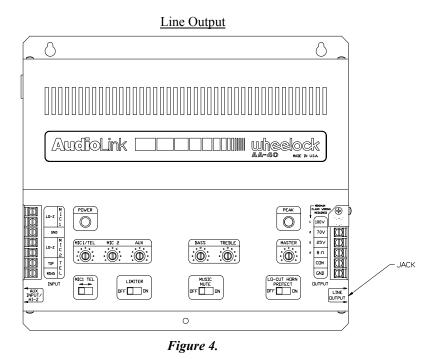


Figure 3.

Line Output: (Figure 5)

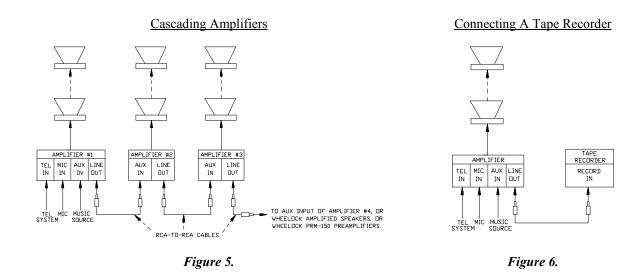
The LINE OUTPUT jack on the side panel, can be used to cascade amplifiers (including amplified speakers, or Wheelock PRM 150 preamplifiers), or feed audio signal to a tape recorder. The signal on this output is a line level mix of the amplifier's input channels. Use single conductor shielded cable with a standard RCA type phone plug.



NOTE: The line output signal is constant and is unaffected by the amplifiers master volume, bass and treble controls.

CASCADING AMPLIFIERS:

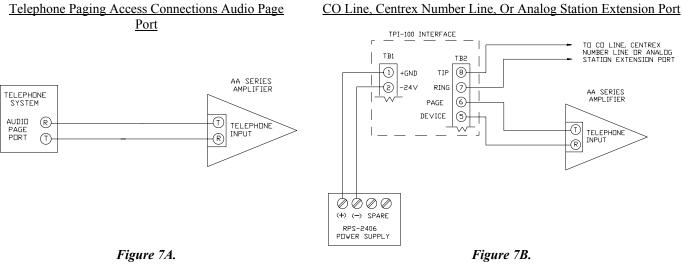
(Figure 5) AA-20 and AA-40 amplifiers can be cascaded to expand existing systems or to distribute large speaker loads.



TO CONNECT A TAPE RECORDER:

(Figure 6)

A tape recorder can be connected to record live programs (microphone inputs), or all of the amplifiers activity (all inputs).



(Refer to TPI-100 installation instructions for internal control settings and adjustments.)

Unused CO Line/Trunk Port Or Stand Alone Telephone

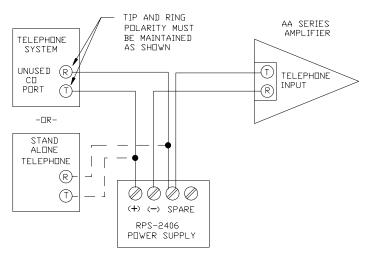


Figure 7C.

OPERATION

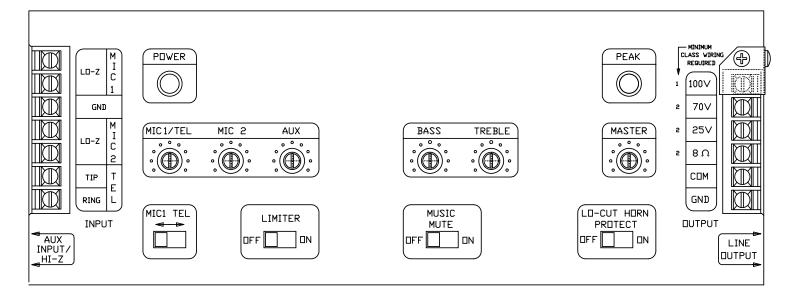


Figure 8. (Front panel controls, switches and indicators.)

NOTE: All controls rotate clockwise to increase and counterclockwise to decrease.

EXTERNAL CONTROLS AND INDICATORS:

(Figure 8)

NOTE: Volume/Tone controls are tamper resistant and must be adjusted with a screwdriver.

Power ON-OFF Indicator:

The LED will illuminate when the AC cord is plugged into a 115/230VAC source.

Power Input Voltage Select Switch: (Located next to power cord connector on the side of the amplifier)

This switch must be set for the appropriate line voltage (i.e., 115VAC for United States). U.S. market versions are factory set at 115VAC.

Master Volume Control:

Adjusts the total output level of the amplifier without disturbing the individual settings of the microphone, telephone and auxiliary input volume controls. (Set at factory in minimum position.)

TEL/MIC 1 Volume Control:

Adjusts the volume of either the TEL (Telephone) paging or MIC 1 (Microphone) input. (Set at factory in the minimum position.)

MIC 2 Volume Control:

Adjusts the volume of either the MIC 2 input. (Set at factory in the minimum position.)

AUX Input Volume Controls:

Adjusts the volume of the AUX input. (Set at factory in the minimum position.)

Bass and Treble Controls:

Adjusts bass and treble for optimum tonal balance of the output signal. The amplifier frequency response is flat with the controls set at the center position. (Set at factory in flat position).

TEL/MIC 1 Selector Switch:

Switch to TEL position for telephone paging, or switch to MIC 1 position when using a microphone. (Set at factory in the TEL position).

Lo-Cut Horn Protect Switch:

Turn the switch ON whenever horns are used in the system. This function will protect the horn voice coils from damage by filtering out low frequencies inherent in some types of music when played at high power settings. (Set at factory in ON position.)

Peak Level Indicator:

Occasional flickering of the LED indicates momentary peak levels, and is a normal operating condition. Steady illumination of the LED is an indication that an overdrive (clipping) condition may exist. If distortion is audible, then lower the appropriate input volume control, and/or the master volume control.

Limiter ON-OFF Switch:

A limiter is desirable for many paging applications because it will help the paging volume sound uniform (compensates for the differences of loudness in people's voices). For live program applications, (i.e., house of worship, auditoriums, etc.) it is often desirable to defeat the limiter function. This results in more "natural" (wider dynamic range) sound reproduction. Thus, the AA Series Amplifier may also be used in general purpose commercial/PA applications (set at the factory in the ON position).

Music Mute ON-OFF switch:

In certain applications (i.e., noise masking, tone signals, etc.), it is often desirable to defeat the auxiliary input mute function. This results in the auxiliary input signal mixing (occurring simultaneously) with telephone paging or microphone input audio. For example, a 4 channel MIC/Line mixer could be patched in at this point and it's signal would not be muted by signal on the 2 other microphone inputs. Thus a 6 microphone system for conferences, etc., is achieved. (Set at factory in the ON position).

CAUTION: To prevent electrical shock do not use this (polarized) plug with an extension cord, receptacle or other outlet unless the blades can be fully inserted to prevent blade exposure.

Attention: Pour prevenir les chocs electriques ne pas utiliser cette fiche polarisee avec un prolongateur, une prise de courant out une autre sortie de courant, sauf si les lames preuvent ete inserees a fond sans en laisser aucune partie a decouvert.

MAINTENANCE:

CAUTION: There are no user-replaceable parts within the unit. Have all internal servicing done by a qualified technician.

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