

A BIBLIOGRAPHY OF JIM WILLIAMS

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<http://readingjimwilliams.blogspot.com>

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Abstract

Jim Williams wrote over 350 publications relating to analog circuit design between 1971 and 2011. Here's what I've found so far.¹



Photo credit: see page 20.

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¹For the latest version of this bibliography, please visit <http://web.mit.edu/klund/www/jw/>.

1 Biography

Jim Williams (1948–2011) was at the Massachusetts Institute of Technology from 1968 to 1979 concentrating exclusively on analog circuit design. His teaching and research interests involved application of analog circuit techniques to biochemical and biomedical problems. Concurrently, he consulted U.S. and foreign concerns and governments, specializing in analog circuits. In 1979, he moved to National Semiconductor Corporation, continuing his work in the analog area with the Linear Integrated Circuits Group. In 1982, he joined Linear Technology Corporation as staff scientist. His interests included product definition, development and support. Jim authored over 350 publications relating to analog circuit design. Awards include the 1992 Innovator of the Year Award from EDN Magazine and election to the Electronic Design Hall of Fame in 2002. His spare time interests included sports cars, collecting antique scientific instruments, art and restoring and using old Tektronix oscilloscopes. He lived in Palo Alto, California with his wife and 62 Tektronix oscilloscopes.²

2 Massachusetts Institute of Technology

Jim wrote several M.I.T. internal reports [1, 2, 3, 4] while he worked for the Department of Nutrition and Food Science. Another report [5] was referenced in an EDN article without a publication date.³

3 National Semiconductor App Notes

Jim worked for National Semiconductor Corporation in the Linear Integrated Circuits Group from 1979 to

²The information in this biography was given to the author by Jim Williams in 2009 (see also Appendix A).

³There were probably other reports. Unfortunately, the M.I.T. Libraries don't seem to have copies of these reports (or anything written by Jim Williams, except his 1991 and 1995 books). Searching in the M.I.T. Institute Archives and Special Collections didn't turn up anything either.

1982. During this period,⁴ he wrote 21 application notes.

- App Note 256 [6]
- App Note 260 [7]
- App Note 262 [8]
- App Note 263 [9]
- App Note 264 [10]
- App Note 265 [11]
- App Note 266 [12]
- App Note 269 [13]
- App Note 272 [14]
- App Note 285 [15]
- App Note 286 [16]
- App Note 288 [17]
- App Note 289 [18]
- App Note 292 [19]
- App Note 293 [20]
- App Note 294 [21]
- App Note 295 [22]
- App Note 298 [23]
- App Note 299 [24]
- App Note 301 [25]
- App Note 311 [26]

⁴Getting a complete list of his app notes is a bit of a mystery hunt. There are several unfortunate reasons for this difficulty:

1. National doesn't always print bylines with author's names on their app notes.
2. National regularly deletes old app notes from their archives.
3. National sometimes updates the publication date of their app notes upon revision.

Thus, for all of these application notes, I had to infer Jim's authorship based on the right time period and other clues. One reliable clue was the inclusion of photographs of Jim's Tektronix 556 oscilloscope with the damaged graticule. In other cases, I made educated guesses based on his use of references, footnotes, or subject matter. A reference to one of Jim's past publications is a good hint, a footnote discussing the Hewlett Packard HP200 oscillator is a dead giveaway! Based on this research, there are (at least?) 21 application notes. Not bad for three years' work!

For more details on the frustrations of this mystery hunt, see <http://web.mit.edu/klund/www/jw/jw-nsc.html>.

4 Linear Technology

4.1 App Notes

Jim wrote 62 application notes for Linear Technology Corporation:

- App Note 1 [27]
- App Note 2 [28]
- App Note 3 [29]
- App Note 4 [30]
- App Note 5 [31]
- App Note 6 [32]
- App Note 7 [33]
- App Note 8 [34]
- App Note 9 [35]
- App Note 10 [36]
- App Note 11 [37]
- App Note 12 [38]
- App Note 13 [39]
- App Note 14 [40]
- App Note 15 [41]
- App Note 17 [42]
- App Note 18 [43]
- App Note 21 [44]
- App Note 22 [45]
- App Note 23 [46]
- App Note 25 [47]
- App Note 28 [48]
- App Note 29 [49]
- App Note 31 [50]
- App Note 32 [51]
- App Note 35 [52]
- App Note 37 [53]
- App Note 43 [54]
- App Note 45 [55]
- App Note 47 [56]
- App Note 49 [57]
- App Note 55 [58]
- App Note 61 [59]
- App Note 65 [60]
- App Note 70 [61]
- App Note 72 [62]
- App Note 74 [63]

- App Note 75 [64]
- App Note 79 [65]
- App Note 81 [66]
- App Note 83 [67]
- App Note 85 [68]
- App Note 86 [69]
- App Note 89 [70]
- App Note 90 [71]
- App Note 92 [72]
- App Note 93 [73]
- App Note 94 [74]
- App Note 95 [75]
- App Note 98 [76]
- App Note 101 [77]
- App Note 104 [78]
- App Note 106 [79]
- App Note 112 [80]
- App Note 113 [81]
- App Note 118 [82]
- App Note 120 [83]
- App Note 122 [84]
- App Note 124 [85]
- App Note 126 [86]
- App Note 128 [87]
- App Note 131 [88]

In October 2011, Linear Technology released a sixty-third app note, App Note 132 [89]. Although this note bears his name (as coauthor) and discusses an appropriate topic, (a high-purity sine wave oscillator⁵), Jim’s signature touches are absent⁶.

There is also a sixty-fourth app note, App Note 133 [90], dated October 2011, which sounds more like Jim. This app note is a more fitting final chapter.

⁵As Jim said in [52], “The sinewave is probably the paramount expression of the analog world. The Old Man Himself, George A. Philbrick, once elegantly discussed analog functions as ‘those which are continuous in excursion and time.’”

⁶The oscilloscope shots are not from his Tektronix 556, there’s no hand-drawn cartoon, there are no voluminous appendices, and there are three pages on computer-screen captures. It just doesn’t feel like Jim.

4.2 LT Magazine

Jim wrote several short articles for Linear Technology Magazine between 1991 and 2009:⁷

Volume 1 [91, 92, 93, 94]
Volume 2 [95]
Volume 3 [96, 97, 98]
Volume 4 [99, 100]
Volume 6 [101, 102]
Volume 7 [103]
Volume 8 [104, 105, 106, 107]
Volume 9 [108, 109]
Volume 12 [110]
Volume 15 [111]
Volume 16 [112, 113]
Volume 17 [114]
Volume 19 [115, 116]

4.3 Design Notes and Solutions

Jim also wrote some short (two-page) Design Notes:⁸

- Design Note 8 [117]
- Design Note 11 [118]
- Design Note 17 [119]
- Design Note 32 [120]
- Design Note 38 [121]
- Design Note 40 [122]
- Design Note 44 [123]
- Design Note 45 [124]
- Design Note 51 [125]
- Design Note 52 [126]
- Design Note 58 [127]
- Design Note 70 [128]
- Design Note 101 [129]
- Design Note 137 [130]
- Design Note 163 [131]
- Design Note 164 [132]
- Design Note 185 [133]
- Design Note 190 [134]
- Design Note 220 [135]
- Design Note 345 [136]

He also wrote Design Solution 11 [137]⁹.

⁷See http://www.linear.com/designtools/lt_journal.php. This list is based on the issues found on the Linear Technology website. There may be some missing issues (there are gaps in the number sequence). For example, volume 11 only has one issue. Other obviously missing issues include vol. 10 no. 3, vol. 12 no. 1, vol. 13 no. 1, and vol. 14 no. 1.

⁸List <http://www.linear.com/doclist/?au=Jim+Williams> is incomplete. It lists all the app notes, but some of the design notes are missing, and there may be other missing items. I have a complete collection up to Design Note 69, but after that, my coverage is incomplete.

⁹Were there other Design Solutions?

5 Books and Book Chapters

Jim edited five books [138, 139, 140, 141, 142].

5.1 EDN Designer’s Guides

Jim edited two books of collected articles from EDN in 1985 and 1987. The first one [138] included 25 collected articles from his time at M.I.T., Teledyne Philbrick, Arthur D. Little, and National Semiconductor. The second book [139] included 26 collected articles from the early days at Linear Technology. For a list of articles in these books, see Section B.1.

5.2 Analog Circuit Design

In the 1990s, he edited of two books on analog circuit design [140, 141] with a wide variety of authors submitting chapters. In these books, he authored several chapters himself:

- “Is analog circuit design dead?” [143]
- “Max Wien, Mr. Hewlett, and a rainy Sunday afternoon” [144]
- “Should Ohm’s Law be repealed?” [145]
- “The zoo circuit: History, mistakes, and some monkeys design a circuit” [146]
- “The importance of fixing” [147]
- “Tripping the light fantastic” [148]
- “There’s no place like home” [149]

5.3 Other Book Chapters

He also contributed a chapter [150] to Bob Pease’s book, “Analog Circuits: World Class Designs”, which is a reprint of the “The zoo circuit” [146].

5.4 Analog Circuit Design 3

In 2011, he co-edited a third book in this “series” with Bob Dobkin [142]. This final book is a collection of 41 reprinted Linear Technology Application Notes, of which Jim wrote 27:

- Chapter 2 is App Note 101 [77]
- Chapter 4 is App Note 126 [86]
- Chapter 6 is App Note 25 [47]
- Chapter 7 is App Note 35 [52]
- Chapter 8 is App Note 70 [61]
- Chapter 11 is App Note 122 [84]
- Chapter 12 is App Note 83 [67]
- Chapter 15 is App Note 81 [66]
- Chapter 16 is App Note 89 [70]
- Chapter 17 is App Note 90 [71]
- Chapter 18 is App Note 92 [72]
- Chapter 19 is App Note 112 [80]
- Chapter 20 is App Note 7 [33]
- Chapter 22 is App Note 86 [69]
- Chapter 24 is App Note 120 [83]
- Chapter 25 is App Note 3 [29]
- Chapter 26 is App Note 9 [35]
- Chapter 27 is App Note 11 [37]
- Chapter 29 is App Note 23 [46]
- Chapter 30 is App Note 28 [48]
- Chapter 32 is App Note 43 [54]
- Chapter 33 is App Note 47 [56]
- Chapter 34 is App Note 72 [62]
- Chapter 36 is App Note 93 [73]
- Chapter 37 is App Note 94 [74]
- Chapter 38 is App Note 106 [79]
- Chapter 39 is App Note 124 [85]

Unfortunately, unlike his other *Analog Circuit Design* books [140, 141], there is no original material in this book.

6 Magazine Articles

Jim wrote many, many articles in various trade magazines.

6.1 EDN

Papers published between 1975 and 2011. He wrote 35 full-length feature articles that appeared in EDN between June 1983 and November 1987 (according to [151]¹⁰). EDN recently listed¹¹ some of the articles that he wrote between 1994 and 2011.

1975 [152]
1976 [153]
1977 [154] [155] [156] [157]
1978 [158]
1979 [159]
1980 [160] [161]
1981 [162] [163] [164] [165] [166] [167] [168] [169]
1982 [170] [171] [172] [173] [174] [175]
1983 [176] [177] [178] [179] [180] [181]
1984 [182] [183] [184] [185] [186] [187]
1985 [188] [189] [190] [191] [192] [193] [194] [195] [196] [197]
1986 [198] [199] [200] [201]
1987 [202] [203] [204] [205] [206] [207]
1988 [208] [209] [210] [211] [212]
1989 [213] [214]
1990 [215] [216] [217] [218]
1991 [219] [220] [221] [222] [223] [224] [225] [226]
1992 [227]
1993
1994 [228] [229] [230]
1995 [231] [232] [233]
1996 [234] [235] [236]
1997 [237] [238]
1998 [239] [240] [241]
1999 [242] [243]
2000 [244] [245] [246] [247]
2001 [248] [249] [250] [251] [252]
2002 [253]
2003 [254] [255] [256] [257] [258]
2004 [259] [260]
2005 [261] [262] [263] [151] [264]
2006 [265] [266]
2007 [267] [268]
2008 [269] [270]
2009 [271] [272] [273]
2010 [274] [275] [276]
2011 [277]

¹⁰Right now, I have 29 of them. He published two papers in May 1983; am I not supposed to count them?

¹¹http://www.edn.com/article/472111-Jim_Williams.php

6.2 Electronics

Papers published between 1974 and 1981.

1974 [278]
1975 [279] [280]
1980 [281]
1981 [282] [283] [284] [285] [286]

6.3 Electronic Design

Papers published between 1974 and 1985.

1974 [287] [288] [289]
1975 [290]
1977 [291]
1981 [292] [293] [294] [295] [296] [297]
1983 [298]
1984 [299] [300] [301]
1985 [302]

6.4 Other Magazines

Jim wrote a short article for Analog Dialogue in 1976 [303]. He wrote one article in Electronic Engineering in 1983 with George Erdi [304]. He wrote an article in New Electronics [305], an article in ESD [306], an article in VLSI Systems Design [307], an article in EE Times [308], and an article in Electronic Design Analog Applications [309].

Also, there were three articles in Electronic Product Design:

1983 [310]
1984 [311]
1986 [312]

7 Technical Publications

Jim coauthored two papers in Analytical Biochemistry [313, 314] while he was at MIT. Jim co-wrote one ISSCC paper in 1986 [315] on the LT1088 RMS-to-DC converter. He also wrote a 1986 Wescon paper [316].

A How Many Oscilloscopes?

In the biography that Jim wrote in 2009 (see Section 1), he said he owned 62 Tektronix oscilloscopes. It is interesting to see how this number changed over time. In 1991 [140], he claimed 14 oscilloscopes. In 1995 [141], he claimed 28 oscilloscopes. In 2008 (in the bio with [150]), he claimed 84 oscilloscopes.

B Cross References

B.1 EDN Books

Jim edited two books of his collected articles from EDN.¹² The first book [138] included the following articles (in the order they appear in the book) [159] [176] [171] [174] [164] [173] [156] [167] [172] [169] [166] [317] [154] [318] [168] [319] [175] [152] [165] [158] [161] [162] [160] [155] [163].¹³

The second book [139] included the following articles (in the order they appear in the book) [179] [182] [184] [189] [190] [191] [197] [194] [195] [196] [159] [198] [177] [178] [183] [185] [187] [188] [192] [193] [199] [200] [201] [180] [181] [186].

B.2 National Semi App Notes

He cited some of his magazine articles in two of his app notes for National Semiconductor. These articles that were cited:

App Note 256 referenced [160].

App Note 260 referenced [290, 280, 158, 4].

B.3 Linear Tech App Notes

He cited some of his magazine articles in his app notes for Linear Technology. These articles that were cited (this list does not include cross references to other app notes) :

App Note 9 referenced [290]

App Note 13 referenced [161, 296]

App Note 14 referenced [158]

App Note 22 referenced [315]

App Note 28 referenced [154]

App Note 29 referenced [295, 175]

App Note 49 referenced [315]

App Note 55 referenced [1, 155, 315]¹⁴

App Note 61 referenced [315]

App Note 55 referenced [1, 315]

App Note 70 referenced [295, 175, 209]

App Note 72 referenced [296]

App Note 74 referenced [186]

App Note 75 referenced [158, 186]

App Note 79 referenced [241]

App Note 81 referenced [166, 211]

App Note 83 referenced [315]

App Note 86 referenced [290]

App Note 89 referenced [1, 156]

App Note 92 referenced [184]

App Note 112 referenced [170]

App Note 120 referenced [241, 186]

App Note 128 referenced [241, 186]

¹²Unfortunately, these books do not include any information about when the articles were originally published. Shameful. All dates listed in the bibliography entries have been found from secondary sources.

¹³I need more information about [317, 318, 319]. I can't find the original publication data.

¹⁴Reference 20 in this app note is "The Ultimate Oven," MIT Reports on Research, March 1972. This article is about Jim's work, but he didn't write it.

References

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- [2] Jim Williams, "Portable wide range chopper stabilized temperature controller," Massachusetts Institute of Technology, Cambridge, Mass., Dept. of Nutrition and Food Science, 1974.
- [3] Jim Williams, "An experimental microprocessor-controlled 18-bit single-slope A/D converter with 1-ppm linearity," Massachusetts Institute of Technology, Cambridge, Mass., Dept. of Nutrition and Food Science, 1975.
- [4] Jim Williams, "Characterization, measurement, and compensation of errors in capacitors... a compendium of study, hacks, some good stuff, and a few pearls," Massachusetts Institute of Technology, Cambridge, Mass., Dept. of Nutrition and Food Science, 1975.
- [5] Jim Williams, "A 0.1-Hz sine wave oscillator using thermal feedback," Massachusetts Institute of Technology, Cambridge, Mass., Dept. of Nutrition and Food Science, unknown date.
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- [8] Jim Williams, "Applying dual and quad FET op amps," National Semiconductor Corp., Santa Clara, Calif., Application Note 262, May 1981.
- [9] Jim Williams, "Sine wave generation techniques," National Semiconductor Corp., Santa Clara, Calif., Application Note 263, Mar. 1981.
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- [11] Jim Williams, "An electronic watt-watt-hour meter," National Semiconductor Corp., Santa Clara, Calif., Application Note 265, Feb. 1984.
- [12] Jim Williams, "Circuit applications of sample-hold amplifiers," National Semiconductor Corp., Santa Clara, Calif., Application Note 266, Jan. 1981.
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- [14] Jim Williams, "Op amp booster designs," National Semiconductor Corp., Santa Clara, Calif., Application Note 272, Sep. 1981.
- [15] Jim Williams, "An acoustic transformer powered super-high isolation amplifier," National Semiconductor Corp., Santa Clara, Calif., Application Note 285, Oct. 1981.
- [16] Jim Williams, "Applications of the LM392 comparator op amp IC," National Semiconductor Corp., Santa Clara, Calif., Application Note 286, Sep. 1981.
- [17] Jim Williams, "System-oriented DC-DC conversion techniques," National Semiconductor Corp., Santa Clara, Calif., Application Note 288, Apr. 1982.
- [18] Jim Williams, "Circuit applications of analog data multiplexers," National Semiconductor Corp., Santa Clara, Calif., Application Note 289, Jan. 1982.
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- [24] Jim Williams, "Audio applications of linear integrated circuits," National Semiconductor Corp., Santa Clara, Calif., Application Note 299, Apr. 1982.

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- [31] Jim Williams, "Thermal techniques in measurement and control circuitry," Linear Technology Corp., Milpitas, Calif., Application Note 5, Dec. 1984.
- [32] Jim Williams, "Applications of new precision op amps," Linear Technology Corp., Milpitas, Calif., Application Note 6, Jan. 1985.
- [33] Jim Williams, "Some techniques for direct digitization of transducer outputs," Linear Technology Corp., Milpitas, Calif., Application Note 7, Feb. 1985.
- [34] Jim Williams, "Power conditioning techniques for batteries," Linear Technology Corp., Milpitas, Calif., Application Note 8, May 1985.
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- [36] Jim Williams, "Methods for measuring op amp settling time," Linear Technology Corp., Milpitas, Calif., Application Note 10, Jul. 1985.
- [37] Jim Williams, "Designing linear circuits for 5V single supply operation," Linear Technology Corp., Milpitas, Calif., Application Note 11, Sep. 1985.
- [38] Jim Williams, "Circuit techniques for clock sources," Linear Technology Corp., Milpitas, Calif., Application Note 12, Oct. 1985.
- [39] Jim Williams, "High speed comparator techniques," Linear Technology Corp., Milpitas, Calif., Application Note 13, Apr. 1985.
- [40] Jim Williams, "Designs for high performance voltage-to-frequency converters," Linear Technology Corp., Milpitas, Calif., Application Note 14, Mar. 1986.
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- [42] Jim Williams, "Considerations for successive approximation A→D converters," Linear Technology Corp., Milpitas, Calif., Application Note 17, Dec. 1985.
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- [44] Jim Williams, "Composite amplifiers," Linear Technology Corp., Milpitas, Calif., Application Note 21, Jul. 1986.
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- [59] Jim Williams, "Practical circuitry for measurement and control problems: Circuits designed for a cruel and unyielding world," Linear Technology Corp., Milpitas, Calif., Application Note 61, Aug. 1994.
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- [61] Jim Williams, "A monolithic switching regulator with $100\mu\text{V}$ output noise: Silence is the perfectest herald of joy..." Linear Technology Corp., Milpitas, Calif., Application Note 70, Oct. 1997.
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Revision History

- v0.1 Linear Technology application notes¹⁵ and “Analog Circuit Design” books (72 references)
- v0.2 National Semiconductor application notes¹⁶ and EDN “Designer’s Guide” books (95 references)
- v0.3 Magazine articles culled from the references in LT app notes (113 references)
- v0.4 EDN articles culled from EDN books and EDN on-line listing¹⁷ (220 references)
- v0.5 Adding LTC design notes and data from various online sources and databases (288 references, that’s over 80% of 350 found!)
- v0.6 First public release, 31 July 2011
- v0.7 Added data on final book [142] in Section 5.4 and did a little reformatting
- v0.8 Added information received from Siu Williams, also Appendix A, more articles from LT Magazine, [89] and [150] (319 references)
- v0.81 Removed erroneous citation (was [207] in v0.8)

Known Errors

Other than being incomplete, there are no known errors in this list.

- The footnotes in the text detail some of the missing information
- Some EDN articles are missing volume, number, and pages
- Some EDN articles have page numbers from the European Edition (postfix e)
- I do not plan to include foreign-language translations in this bibliography

Please contact the author if you find any omissions, errors, or other problems.

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¹⁵<http://www.linear.com/doclist/?au=Jim+Williams>

¹⁶<http://web.mit.edu/klund/www/jw/jw-nsc.html>

¹⁷http://www.edn.com/article/472111-Jim_Williams.php

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@IEEEtranBSTCTL{BSTcontrol,
  CTLdash_repeated_names = "no",
  CTLname_format_string = "{ff }{vv~}{11}{, jj}", }
```

About the Compiler

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