Phil Jones Bass

M-300

BASS INSTRUMENT AMPLIFIER

OWNER'S MANUAL

Phil Jones Bass™

CONTENTS

Thank you for purchasing the M-300. A great deal of dedication and passion went into designing and building this no-compromise, high performance amplifier. It was concieved to be a dedicated amplifier for the "conessieur" bassist. Reading this manual will enable you to get the best performance from it and it will give you many years of service.

READ THIS FIRST

- **Before using the M-300 please read ALL the instructions.**
- **On reciept of product, check for any signs of physical damage arising from shipping. If any damage is visible contact your dealer.**
- **Keep all original packing.**
- **Never use this product in the vicinity of water. If the M-300 were to get wet, it could kill you by electrocution.**
- **The output power of this amplifier can generate enough sound pressure levels from your speakers to cause PERMANENT hearing damage to you and anyone else who is close to it. Take caution with how much volume is used. If you suffer from ears ringing, this is an indication that you may be damaging your hearing.**
- **Do not use this amplifier in a way that would compromise its ventilation system. Never block the air intake or fan output.**
- **Do not locate this amplifier near any heat source.**
- **This amplifier must be connected only to a power source specified in this manual.**
- **For safety do not leave the amplifier plugged into a power source for long periods of time when not in use.**
- **Do not let any liquid or foreign objects fall into any openings on the amplifier.**
- **Never use this amplifier if it has:**
    1. **suffered any physical damage.**
    2. **been subjected to any liquids, rain or moisture.**
    3. **damaged cables connected to it.**

  If any of the above occurs, the amplifier should be examined by qualified service personel.
- **Always operate this amplifier with the correctly rated fuse.**
- **Never use this amplifier without proper grounding.**

WARNING!

If you are using PJB speakers on your M-300, take great care with the volume control. Unlike conventional speakers PJB speakers are capable of generating great output levels (over 140 dB at close proximity, more than 100 times the threshold of pain). Never allow your instrument to feedback at high output levels. This can cause instant deafness and it could be permanent. Do not use PJB speakers for loud playing lead-guitar. Their much higher acoustic output can destroy your hearing, forever!

FEATURES

- Two Active / Passive inputs
- Two 5 Band Graphic EQ
- Optical Limiter
- Headphone Output
- Pre-amp Output
- Balanced Line Output with ground lift.
- Dual AC Voltage 120/240V Operation
- Sophisticated protection circuitry
- Special "Soft-Clipping" 500watt Amplifier
- Ultra low noise pre amplifier circuit.

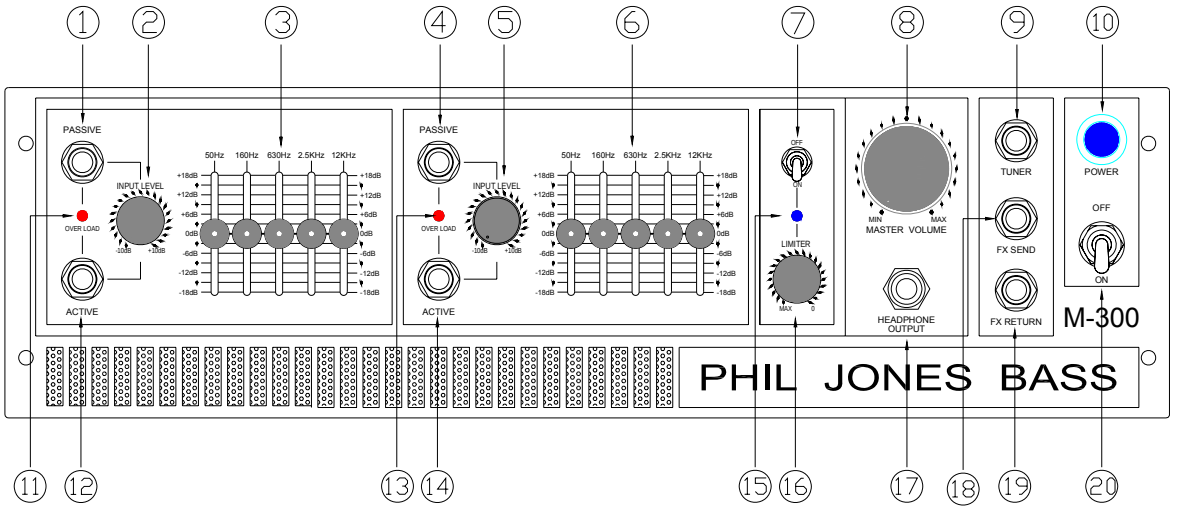
The M-300 has six protection circuits to prevent it from being damaged.

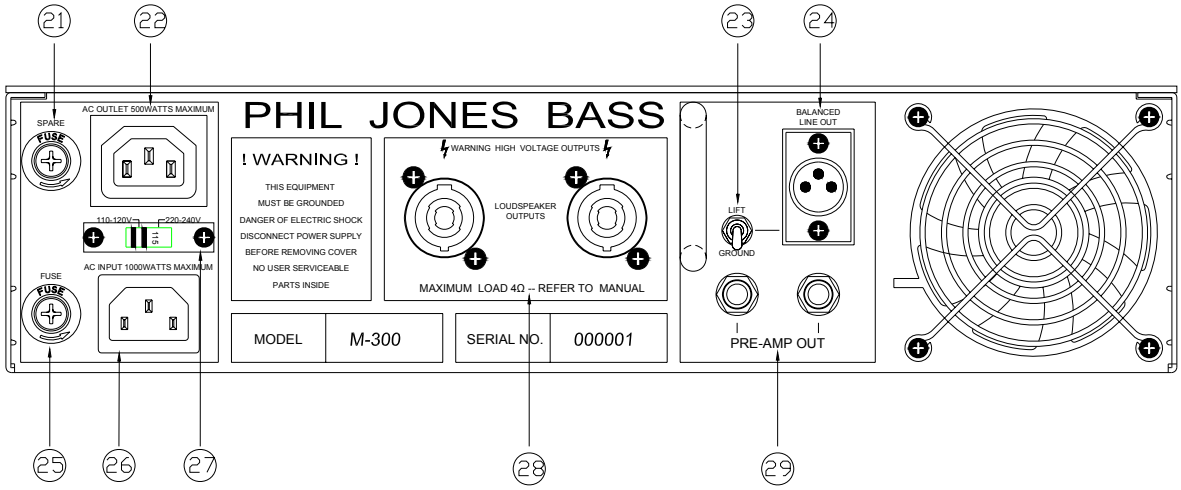
1. **Transformer Over-Heat Protection.** A heat sensing circuit breaker will disconnect the transformer from the power source, should the temperature reaches 105°C.
2. **Soft-Start Speaker Protection.** When the amplifier is switched on, the amplifier will turn on after a 2-second delay. This ensures that no transient thump is sent to the speakers at start up.
3. **Current Limiting Protection.** Should the current exceed 7 amperes in any of the output transistors, the amplifier will shut down. Switch off the amplifier and check your speakers are connected properly and that your cables are not faulty. If every thing is OK, switch the amplifier back on.
4. **Transistor Over-Heat Protection.** If the amplifier reaches an internal temperature 90°C, the amplifier will turn off to protect the output transistors.
5. **Short-Circuit Protection.** If you have a faulty speaker or faulty speaker connections, the amplifier will shut down. Switch power off and press reset button on back panel.
6. **DC Output Protection**. The M-300 is a DC coupled design that offers the best performance. If a fault occurs internally in the amplifier it will shut down and protect your speakers from any lethal DC current. Be aware that DC current can destroy any loudspeaker. This circuit will also prevent any catastrophic damage to the amplifier.

If the fuse blows, there is a spare fuse located in the back panel to replace it. Please remember to keep a spare fuse always. You never know when you may need it.

Although we pride ourselves on the excellence of performance and build quality we put safety first. We always use UL approved power transformers in our amplifiers and all components have voltage and current ratings well beyond their operating range.

FRONT & BACK PANEL OVERVIEW





1. PASSIVE BASS INSTRUMENT INPUT JACK CHANNEL ONE.
High sensitivity input (200mV). For bass instruments featuring non-active electronics. Especially suited for older 'vintage' basses. This input jack is precisely matched to high impedance pickups enabling them to faithfully reproduce the true frequency and dynamic range of the instrument.

2. INPUT LEVEL SENSITIVTY CONTROL CHANNEL ONE.
Just as no two basses are alike, the same goes for players with different styles and technique. This is a fine-tuning adjustment (+/- 10dB) to get the precise match between your instrument and the M-300.

3. 5-BAND GRAPHIC EQUALIZER CHANNEL ONE.
This is a dedicated bass instrument equalizer designed to give you precise tone control of your instrument. It is a very powerful tone processor, which with a little understanding will give you the greatest benefit in getting the most out of your instrument and sound system.

4. PASSIVE BASS INSTRUMENT INPUT JACK CHANNEL TWO.

5. INPUT LEVEL SENSITIVTY CONTROL CHANNEL TWO.

6. 5-BAND GRAPHIC EQUALIZER CHANNEL TWO.

7. LIMITER ON/OFF SWITCH.
Sends signal through limiter or bypass.

8. MASTER VOLUME CONTROL.
This is the master volume control and it controls how much power you send to your speakers. When setting up your tone or plugging in your instrument, you should keep this control at a low level to avoid damaging your hearing or your speakers.

9. TUNER OUTPUT JACK.
This output signal doesn't control by the master volume.

10. POWER ON/OFF LAMP.
This high power LED will illuminate blue when the power is switched on.

11. INPUT OVERLOAD INDICATOR CHANNEL ONE.

12. ACTIVE BASS INSTRUMENT INPUT JACK CHANNEL ONE.
Lower sensitivity input (500mV) for basses with onboard electronics. Input matched for low signal to noise ratio and optimum transfer function of electrical signal from modern high-end basses.

13. INPUT OVERLOAD INDICATOR CHANNEL TWO.

14. ACTIVE BASS INSTRUMENT INPUT JACK CHANNEL TWO.

15. LIMITER INDICATOR.
This L.E.D (Light Emitting Diode) will light up when the signal is being compressed. This will vary on how hard the instrument is played and how the threshold is adjusted.

16. COMPRESSION ADJUSTMENT LEVEL.
This will vary the level the limiter threshold. The compression ratio is 3dB to 1. Adjust this to suit your playing style and output power of instrument.

17. HEADPHONE OUTPUT JACK.

This jack accepts ¼ inch stereo headphone jacks. When a headphone is connected to the jack, the speakers are automatically shut off. The M-300 features a high-performance headphone amplifier. This output is optimized for standard headphone impedance of 30-40Ω but will work on practically any type of headphones.

18. FX SEND OUTPUT JACK.
This jack sends the signal to an effects processing unit. It can also be used to send the signal to a tuner.

19. FX RETURN INPUT JACK.
This jack accepts the signal from an effects processing unit. Plugging this jack in only will disrupt the signal path in the M-300.

20. POWER ON/OFF SWITCH.
This switches the main power on and off in the amplifier. When the M-300 is switched on, there will be a slight delay while the protection circuits give the amplifier a "soft" start so there is no thumping sound to the loudspeakers.

21. SPARE FUSE HOLDER.
This is not connected to the circuit. It simply is a spare fuse should you ever need one. If you replace the main fuse, be sure to put a backup in its place. Always use the correct current rating fuse. Always keep a backup fuse available. You never know when you may need it.

22. IEC POWER OUTPUT SOCKET.
This is a non-switched socket to provide power for effects units or other ancillary equipment. Maximum power rating is 500 watts.

23. XLR- DIRECT OUTPUT GROUND LIFT SWITCH.
If you are in a location with grounding problems, using this switch may eliminate noise when connected to a sound reinforcement or recording console through the DI output socket.

24. XLR- DIRECT OUTPUT SOCKET.
This is an ultra-low impedance (200Ω) balanced line out for use with recording or PA mixing consoles. This output is not controlled by the master volume output control. Changing the input level control will however, vary the DI output.

25. AC POWER INPUT FUSE.
Uses slow blow 1 ¼ inch fuse.

26. IEC POWER INPUT SOCKET.
Connects the amplifier to AC power supply. Always use a grounded plug and make sure the AC cable is more than 10A rating at 250volt AC. We recommend that you always use the PJB high-current AC cable included with this amplifier as it was designed to withstand high current demand that the M-300 needs.

27. AC INPUT -VOLTAGE SELECTOR.
Switches the amplifier to run on either 110-115volt or 220-240volt AC power. **Never try to run the amplifier on a 220-240volt supply when switched to 110-115volt. This can possibly cause major damage to the amplifier.**

28. LOUDSPEAKER OUTPUTS (NEUTRIK SPEAKON CONNECTORS).
The M-300 amplifier will work on any load from 16Ω down to 4Ω, which is the safe maximum load for this amplifier. The 'Speakon' sockets are in parallel so connecting two 8Ω speakers will result in a 4Ω total load. We recommend that you use PJB high current speaker cables; which are dedicated high-current, low-resistance cables. Using inferior cables will greatly impair the performance of your system.

29. PRE AMPLIFIER OUTPUT JACKS.
These are used for driving a second amplifier such as another M-500 or the PJB M-5000 slave amplifier and even a Tuner. You can run a shielded cable from this socket to the line input of another M-500 (with both graphic EQ and parametric EQ bypassed) to give double the amplifier power. The master volume controls the level out of these jack sockets. Its own "buffer" amplifier circuit isolates each output-jack. The benefit is that each output is independent from each other. Even a faulty cable connected to one will not affect the other. (Most brands use paralleled outputs to save costs.)

AIR INTAKE -FORCED AIR COOLING SYSTEM.
The M-300 is capable of providing more than 500 watts without distortion. This is only possible by using a 'forced air' cooling system. Never block these vents, as this will greatly impair the performance and reliability of this amplifier.

AMPLIFIER COOLING FAN OUTPUT.
The M-300 has a fan that will turn on automatically when heat sink temperature over 75 ℃ in order to give you a quiet environment. It will turn off when the heat sink temperature blew 60℃. **Never block the airflow output of this fan.**

GETTING STARTED

Before switching on power
Check that the voltage selector is set to the correct voltage in your country. (110-120volt USA / Japan or 220-240volt Europe / Australia.)

Connect the speaker or speakers to the M-300 using the Speakon connectors. Speakon connectors are far superior in delivering amplifier power to the speakers than standard ¼ inch jacks because they can handle much higher electrical current. For best results with this amplifier you should use PJB loudspeaker cabinets and PJB cables.

ALWAYS USE A HIGH QUALITY GROUNDED AC POWER CABLE. NEVER USE THIS AMPLIFIER WITH THE GROUND CONNECTION REMOVED. We recommend you use PJB cables.

Matching the M-300 to PJB Loudspeakers

The M-300 will work on loudspeakers from 16Ω to 3Ω with ease. It is not recommended to run on 2Ω loads at full power, during the hotter summer months. The amplifier needs a constant flow of cool air to maintain an optimal working temperature. If it does not get the proper cooling it needs, it is possible for the amplifier's thermal protection circuits to operate and turn off the amplifier. The protection circuits work on temperature and current workings in the amplifier's output transistors and power supply. AC power can vary from region to region and time of day due to electricity demand. Also because the amplifier uses force air-cooling, the operating temperature of the amplifier will vary somewhat due to the room temperature you are playing in. These factors alone could determine the amplifier to switch off.

Before turning on make sure your loudspeaker is connected to the M-300. The M-300 speaker outputs are pro-audio industry standard Neutrik Speakon connectors because they can work at higher power levels than the usual ¼ inch jacks. It is strongly recommended that you use PJB speaker cables. They are high current, low resistance dedicated speaker cables for bass instrument amplification. There is also available a PJB Speakon to ¼ inch jack cable for those who are not using PJB speakers.

Keep volume down before plugging in your instrument. Use the passive jack for basses without onboard electronics only. Set the input level to match your instrument. When the red light blinks momentarily you are just below clipping (distortion) so back off a little on this control. Keep this control set and then bring up the master volume to about 1/3 up. The EQ circuits should be first flat. What you are hearing now is the exact sound of your bass.

The Graphic EQ.
This is a 5 band EQ that covers the full spectrum of a bass and beyond. This is used to fine-tune your bass tone to perfection. Often playing in different venues will cause your bass to sound different. This is partially due to the acoustics of the hall influencing the low frequency waves that are coming from your speaker. Bass waves are large and room

dimensions heavily influence them when the walls reflect the sound waves, causing them to collide by adding together or canceling each other out. This causes some fundamental notes (the ones you feel more than hear) to ring out louder than others and some note not to be heard at all.

Here is an indication of where fundamental bass frequencies are, showing open string's approximate frequencies and acoustic wavelength.

F# string	**24Hz**	**46 feet**
B string	**31Hz**	**36 feet**
E string	**41Hz**	**27 feet**
A string	**55Hz**	**20 feet**
D string	**73Hz**	**15 feet**
G string	**98Hz**	**11 feet**
C string	**130Hz**	**9 feet**

This may give you some indication of the offending notes (frequencies) that may be booming or resonating louder or quieter than others. For example if your speakers are 5 feet from a wall, the open A string may sound lack of weight. That could be because the path length of the reflected sound off the wall from your speaker is exactly corresponding to half a wavelength on the open A string causing at that particular note a cancellation.

Note that the position of where you place your speakers will ultimately affect your tone. Placing a speaker with the back close to a wall will help to reinforce the lower notes. Placing the speaker in a room corner will further enhance the low notes.

Unfortunately for bass players, low frequencies are always very difficult to control with room acoustics. The reproduced wavelengths of the notes you are playing often correspond to the room dimensions, in which case the reflected sound off the walls interferes with the sound from the speaker. So the graphic EQ is by far your best weapon of choice in killing standing waves that develop in the room. From about 250Hz upwards, the graphic EQ is just controlling your overtones on the strings bearing in mind that even the 60Hz control will alter the second harmonic on an open B string.

The amount of control per frequency band is up to 36dB (+/- 18dB). You should try to avoid using excessive boosting of EQ on the lower frequency ranges (50Hz) as this will reduce amplifier headroom and possibly damage your speakers, since the amplifier may force them to move beyond their physical capability. If you hear large amounts of distortion coming from your speakers when you boost the lower bands, you should immediately back off on the EQ. If you cannot get enough low-end weight for your taste, maybe you need more speakers.

If you are playing 5 or more strings on your bass beware that the lowest notes can cause great stress on your speakers if you do not have enough of them. Low frequencies only propagate well from large surface areas, which is why upright acoustic basses are a lot bigger then violins. The same goes for speakers: more cone area means better coupling of

low frequencies. So if you really want ground shaking lows from your B / E or even F# strings, consider using a lot more speakers.

Setting up the Limiter
Although a limiter is not essential to bass amplification, it can be a useful tool in smoothing out the character of your instrument or playing style. The M-300 limiter has a preset compression ratio of 3 to 1. For each additional increase of 3dB above the set threshold, the increase in level is actually 1dB. So dynamic range of your instrument is reduced.

First set up the limiter by having the compression control (16) set fully clockwise. Now switch on the limiter (7). Start playing and turn control (16) anti-clockwise. You will see the blue light start to come on and that is the indication that the limiter is now working. Set this control to suit your taste.

POWER AMPLIFIER MAXIMUM POWER OUTPUT RMS
8 ohm: 300W
4 ohm: 450W

The above is the minimum power available from the M-300. In reality amplifier power can vary somewhat due to variations of the AC voltage supply. (Variations can occur due to supply and demand of the region. For example, on a hot day it is possible that voltages drop dramatically due to mass usage of air conditioners in the region.) Also no such speaker has true constant impedance. The impedance of a speaker will vary with frequency. PJB speakers are rated at their minimum impedance load. Power measurements on PJB amplifiers are done with constant 'sine wave' signal at full power across a static load resistor. This is the harshest environment for the amplifier and in real circumstances it would not be subjected to such a hard workout.

Although the M-300 can work on speaker loads down to 2Ω, it is not advisable to do so on a continual basis at high power levels, since there is more heat generated. If the weather is hot, there may not be enough cooling from the internal fan so the amplifier could momentarily cut out as the amp's heat protection circuits kick in.

A Note on Amplifier Power and Speaker Power Handling

Very often loudspeakers and amplifier power ratings are totally misunderstood by the non-technical user for good reason. This is a complex and involving topic that will only be touched upon in this manual.

First the ear is not capable of telling how much power is going to a loudspeaker. Secondly loudspeakers have different power ratings at each and every frequency. The amplifier will produce different power levels if the frequency changes, even if the volume is the same. Finally, we hear sound based on a logarithmic scale. So in order to perceive a note twice as loud, in theory we need 10 times the power to produce the perceived doubling of volume. In reality another parameter comes into this already complex equation. It's called "Power Compression" which are losses in the loudspeaker units due

to heating up and reducing efficiency of converting the amplifier's electrical power to acoustic energy.

Loudspeakers are complex devices and very inefficient converters of electrical energy especially when it comes to reproducing bass frequencies. More than 90% of amp power goes to heating up the speakers and that is why the "Power Compression" factor is a major one.

Two limiting factors determine the power handling of a bass speaker. One is the ability to withstand the heat buildup before the unit goes up on smoke. The other is the excursion capability of the cone. The cone will move in and out further not only with volume increase but also as you play lower notes. An open B or E string will cause the cone to move more than an open G-string at the same volume level. Also boosting the bass EQ will cause greater excursion on the speaker cones.

PJB bass instrument speakers were developed with a focus to overcome the problem of power compression, and this is one of the reasons they outperform competitive products both in sound quality and power handling. The M-300 is rated conservatively with ratings of distortion that are lower than the loudspeakers themselves. Many other amplifiers may have power ratings that are similar but in fact may well have higher distortion ratings. If the M-300 were to be rated this way, it will yield far greater power levels than specified.

If the M-300 is to be used on speakers other than PJB, take great caution since these speakers may not live up to the true power levels the M-300 can provide. So if you hear your speakers distorting at high sound levels, you should immediately back off on the volume. Playing at a lower level will save your speakers from blowing; playing louder will most certainly cause them damage.

A Note On Amplifier Power Ratings

For each watt a transistor amplifier delivers to a speaker it will approximately develop one watt in heat dissipation. So at high power levels an amp can generate a lot of heat.

Not all amplifiers rated at the same power have the same actual power. If a manufacturer rates an amp with a maximum power of 500 watts, what exactly does that mean? It could run for 3 minutes before it goes up in smoke, or it could run all day long effortlessly. It depends on the quality, size and design of the amplifier and its components. The size of the amplifiers internal power supply, the type & quantity of transistors that are used in the output stage, along with solid construction will have a major effect on manufacturing cost.

A cheap amplifier may be designed to last a few years before it dies. It may cost more than its worth to give it an overhaul. In essence you get what you pay for. Your M-300 is built to last for a very long time running day after day at continuous high power levels. From AC input to speaker output the M-300 has more than adequate components to deliver pure power to your speakers with sonic purity.

Taking care of your M-300

The M-300 will give years and probably decades of reliable service if it is cared for.

Use a cover or road case when transporting or storing the amplifier.
The M-300 was built to be as rugged as possible. However you should handle it with care. Keep it away from moisture, heat and dust. Clean with a soft damp cloth such as a moist towel. Do not use chemicals or solvents to clean it.

From time to time the unit may need to be cleaned internally since airflow is constantly running through the amplifier. Dust can build up inside over long periods of time. Your service agent should check the amplifier every 2-5 years for dust build up and cleaned carefully with compressed air. (We recommend this procedure performed by qualified professional service personnel only.)

Many perishable PJB parts are available as replacements, such as handles, feet casters, grills, etc. These are available from your authorized PJB dealer or direct from PJB.

Service at a PJB Service Center

Your amplifier has very sophisticated circuitry, which should only be serviced by a fully trained technician. This is one reason each unit has the printed warning label on the back.

PJB customers may obtain service from an authorized PJB Sales & Service Center. It is important that you have your copy of sale as your proof of purchase. Simply present you bill of sale along with the defective unit to an authorized PJB Service Center to obtain service. They will handle the necessary paperwork and repair. Remember to transport your amplifier in the original PJB packaging.

Should the M-300 ever need to be serviced, service technicians will appreciate its modular construction using multi-pin plugs and Integrated Circuit sockets. So any repairs can be done quickly with ease and speed keeping repair labor costs low.

PJB is dedicated to ongoing research on bass amplification. As a result specifications are likely to change without notice owing to our relentless pursuit of perfection.

All PJB owners manuals can be downloaded form our website in PDF files.

Warranty information

The M-300 has a warranty period of 2 years, starting from the date of purchase. The buyer must complete and return the enclosed warranty card within 14 days of purchase.

This warranty covers defect in materials or workmanship that occurs in normal use. Within warranty period PJB will repair or replace the defect unit free of labor and parts charge. It is the buyer's responsibility to use the amplifier strictly according to instructions written in this manual.

This warranty is not transferable; it is provided to original owner only.

Damage/defects caused by the following conditions are not covered by this warranty:

- Improper handling, neglect or failure to operate the unit in compliance with the instructions given in user manual;
- Connection or operation of the amplifier in any way that does not comply with the technical or safely regulations applicable in the country where the product is used;
- Repairs or modifications by anyone other than authorized PJB service agent;
- Damages/defects caused by force majeure or any other condition that is beyond the control of PJB.
- If the unit's serial number is defaced or removed.

Should you need any warranty service on the M-300, please bring it back to the dealer from whom you purchased the amplifier, along with your sales receipt. Depending on the complexity of the repair work, your dealer may return the defect unit to PJB service center for repair or replacement.

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support@philjonesbass.com

Serial Number: _____

Date Purchased: _____

Dealer: _____

SPECIFICATIONS

Frequency Response
Passive and Active input: 20Hz -40KHz +/- 1dB.
Low Cut Filter: 24dB/Octave at 20Hz.
High Cut Filter: 12dB/Octave at 40KHz.

Maximum Output Power

LOAD Ω	OUTPUT (Watts RMS)
8	300
4	450

Signal to Noise Ratio
Better than 88 dB (EQ off, Input-Gain on Full. Volume on Full.)

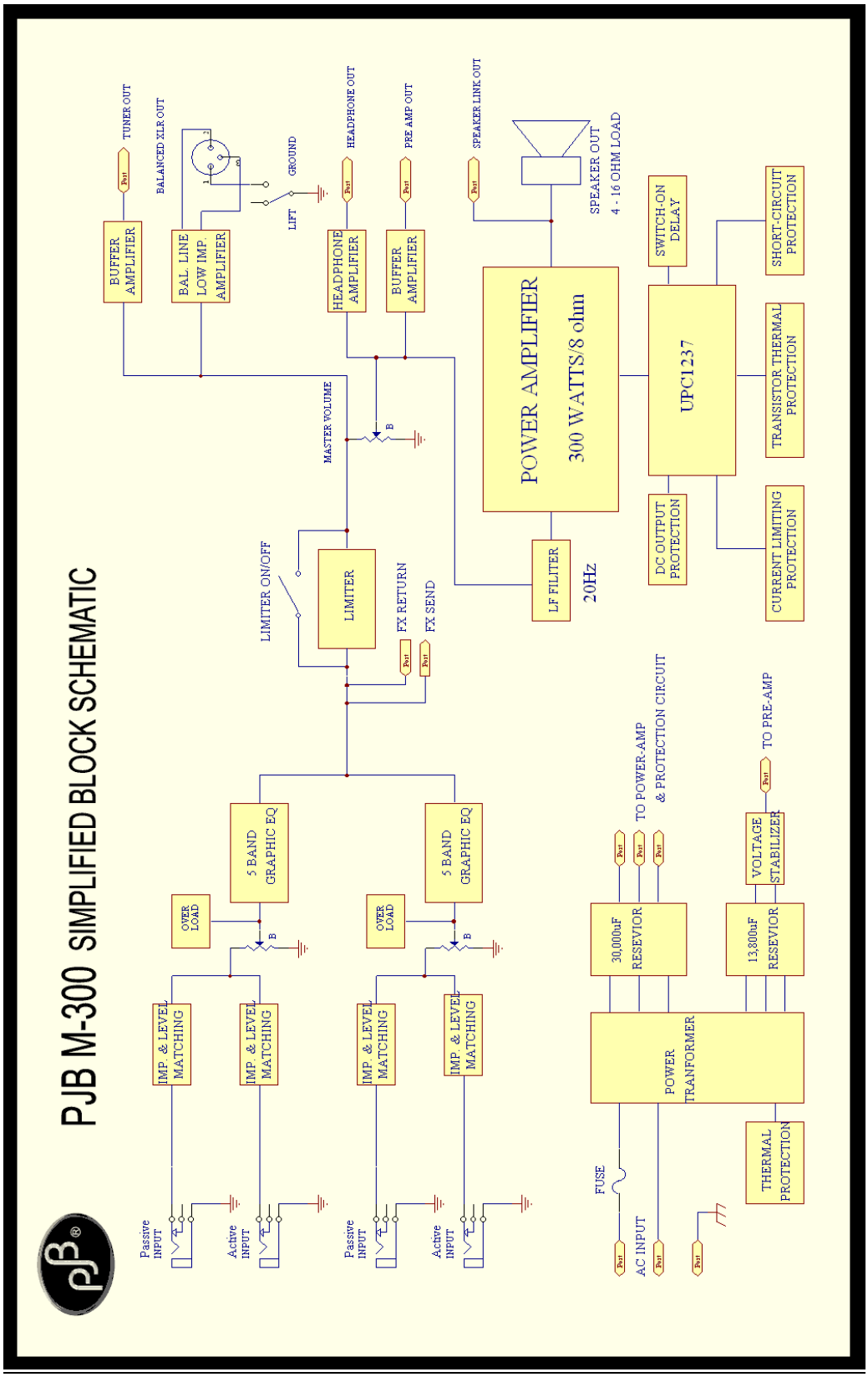
Impedance
Passive Input: >5MΩ/22pF
Active Input: >100KΩ/22pF
FX Return: >75KΩ
FX Send: < 4.7KΩ
Pre Amp Out: < 2KΩ
Bal. Line Out: <200Ω

Levels
Passive Input: 20mV-2.5V
Active Input: 50mV-5V
FX Return: Typical 1V
FX Send: Typical 1V
Pre Amp Out: 1.2V
Bal. Line Out: Typical 600mV

Compressor / Limiter
Gain: 0dB Compression Ratio: - 3dB: 1dB

EQ Section
50, 160, 630, 2.5K, 12KHz at +/- 18dB

Protection Circuits
1. AC line filter.
2. Slow-blow Fuse.
3. AC Transformer: auto cut off at 105ºC, Auto reset at 60º C.
4. Transistor Thermal Protection: auto cut off at 90º C.
5 Loudspeaker Short-Circuit Protection.
6. DC Output Protection.
7. Turn on protection: 2-second delay.


PJB M-300 SIMPLIFIED BLOCK SCHEMATIC
TUNER OUT
BALANCED XLR OUT
GROUND
LIFT
HEADPHONE OUT
PRE AMP OUT
SPEAKER LINK OUT
BUFFER AMPLIFIER
BAL. LINE LOW IMP. AMPLIFIER
HEADPHONE AMPLIFIER
BUFFER AMPLIFIER
MASTER VOLUME
POWER AMPLIFIER
300 WATTS/8 ohm
SPEAKER OUT
4 - 16 OHM LOAD
SWITCH-ON DELAY
SHORT-CIRCUIT PROTECTION
UPC1237
TRANSISTOR THERMAL PROTECTION
DC OUTPUT PROTECTION
CURRENT LIMITING PROTECTION
LF FILITER
20Hz
LIMITER ON/OFF
LIMITER
FX RETURN
FX SEND
5 BAND GRAPHIC EQ
5 BAND GRAPHIC EQ
OVER LOAD
OVER LOAD
IMP. & LEVEL MATCHING
IMP. & LEVEL MATCHING
IMP. & LEVEL MATCHING
IMP. & LEVEL MATCHING
Passive INPUT
Active INPUT
Passive INPUT
Active INPUT
30,000uF RESEVIOR
TO POWER-AMP & PROTECTION CIRCUIT
13,800uF RESEVIOR
VOLTAGE STABILIZER
TO PRE-AMP
POWER TRANFORMER
FUSE
AC INPUT
THERMAL PROTECTION