

Preparation of Papers for the Journal of the American Helicopter Society

First A. Author

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company affiliation,

and simple address (city and state)

Second B. Author, Jr.

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and simple address (city and state)

Abstract

This is an example of abstract text. A helicopter can be defined as any flying machine using rotors to provide lift, propulsion and control forces. The rotor produces a lift force equal to the weight of the helicopter and because the generation of this lift force does not require any forward flight speed, the helicopter can rise vertically from the ground and hover. A simpler definition, therefore, is that a helicopter is an aircraft using a rotor (or rotors) that can hover.

Nomenclature

A amplitude of oscillation

a cylinder diameter

C_p pressure coefficient

C_x force coefficient in the x direction

Footnote text should indicate if paper was presented at National Meeting or other conference.

C_y force coefficient in the y direction

c chord

dt time step

F_x X component of the resultant pressure force acting on the vehicle

F_y Y component of the resultant pressure force acting on the vehicle

f, g generic functions

h height

Subscript

i time index during navigation

j waypoint index

K trailing-edge (TE) nondimensional angular deflection rate

Introduction

This document is a $\text{\LaTeX} 2_\epsilon$ template. If you are reading a hardcopy or PDF version of this document, please download the $\text{\LaTeX} 2_\epsilon$ macros and sample file, `ahs.cls`, from <http://www.vtol.org/index.html> so you can use it to prepare your manuscript. The $\text{\LaTeX} 2_\epsilon$ class file uses only Computer Modern (CM) typefaces, which are part of the $\text{\TeX}/\text{\LaTeX}$ installation. Use the \LaTeX files for formatting purposes, but please use `ahs.cls` or `ahs.pdf` for specific layout instructions. Authors will first need to save the `ahs.cls` to a current/working directory or \TeX default directory. Use italics for emphasis; do not underline.

For references, which will first appear in the Introduction, AHS uses the style “...as shown in Johnson (Ref. 1)...” or the other style is “...which is given in Ref. 2.” When we deal with a range of citations it is best to use the style “...as shown in several sources including Refs. 1–4.” The use of the “cite.sty” package is encouraged, which can be included in the preamble to your \LaTeX document.

Detailed Formatting Instructions

The styles and formats for the AHS Papers class file have been incorporated into the structure of this document using:-

```
\documentclass{ahs}
```

If you are reading a hardcopy or PDF version of this document, please download the $\text{\LaTeX} 2_{\epsilon}$ macros and sample file, `ahs.cls`, from <http://www.vtol.org/index.html> so you can use it to prepare your manuscript. Use the $\text{\LaTeX} 2_{\epsilon}$ files for formatting purposes, but please use `ahs.cls` or `ahs.pdf` for specific layout instructions. Authors will first need to save the file `ahs.cls` to a current/working directory or TeX default directory.

Document text

The default font for AHS papers is only Computer Modern (CM) typefaces (12-point size), which are part of the $\text{\TeX}/\text{\LaTeX}$ installation.

Coding your document

Most commands described in this guide are not part of the standard \LaTeX package. The syntax/usage of some commands has been changed, and some commands are newly defined to accommodate the AHS paper style. Such changes are explicitly mentioned in the sections where these commands are described.

Title, authors' names, and affiliations

The title of your paper should be coded as `\title{Title..}`, with capital and lower-case letters, and centered at the top of the page. The names of the authors, business or academic affiliation, city, and state/province should follow on separate lines below the title. The names of authors with the same affiliation can be listed on the same line above their collective affiliation information. The author name must be coded as `\author{}`. Author names are centered, and affiliations are centered and in italic type. The affiliation line for each author is to include that author's city, state, and zip/postal code (or

city, province, zip/postal code and country, as appropriate). The corresponding affiliation is coded as `\affiliation{Author's Affiliation}`, which should immediately follow the `\authorname{}` command. The title, author name, and affiliation must be followed by the command `\maketitle`. Thus,

```
\documentclass{ahs}

\begin{document}

\markboth{Author Name}{Article Title}

\title{Article Title}

\author{Name of Author 1}

\affiliation{Affiliation of Author 1}

\author{Name of Author 2}

\affiliation{Affiliation of Author 2}

\maketitle
```

`\affiliation{}` command is not part of the standard \LaTeX package.

The first footnote (lower left-hand side) is to contain the job title and department name and street address/mail stop, for each author. This can be coded inside `\author{}` command as below:-

```
\author{Author Name\thanks{Insert Job Title,

    Department Name, Address

    for first author.}}

\affiliation{Business or Academic Affiliation 1,

    City, State, Zip Code}
```

Sections

Use `\section{}` for main section and `\subsection{}` for subsections.

Headings

AHS style provides 3 levels of section headings and they are all defined in the `ahs.cls` class file:

- Heading 1 – \section: bold 12-point font, centered.
- Heading 2 – \subsection: bold, flush left.
- Heading 3 – \subsubsection: bolditalic, flush left & first line of the paragraph.

Abstract

The abstract should appear at the beginning of your paper. It should be one paragraph long (not an introduction) and complete in itself (no reference numbers). It should indicate subjects dealt with in the paper and state the objectives of the investigation. Newly observed facts and conclusions of the experiment or argument discussed in the paper must be stated in summary form; readers should not have to read the paper to understand the abstract. The abstract should coded after \maketitle command as below:

```
\maketitle
\begin{abstract}
This is an example of abstract text. This is an
example of abstract text. This is an example of
abstract text.
\end{abstract}
```

Images, figures, and tables

All artwork, captions, figures, graphs, and tables will be reproduced exactly as submitted. Be sure to submit any figures, tables, graphs, or pictures as you want them printed. Company logos and identification numbers are not permitted on your illustrations.

Place figure captions below all figures; place table titles above the tables. If your figure has multiple parts, include the labels “a),” “b),” etc. below and to the left of each part, above the figure caption. Please verify that the figures and tables you mention in the text actually exist. *Please do not include captions as part of the figures.*

When citing a figure in the text, use the abbreviation “Fig. 1” except at the beginning of a sentence

where you should use “Figure 1” . Do not abbreviate “Table.” Number each different type of illustration (i.e., figures, tables, images) sequentially with relation to other illustrations of the same type.

Figures and tables are referred to as ‘Floats’ in \LaTeX , reflecting their floating nature. They are typically numbered whether or not they have a caption and they are floated to the first available position near the first reference to that figure/table within the text. This is accomplished by placing the figure/table command immediately after the paragraph in which they are referred to for the very first time.

An example of coding `{figure}` is given below:

```
\begin{figure}
\centerline{\includegraphics[width=4.5in]{mouse.eps}}
\caption{This is an example of figure caption.}
\end{figure}
```

Tables can be coded as below:

```
\begin{table}[b][t]
\def~{\hphantom{0}}%
\tbl{This is an example of table caption.
This is an example of table caption}{%
\begin{tabular}{@{}cccc@{}}%
\toprule
First column & Second column & Third column & \\
head$\sim{\rm a}$ & head$\sim{\rm b}$ & & head
& $V_M(r)$ & \\
\colrule
Left & Word entries &  $\sim 0.2$  & 10.55 \\
Left & Word entries &  $\sim 0.15$  & 33.12 \\
Left & Word entries & 10.58 & 45.10 \\
Left & Word entries & 43.9~ & 12.34 \\
Left & Word entries &  $\sim 0.15$  & 60.50
```

```

\botrule
\end{tabular}}
\tabnote{$^{\rm a}$This is a table footnote.
This is a table footnote.}
\tabnote{$^{\rm b}$This is a table footnote.
This is a table footnote.}
\end{table}%

```

`\tbl{ }{ }` is not part of the standard \LaTeX package.

List environment

For lists of items that are complete and/or multiple sentences, use numbers with only the first line indented. An example of a list is as follows:

1) This is an example of the first item on a list, but note that only the first line of each item on the list is indented.

2) Item two follows item one.

3) Item three, and any other items follow until the end of the list.

Alternatively, for lists of items given in sentence fragments, use numbers within the paragraph. An example is as follows: 1) Item one, 2) Item two, 3) Item three. The second type of list is preferred, and most lists will be converted to this form by the typesetter.

```

\begin{enumerate}
\item{} This is an example of the first item on a list.
\item{} Item two follows item one.
\item{} Item three, and any other items follow until the end of the list.
\end{enumerate}

```

Equations, Numbers, Symbols, and Abbreviations

Equations are centered and numbered consecutively, with equation numbers in parentheses flush right, as in Eq. (1). Equation (1) is coded as below:

```
\begin{equation}
\int_0^{r_2} \bm{F}(r,\varphi)\,dr\,d\varphi=
[\sigma r_2/(2\mu_0)]\cdot \int_0^{\infty}
\exp(-\rho|z_j-z_i|)\lambda^{-1}
\end{equation}
```

A sample equation is included below, formatted using the preceding instructions. To make your equation more compact, you can use the solidus (/), the exp function, or appropriate exponents. Use parentheses to avoid ambiguities in denominators.

$$\int_0^{r_2} \mathbf{F}(r, \varphi) dr d\varphi = [\sigma r_2 / (2\mu_0)] \cdot \int_0^{\infty} \exp(-\rho |z_j - z_i|) \lambda^{-1} \quad (1)$$

Be sure that the symbols in your equation are defined in the Nomenclature or before the equation appears, or immediately following. Italicize symbols (*T* might refer to temperature, but T is the unit Tesla). Refer to “Eq. (1),” not “(1)” or “equation (1)” except at the beginning of a sentence use: “Equation (1) is.” Equations can be labeled other than “Eq.” but should they represent inequalities, matrices, or boundary conditions. If what is represented is really more than one equation, the abbreviation “Eqs.” can be used.

Conclusions

The most important results of the paper should be summarized as a concise list of numbered items. Conclusions should be supported by development in the main text and no new material should be introduced in this section. If the paper did not result in specific conclusions, then the section may be entitled Concluding Remarks or Recommendations, with brief summary comments as appropriate. No references or equations must be cited in the conclusions section.

Appendices

An appendix or appendices should be included only for highly specialized data, derivations, and so forth. Appendices should not be used to define symbols. The appendices should be numbered if more than one is used. Each appendix must be cited in the main text.

Acknowledgments

The preferred spelling of the word “acknowledgments” in American English is without the “e” after the “g.” Avoid expressions such as “One of us (S.B.A.) would like to thank” Instead, write “F. A. Author thanks” Sponsor and financial support acknowledgments are also to be listed in the “acknowledgments” section.

References

The following pages are intended to provide examples of the different reference types, as used in the AHS Style Guide. The bibliographic (or reference) chapter is coded within the environment `{thebibliography}`.

```
\begin{thebibliography}{9}%%% Maximum refs
```

```
\bibitem{Johnson80}
```

Johnson, W., *{\it Helicopter Theory}*, Princeton University Press,
Princeton, NJ, 1980, pp. 808--813.

```
\bibitem{Leishman00}
```

Leishman, J. G., *{\it Principles of Helicopter Aerodynamics}*,
Cambridge University Press, New York, NY, 2000, Chapter 10.

...

...

```
\end{thebibliography}
```

If you are using a printed or PDF version of this document, all references should be in 12-point font, with reference numbers inserted in superscript immediately before the corresponding reference. You are not required to indicate the type of reference; different types are shown here for illustrative purposes only.

References

¹Johnson, W., *Helicopter Theory*, Princeton University Press, Princeton, NJ, 1980, pp. 808–813.

²Leishman, J. G., *Principles of Helicopter Aerodynamics*, Cambridge University Press, New York, NY, 2000, Chapter 10.

³Friedmann, P. P., and Hodges, D. H., “Rotary-Wing Aeroelasticity with Application to VTOL Vehicles,” *Flight-Vehicle Materials, Structures, and Dynamics*, edited by A. K. Noor and S. L. Venneri, Vol. 5, Part II, Chap. 6, American Society of Mechanical Engineers, New York, NY, 1993, pp. 299–391.

⁴Chopra, I., “Dynamic Stability of a Bearingless Circulation Control Rotor Blade in Hover,” *Journal of the American Helicopter Society*, Vol. 30, (4), Oct. 1985, pp. 40–47.

⁵Marchman, J. F., III, and Uzel, J. N., “Effect of Several Wing Tip Modifications on a Trailing Vortex,” *Journal of Aircraft*, Vol. 9, (9), 1972, pp. 684–686.

⁶Carpenter, P. J., and Friedovich, B., “Effect of a Rapid Blade-Pitch Increase on the Thrust and Induced-Velocity Response of a Full-Scale Helicopter Rotor,” NACA TN 3044, 1953.

⁷Johnson, W., “A Comprehensive Analytical Model of Rotorcraft Aerodynamics and Dynamics, Part I: Analytical Development,” NASA TM 81182, 1980.

⁸Sadler, S. G., “A Method for Predicting Helicopter Wake Geometry, Wake-Induced Inflow and Wake Effects on Blade Airloads,” American Helicopter Society 27th Annual Forum Proceedings, Washington, DC, May 1971.

⁹Brentner, K. S., and Jones, H. E., “Noise Prediction for Maneuvering Rotorcraft,” Paper AIAA 2000–2031, 6th AIAA/CEAS Aeroacoustics Conference Proceedings, Lahaina, HI, June 12–14, 2000.

List of Figures

1	This is an example of a figure caption.	13
2	This is an example of a figure caption.	14

List of Tables

1	This is an example of a table caption.	15
2	This is an example of a table caption.	16

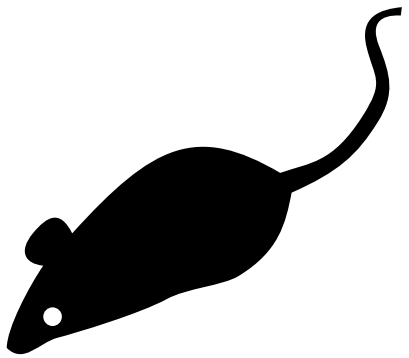


Fig. 1 This is an example of a figure caption.

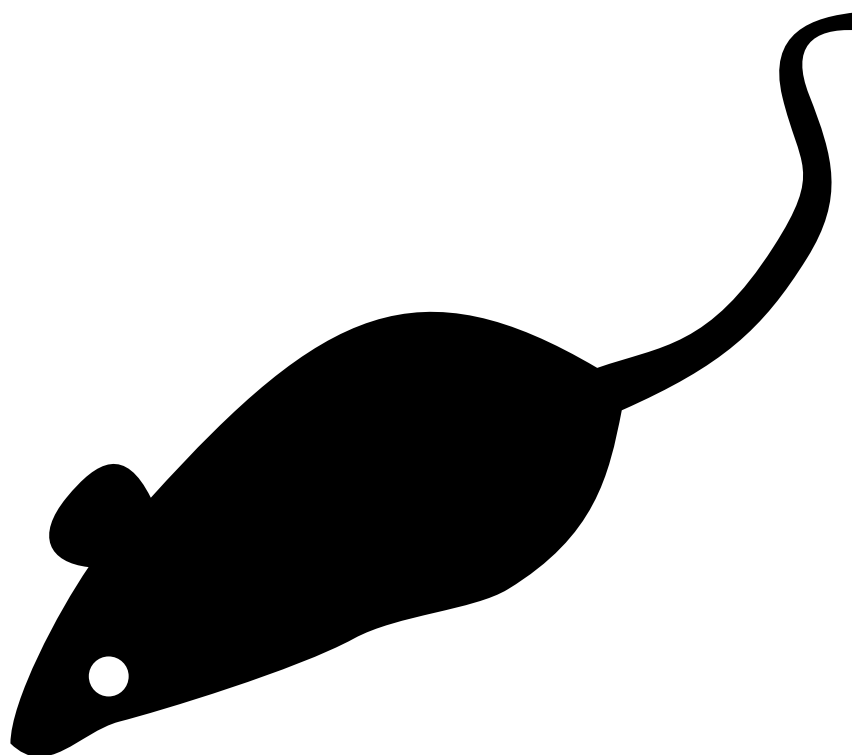


Fig. 2 This is an example of a figure caption.

Table 1. This is an example of a table caption.

First column	Second column	Third column	
head ^a	head ^b	head	$V_M(r)$
Left	Word entries	0.2	10.55
Left	Word entries	10.1	33.12
Left	Word entries	0.5	45.10
Left	Word entries	13.9	12.34
Left	Word entries	0.1	60.50

^aThis is a table footnote.

^bThis is a table footnote.

Table 2. This is an example of a table caption.

First column	Second column	Third column	Forth column	Sixth column	
head ^a	head ^b	head	head	head	$V_M(r)$
Left	Word entries	0.2	10.55	89–99	12
Left	Word entries	0.15	33.12	56–87	15
Left	Word entries	10.58	45.10	65–78	20
Left	Word entries	43.9	12.34	89–92	19
Left	Word entries	0.15	60.50	91–99	20

^aThis is a table footnote.

^bThis is a table footnote.