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MARSHALL



LIMITED EDITION

JTM45/100 - Dual Output 100W Super Lead Head

Owners Manual



40th Anniversary of the 100W stack

From the Chairman

Congratulations on your purchase of this limited edition, 40th Anniversary, hand wired JTM45/100 Dual Output 100 Watt, all-valve head and accompanying pair of 4x12 cabinets. The original version of this world famous amplifier was built in late 1965 at the request of the young rock musicians of that period. I was being asked to provide bigger and louder amplification to accommodate the harder edge and aggression of this younger generation's take on rock and roll and blues. I was only too happy to accept this challenge!

My team of engineers set to work using a JTM45 with two power sections as the basis for the very first Marshall 100 watt head and in November 1965 these formidable amps with accompanying 8x12 cabs made their stage debut. The original 8x12s proved too bulky for transportation and were returned in favour of stacking two 4x12 cabinets, one on top of the other. Thus the Marshall 'stack' was born.

This authentic replica stack and head celebrates the fortieth anniversary of this much documented episode in rock music history and is part of an ongoing series, featuring hand wired re-issues of revered historical Marshall Products. The reason I have decided to do this is simple - public demand!

Marshall's reputation and longevity has evolved as a result of the philosophy behind the design and build of our amplifiers. Our design engineers are nearly always guitarists and have the benefit of developing our products from both musical and electronic view points. Anybody who appreciates great vintage tone will enjoy the magic contained within this milestone of electric guitar amplification. These vintage tones are still to this day regarded as benchmarks.

At a time when the face and sound of popular music was rapidly changing, players were constantly pushing back and redefining musical boundaries. The JTM45/100, with its relatively simple controls, features and circuitry was there on the front line at the beginning of this music revolution.

I sincerely hope that this unique looking and sounding, handwired landmark of Marshall history will provide you with countless hours of playing pleasure, inspiring you to push musical boundaries even further...just like the famous players of the originals did!

Yours Sincerely,

A stylized, handwritten signature of Jim Marshall in black ink, positioned over a background of faint, technical circuit diagrams.

Overview: Historical, Tone and Tech Talk

The JTM45/100 is a Class-A/B, all-valve, 100 Watt head with two channels (High Treble & Normal) that share tone controls. Our goal for this handwired re-issue is both obvious and simple – to make it as identical to the late 1965 made originals as possible. To this end the circuit, cosmetics, construction, sound and all-important dynamic characteristics all have to be 100% correct – and they are. We went to incredible lengths to achieve maximum authenticity and are delighted to report that our suppliers were equally as exacting in their tasks

As 'the Guv'nor', Dr. Jim Marshall, has already stated, this head first saw the light of day in late 1965 and was affectionately named the JTM45/100 because of the continued use of the JTM45 preamp section and also its front panel. Because original JTM45/100's are extremely rare and collectable, we had to travel to various parts of the world to examine other originals in addition to closely examining many photographs kindly provided by the lucky few owners. Slight circuit variations were apparent between models due to Marshall's ongoing development of the 100 watt amplifier at that time.

The circuit we have revisited for the JTM45/100 is vastly different to the later circuit we use for our critically acclaimed, late 60s Plexi re-issue, the 1959HW. The most relevant technical departures in question lie in the dual output transformers, Power Supply Topology and the use of KT66 power valves just like the originals.

As you can see from its front panel layout, the JTM45/100 is an extremely straightforward amplifier. Its two channels – High Treble and Normal - each have two inputs (High and Low sensitivity) and separate Loudness (volume) controls. Both channels share the amplifier's four tone controls: Treble, Middle, Bass and Presence. Like all Marshall valve amplifiers, the JTM45/100 performs at its very best when turned up to deliver your personally preferred dynamic range. Due to its power rating and astonishing projection, it can be a formidable live amplifier in even the largest of venues. A truth bore out by its impressive history time-and-time again.

The JTM45/100's organic, vibrant, sweetly distorted, harmonically rich and thick musical tone emanates from its power valves being driven into a dual 50 watt output stage. When 'cranked,' the JTM45/100 produces its own unique roar with an inspiring 'punch you in the chest' clout. It reacts superbly to the guitar's volume control / player feel combination and, not surprisingly, responds exceedingly well to picking dynamics too. From 'in-your-face' when you play with unbridled aggression to subtle 'in your ear' blues caresses when you pull back and turn down...just like the celebrated masters of the day.

The speaker cabinets in the Anniversary Stack, 812T40 and 812B40, have been designed to recreate the majestic look of the original 8x12s when stacked. We could, of course, have replicated the 8x12 but in consideration to your back (and your roadies!) we decided that dividing it into two 4x12s was much more sensible! Just like the original 8x12, both cabs are loaded with Celestion's highly celebrated T652 Alnico Speakers. The angled top cabinet also features a semi-open back, just like the genuine 8x12 reference we took our dimensions from.

Technical Information

Components: Wherever and whenever possible, we have gone back to the original manufacturers for all components to maintain the highest quality and to ensure maximum authenticity.

Valve compliment: Three ECC83s (12AX7s) in the pre-amp and a quartet of KT66* power valves working in push-pull. All valves are of the highest quality available and are subjected to our usual meticulous grading and testing processes.

***KT66:** these output valves were standard issue on mid sixties Marshall Amplifiers yielding a fat, round tone that has a distinctly vintage flavour.

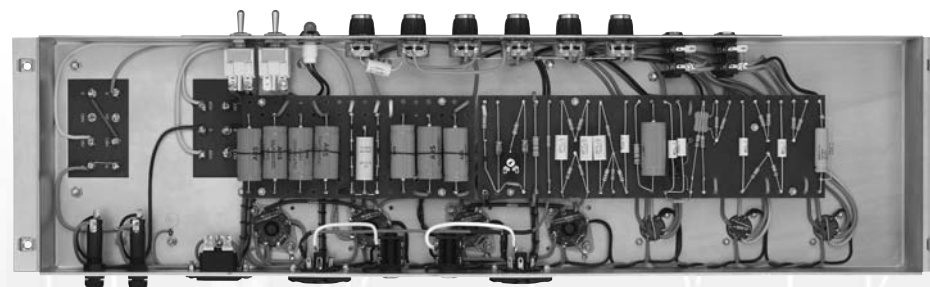


The way the three ECC83s (labelled V1, V2 & V3 in the photo) in the pre-amp are utilised is as follows –

V1 is the pre-amp gain stage for the High Treble and Normal channels. Each half of the valve (the ECC83 is a dual-triode which means it is literally two triode valves in one) acts as a dedicated gain/input buffer stage for each channel.

V2 is common to both channels which are passively summed at the input of this valve. The first half of V2 acts as a second gain stage, which boosts the signal further and directly drives the second half of the valve which is configured as a cathode follower – a unity voltage gain device which acts as a high input impedance buffer, providing a low output impedance to drive the pre-amp's passive tone network.

V3 is the amplifier's phase inverter and sits at the very end of the pre-amp section's tone circuit. V3 divides its input signal into two separate output signals that are inverted with respect to each other – hence the name 'phase inverter' (a.k.a. 'phase splitter'). The two resulting signals are then fed to the push-pull power output stage of the amplifier.



Tone Circuit: In typical Marshall fashion, the JTM45/100's shared tone network is passive and interactive. By interactive we simply mean that the settings of the Bass and Treble controls affect the amount of mid-dip (cut) available via the Middle control.

Tag Boards: The tag boards used in your hand wired re-issue are exactly the same as those in the original in terms of thickness and matrix pitch. The material we're using is made exclusively for us and is 'UL recognised Micom type Marshall EM42'. The reason we didn't use a board with the exact same chemical composition as in the original units is because that material doesn't pass current safety requirements regarding flammability.

Transformers: The mains (power) and output transformers are vital to the performance, sound and feel of an all-valve amplifier. Because of this we spent a great deal of time studying and analysing the constructional methods and materials used in the original transformers so we could match everything as closely as possible. We also went to great lengths to ensure that the all-important electrical characteristics and performance of the originals were duplicated exactly. In order to achieve these vitally important goals we worked extremely closely with our associates in the R&D department of Drake – the company which supplied us with the output transformers used in the original JTM45/100.

Mains (Power) Transformer: In the original JTM45/100 the mains transformer was an "off-the-shelf" device purchased from a highly regarded general electronic components supplier. Referred to as the "RS De Luxe" this transformer is no longer available, but with the help of Drake's expertise we were able to replicate the performance of the original "De Luxe" of which we have several genuine examples. We paid particular attention to an important electrical effect called 'regulation' which is the variation in behaviour of the HT voltage and current from the transformer and is dependant on load demand (i.e. how loud you're playing!). This behaviour affects how the amplifier compresses and reacts to saturation when played at high volumes – hence its importance.

Output Transformers: As already mentioned, the pair of output transformers used in the original JTM45/100s were supplied by Drake, as are those in your reissue. Fortunately Drake still had their original documentation intact after all of these years, a factor which obviously helped ensure that the reissues are 100% accurate.

Power Supply: This circuit has the same exact filtering on the H.T. (high voltage DC, a.k.a. the B+ voltage) line as the original versions, a factor that contributes to the JTM45/100 having a unique, dynamic characteristic all of its own.

Chassis: We are using a box-section chassis made from 16-gauge mild steel with butt-welded corner joints. The steel is also passivated giving lifelong resistance to corrosion.

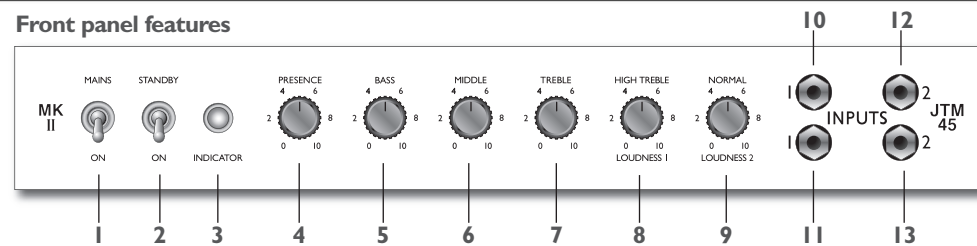
Front Panel: Extra thick, gold coloured Plexiglas (actually Perspex, causing some people to refer to it as 'Perplexi!'), exactly as the original. Specific details pertaining to the front panel features can be found on page 5 of this manual.

Rear Panel: Made from cream styrene with gold print, just like the original references.

Head Cabinet Construction: High-grade, flawless (knot-free) Baltic birch-ply with finger locked joints for maximum strength. The main cabinet frame (sides, top and bottom) are 15mm ply, the front baffle is constructed from 12mm ply while the back of the cabinet is 9mm ply. All edges have a 15mm radius.

Head Cabinet Cosmetics: The Marshall Block logo, black Levant covering, original venting, beading and piping duplicate the look and style of the originals.

Front panel features



1. POWER SWITCH

This is the On/Off switch for mains power to the amplifier.

Note: Please ensure the amplifier is switched off and unplugged from the mains electricity supply whenever it is moved.

2. STANDBY SWITCH

The Standby Switch is used in conjunction with the Power Switch (item 1) to 'warm up' the amplifier before use and to prolong the life of the output valves. When powering up the amplifier always engage the Power Switch first, leaving the Standby switch on 'Standby'. This allows the heater voltage to bring the valves to their correct operating temperature. After approximately two minutes the valves will have reached their correct operating temperature and the Standby Switch can be engaged, enabling the HT without 'shocking' cold valves.

In order to prolong valve life, the Standby Switch alone should also be used to turn the amplifier on and off during breaks in a performance. Also, when switching off, always disengage the Standby Switch prior to the main Power Switch.

3. INDICATOR

This 6.3 Volt incandescent filament indicator will light up when your amplifier's heaters are energised at mains power switch on, (irrespective of standby switch position). It will not be lit when the amplifier is switched off and/or is not receiving mains power.

4. PRESENCE CONTROL

This control operates in the JTM45/100's power section and adds high frequencies to your sound by altering the power amplifier's negative feedback. Turning this control clockwise adds more 'sparkle' to your sound, making it crisper and more cutting.

5. BASS CONTROL

This adjusts the bottom end, turning it clockwise increases the amount of low frequencies in the sound.

6. MIDDLE CONTROL

This adjusts the level of those all-important mid-range frequencies. Turning it clockwise increases the mids and fattens your sound, giving it more punch. Turning it anticlockwise reduces the mids, producing a more 'scooped' tone.

7. TREBLE CONTROL

This adjusts the top-end. Turning it clockwise increases the amount of high frequencies present in the sound, giving your guitar tone a brighter edge.

Note: The following four controls - PRESENCE (item 4), BASS (item 5), MIDDLE (item 6) & TREBLE (item 7) - are all shared, meaning that they are common to both Channel I and Channel II. They are highly interactive and altering one control can change the way the others behave. For this reason, experimentation is recommended.

8. LOUDNESS I

This controls the overall output level of Channel I, turning it clockwise increases the volume. This channel is voiced for a higher treble response than Channel II, hence its 'High Treble' labelling.

9. LOUDNESS II

This controls the overall output level of Channel II, turning it clockwise increases the volume level. This channel is voiced for a 'normal', flatter response and is labelled as the 'Normal' channel.

10. HIGH SENSITIVITY INPUT FOR CHANNEL I

This is the 'high sensitivity' guitar input for Channel I, the so called High Treble channel. It is the most commonly used input. Always use a high quality screened guitar lead.

11. LOW SENSITIVITY INPUT FOR CHANNEL I

This is the 'low sensitivity' guitar input for Channel I.

12. HIGH SENSITIVITY INPUT FOR CHANNEL II

This is the 'high sensitivity' guitar input for Channel II, the so called 'Normal' channel.

13. LOW SENSITIVITY INPUT FOR CHANNEL II

This is the 'low sensitivity' guitar input for Channel II.

Interesting aside: Back in the day, a 'high sensitivity' input jack was recommended for use with a guitar loaded with low-output pickups (e.g.: single coils) while

the 'low sensitivity' input was recommended for higher output pickups (e.g.: humbuckers). This said, the majority of guitarists - then and now - ignore these recommendations and plug high output guitars into the 'high sensitivity' input because it further boosts the strength of their signal.

Performance Note: 'Jumping' the two channels

Because both Channels of the JTM45/100 have the same number of gain stages and are in phase with each other, it is possible to 'jump' (a.k.a. 'link' or 'bridge') them together and use them both at the same time. Doing this enables you to expand upon the amp's tonal capabilities.

The most common way of doing this is to plug your guitar into the top (high sensitivity) input of Channel 1 and then run a short 'jumper' guitar cable (i.e. a screened cable) from Channel 1's bottom (low sensitivity) input to the top (high sensitivity) input of Channel 2. Adjust both channel volumes (Loudness 1 & 2 controls) until the desired mix of tone is achieved.

The reverse is also possible, i.e. plugging your guitar into Channel 1's top input and then running the 'jumper' cable from Channel 2's bottom input to Channel 1's top input.

NOTE: whether the channels are linked or not is entirely the choice of the individual player's taste in tone. As always, experimentation is the key.




Technical Specification

JTM45/100 Head

Power Output	100W RMS
Weight	22 kg
Size	740mm x 270mm x 210mm

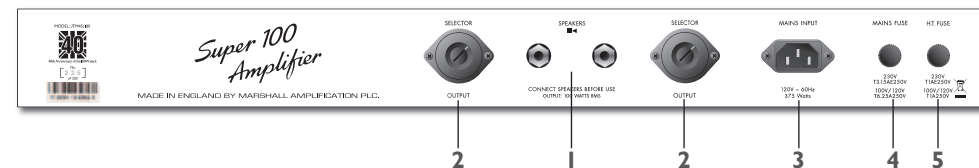
812T40 & 812B40 Cabinets

Power Handling (per cabinet)	100W RMS
Weight - 812T40	36 kg
Weight - 812B40	39 kg
Size	754mm x 741mm x 355.5mm

EUROPE ONLY  **Note:** This equipment has been tested and found to comply with the requirements of the EMC Directive (Environments E1, E2 and E3 EN 55103-1/2) and the Low Voltage Directive in the E.U.

EUROPE ONLY - Note: The Peak Inrush current for the JTM45/100 is 39 amps.

Rear panel features



1. LOUDSPEAKER OUTPUTS

There are two loudspeaker output jacks provided for connection to speaker extension cabinet(s). However, due to the unique power amplifier output configuration, they are not in parallel, as are standard models. Please always ensure that the amplifier's output impedance selector is set correctly (see item 2) and ALWAYS ensure you use good quality speaker (non-screened) cables. NEVER use guitar (screened) cables.

Always use a non-screened Marshall approved speaker lead when connecting an extension cabinet to these units.

WARNING! Never use the amplifier without a load attached!

2. OUTPUT IMPEDANCE SELECTORS

Matches the amplifier's output to the load (speaker) impedance.

Originally, the output selectors were situated on the shrouds of the transformers themselves, however, this is not allowed by current safety requirements. We have therefore logically put them on the rear panel.

Your JTM45/100 should be completely powered down before either Output Impedance Selector is turned.

It is imperative that: a) at least one of the speaker outputs of the amplifier is connected to a load whilst in operation and b) the impedances on the output selectors matches the impedance of the extension speaker cabinet(s) being used. The following combinations are our recommendations:

1x16 Ohm cabinet - Selectors on 16 Ohm.

Use either speaker output.

2x16 Ohm cabinets - Both selectors on 16 Ohm.

Use both outputs.

1x8 Ohm cabinet - Selectors on 8 Ohm.

Use either output.

2x8 Ohm cabinets - Both selectors on 8 Ohm.

Use both outputs.

1x4 Ohm cabinet - Selectors on 4 Ohm.

Use either output.

2x4 Ohm cabinet - Both selectors on 4 Ohm.

Use both outputs.

Stereo cabs can be used provided attention is given to impedance and power handling i.e. at least 50 watts per side.

WARNING! Use of any other combination of cabinets and/or impedances may result in sub standard sound and possible damage to the amplifier!

Failure to comply with any of the points raised in this section may result in damage to the amplifier.

3. MAINS INPUT

Your amp is provided with a detachable mains (power) lead, which is connected here. The specific mains input voltage rating that your amplifier has been built for is indicated on the back panel. Before connecting for the first time, please ensure that your amplifier is compatible with your electricity supply. If you have any doubt, please get advice from a qualified technician. Your Marshall dealer will help you in this respect.

4. MAINS FUSE

The correct value of mains fuse is specified on the rear panel of the amplifier. **NEVER** attempt to bypass the fuse or fit one of incorrect value.

5. H.T. FUSE

The correct value of this H.T. fuse is specified on the rear panel of the amplifier. **NEVER** attempt to bypass the fuse or fit one of incorrect value.

Originally this fuse was mounted internally; however, it is logical to provide access on the rear panel.

Follow all instructions and heed all warnings
KEEP THESE INSTRUCTIONS!