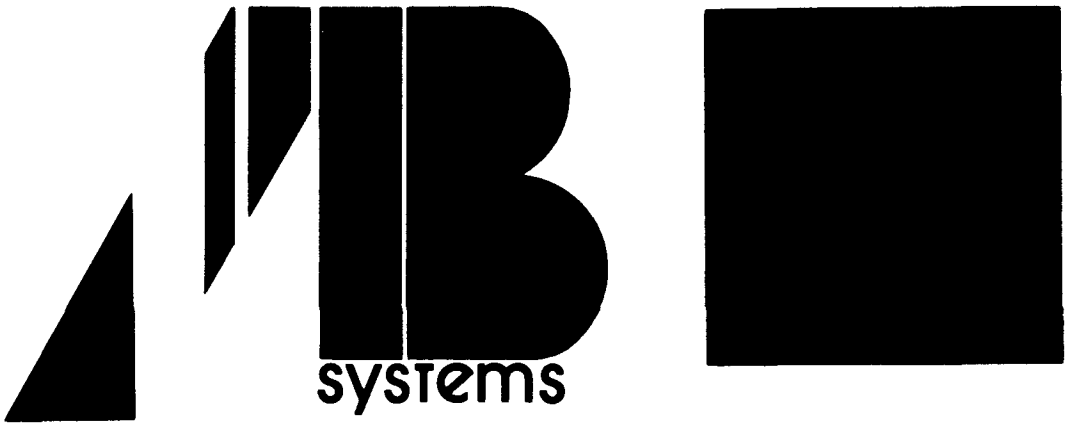
Professional Series



OWNERS MANUAL

AB Systems Design, Inc. — Post Office Box 754 • Folsom, California 95630 • (916) 988-8551

model 410b

TWO CHANNEL POWER AMP

Serial No:_____

Issued To:_____

AB Systems Design, Inc. —Post Office Box 754 • Folsom, CA 95630 • (916) 988-8551

248-501

Congratulations on your purchase of The Four-Ten power amplifier by AB systems. Designed to provide excellence in commercial sound amplification, The Four-Ten is not just an amplifier, but the most versatile power amplification system available today. An exclusive complement of features and options provide flexibility to an audio amplifier that also achieves the best sound quality in its field. Incorporating a design with proven reliability, The Four-Ten is built with uncompromising quality of component and construction on an all modular basis. Integral in the design is an infallable protection system for both internal components and speaker load. Without a doubt, the choice for the most rigorous of commercial sound applications.

CIRCUIT DESCRIPTION:

To assure absolute long term "work horse" reliability, the output section of each channel incorporates 6 RCA Multiple Emitter Power Transistors, which provide 900 Watts of power dissipation per channel - a 2:1 safety margin. The output stage is arranged in a quasi-complimentary format and biased for class AB/2 operation. The bias current is evenly distributed among all output devices. Bias thermal compensation is accomplished by thermally mating a bipolar semiconductor junction to the heat producing output devices. Triple diffused high power driver transistors are employed along with high speed, high voltage silicon annular devices for the predriver and inverter stages. Utilization of these components provides the required separation of ft break points for absolute stability. Fully complementary current source drive and loading is utilized throughout. Only 20 dB of negative feedback is used to reduce forward transfer distortion to typical 0.1%. VI type energy limiters are incorporated for short circuit protection of the amplifier. Due to the unusually large safe operating area of the output stage, the limiters do not actuate until well below a fully reactive or resistive load of 2.8 Ohms at full power. Solid state circuitry protects the speaker system and monitors the DC condition of the output. In the event of a +/- DC latch condition in excess of 1 second, a control circuit is activated which defeats the entire system by turning off the primary AC circuitry.

CONSTRUCTION:

The Four-Ten is designed on an all-modular concept permitting rigorous pre-assembly module testing and maximum service accessibility. Each functional module is fully tested before final assembly. Although components of the highest quality are used throughout, The Four-Ten is burned in prior to shipment at the worst case operating point in conjunction with FTC requirements to eliminate any possibility of component malfunction. All inter-assembly connections are of the spade lug push-on type. Six screws allow removal of the rear panel with the channel amp boards intact. All chassis components are precision machined from high quality aluminum stock. The entire package concept is directed toward maximum efficiency of space and structure, accounting for The Four-Ten's compact size and light weight. Various input configurations, such as XLR, phone jack, or terminal connectors, can be accommodated by an interchangeable adaptor plate at the input. Input accessory sockets are also provided on the rear panel and will accept all industry standard plug in modules.

INSTALLATION AND VENTILATION:

The Four-Ten fits a standard 19" rack and requires only 5¼" (3 rack heights) of vertical space. The front panel is machined from solid aluminum stock, with a black anodized grained finish and sturdy rack mount handles.

Placement of the amplifier is not critical for normal operating conditions, provided that sufficient air flow is allowed to reach the heat sink array. If the unit is to be placed on a shelf, or a similar unenclosed area, allow four inches clearance behind the heat sink to permit vertical air flow through the array. For installation in a cabinet, allow an additional two inches above and one inch below the amplifier to permit air to be drawn around the back. Should overheating occur because of inadequate ventilation, the temperature protection circuitry will automatically shut down the amplifier. When a safe operating temperature is restored, the amplifier will re-activate automatically.

INPUT CONNECTIONS AND PLUG IN ACCESSORIES:

Input connectors are located at the top of the rear panel of the amplifier, and are identified as channel one and channel two input. The Four-Ten is normally supplied with screw type terminals, however an interchangable adaptor plate mounting permits easy conversion to XLR, phone, or phono jacks.

Located directly below the input connectors are two input accessory sockets. These octal sockets will accept all industry standard bridging or matching plug in transformers. If no plug in accessory is used, the sockets must be jumpered through by connecting pins 6 to 7 and 1 to 8 on each socket.

OUTPUT CONNECTIONS:

Output connections are made through two large dual 5-way binding posts located directly below the input accessory sockets at the rear of the chassis. Each is color coded and identified (+) or (-) for correct speaker phasing. See the section on controls (dual/mono) for connection directly to a 70 volt line (transformerless) in bridge mode.

The preferred connectors are high quality dual "banana" plugs. Heavy Class II wire may be used by unscrewing the large plastic portion of the output terminal and inserting the wire into the hole provided. It is extremely important when making wire connections that no wire strand or end touches the adjacent terminal, shorting the output.

POWER CONNECTIONS:

The Four-Ten is equipped with a 3-conductor power cord for direct AC connection, and a 2-conductor remote switching cord for connection to a SWITCHED AC outlet. With the 3-conductor AC cord connected to an appropriate source, the amplifier can be activated either manually by the front panel power switch, or automatically through the remote switching cord. The remote switching circuit is completely isolated internally; thus when the remote cord is not in use, it is not necessary to insulate the cord's exposed prongs.

When the manual power switch is OFF, the amplifier's primary TRIAC switch is remotely gated ON and OFF by a small relay in the amplifier. This is a major convenience when a bank of amplifiers is used; by interconnecting the remote turn-on cord of one amp with the switched outlet of the preceding amp, an entire amplifier bank can be activated from one point in a chain format, with a sequential delay. This lag protects the main system breakers from potentially huge turn-on surges, an especially important feature in the event of power blackouts.

CONTROLS:

Input gain controls for each channel are provided at the rear of the instrument, and are screwdriver adjust recessed controls, rotation fully clockwise provides full sensitivity of 0.75V RMS for full rated output. Counter clockwise rotation provides up to infinite attenuation. Optional front panel gain controls may be ordered or added and will duplicate the operation of the rear panel controls if the rear controls are set to full clockwise. Lesser settings of the rear controls provide an upper limit on the range of the front panel controls.

A dual/mono mode switch, which provides two channel or single channel bridged mono operation may also be ordered or added. In bridge mode operation, the channel one input and gain controls are the functional elements. Channel two input gain controls should be turned fully counter clockwise. The load is then normally connected between the + terminal of channel one and the + terminal of channel two outputs rather than the + and - of the independant channels. The bridge mode of operation may be hard wired in lieu of the option switch by connecting terminal (6) of the upper channel amp board to terminal (5) of the lower channel amp board.

A front panel control is available on special order only which provides front panel selection of two different output loads. Either or both loads may be selected. When fitted with this option, The Four-Ten is provided with dual output posts for each channel, and the input accessory sockets are relocated inside the main chassis.

CAUTION

The Four-Ten amplifier is a product of the most advanced technology and manufacturing techniques and is fully protected against overheating, input overload, and short or mismatched loads. But, as is the case with any precision instrument, some care should be taken in the operation of The Four-Ten. The following precautions should be noted, since damage resulting from their omission is not covered under the terms of the warranty.

DO NOT PARALLEL THE TWO OUTPUTS OF EACH CHANNEL BY CONNECTING THEM TOGETHER, OR PARALLEL THEM WITH ANY OTHER AMPLIFIER OUTPUT.
NEVER CHANGE A FUSE WITH THE POWER CONNECTED.
UNDER NO CIRCUMSTANCES SHOULD THE AMPLIFIER BE OPERATED WITH THE COVER REMOVED. THERE ARE NO USERSERVICEABLE COMPONENTS INSIDE. TO AVOID A POTENTIALLY DANGEROUS SHOCK, KEEP THE COVER SECURED.

ATTACHMENT OF OPTIONS:

All options available for The Four-Ten can be fitted by the dealer except the multiple load selector which must be factory installed.

TO FIT ANY FRONT PANEL OPTION:
Drill the front panel as indicated in the option kit and locate the stick-on label provided. Refer to the schematic section for location of the appropriate push on wires.

TO FIT THE FAN PACK OPTION:
Thread the 2½ inch 10-32 threaded/tapped spacers into the center hole of each rear panel heat sink section. Place the fan package over the heat sink structure with the power cord end near the A.C. accessory socket of the main unit. The threaded spacers go through the baffel clearance holes. Fasten the fan package in place with two 10-32 screws provided, through the rear panel of the fan housing into the tapped hole of the 2½ inch spacers and tighten. Plug the fan package AC cord into the AC accessory outlet of the main unit. The outlet on the fan housing now operates as the switched service outlet.

TO MOUNT 70V OUTPUT TRANSFORMERS:
The fan housing must be in place or a suitable alternate fixture can be used. The fan housing is fitted with (8) threaded nuts on the rear plate. Locate one or two AB-System 70V transformers over a (4) hole pattern to either left or right of the fan intake. Mount the transformer (s) with the four screws provided. The primary leads of the transformer are fitted with a dual "banana" plug which should be plugged into the desired channel output jacks on the main unit. Load connections are made via the solder lug terminals on the 70V transformer as desired and indicated.

LIMITED THREE YEAR WARRANTY:

All AB Systems electronic components receive careful inspection and thorough testing prior to shipment from the factory and are warranted, to the original purchaser, to be free from defects in material and workmanship and to meet or exceed all performance specifications applicable at time of manufacture. AB Systems will provide, without charge, necessary parts and labor to correct any original equipment electronic component which exhibits such a manufacturing defect or incorrect operation for a period of 36 months from date of original purchase provided that the defective system is returned, freight prepaid to such location as may be specified by AB Systems. The warranty coverage of any AB Systems product is contingent upon its purchase from an authorized AB Systems dealer. The AB Systems warranty is non transferable.

Warranty coverage will not be extended to any AB Systems product on which the serial number has been removed or defaced or on which repair has been attempted by any person or agency not authorized by AB Systems or if in the sole opinion of AB Systems the system shows evidence of tampering, abnormal or unreasonable abuse, accident or operation without regard for the restrictions specified in the instructions which accompany the system. AB Systems further reserves the right to readjust prices or other design parameters and specifications without incurring the responsibility for modifying previously purchased systems.

AB Systems specifically excludes from this warranty any responsibility for consequential damages.

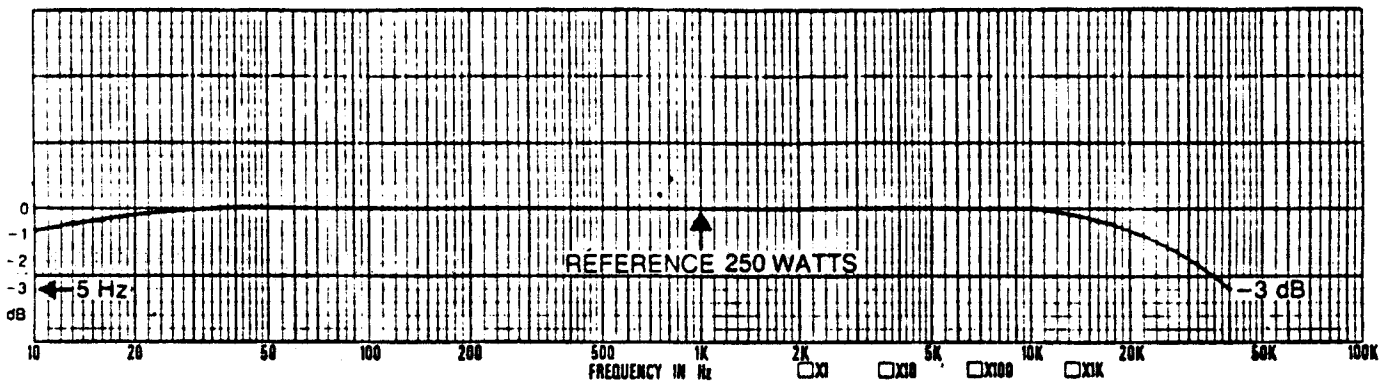
AB SYSTEMS MODEL 410

SPECIFICATIONS

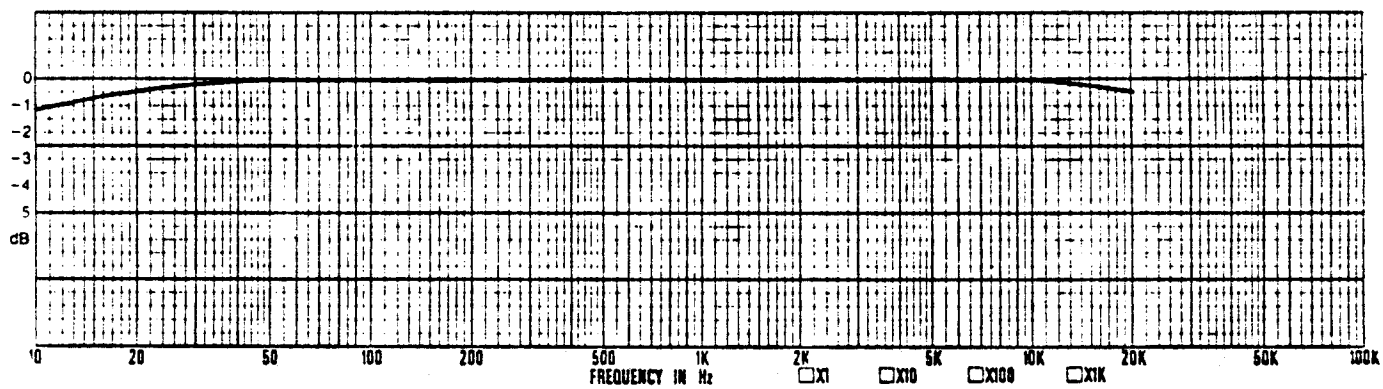
POWER OUTPUT:	TWO CHANNEL: 200 WATTS PER CHANNEL INTO 8 OHMS 350 WATTS PER CHANNEL INTO 4 OHMS USING OPTIONAL FAN PACKAGE BRIDGE MODE: (70V LINE DIRECT-TRANSFORMERLESS) 700 WATTS INTO 8 OHMS USING OPTIONAL FAN PACKAGE.
FREQUENCY RESPONSE:	20Hz TO 20kHz, +/- 0.25dB.
DISTORTION:	NO MORE THAN 0.25% THD OR IM.
NOISE LEVEL:	-101dB REFERRED TO RATED OUTPUT.
INPUT IMPEDANCE:	25k OHM NOMINAL.
INPUT SENSITIVITY:	0.75 VOLTS RMS FOR RATED OUTPUT.
CROSSTALK:	80dB DOWN AT 1kHz.
WEIGHT:	26 POUNDS (11.8kg) LESS OPTIONS.
DIMENSIONS:	5 1/4 INCHES HIGH, 19 INCHES WIDE, 10 3/4 INCHES DEEP (13.33 cm x 48.26 cm x 27.30 cm).

ARCHITECT AND ENGINEERS SPECIFICATIONS: The amplifier shall be a two channel amplifier capable of delivering 200 watts per channel into 8 ohms with no more than 0.25% THD or IM distortion from 20Hz to 20kHz. With optional fan pack cooling provided, the amplifier shall deliver 350 watts per channel into 4 ohms. The input impedance of the amplifier shall be 25k ohms nominal with 0.75V rms sensitivity for full rated output. Provisions shall be available for input and output balanced transformer coupling. Input configurations of either cannon (XLR), phone, terminal strip or phono shall be available via adaptor plates. The amplifier shall be capable of remote AC power control for sequential turn on of multiple units. The chassis shall be designed for mounting in a standard 19 inch wide rack panel requiring only 3 rack spaces (5 1/4 inch) in height and 10 3/4 inches depth.

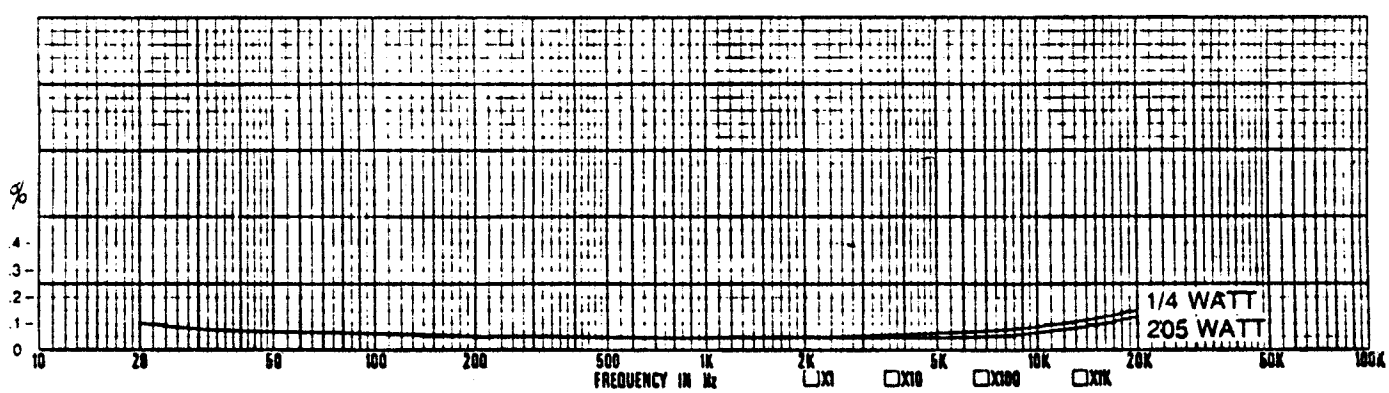
The amplifier shall operate from 120 or 240 vac single phase 50 or 60Hz and weigh no more than 26 pounds. The amplifier shall be the Four-Ten amplifier by AB Systems Design, Inc.



POWER BANDWIDTH @ .1% T.H.D.
REF 250 WATTS CONTINUOUS @ 8Ω AND 1 KHz.
(1 channel driven only)



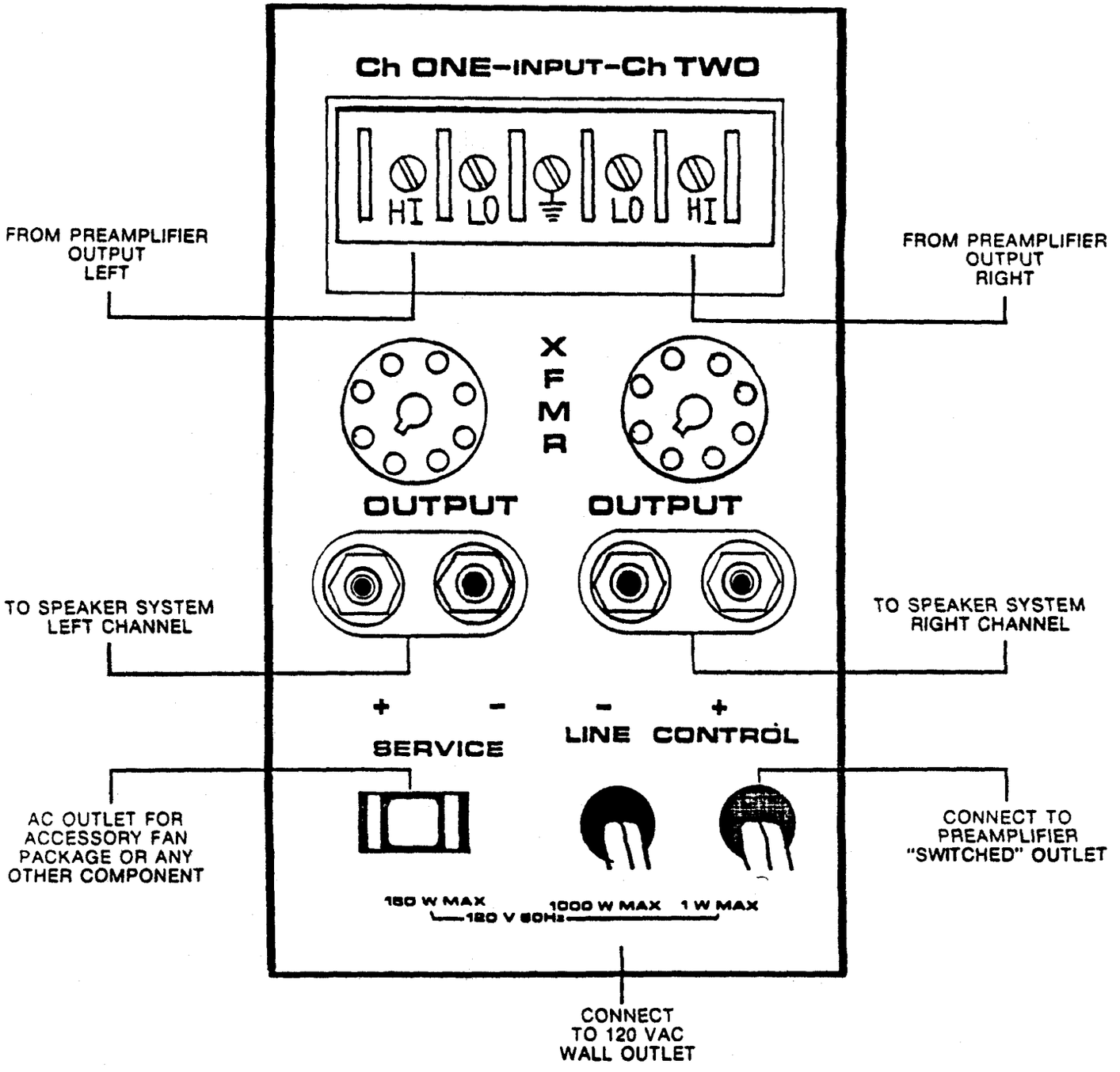
FREQUENCY RESPONSE @ 1 WATT OUT AND @ 205 WATTS OUT



TOTAL HARMONIC DISTORTION
@ 205 WATTS OUT AND 1/4 WATT OUT

The Four-Ten BOTH CHANNELS DRIVEN & LOADED @ 8Ω

The Four-Ten · REAR PANEL CONNECTIONS



SERVICE INFORMATION

CAUTION: NO USER-SERVICEABLE PARTS INSIDE. To prevent electric shock, do not remove cover. Refer service to qualified technician.

The information contained in this manual is designed to assist qualified service personnel in isolating possible sources of malfunction, replacing relevant components, and determining specific circuit characteristics in The Four-Ten Amplifier. Before testing the amplifier, all signal and power connections should be checked, along with critical system settings and adjustments.