AUREA®

TRUE CINEMA SOUND AT HOME

T Series

(Series 2)

OPERATING INSTRUCTIONS

(DT 450/CT 160 LINE)

Proud Technology Partner of MC² AUDIO

CE

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TECHNICAL SPECIFICATION

Parameter (Units)	DT 450	CT 160
Output Power (per channel) (Watts)		
8 ohms	450	160
4 ohms	750	300
2 ohms	1150	475
Output Power (bridged) (Watts)		
8 ohms	1500	600
4 ohms	2300	950
THD+N: (%)(4 ohms)		
@1kHz(@1dB below max output power)<	0.008	0.008
@20Hz to 20kHz(@3dB below max output power)<	0.03	0.03
Gain Options (dB)	32	32
Sensitivity Options (for maximum power) (dBu)	5.5	2
Sensitivity Options (for maximum power) (Volts)	1.4	1
Frequency Response - 20Hz to 20kHz (dB)	+0 / -0.5	+0 / -0.5
Power Consumption: Nominal @ 240v (4 ohms)(Amps)	2.8	1.5
Power Consumption: Nominal @ 120v (Amps)(4 ohms)	5.6	3
Dimensions: (mm)		
Amplifier: H x W x D	88 x 482 x 460	88 x 482 x 428
Boxed (shipping UK): H x W x D	230 x 580 x 560	
Boxed (shipping - all except UK): H x W x D	250 x 610 x 600	
Weight: (Kgs)		
Amplifier:	13.8	13.94
Boxed: (shipping)	15.34	15.8
Additional Specifications		
Input Impedance - Active blanced (k ohms)	20	20
Input CMRR (dB)	>60	>60
Hum & Noise (dB below max output)	-104	-104
Damping Factor: @1kH z into 8 ohms	>400	>400
Signal Limiters - (set to prevent excessive clipping)	Yes	Yes
Protection: Shot ciruit/DC output/Temperature	Yes	Yes
Main s in rush control	Yes	Yes
Output Power (watts) into 8 ohms		
Sine wave @ 1kHz	475	150
Continuouis music with Crest Factor of 2.8 (9dB)	550	160
Continuouis music with Crest Factor of 4.8 (14dB)	575	160
Continuouis music with Crest Factor of 7.8 (18dB)	625	175
Output Power (watts) into 4 ohms		
Sine wave @ 1kHz	875	260
Continuouis music with Crest Factor of 2.8 (9dB)	975	260
Continuouis music with Crest Factor of 4.8 (14dB)	1025	300
Continuouis music with Crest Factor of 7.8 (18dB)	1125	300
Output Power (watts) into 2 ohms		
Sine wave @ 1kHz	1375	400
Continuouis music with Crest Factor of 2.8 (9dB)	1600	460
Continuouis music with Crest Factor of 4.8 (14dB)	1750	475
Continuouis music with Crest Factor of 7.8 (18dB)	1900	600

*** NOTE**: DT 450, is dual channel amplifier. CT 160 is a 4-channel amplifier with 2 channels (C & D) bridgeable into 8 or 4 ohms. Channels C & D will drive into 2 ohm loads in normal 4-channel mode. Channels A & B will not drive into 2 ohms.

Power requirements

DT 450 is fitted with an adaptable mains transformer which can be configured for nominal 115V or 230V supplies. Internal links set these conditions.

CT 160 is fitted with either a 100/120V or 220/240V tapped transformer according to customer requirements.

This amplifier will only operate to its very high specification if it is installed and operated as described in this manual.

INTRODUCTION

Your *T Series* power amplifier is a no compromise, high quality, class AB power amplifier. There is no dynamic switching of the audio or power rails (a very common method of achieving extra power at the expense of audio quality) thus ensuring optimum sonic performance.

Fan speed is varied as required to keep the amplifier within its temperature limits. Signal limiters are included to protect speakers from clipped signals.

The amplifiers include full DC and short circuit protection to ensure trouble-free service even in 'harsher' environments.

INSTALLATION: ELECTRICAL

The amplifier has been manufactured to comply with your local power supply requirements, but before connecting the unit to the supply, ensure that the voltage (printed on the rear panel) is correct, and that a mains fuse of the correct type and rating has been fitted (EXCEPT CT 160 WITH CIRCUIT BREAKER).

Make sure power outlets conform to the power requirements listed on the back of the unit. Damage caused by connecting to improper AC voltage is not covered by the warranty.

SAFETY WARNING

This unit is fitted with a 3-wire power connector. For safety reasons, THE EARTH LEAD SHOULD NOT BE DISCONNECTED IN ANY CIRCUMSTANCE. If ground loops are encountered consult the section on input connections later in this manual.

WHERE A FIXED MAINS LEAD IS FITTED, THE WIRING COLOURS ARE:

230V AREAS:	EARTH = GREEN AND YELLOW NEUTRAL = BLUE LIVE = BROWN
120V AREAS:	EARTH = GREEN NEUTRAL = WHITE LIVE = BLACK

TO PREVENT THE LIKELIHOOD OF SHOCK OR FIRE HAZARD, DO NOT EXPOSE THE UNIT TO RAIN OR MOISTURE. DO NOT PLACE OBJECTS CONTAINING LIQUID ON TOP OF THE APPARATUS.

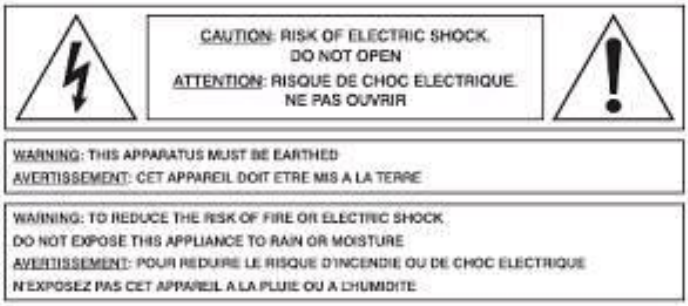
TO AVOID ELECTRICAL SHOCK DO NOT REMOVE COVERS. REFER ALL SERVICING TO QUALIFIED PERSONNEL.

DO NOT USE THE UNIT IF THE ELECTRICAL POWER CORD IS FRAYED OR BROKEN. The power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords and plugs and the point where they exit from the appliance.

ALWAYS OPERATE THE UNIT WITH THE AC GROUND WIRE CONNECTED TO THE ELECTRICAL SYSTEM GROUND. Precautions should be taken so that the means of grounding of a piece of equipment is not defeated.

DO NOT REMOVE THE LID. Removing the lid will expose you to potentially dangerous voltages. There are no user serviceable parts inside.

IMPORTANT SAFETY INSTRUCTIONS



The lightning flash with arrowhead symbol within an equilateral triangle is 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.

The exclamation point within an equilateral triangle is intended to alert the user to the presence 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. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles and the pint where they exit from the apparatus.
10. The mains circuit breaker shall remain readily accessible.
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. Disconnect 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. Where the amplifier is mounted in a rack and permanently connected to the mains, then the rack should be installed with a readily accessible connector or an ALL POLE circuit breaker with 3mm breaking distances.
18. This unit is fitted with a 3-wire power cord. For safety reasons, THE EARTH LEAD SHOULD NOT BE DISCONNECTED IN ANY CIRCUMSTANCE.
19. The cooling fans suck cool air in through the front and blow hot air out at the rear of the unit through the ventilating grills. The front and rear of the amplifier should have free exposure to the air (i.e. in a rack leave the front and rear doors off), with 2cm air gap at the sides and top. IF AIR IS NOT ALLOWED TO ESCAPE FROM THE REAR, OVER-HEATING WILL OCCUR. Take care when mounting other equipment in the same rack.
20. The mains switch on the amplifiers only switches one pole of the mains supply, therefore for units with a detachable cord to be fully disconnected from the mains, the mains disconnect device (ie mains plug or mains coupler) should remain readily operable. For units with a fixed mains lead the external all pole circuit breaker with 3mm breaking distances is the disconnect device and therefore the installation of the amplifier shall be carried out in accordance with all the applicable installation rules.

INSTALLATION: MECHANICAL

To ensure that this equipment performs to specification, it should be mounted in a suitable rack or enclosure as described below. Like all high power amplifiers, it should be kept away from other equipment which is sensitive to magnetic fields. Also, this amplifier may suffer a substantial reduction in performance if it is subjected to, or mounted close to equipment which radiates high R.F. fields.

When mounting the amplifier in a rack or enclosure, ensure that :-

1. The rear of the unit is adequately supported. The brackets which are supplied fit standard 19 inch (483mm) rack mounting systems. THE FRONT PANEL IS NOT CAPABLE OF SUPPORTING THE UNIT ON ITS OWN.

2. THERE IS ADEQUATE VENTILATION. The cooling fans suck cool air in through the front and blow hot air out at the rear of the unit through the ventilating grills. IF THIS AIR IS NOT ALLOWED TO ESCAPE, OVERHEATING WILL OCCUR. Take care when mounting other equipment in the same rack.

   ALSO SEE MAINTENANCE SECTION.

CONNECTIONS

INPUTS

The inputs are made via 3-pin XLR connectors, which are electronically balanced and should be connected via a high grade twin core screened cable, as follows :-

PIN1 - Screen (see note)
PIN2 - Hot (signal +)
PIN3 - Cold (signal -)

The amplifier is designed to operate with fully balanced equipment and ground loops or loss of performance may be experienced if connected to unbalanced sources. If it is unavoidable however, the following wiring should be used. The cable should still be twin core plus screen.

PIN1 - Screen - connected to the chassis of the unbalanced equipment - or left disconnected at the unbalanced end.
PIN2 - Signal Hot
PIN3 - Signal Cold

NOTE: This amplifier is wired to the latest industry recommendations. PIN1 is connected directly to the chassis/mains earth. If ground loops (mains hum) are encountered remove the screen connection from the other end of the cable and leave it open circuit. If problems persist, consult your dealer/ supplier, DO NOT TAMPER WITH OR ALTER ANY GROUND (EARTH) CONNECTIONS INSIDE THE AMPLIFIER.

For bridged operation input should be made to channel A only and the rear panel switch set for bridged mode. Channel B will then be fed out of phase with channel A.

OUTPUTS

The speaker outputs are via Neutrik Speakon connectors. 2 pole (NL2FC) or 4 pole (NL4FC) connectors can be used.

1 - Terminations are as follows :- HOT Pin +1
COLD Pin -1

2 - Additionally Channel A Speakon connector carries Channel B output on Pins +2 & -2 to allow easy bi-amping or bridged operation.

HOT Pin +2
COLD Pin -2 **CONFIGURATION 2 DOES NOT APPLY TO CT 160**

(See also Bridged operation)

NOTE: 1. There must be no shared connections between channels.

NOTE: 2. Because the currents involved are very high, the speaker cables should conform to the following minimum requirements, otherwise the losses will cause the cables to get hot and audio power will be reduced:

NOTE: Do not connect the inputs/outputs to any other voltage source such as a battery, mains source or

power supply, regardless of whether the amplifier is turned on or off.

Do not run the output of any amplifier channel back into another channel's input and do not parallel or series-connect an amplifier output with any other amplifier output.

BRIDGED (MONO) OPERATION (DT 450)

Supply the signal to Channel A input only & push in the rear panel switch marked 'Bridged Mono'

Use Channel A Output Speakon connector and connect as follows:

HOT Pin +2
COLD Pin -1

BRIDGED (MONO) OPERATION (CT 160)

Use centre Speakon connector marked 'BRIDGED' and connect as follows:

HOT Pin +1 (Channel C - IN PHASE)
COLD Pin -1 (Channel D - OUT OF PHASE)

When operating in bridged mode, the minimum impedances are doubled. The minimum load in bridged mode is: DT 450: 4 ohms, CT 160: (Ch C & D only): 4 ohms.

LINK SOCKET

Each channel is provided with a 3-pin XLR connector marked 'LINK' which allows the input signal to be linked to further amplifiers etc. The connections are the same as for the input XLR.

OPERATION

Read all documentation before operating your equipment and retain all documentation for future reference.

Do not spill water or other liquids into or on the unit and do not operate the unit while standing in liquid.

Do not block fan intake or rear ventilation outlets or operate the unit in an environment which could impede the free flow of air around the unit.

If the unit is used in an extremely dusty or smoky environment, it should be cleaned of any collected debris at regular intervals. (See Maintenance section.)

It is important that the power output of your amplifier is matched to the power handling capacity of your loudspeaker. If not, damage to the loudspeaker could occur.

SWITCHING ON

At 'switch-on' the protection circuit will initially activate whilst the circuits stabilise. Assuming no faults are detected after a few seconds only the 'POWER' LED (and 'SIGNAL' indicators if signal is applied) will illuminate.

PANEL CONTROLS AND INDICATORS

Level controls

These are analogue controls allowing precise level settings. Note that in 'BRIDGED' mode only 'channel A' control is active.

Signal Indicators (blue LED)

These are active from a minimum output level of approximately 1 Watt and are an indication only of signal presence.

Limiters (amber LED)

The *T Series* amplifiers incorporate signal limiters, which are preset to prevent clipping with high levels of drive. The amber LEDs on the front panel illuminate to indicate operation of the limiters.

Temperature Control

The cooling fans respond to temperature sensors within the unit to maintain a safe operating temperature. In the event of excessive temperature, the protection circuit will operate, disabling the output. The red Audio-Protect (A/P) LED will indicate this condition (see fault indicator).

On the DT 450 there are two cooling fans. The second (rear) fan can be set to only work when the temperature exceeds 90°C. A jumper link (JF3) is normally set to permanently enable FAN2 so that it varies in speed, proportional to temperature in conjunction with FAN1.

The CT 160 has two fans with variable speed and a jumper link to enable them from cold.

Normal dynamic signals will not cause the amplifier to overheat unless the ventilation is inadequate. (See installation section and maintenance section.)

Fault Indicator (Audio Protection – red LED)

If the outputs are shorted or if DC is present, the protection circuit will disengage the outputs and the A/P LED will illuminate. The amplifier will continue to be monitored and depending on the type of fault, will either reset after the fault has cleared or require manual resetting by switching off at the mains switch and then on again after a few seconds. (See also temperature control above)

Temperature related faults will reset once the unit has cooled sufficiently.

Output short circuits will require manual reset after clearing the fault.

Bridged LED (green)

This indicates the position of the switch on the rear panel and is illuminated when bridged mode is selected with the switch pressed in.

100V LINE OPERATION

When using the *T Series* with 'line' transformers, it is recommended that the frequency response is altered to prevent saturation of the transformer core with large signals. This could trigger a fault condition since it would be seen by the amplifier protection circuit as a short circuit on the output.

The CT 160 should be fitted with a suitable cross-over card set to roll off the LF response to be -3dB @ 63Hz.

The DT 450 can also be fitted with a cross-over card but they also have single filters built-in for this purpose. There are 4 black jumper links marked as HPF and when links are removed the frequency response is modified for 100V line operation.

For normal operation, all 4 links should be fitted.

MAINTENANCE - (ENSURE THAT ELECTRICAL POWER TO THE UNIT IS DISCONNECTED BEFORE CARRYING OUT ANY MAINTENANCE.)

The filter behind the air intake apertures on the front of *T Series* amplifiers should be cleaned or replaced periodically, e.g. 12-24 months. (Filters in amplifiers located in more 'dirty' atmospheres may require more frequent maintenance). The filter should be 'dry' cleaned, using a vacuum cleaner preferably. Running the unit without a filter is not recommended unless it is within a 'clean room'. Replacement filter material is available.

No other regular maintenance is required.

If you have any doubt about carrying out this procedure, refer to a service engineer or contact your dealer.

IF YOUR AMPLIFIER DEVELOPS A FAULT, PLEASE REFER TO YOUR SUPPLIER FOR SERVICE AND TECHNICAL SUPPORT. DO NOT ATTEMPT TO REPAIR THE FAULT YOURSELF AS THIS WILL INVALIDATE THE WARRANTY.

PENDIX I

DT LINE - OPERATING INSTRUCTIONS

The DT Line chassis can be configured with up to 4 transformers, which can be any mix of the available types: 250W, 500W, 750W at 100V output, 4 ohms input. Other specifications (70V/50V) are available to special order.

The power rating of each channel is printed on the rear panel.

The connections are via 4-pole SPEAKON connectors (NL4FC).

INPUTS (4 ohms) are: +1 = HOT, -1 = COLD

OUTPUTS (100V) are: +2 = HOT, -2 = COLD

THERE ARE NO USER-SERVICEABLE PARTS INSIDE AND NO MAINTENANCE IS REQUIRED.

IN THE EVENT OF A FAILURE, REFER TO A QUALIFIED SERVICE ENGINEER.

TECHNICAL SPECIFICATION

			DT LINE		
Rated power handling @ input impedance - 4Ω			250W	500W	750W
Output impedance rated @	100V		40.0Ω	20.0Ω	13.3Ω
	70V		19.6Ω	9.8Ω	6.5Ω
	50V		10.0Ω	5.0Ω	3.3Ω
Frequency response	50Hz-16kHz	± 1dB			
Distortion (THD)	50Hz-16kHz	<0.03%			
Weight (each)	Chassis only	12kgs			
	250W transformer	2.3kgs			
	500W transformer	2.8kgs			
	750W transformer	4.4kgs			
Dimensions (mm) - 2U	88 x 482 x 428				

When mounting the amplifier in a rack or enclosure, ensure that :-

The rear of the unit is adequately supported. The brackets which are supplied fit standard 19 inch (483mm) rack mounting systems. THE FRONT PANEL IS NOT CAPABLE OF SUPPORTING THE UNIT ON ITS OWN.

(The general *T Series* safety warnings, precautions and service advice also apply to the DT LINE.)

APPENDIX II

Instructions for using 'DT' series amplifiers with 100V/70V line transformers

Frequency response

It is necessary to provide some low frequency roll off to prevent the possibility of the line transformer saturating.

On the CD 160 we recommend using an crossover filter PCB – XO5 (each XO5 card handles 2 channels) normally set to a crossover frequency of 63 Hz. The roll off is normally at 24dB per octave.

On the DT 450 the roll off is included on the main board as standard. To bring the 63 Hz roll off into circuit, remove the 4 jumper links at 'hpf'.

The response must be at least -3dB at 70 Hz and roll off at minimum 12dB per octave.

LINE TRANSFORMER LEAD OUTS

250W and 500W single 100V winding:

Primary:	Orange = +ve, Black = -ve (4 ohms)
Secondary:	Yellow = +ve, Grey = -ve (100V)
	Blue = centre tap, for monitoring purposes only

750W dual secondary 50V + 50V:

Primary:	Orange = +ve, Black = -ve (4 ohms)
Secondary 1:	Yellow = +ve, Blue = -ve (50V)
Secondary 2:	Green = +ve, Grey = -ve (50V)