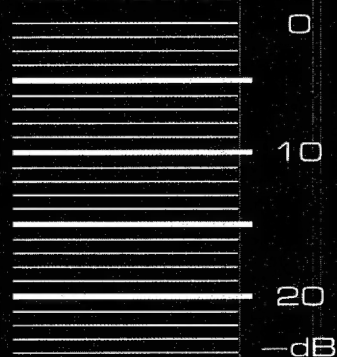


Natural Sound Digital Surround Decoder

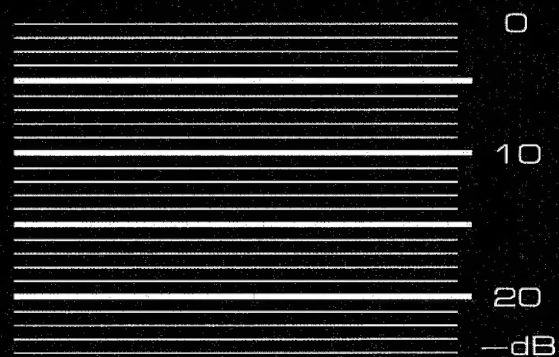
DSR-100 PRO

OPERATION MANUAL

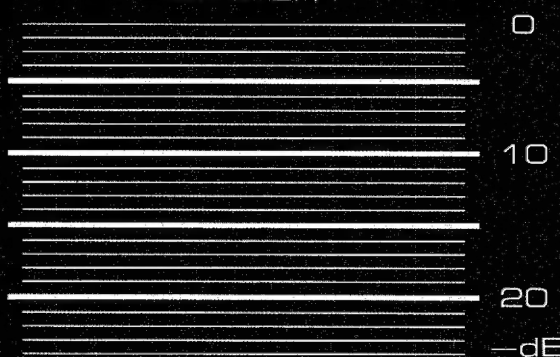
SURROUND



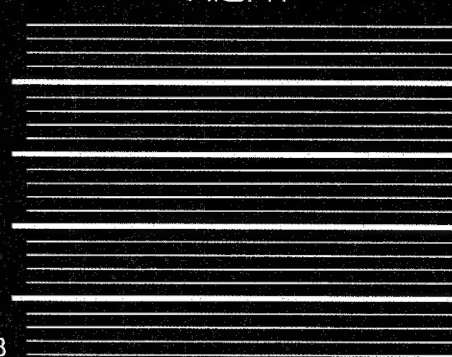
LEFT



CENTER



RIGHT



YAMAHA

Congratulations

You are now the proud owner of a Yamaha DSR-100PRO Dolby Pro Logic Surround Processor. This sophisticated digital surround decoder lets you experience the full realism and impact of Dolby Surround movie theater sound in your own home.

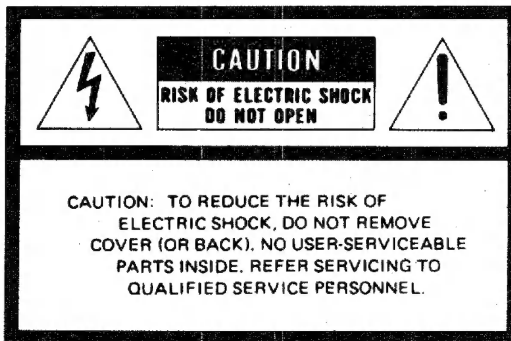
Dolby Pro Logic Surround gets its name from its professional-grade directional logic circuitry, which provides greater effective channel separation for a much higher degree of realism than the "passive" Dolby Surround circuits found in today's typical home audio/video equipment. With a suitable complement of surround amplifiers and speakers, the DSR-100PRO can bring you the kind of exciting, dramatic listening experience that normally can only be had at leading movie theaters.

To further extend the range of realistic listening environments you can create with your system, we recommend the Yamaha DSP-series Digital Sound Field Processors. These DSP units simulate some of the world's most famous music listening environments, including actual movie theaters, concert halls, cathedrals, and jazz clubs. They are also effective with any audio source, including monophonic program material. Together, the DSR-100PRO and a DSP unit such as the DSP-1 or DSP-3000 form a perfect pair, for the ultimate in listening excitement.

To assure maximum performance and trouble-free operation, refer to the connection recommendations and operating instructions in this manual. Be sure to store the manual in a safe place for future reference.

PRECAUTIONS & SAFETY INSTRUCTIONS

SAFETY INSTRUCTIONS



•Explanation of Graphical Symbols



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert you to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert you to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING

To reduce the risk of fire or electric shock, do not expose this appliance to rain or moisture.



1 Read Instructions—All the safety and operating instructions should be read before the appliance is operated.

2 Retain Instructions—The safety and operating instructions should be retained for future reference.

3 Heed Warnings—All warnings on the appliance and in the operating instructions should be adhered to.

4 Follow Instructions—All operating and other instructions should be followed.

5 Water and Moisture—The appliance should not be used near water—for example, near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool, etc.

6 Cart and Stands—The appliance should be used only with a cart or stand that is recommended by the manufacturer.

6A An appliance and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn.

7 Wall or Ceiling Mounting—The appliance should be mounted to a wall or ceiling only as recommended by the manufacturer.

8 Ventilation—The appliance should be situated so that its location or position does not interfere with its proper ventilation. For example, the appliance should not be situated on a bed, sofa, rug, or similar surface that may block the ventilation openings; or cabinet that may impede the flow of air through the ventilation openings.

9 Heat—The appliance should be situated away from heat sources such as radiators, stoves, or other appliances that produce heat.

10 Power Sources—The appliance should be connected to a power supply only of the type described in the operating instructions or as marked on the appliance.

11 Power-Cord Protection—Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the appliance.

12 Cleaning—The appliance should be cleaned only as recommended by the manufacturer.

13 Nonuse Periods—The power cord of the appliance should be unplugged from the outlet when left unused for a long period of time.

14 Object and Liquid Entry—Care should be taken so that objects do not fall into and liquids are not spilled into the inside of the appliance.

15 Damage Requiring Service—The appliance should be serviced by qualified service personnel when:

- A. The power-supply cord or the plug has been damaged; or
- B. Objects have fallen, or liquid has been spilled into the appliance; or
- C. The appliance has been exposed to rain; or
- D. The appliance does not appear to operate normally or exhibits a marked change in performance; or
- E. The appliance has been dropped, or the cabinet damaged.

16 Servicing—The user should not attempt to service the appliance beyond those means described in the operating instructions. All other servicing should be referred to qualified service personnel.

17 Power Lines—An outdoor antenna should be located away from power lines.

18 Grounding or Polarization—Precautions should be taken so that the grounding or polarization of an appliance is not defeated.

19 This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type-tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna
- Relocate the DSR-100PRO with respect to the receiver
- Move the DSR-100PRO away from the receiver
- Plug the DSR-100PRO into a different outlet so that the DSR-100PRO and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful: "How to Identify and Resolve Radio-TV Interference Problems".

This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 004-000-00345-4.

IMPORTANT!

Please record the serial number of your unit in the space below.

Model: **DSR-100PRO**

Serial No.:

The serial number is located on the rear of the unit.
Retain this Owner's Manual in a safe place for future reference.

PRECAUTIONS & SAFETY INSTRUCTIONS

1. AVOID EXCESSIVE HEAT, HUMIDITY, DUST AND VIBRATION

Keep the unit away from locations where it is likely to be exposed to high temperatures or humidity—such as near radiators, stoves, etc. Also avoid locations which are subject to excessive dust accumulation or vibration which could cause mechanical damage.

2. AVOID PHYSICAL SHOCKS

Strong physical shocks to the unit can cause damage. Handle it with care.

3. DO NOT OPEN THE UNIT OR ATTEMPT REPAIRS OR MODIFICATIONS YOURSELF

This product contains no user-serviceable parts. Refer all maintenance to qualified Yamaha service personnel. Opening the unit and/or tampering with the internal circuitry will make servicing difficult and will endanger you and your DSR-100PRO.

4. MAKE SURE POWER IS OFF BEFORE MAKING OR REMOVING CONNECTIONS

Always turn the power OFF prior to connecting or disconnecting cables. This is important to prevent damage to the unit itself as well as other connected equipment.

5. HANDLE CABLES CAREFULLY

Always plug and unplug cables—including the AC cord—by gripping the connector, not the cord.

6. CLEAN WITH A SOFT DRY CLOTH

Never use solvents such as benzine or thinner to clean the unit. Wipe clean with a soft, dry cloth.

7. ALWAYS USE THE CORRECT POWER SOURCE

Make sure that the power source voltage specified on the rear panel matches your local AC mains supply.

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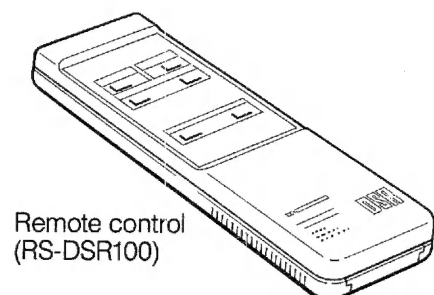
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SECTION 1—SETUP & ADJUSTMENT

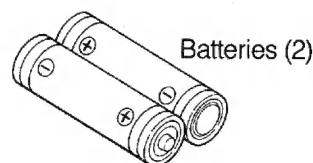
1-1. GETTING STARTED

Unpacking

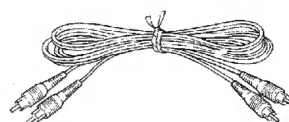
Carefully remove the DSR-100PRO from its packing box. With the DSR-100PRO you will find the remote control unit, connection cables, and a pair of batteries for the remote.



Remote control
(RS-DSR100)



Batteries (2)

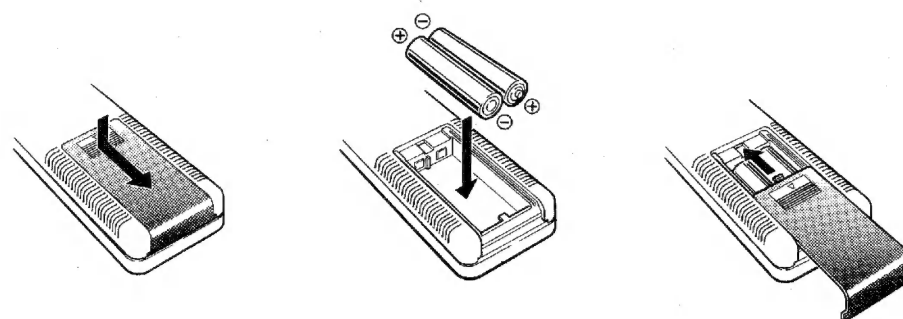


Pin cables (4)

Putting in the Batteries

Since the remote is handy for controlling DSR-100PRO operations, begin by installing the supplied batteries.

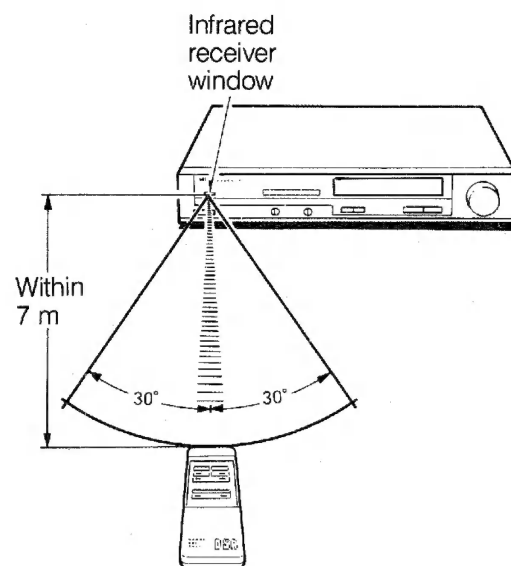
1. The battery compartment cover is on the back of the remote control unit. To open, pull down on the compartment cover clip while pulling the cover outward.
2. Insert the two batteries (SUM-3 or AA type), being careful to align their polarity with the markings inside the compartment.
3. Put the battery compartment cover back on.



- The batteries should last for quite a while, but they should be replaced if remote control operation seems erratic or if it no longer works from a reasonable distance.

Always replace with two new batteries. Any SUM-3 or AA type batteries will do, but they should both be the same.

SETUP & ADJUSTMENT



- The remote uses a highly directional infrared beam. Operate the remote while aiming it directly at the DSR-100PRO front panel.

The remote may not operate correctly if a strong light source is shining on the infrared receiver window, if the direct line from the remote to the DSR-100PRO is obstructed by furniture or other items, or if you press the keys while aiming the remote away from the DSR-100PRO.

1-2. SYSTEM CONFIGURATIONS

Amplification and Speaker Arrangements

The Basic System

To achieve the same dynamic sound that the professional Dolby systems in movie theaters do, the DSR-100PRO "active" circuit configuration breaks the Dolby Surround encoded stereo signal into several different channels: a center channel for dialog, the main left and right channels, and rear surround channels. A typical system setup includes five speakers with appropriate amplifiers. The center dialog speaker is placed adjacent to the screen, the main speakers are placed in their usual positions for stereo listening, and the surround speakers are placed at the left and right sides in the rear.

If for some reason it is not practical to use five speakers, it is possible to eliminate the center dialog speaker. The "phantom" mode is used in this case to route the dialog to the main speakers. Best results are obtained with the full five-speaker system, however.

It is also possible to further expand your system with the addition of a subwoofer and amplifier. The subwoofer should be placed in the rear of the room in the center.

NOTE: The Yamaha M-35 power amplifier (which provides four channels of amplification) is recommended to satisfy your additional amplification system needs.

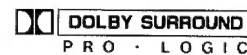
Dolby Pro Logic Surround Technical Notes

The DSR-100PRO uses an "active" circuit configuration which is similar to professional Dolby stereo decoders employed in movie theaters. How is this different from the "passive" decoders found in typical home equipment?

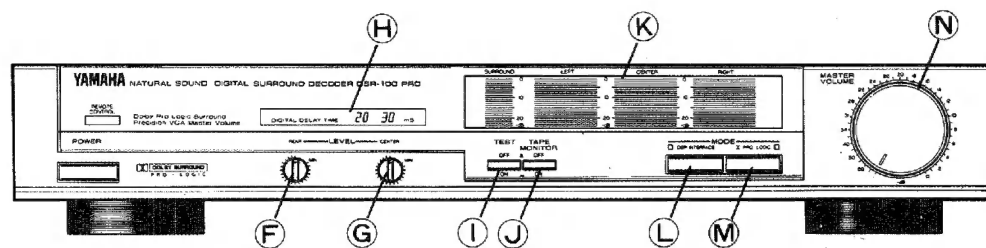
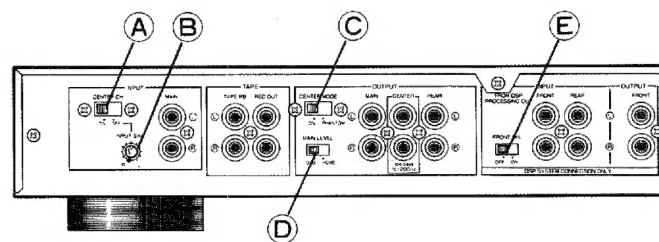
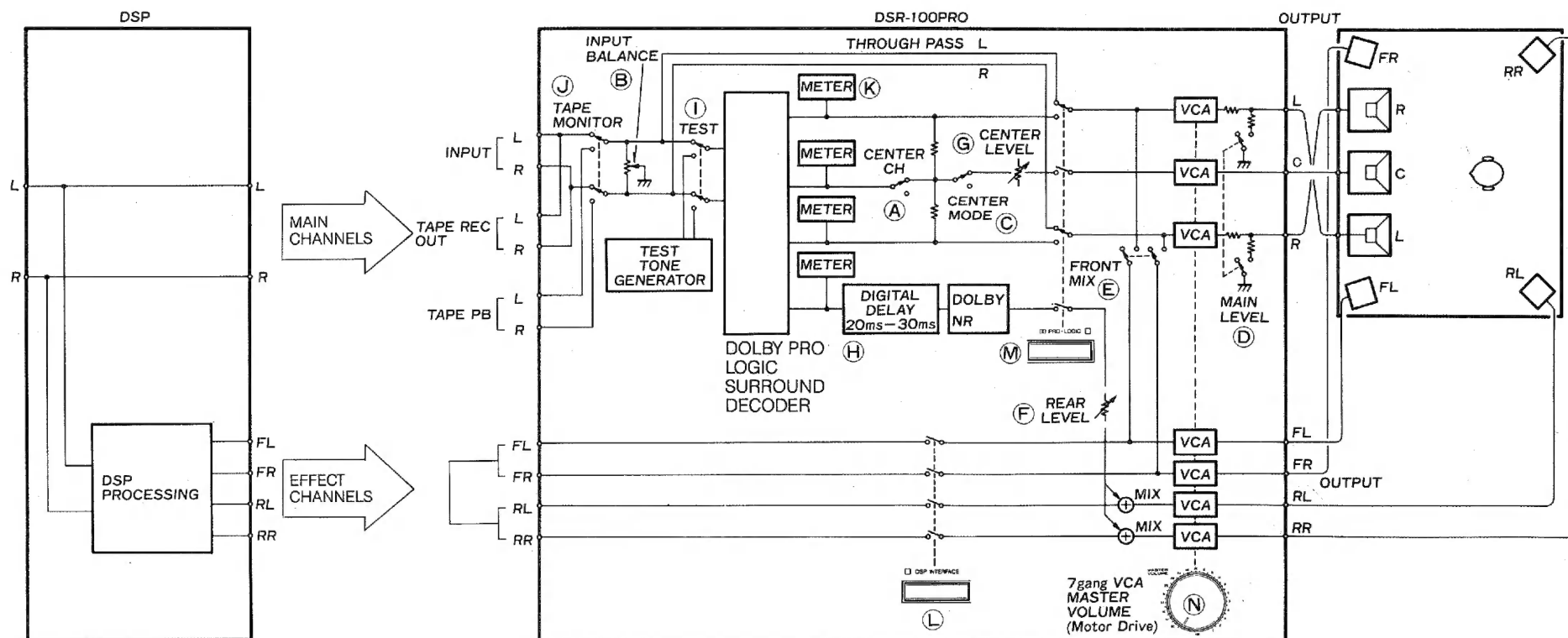
The Dolby Pro Logic Surround system is distinguished by logic circuitry that emphasizes "directional" information by proportionally canceling unwanted crosstalk. Taking the left and right channel signals as its input, the DSR-100PRO first produces two additional signals, a left-plus-right signal (L+R) for the center channel and a left-minus-right signal (L-R) for the rear surround channel. It then compares the levels of these four signals, L, R, L+R, and L-R. Based on these level differences, the DSR-100PRO emphasizes particular channels. For example, dialog is characterized by an increase in L+R signal level. When this is detected, the DSR-100PRO routes dialog to the center channel. As this results in a slight drop in the signal level sent to the left and right speakers, the DSR-100PRO boosts the center channel slightly to maintain overall volume at a constant level. Similarly, when L-R signal level is high, the DSR-100PRO boosts the surround channel level and reduces left and right channel levels.

This results in the high dynamic range and sharp effective channel separation of 26—40dB. Dolby Pro Logic Surround provides a true center channel, so that there are four independent channels, unlike passive Dolby Surround which in effect has only three channels, left, right and rear.

In fact, in a passive Dolby Surround system, it is a bad idea to use a center speaker, because it would reduce the effective channel separation that you hear between the left and right speakers. However, with the DSR-100PRO's active circuitry, dialog is automatically locked on screen while maintaining the width and separation of the stereo sound stage.



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SETUP & ADJUSTMENT

Equipped with Center Switch to Match Your System

On the rear panel of the DSR-100PRO you will find a CENTER MODE switch. This has an important role in matching DSR-100PRO operation to the capabilities of your audio system.

- When this switch is at the ON position, a center channel signal is provided to the center output jack. Information below 100Hz is fed to the left and right main speakers, so you can use a relatively small speaker system for center channel reproduction.
- If not using a center speaker, you should set this switch to the PHANTOM position. This allocates all center channel information to the left and right main speakers.

With a Yamaha DSP-Series Sound Field Processor

The DSR-100PRO is equipped with a complete set of inputs and selection facilities for connection to Yamaha DSP-Series Digital Sound Field Processors. In this case the pair of rear speakers used in the basic DSR-100PRO system also handles the DSP-Series rear effect signals. DSP-Series front effect channels can be reproduced independently of the main front speakers (in which case you will need yet another stereo amp and speakers). Or they may be blended with the conventional main speaker output (by setting the DSR-100PRO FRONT MIX switch to the ON position and setting the DSP-Series unit's FRONT MIX switch to the 6ch or OFF position). At a later date you can always upgrade to a full 6-channel setup.

In either case, the DSR-100PRO's volume control alone can adjust entire system volume, a real convenience, particularly with the remote.

DSP: In the following explanations, special notes concerning DSP-Series connections and operations will be preceded by the "DSP" mark.

Receivers and Integrated Amps versus Separate Pre- and Power Amps

If your current hi-fi system is built around a receiver or integrated amp then you can continue to use it for source selection and to drive your main (front) speakers.

However, you may notice that sound quality is better with a separate preamp and power amp.

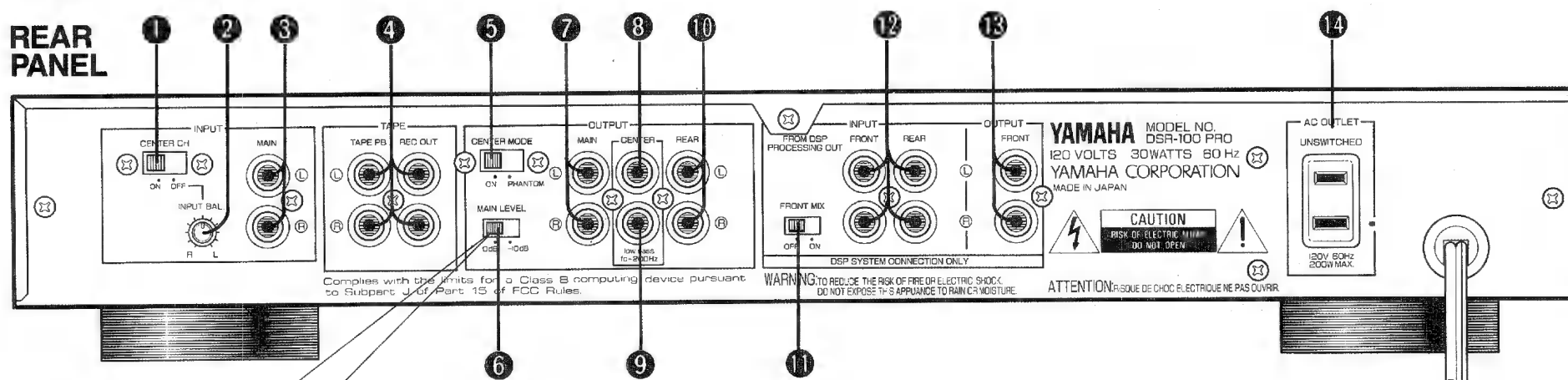
For the center channel, you may wish to purchase a mono power amp. For the rear surround speakers and (if using a DSP-Series unit) front effect speakers, additional stereo power amps are the optimum solution. However, if you already own an extra receiver or integrated amp, then it can be used just as well.

For subwoofer output you may wish to choose the convenience and sound quality of a Yamaha Electronic Super Woofer System which has its own built-in power amp. Otherwise, you will need another mono amp and a single subwoofer speaker system.

SETUP & ADJUSTMENT

1-3. SETUP

Before You Start Making Connections Make Sure that the DSR-100PRO and All Related Electronic Components are Turned Off.



Main Level Switch Setting

Set the MAIN LEVEL switch to -10dB if the INPUT jacks are connected to the output jacks of a separate preamplifier (control amplifier) or to the PRE OUT jacks of an integrated amplifier. Set the MAIN LEVEL switch to 0dB

if the INPUT jacks are connected to the TAPE PB jacks of an integrated amplifier or receiver. If you are using an integrated amp and it is equipped with PRE OUT and MAIN IN jacks, then it is far preferable to use these instead of the TAPE PB and REC jacks.

② Input Balance Control

This adjusts left/right input signal balance (when the center channel switch is set to the OFF position) to "fine tune" the operation of the Dolby logic circuitry.

③ Main Input Jacks

These accept input from a preamplifier, the "PRE OUT" or "TAPE REC" outputs from an integrated amplifier or receiver, or direct input from a line-level source such as a CD player.

DSP: Connect main output jacks to these inputs.

① Center Channel Switch

This must be set to the ON position for normal operation.

The OFF position is used only when adjusting the input balance control.

SETUP & ADJUSTMENT

④ Tape Recording and Playback Jacks

This is the place to connect a tape deck if the tape jacks of your integrated amp or receiver will be occupied by connection to the DSR-100PRO.

⑤ Center Mode Switch

Set to the ON position if you will be using a center speaker. Set to the PHANTOM position if you wish the center channel information to be reproduced through the conventional left and right channel front (main) speakers. (In either case, the center channel switch must also be at the ON position.)

⑥ Main Level Switch

Can be used to reduce MAIN output level by 10dB. For improved sound quality (higher S/N ratio), this should be set to -10dB if the DSR-100PRO is connected to a separate preamp or to the PRE OUT/MAIN-IN jacks of an integrated amp or receiver. Set to 0dB if using the tape loop (REC/PLAY or TAPE-IN/TAPE-OUT) jacks of an integrated amp or receiver.

⑦ Main Output Jacks

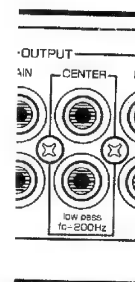
Connect these jacks to the amplifier that drives your main (front) speakers. If using an integrated amp or receiver, connect to the TAPE PB jacks or, if your amp has them, the MAIN IN jacks.

⑧ Center Output Jack

The upper jack provides the Dolby Surround center channel signal. Use this for output to an amplifier driving a center speaker.

A signal is output to this jack only when the front panel Dolby Surround Mode switch is on.

Both the center channel switch and the center mode switch must also be on for this to operate.



⑨ Center Subwoofer Output Jack

Use the lower jack (low pass) for output to a Yamaha Electronic Super Woofer System or to a mono amplifier driving a subwoofer. This output operates regardless of the positions of the center channel switch or center mode switch. Frequencies above 200Hz are filtered out so only the bass range remains.

SETUP & ADJUSTMENT

⑩ Rear Output Jacks

These provide the Dolby Surround system's decoded surround sound signals. Connect these outputs to the left and right channel input jacks of the amp that will drive your rear speakers.

DSP: DSP-Series rear effect output is also routed to these output jacks.

DSP: Additional Facilities for DSP System Connection Only

⑪ Front Mix Switch

Set to the OFF position if you will be connecting the front output jacks (at the far right) to an additional stereo amp and front speakers for independent reproduction of the DSP front effect channels.

Set to the ON position if DSP front effect channel signals are to be reproduced through your conventional main speaker system.

The DSP-Series unit's own "front mix" switch must be set to the OFF (or 6ch) position regardless of the setting that you choose for this switch.

⑫ Front and Rear Effect Input Jacks

Connect the DSP-Series unit's "processing front and rear" jacks to these inputs.

⑬ Front Effect Output Jacks

Connect to an additional stereo amp and speakers for independent reproduction of DSP processed front channel signals. The front mix switch should be at the OFF position in this case.

⑭ Voltage Selector

This will ordinarily have been set to the correct voltage for the country in which this unit was purchased. The setting may need to be changed if this unit will be used in a country having a different AC voltage.

⑮ Auxiliary AC Outlet

You may plug other audio components into this socket as long as power consumption does not exceed 200 watts.

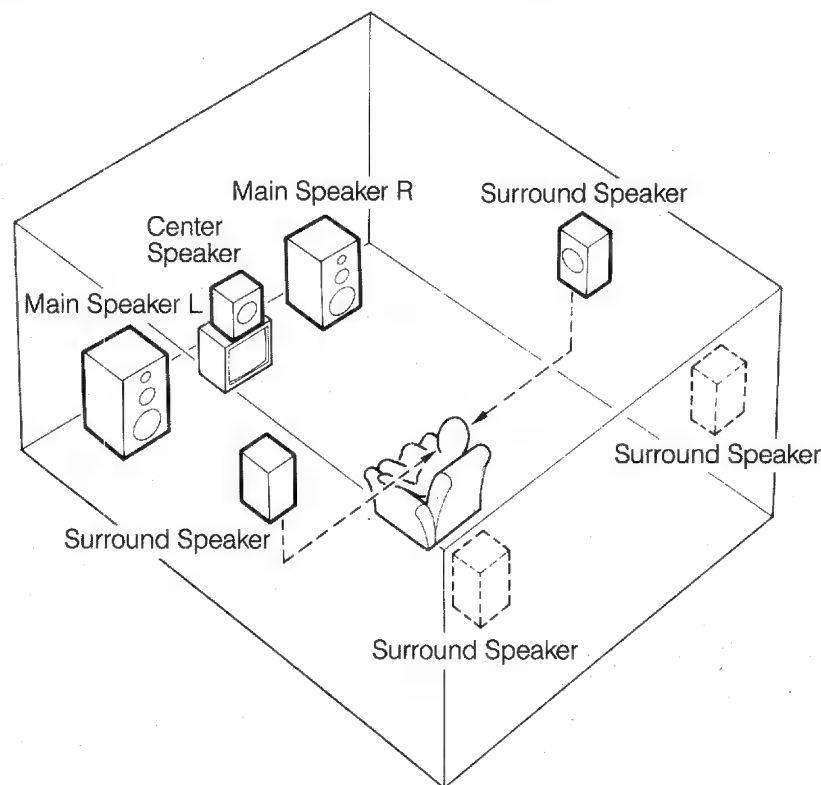
"Unswitched" means that power is available even when the DSR-100PRO is off.

The outlet is marked to indicate electrical polarity. Plug in other audio equipment so that the marked (or wide) prong goes into the marked socket. This may contribute to improved sound quality.

SETUP & ADJUSTMENT

Speakers & Speaker Placement

In a full 5-channel system you will use two sets of stereo speakers: the front MAIN SPEAKERS (your normal stereo speakers), the rear SURROUND SPEAKERS, and the CENTER SPEAKER. You may also be using a SUBWOOFER.



You will probably use your present stereo speaker system for the MAIN SPEAKER pair. The rear and center speakers do not need to be of such high quality. But they should have high enough power handling to accept the maximum output of the amps that will drive them. The rear channel output is filtered so that it covers only the frequencies between 100Hz and 7kHz. Therefore, you do not need to worry about reproduction of the high treble and low bass tones—they are not present in the surround channel signal.

Place the MAIN SPEAKERS in their normal position.

Place the rear SURROUND SPEAKERS beside your listening position and facing inward. They should be nearly six feet up from the floor. If your power amp can drive two sets of speakers, all the better. Place the second pair behind you for even greater effectiveness.

Place the CENTER SPEAKER precisely between the two MAIN SPEAKERS. (To avoid interference, keep the speaker away from TV sets, or use a magnetically shielded speaker)

If using a SUBWOOFER such as a Yamaha Electronic Super Woofer System, the position of the speaker is not so critical because low bass tones are not highly directional.

DSP: If using additional FRONT EFFECT SPEAKERS, install them further apart than the MAIN SPEAKERS. It is best to move the MAIN SPEAKERS slightly inward and mount the FRONT EFFECT SPEAKERS on the wall several feet above and behind them.

SETUP & ADJUSTMENT

The Dolby Surround rear SURROUND SPEAKERS double as the REAR EFFECT SPEAKERS in the DSP system. Adjust their position so that they are at about the same height and distance apart as the DSP FRONT EFFECT SPEAKERS. Ideally, the four effect speakers should be mounted in the corners of the room, all pointing downward and inward toward the listening position.

DSP: If not using additional FRONT EFFECT SPEAKERS (that is, if the FRONT MIX switch on the DSR-100PRO is on), then the MAIN SPEAKER pair will also be reproducing the DSP front effect signals.

Set the MAIN SPEAKERS in the position that gives the best stereo image. They should be reasonably wide apart and at equal distances from your listening position.

NOTE: Since most speakers are sold in pairs, one practical solution is to use one speaker for the center channel and the other for the surround channel.

In this case you would use only one of the rear speaker output jacks, either L or R. This is possible because in the Dolby Surround system the surround channel information is actually monophonic.

However, this is not recommended if you are using the DSR-100PRO with a Yamaha DSP series unit.

Room Furnishings

You will get maximum realism from the DSR-100PRO and DSP-Series units if the listening room is carpeted and curtained so that it absorbs sound waves. With this kind of acoustically "dead" room, most of what you hear comes from the speakers and not from room reflections. However, these are recommendations for optimization. You will find the DSR-100PRO to be effective in virtually any listening area.

General Instructions for Connections

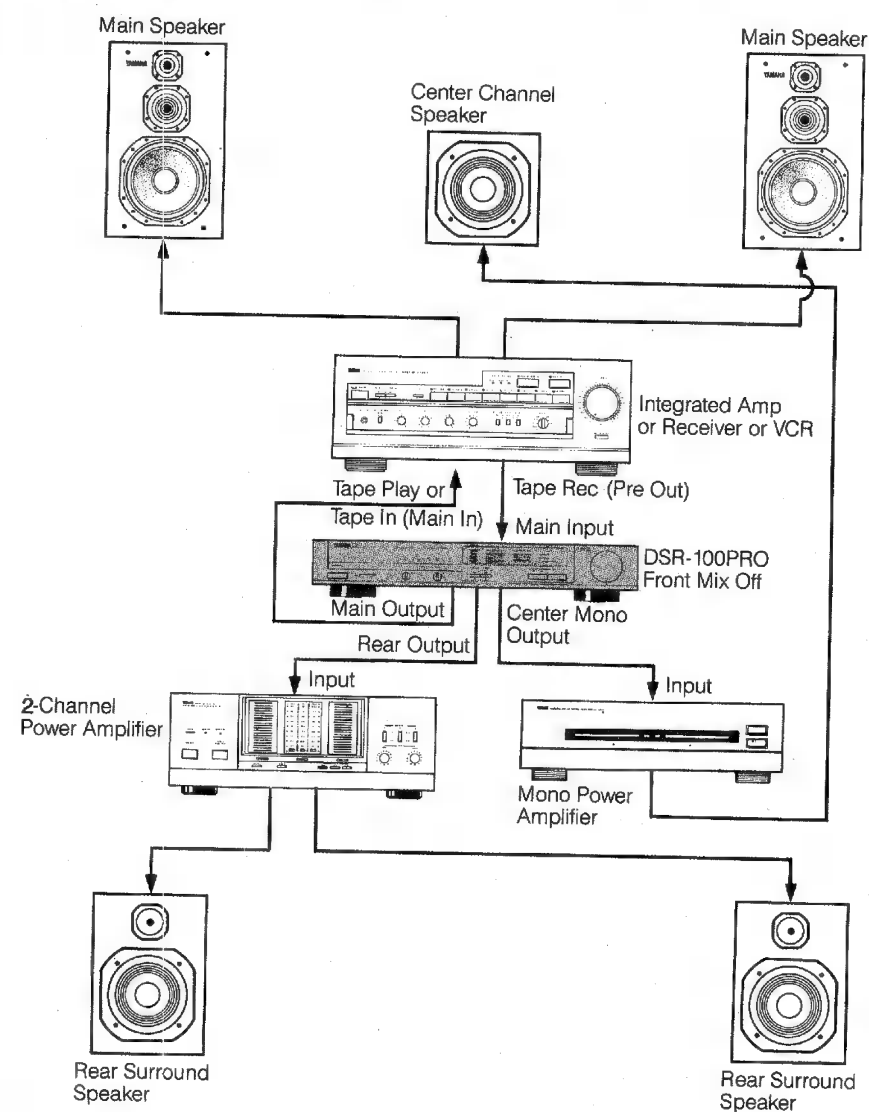
Use the supplied stereo cables or an equivalent high quality connection cable.

Make sure that you have the left (L) and right (R) channels correctly connected. That means that the jack marked "L" on the amp must be connected to the jack marked "L" on the DSR-100PRO. Likewise with the "R" jacks. This is easy if you remember to always use the red plugs for the "R" jacks and use the other plugs for the "L" jacks. By convention, "R" jacks are located below "L" jacks.

With speaker connections you must also be sure that the polarity is correct. For each amplifier and each channel, connect the plus (+) terminal of the amplifier to the plus terminal of the speaker, and connect the minus (–) terminal of the amplifier to the minus terminal of the speaker. To keep track of polarity, use speaker cable that has one of the two wires marked by a stripe or a different color.

SETUP & ADJUSTMENT

CONNECTING THE MAIN INTEGRATED STEREO AMPLIFIER, STEREO RECEIVER OR COMPONENT PREAMPLIFIER AND POWER AMPLIFIER TO THE DSR-100PRO.



Using an Integrated Amplifier or Stereo Receiver equipped with "PRE OUT" and MAIN IN" Jacks.

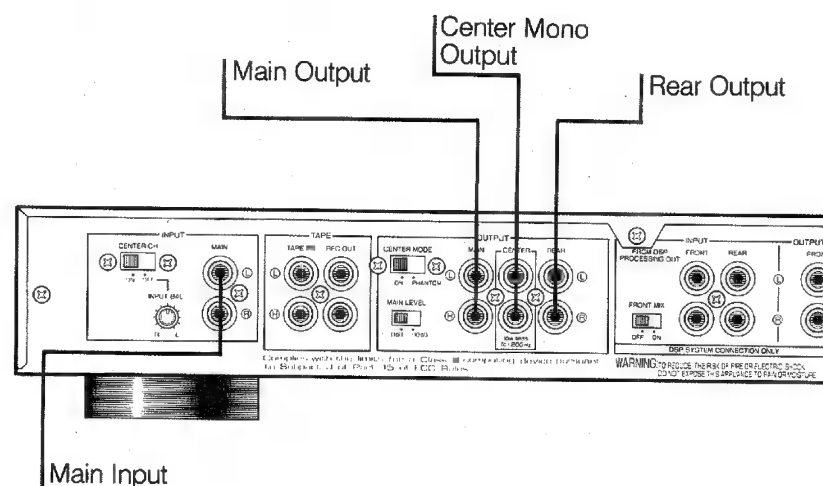
Some integrated amplifiers and a few receivers are equipped with PRE OUT and MAIN IN jacks. These allow you to use the unit's preamp and power amp circuits independently of each other.

On some amps or receivers you will need to change a rear panel switch setting. On others you must remove the jumper cables that connect the PRE OUT jacks to the MAIN IN jacks.

Connect the PRE OUT jacks to the MAIN INPUT jacks on the DSR-100PRO rear panel.

Connect the DSR-100PRO's MAIN OUTPUT jacks to the MAIN IN jacks on the integrated amp or receiver.

Connect the MAIN SPEAKERS to the speaker terminals on the amp or receiver.



SETUP & ADJUSTMENT

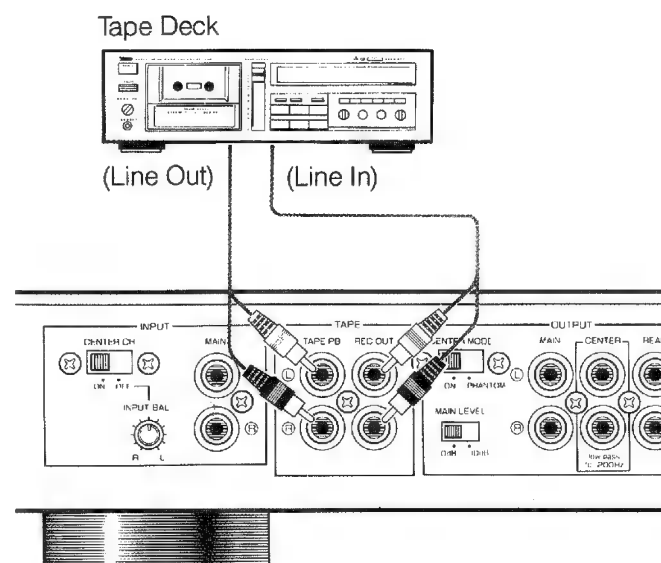
Using an Integrated Amplifier or Stereo Receiver that Does Not Have "PRE OUT" and "MAIN IN" Jacks

Connect the amp or receiver TAPE REC (or TAPE OUT) jacks to the MAIN INPUT jacks on the DSR-100PRO rear panel.

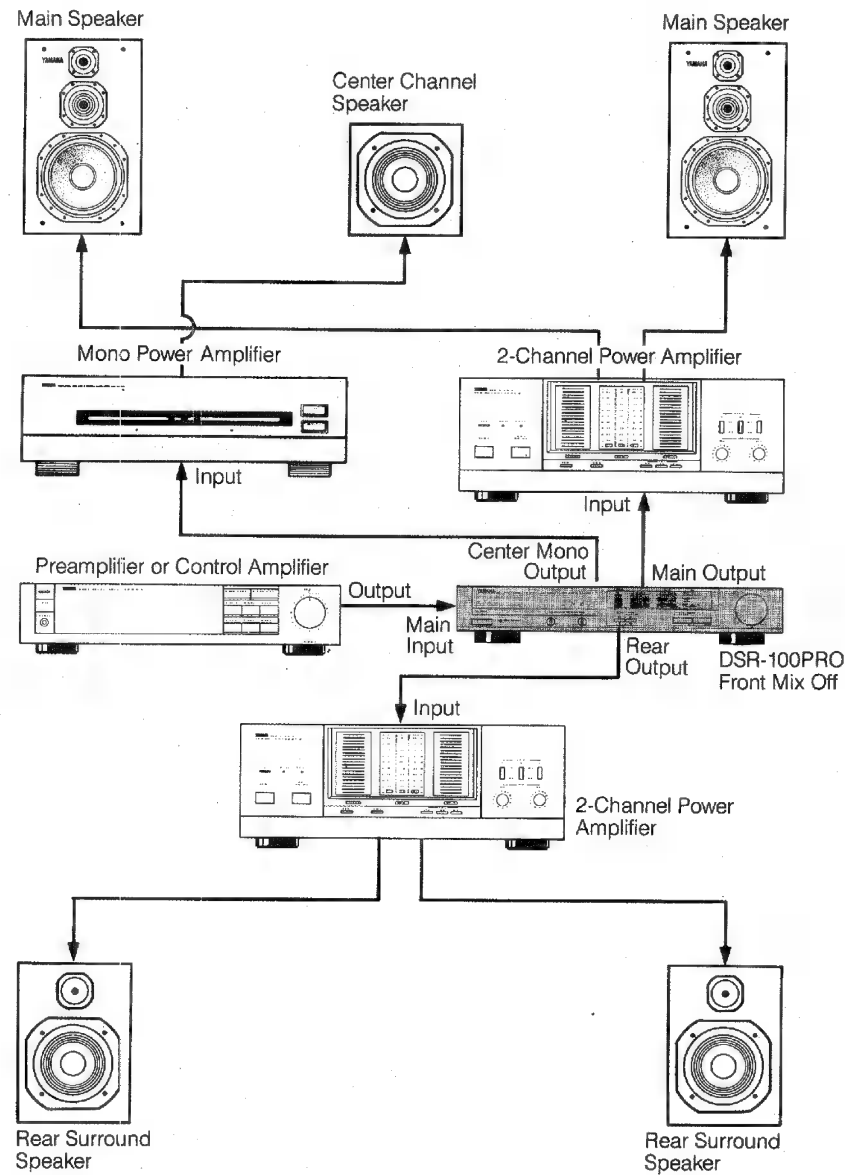
Connect the DSR-100PRO's MAIN OUTPUT jacks to the TAPE PLAY (or TAPE IN) jacks on the integrated amp or receiver.

Connect the MAIN SPEAKERS to the speaker terminals on the amp or receiver.

NOTE: If connecting the DSR-100PRO displaces your tape deck, connect the deck to the DSR-100PRO rear panel TAPE PB and REC OUT jacks. The DSR-100PRO TAPE PB jacks connect to your deck's output or TAPE PLAY jacks. The REC OUT jacks connect to your deck's input or TAPE REC jacks.



SETUP & ADJUSTMENT

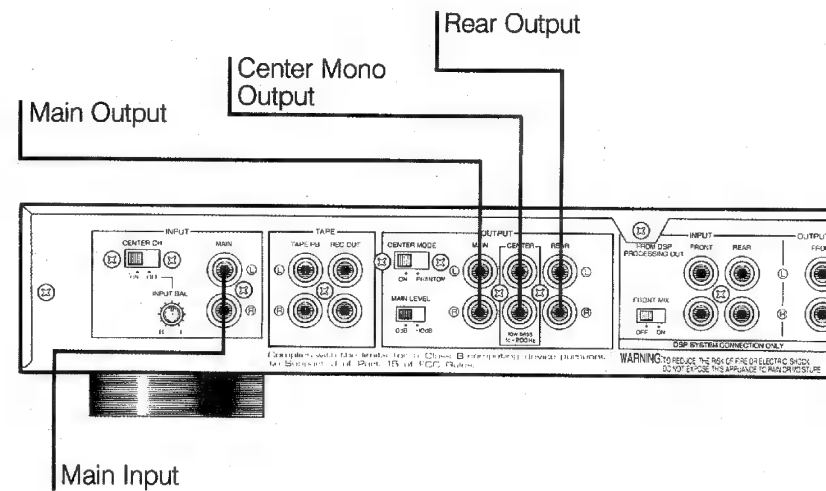


Using a Component Preamplifier and Power Amplifier (or Direct Connection from a Video Cassette Recorder)

Connect the output jacks of the preamplifier to the MAIN INPUT jacks on the DSR-100PRO rear panel. (Or connect the VCR's audio output jacks to the MAIN INPUT jacks on the DSR-100PRO rear panel.)

Connect the DSR-100PRO's MAIN OUTPUT jacks to the input jacks on your power amplifier.

Connect the MAIN SPEAKERS to the speaker terminals on the power amplifier.



SETUP & ADJUSTMENT

CONNECTING THE SURROUND POWER AMPLIFIER AND SPEAKERS

Connect the DSR-100PRO's REAR OUTPUT jacks to the input jacks of the power amplifier that will drive the rear SURROUND SPEAKERS.

Connect the speakers to the amplifier.

NOTE: A 4-channel power amp such as the Yamaha M-35 can be used to drive both the MAIN SPEAKERS and the rear SURROUND SPEAKERS. With this kind of amp you would use the first two channels of the power amplifier (channels "1" and "2" or "A" and "B") for the MAIN SPEAKERS, and the second two channels ("3" and "4" or "C" and "D") for the rear SURROUND SPEAKERS.

CAUTION: It is absolutely essential that all connections are matched according to channel, that is, left-to-left and right-to-right. In the case of the speaker terminals, you must also be careful to match the polarity of the terminals as well.

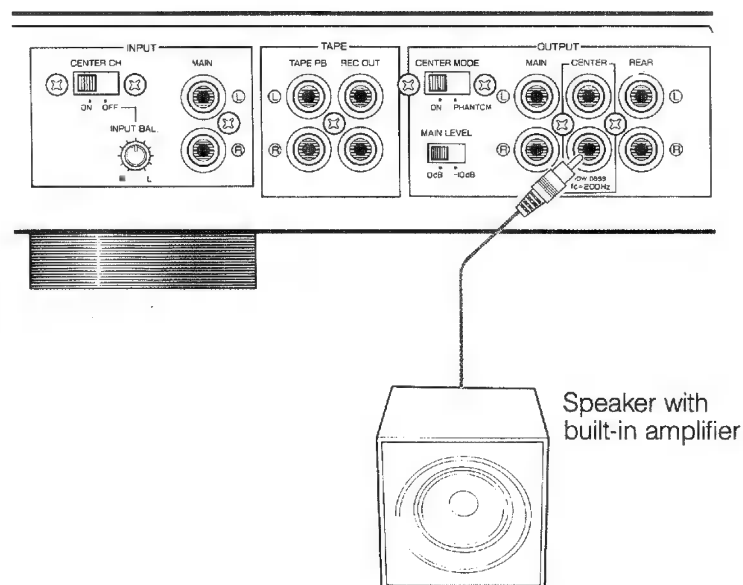
CONNECTING A CENTER AMPLIFIER AND SPEAKER AND/OR SUBWOOFER SYSTEM

True center channel capability is one of the most important features of the Dolby Pro Logic Surround system.

On the rear panel of the DSR-100PRO are two jacks in the section marked "CENTER." The upper CENTER jack is for the Dolby Pro Logic Surround center channel output. Connect this to the input jack on the center channel power amp. In turn, connect the CENTER SPEAKER to the speaker terminals on the amplifier.

Do the same for the DSR-100PRO subwoofer output jack (the lower jack marked "low pass $f_c=200\text{Hz}$ ") if you will be using this option. A Yamaha Electronic Super Woofer System is highly suited to this purpose since it combines a mono power amp and subwoofer speaker in a single cabinet.

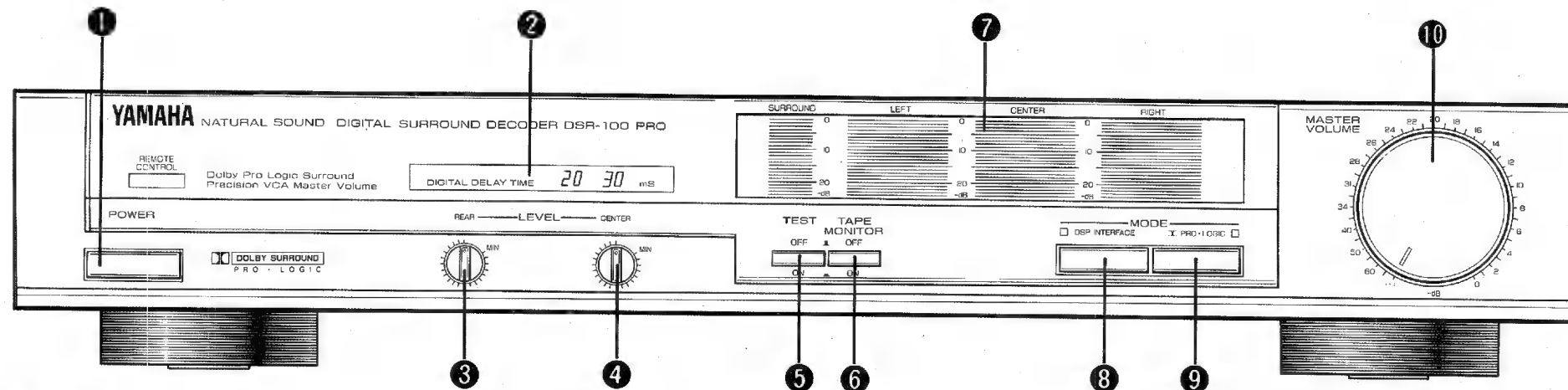
NOTE: The signals from these jacks are monophonic so separate mono amps are recommended to provide independent amplification. The use of a stereo power amp to handle both of these mono signals is another alternative.



SETUP & ADJUSTMENT

1-4. CONTROLS & ADJUSTMENTS

FRONT PANEL



① Power Switch

Sound is muted for a few seconds after the power is switched on. Previous settings are recalled automatically when the power is turned on.

② Delay Time Display

Indicates your selection of 20ms or 30ms delay time for Dolby Surround operation. Delay time is selectable using the remote.

③ Rear Level Control

Adjusts the rear Dolby Pro Logic Surround channel signal level. This does not affect DSP rear effect channel signal level.

④ Center Level Control

Adjusts Dolby Pro Logic center channel signal level. This has no effect in the "phantom" mode.

This does not affect subwoofer output (that is, the lower center jack).

⑤ Test Button

When this button is in the ON (depressed) position, the DSR-100PRO generates a pink noise signal that is sent in succession to the right, center, left, and surround channels. This function is useful for system calibration when adjusting the output level of the amps used to drive the various speakers.

SETUP & ADJUSTMENT

⑥ Tape Monitor Switch

Set this to the ON (depressed) position to listen to a tape deck connected to the DSR-100PRO rear panel TAPE jacks.

Set to the OFF position for normal operation.

⑦ Dolby Pro Logic Surround Channel Level Display

Shows signal level in each channel of the Dolby Pro Logic Surround system when the Dolby Surround Mode switch is turned on.

⑧ DSP Mode Switch

When this switch is on (as confirmed by a lit LED above the key), the DSR-100PRO accepts input via the rear panel DSP front and rear effect input jacks

⑨ Dolby Pro Logic Surround Mode Switch

When this switch is on (as confirmed by a lit LED above the key), the DSR-100PRO's Dolby Pro Logic Surround System actively decodes the input signal connected to the MAIN INPUT jacks.

This switch should be off if your listening source is not Dolby Surround encoded.

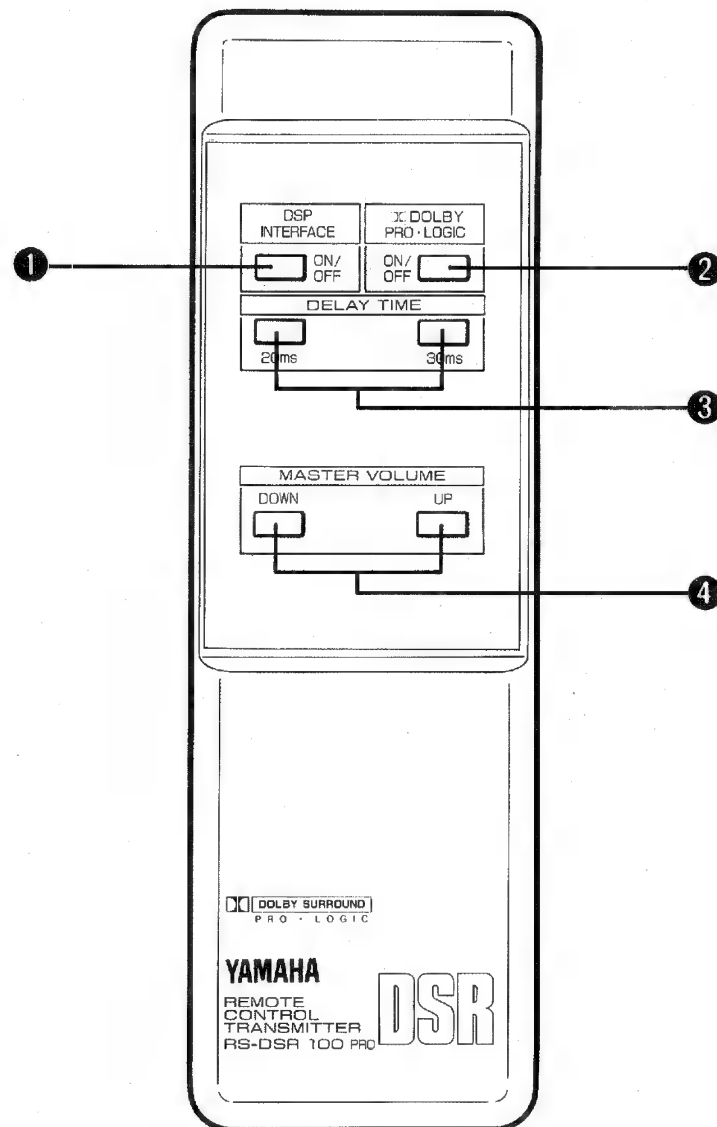
⑩ Master Volume Control

This knob simultaneously controls signal level at all DSR-100PRO outputs: MAIN, CENTER (including sub-woofer), REAR, and DSP FRONT.

(This does not affect TAPE REC OUT level.)

SETUP & ADJUSTMENT

REMOTE CONTROL UNIT



① DSP Interface On/Off Key

Same as the front panel DSP Mode Switch.

② Dolby Pro Logic Surround On/Off Key

Same as the front panel Dolby Pro Logic Surround Mode Key.

③ Delay Time Keys (20ms and 30ms)

These let you select the delay time applied to the surround (rear) signal when Dolby Pro Logic Surround is used. Select the delay setting that gives the best results with your system and with the program material being used.

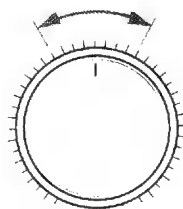
Your setting is confirmed by the DSR-100PRO delay time display.

④ Master Volume Keys (Down and Up)

Press to raise or lower the volume. These keys let you adjust the master volume control knob by remote control. The red LED on the knob lights when you press one of these keys.

SECTION 2—PREPARATION

1. Set volume to minimum on the preamplifier, integrated amplifier, or receiver
2. Turn on the power to all components in the system.
3. Select your video cassette deck or video disc player (or other Dolby Surround encoded program source) as the source on your preamplifier, integrated amplifier, or receiver.
4. Begin playback of Dolby Surround encoded program material.



5. Increase the setting of the volume control on your preamplifier, integrated amplifier or receiver to about the halfway point.
6. Set the DSR-100PRO master volume control knob near the center position.
7. Adjust the volume on each of the power amps to a comfortable listening level.

2-1. INPUT LEVEL ADJUSTMENT

The DSR-100PRO is designed to accept input signal levels of up to 3 volts. Distortion occurs if input signal level exceeds this value. On the other hand, noise increases if input level is insufficient.

NOTE: Input level adjustment is not possible or necessary if the DSR-100PRO is connected directly to a VCR, video disc player, or to the tape jacks of an integrated amplifier or receiver.

1. Listen to a Dolby Surround encoded source and turn on the Dolby Surround Mode switch on the DSR-100PRO front panel.
2. Adjust the preamplifier, integrated amplifier or receiver volume control to the point where both noise and distortion are minimized.

Raise the volume slightly if you hear excessive noise from the effects speakers.

Lower the volume slightly if you hear distortion from the effects speakers. It is particularly important to check for distortion on the highest level music peaks, since these have the greatest chance of overloading the circuitry.

3. When you are satisfied with the sound quality, make a note of the volume setting.

NOTE: You will want to return to this volume setting for optimum sound quality when using the DSR-100PRO.

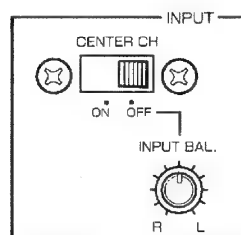
Final volume adjustment should be performed on the DSR-100PRO (and on the power amps driving the various speakers in the system).

PREPARATION

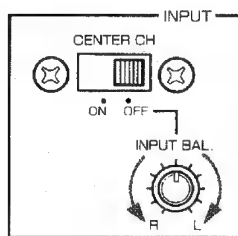
2-2. INPUT BALANCE ADJUSTMENT

This adjustment should be performed to assure optimum performance of the Dolby Pro Logic Surround decoder.

1. Set the rear panel center channel switch to the OFF position.
2. Begin playback of Dolby Surround encoded program material.



3. While listening to spoken dialog, adjust the input balance control so that the dialog volume (heard from the left and right main and surround speakers) is reduced to the minimum. (During normal operation, this dialog is reproduced over the center channel.)

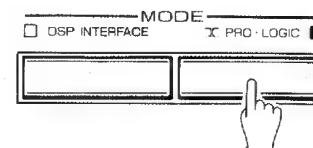


4. When you have completed this adjustment, be sure to return the rear panel center channel switch to the ON position.

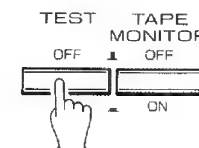
2-3. MAIN/CENTER/SURROUND SPEAKER BALANCE ADJUSTMENT

Using the built-in test tone generator, this procedure lets you adjust the volume balance between the main, center, and surround speakers. This adjustment is important for proper Dolby Pro Logic Surround operation.

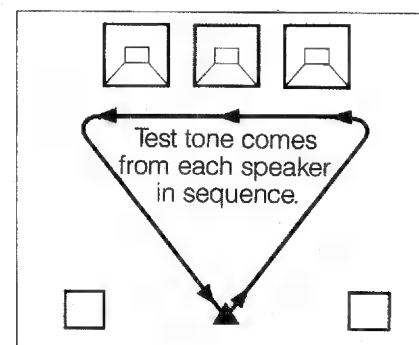
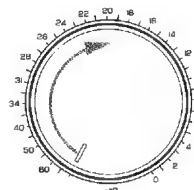
1. Turn on the Dolby Surround Mode switch.



2. Turn on the TEST button.

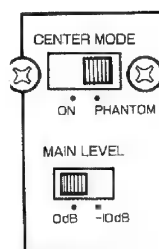


3. Turn up the DSR-100PRO's master volume control. You will hear a test tone (pink noise) from the right main speaker, then the center speaker, then the left main speaker, then the surround speakers, for about two seconds each.
4. Adjust the amplifier volume and balance controls so that the volume heard at the listening position is the same from each speaker.



PREPARATION

- If not using a center speaker, be sure to set the rear panel center mode switch to the PHANTOM position. You will then hear the center channel test tone from the left and right main speakers.

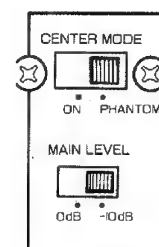


Adjust the power amplifiers driving the MAIN, CENTER, and SURROUND speakers so that the volume is approximately the same from each, as heard from your preferred listening position.

- You can use the DSR-100PRO front panel REAR and CENTER LEVEL controls to adjust volume if your center and surround amps are not equipped with their own level controls. Otherwise, leave these at their maximum settings.
- If you can not achieve sufficient SURROUND speaker volume to match the MAIN speaker volume, then you have two options:

With an integrated amp, try turning down the amplifier's volume until main/surround balance is achieved.

Set the rear panel MAIN LEVEL switch to the -10dB position. This will drop the main speaker volume to about one third of normal.



After completing this adjustment, turn off the front panel TEST button.

NOTE: Once you have completed these adjustments, use only the DSR-100PRO master volume control knob to adjust listening volume.

Do not change any other volume settings in the system.

SECTION 3—GENERAL OPERATION

3-1. PLAYBACK WITH DOLBY SURROUND

1. Turn on the power on all components in the system.
2. Turn on the Dolby Pro Logic Surround Mode switch.
3. Select your input source on the preamplifier, integrated amplifier, or receiver.
 - If the source is a tape deck connected to the DSR-100PRO rear panel tape jacks, then set the front panel tape monitor switch to the ON position.
4. Adjust the master volume control knob on the DSR-100PRO front panel.
5. If necessary, use the remote control unit to change the delay time setting.
6. If necessary, adjust the front panel center and rear level controls to match your listening source.

NOTE: The Dolby Pro Logic Surround system is designed to be used with program material (mainly videotaped movie soundtracks) that is encoded with the Dolby Surround system. The results with material not encoded with Dolby Surround may be unnatural.

NOTE: Some amplifiers and receivers have built-in surround sound or ambience processing circuitry. If this is the case in your system, then be sure that the surround or ambience circuitry is off on the source amp or receiver while you are using the DSR-100PRO's Dolby Pro Logic Surround decoding function.

3-2. ORDINARY STEREO REPRODUCTION

Set the Dolby Pro Logic Surround Mode switch to the OFF position. Then operate your system components as usual.

- Be sure to turn on the power on the DSR-100PRO.
- If the source is a tape deck connected to the DSR-100PRO rear panel tape jacks, then set the front panel tape monitor switch to the ON position.

GENERAL OPERATION

3-3. SOURCE SELECTION WITH TAPE LOOP CONNECTION

If your integrated amp or receiver tape jacks are used for connection to the DSR-100PRO, then the amp or receiver looks at the DSR-100PRO as if it were a tape deck. Therefore, you must set the amp or receiver as if you were going to make a tape recording of your desired listening source.

If the amp or receiver has a REC SELECTOR, set it to your desired listening source.

If it does not have a REC SELECTOR, simply select your listening source using the usual controls.

Turn on the TAPE MONITOR switch on the amp or receiver.

NOTE: If the DSR-100PRO is connected to the tape jacks on an integrated amp or receiver, then all of the tape related controls (tape monitor switch, tape deck selector, rec out selector, and tape dubbing selector controls) may affect operation. It is therefore necessary to pay special attention to the settings of these controls in order to assure the correct routes for the signals.

3-4. RECORDING ON A DECK CONNECTED TO THE DSR-100PRO

You can make tape recordings at any time, regardless of switch and control knob settings on the DSR-100PRO. The DSR-100PRO's rear panel TAPE REC OUT jacks provide the same signal as is input to its MAIN INPUT jacks.

However, the recorded signal does not include the effect of the Dolby Pro Logic Surround decoder.

SECTION 4—USING DSP-SERIES UNITS

Using DSP Series Sound Field Programs

Note that it is possible to use the Dolby Pro Logic Surround decoding feature of the DSR-100PRO together with sound field programs on the DSP Series Sound Field Processors. A certain amount of experimentation will be required to determine suitable sound field programs for a given movie scene. Don't use the Dolby Surround preset program on the sound field processor when you are using the DSR-100PRO.

Example DSP Presets for use with Dolby Pro Logic Surround Decoding

Type of Source	DSP Preset
Music video	Disco, Jazz Club, or Rock Concert
Adventure/Mystery	Theater, Chamber, Pavilion
Musical	Concert Hall
Drama	Presence, Chamber, Theater

Do not use the Dolby Surround preset on the DSP unit.

4-1. GENERAL SETTINGS AND RECOMMENDATIONS

The DSP unit should be connected between the source unit (preamp, integrated amp, or receiver) and the DSR-100PRO.

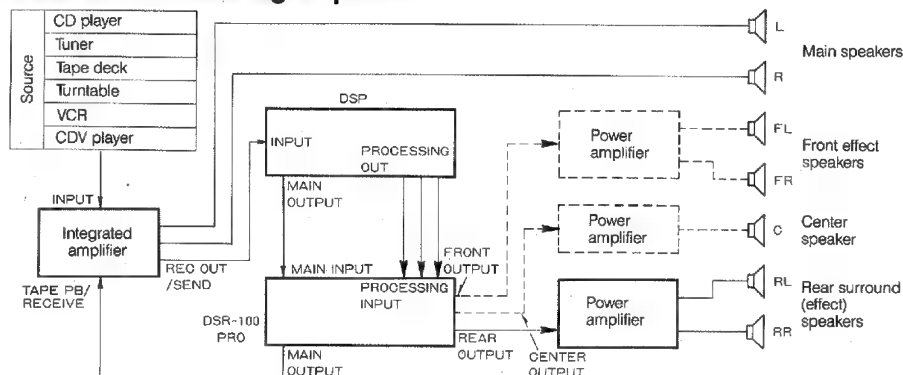
Set the DSP unit's MAIN LEVEL switch to 0dB in all cases. This is essential to assure high sound quality from the DSR-100PRO.

Set the DSP unit's FRONT MIX switch to "OFF" or "6ch" in all cases, regardless of how many effects channels you will be using.

If you are using an integrated amp or receiver and it is equipped with PRE OUT and MAIN IN jacks, then it is highly recommended that you use them instead of the TAPE PB and REC jacks.

NOTE: Be sure that the DSP unit's FRONT MIX switch is OFF. If the DSP unit's FRONT MIX switch is set to "ON" or "4ch," then the main output going to the DSR-100PRO main input will contain DSP front effect information. This will interfere with Dolby Pro Logic Surround decoding.

DSR100PRO+DSP signal paths



USING DSP-SERIES UNITS

Speaker System Configuration for DSP Units

For optimum results when you use a DSP unit with the DSR-100PRO, you may wish to add one more pair of speakers to reproduce the DSP front effect output. This gives you a total of seven individual speakers.

However, without these extra speakers you can configure a 5-speaker system by setting the DSR-100PRO's FRONT MIX switch to the ON position.

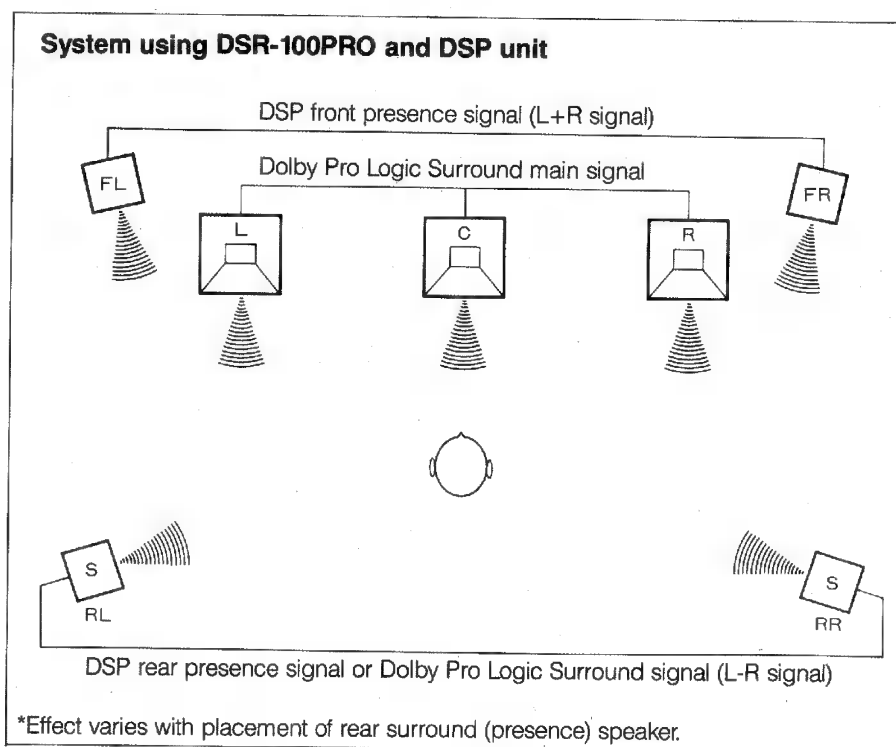
For a simple 4-speaker system without a center speaker, additionally set the DSR-100PRO's rear panel CENTER MODE switch to the PHANTOM position.

- The DSR-100PRO's surround speakers also handle the DSP unit's rear effect signals.
- The DSR-100PRO's center channel output does not reproduce DSP signals.
- The DSR-100PRO's center subwoofer output does reproduce DSP signals.

Speaker Placement for DSP Units

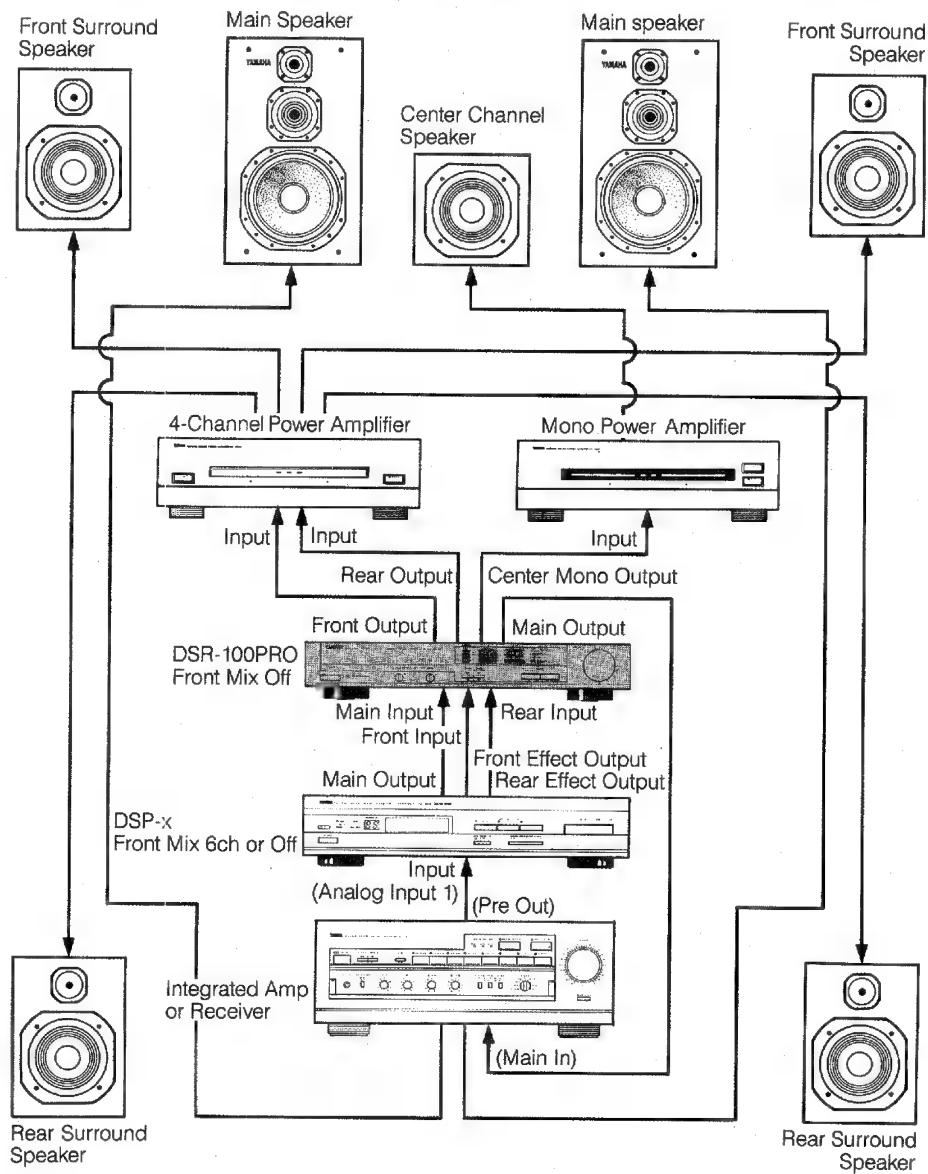
Place DSP front effect speakers above and behind the main speakers, facing inward toward your listening position.

Place the rear speakers on both sides of your listening position or behind your listening position. Experiment to decide which position gives the best results in your listening room.



USING DSP-SERIES UNITS

4-2. CONNECTIONS FOR DSP-SERIES UNITS

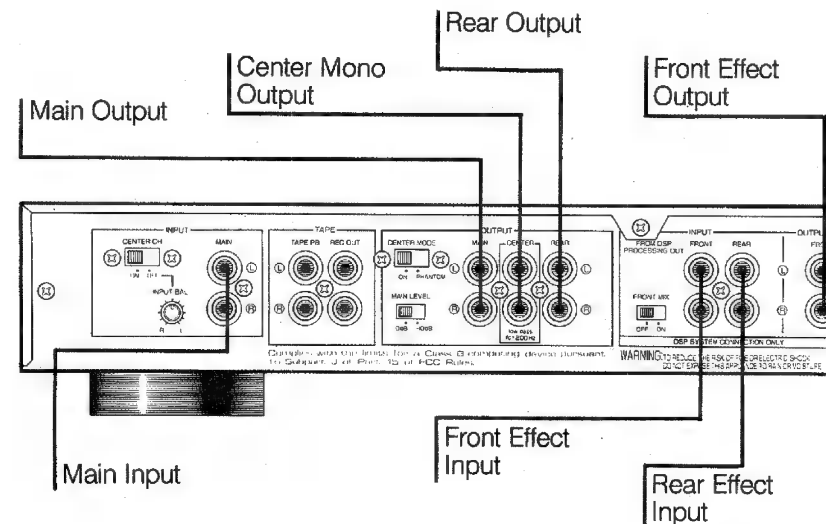


1. CONNECTING THE MAIN INTEGRATED STEREO AMPLIFIER, STEREO RECEIVER OR COMPONENT PREAMPLIFIER TO THE DSP UNIT.

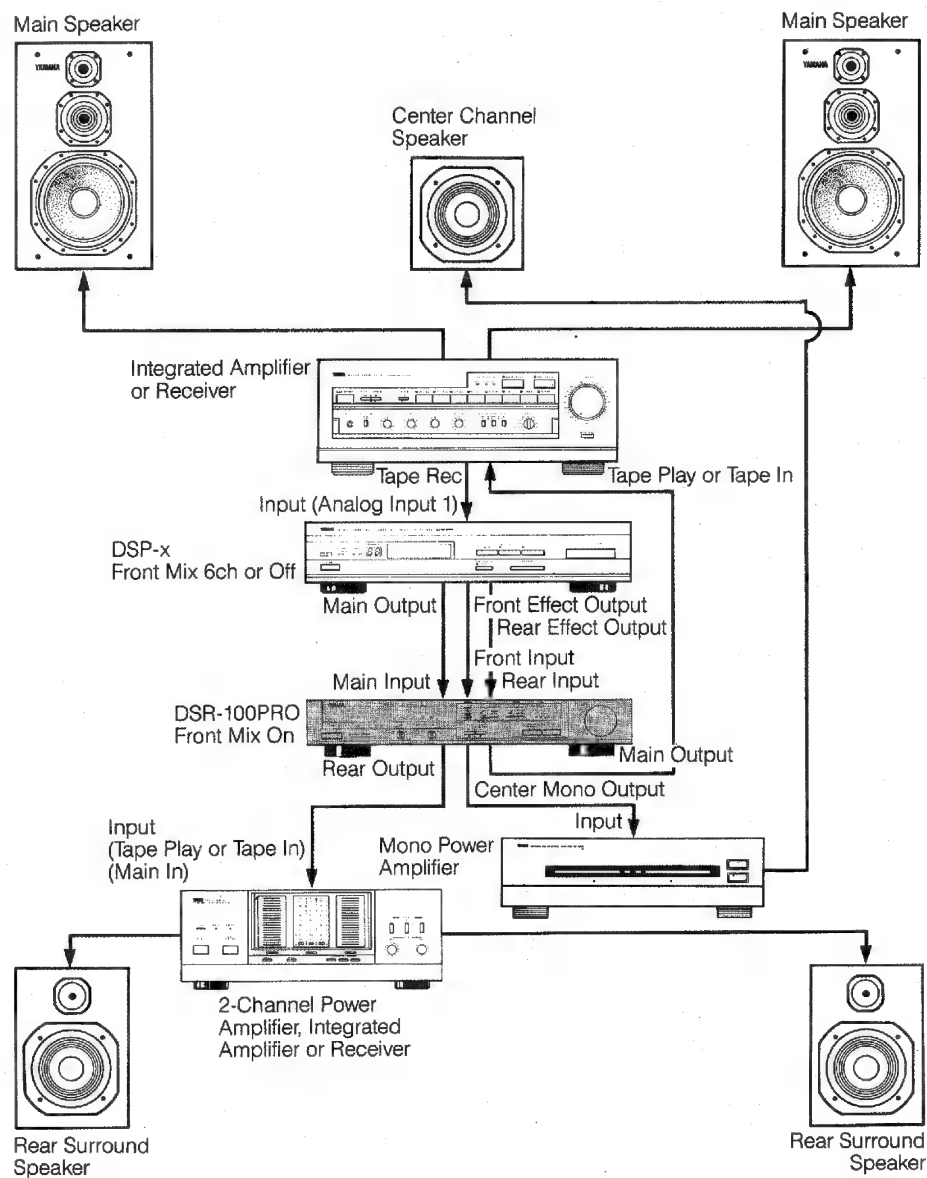
If you already have a DSP unit installed, then leave the input connections as they are.

- Using an Integrated Amplifier or Stereo Receiver equipped with "PRE OUT" and "MAIN IN" Jacks.

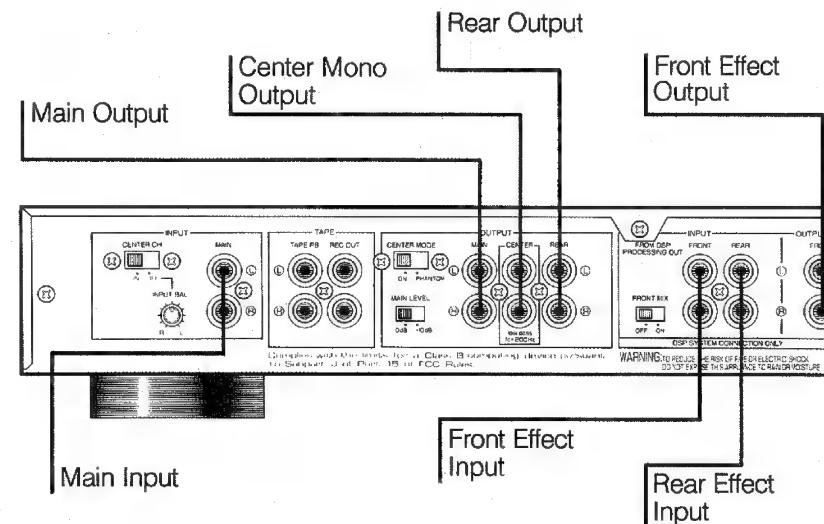
Connect the PRE OUT jacks to the input jacks on the DSP unit's rear panel.



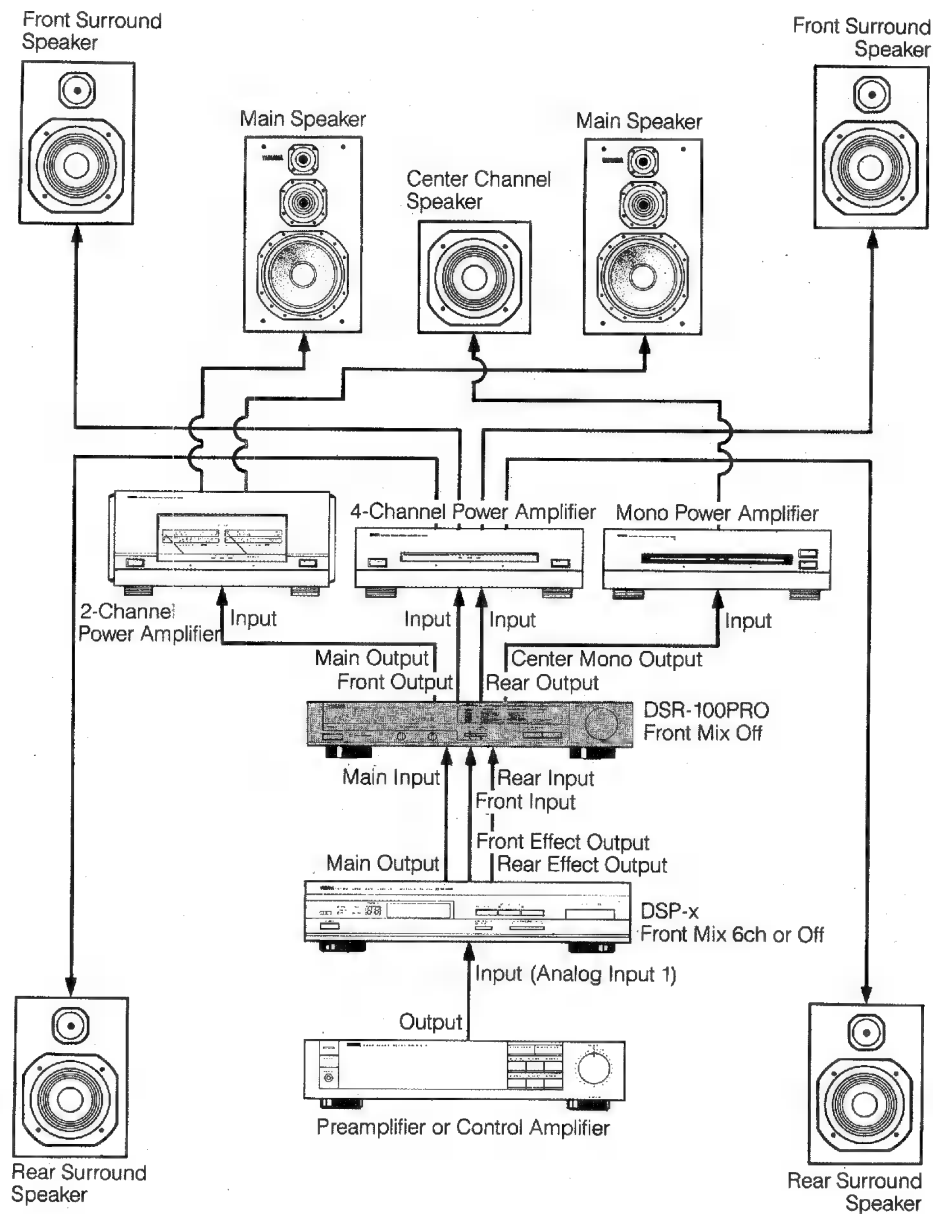
USING DSP-SERIES UNITS



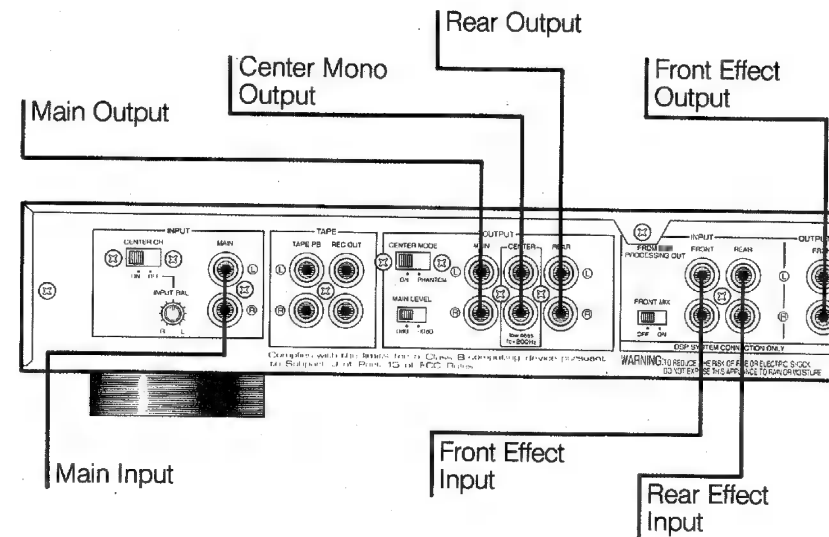
- Using an Integrated Amplifier or Stereo Receiver that Does Not Have "PRE OUT" and "MAIN IN" Jacks
Connect the amp or receiver TAPE REC (or TAPE OUT) jacks to the input jacks on the DSP unit's rear panel.



USING DSP-SERIES UNITS



- Using a Component Preamplifier and Power Amplifier
Connect the preamplifier's output jacks to the input jacks on the DSP unit rear panel.



USING DSP-SERIES UNITS

2. CONNECTING THE DSP-SERIES UNIT TO THE DSR-100PRO

Connections from the DSP unit to the DSR-100PRO are the same for all configurations, regardless of other aspects of the system.

- Connect the DSP main output jacks to the DSR-100PRO MAIN INPUT jacks.
- Connect the DSP processing front and rear output jacks to the DSR-100PRO FRONT and REAR input jacks (in the section on the rear panel that is marked "FROM DSP PROCESSING OUT").

3. CONNECTING THE DSR-100PRO TO THE AMPLIFIERS

Connect the DSR-100PRO MAIN OUTPUT jacks to the amp or receiver that will drive the MAIN SPEAKERS.

- If using a receiver or integrated amplifier, then connect to the amp or receiver TAPE IN or TAPE PLAY jacks, or preferably to the amp or receiver MAIN IN jacks, if so equipped.
- Connect the DSR-100PRO's REAR OUTPUT jacks to the input jacks of the power amplifier that will drive the REAR SURROUND speakers. (These also handle the DSP rear effect sound.)
- Connect the DSR-100PRO's CENTER jacks to the amp or amps that will be driving the CENTER SPEAKER and/or SUBWOOFER.

Connect the speakers to the amplifiers.

- If you will be using separate front effect speakers for DSP output, first set the DSR-100PRO's FRONT MIX switch to the OFF position. Then connect the DSR-100PRO'S DSP. FRONT OUTPUT jacks to the input jacks of the power amplifier that will drive the DSP front effect speakers.
- If not using separate front effect speakers, set the DSR-100PRO's FRONT MIX switch to the ON position. This blends the front effect signal with the main stereo signal for reproduction through the MAIN SPEAKERS.

4-3. INPUT BALANCE ADJUSTMENT

1. Turn down the volume on all components in the system.
2. Turn on the power to all components in the system.
 - If the DSP unit has a volume control, it should be set to the maximum level. This helps provide higher sound quality.
 - Set the DSP unit's MAIN LEVEL switch to 0dB.
 - Set the DSP unit's FRONT MIX switch to the "OFF" or "6ch" position.
3. Select your video cassette deck or video disc player (or other Dolby Surround encoded program source) as the source on your preamplifier, integrated amplifier, or receiver. Then begin playback of Dolby Surround encoded program material.
4. Increase the setting of the volume control on your preamplifier, integrated amplifier or receiver to nearly the halfway point (between -16dB and -20dB if marked).

USING DSP-SERIES UNITS

5. Set the DSR-100PRO master volume control knob near the center position.
6. Adjust the volume on each of the power amps to a comfortable listening level.
7. Set the DSR-100PRO rear panel center channel switch to the OFF position.
8. While listening to spoken dialog, adjust the input balance control so that the dialog volume (heard from the left and right main speakers) is reduced to the minimum. (During normal operation, this dialog is reproduced over the center channel.)
9. Return the rear panel center channel switch to the ON position.

4-4. MAIN/CENTER/SURROUND SPEAKER BALANCE ADJUSTMENT

This procedure optimizes the volume balance between the main, center, and surround speakers.

1. Turn on the Dolby Mode switch.
2. Turn on the TEST button.
3. Turn up the DSR-100PRO's master volume control so that you hear the test tone. It rotates in a circle, going first to the right main speaker, then to the center speaker, then to the left main speaker, then to the surround speakers, for about two seconds each.

- If not using a center speaker, be sure to set the rear panel center mode switch to the PHANTOM position. You will then hear the center channel test tone from the left and right main speakers.

4. Adjust the power amplifiers driving the MAIN, CENTER, and SURROUND speakers so that the volume is approximately the same from each, as heard from your preferred listening position.

- Use the DSR-100PRO front panel REAR and CENTER LEVEL controls to adjust volume if the center and surround amps do not have input level controls.

- If you cannot achieve sufficient SURROUND speaker volume to match the MAIN speaker volume, then you have two options:

Turn down the source amp or receiver volume until main/surround balance is achieved.

Set the rear panel MAIN LEVEL switch to the -10dB position. This will drop the main speaker volume to about one third of normal.

5. After completing this adjustment, turn off the front panel TEST button.

Once you have completed the preceding steps, use only the DSR-100PRO master volume control knob to adjust listening volume. If you are using independent front effect speakers for DSP output, then you may wish to make additional adjustments as outlined in the steps below.

USING DSP-SERIES UNITS

4-5. ADDITIONAL ADJUSTMENTS FOR DSP UNIT

1. On the DSR-100PRO front panel, turn off the Dolby Mode switch and turn on the DSP Mode switch.
2. Use the DSP unit's remote control to turn on the "main mute" function. Adjust the volume of the amp driving the front effect speakers so that it is at about the same level as the rear speakers. When finished, turn off the main mute function.
 - Use the DSP unit's remote control to adjust rear/front balance for individual effects.
 - Refer to the DSP unit's operation manual for further details.
3. If necessary, use the DSR-100PRO's front panel rear and center level adjustment controls to make further adjustments.

4-6. OPERATION WITH DSP-SERIES UNITS

1. Turn on the power on all system components.
2. Select the desired listening source on the amplifier or receiver.
3. Turn on the DSP Mode switch on the front panel of the DSR-100PRO if you wish to have DSP effects applied to the reproduced signal.
4. Adjust the DSR-100PRO master volume knob.
5. Operate the DSP unit as usual. Refer to the DSP unit's operation manual for details.
 - The DSP Mode and Dolby Mode can both be used at the same time if the source material is Dolby Surround encoded.
 - For normal stereo playback, both the DSP Mode and the Dolby Mode switches must be turned off.

NOTE: Be sure to turn on the DSP unit's power even if you are not using DSP effects.

SECTION 5—APPENDIX

5-1. TROUBLESHOOTING

Most problems can be corrected by making a change in the connections or control settings. If there is a problem with your system, please check this chart to find the proba-

ble cause. If trouble persists despite corrective measures, contact your Yamaha service station.

SYMPTOM	CHECK POINTS	REMEDY
Power does not turn on even when the power switch is pressed.	AC cord is not properly plugged in.	Plug in AC cord of DSR-100PRO and other units.
No sound.	Audio cables are not properly connected.	Connect all cables, plugging them firmly into correct jacks.
	DSP unit is not turned on.	Turn on power on DSP unit and other units in system.
	Wrong source selected on amp or receiver.	Select the desired input source and/or set the rec selector and tape monitor switch to the correct setting on the amp or receiver.
	DSR-100PRO tape monitor switch is on.	Turn off DSR-100PRO tape monitor switch.
No sound from rear speakers.	Front panel rear level control is turned down.	Turn up rear level control.
	Front panel Dolby Pro Logic Surround mode switch is not turned on when listening to a Dolby Pro Logic Surround encoded source.	Turn on Dolby Pro Logic Surround mode switch when listening to Dolby Pro Logic Surround encoded sources.
	Source does not have rear channel information.	Use a Dolby Pro Logic Surround encoded source.
	Front panel DSP mode switch is not turned on when using a DSP unit.	Turn on DSP mode switch.
Sound is muffled.	Dolby Pro Logic Surround mode switch is on but source is mono or not encoded with Dolby Surround.	Turn off Dolby Pro Logic Surround mode switch when listening to sources that are not Dolby Surround encoded.
Sound is "thin."	Rear panel center mode switch is on when no center speaker is used.	Set center mode switch to "phantom" position if no center speaker is used.

APPENDIX

SYMPTOM	CHECK POINTS	REMEDY
No sound from center speaker.	Rear panel center channel switch is turned off. Rear panel center mode switch is set to "phantom" when using a center speaker. Front panel center level control is turned down. Center channel output is not produced unless the Dolby Pro Logic Surround mode switch is on.	Set center channel switch to "ON" position. Set center mode switch to "ON" position. Turn up center level control knob. Turn on Dolby Pro Logic Surround mode switch when listening to Dolby Surround encoded sources.
Excessive noise when using DSP unit.	DSP unit's main level switch is set to -10dB.	Set DSP unit's main level switch to 0dB.
DSP front effect sound is heard even when front panel DSP mode switch is off.	DSP unit's front mix switch (on rear panel) is set to "4ch" or "ON" position.	Set DSP unit's front mix switch to "OFF" or "6ch" position.
Remote control unit does not function correctly.	Batteries are exhausted. Incorrect angle, excessive distance, or bright light shining on DSR-100PRO front panel.	Replace DSR-100PRO remote control unit's batteries. Operate within seven meters and a 30 degree angle. Avoid exposure of the front panel to bright light sources.
Interference in TV picture.	Magnetic field from nearby speaker is interfering with electron beam scanning.	Use special shielded speaker system for center speaker or move TV set away from speaker position.
Tape recordings from DSR-100PRO do not include Dolby Pro Logic Surround effect.	This is normal.	You can only record the same signal as is input to the DSR-100PRO.
Unnatural Dolby Pro Logic Surround effect.	Source amp or receiver has built-in surround circuitry that is turned on. DSP unit's FRONT MIX switch is set to "ON" or "4ch" position.	Turn off surround effect on source amp or receiver. Set DSP unit's FRONT MIX switch to "OFF" or "6ch" position.

5-2. SPECIFICATIONS

- Audio Specifications (Dolby Surround Off)
 - THD: 0.003% (1kHz, 1V rms)
 - Residual noise: 20 microvolts (IHF A)
 - Frequency response: 10Hz—50kHz (+0, -3dB)
- Surround Decoder
 - Digital delay sampling frequency:
49.7kHz, 14-bit floating point.
 - Input capacity: 2.5V rms
 - S/N ratio: 90dB
- Input/Output
 - Input impedance: 47 kohms
 - Output impedance: main channel 1 kohm
front/rear/center 470 ohms
subwoofer 5 kohms
 - Input/output gain: 0dB (at maximum volume)
 - Input sensitivity: 150mV
- Dimensions (W/H/D): 435 × 75 × 319.5mm
- Weight: 4.1kg
- Power consumption: 30W
- AC output: 200W maximum, unswitched
(not provided in some areas)

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