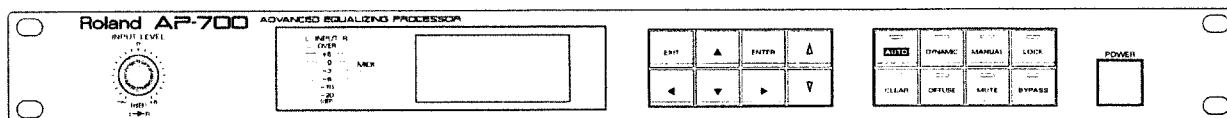# Roland®

ADVANCED EQUALIZING PROCESSOR

AP-700

Owner's Manual

We'd like to take a moment to thank you for purchasing the Roland AP-700 Advanced Equalizing Processor.

In order to fully realize the potential of the AP-700, and to ensure years of trouble-free operation, please take the time to read this manual thoroughly.

Table of Contents

Main Features

Anti-Feedback Mode

Points where feedback (howling) occurs are detected automatically, and a selected filter is applied to the frequency response at those points to eliminate the feedback.

18-Band Parametric Equalizer Mode

You can use the AP-700 as a parametric equalizer with up to 18 bands. Curves showing frequency response appear on the display.

Graphic Equalizer Mode

This mode makes it possible to use the AP-700 as a 91-band monaural equalizer or a 31-band stereo equalizer. The equalizer settings can be confirmed on the display as they are made.

Spectrum Analyzer Function

The AP-700 features a spectrum analyzer function. This works as a 91-band analyzer, showing the level of each band on the display (not available in the GEQ mode).

Diffuse Function

This applies a slow modulation that is inaudible to the human ear to help suppress feedback and coloration (AFB mode only).

High-Pass Filter (HPF) and Low-Pass Filter (LPF)

The HPF and LPF can be used to cut unwanted frequency bands.

Digital I/O Jacks

The AP-700 is equipped with cannon type digital I/O jacks that conform to AES/EBU standards.

Important Notes

In addition to the items listed under Safety Precautions inside the front cover, please read and observe the following:

Power Supply

• Before connecting this unit to other devices, turn off the power to all units; this will help prevent damage or malfunction.

• Do not use this unit on the same power circuit with any device that will generate line noise; an electric motor or variable lighting system for example.

Placement

• Using the unit near power amplifiers (or other equipment containing large power transformers) may induce hum.

• This device may interfere with radio and television reception. Do not use this device in the vicinity of such receivers.

Maintenance

• For everyday cleaning wipe the unit with a soft, dry cloth or one that has been slightly dampened with water. To remove stubborn dirt, use a mild, non-abrasive detergent. Afterwards, be sure to wipe the unit thoroughly with a soft, dry cloth.

• Never use benzene, thinners, alcohol or solvents of any kind, to avoid the possibility of discoloration and/or deformation.

Additional Precautions

• Protect the unit from strong impact.

• A small amount of heat will radiate from the unit during normal operation.

• Before using the unit in a foreign country, consult with qualified service personnel.

Memory Backup

• This unit contains a battery which powers the unit's memory circuits while the main (AC) power is off. The expected life of this battery is 3 years or more. However, to avoid the untimely loss of memory data, it is strongly recommended that you change the battery every 3 years. Please be aware that the actual life of the battery will depend upon the physical environment — especially the temperature — in which the unit is used. When it is time to change the battery, consult with qualified service personnel.

• When the battery becomes weak the following message will appear in the display: **"Battery Low Please Change."** Please change the battery as soon as possible to avoid the loss of memory data.

• Please be aware that the contents of memory may at times be lost; when the unit is sent for repairs or when by some chance a malfunction has occurred. Important data should be stored in another MIDI device (eg., a sequencer), or written down on paper (if possible). During repairs, due care is taken to avoid the loss of data. However, in certain cases (such as when circuitry related to memory itself is out of order), we regret that it may not be possible to restore the data.

Overview of the AP-700

The AP-700 is equipped with the following three modes. Select the mode according to what you wish to do. See "Choosing the Mode" (p. 10) if you need more information on how to select a mode.

AFB (Anti-Feedback) Mode

This mode is used to eliminate feedback (howling) generated in a sound reinforcement system where a microphone is in use.

PEQ (Parametric Equalizer) Mode

This functions as a parametric equalizer that allows settings for up to 18 bands. You can set the frequency, Q, and level for each band.

GEQ (Graphic Equalizer) Mode

This mode allows use as a 91-band monaural or 31-band stereo equalizer. The equalizer settings can be confirmed on the display as they are made.

How to Use This Manual

This manual is divided into two parts: items that are common to all modes, and items that are required for individual modes.

At the end of the manual there is an alphabetical index. This index may be helpful if you come across any words you don't understand as you follow the procedures described in this manual.

Here is what is covered in each of the sections.

Section 1: Basic Operation

This section explains installation and operation procedures that are common to all of the modes.

Section 2: How to Use the AFB Mode

This section provides an overview of the AFB mode and describes its steps of operation.

Section 3: How to Use the PEQ Mode

This section describes the steps of operation for the PEQ mode.

Section 4: How to Use the GEQ Mode

This section describes the steps of operation for the GEQ mode.

Section 5: Editing

This section describes the parameters that can be changed in each mode, and explains how to make these changes.

Section 6: How to Use MIDI

This section explains how to control the AP-700 when using an external MIDI instrument, and how to send and receive MIDI data. You should read this section if you want to make use of MIDI functions.

Section 7: Supplementary Materials

This section provides a list of the messages that appear during operation, and explains what each means. It also contains materials on the specifications of the AP-700.

Part Names and Functions

Front Panel

LOCK Button
MANUAL Button
DYNAMIC Button
AUTO Button
Value Buttons(UP,DOWN)
ENTER Button
EXIT Button
MIDI Indicator
POWER Switch

Roland AP-700 ADVANCED EQUALIZING PROCESSOR

INPUT LEVEL Knobs L,R
INPUT Level Indicator
Display
Cursor Buttons
CLEAR Button
DIFFUSE Button
MUTE Button
BYPASS Button

Rear Panel

DIGITAL I/O Connectors(IN,OUT)
MIDI Connectors(IN,OUT)
OUTPUT Jacks(L,R)
INPUT Jacks(L,R)

Making the Connections

The AP-700 can be connected up in various ways depending on how it is to be used. Refer to the example setups that are given in the following.

* When making the connections, be sure that the volume on your amp is turned down all the way, and that all equipment is switched off. Equipment may be damaged if connected while the power is on.

* Set the input and output level for the equipment being connected to "+4 dBm."

* For the input jacks, the 1/4 inch phone jacks take priority over other types.

* Do not connect the AP-700 to the output of a power amp.

* The 1/4 inch phone jacks support balanced input using a stereo plug.

HOT

COLD

GROUND
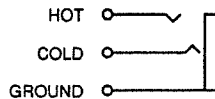
* The pin assignment for the XLR connectors is as follows: Before making any connections, confirm pin assignment compatibility with all other devices.

1
2
3

2
1
3

1:GND
2:COLD
3:HOT
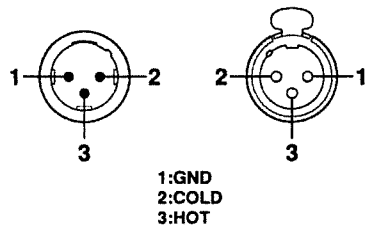
Use with a Specific Microphone or Instrument

This is an example of a connection that uses the AP-700 with only a specific microphone or instrument.

When connecting the microphone to the AP-700, make the connection through a preamp or use the channel insertion for a mixer to match up the input and output levels for the connection.

Pre Amplifier

Mixer

Power Amplifier

Speakers

(Channel Insert)

Mixer

Power Amplifier

Speakers
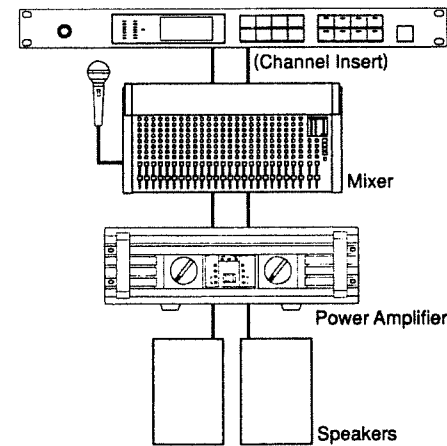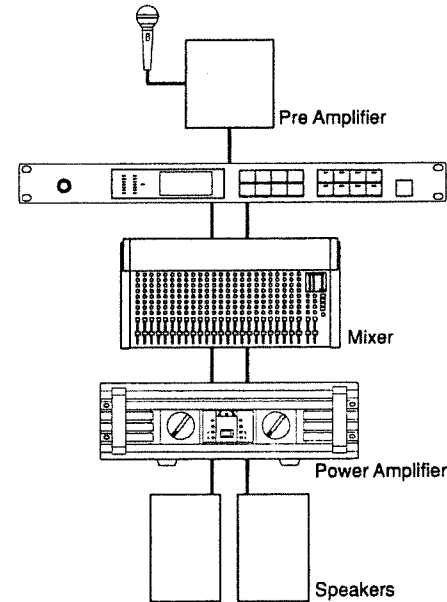
* You will not be able to obtain the intended results if a microphone is connected directly to the AP-700.

Use with an Entire PA System

When using the AP-700 with all of the equipment that is connected to the mixer, connect the output from the mixer to the AP-700.

Mixer

Power Amplifier

Speakers
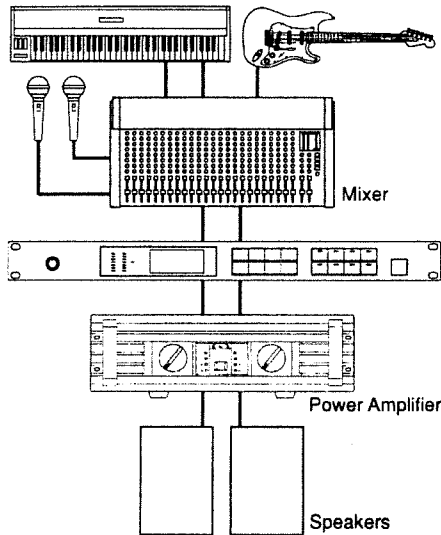
Use in the AFB Mode with a Number of Microphones

Mix all of the microphones with a small mixer before they connect with the AP-700.

Mixer

Mixer

Power Amplifier

Speakers
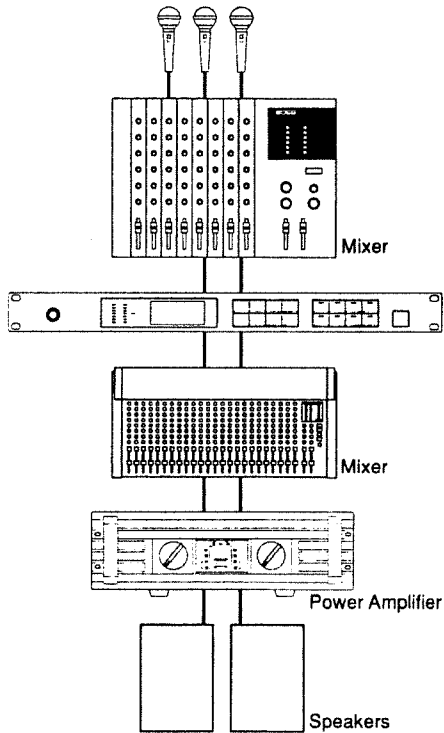
Powerup and Standby

Switching On the Power

First check the connections with the external equipment, and then switch on the AP-700.

The display flashes, and the AP-700 returns to the state in effect when the power was last switched off.
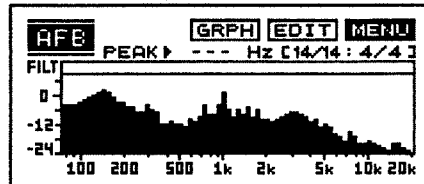
* **Adjust the volume for the amp after switching on all other equipment.**

* **To protect its internal circuitry, the AP-700 will not function for a short while after the power is switched on.**

* **When the power is not on, signals input to the AP-700 are output without change.**

* **The display may be hard to make out when installed in certain positions. If this is the case, adjust the contrast of the display (p. 22).**

Adjusting the Input Level

The INPUT LEVEL knob should normally be left at "0" during use. The "0" position is for uni-gain, so the input and output levels will be identical.

You will need to use the INPUT LEVEL knob to adjust the input level if the "OVER" segments in the level indicator light up, or if the input level is too low.
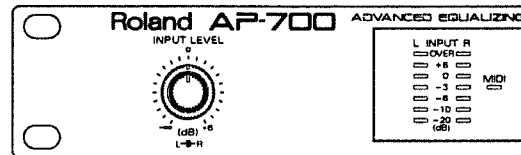
* **The input levels for the left and right channels can be set independently.**

Bypass

If you want direct output of the input sound, turn on Bypass.

AUTO	DYNAMIC	MANUAL	LOCK
CLEAR	DIFFUSE	MUTE	BYPASS
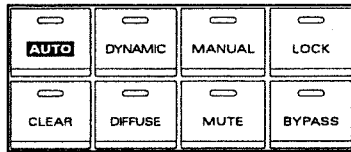
Each press of the [BYPASS] button toggles Bypass on or off. The button's indicator lights up when Bypass is on.

* In the AFB mode, be sure to turn down the volume for your speaker system to a low enough level before turning on Bypass, or feedback (howling) may occur.

Lock

The Lock function can be switched on to protect the settings and prevent them from being changed if the panel buttons are inadvertently pressed.

AUTO	DYNAMIC	MANUAL	LOCK
CLEAR	DIFFUSE	MUTE	BYPASS
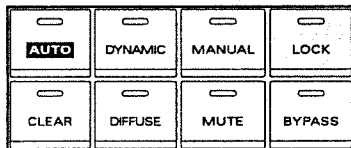
To switch on the Lock:

Hold down the [LOCK] button for more than two seconds. The button's indicator lights up and the unit is locked.

To release the Lock:

Hold down the [LOCK] button for more than two seconds. The button's indicator goes out and the lock is released.

Choosing Parameters

You can change the functioning of the AP-700 by varying the parameter settings.

Here's how to choose the desired parameter and change its setting.

1. **Use the cursor buttons and the (ENTER) button to switch parameters until the desired parameter appears on the display.**

2. **When the parameter you want is shown on the display, move the cursor to the parameter.**

3. **Use the VALUE buttons to change the setting.**

About the Notation for Parameter Selection

The explanations in this manual skip a description of the procedure you need to follow to show the desired parameter on the display.

Example: Adjusting the HPF Frequency for the AFB Mode

MENU ▶ AFB mode ▶ HPF/LPF▶

The actual operation for this procedure is as follows.

1. **Use the cursor buttons to move the cursor to (MENU), then press (ENTER).**

AFB	GRPH EDIT MENU

PEAK ▶ --- Hz [14/14 : 4/4]
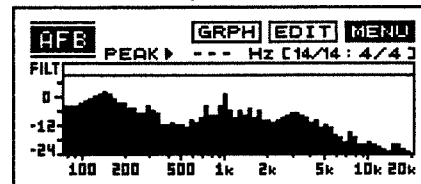
2. **Use the cursor buttons to move the cursor to (AFB mode) and press (ENTER).**

```
════════ M E N U ════════

SYSTEM    AFB mode
MEMORY    PEQ mode
MIDI      GEQ mode
```
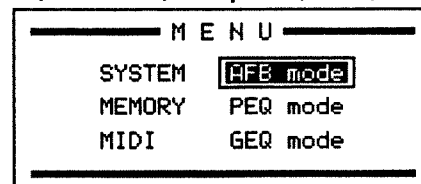
3. **Use the cursor buttons to move the cursor to (HPF/LPF) and press (ENTER).**

```
════════ AFB mode ════════
AUTO/DYNA      LINK
RESERVE        DIFFUSE
EDIT           MUTE
HPF/LPF
```
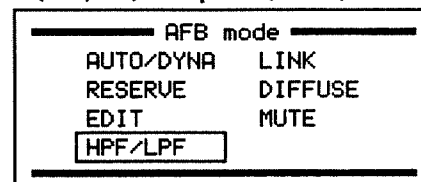
4. Use the cursor buttons to move the cursor to the HPF frequency and adjust the setting with the VALUE buttons.

```
━━━━━ AFB HPF/LPF ━━━━━

          ▐FREQ▌    ▐TYPE▌
  ▐HPF▌:[ 80.0Hz ]   OFF
  ▐LPF▌: 8.00KHz     OFF
```
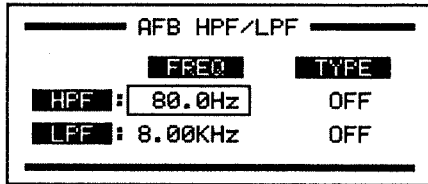
* The starting point for these operations is the Analyzer/Filter screen. No matter what mode you're in, you can get to the Analyzer/Filter screen by pressing the [EXIT] button repeatedly — the Analyzer/Filter screen is the last screen to appear.

* This manual contains a "Parameter Table" that shows the structure of the parameters.

* Manipulation of a setting causes the contents of the setting to switch with each change.

* Each press of the [EXIT] button causes the display to go back one screen. The contents of settings (or changes) are retained.

Choosing the Mode

Choose whichever one of the three modes that you wish to use.

MENU ▶

The mode that is highlighted in the display is the currently selected mode.

1. Using the cursor buttons, move the cursor to (MENU), then press (ENTER).

2. Move the cursor to the mode you want to use.

AFB mode: AFB (Anti-Feedback) mode

PEQ mode: PEQ (Parametric Equalizer) mode

GEQ mode: GEQ (Graphic Equalizer) mode

3. Press (ENTER).

As shown below, a message asking you to confirm the change in mode appears on the display. (The actual message varies according to the modes being changed.)

```
━━━━━ M E N U ━━━━━
┌─────────────────────────┐
│ GEQ process will function│
│    instead of AFB process│
│                          │
│      ▐OK▌    ▐CANCEL▌     │
└─────────────────────────┘
```
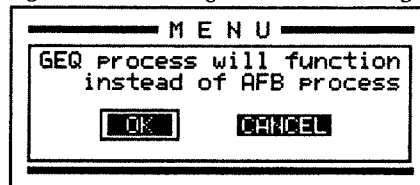
4. Press (ENTER) to go ahead and change the mode. If you want to start over, move the cursor to (CANCEL) and press (ENTER).

Section 2: How to Use the AFB Mode

About the AFB Mode

The AFB mode uses a filter with an extremely high Q to eliminate feedback (howling) occurring in a sound reinforcement system that uses a microphone, and keep fluctuations in the sound quality to a minimum.

The AFB mode performs compensation to minimize fluctuations in sound quality, but this does not mean that no changes at all occur in the sound quality. As the number of points at which feedback-suppression points increases, the sound quality also gradually changes. Fluctuations in sound quality can be kept to a minimum by using the AFB mode after first positioning the sound reinforcement device so as to reduce the chance of feedback occurring.

Functions of the AFB Mode

The AFB mode offers the following functions for eliminating feedback.

• Auto Function

This function is suited to eliminating feedback during sound checks.

The Auto function automatically searches for the feedback point (the frequency at which feedback occurs), and sets up a filter to correct the frequency response at that point and eliminate feedback.

• Dynamic Function

This function eliminates sudden feedback occurring because of changes in the sound production environment, or other factors such as the microphone being moved. Like the Auto function, the Dynamic function is automatic.

• Manual Function

The Manual function can be used to switch filters on or off.

• Diffuse Function

The Diffuse function applies slow, inaudible modulation to suppress feedback and coloration.

This function is particularly effective in suppressing feedback and coloration in the treble range.

• Mute Function

The Mute function can be switched on when you want to lower the output level. Parameters for setting the mute level are available.

In addition to these five functions, the AFB mode also offers the following functions.

• Spectrum Analyzer

This works as a 91-band analyzer, showing the frequency response of the input sound on the display. Zoom and Scroll can be used to switch the frequency range or level being monitored.

• High-Pass Filter (HPF) and Low-Pass Filter (LPF) Settings

These allow the AFB mode to be used more effectively in the required frequency bands by cutting unnecessary frequency bands.

About the Display on the Analyzer/Filter Screen

The following information appears on the Analyzer/Filter screen for the AFB mode.

"AUTO": The Auto function is in operation
"DYNA": The Dynamic function is in operation
"AFB": A function other than the foregoing two is in operation (AFB mode)

Frequency (Hz)
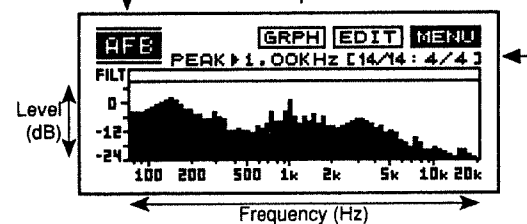
"AUTO"
Example: A-1 1.00 kHz -3.0 dBm 13/14
Filters set by the Auto function, and numbers of remaining/reserve filters
"DYNA"
Example: D-1 1.00 kHz -3.0 dBm 3/4
Filters set by the Auto function, and numbers of remaining/reserve filters
"AFB"
Example: PEAK 1.00 kHz [14/14 : 4/4]
Peak point and numbers of remaining/reserve filters(Auto:Dynamic)

Frequency (Hz)

Peak Point

```
┌─────────────────────────────────────┐
│ ▓▓AFB  [M-4]▶   600Hz  +1.0dB         │
│ FILT━━━━━━━ PEAKING  Q= 2.5           │
└─────────────────────────────────────┘
        ↑      ↑↑              ↑
   Low shelving              High shelving
```
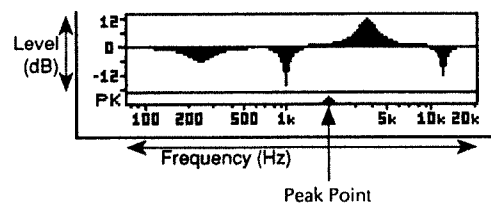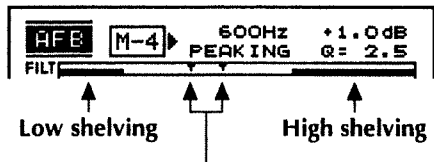
Display of the center frequency for the peaking filter

Basic Usage

This section describes the simple steps that are needed for operation using the AFB mode.

Practical applications such as independent use for the left and right channels (Link Off), as well as the following items, are described in "Section 5: Editing." Take a look at that section if this is what you need.

Quick Edit

HPF and LPF settings

Initialization

In the steps described below, it is assumed that you have already set up and connected your equipment. Also, check to make sure that the indicators for the [BYPASS] and [MUTE] buttons are not lit up. If either one is lit, press the corresponding button to make the indicator go out.

1. Clear any filters set by the Auto function.

You can skip this step if the indicator for the [CLEAR] button is lit up.

1-2

1-1
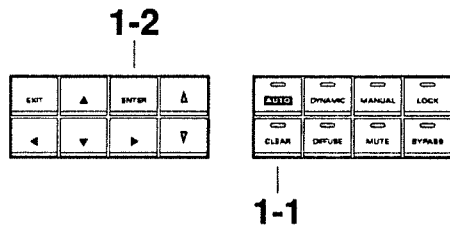
1-1 Press (CLEAR).

The display changes to show a message confirming that the filters set by the Auto function are to be cleared.

1-2 To clear the filters, press (ENTER). If you want to start over, move the cursor to (CANCEL) and press (ENTER).

The indicator for the [CLEAR] button lights up. All filters set by the Auto function are cleared.

2. Eliminate feedback with the Auto function.

2-1,2-3
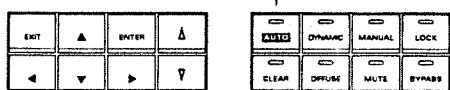
2-1 Press (AUTO) once.

The button's indicator flashes to show that the Auto function is working.

2-2 Gradually increase the volume of the sound reinforcement system.

As the volume rises and feedback occurs, the AFB mode's Auto function automatically sets up filters and eliminates the feedback. The indicator for the [CLEAR] button goes out as soon as even one filter is set.

2-3 Increase the volume to the desired level and press (AUTO).

The indicator for the [AUTO] button goes out and the Auto function is ended.

You can change the settings for the filters set by the Auto function. The way to do this is the same as for Quick Edit. See "Quick Edit" (p. 17) for details.

3. Use the Dynamic function to guard against sudden feedback.

Even after feedback has been eliminated by the Auto function, feedback may still occur because of changes in the sound production environment, or if a microphone is moved. To take care of this, you can suppress sudden feedback with the Dynamic function while leaving the settings for the Auto function in place.

* When the number of filters that the Dynamic function sets up exceeds its pre-assigned number of filters, the Dynamic function clears the first filter in order to set up a new one.

* All filters established by the Dynamic function are cleared when the function is switched off.

3-1
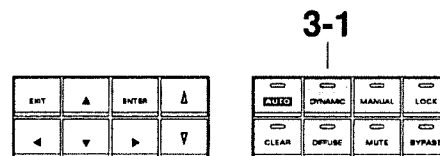
3-1 Press (DYNAMIC) once.

The button's indicator lights up to show that the Dynamic function is working.

Each press of the [DYNAMIC] button toggles the Dynamic function on or off. When the Dynamic function is on, its button indicator lights up.

If feedback occurs, the Dynamic function automatically compensates the frequency response and eliminates the feedback.

4. Use the Diffuse function.
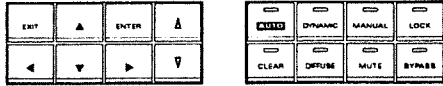
4-1

4-1 Press (DIFFUSE) once.

The button's indicator lights up to show that the Diffuse function is working.

Each press of the [DIFFUSE] button toggles the Diffuse function on or off. When the Diffuse function is on, its button indicator lights up.

Manual On/Off Switching

You can use the Manual function to switch on or switch off the filters that have been set.
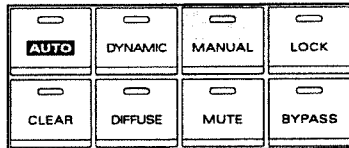
Each press of the [MANUAL] button toggles the Manual function on or off. When the Manual function is on, its button indicator lights up.

* **The steps for setting filters used by the Manual function are described in "Quick Edit" (p. 17).**

Mute

Switch on Mute when you want to lower the output level.

The mute level can be adjusted to match the desired usage. See "Mute Function" (p. 19) for an explanation of how to make the settings.
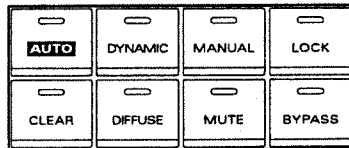
Each press of the [MUTE] button toggles the Mute function on or off. When the Mute function is on, its button indicator lights up.

Switching the Display (FILTER and ANALYZE)

The AFB mode not only lets you display a 91-band spectrum analyzer showing the frequency response for input sound, it also lets you switch to a display of filter characteristics.

GRPH ▶ SELECT ▶

FILTER: Shows filter characteristics on the display.

ANALYZE: Shows the frequency response of input sound on the display as a 91-band spectrum equalizer.

Zoom/Scroll for the Display

The display's Zoom and Scroll functions work the same in every mode. See "Zoom/Scroll for the Display (Common for All Modes)" (p. 21) for a description of the steps to use.

About the PEQ Mode

This mode lets you use the AP-700 as a stereo parametric equalizer with 18 bands per channel, and allows you to set the frequencies, Q values, and levels for each band. The contents of the settings can be viewed and confirmed in the form of frequency response curves appearing on the display. You can also use the HPF and LPF independently of the parametric equalizer.

About the Display on the Analyzer/Filter Screen

The following information appears on the Analyzer/Filter screen for the PEQ mode.

Filter screen

Analyzer screen

Basic Usage

This section describes the simple steps that are needed for operation using the PEQ mode.

Practical applications such as independent use for the left and right channels (Link Off), as well as the following items, are described in "Section 5: Editing." Take a look at that section if this is what you need.

HPF and LPF settings

Initialization

EDIT ▶
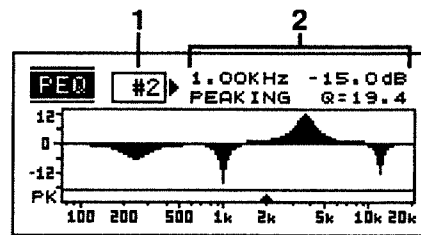
1. **Use the cursor buttons to move the cursor to the band number, then use the (VALUE) buttons to select the band you want to modify.**

2. **Use the cursor buttons to move the cursor to the parameter you want to modify, then use the (VALUE) buttons to change the setting.**

   You can repeat steps 1 and 2 to change the settings for all the band numbers.

[BAND NUMBER] (1 to 18)

This selects the band that is to be set. The parameters for the selected band appear in the display.

[FILTER TYPE]
(PEAKING, LOW SHELVING, or HIGH SHELVING)

This selects the type of filter.

PEAKING: Sets Frequency, Q, and level as a parametric type equalizer.

LOW SHELVING: Sets frequency and level as a low-shelving type equalizer.

HIGH SHELVING: Sets frequency and level as a high-shelving type equalizer.

[FREQUENCY] (19.7 Hz to 20.2 kHz)

This sets the center frequency for the filter.

[Q] (0.3 to 100)

This sets the range over which the filter is applied, centering on the frequency set with "FREQUENCY."

Larger values for Q result in steeper filter characteristics.

* The Q value is ignored when "LOW SHELVING" or "HIGH SHELVING" is selected as the filter type.

[LEVEL] (−40.0 to +12.0 dB)

This sets the filter level (amount of boost or cut).

* In the PEQ mode, settings can also be made within a screen called up (using the following procedure) from the Analyzer/Filter screen.

   MENU ► PEQ mode ► EDIT ►

Switching the Display (FILTER, 91BAND, and 31BAND)

The PEQ mode not only lets you display a 31- or 91-band spectrum analyzer showing the frequency response for input sound, it also lets you display filter characteristics.

   GRPH ► SELECT ►

FILTER: Shows filter characteristics on the display.

91BAND: Displays the frequency response of input sound on the display as a 91-band spectrum equalizer.

31BAND: Displays the frequency response of input sound on the display as a 31-band spectrum equalizer.

Zoom/Scroll for the Display

The Zoom and Scroll functions for the display work the same in every mode. See "Zoom/Scroll for the Display (Common for All Modes)" (p. 21) for a description of the steps to use.

About the GEQ Mode

This mode enables use as a 91-band mono or 31-band stereo graphic equalizer. You can make the settings for the equalizer as you view them on the display. You can also use the HPF and LPF independently of the graphic equalizer.

About the Display on the Filter Screen

The following information appears on the Filter screen for the GEQ mode.
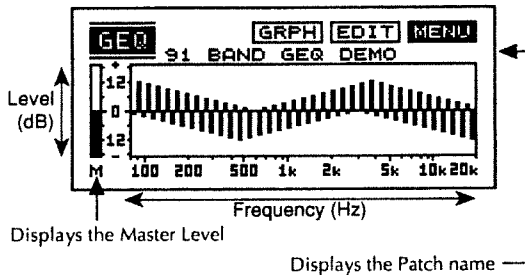
Level (dB)

Displays the Master Level

Displays the Patch name

Frequency (Hz)

Basic Usage

This section describes the simple steps that are needed for operation using the GEQ mode.

Practical applications such as independent use for the left and right channels (Link Off), as well as the following items, are described in "Section 5: Editing." Take a look at that section if this is what you need.

HPF and LPF settings

Initialization

• Master Level Setting

This sets the amount of boost or cut for the overall output level (master level) of the equalizer.

EDIT ▶ MSTR ▶

Use the (VALUE) buttons to set the master level.

• Level Settings for Each Band (Frequency)

This adjusts the level (amount of boost or cut) for each of the bands.

EDIT ▶ BAND ▶
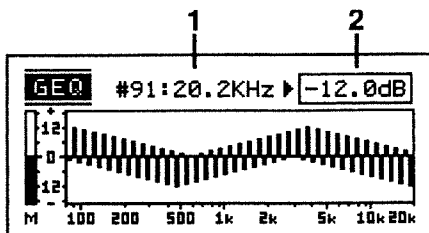
1. **Use the cursor buttons to move the cursor to the band (frequency), then use the (VALUE) buttons to select the band.**

2. **Use the cursor buttons to move the cursor to the level, and adjust the level with the (VALUE) buttons.**

   You can repeat steps 1 and 2 to set the level for all bands.

[LEVEL] (−12.0 to +12.0 dB)

This sets the level (amount of boost or cut).

• Setting the Level Curve Automatically

The AP-700 comes with a function that lets you select a starting band, ending band, and level, then automatically sets a smooth level for the range between the starting and ending bands.

EDIT ▶ FORM ▶

1. **Choose the starting (upper) and ending (lower) bands (frequencies).**

   The current levels will be shown.

2. **Set the level for the starting (upper) and ending (lower) points.**

3. **Move the cursor to where the type (one of three below) is displayed and change it, if necessary, using (VALUE).**

   LINE: Linearly connects the starting and ending points.

   CURVE: Connects the starting and ending points with a smooth curve. The curve will change depending on the settings.

   UNDO: Returns the AP-700 to the state before making automatic settings.

4. **Press (ENTER) to set the equalizer to work automatically.**

To cancel what has been automatically set up, perform an "UNDO." This will put the unit back into the status it was in before it was set to work automatically.

* In the GEQ mode, settings can also be made at the screen called up by using the following procedure.

   MENU ▶ GEQ mode ▶ EDIT ▶

Zoom/Scroll for the Display

The Zoom and Scroll functions for the display work the same in every mode. See "Zoom/Scroll for the Display (Common for All Modes)" (p. 21) for a description of the steps to use.
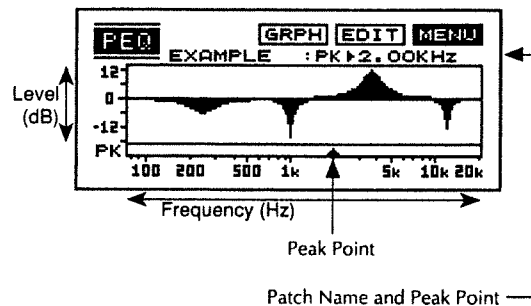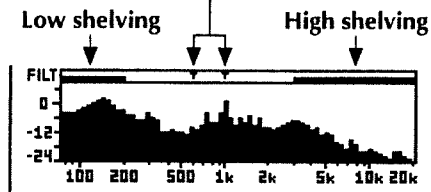
This section describes the parameters that can be changed (edited) in the different modes, and explains how to make these changes -- in other words, how to edit.

Editing in the AFB Mode

Quick Edit

When you use the AP-700 in the AFB mode, filters are set manually. You can also use the same procedures to modify filters set by the Auto function.

* Filters produced by the Dynamic function cannot be modified.

EDIT ►

1. **Move the cursor to the filter number and use the (VALUE) buttons to select the filter number you wish to modify.**
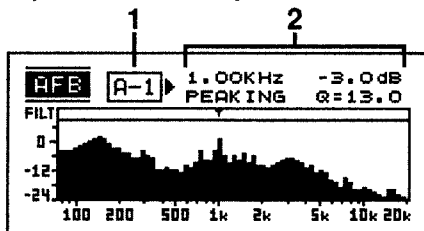
2. **Use the cursor buttons to move the cursor to the parameter you want to work with, and make the settings with the (VALUE) buttons.**

If you modify the parameters for a filter that was set by the Auto function, the filter number is highlighted (inversed), indicating that the setting has been modified. Also, when feedback occurs at the same frequency as a modified filter, the feedback is eliminated by a different filter set to the same frequency.

You can repeat steps 1 and 2 to set the parameters for all filters.

* Settings for the filters can also be made in the screen called up by using the following procedure.

MENU ► AFB mode ► EDIT ►

[FILTER NUMBER] (A1 to A18 and M1 to M18)

This selects the filter to be set. The parameters for the chosen filter appear on the display.

A: Displays a filter set by the Auto function.

M: Displays a filter toggled on or off by the Manual function.

* A filter set by the Auto function can be made into a Manual function filter, and a filter reserved for the Manual function can also be made into a filter reserved for the Auto function. This change is made by selecting the filter number to be changed and pressing [ENTER]. When you do this, a message asking you to confirm the change appears on the display. Press [ENTER] to change the Auto or Manual function. If you want to start over, move the cursor to [CANCEL] and press [ENTER].

If you choose not to make the above change, only the parameters will be changed.

(If a change has been made in the reservations, the filters numbers will be rearranged.)

[FILTER TYPE]
(PEAKING, LOW SHELVING, or HIGH SHELVING)

This selects the type of filter.

PEAKING: Sets Frequency, Q, and level as a parametric type equalizer.

LOW SHELVING: Sets frequency and level as a low-shelving type equalizer.

HIGH SHELVING: Sets frequency and level as a high-shelving type equalizer.

* The type of a filter reserved for the Auto function is fixed at "PEAKING" and cannot be changed.

[FREQUENCY] (19.7 Hz to 20.2 kHz)

For a parametric type filter, this sets the center frequency. With a shelving type filter, this sets the frequency at which the filter begins to be applied.

[Q] (0.3 to 100)

This sets the range over which the filter is applied, centering on the frequency set with "FREQUENCY."

Larger values for Q result in steeper filter characteristics.

* The Q value for a filter set by the Auto function is set automatically according to the level. However, this parameter can be used to change the value set for Q.

* The Q value is not displayed when "LOW SHELVING" or "HIGH SHELVING" is selected for Filter Type.

[LEVEL] (AUTO: -40.0 to 0.0 dB; MANUAL: -40.0 to +12.0 dB)

This sets the filter level (amount of boost or cut).

* Setting the level to "0 dB" clears the filter.

HPF and LPF Settings

The same procedure is used in each mode to make the settings for the HPF and LPF. See "HPF and LPF Settings (Common for All Modes)" (p. 20) for a description of this procedure.

Initializing the AFB Mode

This initializes the AFB mode. There are parameters that initialize the entire AFB mode, as well as parameters that initialize individual functions.

[FILTER RESERVE: Number of Reserved Filters] (AUTO: 0 to 18, DYNAMIC: 0 to 18)

MENU ▶ AFB mode ▶ RESERVE ▶

The number of filters that can be used simultaneously is a total of 18 bands for each channel. This parameter sets how the 18 bands are allocated to the three functions (A – Auto, D – Dynamic, and M – Manual). The number of filter bands that can be set with each function is within the value set here.

[LINK] (ON or OFF)

MENU ▶ AFB mode ▶ LINK ▶

This makes the setting for linking the channels.

ON: The two channels operate in the same way.

OFF: The channels operate independently. Because all settings are independent, separate settings are made for each channel.

• When Link Is Switched from OFF to ON

This sets which channel – left or right – will serve as the basis for the settings that are applied commonly to both channels when Link is set to ON.

L CH: The settings for the left channel become the common settings for both channels.

R CH: The settings for the right channel become the common settings for both channels.

• When Link Is Switched from ON to OFF

This sets which channel – left or right – is affected by panel operations for the Auto or Dynamic functions.

L CH: Settings affect only the left channel.

R CH: Settings affect only the right channel.

L+R CH: Settings affect both the left and right channels.

* **Settings made here can be switched from the Analyzer/Filter screen.**

• Operation When Link Is Set to OFF

Because the channels act independently when Link is set to OFF, the following settings are possible.

Selecting the Channel to Edit

This selects the channel affected by panel operations. The current setting is shown on the Analyzer/Filter screen.

L CH: Panel operations affect only the left channel.

R CH: Panel operations affect only the right channel.

L+R CH: Panel operations affect both the left and right channels.

To change the channel setting, move the cursor to the channel display ("L CH," "R CH," or "L+R CH"), and press [ENTER]. This switches you to the setting screen.

Filter Operation During a Quick Edit Session

The channel ("L" or "R") appears to the left of the filter number.

Auto Function

This perform initialization when using the Auto function.

[STEP] (0.5 to 40.0 dB)

MENU ▶ AFB mode ▶ AUTO/DYNA ▶

This adjusts the amount of change in the level that takes place at one time for the filter suppressing feedback (howling). If the amount of change is small, some time is required to suppress feedback, but changes in sound quality can be reduced. A large amount of change allows feedback to be suppressed quickly, but sound quality may change considerably.

[RESPONSE] (SLOW1 to FAST10)

MENU ▶ AFB mode ▶ AUTO/DYNA ▶

This adjusts the time until a signal above the threshold is recognized as feedback (howling). Settings close to "Fast" result in signals above the threshold being recognized as feedback in a more immediate manner. Conversely, settings close to "SLOW" result in a slower response. If you should obtain undesirable results, such as when there is frequent noise at the mike, it can be set to "SLOW."

[THRESHOLD] (–60.0 to +20.0 dB)

MENU ▶ AFB mode ▶ AUTO/DYNA ▶

This adjusts the level at which the Auto function recognizes the input signal as feedback (howling).

If the input level rises above the threshold, the input signal is considered to be feedback and the frequency response is corrected.

[MARGIN] (0.0 to +12.0 dB)

MENU ▶ AFB mode ▶ AUTO/DYNA ▶

When the Auto function is searching for a feedback point (in other words, during operation of the Auto function), the output level can increase by only the level set here.

When the Auto function is exited, the level returns to its original value, providing a margin against feedback.

Dynamic Function

Like the Auto function, the Dynamic function is also provided with independent parameters. To guard against sudden feedback, however, its settings are normally different from the Auto function. The step is larger, the response is set closer to "FAST," and the threshold is set higher to prevent operation from being triggered by an input signal (an ordinary signal other than feedback).

[STEP] (0.5 to 40.0 dB)

MENU ▶ AFB mode ▶ AUTO/DYNA ▶

[RESPONSE] (SLOW1 to FAST10)

MENU ▶ AFB mode ▶ AUTO/DYNA ▶

[THRESHOLD] (–60.0 to +20.0 dB)

MENU ▶ AFB mode ▶ AUTO/DYNA ▶

Diffuse Function

This makes the settings for the Diffuse function. Because the frequency at which feedback occurs is normally determined by the distance between the mike and the sound reinforcement device, feedback can be eliminated by moving the microphone. The Diffuse function creates this effect electrically.

[CYCLE] (0.1 to 20.0 sec)

MENU ▶ AFB mode ▶ DIFFUSE ▶

This adjusts the cycle.

[DISTANCE] (0.01 to 14.0 m)

MENU ▶ AFB mode ▶ DIFFUSE ▶

This adjusts the distance.

Mute Function

[MUTE LEVEL] (– ∞ to 0.0 dB)

MENU ▶ AFB mode ▶ MUTE ▶

This sets the amount by which output will be attenuated when the Mute function is on.

▌ Editing in the PEQ Mode

HPF and LPF Settings

The same procedure is used in each mode to make the settings for the HPF and LPF. See "HPF and LPF Settings (Common for All Modes)" (p. 20) for a description of this procedure.

Initializing the PEQ Mode

This initializes the PEQ mode.

[LINK] (ON or OFF)

MENU ▶ PEQ mode ▶ LINK ▶

This makes the setting for linking the channels.

ON: The two channels operate in the same way.

OFF: The channels operate independently. Because all settings are independent, separate settings are made for each channel.

● When Link Is Switched from OFF to ON

This sets which channel -- left or right -- will serve as the basis for the settings that are applied commonly to both channels when Link is set to ON.

L CH: The settings for the left channel become the common settings for both channels.

R CH: The settings for the right channel become the common settings for both channels.

● Operation When Link Is Set to OFF

Because the channels act independently when Link is set to OFF, the following settings are possible.

Selecting the Displayed/Manipulated Channel

This selects the channel whose settings are shown and can be manipulated in the Analyzer/Filter screen.

L CH: Settings for the left channel are displayed/become manipulable.

R CH: Settings for the right channel are displayed/become manipulable.

To change the channel setting, move the cursor to the channel and press [ENTER]. This switches you to the setting screen for the channel.

Filter Operation During a Quick Edit Session

The channel ("L" or "R") appears to the left of the filter number.

[RESOLUTION] (91BAND or 31BAND)

MENU ▶ PEQ mode ▶ ANALYZER ▶

This chooses the number of bands for the spectrum analyzer.

91BAND: Functions as a 91-band spectrum analyzer.

31BAND: Functions as a 31-band spectrum analyzer.

▌Editing in the GEQ Mode

HPF and LPF Settings

The same procedure is used in each mode to make the settings for the HPF and LPF. See "HPF and LPF Settings (Common for All Modes)" for a description of this procedure.

Initializing the GEQ Mode

This initializes the GEQ mode.

[TYPE] (91BAND or 31BAND)

MENU ▶ GEQ mode ▶ TYPE ▶

This sets the type of graphic equalizer.

91BAND

This makes the AP-700 function as a 91-band monaural graphic equalizer. When this type is selected, you can select Bypass or Mute for the channel that uses the equalizer and the channel that doesn't.

31BAND

This makes the AP-700 function as a 31-band stereo graphic equalizer. When this type is selected, you can set Link to ON or OFF.

ON: The two channels operate in the same way.

OFF: The channels operate independently. Because all settings are independent, separate settings are made for each channel.

• When Link Is Switched from OFF to ON

This selects which channel – left or right – will serve as the basis for the settings that are applied commonly to both channels when Link is set to ON.

L CH: The settings for the left channel become the common settings for both channels.

R CH: The settings for the right channel become the common settings for both channels.

• Operation When Link Is Set to OFF

Because the channels act independently when Link is set to OFF, the following settings are possible.

Selecting the Displayed/Manipulated Channel

This selects the channel whose settings are shown and can be manipulated in the Analyzer/Filter screen.

L CH: Settings for the left channel are displayed/become manipulable.

R CH: Settings for the right channel are displayed/become manipulable.

To change the channel setting, move the cursor to the channel and press [ENTER]. This switches you to the setting screen for the channel.

Filter Operation During a Quick Edit Session

The channel ("L" or "R") appears to the left of the filter number.

▌Common Operations for All Modes

HPF and LPF Settings (Common for All Modes)

This sets the parameters for the high-pass filter (HPF) and low-pass filter (LPF). The high-pass filter cuts frequency components lower than the setting, and the low-pass filter cuts frequency components higher than the setting.

MENU ▶ AFB mode(PEQ mode)(GEQ mode)▶ HPF/LPF ▶

<LPF>

[FREQUENCY] (500.0 Hz to 20.0 kHz)

This sets the cutoff frequency (the frequency at which the effect starts) for the low-pass filter.

[TYPE] (OFF, −6 dB/oct, or −12 dB/oct)

This sets the type of low-pass filter.

OFF: No LPF is used.

−6 dB/oct: This type cuts −6 dB per octave.

−12 dB/oct: This type cuts −12 dB per octave.

<HPF>

[FREQUENCY] (20.0 Hz to 2.0 kHz)

This sets the cutoff frequency (the frequency at which the effect starts) for the high-pass filter.

[TYPE] (OFF, –6 dB/oct, or –12 dB/oct)

This sets the type of high-pass filter.

OFF: No HPF is used.

–6 dB/oct: This type cuts –6 dB per octave.

–12 dB/oct: This type cuts –12 dB per octave.

Zoom/Scroll for the Display (Common for All Modes)

This lets you set the range displayed when using Zoom or Scroll on the display.

GRPH ▶
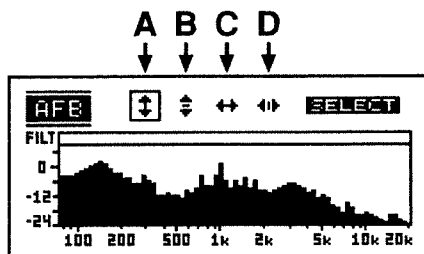
1. Move the cursor to the function to be set.

A: Scrolls (moves) through the displayed levels.

B: Performs a zoom (magnification or reduction) on the displayed levels.

C: Scrolls (moves) through the displayed frequencies.

D: Performs a zoom (magnification or reduction) on the displayed frequencies.

2. Use the (VALUE) buttons to set the display range.

▌Editing System Parameters

Audio I/O (Audio Input and Output)

The AP-700 can be input and output for analog and digital signals simultaneously. Here you can adjust the respective analog and digital input and output levels.

Information on digital I/O (input and output) is shown on the display.

<ANALOG>

[INPUT] (– ∞ to 0.0 dB)

MENU ▶ SYSTEM ▶ AUDIO I/O ▶

This sets the input level for analog input.

* When only digital input is used, set this to "– ∞."

[OUTPUT] (– ∞ to 0.0 dB)

MENU ▶ SYSTEM ▶ AUDIO I/O ▶

This sets the output level for analog output.

<DIGITAL>

[INPUT] (– ∞ to 0.0 dB: ON or OFF)

MENU ▶ SYSTEM ▶ AUDIO I/O ▶

This sets the input level for digital input. It also sets whether digital output is used (ON) or not used (OFF).

* When only analog input is used, set this to "OFF."

[OUTPUT] (– ∞ to 0.0 dB: ON or OFF)

MENU ▶ SYSTEM ▶ AUDIO I/O ▶

This sets the output level for digital output. It also sets whether digital input is used ("ON") or not used ("OFF").

Delay

On the AP-700, each channel is provided with a delay for sound field compensation. These delays are common to all modes, and each delay has a maximum delay time of 411 msec (140 m). The delay time can be set as either a time or a distance value. Here's how to make the settings for this parameter.

[L CH: Left Channel] (0 cm to 140 m / 0 to 411 msec)

MENU ▶ SYSTEM ▶ DELAY ▶

This sets the delay time for the left channel.

[R CH: Right Channel] (0 cm to 140 m / 0 to 411 msec)

MENU ▶ SYSTEM ▶ DELAY ▶

This sets the delay time for the right channel.

Displaying the Software Version

This displays the version number for the AP-700's software.

MENU ▶ SYSTEM ▶ INFORMATION ▶

Displaying Temporary Information

This displays what is currently in operation. Information on the following items is displayed.

MENU ▶ SYSTEM ▶ INFORMATION ▶

Original Patch Number

Patch Name

Whether edits have been performed

Comments

Adjusting the Contrast of the Display

The display may occasionally become difficult to make out, depending on how and where the AP-700 is installed. If the display is hard to read, this parameter can be used to adjust the contrast (brightness).

[CONTRAST] (1 to 100)

MENU ▶ SYSTEM ▶

This adjusts the contrast of the display.

Initialize

This initializes the settings for the AP-700.

MENU ▶ SYSTEM ▶ INITIALIZE ▶

1. Move the cursor to what you want to be initialized.

ALL: Initializes all settings. The settings return to the same values they had when shipped from the factory.

SYSTEM: Initializes the settings for system parameters.

TEMP: Initializes the settings for the mode that is currently in operation.

2. Use the (VALUE) buttons to select what you want to initializes.

3. Move the cursor to "EXEC" (execute) and press (ENTER). A message appears to confirm the initialization. Press (ENTER) to initialize the settings.

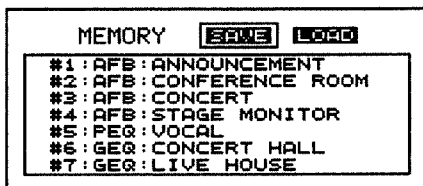**If you want to start over, move the cursor to (CANCEL) and press (ENTER).**

Memory Function

You can use the Memory function to attach names and comments to 16 types of settings, and save these as Patches. The contents of these Patches can then be called up and used whenever you need them. It's also possible to modify what you've called up and save it as a new Patch.

Storing Settings (Save)

This stores the current settings in memory.

MENU ▶ MEMORY ▶

```
MEMORY   [SAVE] [LOAD]
#1:AFB:ANNOUNCEMENT
#2:AFB:CONFERENCE ROOM
#3:AFB:CONCERT
#4:AFB:STAGE MONITOR
#5:PEQ:VOCAL
#6:GEQ:CONCERT HALL
#7:GEQ:LIVE HOUSE
```

1. **Move the cursor to "SAVE" and press (ENTER).**

2. **Use the cursor buttons to move the cursor to the Patch number to serve as the destination for saving, and press (ENTER).**

3. **The display changes to the Patch Name settings screen. Move the cursor to the text input area and use the (VALUE) buttons to change the characters.**

   Repeat step 3 until you've finished inputting the Patch Name and comment.

4. **Press (ENTER).**

5. **Press (ENTER) to save the Patch.**

   If you want to start over, move the cursor to (CANCEL) and press (ENTER).

Calling Up a Patch (Load)

This calls up a Patch stored in memory.

MENU ▶ MEMORY ▶

1. **Move the cursor to "LOAD" and press (ENTER).**

2. **Use the cursor buttons to move the cursor to the patch number to choose the patch you want to call up, and press (ENTER).**

The Patch Name and comment stored with the Patch you've selected appear on the display.

3. **Press (ENTER) to load the Patch.**

   If you want to select over, move the cursor to (CANCEL) and press (ENTER).

Section 6: How to Use MIDI

This section describes the MIDI functions of the AP-700. The settings you make will vary depending on the desired use.

What Can You Do With MIDI?

With the AP-700, you can use MIDI to perform the following operations.

• Switching Program Numbers

The unit can be set so the Patch on the AP-700 changes at the same time when a tone change (Program Change message) is received from the external MIDI device.

The correspondences between Program Change numbers and the AP-700's Patches can be changed by altering the Program Change Map.

• Data Transmission

Exclusive (SysEx) messages can be used to send settings stored in the AP-700 to another MIDI device. This makes it possible to re-create identical settings on another AP-700, or send the settings to a sequencer for storage.

• MIDI messages passing through

MIDI messages input from the MIDI IN connector are output from the MIDI OUT connector.

• MIDI Indicator

The AP-700 comes with a MIDI indicator. The MIDI indicator lights up only while receiving MIDI information from another MIDI device.

MIDI Indicator
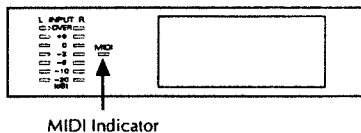
Settings for MIDI Functions

This performs operations for MIDI functions on the AP-700.

* If you require more details about MIDI on the AP-700, a separate "MIDI Implementation" is available for purchase. Contact your nearest Roland Service Station.

[OMNI: Omni Mode] (ON or OFF)

MENU ▶ MIDI ▶ PROPERTY ▶

When the Omni mode is set to ON, the information on all MIDI channels is received, regardless of the actual MIDI channel setting.

* Even when the Omni mode is set to ON, SysEx messages are received only when the data is on the MIDI channel (device ID) set with the "MIDI Channel" parameter.

[CHANNEL: MIDI Channel] (1 to 16)

MENU ▶ MIDI ▶ PROPERTY ▶

This sets the MIDI channel. The AP-700 sends and receives MIDI information on the MIDI channel that is set here.

[DEVICE ID] (1 to 127)

MENU ▶ MIDI ▶ PROPERTY ▶

This sets the Device ID Number in order to handle System Exclusive message when transmitting or receiving data settings via MIDI.

Settings for the Program Change Map

The AP-700 can change Patches according to Program Change messages sent from an external MIDI instrument, and this parameter lets you set the relationship between the received Program Change number and the Patch number that changes however you like.

MENU ▶ MIDI ▶ PC MAP ▶

1. **Use the cursor buttons to move the cursor to Program Change number to be received.**

2. **Use the (VALUE) buttons to select the AP-700 Patch number to correspond to the received Program Change number.**

   Repeat steps 1 and 2 to set the corresponding Patch number for each of the Program Change numbers.

Settings for the Control Change Map

You can control the functions in the AFB mode with Control Change messages sent from the external MIDI device. The function is switched on when the value of the received Controller number is higher than the median value (64 to 127) and switched off when it is lower (0 to 63).

The relationship between the Controller number that the AP-700 receives and the function that is switched can be changed however you like.

MENU ▶ MIDI ▶ CC MAP ▶

1. Use the cursor buttons to select the function in the AFB mode that you want to set.

AUTO: Sets the Controller number for switching the Auto function on and off.

CLR: Sets the Controller number for clearing filters set by the Auto function.

DYNAMIC: Sets the Controller number for switching the Dynamic function on and off.

MANUAL: Sets the Controller number for switching the Manual function on and off.

DIFFUSE: Sets the Controller number for switching the Diffuse function on and off.

MUTE: Sets the Controller number for switching the Mute function on and off.

LOCK: Sets the Controller number for switching the Lock on and off.

BYPASS: Sets the Controller number for switching Bypass on and off.

2. Use the (VALUE) buttons to set the Controller number (0 to 31 or 64 to 95) to correspond to the function.

**Repeat steps 1 and 2 to set the corresponding Controller number for each of the functions.**

Sending Data (Bulk Dump)

With the AP-700, you can use SysEx messages to re-create identical settings on another AP-700, or send data to sequencer to be saved. This transmission of SysEx messages is called a "bulk dump." You can specify the data you want to send so that only that data is sent.

## <How to Make the Connections>

Saving Data on a Sequencer

Hook up the two devices as shown below, and get the sequencer ready for receiving SysEx messages.

MIDI OUT

MIDI IN
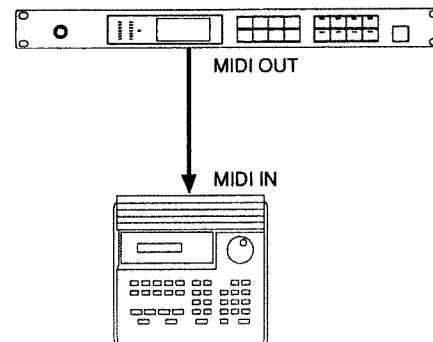
* Refer to the sequencer's manual if you need instructions on how to operate the sequencer.

Copying Data to Another AP-700

Hook up the two devices as shown below, and make sure the sending unit and the receiving unit are set to the same MIDI channel.

MIDI OUT

MIDI IN

<How to Send the Data>
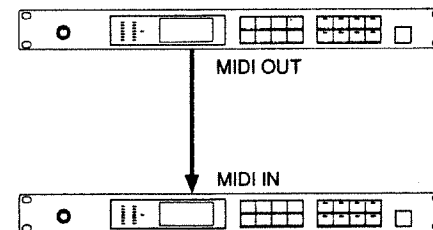
MENU ▶ MIDI ▶ BULK DUMP ▶

1. Moving the cursor, select the type of data you want to send.

ALL: Sends all settings.

SYSTEM: Sends the settings for the system parameters.

TEMP: Sends the settings for the current state of operation.

MEMORY ALL: Sends the contents of all the Patches.

#1 to #16: Sends the settings for the corresponding Patch.

2. Use the (VALUE) buttons to select what is to be sent.

**3. Move the cursor to "EXEC" and press (ENTER) to send the data.**

Receiving Data (Bulk Load)

You can receive data from another AP-700, or receive AP-700 data previously stored on a sequencer. Such data reception is called a "bulk load."

<How to Make the Connections>

Receiving Data Stored on a Sequencer

Connect the two devices as shown below. Set the AP-700 to the same MIDI channel that was used when the data was saved on the sequencer.
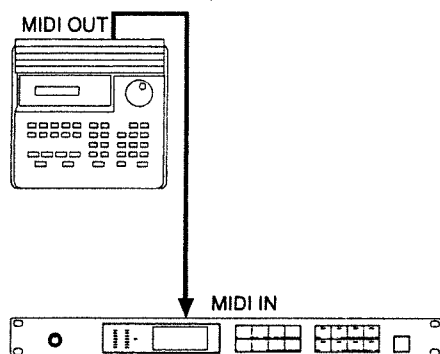
* **Refer to the sequencer's manual if you need instructions on how to operate the sequencer.**

<How to Receive the Data>

The AP-700 can receive SysEx messages from an external MIDI device at any time.

The following message appears on the display while receiving bulk data.

DATA RECEIVING

If You Think There May Be a Problem, Check Here First

If no sound is produced, or if you think operation may be strange, then first check the points described here. If this doesn't clear up the problem, then go ahead and contact the store where you purchased the AP-700 or your nearest Roland Service Station.

There's No Sound or Sound Is Too Low

- Is the other equipment connected correctly?

- Is the connected amp or mixer turned on, and is the volume turned up high enough?

- Is the INPUT LEVEL knob turned up high enough?

- Is the Mute function switched off?

- Could there be broken elements inside the connection cables?

  Try replacing the connection cables.

## Sound Is Distorted (The "OVER" Reading on the Level Meter Lights Up)

- Is the INPUT LEVEL knob at an appropriate setting (p. 8)?

- Could the output level of the external equipment be too high?

- Is the sound still distorted when you change Patches?

  If the distortion disappears when the Patch is changed, check the settings for the first Patch.

Patches Don't Change As Expected

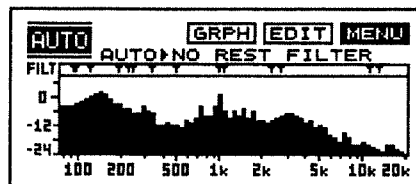- Are the two devices set to the same MIDI channel?

  If the Patch changes to the wrong one, check the settings for the Program Change Map (p. 24).

List of Display Messages

Shown below are the messages that may be displayed during operation of the AP-700.
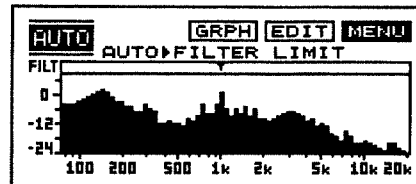
The Auto function requested a setting that is beyond the capacity of the filter (compensation over –40 dB is required).

A request was made for more filters than the reserved number.
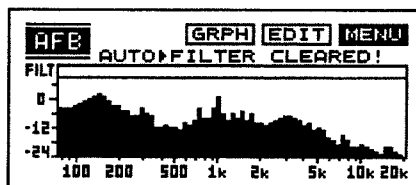
The [CLEAR] button was used to clear the filters of the Auto function.

The Dynamic function requested a setting that is beyond the capacity of the filter (compensation over –40 dB is required).

A Dynamic Off was issued, clearing the filters of the Dynamic function.

About Digital Input and Output

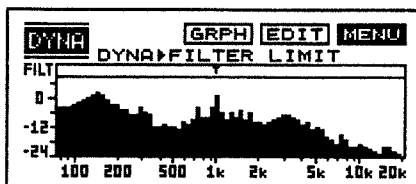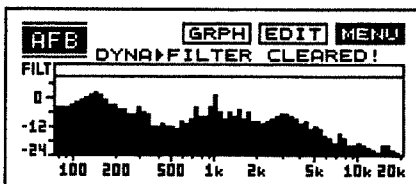The AP-700 uses the following types of digital audio signals in AES/EBU format.

- **Professional Use**
- **Audio Signal**
- **Emphasis Rating:**   50 µsec/15 µsec
- **Sampling Frequency:** 44.1 kHz/48 kHz
- **2-Channel Mode**

<Digital Input>

Format:	AES/EBU Professional Use
Connector:	XLR-3-31 type
Electrical characteristics:	RS-422A
Impedance:	250 Ω balanced
Transfer rate:	3.072 Mbit/sec, fs = 48 kHz

<Digital Output>

Format:	AES/EBU Professional Use
Connector:	XLR-3-32 type
Electrical characteristics:	RS-422A
Impedance:	110 Ω balanced
Transfer rate:	3.072 Mbit/sec, fs = 48 kHz

About Channel Status

The channel status for the AP-700 is set as follows.

When Using Digital Input

Digital output is made while maintaining the channel status for digital input.

When Not Using Digital Input

Digital output is made with the following settings

- **Professional Use**
- **Audio Signal**
- **Emphasis: Off**
- **Sampling Frequency: 48 kHz**

Important Points When Using Digital Input

When using digital input, momentary muting or noise may occur in the following cases in order to ensure synchronization of internal processing and the external input.

- **When connecting or disconnecting connectors**
- **When the sampling frequency changes**
- **When an error occurs**

Equalizer Characteristics

<AFB mode>

AUTO / DYNAMIC / MANUAL

FILTER TYPE:	PEAKING	**FREQUENCY(Hz):**	**630 to 1080**
Q :	15.0 (AUTOMATICALLY)	LEVEL(dB):	–10

FREQUENCY RESPONSE

<AFB mode>
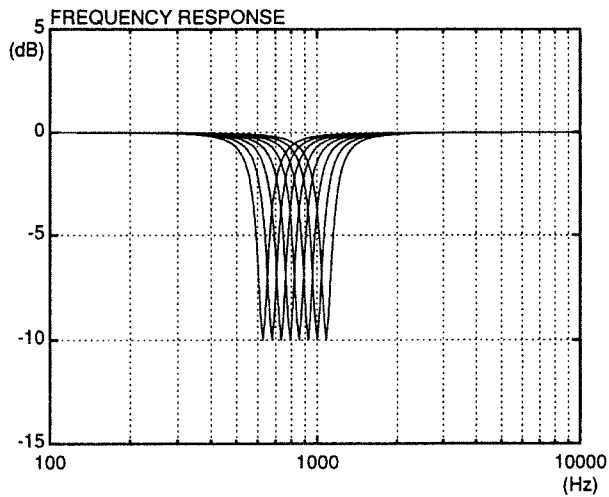
AUTO / DYNAMIC

FILTER TYPE:	PEAKING	FREQUENCY(Hz):	1000
Q :	AUTOMATICALLY	**LEVEL(dB):**	**–5 to –40**

FREQUENCY RESPONSE

<AFB mode>
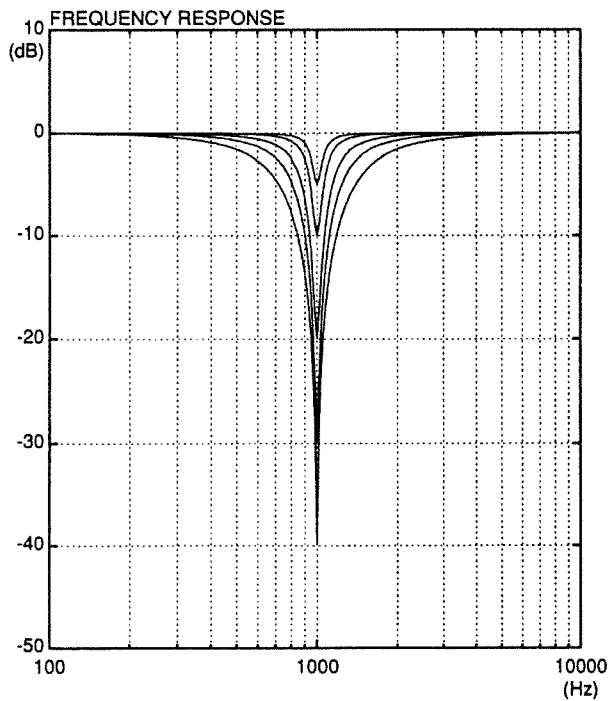
MANUAL

FILTER TYPE: PEAKING
Q : **25 to 100**

FREQUENCY(Hz): 1000
LEVEL(dB): –20

<AFB mode / PEQ mode>
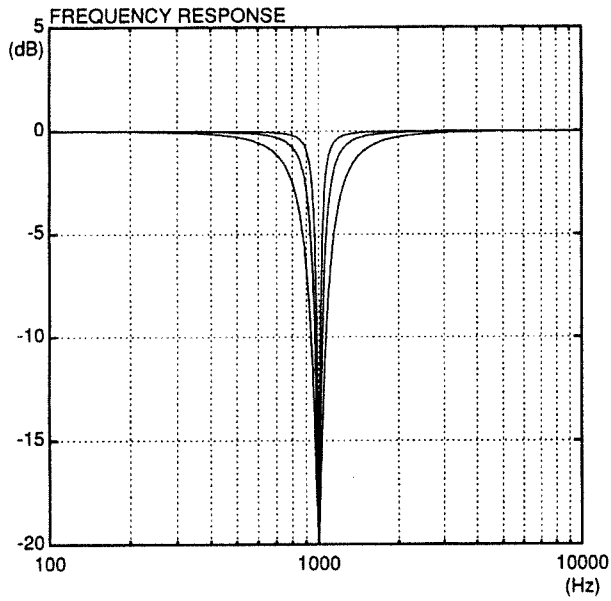
FILTER TYPE: LOW SHELVING / HIGH SHELVING
FREQUENCY(Hz): 25 to 250 / 1600 to 16000 LEVEL(dB): –10 / +10

<AFB mode: MANUAL / PEQ mode>
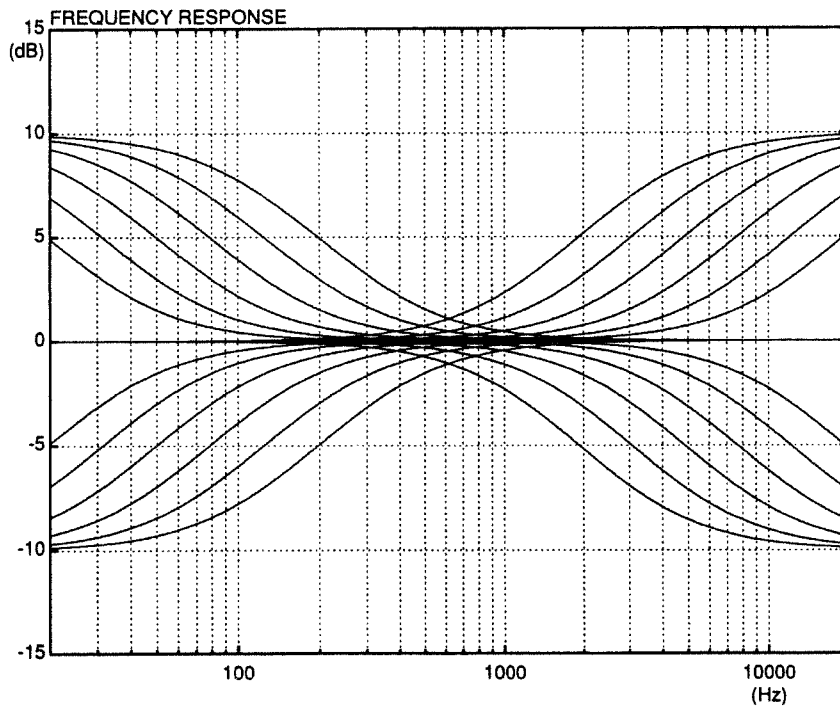
FILTER TYPE: LOW SHELVING / HIGH SHELVING

FREQUENCY(Hz):   250 / 2000   **LEVEL(dB):**   ±3 to ±12

<PEQ mode>
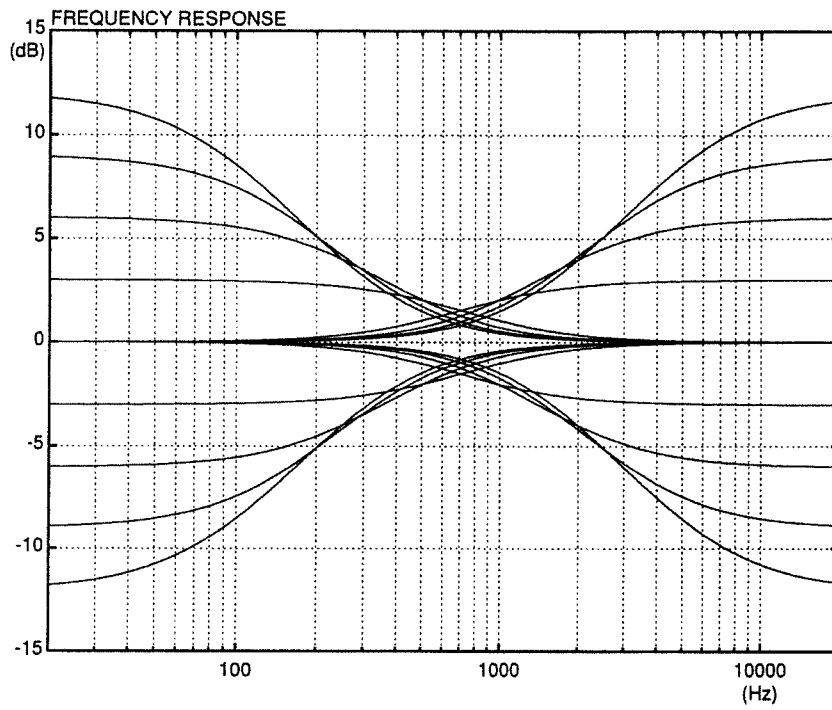
FILTER TYPE:	PEAKING	**FREQUENCY(Hz):**	**100 to 6300**
Q :	20	LEVEL(dB):	–12 / +12

\<PEQ mode\>
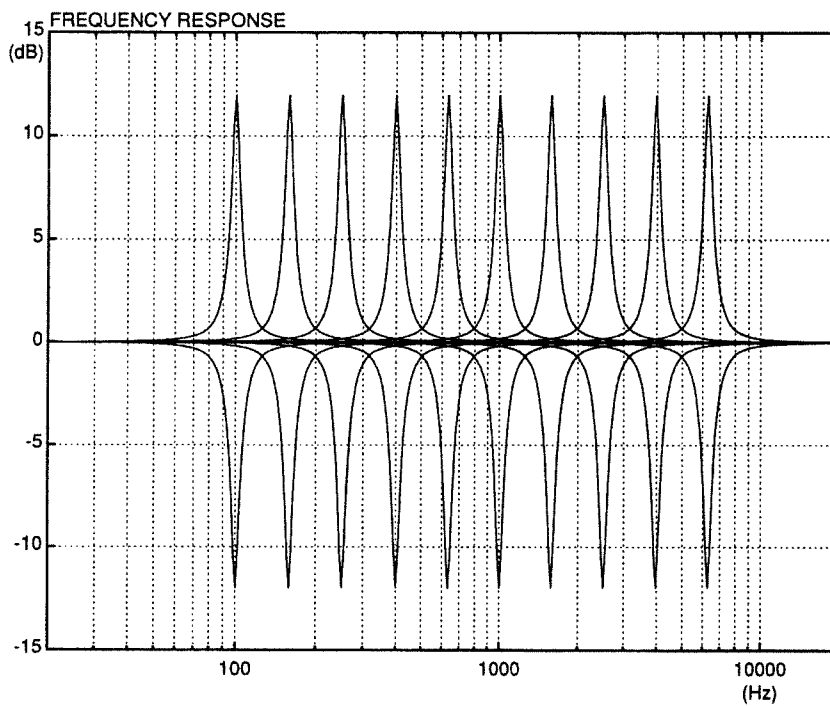
FILTER TYPE:	PEAKING	FREQUENCY(Hz):	1000
Q :	**0.3 to 100**	LEVEL(dB):	–12 / +12

\<PEQ mode\>
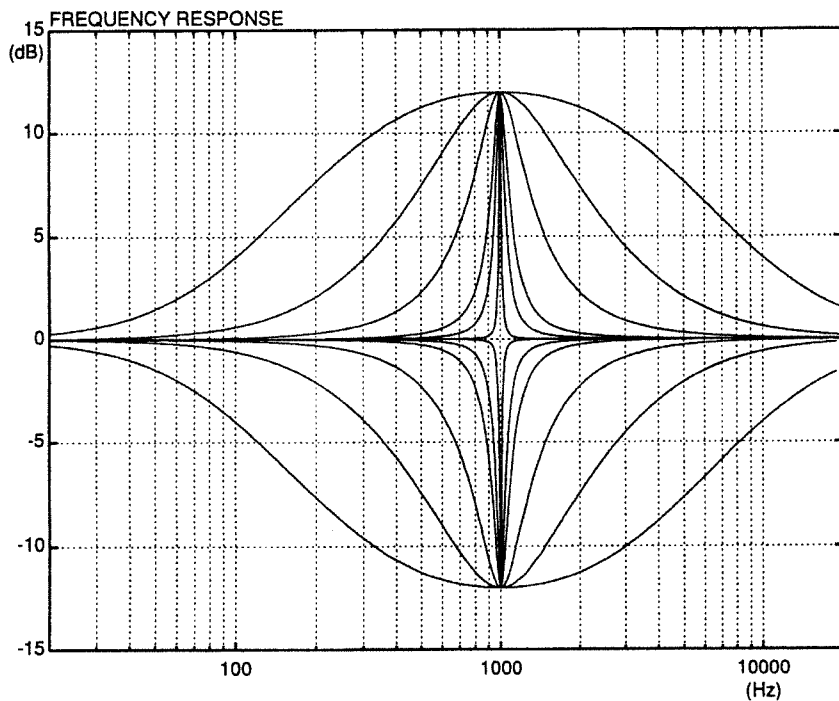
FILTER TYPE:	PEAKING	FREQUENCY(Hz):	1000
Q :	2	**LEVEL(dB):**	**–12 to +12**

<GEQ mode>

31 Band EQUALIZER

LEVEL(dB):   −12 / +12

FREQUENCY RESPONSE

<GEQ mode>
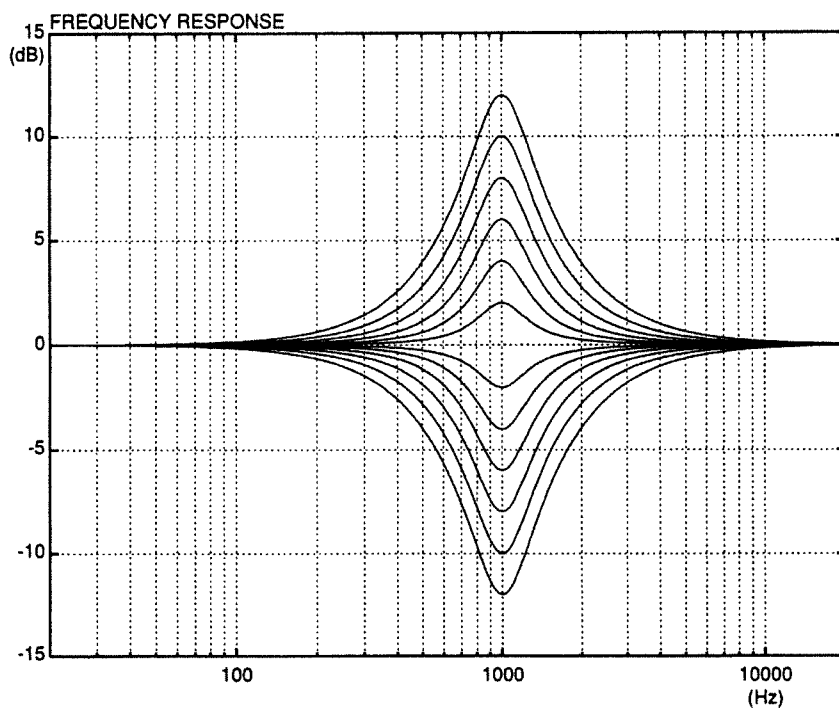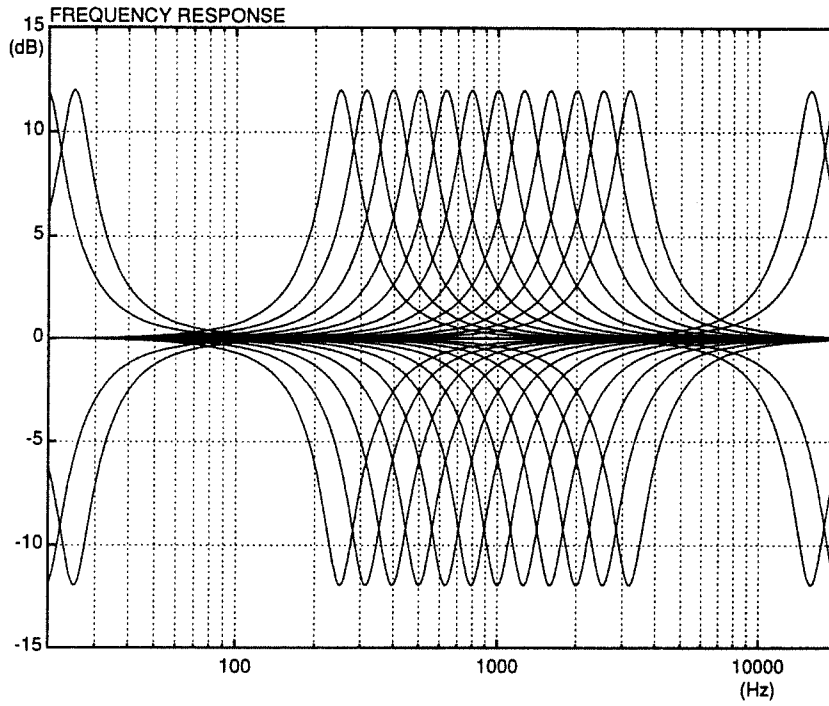
91 Band EQUALIZER

LEVEL(dB):   −12 / +12

FREQUENCY RESPONSE

\<AFB mode / PEQ mode / GEQ mode>
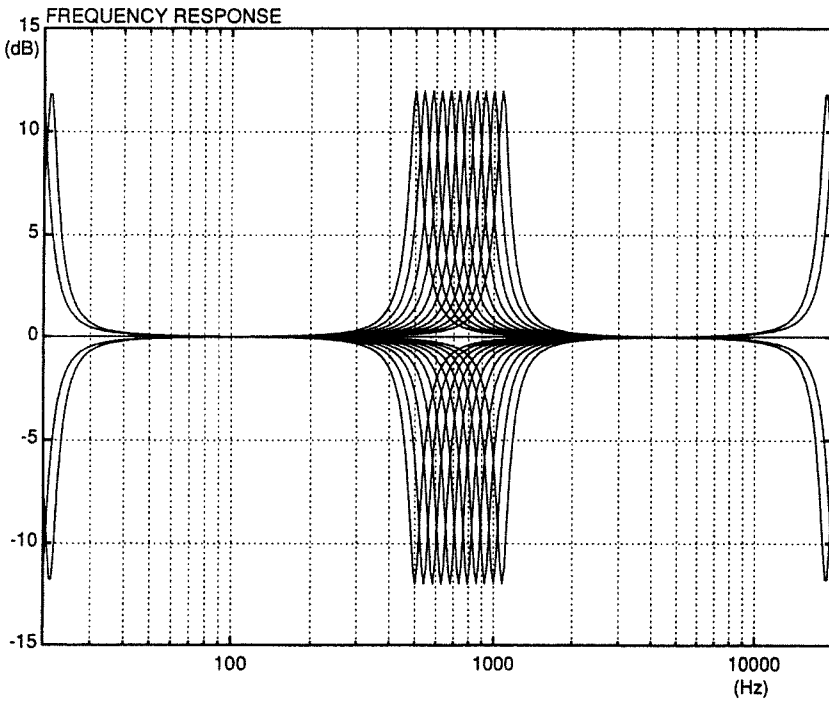
FILTER TYPE: HPF / LPF   FREQUENCY(Hz):   25 to 200 / 2500 to 16000

TYPE: −12 dB/oct

FREQUENCY RESPONSE

\<AFB mode / PEQ mode / GEQ mode>

FILTER TYPE: HPF / LPF   FREQUENCY(Hz):   25 to 200 / 2500 to 16000

TYPE: −6 dB/oct

FREQUENCY RESPONSE

Parameter Table

AFB


```
EDIT ── FILTER NUMBER
        AUTO ──┬─ FREQUENCY
               ├─ Q
               └─ LEVEL
        MANUAL ─┬─ FILTER TYPE
                ├─ FREQUENCY
                ├─ Q
                └─ LEVEL
GRAPH ──┬─ ZOOM/SCROLL
        └─ SELECT
```

PEQ


```
EDIT ── BAND NUMBER ─┬─ FILTER TYPE
                     ├─ FREQUENCY
                     ├─ Q
                     └─ LEVEL
GRAPH ──┬─ ZOOM/SCROLL
        └─ SELECT
```
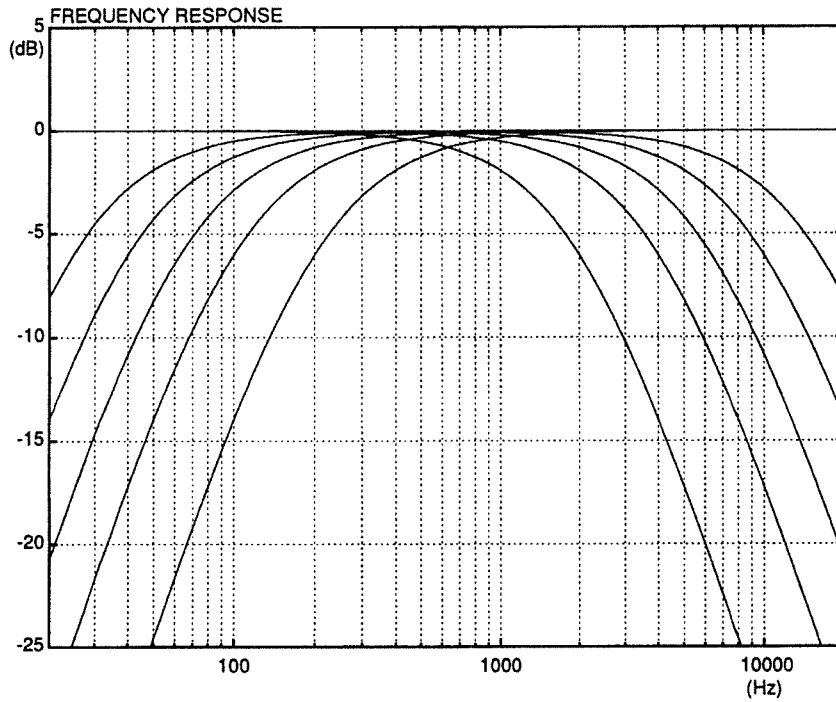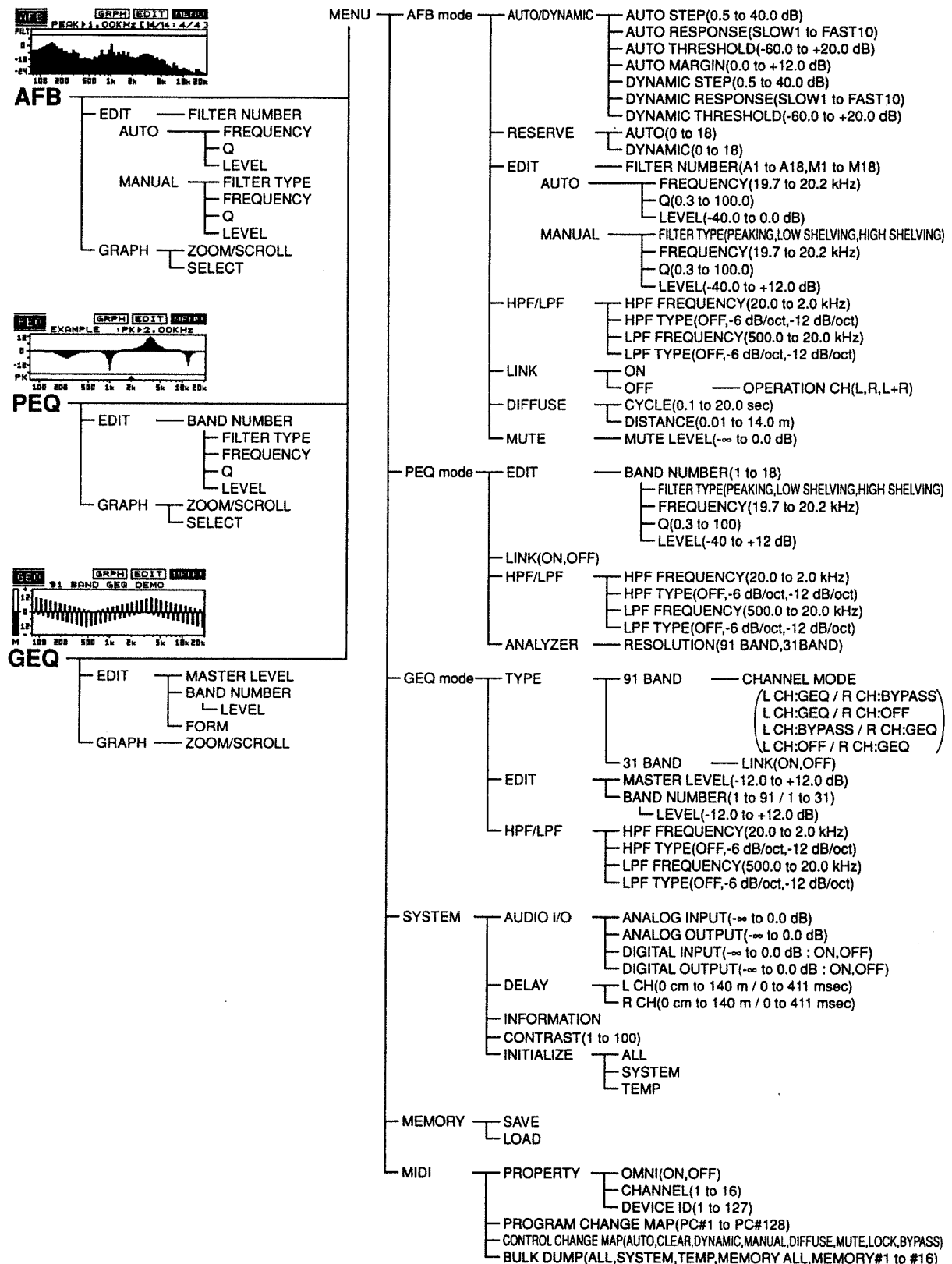
GEQ


```
EDIT ──┬─ MASTER LEVEL
       ├─ BAND NUMBER
       │   └─ LEVEL
       └─ FORM
GRAPH ── ZOOM/SCROLL
```

```
MENU ──┬─ AFB mode ──┬─ AUTO/DYNAMIC ──┬─ AUTO STEP(0.5 to 40.0 dB)
       │             │                 ├─ AUTO RESPONSE(SLOW1 to FAST10)
       │             │                 ├─ AUTO THRESHOLD(-60.0 to +20.0 dB)
       │             │                 ├─ AUTO MARGIN(0.0 to +12.0 dB)
       │             │                 ├─ DYNAMIC STEP(0.5 to 40.0 dB)
       │             │                 ├─ DYNAMIC RESPONSE(SLOW1 to FAST10)
       │             │                 └─ DYNAMIC THRESHOLD(-60.0 to +20.0 dB)
       │             ├─ RESERVE ──┬─ AUTO(0 to 18)
       │             │            └─ DYNAMIC(0 to 18)
       │             ├─ EDIT ── FILTER NUMBER(A1 to A18,M1 to M18)
       │             │          AUTO ──┬─ FREQUENCY(19.7 to 20.2 kHz)
       │             │                 ├─ Q(0.3 to 100.0)
       │             │                 └─ LEVEL(-40.0 to 0.0 dB)
       │             │          MANUAL ─┬─ FILTER TYPE(PEAKING,LOW SHELVING,HIGH SHELVING)
       │             │                  ├─ FREQUENCY(19.7 to 20.2 kHz)
       │             │                  ├─ Q(0.3 to 100.0)
       │             │                  └─ LEVEL(-40.0 to +12.0 dB)
       │             ├─ HPF/LPF ──┬─ HPF FREQUENCY(20.0 to 2.0 kHz)
       │             │            ├─ HPF TYPE(OFF,-6 dB/oct,-12 dB/oct)
       │             │            ├─ LPF FREQUENCY(500.0 to 20.0 kHz)
       │             │            └─ LPF TYPE(OFF,-6 dB/oct,-12 dB/oct)
       │             ├─ LINK ──┬─ ON
       │             │         └─ OFF ── OPERATION CH(L,R,L+R)
       │             ├─ DIFFUSE ──┬─ CYCLE(0.1 to 20.0 sec)
       │             │            └─ DISTANCE(0.01 to 14.0 m)
       │             └─ MUTE ── MUTE LEVEL(-∞ to 0.0 dB)
       │
       ├─ PEQ mode ──┬─ EDIT ── BAND NUMBER(1 to 18)
       │             │          ├─ FILTER TYPE(PEAKING,LOW SHELVING,HIGH SHELVING)
       │             │          ├─ FREQUENCY(19.7 to 20.2 kHz)
       │             │          ├─ Q(0.3 to 100)
       │             │          └─ LEVEL(-40 to +12 dB)
       │             ├─ LINK(ON,OFF)
       │             ├─ HPF/LPF ──┬─ HPF FREQUENCY(20.0 to 2.0 kHz)
       │             │            ├─ HPF TYPE(OFF,-6 dB/oct,-12 dB/oct)
       │             │            ├─ LPF FREQUENCY(500.0 to 20.0 kHz)
       │             │            └─ LPF TYPE(OFF,-6 dB/oct,-12 dB/oct)
       │             └─ ANALYZER ── RESOLUTION(91 BAND,31 BAND)
       │
       ├─ GEQ mode ──┬─ TYPE ──┬─ 91 BAND ── CHANNEL MODE
       │             │         │             ⎛ L CH:GEQ / R CH:BYPASS ⎞
       │             │         │             ⎜ L CH:GEQ / R CH:OFF    ⎟
       │             │         │             ⎜ L CH:BYPASS / R CH:GEQ ⎟
       │             │         │             ⎝ L CH:OFF / R CH:GEQ    ⎠
       │             │         └─ 31 BAND ── LINK(ON,OFF)
       │             ├─ EDIT ──┬─ MASTER LEVEL(-12.0 to +12.0 dB)
       │             │         └─ BAND NUMBER(1 to 91 / 1 to 31)
       │             │             └─ LEVEL(-12.0 to +12.0 dB)
       │             └─ HPF/LPF ──┬─ HPF FREQUENCY(20.0 to 2.0 kHz)
       │                          ├─ HPF TYPE(OFF,-6 dB/oct,-12 dB/oct)
       │                          ├─ LPF FREQUENCY(500.0 to 20.0 kHz)
       │                          └─ LPF TYPE(OFF,-6 dB/oct,-12 dB/oct)
       │
       ├─ SYSTEM ──┬─ AUDIO I/O ──┬─ ANALOG INPUT(-∞ to 0.0 dB)
       │           │              ├─ ANALOG OUTPUT(-∞ to 0.0 dB)
       │           │              ├─ DIGITAL INPUT(-∞ to 0.0 dB : ON,OFF)
       │           │              └─ DIGITAL OUTPUT(-∞ to 0.0 dB : ON,OFF)
       │           ├─ DELAY ──┬─ L CH(0 cm to 140 m / 0 to 411 msec)
       │           │          └─ R CH(0 cm to 140 m / 0 to 411 msec)
       │           ├─ INFORMATION
       │           ├─ CONTRAST(1 to 100)
       │           └─ INITIALIZE ──┬─ ALL
       │                           ├─ SYSTEM
       │                           └─ TEMP
       │
       ├─ MEMORY ──┬─ SAVE
       │           └─ LOAD
       │
       └─ MIDI ──┬─ PROPERTY ──┬─ OMNI(ON,OFF)
                 │             ├─ CHANNEL(1 to 16)
                 │             └─ DEVICE ID(1 to 127)
                 ├─ PROGRAM CHANGE MAP(PC#1 to PC#128)
                 ├─ CONTROL CHANGE MAP(AUTO,CLEAR,DYNAMIC,MANUAL,DIFFUSE,MUTE,LOCK,BYPASS)
                 └─ BULK DUMP(ALL,SYSTEM,TEMP,MEMORY ALL,MEMORY#1 to #16)
```

Advanced Equalizing Processor　　　　　　　　　　　　　　　　　　Date : Jan. 10, 1995

Model AP-700　　　　　**MIDI Implementation Chart**　　　　Version : 1.00

	Function...	Transmitted	Recognized	Remarks
Basic Channel	Default Changed	1 — 16 1 — 16	1 — 16 1 — 16	Memorized
Mode	Default Messages Altered	X X *************	OMNI ON/OFF X X	Memorized
Note Number :	True Voice	X *************	X X	
Velocity	Note ON Note OFF	X X	X X	
After Touch	Key's Ch's	X X	X X	
Pitch Bend		X	X	
Control Change	0 — 31	X	O *1	*2
	64 — 95	X	O *1	*2
Prog Change	: True #	X *************	O *1 0 — 127	
System Exclucive		O	O	
System Common	: Song Pos : Song Sel : Tune	X X X	X X X	
System Real Time	: Clock : Commands	X X	X X	
Aux Message	: Local ON/OFF : All Notes OFF : Active Sense : Reset	X X X X	X X X X	
Notes		* 1 Can be set manually to O/X, and permanently memorized. * 2 Made controllable by specifying one particular parameter. MIDI messages input from the MIDI IN connector are output from the MIDI OUT connector. **For detained information on MIDI data of the AP-700,** **a separate "MIDI Implementation document" is available at any Roland Service Station.**		

Mode 1 : OMNI ON, POLY　　Mode 2 : OMNI ON, MONO　　　　　　　　O : Yes

Mode 3 : OMNI OFF, POLY　Mode 4 : OMNI OFF, MONO　　　　　　　X : No

Main Specifications

AP-700: ADVANCED EQUALIZING PROCESSOR

•A/D Conversion
20 bit 64 times oversampling $\Delta\Sigma$ Conversion

•D/A Conversion
20 bit 8 times oversampling

•Sampling Frequency
44.1 / 48 kHz

•Program Memory
16

•Frequency Response
8 to 22.5 kHz (+0 / –3 dB) at 48 kHz Sampling

•Nominal Input Level
+4 dBm (Balanced)

•Input Impedance
30 kΩ: 2pin(COLD) – 3pin(HOT)
10 kΩ: 1pin(GND) – 3pin(HOT)/1pin(GND) – 2pin(COLD)

•Head Room
20 dB

•Nominal Output Level
+4 dBm (Balanced) into 600 Ω

•Output Impedance
350 Ω: 2pin(COLD) – 3pin(HOT)
100 Ω: 1pin(GND) – 3pin(HOT)/1pin(GND) – 2pin(COLD)

•Maximum Output Level
24 dBm into 600 Ω

•Total Harmonic Distortion
0.02 % or Less at 1 kHz; +4 dBm into 600 Ω

•Dynamic Range
105 dB or greater (IHF-A)

•Controls
INPUT LEVEL Knobs (L, R)
Cursor Buttons (Up, Down, Right, Left)
Value Buttons (Up, Down)
ENTER Button
EXIT Button
AUTO Button
DYNAMIC Button
MANUAL Button
CLEAR Button
DIFFUSE Button
MUTE Button
BYPASS Button
LOCK Button
POWER Switch

•Display
160 x 64 (backlit Graphic LCD)

•Indicators
INPUT Level Indicator (7 points Stereo)

MIDI Indicator

•Connectors
INPUT Jacks (L, R) XLR, PHONE

OUTPUT Jacks (L, R) XLR, PHONE

DIGITAL I/O Connectors (IN, OUT) (XLR; AES/EBU)

MIDI Connectors (IN, OUT)

•Power Supply
AC117 V, AC230 V or AC240 V

•Power Consumption
27 W

•Dimensions
482 (W) x 359 (D) x 44 (H) mm

19 (W) x 14-3/16 (D) x 1-3/4 (H) inches

(EIA-1U rack mount type)

•Weight
4.5 kg / 9 lbs 15oz

•Accessories
Owner's Manual

* 0 dBm = 0.775 Vrms

* The specifications for this product are subject to change without prior notice.

Index

Information

When you need repair service, call your local Roland Service Station or the authorized Roland distributor in your country as shown below.

U. S. A.
Roland Corporation U.S.
7200 Dominion Circle
Los Angeles, CA. 90040-3696, U. S. A.
TEL: (213) 685 5141

CANADA
Roland Canada Music Ltd.
(Head Office)
5480 Parkwood Way
Richmond B. C., V6V 2M4
CANADA
TEL: (604) 270 6626

Roland Canada Music Ltd.
(Montreal Office)
9425 Transcanadienne
Service Rd. N., St Laurent,
Quebec H4S 1V3, CANADA
TEL.: (514) 335 2009

Roland Canada Music Ltd.
(Toronto Office)
346 Watline Avenue,
Mississauga, Ontario L4Z
1X2, CANADA
TEL.: (416) 890 6488

AUSTRALIA
Roland Corporation
Australia Pty. Ltd.
38 Campbell Avenue
Dee Why West. NSW 2099
AUSTRALIA
TEL: (02) 982 8266

NEW ZEALAND
Roland Corporation
(NZ) Ltd.
97 Mt. Eden Road, Mt. Eden,
Auckland 3, NEW
ZEALAND
TEL: (09) 3098 715

UNITED KINGDOM
Roland (U.K.) Ltd.
Rye Close Ancells Business
Park Fleet, Hampshire GU13
8UY, UNITED KINGDOM
TEL: (0252) 816181

Roland (U.K.) Ltd.,
Swansea Office
Atlantic Close, Swansea
Enterprise Park, Swansea,
West Glamorgan SA79FJ,
UNITED KINGDOM
TEL: (0792) 700 139

IRELAND
The Dublin Service
Centre Audio
Maintenance Limited
11 Brunswick Place Dublin 2
Republic of Ireland
TEL: (01) 677322

ITALY
Roland Italy S. p. A.
Viale delle Industrie 8 20020
ARESE MILANO ITALY
TEL: (02) 93581311

SPAIN
Roland Electronics
de España, S. A.
Calle Bolivia 239 08020
Barcelona, SPAIN
TEL: (93) 308 1000

GERMANY
Roland Elektronische
Musikinstrumente
Handelsgesellschaft mbH.
Oststrasse 96, 22844
Norderstedt. GERMANY
TEL: (040) 52 60090

FRANCE
Guillard Musiques Roland
ZAC de Rosarge Les Echets
01700
MIRIBEL FRANCE
TEL: (72) 26 5060

Guillard Musiques Roland
(Paris Office)
1923 rue Léon Geoffroy
94400 VITRY-SUR-SEINE
FRANCE
TEL: (1) 4680 86 62

BELGIUM/HOLLAND/ LUXEMBOURG
Roland Benelux N. V.
Houtstraat 1 B-2260 Oevel-
Westerlo BELGIUM
TEL: (014) 575811

DENMARK
Roland Scandinavia A/S
Langebrogade 6 Box 1937
DK-1023 Copenhagen K.
DENMARK
TEL: 31 95 31 11

SWEDEN
Roland Scandinavia A/S
Danvik Center 28 A, 2 tr.
S-131 30 Nacka SWEDEN
TEL: (08) 702 0020

NORWAY
Roland Scandinavia
Avd. Kontor Norge
Lilleakerveien 2 Postboks 95
Lilleaker N-0216 Oslo 2
NORWAY
TEL: (02) 73 0074

FINLAND
Fazer Musik Inc.
Länsituulentie POB 169,
SF-02101 Espoo FINLAND
TEL: (00) 43 5011

SWITZERLAND
Roland (Switzerland) AG
Musitronic AG
Gerberstrasse 5, CH-4410
Liestal, SWITZERLAND
TEL: (061) 921 1615

AUSTRIA
E. Dematte &Co.
Neu-Rum Siemens-Strasse 4
A-6040 Innsbruck P.O.Box
83
AUSTRIA
TEL: (0512) 26 44 260

GREECE
V. Dimitriadis & Co. Ltd.
20, Alexandras St. &
Bouboulinas 54 St. 106 82
Athens, GREECE
TEL: (01) 8232415

PORTUGAL
Caius - Tecnologias
Audio e Musica , Lda.
Rue de Catarina 131
4000 Porto, PORTUGAL
TEL: (02) 38 4456

HUNGARY
Intermusica Ltd.
Warehouse Area 'DEPO'
Pf.83 H-2046 Torokbalint,
Budapest HUNGARY
TEL: (1) 1868905

ISRAEL
D.J.A. International Ltd.
Twin Towers, 33 Jabntinsy St.
Room 211, Ramat Gan 52511
ISRAEL
TEL: (03) 751 8585

CYPRUS
Radex Sound
Equipment Ltd.
17 Diagorou St., P.O.Box
2046, Nicosia CYPRUS
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