

1. *Why use an Equalizer?*
2. *What Constant Q can do for You*
3. *What makes ARX Equalizers better?*

---

### 1. *Why use an Equalizer?*

Equalization allows the user to vary the tonal characteristics of the signal being reproduced in an Audio chain or system. This can be for a variety of reasons. These may be:

1. In **Live Sound Systems** (both fixed installation and portable/touring) to correct for the frequency response of the environment in which the system is being used in order to reduce feedback rings and howl round, to correct for irregular room frequency response, to correct loudspeaker amplitude response.
2. In **fixed installations** equalizers can be used to tailor the frequency response of the system. For example background music needs a smooth mellow unobtrusive sound, and therefore less low and high frequency energy, while paging systems require high articulation for airports halls shopping centres, and therefore more midrange energy.
3. In **Studio** use to correct for the acoustics of the control room, equalise instruments vocals etc. In Studios used for Film/Video production equalizers can be used to compensate for screen loss, reducing air-conditioning rumble and other unwanted noise on soundtracks.
4. In **Broadcast** applications most of the above are applicable, as well as equalizing landlines and satellite uplinks and downlinks.

Professional analogue equalizers usually come in two types: Graphic and Parametric. For the moment we'll look at graphic equalizers. Parametric equalizers are covered in another [Technical File](#) topic.

**Graphic equalizers** come in a variety of shapes and sizes, some very good, some useable and some virtually no use at all! For Semi Pro (Prosumer?) and Pro use they vary in size from single 2/3rd octave (15 Band) through to dual channel 1/3rd octave (dual 30 or 31 Band).

They also have a variety of differing ins and outs, depending on their projected market. RCA or Jack, Unbalanced (Prosumer), Jack and XLR (Pro), either Balanced or Unbalanced.

---

### 2. *What Constant Q can do for You*

The ARX [EQ260](#) ( the [EQ130](#) is its identical single channel sister ) is our Dual Band 1/3rd Octave Constant Q Graphic equalizer.

The ARX [EQ215](#) is our Dual Band 2/3rd Octave Constant Q Graphic equalizer.

They both have Balanced Inputs and Outputs on both ¼" jack and XLR connectors. These allow the EQ260, EQ130 and EQ215 to interface with virtually **any** combination of professional connector in the audio world.

The singular most important feature (apart from their overall sonic quality) for these graphic equalizers is the fact that they are **CONSTANT Q!** What's constant Q? Good question.

Graphic equalizers are of two basic types: **Constant Q** and **Proportional Q**

**What is Q?** Q denotes the "quality factor" of the filter used in an equalizer circuit. It's an indication of how sharp the filter curve is. Q's of lower numbers indicate broad filters while Q's of high numbers indicate sharper filters.

**Constant Q** indicates that the shape or skirt of the filter remains the same irrespective of the setting of the fader or gain control for its frequency band.

For example, at 3dB cut or boost the shape of the filter is the same as if the setting was 15dB cut or boost. This type of filter allows for very **precise** equalisation of specific frequency bands without adversely affecting those bands near it on the equalizer control panel.

This feature becomes **very important** when we examine the functions of the other style of graphic equalizer topology namely the 'Proportional Q equalizer'. Proportional Q equalizers are popular with Audio manufacturers mainly because they are relatively easy to design and cheap to manufacture!

However the main **problem** with this type of equalizer is that as you vary the amount of cut or boost on the control panel the width of the filter varies. At the previous example of 3dB cut or boost, the Q can be up to **an octave wide!** (This problem makes fine EQ'ing of audio systems extremely hard!) It **only** narrows to a true 1/3rd octave as you reach the maximum amount of cut or boost (usually around 10-12dB ).

**Constant Q** allows **precise** EQ'ing at **any** level of cut or boost and ensures minimal interaction between frequency bands.

---

### 3. *What makes ARX EQs better?*

#### Balanced inputs and outputs

Most equalizers these days feature electronically Balanced inputs. However they usually offer either unbalanced single ended type or a noisy 6dB gain increase type electronic output. Not us, though. **All ARX EQ's** feature our *cross coupled ground referenced servo balanced outputs*, ensuring ultra low noise, unity gain and high stability into either balanced or unbalanced loads.

#### Hardwire bypass

Depressing the Hardwire Bypass switch on an ARX Graphic removes the Audio Signal **completely** from all electronic circuitry. Most EQ circuits only switch the output which means the signal is being loaded by the input circuitry, even when "switched out". This can cause high frequency roll off and other loading and phase distortions.

#### ±15dB cut or boost

It's a tough Audio world out there and somedays the typical 10 or 12dB of cut or boost simply isn't enough. ARX equalizers don't leave you short. As well as a high resolution ±6dB, we give you the switchable option of a full ±15dB of Graphic Equalisation, because **'you'll need it one day!'**. It's the most we know of in the Industry.

#### Ultra low noise

The **last** thing you want any equalizer to introduce into your Audio System is noise. ARX equalizers have just about the **lowest** noise floor in any equalizer available today. **-93dB** Unweighted and **-98dB** 'A' Weighted. Now that's at least **12dB** quieter than most Digital EQs! and at least **8dB** quieter than most other analog designs currently available.

#### Sonic quality

With ARX equalizers what goes in comes out. Our Ultra low distortion specs of **.004 %** ensure

flawless frequency modification at any level or frequency. Ultra Low Noise ICs and **hand picked** Premium grade components throughout these units ensure total signal integrity.

### **Accurate**

DB magazine in the U.S.A, in an exhaustive review by Len Feldman called our earlier EQ60 **"one of the most accurate Graphic Equalizers we have ever tested"** so what more can we say! Audio Media magazine from the U.K called it simply **"accurate"**.