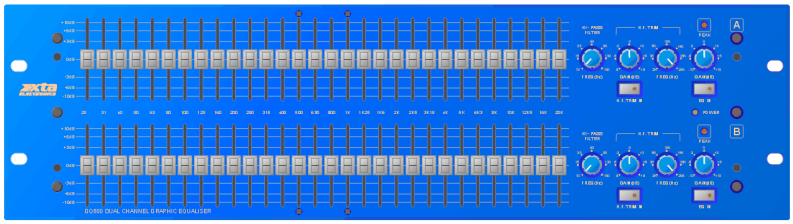
GQ600 Dual Channel Graphic Equaliser



Operators Manual

XTA Electronics Ltd.
The Design House,
Vale Business Park,
Worcester Road,
Stourport-on-Severn,
Worcs. DY13 9BZ.
England
Tel: 01299 879977 (Intl. +44 1299 879977)
Fax: 01299 879969 (Intl. +44 1299 879969)
Web: http://www.xta.co.uk

If you have any comments or suggestions about this manual, please contact XTA at the address above, or email manuals@xta.co.uk

Contents

Declaration Of Conformity

We, the manufacturer:

XTA Electronics Ltd.,
The Design House,
Vale Business Park,
Worcester Road,
Stourport on Severn,
Worcestershire,
England
DY13 9BZ

acknowledge our responsibility that the following products:

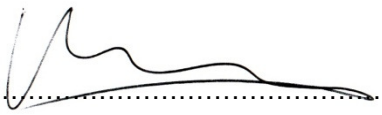
Kind of equipment:	Audio processor
Commodity Code:	8518408990
Type Designation:	GQ600

are manufactured:

in accordance with EMC Directive 2004/108/EC,
in compliance with the following norm(s) or document(s):
Technical Regulations: EN55103-1:1996, EN55103-2:1996

and

in accordance with the Low Voltage Directive 2006/95/EC,
in compliance with the following norm(s) or document(s):
Technical Regulations: EN/IEC60065:1993

Signed: 

Name:	Alex Cooper
Position:	Research and Development Manager
Date:	January 2012

CE

Important Safety Instructions

CAUTION: RISK OF ELECTRIC SHOCK.
DO NOT OPEN

The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence if uninsulated “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

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

WARNING: Apparatus with CLASS I construction shall be connected to a MAINS socket outlet with a protective earthing connection.

WARNING: To prevent injury, this apparatus must be securely attached to the rack in accordance with the installation instructions.

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 ventilation openings, install in accordance with the 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 prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fi t 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 where they exit from the apparatus.

11. Only use attachments/accessories specified by the manufacturer.

12. Use only with the cart, 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 a tip over.

13. Unplug this apparatus during lightning storms or when unused for a long period of time.

14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as if the 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.

15. Do not expose this equipment to dripping or splashing and ensure that no objects filled with liquids, such as vases, are placed on the equipment.

16. To completely disconnect this equipment from the AC mains, disconnect the power cord from the mains circuit breaker.

17. This unit is fitted with a 3-wire power cord. For safety reasons, THE EARTH LEAD SHOULD NOT BE DISCONNECTED IN ANY CIRCUMSTANCE.

Instructions De Securite Importantes

ATTENTION: RISQUE DE CHOC ELECTRIQUE.
NE PAS OUVRIR

Le symbole représentant un éclair fléché dans un triangle équilatéral a pour but d'alerter l'utilisateur de la présence d'une "tension dangeruese" non isolée à l'intérieur du boitier, pouvant être d'une force suffisante pour constituer un risqué d'électrocution.

Le point d'exclamation dans un triangle équilatéral a pour but d'alerter l'untilisateur de la présence d'instructions importantes concernant le fonctionnement et la maintenance, dans la documentation qui accompagne l'appariel.

ATTENTION: Appareils de construction de CLASSE I doit être raccordé au réseau électrique via une prise de courant reliée à la terre.

ATTENTION: Pour éviter toute blessure, cet appareil doit être solidement fixé à la torture, conformément aux instructions d'installation.

1. Lisez ces consignes.

2. Conservez ces consignes.

3. Respectez tous les avertissements.

4. Respectez toutes les consignes d'utilisation.

5. N'utilisez jamais l'appareil à proximité d'un liquide.

6. Nettoyez l'appareil avec un chiff on sec.

7. Veillez à ne pas empêcher la bonne ventilation de l'appareil via ses ouïes de ventilation. Respectez les consignes du fabricant concernant l'installation de l'appareil.

8. Ne placez pas l'appareil à proximité d'une source de chaleur telle qu'un chauff age, une cuisinière ou tout appareil dégageant de la chaleur (y compris un ampli de puissance).

9. Ne supprimez jamais la sécurité des prises bipolaires ou des prises terre. Les prises bipolaires possèdent deux contacts de largeur diff érente. Le plus large est le contact de sécurité. Les prises terre possèdent deux contacts plus une mise à la terre servant de sécurité. Si la prise du bloc d'alimentation ou du cordon d'ali-mentation fourni ne correspond pas à celles de votre installation électrique, faites appel à un électricien pour eff ectuer le changement de prise.

10. Installez le cordon d'alimentation de telle façon que personne ne puisse marcher dessus et qu'il soit protégé d'arêtes coupantes. Assurez-vous que le cordon d'alimentation est suffisamment protégé, notamment au niveau de sa prise électrique et de l'endroit où il est relié à l'appareil; cela est également valable pour une éventuelle rallonge électrique.

11. Utilisez exclusivement des accessoires et des appareils supplémentaires recommandés par le fabricant.

12. Utilisez exclusivement des chariots, des diables, des présentoirs, des pieds et des surfaces de travail recommandés par le fabricant ou livrés avec le produit. Déplacez précautionneusement tout chariot ou diable chargé pour éviter d'éventuelles blessures en cas de chute.

13. Débranchez l'appareil de la tension secteur en cas d'orage ou si l'appareil reste inutilisé pendant une longue période de temps.

14. Les travaux d'entretien de l'appareil doivent être eff ectués uniquement par du personnel qualifié. Aucun entretien n'est nécessaire sauf si l'appareil est endommagé de quelque façon que ce soit (dommages sur le cordon d'alimentation ou la prise par exemple), si un liquide ou un objet a pénétré à l'intérieur du châssis, si l'appareil a été exposé à la pluie ou à l'humidité, s'il ne fonctionne pas correctement ou à la suite d'une chute.

15. N'exposez pas cet équipement au fait de tomber goutte à goutte ou au fait d'éclabousser et garantissez qu'aucun objet rempli des liquides, comme les vases, n'est placé sur l'équipement.

16. Pour complètement débrancher cet équipement de la conduite principale de courant alternatif, débranchez la corde de pouvoir du disjoncteur de conduite principale.

17. Cette unité est correspondue avec une corde de pouvoir de 3 fils. Pour les raisons de sécurité, L'AVANCE DE TERRE NE DEVRAIT ÊTRE DÉBRANCHÉE DANS AUCUNE CIRCONSTANCE.

Thanks

Thank you for choosing the XTA GQ600 for your application. Please spare a little time to digest the contents of this manual, so that you obtain the best possible performance from this unit.

All XTA products are carefully engineered for world-class performance and reliability.

If you would like further information about this or any other XTA product, please contact us.

We look forward to helping you in the near future.

Unpacking the GQ600

After unpacking the unit please check carefully for damage. If damage is found, please notify the carrier concerned at once. You, the consignee, must instigate any claim. Please retain all packaging in case of future re-shipment.

Introduction

The GQ600 combines innovative features with impressive specification, to produce a new level of performance in professional equalisation.

The GQ600 is a precision dual channel 1/3 octave graphic equaliser, which provides up to 10dB of boost or cut at 30 centre frequencies between 25Hz and 20kHz. Filter design has been carefully optimised for good interpolation and improved narrow band performance, whilst high quality long-throw 45mm sliders are used for better resolution. The GQ600 also provides excellent noise and distortion performance, with a flat noise figure of better than -98dBm.

A shelving H.F. Trim section is provided, with adjustable gain and frequency allowing fast adjustments to be made to overall high frequency response. This obviates the need for system re-voicing when, for example, changes in humidity or audience size occur.

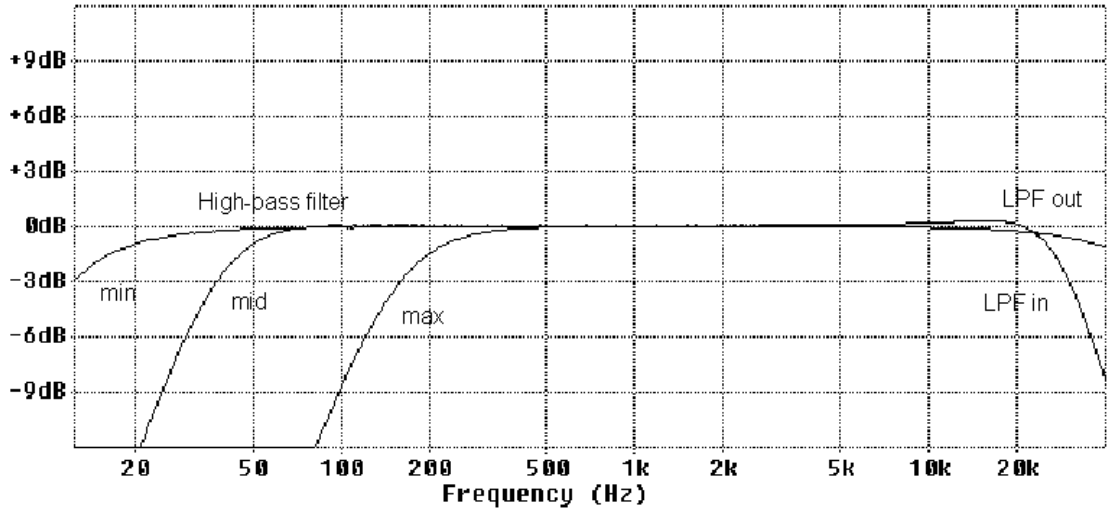
A sweepable high-pass filter offers turnover frequencies of 10Hz to 150Hz and a fixed frequency low-pass filter is also provided for increased H.F. driver protection. This filter is selectable in or out of circuit via jumper links on the main circuit board.

Audio inputs and outputs are provided on lockable XLR 's and 'quick-wire' Klippon connectors and are fully electronically balanced as standard. Optional transformer balancing is also available for both inputs and outputs.

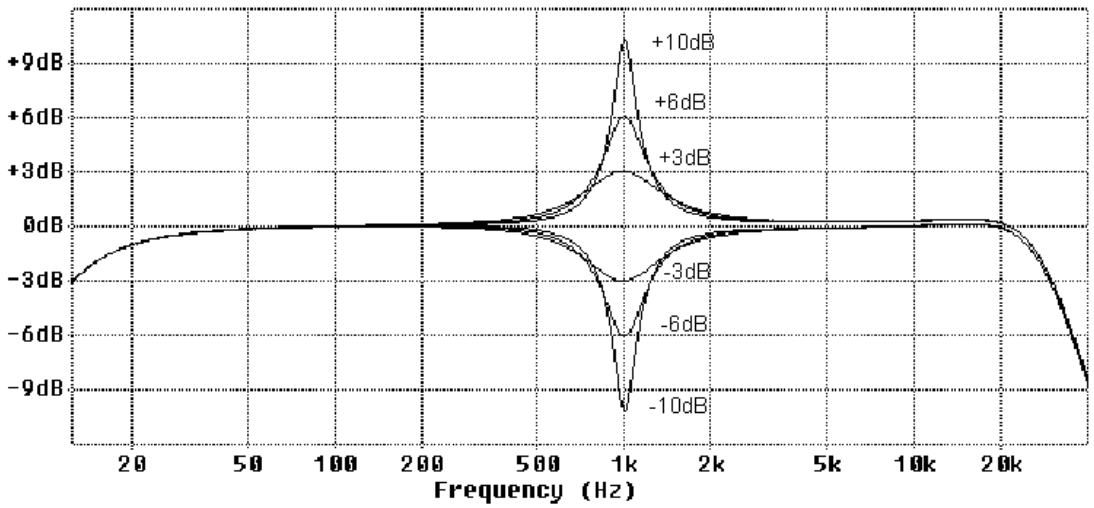
Additional features include: relay fail-safe bypass, peak level indicators and optional Perspex security cover.

The GQ600 is sturdily constructed from high quality components and undergoes extensive testing and quality control procedures including a minimum 48 hours burn-in period prior to despatch.

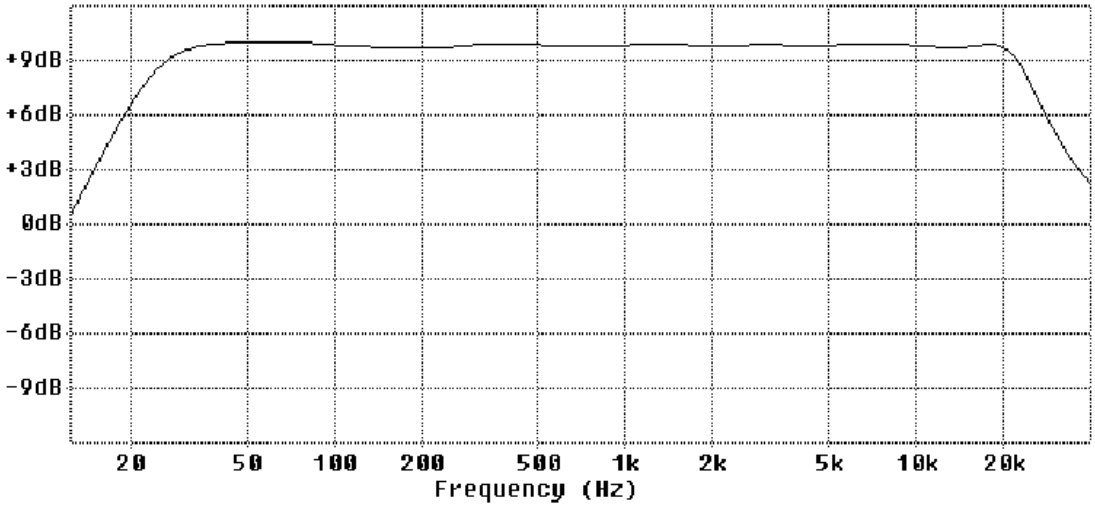
GQ600 Filter Characteristics



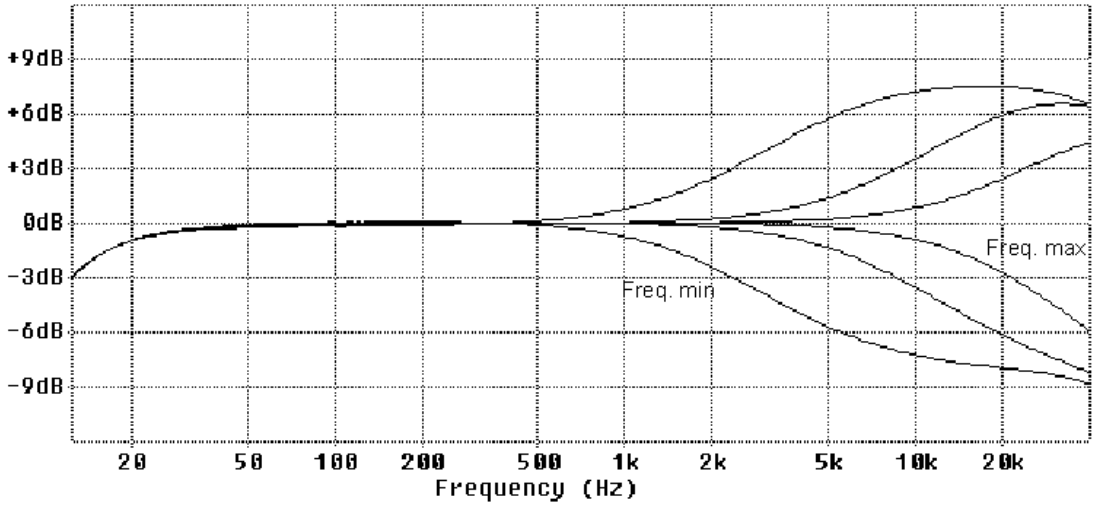
Frequency response of GQ600 with sliders set "flat" and EQ "in", showing effect of high-pass and low-pass filters.



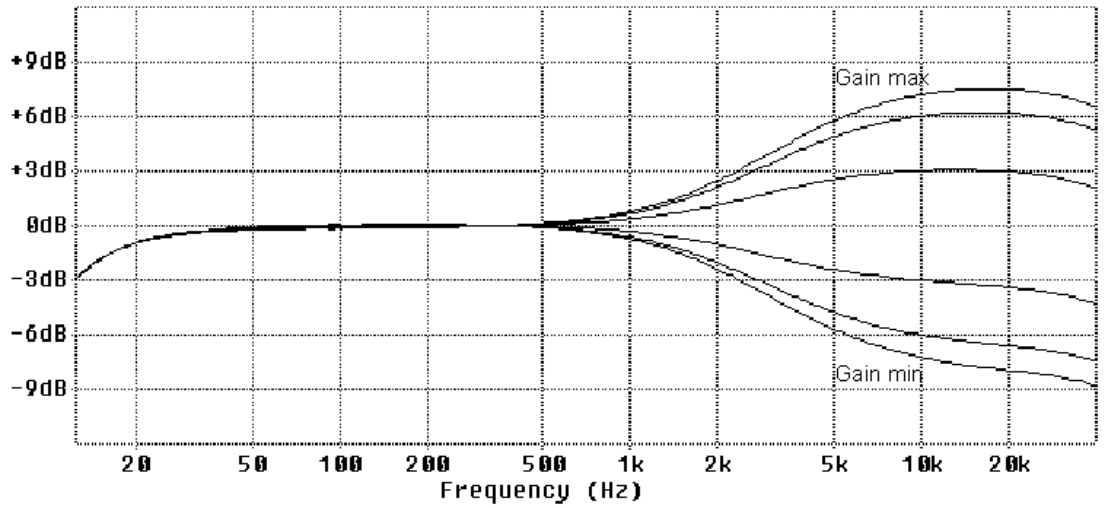
Response of a single 1/3 octave filter section.



Combining effect with sliders set to achieve +10dB overall gain. Note lack of amplitude ripple.



Response of H.F. Trim frequency control. At maximum and minimum gain.



Effect of H.F. trim gain control, with frequency set at minimum.

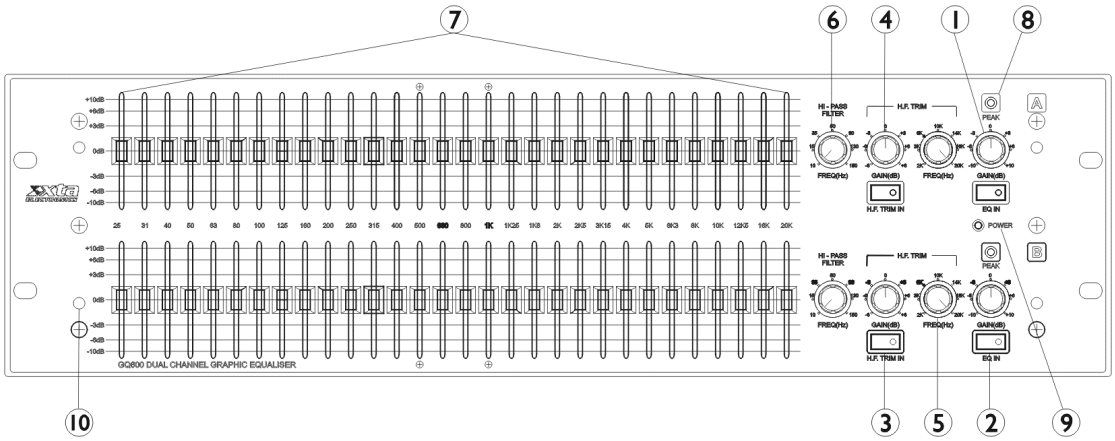
1/3 Octave Centre Frequencies

The 1/3 octave ISO centre frequencies used on most graphic equalisers are normally 'rounded off' to whole numbers. This leads to unequal spacing of filters if these marked frequencies are used to calculate filter values.

The GQ600 uses true 1/3 octave frequencies based on 1kHz as a reference, and each filter is automatically tested and adjusted when required, to achieve a centre frequency accuracy of within ±3% of these true 1/3 octave frequencies. These are as follows:

Marked	True	Marked	True	Marked	True
25	24.80	250	250	2k5	2k52
31	31.25	315	315	3k15	3k175
40	39.38	400	396.7	4k	4k
50	49.61	500	500	5k	5k04
63	62.5	630	630	6k3	6k35
80	78.75	800	793.7	8k	8k
100	99.21	1k	1k	10k	10k08
125	125	1k25	1k26	12k5	12k70
160	157.5	1k6	1k587	16k	16k
200	198.4	2k	2k	20k	20k16

Front Panel Functions



1. **Output Gain Control** - allows ±10dB of gain to be applied. This control features a centre detent for 0dB gain.

2. **E.Q. In/Out Switch** - selects graphic equaliser filter section in or out of circuit.

3. **H.F. Trim Switch.** - selects H.F. Trim section in or out of circuit.

4. **Trim Gain** - provides up to ±8dB of gain at 20kHz.

5. **Trim Frequency** - sets the +3dB frequency for the shelving 'Trim' filter anywhere between 2kHz and 20kHz (with Trim gain set for maximum).

6. **Hi-Pass Filter Frequency** - sets the -3dB frequency anywhere between 10Hz and 150Hz.

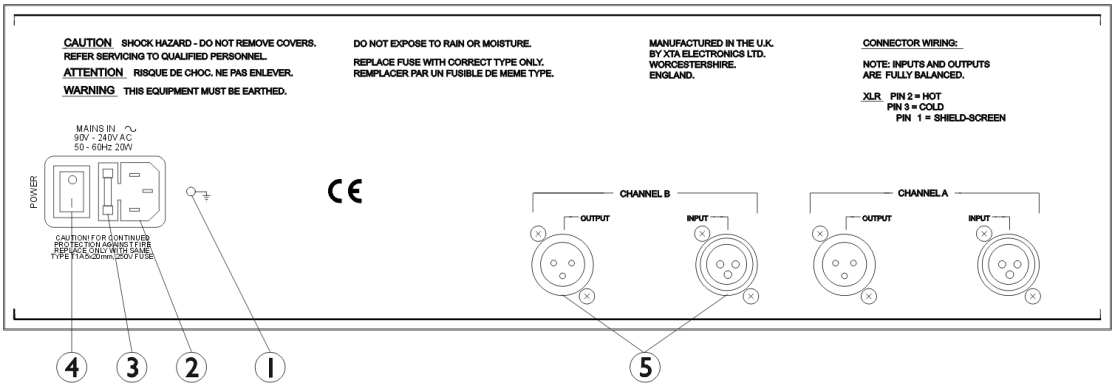
7. **Graphic Controls** - gain of up to ±10dB is provided at each centre frequency. High quality slider controls feature centre detent for accurate 'flat' position.

8. **Peak LED** - illuminates as clipping point is approached anywhere within the equaliser circuitry. Threshold is +20dB.

9. **Power LED** - indicates unit is powered on.

10. **Fixing Holes** - for security cover.

Rear Panel Functions



1. **Safety Ground Screw** - Do Not Remove.

2. **Mains Power** - is connected via a standard IEC socket. A compatible power cord is supplied with the unit.

3. **Mains Fuse** - is located in a finger-proof fuseholder adjacent to the mains inlet. Always replace this fuse with the correct type as shown on the rear panel legend.

4. **Power Switch** - a double pole rocker switch isolates both live and neutral connections. Please ensure that the mains switch is accessible at all times.

5. **XLR Inputs and Outputs** - separate 3 pin XLR connectors are provided for each audio input and output. All terminations are fully balanced where pin 2 = Hot, pin 3 = Cold and pin 1 = Screen (shield). See page 8 "Grounding" for more information.

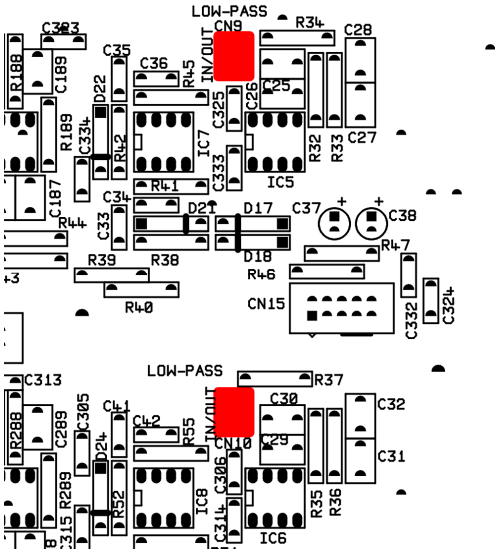
Specifications

Inputs	Two, electronically balanced.
Impedance	> 10k ohms.
CMRR	> 65dB 50Hz - 10kHz.
Outputs	Two, electronically balanced.
Source Imp.	< 60 ohms.
Min. Load	600 ohms.
Max. Level	+23dBm into 600 ohm load.
Gain	± 10dB via rotary control.
Frequency Response	± 0.5dB 20Hz - 20kHz with controls "flat".
Equivalent Input Noise	< -98dBm (20-20kHz unweighted) with controls '"flat".
Distortion @ +18dBm	< 0.01% @ 1kHz.
Peak Indicator	Threshold: +20dBu.
H.F. Trim	
Filter Type	2nd order, optimum phase, shelving.
Frequency	2kHz - 20kHz.
Gain	± 8dB max. @ 20kHz.
H.F. Trim In/Out	Front panel switch with LED indicator.
High-pass Filter	
Filter Type	12dB/octave H.P.
Frequency	10Hz - 150Hz.
Low-pass Filter	
Filter Type	18dB/octave -3dB @ 27kHz.
LPF In/Out	Link selectable on PCB.
Equaliser Section	
Filters	2 x 30, 1/3 octave, 25Hz- 20kHz.
Filter Type	High performance simulated LCR network.
Freq. Tolerance	± 3%.
Range	± 10dB.
Connectors	
Inputs	3 pin female XLR.
Outputs	3 pin male XLR.
Power	3 pin IEC.
Power	80VAC – 260VAC @ 50/60Hz.
Consumption	< 20W
Weight	5kg. Nett (6.7kg. shipping)
Size	5.25"(3U) x 19" x 9.3" (133 x 482 x 237mm) excluding connectors.
Options	Input transformers available. Output transformers available. Perspex security cover.

Operating Notes

Generally, operating the GQ600 is very straightforward, however certain functions may not be immediately obvious and these are discussed here.

Low Pass Filter. 18dB/octave filters are provided for each channel to provide additional H.F. driver protection against unwanted high frequency signals. These have negligible effect on frequency response at 20kHz. All units are factory set with these filters in, if not required these filters can be removed from the signal path by changing the position of two jumper links on the main circuit board, see following diagram.



Output Balancing Transformers. Outputs are fully electronically balanced as standard. If optional output transformers are required proceed as follows:-

1. Remove four "jumpers" from CN4 and CN8 on main circuit board (located near XLR outputs).

2. Fasten two output transformers type 7470 to the inside of the rear panel chassis, using the screws and washers provided, through the two mounting holes located above each pair of input/output XLR's. Plug in transformer connectors into CN4 and CN8.

3. Monitor output noise of unit and rotate appropriate transformer until noise (hum) is at a minimum. Fasten transformer in this position and repeat for other channel.

Input Balancing Transformers. Inputs are fully electronically balanced as standard. Input transformers if required, should be requested at time of purchase if possible. if it necessary to fit input transformers to existing units proceed as follows:-

On main circuit board.

1. Remove R2, R3, R4, R6, R8, R11, R15, R16, R17, R19, R21, R24.

2. Fit R2 and R15 = 10k ohms, R11 and R24 = 0R0 link.

3. Solder in input transformers type LL1540 to positions TX2 and TX3 on main circuit board.

Security Cover. A perspex security cover is available to enclose all front panel controls and so avoid accidental or unauthorised adjustment. To fit this cover proceed as follows:-

Fit four M4 x 17mm pillars into the four front panel bushes located in between the six panel mounting screws.

Position security cover over pillars and fasten with screws and washers provided.

Warranty

This product is warranted against defects in components and workmanship only, for a period of one year from the date of shipment to the end user. During the warranty period, XTA will, at it's option, either repair or replace products which prove to be defective, provided that the product is returned, shipping prepaid, to an authorised XTA service facility.

Defects caused by unauthorised modifications, misuse, negligence, act of God or accident, or any use of this product that is not in accordance with the instructions provided by XTA, are not covered by this warranty.

This warranty is exclusive and no other warranty is expressed or implied. XTA is not liable for consequential damages.