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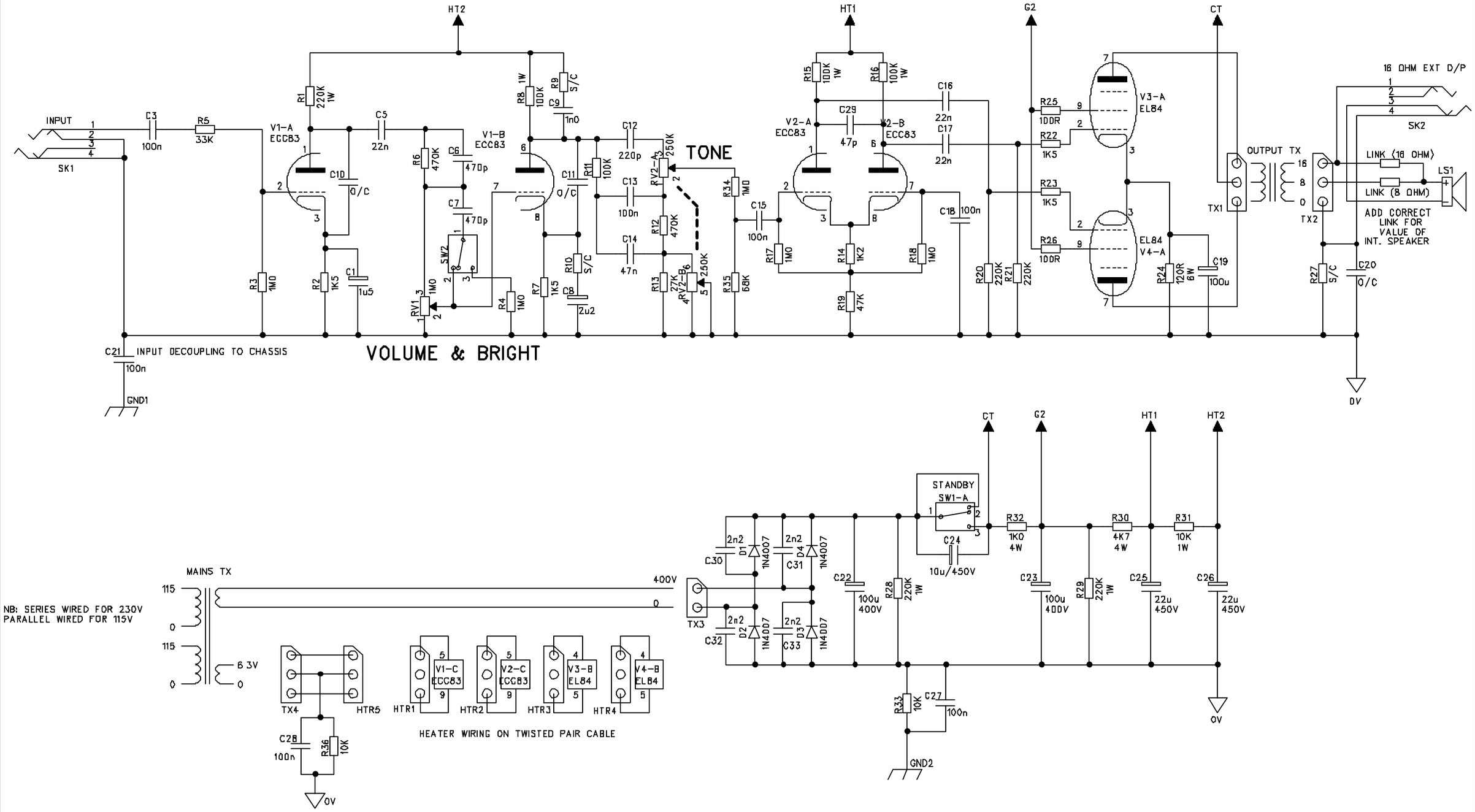
GIBSON GA15 GUITAR AMPLIFIER



CIRCUIT DESIGN BY PAUL STEVENS

TITLE	CIRCUIT DIAGRAM
PROJECT	GOLDTONE GA15 GUITAR COMBO
DRAWING No	CD00037
ISSUE	2
DATE	8/3/1998
DRAWN BY	J B RECKLESS

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GIBSON ‘GOLD TONE’ GA-15
CIRCUIT DISCRIPTION

Please refer to circuit diagram for DC voltages and other information

INPUT SECTION AND PREAMP

SK1 is the guitar input to the preamp.

C3 is to block any DC from the input that may unintentionally be present, this would otherwise change the bias point of the first valve stage.

V1a is the first gain stage and is configured as a cathode bias, common cathode, voltage amplifier with bypassed cathode resistor for increased gain.

R6 and C6 give a slight presence lift and the frequency of the Bright effect is set by C7, which, when switched in, is across pins 2 and 3 of RV1 (Volume). Obviously connected like this the amount of brightness added will decrease as RV1 is turned up.

V1b is the second gain stage configured similar to before, C9 is added across the anode resistor R8 to smooth out the top end.

The Tone network is passive and controlled by RV2. This is a dual ganged potentiometer, one part of which effectively controls the mids (RV2B) while the other part inversely controls the treble (RV2A).

R34 and R35 act as a potential divider to lower the signal sent into the phase splitter.

POWER STAGE

The phase splitter (V2A and V2B) is a differential input splitter which produces the two anti-phase signals necessary to drive the push pull output stage.

V3 and V4 are the two EL84 output valves connected as a push pull, cathode biased class A power amplifier.

The quiescent current is set by R24, which is bypassed by C19 for extra gain.

OUTPUT TRANSFORMER AND SPEAKER CONNECTIONS

The output transformer has secondary taps for 16Ω and 8Ω. The 16Ω tap is used to drive the External Speaker Output, SK2. When a jack plug is inserted into SK2 the internal speaker is disconnected.

The two LINK positions are provided on the PCB so that different impedance internal speakers can be used in production. Depending on whether the internal speaker is 16Ω or 8Ω the correct LINK should be fitted. This has been done purely so that different impedance speakers can be used if there are any problems with supply.

POWER SUPPLIES

The HT supply is a very simple bridge rectifier diode network, with 4n7 1KV capacitors across each diode for EMC reasons, which is then smoothed by C22, to supply the centre tap of the output transformer. This is then further smoothed by R32/C23, R30/C25 and R31/C26 to supply the screen grids, phase splitter and preamp respectively.
R28 and R29 are to discharge the high voltage capacitors when then unit is turned off.

The ac heater supply is simply connected via a twisted pair connecting lead to V1, V2, V3 and V4.

Paul Stevens
30 June 1999

VELOCETTE ALL VALVE GUITAR AMPLIFIER

Introduction

The Velocette is no nonsense, compact, purists valve guitar amplifier. It has the minimum controls necessary to produce a good range of sounds, from clean to overdriven, into its single speaker.

The circuit topology has been based on traditional guitar amplifier designs, with new ideas incorporated where beneficial.

The preamp and power stage sections are 100% valve. The valves used are two ECC83/12AX7's and two EL84/6BQ5's.

REAR PANEL CONTROLS

INPUT

A single jack socket is provided for connection to your instrument. This is a high impedance input which allows for perfect matching to both passive and active guitars.

BRIGHT SWITCH

The BRIGHT switch adds more high frequencies when selected. It works in the traditional way, therefore as the volume control is increased the effect becomes less apparent.

VOLUME

This sets the overall volume level of the amplifier as well as the tone and the amount of overdrive. From low to about halfway, depending on the output level of the guitar used, the sound should remain reasonably clean. Increasing the control further will progressively increase the level of distortion in the sound, obviously being a valve amp it will respond to the player's dynamics and use of the instruments volume.

TONE

Unlike other single tone controls on other amplifiers, which act merely as a treble roll off, this control works in a different way. In the fully anti-clockwise position the midrange is dominant in the sound, turning the control clockwise decreases the mids while at the same time increasing the higher frequencies.

EXTERNAL SPEAKER OUTPUT

This is provided so that the user can connect the Velocette to an external 16Ω speaker cabinet, such as a 4x12, for a different sound. This is useful for both live and studio use. When

a jack is inserted into this socket the internal speaker is disconnected. Always ensure that the amplifier is correctly loaded when in use.

POWER SWITCH (OFF/STANDBY/ON)

As the name implies, this switches the amplifier from OFF to STANDBY mode, where only the valve heaters are on, to ON for actual use. This should be used correctly every time the unit is used to prevent problems with valves and increase their life.

Before mains is applied to the unit, check that it is the correct voltage and make sure the POWER switch is in the OFF position. Connect power lead to mains outlet then switch to STANDBY and wait at least 30 seconds before switching to ON. This will ensure that the valves have time to warm up before large voltages are applied to the plates. During short breaks the amplifier can be switched to standby and will therefore be ready to play when next needed.

MAINS FUSE

In the event of having to replace the mains fuse always use the same rating and type as marked on the unit's rear panel. Using one of higher rating will invalidate the guarantee.

If after replacement the mains fuse should blow a second time, immediately refer the unit to a TRACE ELLIOT approved service engineer for checking.

ORIENTATION OF VALVES

Looking at the VELOCETTE from the rear with the vinyl covered rear panel removed you will see four valves, the two on the left should be ECC83/12AX7's and the two on the right should be EL84/6BQ5's. For improved performance and reliability the EL84/6BQ5's should be a matched pair.

TECHNICAL SPECIFICATIONS

INPUT IMPEDANCE	1 MΩ
TONE CONTROL	SINGLE DUAL FUNCTION PASSIVE CONTROL
CIRCUIT TOPOLOGY	PREAMP AND POWER STAGE 100% VALVE
SPEAKER	SINGLE 10" CELESTION
POWER RATING	~ 15W

VELOCETTE SPECIFICATIONS

Velocette Facilities

Rear Panel

Input Impedance 1Meg Ohms.
Controls Volume & Tone controls, plus Bright switch.
Output Class A,15 watts RMS into either internal speaker connected inside chassis or external 16Ohm External Speaker Output on rear panel.

Valves

2 x ECC83/12AX7, 2 x EL84/

Speaker Configuration

1 x 10” (Celestion Vintage 10)

Dimensions

W455mm/H3375m/D182mm

Weight

10Kg

C32-PC00042x3.

GIBSON GA15

ISSUE 3 2/6/98 PS

Description	Part Code	Qty	Where Used
PCB	PC00042 issue 2	1	
RESISTORS			
0 ohm link	72-RCZERO	14	R9 R10 R27 SW1 '8 ohms' (and links as shown on PCB)
1K0 6W	72-RWW1K-6W	1	R32
1K2 1/4W	72-RM1K2	1	R14
1K5 1/4W	72-RM1K5	4	R2 R7 R22 R23
4K7 4W	72-RWW4K7-4W	1	R30
10K 1/4W	72-RM10K	2	R33 R36
10K 1W	72-RM10K-1WATT	1	R31
27K 1/4W	72-RM27K	1	R13
33K 1/4W	72-RM33K	1	R5
47K 1/4W	72-RM47K	1	R19
68K 1/4W	72-RM68K	1	R35
100K 1/4W	72-RM100K	1	R11
100K 1W	72-RM100K-1WATT	3	R8 R15 R16
220K 1/4W	72-RM220K	2	R20 R21
220K 1W	72-RM220K-1WATT	2	R1 R29
470K 1/4W	72-RM470K	2	R6 R12
1M0 1/4W	72-RM1M	5	R3 R4 R17 R18 R34
120R 6W	72-RWW120R-6W	3	R24 R25 R26
SEMICONDUCTORS			
1N4007	72-D-IN4007	4	D1 D2 D3 D4
CAPACITORS			
47p 500V ceramic	72-C47P-500VCD	1	C29
220p 1KV ceramic	72-C220P-1KVCD	2	C7 C12
470p 1KV ceramic	72-C470P-1KVCD	1	C6
1n0 1KV ceramic	72-C1000P-1KVCD	1	C9
2n2 1KV ceramic	72-C2200P-1KVCD	4	C30 C31 C32 C33
1u5 35V tant	72-C1.5-35VT	1	C1
2u2 35V tant	72-C2.2-35VT	1	C8
22u 450V elect axl	72-C22-450VA	2	C25 C26
100u 400V elect rad	73-CAP-100400V	2	C22 C23
220u 25V elect rad	72-C220-25VER	1	C19

22n 400V poly box	72-C22N-400VPR	3	C5 C16 C17
47n 400V poly box	72-C47N-400VP	1	C14
100n 100V poly box	72-C100N-100VP	4	C3 C21 C27 C28
100n 250V poly box	72-C100N-250VB	3	C13 C15 C18
CONNECTORS			
3way 0.1”	72-HEAD-3W-2	5	HTR1 - 5
2way 0.2”	72-HEAD-2W-2	1	TX3
3way 0.2”	72-HEAD-3W-3	3	TX1 TX2 TX4
SOCKETS			
1/4” MONO JACK SKT	73-SKT-JCKBNBG	2	SK1 SK2
SWITCHES			
Mini Toggle SPDT vert	73-SWT-M-TGL-PCB	1	SW2
POTENTIOMETERS			
1M0	73-POT-A1M	1	RV1
250K LIN DUAL GANG	73-POT-B250K-DG	1	RV2
VALVE BASES			
B9A PCB valve base	73-VAL-SOCKET	4	V1 V2 V3 V4
FLYING LEADS			
Cathode heater lead	C00-LEAD-VEL-HTR	1	HTR1 - 5
Speaker lead	LOOM-00050	1	LS1