Feedback Ferret™ II Operations Manual

precision stereo digital dynamic anti-feedback filter array

Intended to alert the user 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.

Intended to alert the user of the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

CAUTION: Risk of electrical shock — DO NOT OPEN!
CAUTION: To reduce the risk of electric shock, do not remove cover. No user serviceable parts inside. Refer servicing to qualified service personnel.

WARNING: To prevent electrical shock or fire hazard, do not expose this appliance to rain or moisture. Before using this appliance, read the operating guide for further warnings.

Este símbolo tiene el propósito, de alertar al usuario de la presencia de "(voltaje) peligroso" sin aislamiento dentro de la caja del producto y que puede tener una magnitud suficiente como para constituir riesgo de descarga eléctrica.

Este símbolo tiene el propósito de alertar al usario de la presencia de instruccones importantes sobre la operación y mantenimiento en la información que viene con el producto.

PRECAUCION: Riesgo de descarga eléctrica ¡NO ABRIR!
PRECAUCION: Para disminuír el riesgo de descarga eléctrica, no abra la cubierta. No hay piezas útiles dentro. Deje todo mantenimiento en manos del personal técnico cualificado.

ADVERTENCIA: Para evitar descargas eléctricas o peligro de incendio, no deje expuesto a la lluvia o humedad este aparato Antes de usar este aparato, lea más advertencias en la guía de operación.

Ce symbole est utilisé dans ce manuel pour indiquer à l'utilisateur la présence d'une tension dangereuse pouvant être d'amplitude suffisante pour constituer un risque de choc électrique.

Ce symbole est utilisé dans ce manuel pour indiquer à l'utilisateur qu'il ou qu'elle trouvera d'importantes instructions concernant l'utilisation et l'entretien de l'appareil dans le paragraphe signalé.

ATTENTION: Risques de choc électrique — NE PAS OUVRIR!
ATTENTION: Afin de réduire le risque de choc électrique, ne pas enlever le couvercle. Il ne se trouve à l'intérieur aucune pièce pouvant être reparée par l'utilisateur. Confiez l'entretien et la réparation de l'appareil à un réparateur Peavey agréé.

AVERTISSEMENT: Afin de prévenir les risques de décharge électrique ou de feu, n'exposez pas cet appareil à la pluie ou à l'humidité. Avant d'utiliser cet appareil, lisez attentivement les avertissements supplémentaires de ce manuel.

Dieses Symbol soll den Anwender vor unisolierten gefährlichen Spannungen innerhalb des Gehäuses warnen, die von Ausreichender Stärke sind, um einen elektrischen Schlag verursachen zu können.

Dieses Symbol soll den Benutzer auf wichtige Instruktionen in der Bedienungsanleitung aufmerksam machen, die Handhabung und Wartung des Produkts betreffen.

VORSICHT: Risiko — Elektrischer Schlag! Nicht öffnen!
VORSICHT: Um das Risiko eines elektrischen Schlages zu vermeiden, nicht die Abdeckung enfernen. Es befinden sich keine Teile darin, die vom Anwender repariert werden könnten. Reparaturen nur von qualifiziertem Fachpersonal durchführen lassen.

ACHTUNG: Um einen elektrischen Schlag oder Feuergefahr zu vermeiden, sollte dieses Gerät nicht dem Regen oder Feuchtigkeit ausgesetzt werden. Vor Inbetriebnahme unbedingt die Bedienungsanleitung lesen.

IMPORTANT SAFETY INSTRUCTIONS

WARNING: When using electrical products, basic cautions should always be followed, including the following:

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with a dry cloth.
7. Do not block any of the ventilation openings. Install in accordance with manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding plug. The wide blade or third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point they exit from the apparatus.
11. Note for UK only: If the colors of the wires in the mains lead of this unit do not correspond with the terminals in your plug, proceed as follows:

    a) The wire that is colored green and yellow must be connected to the terminal that is marked by the letter E, the earth symbol, colored green or colored green and yellow.

    b) The wire that is colored blue must be connected to the terminal that is marked with the letter N or the color black.

    c) The wire that is colored brown must be connected to the terminal that is marked with the letter L or the color red.
12. Only use attachments/accessories provided by the manufacturer.
13. Use only with a cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
14. Unplug this apparatus during lightning storms or when unused for long periods of time.
15. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
16. Never break off the ground pin. Write for our free booklet "Shock Hazard and Grounding." Connect only to a power supply of the type marked on the unit adjacent to the power supply cord.
17. If this product is to be mounted in an equipment rack, rear support should be provided.
18. Exposure to extremely high noise levels may cause a permanent hearing loss. Individuals vary considerably in susceptibility to noise-induced hearing loss, but nearly everyone will lose some hearing if exposed to sufficiently intense noise for a sufficient time. The U.S. Government's Occupational Safety and Health Administration (OSHA) has specified the following permissible noise level exposures:

Duration Per Day In Hours	Sound Level dBA, Slow Response
8	90
6	92
4	95
3	97
2	100
1 ½	102
1	105
½	110
¼ or less	115

According to OSHA, any exposure in excess of the above permissible limits could result in some hearing loss. Ear plugs or protectors to the ear canals or over the ears must be worn when operating this amplification system in order to prevent a permanent hearing loss, if exposure is in excess of the limits as set forth above. To ensure against potentially dangerous exposure to high sound pressure levels, it is recommended that all persons exposed to equipment capable of producing high sound pressure levels such as this amplification system be protected by hearing protectors while this unit is in operation.

SAVE THESE INSTRUCTIONS!

ENGLISH

Feedback Ferret™ II precision stereo digital dynamic anti-feedback filter array

Find it. Fix it. Forget it! The Feedback Ferret strikes again—automatically. You can now eliminate feedback in stereo via 16 filters on each of its two channels. The Feedback Ferret II has all the features that made the original Ferret so remarkable, including precise digital filters that locate exact problem frequencies, balanced I/O and an internal power supply.

The Ferret II applies **16 stereo digital dynamic filters** (or 32 filters in dual mono mode) at a resolution of **24 bits**, automatically controlling feedback without sacrificing volume or tone. This feedback eliminator uses sophisticated algorithms to distinguish between music and feedback, so it won't destroy your sound. Although there is no substitute for a good soundman, the Ferret II can greatly improve most sound applications.

Please read this guide carefully to ensure your personal safety as well as the safety of your equipment.

Features

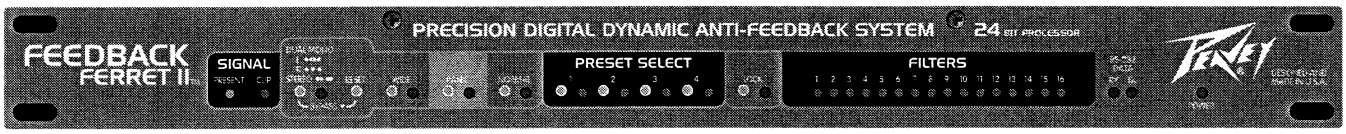
- Sophisticated **seek and destroy algorithms** that find, lock in and reduce offending frequencies
- **24-bit converters** and a **sample rate of 48 kHz**
- **16 stereo, dynamically controlled digital notch filters** (or 32 filters in dual mono mode) configured for 1/12 octave performance give the Ferret II more feedback control than any other unit on the market
- **Four preset locations** allow you to store settings for your most common performance venues
- **Disable button** located on rear panel allows you to quickly disable the front panel once your settings are made
- **+4 or -10 dB switches** on each in/out
- **RS-232 port** for future expandability
- **Wide/Narrow button** changes the width of filters (more on this later)
- **Reset button** resets some or all of the filters

QUICK SETUP

1. Turn off power to all units in your signal path.
2. Insert the Ferret II into your signal path between the mixer and power amp. Make sure your speakers are connected. Connect the mixer's main output and/or monitor output (depending on your application) to the Ferret II's input. Connect one of the Ferret II's outputs to the power amp input. Connect all microphones.
3. Power up all units with the master volume completely down. *(Remember: You should turn your power amp ON LAST and OFF FIRST.)* Make sure the Ferret II is NOT set to **Normal Mode (LED off)**. *(Remember: you want a fairly quiet room with the microphone levels up and no signal going through the system.)*
4. Slowly bring up the master volume. The Ferret II starts to work as feedback occurs, beginning with filter 1. The filter LEDs will blink as the filters are needed, letting you know that a feedback frequency has been found and the filter defined. Expect some LEDs to light solidly as filters lock down on problem frequencies.
5. Once the feedback is eliminated and filters are set, depress the Normal button on the front panel of the Ferret II and return the mixer gain to a normal level. That's it! Your Ferret II is working for you.

FOR BEST RESULTS, PLEASE READ THE ENTIRE OPERATING GUIDE.

Feedback Ferret II™ Front Panel Controls



Signal
The Present LED lights when a signal is present (40 dB down from full scale). The Clip LED lights when the signal is 1/2 dB down from clipping.

Stereo/Dual Mono
Pressing and holding the Stereo button alternates the Ferret II between Stereo and Dual Mono mode. Operating in Stereo mode, the Ferret II eliminates feedback from the left and right channels. In Dual Mono mode, the Ferret II acts as two separate units and can eliminate feedback from both the mains and monitors. See the hookup guide in this manual for connection possibilities. Graphics on the front panel indicate how the LEDs flashes differently for each mode.

Bypass
To bypass the unit, press the Stereo and Reset buttons simultaneously. This takes the Ferret II out of the signal path completely. Use caution when engaging the Bypass, as feedback could occur again—very loudly! When in Bypass mode, the Signal present and Clip LEDs will blink alternately. The status of the filters may be observed by pressing the Stereo button. The Ferret II will exit Bypass when the Reset button is pressed.

Reset
The Reset button has two stages. By pressing and holding the reset button, all filter LEDs will begin to flash. Filters 9–16 (dynamic) will clear first, as indicated by their non-lit LEDs. Releasing the button at this point will leave the static filters (1–8) in their current state. Continuing to hold the reset button will clear the remaining filters 1–8 (static).

Wide
Engaging the Wide button increases the range of frequencies each filter affects. The LED lights when Wide is activated. *(Note: Feedback often occurs around a range of pitches or frequencies, not necessarily at a single pitch. By engaging this button, the Ferret II widens the effective range of each filter and subsequently uses fewer filters to accomplish the same result.)*

Panic
Panic filters are a special class of filters designed to quickly control sudden, extreme feedback. Panic is automatically engaged in Normal operating mode. The LED lights when Panic is activated.

Normal
Activated after setting up for each venue. Automatically engages the Panic filters. Deactivated in Setup mode.

Preset Select
The Ferret II provides four preset locations and associated LEDs. Press and hold to store. Press to recall. A preset stores all front panel settings.

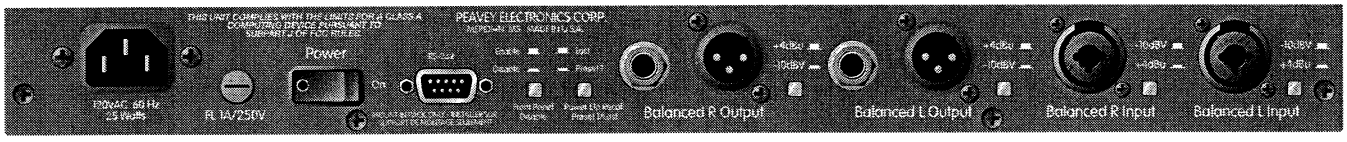
Lock
Stops the Ferret II from engaging new filters, but keeps the filters already defined in place.

Filters
There are two sets of filters on the Ferret II. Filters 1–8 are static and always set before the dynamic filters. Once these static filters are defined, they lock and maintain their status until they are reset. The dynamic filters (9–16) are those filters that change as input changes (i.e., volume changes, etc.).

RS-232 Data
The RX and TX LEDs indicate data received and transmitted, respectively, via the RS-232 port located on the Ferret II's rear panel.

Power
This LED lights when AC power is supplied and the power switch is on.

Feedback Ferret II™ Back Panel



AC Power
This is a standard IEC power connector. A mains cord with the appropriate AC plug and ratings for the intended operating voltage is included. The mains cord should be connected to the unit before plugging into a suitable AC outlet.

Fuse
Domestic: 1 Amp Slow-Blow
Export: 500 mA Time Delay

Power Switch
This switch supplies AC mains power to the internal power supply. When the unit is functioning, the Power LED on the front panel will illuminate.

RS-232 Port
This port allows for connection to a computer or peripheral device.

Watch our Web site (www.peavey.com) for exciting product announcements on upcoming support for the RS-232 Port.

Front Panel Disable Switch
When the **Disable** switch is engaged, all buttons on the front of the unit are disabled. Use this switch to prevent accidental changes to your settings once you've set up your system.

Power-Up Recall
This button determines, upon powering up, whether the unit recalls the last settings used or Preset 1.

Outputs
1/4" TRS balanced audio outputs

[tip = positive; ring = negative; sleeve = ground]

XLR balanced audio outputs

[pin 1 = ground; pin 2 = positive; pin 3 = negative]

unbalanced

[tip = positive; sleeve = ground]

Inputs
XLR and 1/4" combo jack, 1/4" TRS balanced audio inputs

[tip = positive; ring = negative; sleeve = ground]

XLR balanced audio inputs

[pin 1 = ground; pin 2 = positive; pin 3 = negative]

unbalanced

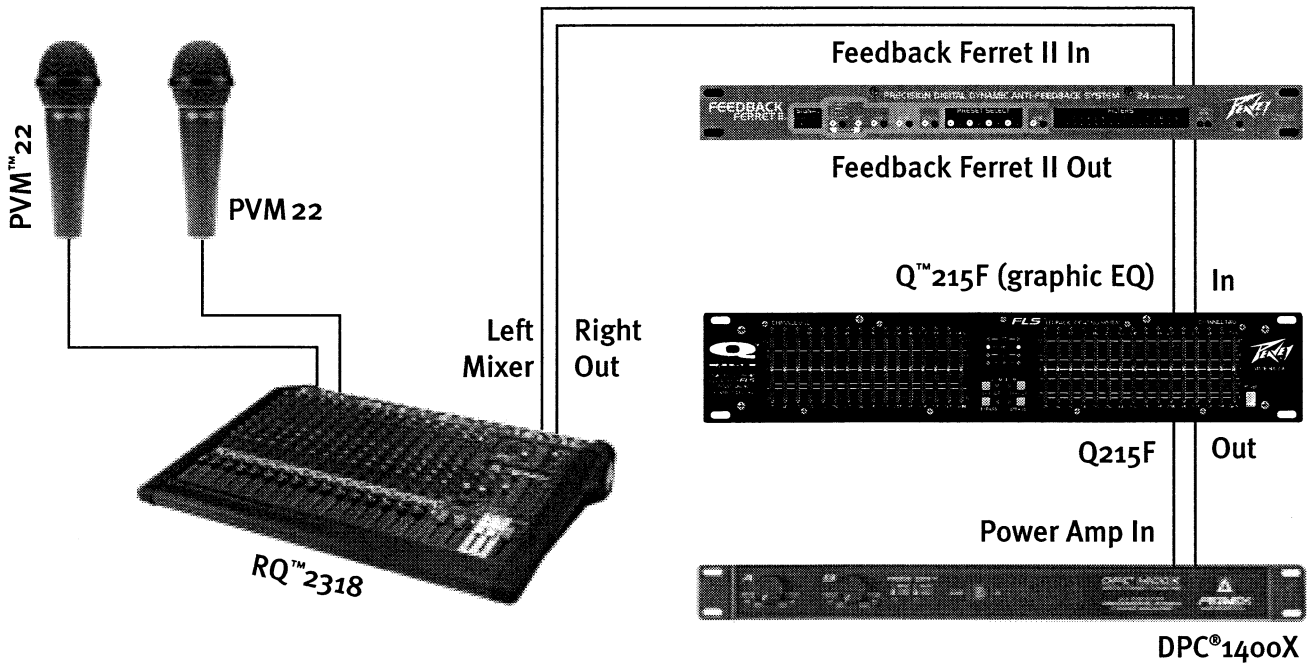
[tip = positive; sleeve = ground]

Output Level
Sets the output level for +4 dBu (nominal), +18 dBu (max); or -10 dBV (nominal), +4 dBV (max).

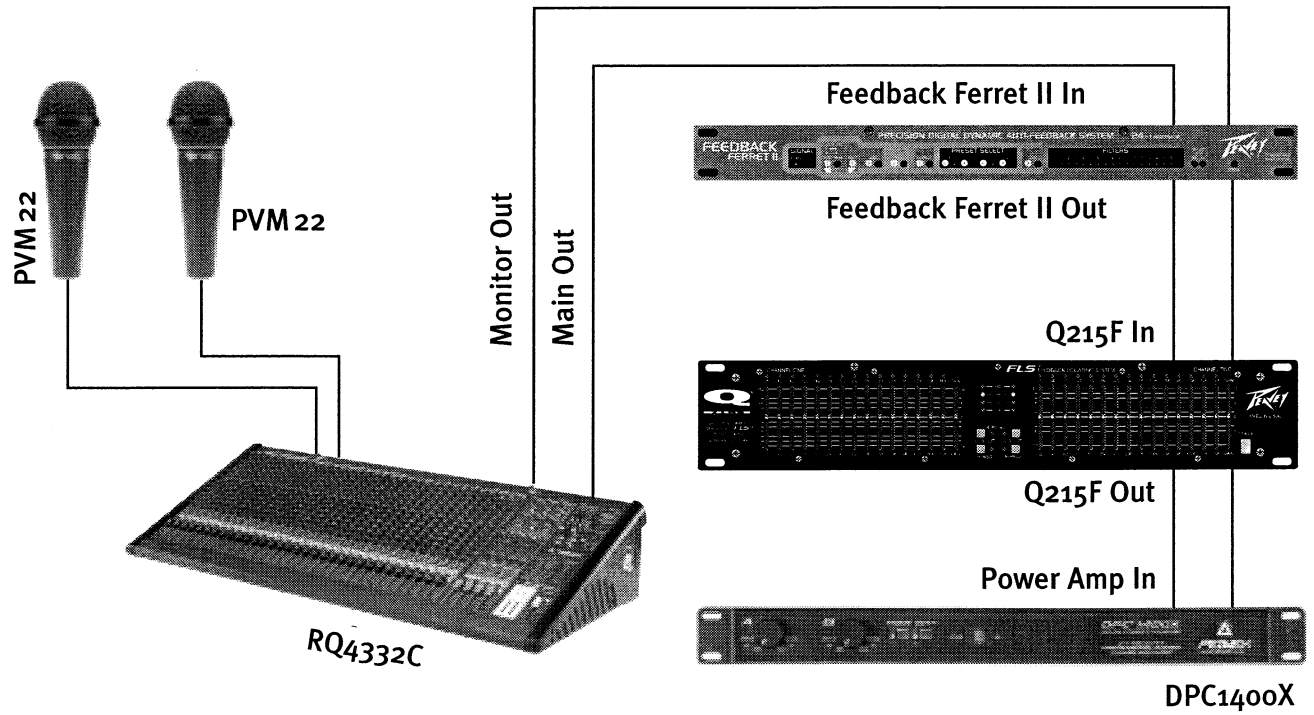
Input Level
Sets the input level for +4 dBu (nominal), +18 dBu (max); or -10 dBV (nominal), +4 dBV (max).

Feedback Ferret II™ Hookup Diagrams

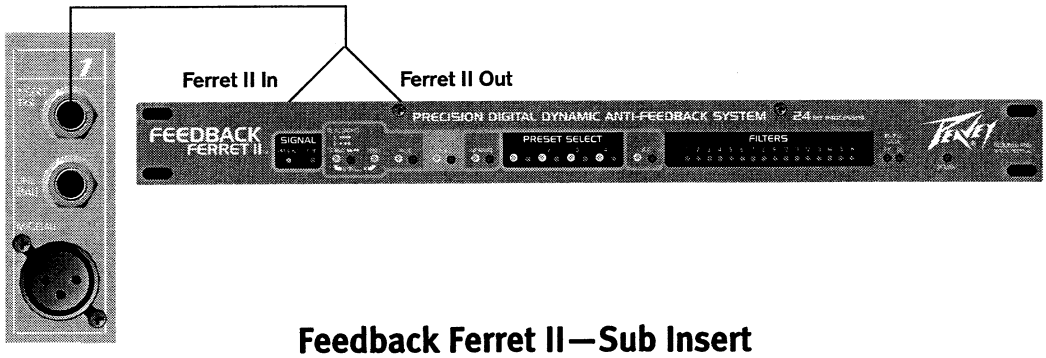
Feedback Ferret II—Stereo Mode



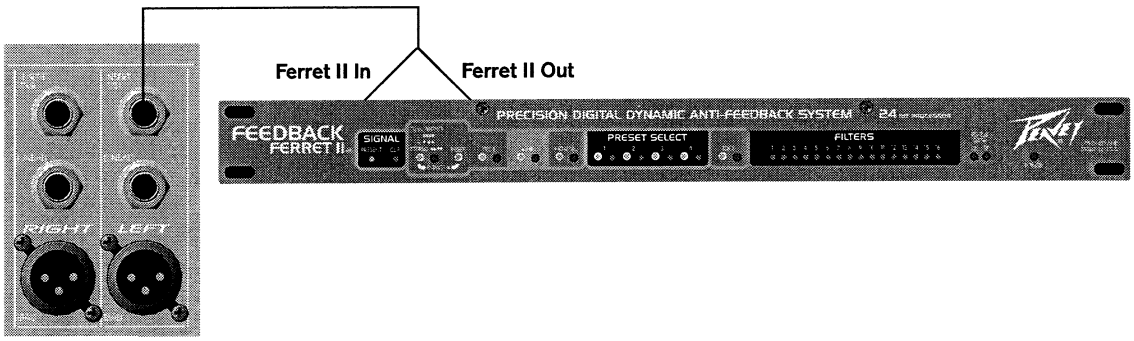
Feedback Ferret II—Dual Mono Mode: Mains & Monitor



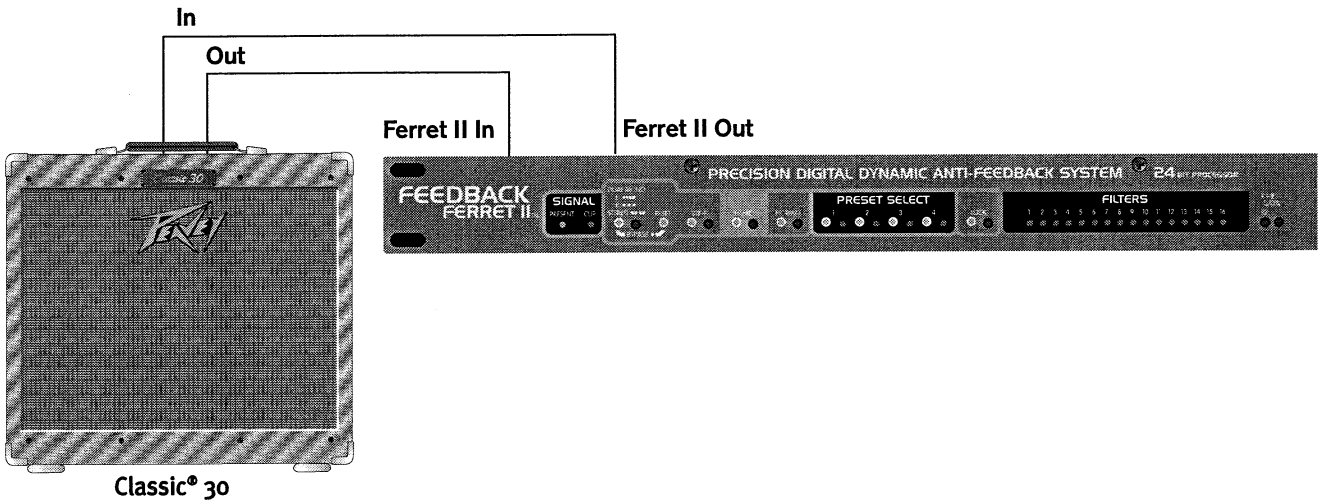
Feedback Ferret II™—Single Channel Insert



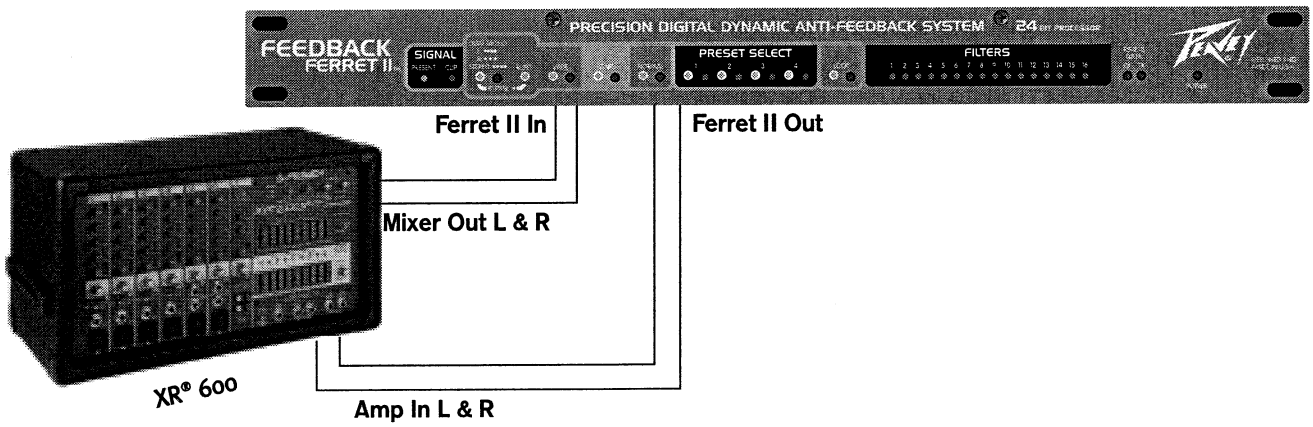
Feedback Ferret II—Sub Insert



Feedback Ferret II—Instrument Amp



Feedback Ferret II—Powered Mixer



Operating Instructions

Where To Put Your Feedback Ferret™ II

The Feedback Ferret II can be used in a variety of locations within a sound system. Place a Ferret II at the input insert of every microphone, or process multiple microphones together by placing a single Ferret II on the output of a vocal subgroup. One of the most common uses is to install the Ferret II between the power amp's input and the mixer's output (the main output or the monitor output, depending on your needs). You can also place the Ferret II on a single channel's insert to eliminate feedback from a single microphone or instrument. Once the Ferret II has determined the problem frequencies for a particular setup, you can save that group of filter settings to one of the four preset buttons for instant recall.

How Does It Work?

The Ferret II's dual sets of 16 digital notch filters employ sophisticated algorithms to seek and destroy feedback without destroying your tone. There are two sets of filters on the Ferret II, **static** and **dynamic**. Filters 1–8 are static and always set before the dynamic filters (9–16). Once these static filters are set, they lock and maintain their status until the user either resets them or selects a preset. The dynamic filters (9–16) are those that change as your needs change. Any filter (static or dynamic) that is set but not locked in (as indicated by blinking filter LED) will slowly return to flat (0 dB) and be available for use.

The Ferret II applies a filter when it locates an offending frequency (feedback), starting with filter 1. This filter is centered at the feedback frequency and uses only as much attenuation as needed to remove the feedback. If feedback continues, the filter depth is progressively increased until the feedback is gone. If the feedback is momentary, such as a short squeal, the Ferret II applies a filter but slowly releases it in .10 dB steps until it is returned to flat (0 dB). If the same frequency causes feedback again, the same filter will be reapplied. This process continues as additional filters are engaged until all feedback is gone. Monitoring continues as the Ferret II attempts to release each active unlocked filter .10 dB at a time. Once a filter reaches 0 dB, the Ferret II returns the filter to the available queue.

Setup

For best results, complete the Setup in a relatively quiet room. This allows the Ferret II to find primary acoustic feedback frequencies. Every room and setup has problem frequencies. This makes each room different and creates different feedback problems. It is important to understand that while in Setup mode, the Ferret II does not distinguish between feedback and music. If you play music through the system while in Setup mode, the Ferret II will try to eliminate it.

Step One

These instructions assume you have connected the Ferret II from the mixer outputs and not from a single channel insert. Make sure the Normal LED is off (this engages Setup mode) and that your microphone levels are set. **Slowly** bring up the master level. You should see the filters seek and lock as feedback starts to occur. The Ferret II will begin with filter 1 and progress from left to right automatically. You will notice that each filter will first blink and then light solidly when each frequency is locked down. This is accomplished with the minimum amount of attenuation.

Step Two

Continue bringing the master level up until you've reached the required volume level. As you start to hear feedback, stop adjusting the levels momentarily to allow the Ferret II to complete its filter adjustment. Normally, you should hear the onset of feedback before the Ferret II takes control. In most applications, this should give you plenty of gain and still leave additional filters open for later use. If all or most of the filter LEDs are lit up, bring the master level back down, reset the filters and start over. But this time, push the Wide button on the front panel. This allows each filter to work on a wider range of frequencies, thereby freeing up additional filters for other uses. A typical room should only set one to six filters during this soundcheck setup. *(Note: If all or most of the filter LEDs light up, this probably indicates a bad room, bad system setup or too much volume!)*

Step Four

Finally, switch the unit to Normal mode. This automatically engages the Panic button. Your system should now be performance-ready! At this point, it is advisable to engage the Front Panel Disable Switch in order to minimize accidental changes. Once you are content with your settings, press and hold one of the preset buttons (1–4) to save your filter settings.

Note: The Ferret II is not a replacement for a good soundman. Good sound system performance starts with good microphone and speaker placement.

Feedback Ferret II™
SPECIFICATIONS

Input Impedance:
40 k ohm

Output Impedance:
120 ohm

Dynamic Range:
103 dBr @ 1 kHz ref to +18 dBu output
22 Hz to 22 kHz unweighted

Total Harmonic Distortion:
0.005% @ 1 kHz typical

Input Sensitivity:
+4 dBu nominal, +18 dBu full scale
-10 dBV nominal, +4 dBV full scale

Output Drive:
+4 dBu nominal, +18 dBu full scale
-10 dBV nominal, +4 dBV full scale

Dimensions:
Width: 19.000" (48.26 cm)
Depth: 8.000" (20.32 cm)
Height: 1.750" (4.45 cm)
Weight: 7.1 lbs. (3.95 kg)

Power:
Domestic: 120 VAC; 60 Hz; 25 Watts
Export: 230 VAC; 50/60 Hz; 25 Watts

Bypass:
True power-off bypass

Mounting:
One EIA rack space

Connections:
Balanced combo female

XLR/female 1/4" TRS for input

Separate balanced male XLR and female 1/4" TRS for output

RS-232 DB-9 for PC interface

Sample Rate:
48 kHz

Converters:
24 bit

Frequency Response:
+/- 0.5 dB

(20 Hz to 20 kHz, ref. 1 kHz)

Input Level:
Switchable +4 dBu and -10 dBv

Output Level:
Switchable +4 dBu and -10 dBv

Other Back Panel Controls:
Front panel disable

Power-up recall select

PEAVEY ELECTRONICS CORPORATION LIMITED WARRANTY

EFFECTIVE DATE: JULY 1, 1998

What This Warranty Covers
Your Peavey Warranty covers defects in material and workmanship in Peavey products purchased and serviced in the U.S.A. and Canada.

What This Warranty Does Not Cover
The Warranty does not cover: (1) damage caused by accident, misuse, abuse, improper installation or operation, rental, product modification or neglect; (2) damage occurring during shipment; (3) damage caused by repair or service performed by persons not authorized by Peavey; (4) products on which the serial number has been altered, defaced or removed; (5) products not purchased from an Authorized Peavey Dealer.

Who This Warranty Protects
This Warranty protects only the original retail purchaser of the product.

How Long This Warranty Lasts
The Warranty begins on the date of purchase by the original retail purchaser. The duration of the Warranty is as follows:

Product Category	Duration
Guitars/Basses, Amplifiers, Pre-Amplifiers, Mixers, Electronic Crossovers and Equalizers	2 years *(+ 3 years)
Drums	2 years *(+ 1 year)
Enclosures	3 years *(+ 2 years)
Digital Effect Devices and Keyboard and MIDI Controllers	1 year *(+ 1 year)
Microphones	2 years
Speaker Components (incl. speakers, baskets, drivers, diaphragm replacement kits and passive crossovers) and all Accessories	1 year
Tubes and Meters	90 days

[*Denotes additional warranty period applicable if optional Warranty Registration Card is completed and returned to Peavey by original retail purchaser within 90 days of purchase.]

What Peavey Will Do
We will repair or replace (at Peavey's discretion) products covered by warranty at no charge for labor or materials. If the product or component must be shipped to Peavey for warranty service, the consumer must pay initial shipping charges. If the repairs are covered by warranty, Peavey will pay the return shipping charges.

How To Get Warranty Service
(1) Take the defective item and your sales receipt or other proof of date of purchase to your Authorized Peavey Dealer or Authorized Peavey Service Center.
OR
(2) Ship the defective item, prepaid, to Peavey Electronics Corporation, International Service Center, 412 Highway 11 & 80 East, Meridian, MS 39301 or Peavey Canada Ltd., 95 Shields Court, Markham, Ontario, Canada L3R 9T5. Include a detailed description of the problem, together with a copy of your sales receipt or other proof of date of purchase as evidence of warranty coverage. Also provide a complete return address.

Limitation of Implied Warranties
ANY IMPLIED WARRANTIES, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO THE LENGTH OF THIS WARRANTY.
Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

Exclusions of Damages
PEAVEY'S LIABILITY FOR ANY DEFECTIVE PRODUCT IS LIMITED TO THE REPAIR OR REPLACEMENT OF THE PRODUCT, AT PEAVEY'S OPTION. IF WE ELECT TO REPLACE THE PRODUCT, THE REPLACEMENT MAY BE A RECONDITIONED UNIT. PEAVEY SHALL NOT BE LIABLE FOR DAMAGES BASED ON INCONVENIENCE, LOSS OF USE, LOST PROFITS, LOST SAVINGS, DAMAGE TO ANY OTHER EQUIPMENT OR OTHER ITEMS AT THE SITE OF USE, OR ANY OTHER DAMAGES WHETHER INCIDENTAL, CONSEQUENTIAL OR OTHERWISE, EVEN IF PEAVEY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.
Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This Warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

If you have any questions about this warranty or service received or if you need assistance in locating an Authorized Service Center, please contact the Peavey International Service Center at (601) 483-5365 / Peavey Canada Ltd. at (905) 475-2578.

FEATURES AND SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

Features and specifications subject to change without notice.

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