The Impact of Technology on the Role and Function of the Bass in Jazz

Peter Dowdall

Thesis submitted for the degree of Doctor of Philosophy
Elder Conservatorium of Music
Faculty of Humanities and Social Sciences
The University of Adelaide
February 2012

TABLE OF CONTENTS

Title Page	i
Table of Contents	ii
List of Figures	iii
Abstract	vii
Declaration	viii
Acknowledgments	ix
Introduction. Project Summary, Literature Review, Theoretical Framework, Chapter Outline	1
Chapter 1. The Bass and the Early Mechanical Roots of Jazz (1915-1930)	14
Chapter 2. The Bass, Technology and the Development of the Rhythm Section (1930-1945)	45
Chapter 3. The Spoils of War and the Jazz Bass: Tape Recorders and Editing (1945-1960)	70
Chapter 4. The Electrification of the Bass: Behold the Illegitimate Cousin (1954-1970)	101
Chapter 5. The Jazz Bass, Multi-Track Recording Technology and Fusion (1970s)	140
Chapter 6. Jaco Pastorius: The Electric Jazz Bass Attains Respectability (1976-1985)	169
Chapter 7. The Young Lions and the Technological Backlash (1980-1990)	205
Chapter 8. Pro Tools, Computers and the Bass (1990-2005)	221
Chapter 9. The Future of the Jazz Bassist (2005-2012)	243
Conclusion	256
Appendix A. List of CD tracks	263
Appendix B. A Case Study in the Shortcomings of Employing Old Technology	266
Bibliography	271

LIST OF FIGURES

- Figure 1.1. Louis Armstrong and the Hot 7, 'Gully Low Blues', Okeh 8474 (1927), p. 16.
- Figure 1.2. Waveform produced in Pro Tools illustrating the characteristics of the string bass' acoustic envelope, p. 18.
- Figure 1.3. A waveform illustrating the characteristics of the tuba's acoustic envelope, p. 19.
- Figure 1.4. Frequency analysis. One-second window showing harmonic spectrum of a C (67Hz) as played on a string bass using a jazz pizzicato stroke, p. 21.
- Figure 1.5. Frequency analysis. One-second window showing harmonic spectrum of a C (67Hz) as played on a tuba, p. 22.
- Figure 1.6. Bill Johnson's bass solo on 'Bull Fiddle Blues', Victor 21552-A (1928), p. 23.
- Figure 1.7. Waveform C (65.41Hz). Sideways pulled, p. 25.
- Figure 1.8. Frequency analysis. C (65.41Hz). Sideways pulled, p. 26.
- Figure 1.9. Waveform C (65.41Hz). Slapped note, p. 26.
- Figure 1.10. Frequency analysis. C (65.41Hz) Slapped note, p. 27.
- Figure 1.11. Original Dixieland Jazz Band, 'Livery Stable Blues', Victor 18255-B (1917), pp. 33-34.
- Figure 1.12. Kid Ory, 'Society Blues', Nordskog 3009B (1922), p. 36.
- Figure 1.13. Bill Johnson's walking bass line performed on King Oliver's Creole Jazz Band, 'Canal Street Blues', Gennett #5133-B (1923), p. 37.
- Figure 1.14. A typical recording characteristic of an early electrically recorded 78rpm disc compared with that of an acoustically recorded 78rpm disc, p. 39.
- Figure 1.15. Fletcher-Munson Curves, p. 41.
- Figure 1.16. Foster's string bass part to Louis Armstrong and his Savoy Ballroom Five, 'Mahogany Hall Stomp' Okeh 8680 (1929), p. 43.
- Figure 2.1. Advertisement for the Stroh Bass, p. 63.
- Figure 2.2. Audio output from a pick-up (Realist brand) attached to a string bass, p. 63.

- Figure 2.3. Coincident audio output from a microphone (Neumann U-87), p. 64.
- Figure 2.4. Ampeg and Bassamp combination, p. 66.
- Figure 2.5. Howard Rumsey (center) playing a Rickenbacker electric upright in the Stan Kenton Band, 1941, p. 67.
- Figure 2.6. Regal Basso-Guitar (left) alongside a double bass, p. 68.
- Figure 2.7. Paul Tutmarc and Audiovox Model 736 Electronic Bass, p. 69.
- Figure 3.1. Excerpt from Curley Russell's bass performance on 'Cherokee' in 1945, p. 73.
- Figure 3.2. Excerpt from Robert Hurst's bass performance on 'Cherokee' (II) in 1987, p. 74.
- Figure 3.3. Oscar Pettiford's bass line in Thelonius Monk, 'It Don't Mean A Thing If It Ain't Got That Swing', *Thelonius Monk Plays Duke Ellington*, Riverside REP-111 (1955), p. 82.
- Figure 3.4. Paul Chambers' bass line on Miles Davis, 'The Theme', *Workin' with the Miles Davis Quintet*, Prestige OJCCD-296-2 (1987), p. 86.
- Figure 3.5. Sharp, deep filter (Q of 100) used to remove specific pitched resonances, p. 88.
- Figure 3.6. The Bill Evans Trio, 'Solar' featuring Scott LaFaro on bass (1961), p. 90.
- Figure 4.1. A waveform illustrating the characteristics of the electric bass' sonic envelope, p. 108.
- Figure 4.2. A comparison of the waveform characteristics of the tuba, acoustic and electric bass, p. 109.
- Figure 4.3. Paul McCartney's bass part to 'All My Loving', *With The Beatles*, Parlophone PCS3045 (1963), p. 113.
- Figure 4.4. The bass line to the first three choruses of 'Billie's Bounce', as played by Monk Montgomery on *Fingerpickin*' Pacific CDP 7243 8 37987 2 8 (1996), p. 120.
- Figure 4.5. Excerpt of Willie Dixon's string bass line on Chuck Berry, 'Roll Over Beethoven', *Chuck Berry The Great Twenty-Eight*, Chess CHD 92500, (1984), p. 125.

- Figure 4.6. Excerpt of Paul McCartney's electric bass line on The Beatles, 'Roll Over Beethoven', *With the Beatles*, Parlophone CDP 7 46436 2, (1963), p. 127.
- Figure 4.7. Excerpt of Willie Dixon's string bass line on Howlin' Wolf, 'Spoonful', *Howlin' Wolf: His Best*, Chess CDH9375 (1997), p. 131.
- Figure 4.8. Excerpt of Jack Bruce's electric bass line on Cream, 'Spoonful', *Fresh Cream*, RSO 827 576-2 (1976), p. 133.
- Figure 4.9. Excerpt of James Jamerson's electric bass line on Marvin Gaye, 'What's Going On', Tamla Motown 5C5493203 (1971), p. 138.
- Figure 5.1. Three loops employed in Miles Davis' 'Shhh/Peaceful', *In a Silent Way*, CBS 450982 2 (1969), p. 142.
- Figure 5.2. Various bass loops as employed in Miles Davis' 'In a Silent Way', *In a Silent Way*, CBS 450982 2 (1969), p. 145.
- Figure 5.3. Bass line to Sly and the Family Stone, 'Sing a Simple Song', Epic 510407 (1968) as performed by Larry Graham, p. 146.
- Figure 5.4. Bass line (2nd section) to Miles Davis, 'Right Off', *A Tribute to Jack Johnson*, Columbia KC 30455 (1971) as performed by Michael Henderson on the Fender Bass, p. 146.
- Figure 5.5. Bass line to Miles Davis, 'Miles Runs the Voodoo Down', *Bitches Brew*, Columbia/Legacy GP-26 (1970) as performed by Harvey Brooks on the Fender Bass, p. 147.
- Figure 5.6. Bass line to Miles Davis, 'Bitches Brew', *Bitches Brew*, Columbia/Legacy GP-26 (1970) as performed by Harvey Brooks on the Fender Bass, p. 148.
- Figure 5.7. Waveform illustrating the characteristics of the string bass' acoustic envelope captured by a Neumann TLM 103, p. 153.
- Figure 5.8. Waveform illustrating the characteristics of the string bass' envelope captured by a pickup placed under the foot of the bridge, p. 154.
- Figure 5.9. A diagram illustrating the characteristics of the string bass' acoustic spectrum captured by a Neumann TLM 103, p. 155.
- Figure 5.10. A diagram illustrating the characteristics of the string bass' acoustic spectrum produced by a pickup placed under the foot of the bridge, p. 156.
- Figure 5.11. Four bar excerpt from a big band performance showing waveform of the output from a pick-up (unprocessed), p. 157.

- Figure 5.12. The same four bar excerpt showing waveform of the output from a pick-up after the application of compression and limiting, p. 158.
- Figure 5.13. The same four bar excerpt showing waveform of the output from a U-87 microphone, p. 158.
- Figure 5.14. The same four bar excerpt showing waveform of the output from a U-87 microphone after the application of compression and limiting, p. 159.
- Figure 5.15. Bass line to Herbie Hancock, 'Spank a Lee', *Thrust*, CBS 80193 (1974), as performed by Paul Jackson on the Fender Bass, p. 162.
- Figure 5.16. Bass line to Herbie Hancock, 'Palm Grease', *Thrust*, CBS 80193 (1974), as performed by Paul Jackson on the Fender Bass, p. 162.
- Figure 5.17. Bass line to Herbie Hancock, 'Actual Proof, *Thrust*, CBS 80193 (1974), as performed by Paul Jackson on the Fender Bass, p. 162.
- Figure 5.18. Bass line (1st section) to Miles Davis, 'Right Off', *A Tribute to Jack Johnson*, Columbia KC 30455 (1971) as performed by Michael Henderson on the Fender Bass, p. 162.
- Figure 6.1. Excerpt from Jaco Pastorius' performance of 'Donna Lee'. Jaco Pastorius, *Jaco Pastorius*, Epic EK 33949 (1976), p. 175.
- Figure 6.2. An excerpt of the bass line to Ornette Coleman, 'Round Trip', from *New York Is Now*, Blue Note LP BST 84287 (1968), performed on string bass by Jimmy Garrison, pp. 180-181.
- Figure 6.3. Excerpt of the bass line to Ornette Coleman's 'Round Trip', performed on electric bass by Jaco Pastorius in 1975. Pat Metheny, *Bright Size Life*, ECM 1073 (1976), pp. 184-186.
- Figure 8.1. A 1.5 minute window showing the extent of editing on trumpets, saxophones and trombones, p. 227.
- Figure 8.2. A two-second window showing (from top to bottom) unedited bass drum, bass and snare drum with rhythmic inaccuracies, p. 228.
- Figure 8.3. A two-second window showing edited bass part with entrances aligned and pitches corrected, p. 228.
- Figure 10.1 John Lindsay's bass line to Jelly Roll Morton's 'Black Bottom Stomp' Victor 20221-A (1926), pp. 267-270.

ABSTRACT

The thesis explores the critical impact of technology on the bass, and the extent to which that has fundamentally influenced the course of jazz. It does so according to a three-tiered framework involving technologies that are intrinsic to the instrument, including its eventual electrification; technologies extrinsic to the bass, most notably evolving recording technologies; and an evaluation of the ways in which the implementation of these technologies has transformed jazz as an art form. Topics include: the impact of organological changes brought about by the transition from tuba to string bass and the adoption of the electric bass; audio technology's role in the presentation of the jazz bassist's performance; and the influence of technical developments in the recording studio on the advancement of jazz bass style. The study also considers the challenges facing the bassist as a result of the increasing power of the recording engineer. Finally, it assesses the ways in which emerging technologies might threaten the security of the bassist within the jazz ensemble.

Among the conclusions drawn is that the technological empowerment of the bassist is largely responsible for the innovations of jazz's more celebrated soloists. In this regard the study describes the stylistic evolution of jazz from the bass player's perspective – that is, from the musical foundation up. A clear and valid link emerges between the emancipation of the bass in jazz and the role of technology in delivering its full potential.

DECLARATION

This thesis contains no material that has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text of the thesis.

I give consent to this copy of my thesis, when deposited in the University Library, being made available for loan and photocopying subject to the provisions of the Copyright Act 1968.

I also give permission for the digital version of my thesis to be made available on the web, via the University's digital research repository, the Library catalog, the Australian Digital Theses Program (ADTP) and also through web search engines, unless permission has been granted by the University to restrict access for a period of time.

a· 1	D (
Signed:	Date:

ACKNOWLEDGEMENTS

I would like to extend my heartfelt gratitude to my principal supervisor Dr. Mark Carroll for his guidance through the research journey, and his editorial assistance in writing up the dissertation. Thanks are also due to co-supervisor Bruce Hancock whose expertise in both jazz and electronics proved invaluable in the completion of this study. The help of Dr. Theodore Nettelbeck who offered advice on many preliminary drafts and suggested avenues of inquiry is also duly appreciated. I would also like to thank the supportive postgraduate research environment at the Elder Conservatorium, under the guidance of Dr. Kimi Coaldrake. This work is dedicated to Gillian.