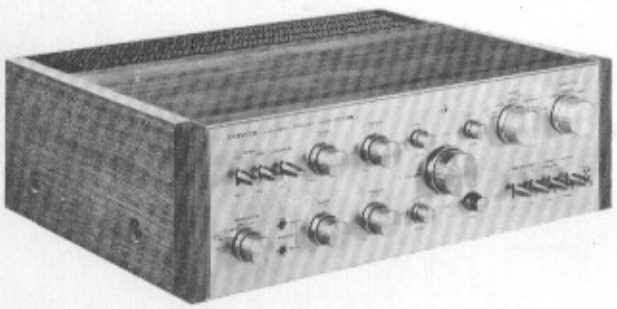
SOLID STATE 4-CHANNEL AMPLIFIER

QA-800A

KUW
FVW



OPERATING INSTRUCTIONS

PIONEER®

FEATURES

ACOUSTICAL FIELD REPRODUCTION FROM 4-CHANNEL STEREO

The amplifier section consists of four separate channels having excellent frequency response and very low distortion, providing for 4-channel discrete reproduction of a 4-channel source (recorded tape).

CHOICE OF MATRIX DECODERS

The QA-800A offers a choice of two decoders, the regular matrix and the SQ matrix. The source may be a matrix recording or FM broadcast of a matrix recording. The result is realistic 4-channel reproduction.

MATRIX CIRCUIT FOR ORDINARY 2-CHANNEL STEREO

Use of the internal matrix circuit enhances the effect of ordinary 2-channel stereo source material, over and above that normally obtainable.

HEAD AMPLIFIER WITH WIDE DYNAMIC RANGE

The equalizer/head amplifier employs new silicon transistors in its two directly coupled stages. It produces sufficient gain for accurate compensation and boasts a wide dynamic range.

SEPARATE TONE CONTROLS FOR FRONT AND REAR

Give you complete control over the tonal quality of the sound field. The tone controls are accurate click stop types.

LEVEL CONTROLS FOR EACH CHANNEL

There's a level control for each of the four channels, permitting complete control over the sound field intensity even if different types of speakers are used for the front and rear.

FULL ARRAY OF TERMINALS AND AUXILIARY CONTROLS

Inputs accept two turntables, two tape decks, a tuner and two other sound sources. Separate headphones jacks are provided for monitoring the front and rear channels. Controls include a −20dB muting switch, high and low filters and tape monitor switches.

VERSATILE TAPE-TO-TAPE DUPLICATING FACILITIES

Normal 2-channel tape-to-tape duplicating is possible too, as well as 4-channel tape-to-tape duplicating.

PRE AND MAIN AMPLIFIERS CAN BE USED SEPARATELY

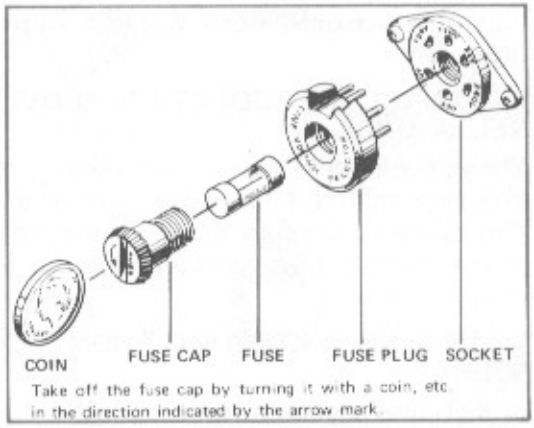
By separating the preamplifier outputs from the power amplifier inputs, the QA-800A can be combined with an electronic crossover network to create a 2-way multi-amplifier system.

ALL NEW "4-CHANNEL" EXTERIOR DESIGN

Cabinet and control panel are visual symbolizations of the Pioneer "4-channel" concept, with a modernistic and logically arranged control panel.

LINE VOLTAGE AND FUSE

The QA-800A is available in two models: one model operates only on 120V, and the other does on one of the five line voltages, 110V, 120V, 130V, 220V and 240V. If your QA-800A is the latter model, set the unit to the proper line voltage by following the procedure described below.



Take off the fuse cap by turning it with a coin, etc. in the direction indicated by the arrow mark.

CHANGING LINE VOLTAGE SETTING AND FUSE

To remove the fuse, turn the fuse cap located on the line voltage selector in the direction indicated by the arrow. Then remove the fuse plug from the unit. Put the fuse plug back so that the proper line voltage marking can be seen through the cut in the edge of the plug. Whenever the position of the selector is changed, check the rating of the fuse. A 1.5-ampere fuse is to be used for either 220V or 240V operation and a 3-ampere fuse for 110V, 120V or 130V operation. If the rating of the fuse is correct, replace cap.

FUSE REPLACEMENT

If the fuse blows, remove the fuse cap and replace the fuse with a new one.

COMPOSITION OF 4-CHANNEL STEREO SYSTEM

To compose an ideal 4-channel stereo system, the QA-800A, a solid-state 4-channel amplifier, can be combined with four speaker systems, tuner, tape decks, turntables, etc. as shown in Fig. 1. If an electronic crossover network (separately available Pioneer SF-500 or SF-700) is installed as shown in Fig. 2, a 2-way multi-amplifier system can be set up.

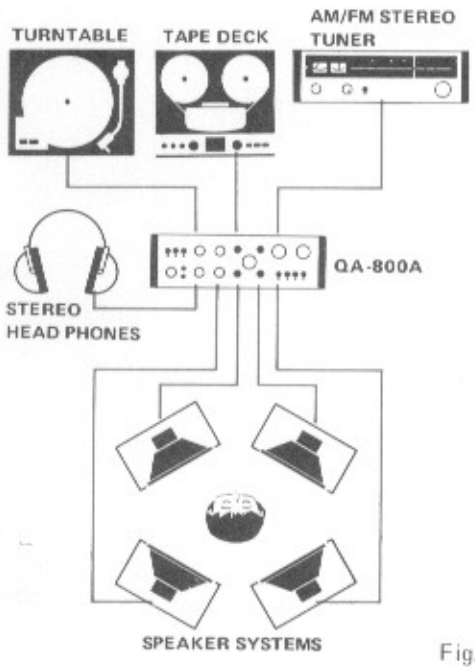


Fig. 1

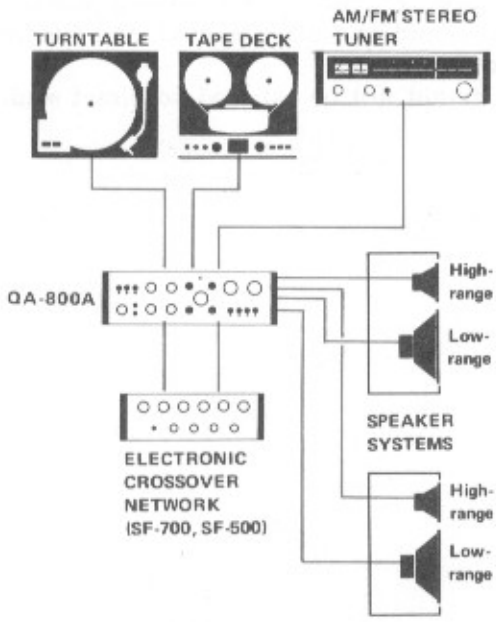


Fig. 2

PERFORMANCE OF QA-800A

4-CHANNEL STEREO PERFORMANCE

With a 4-channel stereo tape deck installed, the QA-800A can provide a 4-channel stereo playback of programs recorded on tape.

4-CHANNEL REPRODUCTION FROM MATRIX 4-CHANNEL SOURCE

The self-contained matrix circuit permits 4-channel reproduction from matrix 4-channel records or FM stereo broadcasts. The mode switch has positions for regular matrix and SQ matrix reproduction, allowing reproduction to take either of these forms.

MATRIX REPRODUCTION FROM 2-CHANNEL STEREO SOURCE

A 2-channel signal from a record or FM broadcast can be reproduced in 4-channel form via the regular or SQ matrix circuit. In this case, the result is an improvement over ordinary 2-channel stereo reproduction.

2-CHANNEL STEREO PERFORMANCE

Conventional 2-channel stereo performance can be provided through an arrangement of two or four speaker systems in the front, left-side speaker system(s) and right-side speaker system(s).
A 2-way multi-amplifier system can be set up by installing an electronic crossover network (see Fig. 2).

INSTALLATION

The fully-transistorized QA-800A generates no heat. When installing it, however, check the following points:

- The place should be well-ventilated, and free from dampness and dust.
- The unit should not be exposed to direct sunlight.

SPEAKER SYSTEM ARRANGEMENT

As shown in Fig. 3, the 4-channel system employs four speakers, one each on the left and right at the front and rear. Locating the rear speakers anywhere in the blue-shaded area of this figure will give an ample 4-channel effect.

Front left . . . . . Channel 1
Front right . . . . . Channel 3
Rear left . . . . . Channel 2
Rear right . . . . . Channel 4

NOTE: For a better 4-channel stereophonic effect, it is suggested that the rear speaker systems be installed on a level a little higher than the listening position.

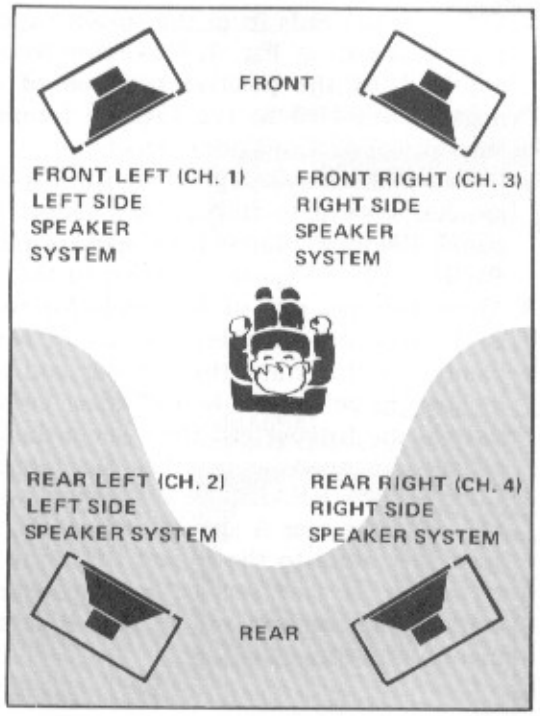


Fig. 3

A WORD ABOUT SPEAKER SYSTEMS

For the best 4-channel stereo performance, it is desired to use four speaker systems having the same characteristics. Since it is difficult to satisfy this requirement, it is suggested that speaker systems be selected and arranged as follows:

1. Select two speaker systems having the same characteristics, and arrange them in the front.
2. Select two speaker systems having characteristics close to those of the speaker systems to be installed in the front, and arrange them in the rear.

CONNECTING THE SPEAKER SYSTEMS

1. Connect the leads from the speaker system to the speaker plug as shown in Fig. 4. Make sure to connect the positive (+) lead to the positive terminal of the plug, and the negative (−) lead to the negative terminal. Then, confirm that all connections are correct.
2. Connect the speaker plug for the FRONT LEFT (CH. 1) speaker system to the speaker socket CH. 1 on the rear panel; likewise, connect the speaker plug for the FRONT RIGHT (CH. 3) speaker system to the socket CH. 3.
3. There are two sets of terminals for rear speakers; A and B. In way of example, one set of rear speakers can be located well behind the listener and another set can be located more or less to his sides. Using the SPEAKERS switch, the listener can then select the combination which satisfies his needs or matches the program sources.
4. Connect the REAR LEFT speaker system to the socket CH. 2 of the rear A speaker terminals, the REAR RIGHT speaker system to the socket CH. 4 of the rear A speaker terminals. If two sets of rear speakers are to be used, connect the second set to rear B terminals in the same manner.

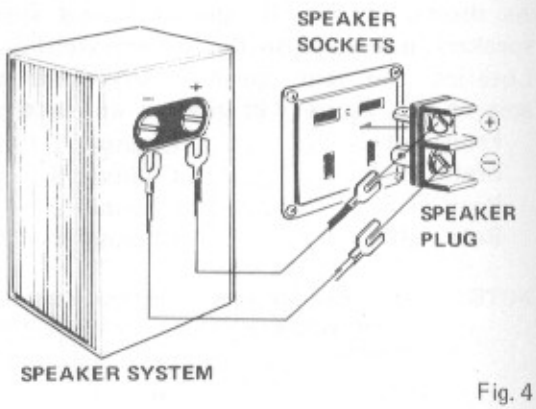


Fig. 4

CONNECTING THE TURNTABLE

Connect the outputs from the turntable equipped with a moving-magnet phono cartridge to PHONO 1 input jacks. When two turntables are used simultaneously, connect the second turntable to PHONO 2 input jacks. The upper jack is for the left channel, and the lower jack for the right channel.

NOTES:
1. For using a turntable equipped with a moving-coil (MC) phono cartridge, use a head amplifier or separately available phono input transformer (stepup transformer).
2. Prepare a cartridge and adaptor exclusively used for playing discrete 4-channel records (CD-4). Plug the output jacks of the adaptor into the AUX jacks.
3. If the plug of the output cord of the turntable does not fit into the PHONO input jack, replace it with the pin plug furnished with the QA-800A.

CONNECTING THE TUNER

Plug the left-channel output of an AM/FM stereo tuner into the FRONT LEFT (CH. 1) jack, and the right-channel output into the FRONT RIGHT (CH. 3) jack. Although the channel 2 and 4 are provided with the jacks, they are seldom, if ever, used usually.

CONNECTING THE CARTRIDGE TAPE PLAYER

Plug the output of a cartridge tape player into either AUX 1 or AUX 2 input jacks.

NOTES:
1. For using a 2-channel stereo tape player, plug the left channel output into CH.1 of AUX input jacks, and the right channel output to CH. 3.
2. For using a 4-channel stereo tape player, follow the procedures as explained in the player manual.

USE OF AUX JACKS (1–2)

These jacks are spare input terminals. They may be used for connecting stereo output from a cartridge tape player, discrete 4-channel record (CD-4) adaptor, or multiplex television tuner, adding versatility.

CONNECTING THE TAPE DECK

RECORDING

Plug the LINE INPUT of the tape deck into TAPE 1 REC output jacks of the QA-800A.

PLAYBACK

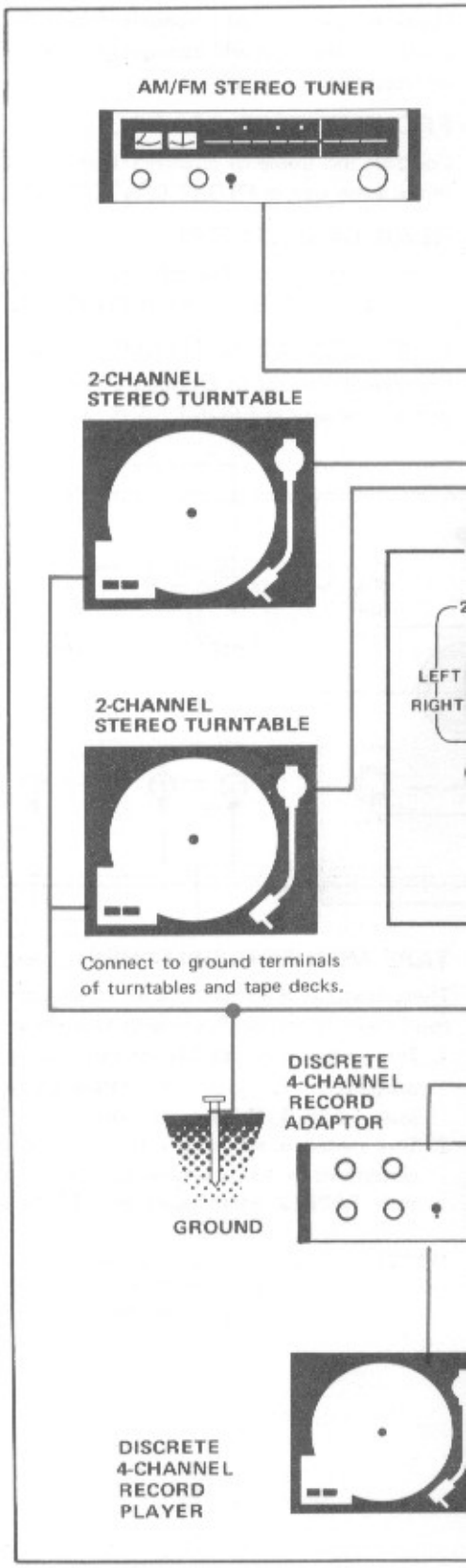
Plug the LINE OUTPUT (or TAPE MONITOR) into TAPE 1 MON input jacks of the QA-800A.

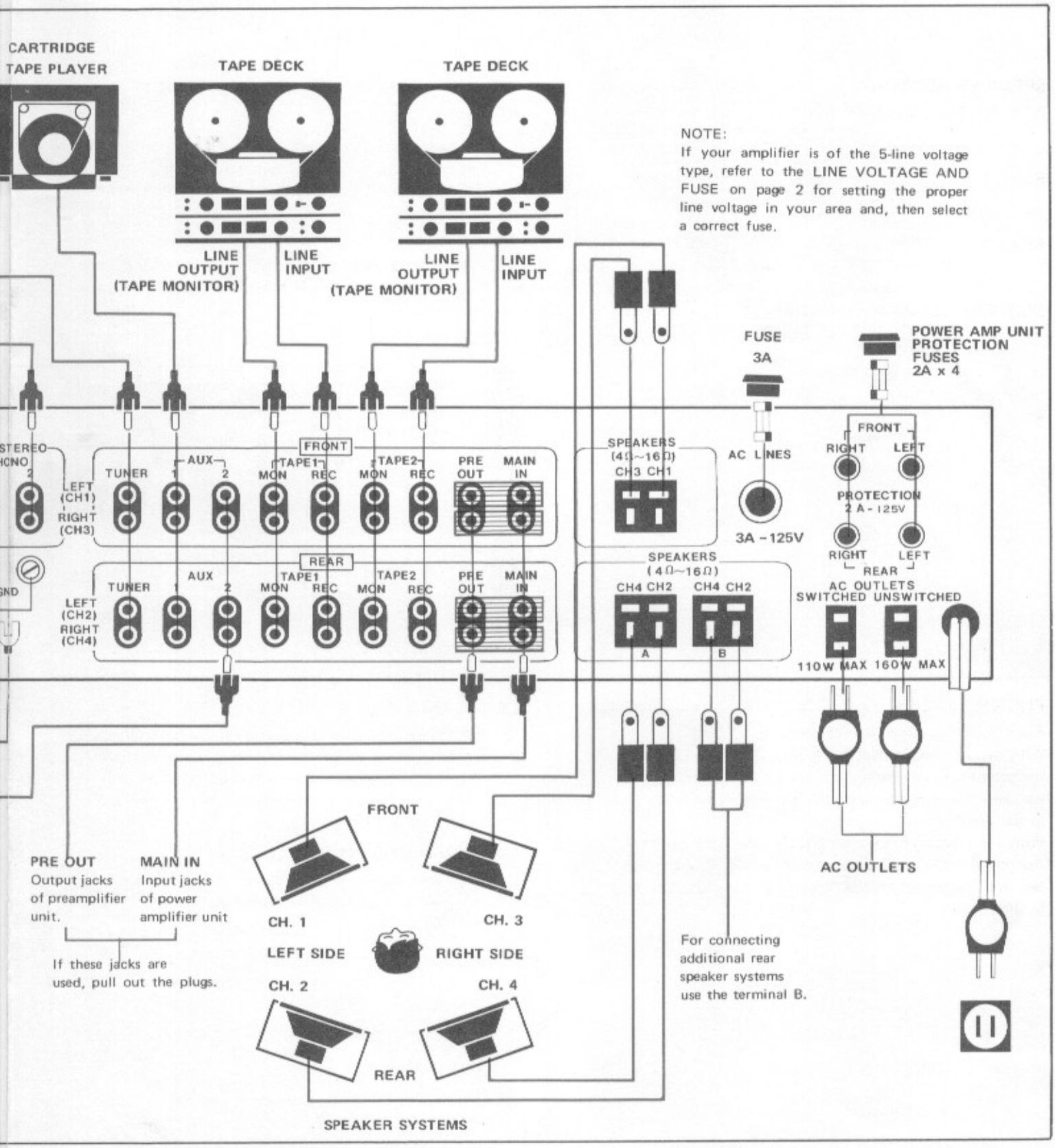
NOTES:
1. For using a 2-channel stereo tape deck, plug the left channel input (output) into REC (MON) jack (CH. 1), and the right channel input (output) into REC (MON) jack (CH. 3). In case of a 4-channel stereo tape deck, follow the procedures as explained in the tape deck manual.
2. For using two tape decks simultaneously, plug the second tape deck into TAPE 2 REC and TAPE 2 MON jacks such the same as in connection of a single tape deck.
3. For the above connections, use the connecting cord furnished with the tape deck.

TWO TAPE DECK CONNECTIONS FOR DUPLICATING OR EDITING A RECORDED PROGRAM

Connect two tape decks as described in the above-mentioned RECORDING and PLAYBACK.

CONNECTION DIAGRAM




CARTRIDGE
TAPE PLAYER
TAPE DECK
TAPE DECK
LINE OUTPUT (TAPE MONITOR)
LINE INPUT
LINE OUTPUT (TAPE MONITOR)
LINE INPUT
NOTE:
If your amplifier is of the 5-line voltage type, refer to the LINE VOLTAGE AND FUSE on page 2 for setting the proper line voltage in your area and, then select a correct fuse.
FUSE
3A
POWER AMP UNIT PROTECTION FUSES
2A x 4
FRONT
REAR
AUX
TUNER
TAPE1
TAPE2
MON
REC
PRE OUT
MAIN IN
LEFT (CH1)
RIGHT (CH3)
LEFT (CH2)
RIGHT (CH4)
SPEAKERS (4Ω~16Ω)
CH3 CH1
CH4 CH2
A
B
AC LINES
3A - 125V
PROTECTION 2A - 125V
RIGHT
LEFT
AC OUTLETS
SWITCHED
UNSWITCHED
110W MAX
160W MAX
PRE OUT
Output jacks of preamplifier unit.
MAIN IN
Input jacks of power amplifier unit
If these jacks are used, pull out the plugs.
FRONT
CH. 1
CH. 3
LEFT SIDE
RIGHT SIDE
CH. 2
CH. 4
REAR
SPEAKER SYSTEMS
For connecting additional rear speaker systems use the terminal B.
AC OUTLETS

FRONT PANEL FACILITIES

SPEAKER SWITCH

POWER OFF . . Turns the power off. Power supply to the AC OUTLET (SWITCHED) on the rear panel will also be cut off.

REAR A . . . . The rear speaker systems plugged into the REAR A speaker terminals is in operation.

REAR B . . . . The rear speaker systems plugged into the REAR B speaker terminals is in operation.

SPKR OFF . . . All speaker systems off.

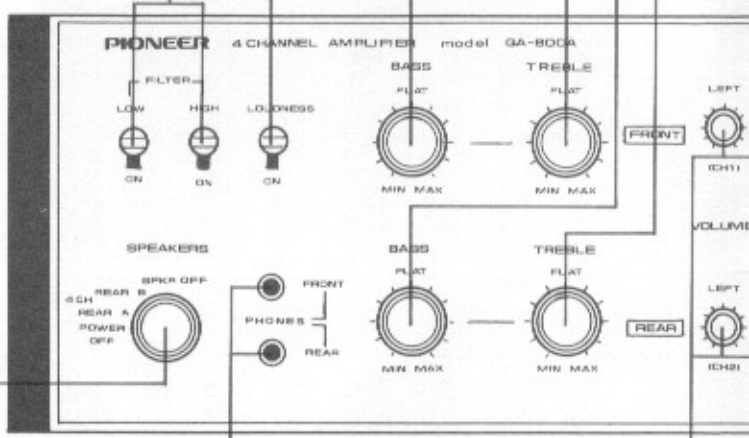
FILTERS

LOW – Use this filter to eliminate low-frequency interference, such as motor rumbling or hum.

HIGH – Use this filter to eliminate high-frequency interference, such as that from fluorescent lights.

LOUDNESS

To listen to quieter sound, set this to ON. This emphasizes the low and high notes. For normal listening, set it to OFF.



PHONES JACKS

For connecting stereo headphones.

With the plug connected to FRONT jack, you will hear the sound through the speaker system (CH. 1) in the left ear, and the sound through the speaker system (CH. 3) in the right ear.

With the plug connected to REAR jack, you will hear the sound through the speaker system (CH. 2) in the left ear, and the sound through the speaker system (CH. 4) in the right ear.

LEVEL CONTROLS (CH 1, CH 2, CH 3, CH 4)

Control the output level of each speaker system. Turn the control (CH. 1) to increase the level of the FRONT LEFT (CH. 1) speaker system. Likewise, turn the controls (CH. 2 to CH. 4) to increase the level of the corresponding speaker system.

VOLUME CONTROL

Controls the output volumes of all four channels simultaneously. Turning the control to the right will increase the volume.

FRONT BASS CONTROL

Controls the bass of channels 1 and 3. Turning the control to the right will increase the tone, and to the left will decrease the tone.

FRONT TREBLE CONTROL

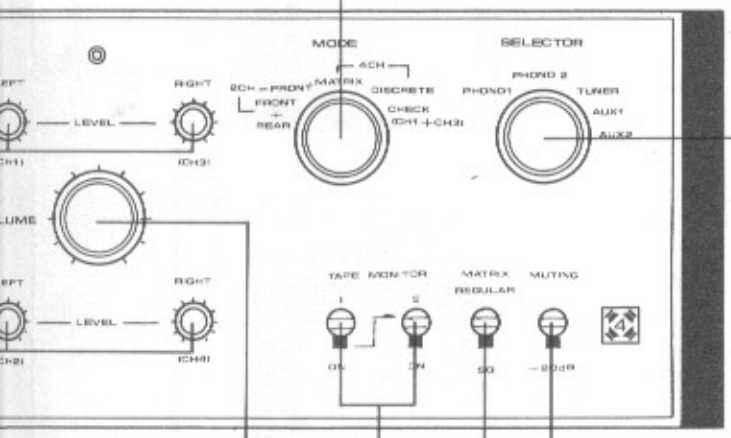
Controls the treble of channels 1 and 3. Use the control in the same way as FRONT BASS CONTROL.

REAR BASS CONTROL

Controls the bass of channels 2 and 4. Use the control in the same way as FRONT BASS CONTROL.

REAR TREBLE CONTROL

Controls the treble of channels 2 and 4. Use the control in the same way as FRONT BASS CONTROL.



TAPE MONITOR SWITCHES (1 and 2)

These switches are set to ON for checking the recording conditions or for playback with tape decks.

1. This switch is set to ON for monitoring recording in progress or for playback with a tape deck plugged into TAPE 1 MON jacks and TAPE 1 REC jacks.
2. This switch is set to ON for checking the recording conditions or for playback with a tape deck plugged into TAPE 2 MON jacks and TAPE 2 REC jacks.

NOTE: For a playing record or radio reception, leave these switches set to the OFF position. With the switches set to ON, no sound will come from the speakers.

MODE SWITCH

This switch selects the mode of reproducing sound.

2 CH

FRONT + REAR. . . Used for reproduction of 2-channel stereo. At this position, Left channel signal comes from left FRONT and REAR speakers, right channel signal from right FRONT and REAR speakers.

2 CH FRONT . . . Used for reproduction of 2-channel stereo with the FRONT speakers only. At this position, no sound comes from the rear speakers.

4 CH MATRIX . . Used for reproduction of regular and SQ matrix records and FM broadcasts, on a 4-channel stereo. This position is also used for matrix reproduction of 2-channel source.

4 CH DISCRETE . . Used for reproduction of discrete 4-channel source (tapes and cartridges).

CHECK . . . . . At this position, CH. 1 and CH. 3 (CH 1 + CH 3) sound is mixed and fed to the four speakers. This position is used to check phase and level balance among the channels and to check connections.

SELECTOR SWITCH

PHONO 1 . . . . . For playing records by a turntable plugged into the PHONO 1 jacks.

PHONO 2 . . . . . Same as above, for PHONO 2 jacks.

TUNER . . . . . For radio reception through a tuner.

AUX 1 . . . . . For playing signal source fed to the AUX 1 jacks.

AUX 2 . . . . . Same as above, for AUX 2 jacks.

MUTING SWITCH

With this switch set to −20dB position, the output level is attenuated by 20dB at once.

MATRIX SWITCH

REGULAR . . . . . Used for reproduction of 4-channel records and FM broadcasts via the regular matrix mode.

SQ . . . . . Used for reproduction of 4-channel records and FM broadcasts via the SQ matrix mode.

CHECK POINTS BEFORE OPERATION

BEFORE SWITCHING THE POWER ON, CHECK THE FOLLOWING ITEMS:

1. The VOLUME control and LEVEL controls are set at MIN.
2. The MODE switch is set at CHECK.
3. The BASS and TREBLE controls are all set at FLAT.
4. The TAPE MONITOR switches (1, 2) are set at OFF. (The switches should be set at ON for a tape playback only.)

CHECKING INTERACTION BETWEEN CHANNELS AND SPEAKER SYSTEMS

Play a record or receive some radio stations, with the four LEVEL controls set at MIN and the VOLUME control turned slightly to the right.

First, turn the CH. 1 LEVEL control to the right and confirm that the FRONT LEFT (CH. 1) speaker system is in operation. Then, turn the CH. 2 LEVEL control to the right and confirm that the REAR LEFT (CH. 2) speaker system is in operation. Likewise, confirm the operations of the FRONT RIGHT (CH. 3) and REAR RIGHT (CH. 4) speaker systems by turning the LEVEL controls (CH. 3 and CH. 4), respectively.

If any other speaker system than the proper one is operating during the above verification test, check the connection of that particular speaker system.

LEVEL BALANCE ADJUSTMENT AMONG FOUR CHANNELS

After the interaction between channels and speaker systems has been checked, return the VOLUME control to MIN, and turn the four LEVEL controls fully clockwise. Then, set the VOLUME control to a normal volume for your listening, and see if the level balance among four channels is complete. If the level of any particular channel is unbalanced, adjust the level balance by turning the LEVEL control of that channel.

RECORDS PLAYING

1. When records are played by the turntable plugged into PHONO 1 jacks, set the SELECTOR switch to PHONO 1. Likewise, when records are played by the turntable plugged into PHONO 2 jacks, set the SELECTOR switch to PHONO 2.
2. Set the MODE switch to 4 CH MATRIX.
3. Set the MATRIX switch according to the type of record to be played.
   Regular matrix record . . . . . .REGULAR position
   SQ matrix record . . . . . SQ position
   Note that the REGULAR and SQ positions may be used for reproduction of ordinary stereo records, in which a surround effect will result.
4. Set VOLUME, BASS, and TREBLE controls to desired positions.

NOTES: 1. To reproduce 2-channel stereo records in the usual manner, set the MODE switch to 2 CH FRONT + REAR or 2 CH FRONT.
2. A separate adaptor is required to reproduce CD-4 records. In this case, set the MODE switch to 4 CH DISCRETE.

RADIO RECEPTION WITH TUNER

1. Set the SELECTOR switch to TUNER.
2. Set tuner controls to receive a station of your choice.
3. Set the MODE switch to the 4 CH MATRIX position. (In the case of AM or FM MONO reception, set the MODE switch to the 2 CH FRONT + REAR or 2 CH FRONT position.)
4. Set the MATRIX switch to the REGULAR or SQ position. These steps set up the system for reception of matrix 4-channel FM stereo broadcasts. Note that matrix reproduction (REGULAR or SQ position) may also be used for listening to ordinary 2-channel stereo broadcasts.
5. Set volume and tone controls to desired positions.

PLAYBACK WITH CARTRIDGE TAPE PLAYER

1. Set the SELECTOR switch to AUX 1 or AUX 2 (whichever accommodates the tape player).
2. In the case of a 4-channel cartridge tape, set the MODE switch to 4 CH DISCRETE. In the case of a 2-channel cartridge tape, set the MODE switch to MATRIX.
   Set the MATRIX switch to REGULAR or SQ.
3. Set the tape player into operation, beginning playback.
4. Set volume and tone controls to desired positions.

NOTE: Set the MODE switch to 2 CH FRONT + REAR or 2 CH FRONT for reproduction of 2-channel stereo signal.

RECORDING AND PLAYBACK WITH TAPE DECK

PLAYBACK

1. Set the TAPE MONITOR (1 or 2) switch corresponding to the tape deck to be used, that is, to TAPE 1 MON or TAPE 2 MON jacks.
2. If a 4-channel tape is to be reproduced, set the MODE switch to 4 CH DISCRETE. If a 2-channel tape is to be reproduced, set the MODE switch to 4 CH MATRIX and the MATRIX switch to REGULAR or SQ.
3. Set the tape deck into operation, beginning playback.
4. Set volume and tone controls to desired positions.

NOTE: For reproduction of 2-channel stereo, set the MODE switch to the 2 CH FRONT + REAR or 2 CH FRONT position.

RECORDING

As shown in Fig. 5, live signals selected by the SELECTOR switch is always appearing at TAPE 1 REC and TAPE 2 REC jacks. Operate the QA-800A as described in "Records playing" and "Radio reception with tuner" on page 11.

NOTES: 1. The MODE switch, MATRIX select switch, VOLUME, BASS, TREBLE controls cannot control the signals appearing at TAPE 1 REC and TAPE 2 REC jacks.
2. Control the recording level with the controls on the tape deck.

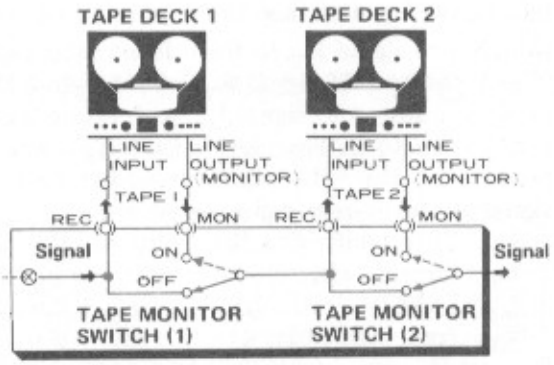


Fig. 5

• MONITORING

When a three-head type tape deck equipped with monitor function is used, recording can be monitored by operating the TAPE MONITOR switch as long as the recording and playback connections are provided.

DUPLICATING OR EDITING RECORDED PROGRAMS WITH TWO TAPE DECKS

You can make your own "Tape Library" by duplicating or editing recorded programs, using two tape decks combined with the QA-800A. For instance, you can record only your favorite music from an FM stereo program recorded on tape.

1. Connect two tape decks as shown in Fig. 6.
2. Set the TAPE MONITOR switch 1 to ON, and reproduce a recorded program by operating the tape deck connected to TAPE 1 MON.
3. Record the playback in the way you want by operating the tape deck connected to TAPE 2 REC (MON). Operating the TAPE MONITOR switch 2 allows you to monitor a recording now in progress.

NOTES: 1. Make sure to set the TAPE MONITOR switch 1 to ON.
2. Recording with a PAUSE switch-provided tape deck will facilitate duplicating or editing of recorded programs.

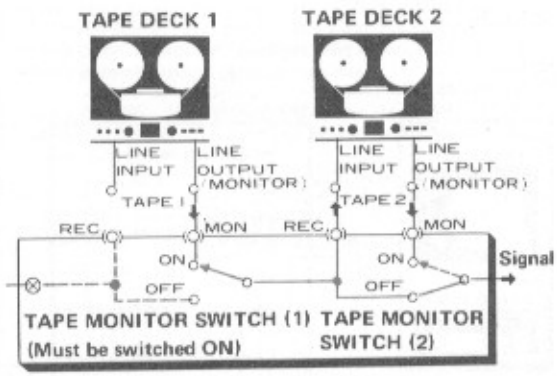


Fig. 6

MATRIX 4-CHANNEL DECODER

There are two types of matrix 4-channel systems: the regular matrix and the SQ matrix. Signal source comes directly from matrix 4-channel records now available on the market or indirectly from FM broadcasts of such records. As these methods are not compatible, two decoders must be added to obtain 4-channel reproduction which exhibits the inherent features of each.

REGULAR MATRIX

As shown in Fig. 7, signals L_T and R_T from a matrix 4-channel record (or FM broadcast) pass through phase shifters and appear as four separate outputs. This figure also shows that the α portion of signal R_T is added to signal L_T to form front left signal L_F and that the α portion of signal L_T is added to signal R_T to form front right signal R_F. The β portion of signal R_T with phase led to 90° ($+jR_T$) is added to signal L_T with phase lagged 90° ($-jR_T$) to form rear left signal L_R, while the β portion of the $-jL_T$ signal is added to the $+jR_T$ signal to form rear right signal R_R.

L_F (front left, CH. 1): $L_T + \alpha R_T$
R_F (front right, CH. 3): $R_T + \alpha L_T$
L_R (rear left, CH. 2): $-jL_T + j\beta R_T$
R_R (rear right, CH. 4): $+jR_T - j\beta L_T$

L_T and R_T are signals from a record or FM broadcast. Term $-j$ denotes that the phase of the signal has been lagged 90° (with a phase shifter), while term $+j$ denotes that the phase of the signal has been led to 90°.

Even if 2-channel stereo records (FM broadcasts) supply the source material, the resultant effect is an improvement over ordinary 2-channel stereo sound.

SQ MATRIX

As shown in Fig. 8, signals L_T and R_T from an SQ matrix record (or FM broadcast) pass through phase shifters and appear as four separate outputs. This figure shows that signal L_T becomes signal L_F (CH. 1) and that signal R_T becomes signal R_F (CH. 3), without any alteration.

A phase shifter lags the phase of signal L_T by 90°, after which the lagged signal is added to signal R_T. Level of the resultant signal is dropped by $1/\sqrt{2} \fallingdotseq 0.7$ and phase is inverted to form CH. 2 signal L_R (CH. 2). In the same manner, signal L_T is added to signal R_T with phase lagged 90°. The level is reduced by $1/\sqrt{2}$ to form signal R_R (CH. 4).

L_F (CH. 1): L_T
R_F (CH. 3): R_T
L_R (CH. 2): $+j0.7L_T - 0.7R_T$
R_R (CH. 4): $-j0.7R_T + 0.7L_T$

Thus, it is seen that separation in the SQ matrix system is better than that in the regular matrix system, that is, separation between L_F and R_F. A principal feature of the SQ matrix is the use of logic circuitry, a feature which cancels rear center sound when front center sound exists or vice versa. This arrangement also leads to naturalness in reproduction.

In matrix reproduction of 2-channel records (FM broadcasts), front (L_F, R_F) separation theoretically becomes infinite. At the same time, rear signals are 90° out of phase to front (L_F, R_F), resulting in a feeling of depth which corresponds to a large hall.

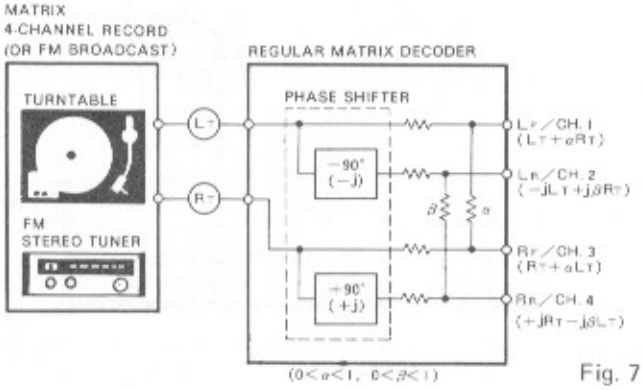


Fig. 7

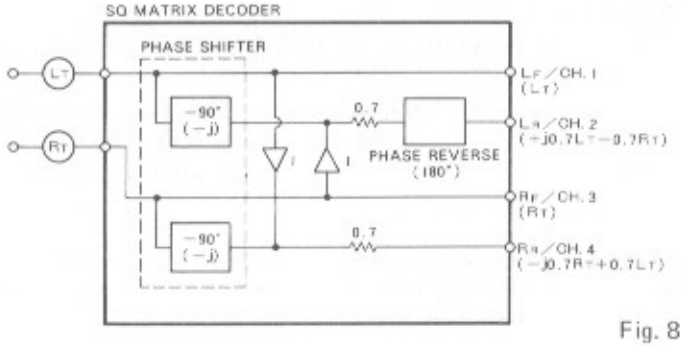


Fig. 8

SETTING UP 2-WAY MULTI-AMPLIFIER SYSTEM

By combining separately available electronic crossover network (SF-500 or SF-700) with the QA-800A, a 2-way multi-amplifier system can be set up. Connect the crossover network to the QA-800A as follows:

1. Remove the PRE OUT/MAIN IN plugs on the rear panel of the QA-800A.
2. Plug the input jacks of the crossover network into the PRE OUT jacks of the QA-800A.
3. Plug the MAIN IN jacks (CH. 1 and CH. 3) into the high-range output jacks of the crossover network.
4. Plug the MAIN IN jack (CH. 2 and CH. 4) into the low-range output jacks of the crossover network.
5. Plug the output for the tweeter into the speaker sockets CH. 1 and CH. 3, and the output for the woofer into the socket of CH. 2 and CH. 4.

CONDITIONS FREQUENTLY MISTAKEN FOR MALFUNCTION

To locate the cause of troubles, follow the chart below. Check not only QA-800A but also the and/or turntable and tuner of the system.

	SYMPTOM	SUSPECTED SOURCE OF NOISE	DIAGNOSIS AND REMEDY
WHEN LISTENING TO BROADCAST	Continuous or intermittent noise like jjjjjj or zzzzzz.	• Static (lightning) • Fluorescent lamp, motor, or thermostat may be in use in house or in the vicinity of the house.	In many cases, it is very difficult to remove the source of noise. In order to make the radio input larger than the noise level, set up a good outdoor antenna and make a complete grounding.
	When a station is tuned in, hum is mixed in the program.	• Poor fluorescent lamp, motor, or electric heater may be in use in house or near the house.	Reversing the line plug may occasionally alleviate this noise problem. Usually it is very difficult to eliminate the noise.
	Hissing sound noise in AM (medium wave) reception.	• The frequency of an adjacent station is interfering with that of the station being tuned in (10 kHz beat interference). • TV set is on in the same house with the receiver.	Impossible to remove such interference. If the cause of such noise is in the TV set, increase the distance between the TV set and tuner.
	Static noise (in particular, when automobiles run close to the house).	• White noise generated from automobile engines. • High frequency sewing machine or welding machine being used near your house.	In an area surrounded by hills or high buildings, the FM input signals are very weak. Thus the noise limiter in the circuit loses its function. Set up an outdoor FM antenna having many director elements.
	Reception of FM stereo program contains more noise than FM mono program.	• Note that the service area covered by an FM stereo broadcast is about 50% of that of a regular mono broadcast.	Increasing FM input signal may alleviate this problem. Use an exclusive FM outdoor antenna instead of the indoor T-type antenna.
WHEN PLAYING RECORDS	Hum or buzz. When switched to radio reception, the noise disappears.	• Poor connection of shielded wire (a). • Jack connection is loose. (b). • Line cord or fluorescent lamp is near the shielded wire. (c). • Poor grounding. (d). • Ham transmitting station or TV transmitting station is near your house. (e).	Correct the conditions stated in (a), (b), (c) or (d). In case of (e), report it to an official activity.
	Output tone quality is poor and mixed with noise. Treble is not clear.	• Stylus wears out. (a) • Record wears out. (b) • Dust adheres to stylus. (c) • Stylus is improperly mounted. (d) • Stylus pressure is not proper. (e) • The TREBLE level is too high.	Check (a) through (e) and correct the condition. Lower the TREBLE level.

SPECIFICATIONS

SEMICONDUCTORS

FETs	2
Transistors	65
Diodes	15

POWER AMPLIFIER SECTION

Music Power Output (IHF)	204W (4Ω) 144W (8Ω)
Continuous Power Output (1kHz 2-channel driven)	34W+34W/34W+34W (4Ω) 27W+27W/27W+27W (8Ω)
Continuous Power Output (1kHz 4-channel driven)	24W x 4 (4Ω) 20W x 4 (8Ω)
Power Output in the range of 20Hz to 20kHz (2-channel driven)	23W+23W/23W+23W (8Ω, Harmonic Distortion less than 0.5%)
Harmonic Distortion	Less than 0.5% (Continuous Power Output)
Intermodulation Distortion	Less than 0.8% (Continuous Power Output)
Power Bandwidth (IHF) (2-channel driven) (4-channel driven)	(8Ω, Harmonic Distortion less than 0.5%) 10Hz to 50kHz 15Hz to 50kHz
Frequency Response	8Hz to 70kHz, ±1dB
Input Sensitivity/Impedance (1kHz Continuous Power Output)	500mV/50kΩ
Damping Factor	40 (8Ω, 1kHz)
Speakers Output	1 pair for Front, 2 pair for Rear (Impedance 4~16Ω)
Headphones Jacks	Front and Rear

PREAMPLIFIER SECTION

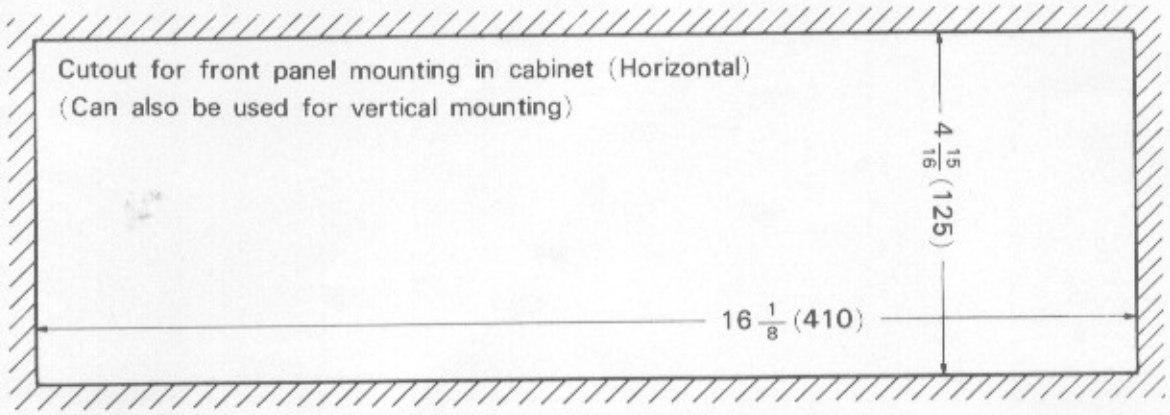
Output Voltage	500mV (Rated output)
Harmonic Distortion	Less than 0.08%
Frequency Response	20Hz to 40kHz, ±1dB
Input Sensitivity/Impedance (1kHz, for rated output)	PHONO 1 MAG 2.5mV/50kΩ PHONO 2 MAG 2.5mV/50kΩ TUNER 200mV/100kΩ (4-CH.) AUX 1, 2 200mV/100kΩ (4-CH.) TAPE MONITOR 1, 2 200mV/100kΩ (4-CH.)
Recording Output	TAPE REC 1, 2 (Pin jack) 200mV/(4-CH.)
BASS Control	−10dB, +10dB/100Hz
TREBLE Control	−10dB, +10dB/10kHz
LOW Filter	−10dB/50Hz (6dB/oct.)
HIGH Filter	−10dB/10kHz (6 dB/oct.)
Equalization Curve	PHONO: RIAA S.T.D.
Loudness Contour	+11dB/100Hz, +7dB/10kHz with Volume Control set at −40dB position.
Muting	−20dB
Hum and Noise (IHF; short circuit, A network)	PHONO More than 80dB TUNER, AUX More than 90dB

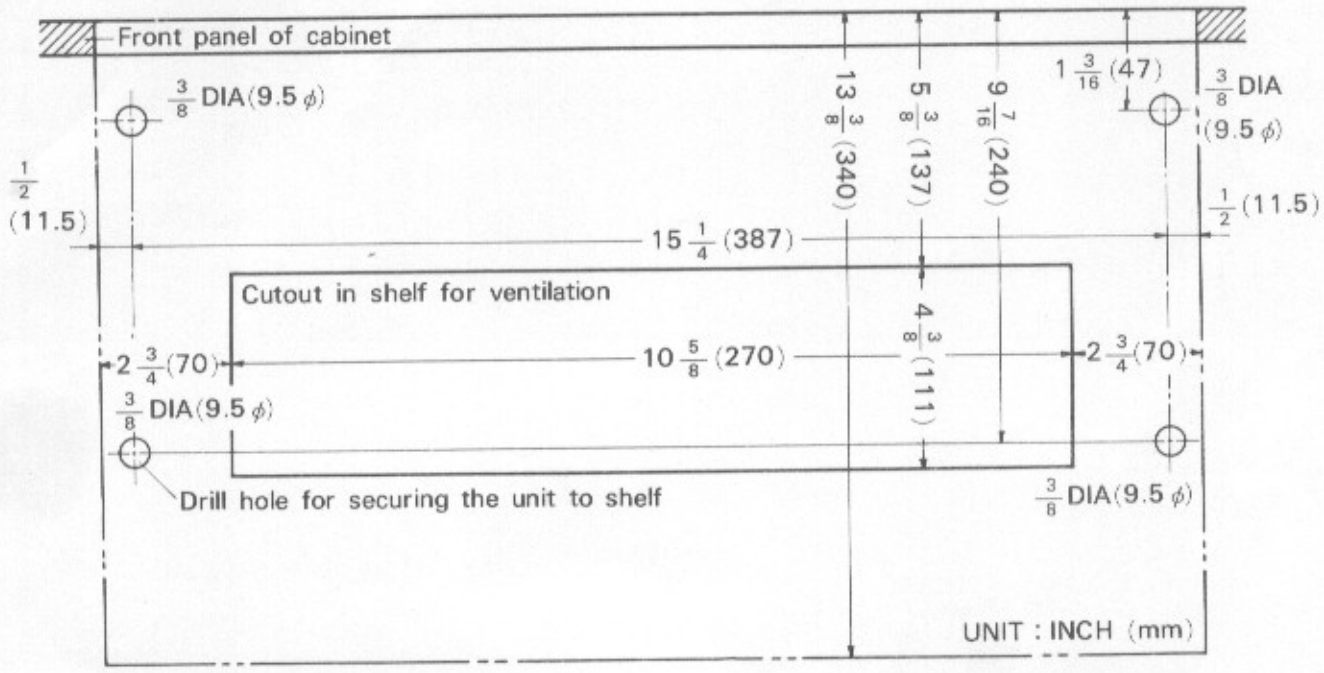
MISCELLANEOUS

Power Requirements	120V 60Hz or 110V, 120V, 130V, 220V and 240V (Switchable) 50-60Hz	
Power Consumption	290W (Max.)	
AC Outlets	Switched 1, Unswitched 1	
Dimensions (overall)	16-15/16 in./430mm (width) 5-7/16 in./138mm (height) 13-1/4 in./337mm (depth)	
Weight: Without package	24 lb/10.9 kg	
With package	28 lb 6oz/12.9 kg	
Furnished Parts	Pin Plugs	4
	Speaker Plugs	6
	Polishing Cloth	1
	Connection Cords	2
	Operating Instructions	1

NOTE: Specifications and the design subject to possible modification without notice due to improvements.

MOUNTING TEMPLATE





Remove the four feet on the bottom plate of the unit.