

A C C U P H A S E      P-20

I N S T R U C T I O N   M A N U A L

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Thank you for purchasing this Accuphase product, which we here at Kensonic, who are dedicated to the policy of creating the highest quality audio components, are proud to introduce. You can be assured that in preparing this component, every attention was paid in great detail by our entire staff to strict quality control. This dedication was followed throughout the whole manufacturing process - from basic research, the selection of each part, assembly, testing, data recording, packing and shipping - so that we could supply a product with every confidence that it will give full owner satisfaction and pride.

We welcome you to the fast-growing Accuphase circle of dedicated audio enthusiasts and true sound lovers.

## "SPECIAL FEATURES"

### \*TWO MONOPHONIC AMPLIFIERS IN STEREO CONSTRUCTION

The P-20, each channel with its own independent power supply, can be considered consisting of two separate monophonic amplifiers, and assures practically an ideal condition to minimize inter-channel interference, which may be caused by layouts of parts and wiring in a stereo phonic amplifier.

### \*PUSH-PULL CIRCUITS THROUGHOUT ASSURE HIGH STABILITY, GOOD LINEARITY AND WIDE DYNAMIC RANGE

Accuphase's original innovation, the utilization of push-pull amp circuits in every stage, is also adopted in the P-20. This minimizes phase distortion and also ensures outstanding linearity over a wide dynamic range, as well as good stability against temperature changes and line voltage fluctuations.

### \*HIGH S/N, LOW RESIDUAL NOISE

Residual noise is that which is created within a power amplifier itself. It has no connection with the strength of the external signal. If an amplifier's residual noise characteristics is high, its S/N ratio and ppp characteristics will be poor. Residual noise is also a source of annoying interference during no signal conditions. It becomes more pronounced when high efficiency speakers are used.

Residual noise, however is practically non-existent in the P-20 due to the most discriminating choice of parts and painstaking circuit design. It is almost unnoticeable even when the P-20 is connected directly to a horn driver in a multi-amplification application.

#### \*DAMPING FACTOR SELECTOR ENHANCES SPEAKER PERFORMANCE

The Damping Factor (DF) of solid state amplifiers is normally very high and is ideal for damping speakers. Increasing the damping factor, however, does not always improve speaker performance, especially with large floor-type speakers operated under certain acoustic environments. This is especially true with speaker systems developed during the vacuum tube era.

The P-20 is built to work well with all types of speaker systems and enhance their performance. It is equipped with a Damping Factor Selector Switch which can control balance and richness of sounds in reproduction to get the best sound that any speaker system is capable of producing. Power is not lost when the damping factor is changed, as it is done by varying Current Feedback.

#### \*PERFECT OVERLOAD MEASURES

According to a test conducted by the U.S. Magazine Stereo Review concerning perceptibility of clipping distortion, it is reported that up to 3dB clipping could not be detected for string instruments in which such distortion is most noticeable. In the case of piano music, clipping distortion only become apparent after clipping of 5dB. In other words, one can not notice distortion of sound when a 150 watt string instrument peak signal is reproduced through a 75W amplifier at its maximum power output, or when piano music is reproduced through a 42W amplifier. However this is subject to a condition that such amplifiers must have adequate power supplies that assure stabilized energy at their rated maximum power outputs.

For this reason it is important particularly for low and medium power amplifiers to have some means to handle such peak input signal surges without tripping the Protection Circuit and cutting off the program source.

The P-20 is equipped with just such Protection Circuit. It can handle any input signal, no matter how large as long as it is alternating, i.e. music waveform, without cutting off the program source. At the same time, it provides sure protection against short circuits and overloads in the output and speaker circuits.

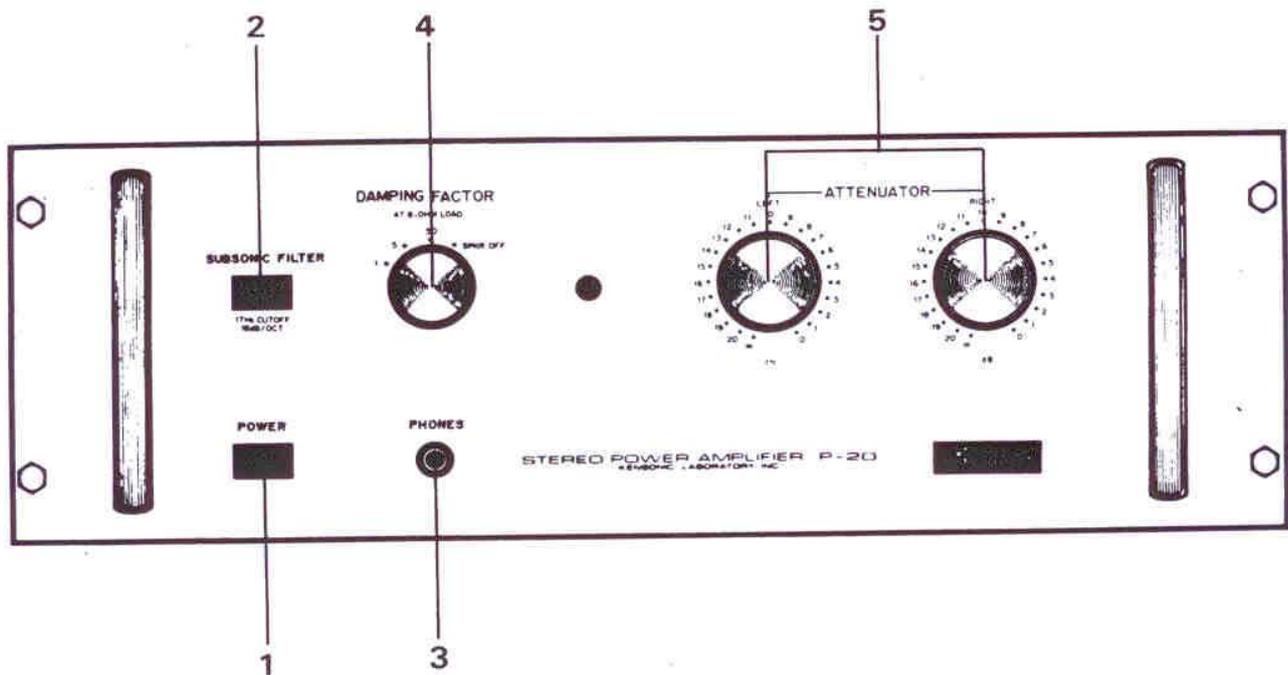
#### \*SUB-SONIC FILTER ELIMINATES NOISE

Sub-sonic vibrations can cause intermodulation problems of interference and damage the speaker system. The P-20 is equipped with a 17Hz 18dB/Oct. Sub-Sonic Filter which completely eliminates such problems.

#### \*1dB STEP ATTENUATOR

An independent power amplifier should have its own Level Control so that it can be adjusted in accordance with speaker efficiency, or the volume level of sound reproduction. The P-20 is equipped with a detent type attenuator with which volume level can be adjusted down to -20dB in 1dB steps.

## "PARTS AND THEIR FUNCTIONS"



### (1) POWER - AC Power Switch

Push this button to turn power ON. Push it again to turn power OFF.

### (2) SUBSONIC FILTER

ON position results in a sharp 18dB cutoff of subsonic frequencies below 17Hz, and eliminates adverse effects that they may otherwise cause within the audible range.

### (3) PHONES - Headphone Jack

Plug stereo headphones into this jack for private listening. Use 4 to 32 ohms headphones here. When a headphone is plugged in, the signal is not cut off at the SPEAKERS terminals of this amplifier. Therefore, be sure to set the DAMPING FACTOR switch (4) to SPKR OFF when listening to headphones only.

(4) DAMPING FACTOR - Speaker Damping Control

This control is ordinarily used at "50" position. Switching it to "5" or "1" position, you can get a softer sound quality. Learn to make use of this control and enjoy the sound variation that it offers.

They will make audiophiles appreciate their "old favorite" speakers even more because of the different soothing sound that they will be able to get from them.

When this is switched to SPKR OFF, all speakers will be silenced and output signal will be available only at the PHONES jack.

(5) ATTENUATOR - Volume Level Control.

These knobs control the levels of the channels indicated. Clockwise rotation increases output volume level to maximum at "0" reading. Counter clockwise rotation attenuates level by 1dB steps to "20" (-20dB attenuation). Depending on the output level of the Control Center (preamplifier) and the efficiency of the speaker used, this control should be set to the position that makes operation of the system easiest.

(6) INPUT - Input jacks

Connect the Control Center (preamplifier) output to these jacks.

(7) SPEAKERS - Speaker Connecting Terminals

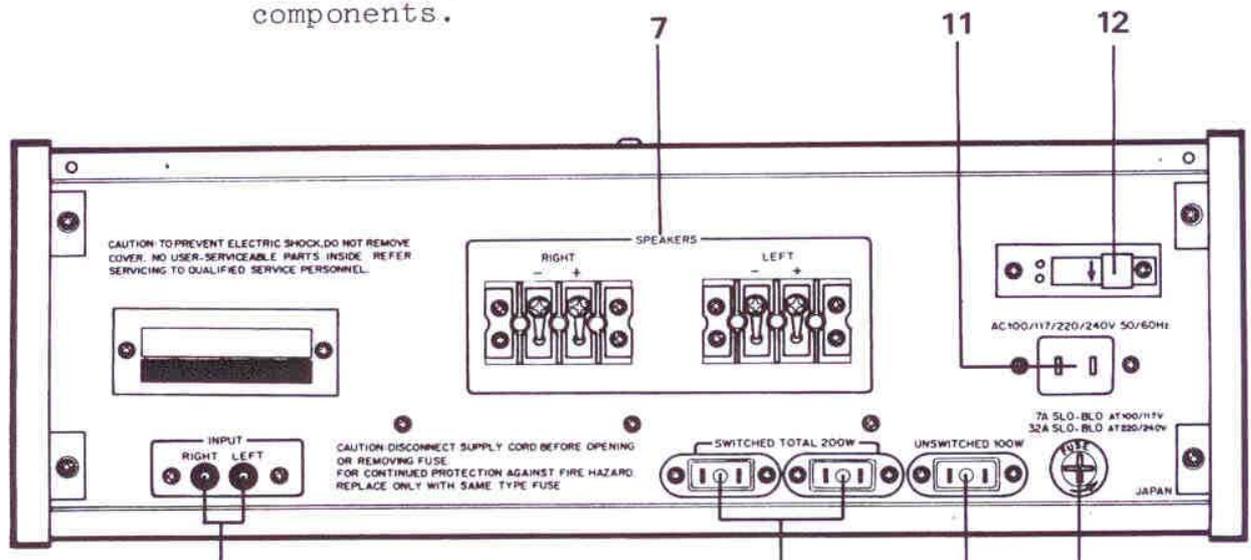
Use 4 to 16 ohms speakers when connecting to these terminals.

(8) SWITCHED TOTAL 200W - Switched AC Convenience Outlets

When the POWER switch of this amplifier is turned ON or OFF, all components connected to these receptacles are turned ON or OFF simultaneously. Total power consumption of the components connected should not exceed watts.

(9) UNSWITCHED 100W - AC Receptacle

When the power cord of this amplifier is connected to an AC power supply, the same line voltage is delivered to this receptacle regardless of the position (ON or OFF) of the POWER switch. This outlet may be used to power other associated components.



## (10) FUSE

This is an AC line fuse. If after use, the amplifier should fail to operate due to fuse failure, check its cause and eliminate it, before replacing the fuse. Sometimes a fuse may fail by itself without cause.

Use the same type Slow-Blow 7A glass tube fuse for 100, 117V as shown below and 3.2A for 220, 240V when making fuse replacements.

### **IMPORTANT**

The wires in this mains lead are coloured in accordance with the following code:

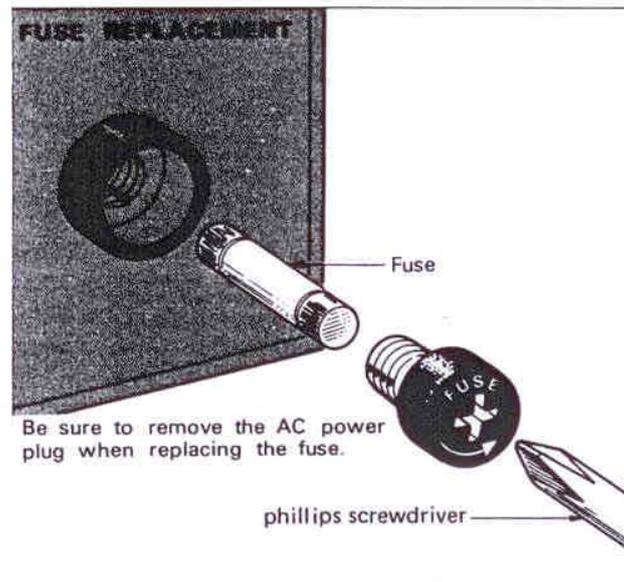
Green-and-Yellow: Earth  
Blue: Neutral  
Brown: Live

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug proceed as follows:

The wire which is coloured green-and-yellow must be connected to the terminal in the plug which is marked by the letter E or by the safety earth symbol  $\perp$  or coloured green or green-and-yellow.

The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black.

The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.



## (11) AC POWER CORD RECEPTACLE

Connect the AC power cord that is supplied with this unit to this receptacle.

## (12) AC Voltage Selector Plug

The arrow on the plug points to the power voltage selected for correct operation. When this unit is to be used in different line voltage areas, this plug must be removed and reinserted accordingly.

## "PRECAUTIONS BEFORE USING"

### \*CONCERNING SHIELDED CABLES

Shielded cables must be used for all interconnecting input circuits between the tuner, preamplifier, power amplifier, player, tape deck, etc. For best results, use the lowest capacity cables available. High capacity cables adversely affect high frequency response characteristics, and also are apt to pick up external noise. Also remember to keep interconnecting cables as short as possible.

### \*KEEP AIR CIRCULATION SPACE OPEN

Power amplifier generates a considerable amount of heat. This unit utilizes a natural air flow cooling system with vents provided on all sides so it should never be installed in a narrow, poorly ventilated space, nor in a place this is exposed to direct sunlight.

### \*SET AMPLIFIER ON A STRONG FOUNDATION

Since this amplifier is heavy, it should be set up on a table or shelf which provides a sufficiently sturdy foundation.

### \*ATTENUATE PREAMP VOLUME FIRST WHEN USING A RECORD PLAYER

With a power amplifier there is always a danger of damaging the speaker when the record player cartridge is lowered on to the record, or lifted from its surface. This is due to a very large low frequency current flow that results, although the audible sound may not be too apparent. Therefore, remember to attenuate the preamplifier volume level to minimum before operating a record player.

**\*TURN AC POWER OFF WHEN CONNECTING OR DISCONNECTING  
INTERCONNECTING CABLES**

When RCA type pin plugs, the most widely used connectors for interconnecting cables, are used, the (+) and (-) leads are connected or disconnected separately, one side being taken care of before the other. If this is done without having first turned off the AC power, a momentary current surge that results may damage the speaker. Always remember to turn the AC power off before trying to connect or disconnect the cables between associated components.

**\*AVOID COMMON GROUND AT SPEAKER & AMPLIFIER SELECTOR SWITCH**

When two or more amplifiers and speakers are used and controlled with a Selector Switch, avoid making common ground connections at the switch, as this may induce abnormal feedback. Be sure the Selector Switch that you use does not have a common ground.

**\*KEEP SUBSONIC FILTER ON NORMALLY**

This unit is equipped with a Subsonic Filter which cuts off ultra-low frequency noise from several Hz to 12-13 Hz which can cause intermodulation surges injurious to the speaker. It is recommended that the Subsonic Filter always be kept at ON.

## "OPERATING INSTRUCTIONS"

This power amplifier should be used together with a low distortion control center (preamplifier) with an output rating of more than 1 volt. After making sure that all interconnections have been made correctly, proceed as follows:

- 1) Adjust the VOLUME of the Control Center to minimum and switch the AC power ON.
- 2) Set both the LEFT and RIGHT Attenuators of the power amplifier to  $\infty$  and turn the power switch ON. Then advance both Attenuators to around midpoint position.
- 3) Select the program source desired with the Control Center and advance VOLUME. Sound will then be heard from the speakers.
- 4) The Attenuators of this power amplifier are adjusted according to the efficiency of the speakers and output levels of the Control Center. Normally they need not be touched after they have been adjusted once.

**\*GUARANTY SPECIFICATIONS**

Performance Guaranty: Products of Accuphase guarantee specifications stated.

POWER OUTPUT: (both channels driven from 20Hz to 20,000Hz with no more than 0.1% total harmonic distortion):

100 watts per channel, min.RMS, at 4ohms  
70 watts per channel, min.RMS, at 8ohms  
35 watts per channel, min.RMS, at 16ohms

TOTAL HARMONIC DISTORTION: (from 20Hz to 20,000Hz at any power output from 1/4 watt to rated power):

4 ohms; 0.1% max.  
8 ohms; 0.1% max.  
16 ohms; 0.1% max.

INTERMODULATION DISTORTION:

will not exceed 0.1% at rated power output for any combination of frequencies between 20Hz and 20,000Hz

FREQUENCY RESPONSE:

20Hz to 20,000Hz; +0, -0.2dB at rated power output  
5Hz to 90,000Hz; +0, -3.0dB at rated power output

SLEWING RATE: 15V/ $\mu$ S

DAMPING FACTOR: (8ohms load at 40Hz)  
changeable for 50, 5, 1

INPUT SENSITIVITY AND IMPEDANCE:

1.0 Volt, 100 kohms, for rated power output at the maximum level control

HUM AND NOISE: 100dB below rated output

OUTPUT LOAD IMPEDANCE: 4, 8 and 16ohms

SUBSONIC FILTER: cutoff frequency; 17Hz, 18dB/oct.

ATTENUATOR: precision, 1dB stepping type

POWER REQUIREMENT:

Voltage Selector for 100V, 117V, 220V, 240V 50/60Hz operation  
Consumption; 45 watts at zero signal output  
290 watts at rated power output into 8ohms load  
530 watts at rated power output into 4ohms load

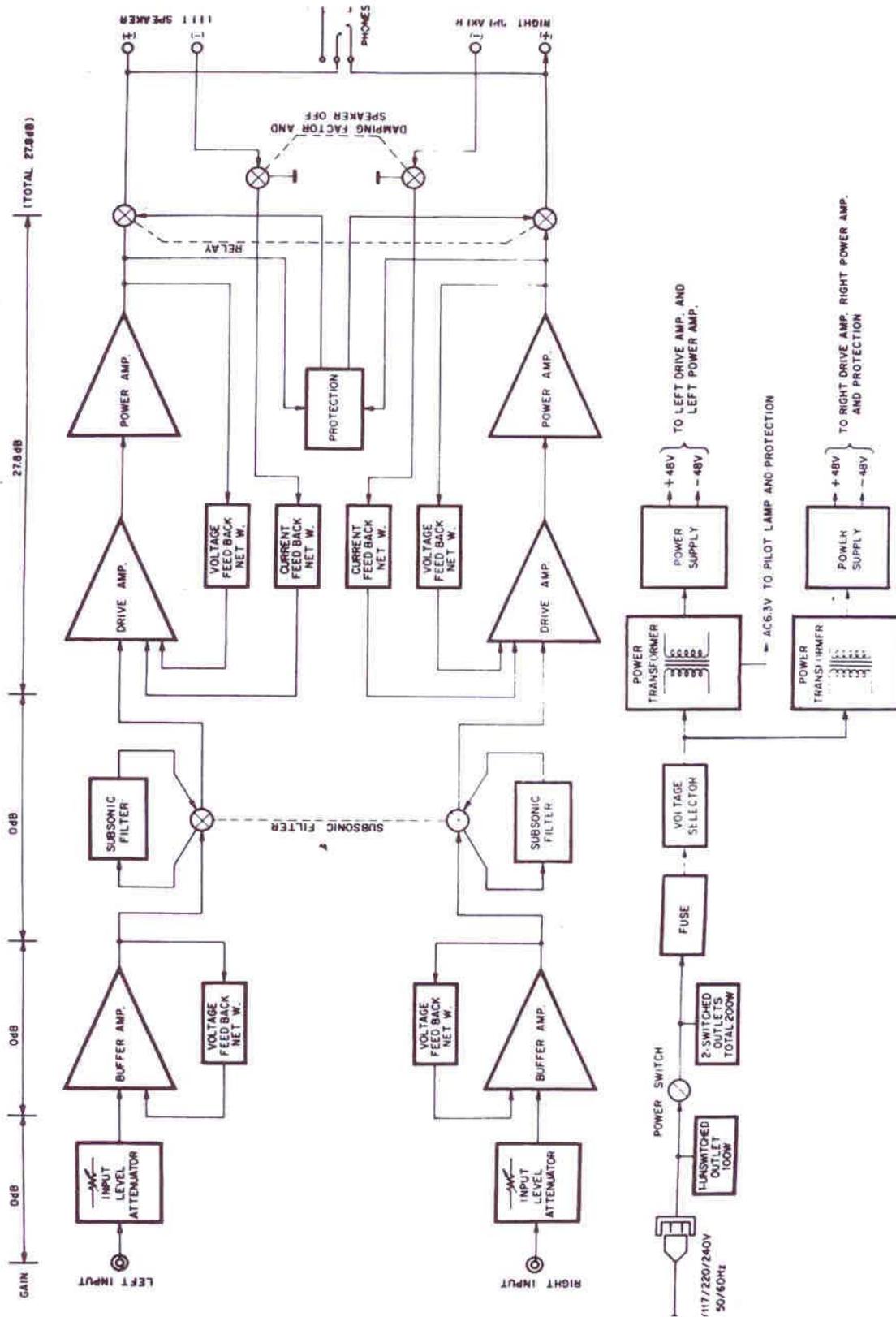
SEMICONDUCTOR COMPLEMENT: 60 Transistors, 44 Diodes, 1 IC

DIMENSIONS: 482mm(19 inches)wide, 150mm(6 inches)high,  
353mm(13-7/8 inches)deep

\*mountable on 19" standard rack. rack mount pitch; 100mm(4")  
rack inside horizontal measurement; 430mm(16-15/16")

WEIGHT: 23.5kgs(51.7lbs) net, 28.1kgs(61.8lbs) in shipping carton

"BLOCK DIAGRAM"



# "PERFORMANCE CURVES"

