HAL COMMUNICATIONS CORP.

DOCUMENT STANDARDS

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The following is intended to serve as a guideline for documentation format and procedures at HAL Communications Corp. These guidelines are to be followed for all documents that may be distributed outside of HAL Communications. These procedures are recommended but not required for internal documents.

1.0 INTERNALLY CONSISTENT

All documents shall be internally consistent. This means that, within a given document, the same page format, type style, and construction shall be followed whenever possible. For example, if the document uses left- and right-hand justification, the whole document shall be justified (tables excepted). A given type size and style shall be followed throughout the document whenever possible. Headers, footers, titles, and section headings should be consistent within the document.

2.0 PAGE SIZE AND MARGINS

Whenever possible, the document shall be prepared on "A" size paper (8.5" x 11"). Left- and right-hand margin widths of 1.0" are highly recommended. 10 character-per-inch type should use a line length of 65 characters. Use 79 character lines for 12 character-per-inch, proportionally-spaced type. "B" size (11x17) pages may be used, but should be folded to a maximum width of 8.5 inches (Z-fold). Numerical data in "spread-sheet" format should be reproduced onto "A" or "B" size pages. Spread-sheets may be rotated 90 degrees if required (right edge of page is "bottom").

3.0 DRAWINGS

Manual illustrations shall be placed within or adjacent to descriptive and/or reference text whenever possible. It is preferred that small illustrations be included on the same page as the descriptive text. These drawings should not include a HAL title block.

Drawings that require pages separate from the text shall be placed on either an "A" (8.5x11) or "B" (11x17) size page. Unless forbidden by customer requirements, a drawing may be placed "sideways" (landscape format) on an "A" sized page. However, all such drawings shall be placed

so that they are right-reading when the finished document booklet is rotated 90 degrees clock-wise; all drawings are right-reading from the right-hand side of the page. When "B" size (11x17) drawings are included in a document, the page shall be "Z-folded" so that its maximum width is 8.5 inches.

A drawing may be reduced in size when printed. The drawing reduction factor shall be governed by the readability of the final reproduced (printed) page. Multiple pages shall be used when reduction of a single-page drawing would otherwise result in unreadable and/or unreproducable details.

HAL title blocks shall be included in all separate-page drawings unless specifically forbidden by customer requirements. Only the most recent version of a drawing shall be used and it shall include all required approval signatures prior to duplication.

4.0 NUMBERED OUTLINE FORMAT

All documents shall use the outline format whenever possible. The recommended format is:

1. CHAPTER TITLE   1st Level

1.1 Major Section   2nd Level

1.1.1 Sub-section of 1.1   3rd Level

1.1.1.1 Sub-section of 1.1.1   4th Level

1.1.1.1.1 Sub-section of 1.1.1.1   5th Level

The outline format should be restricted to five levels at the most.

There must be at least two headings to open a new outline level. For example:

Acceptable: NOT Acceptable:
----------------------------   -------------------
1.1 Major Section   1.1 Major Section

1.1.1 1st sub-section of 1.1   1.1.1 Sub-heading

1.1.2 2nd sub-section of 1.1   1.2 Major Section

Lists within an outline level may be lettered or numbered. Numbering is recommended for long lists, such as test procedure steps, especially if the list continues through several outline sections and/or sub-sections. Lower-case lettered lists are recommended for short lists that are limited to one section or subsection.
 Major section titles (CHAPTER TITLES) should be written in all capital letters. They may be in a larger and/or bold type face, and/or be underlined. Lower level titles should start each major word with a capital letter and use lower case for all other letters and minor words (and, or, the, etc.). Heading style size, and format must be consistent within the document.

Section and outline titles should be short and descriptive. Text should not start on the same line as the title.

5.0 PARAGRAPHS

A blank line shall always be inserted between paragraphs. The start of a paragraph may be left justified or indented, but all paragraphs within a document must be consistent. The recommended HAL style is to not use indenting at the start of each new paragraph.

6.0 EMPHASIS

Bold and/or extra-large type may be used to emphasize chapter titles. **Bold**, underline, *italic* or ALL CAPS type may be used within text for emphasis. However, text size should not change within a paragraph of text. Use of differing styles should be minimized to avoid diluting the intended emphasis.

7.0 PAGE NUMBERING

All pages within the document shall be sequentially numbered. Text pages may be either sequentially numbered through-out the document or by chapter. "Forward matter" shall be numbered by lower-case Roman-numerals. The text Page number shall be included in the header and right-justified (WordStar .he feature).

Forward matter numbering starts at the title/cover page and continues through the TABLE OF

CONTENTS, LIST OF ILLUSTRATIONS, etc. The title/cover page number is <u>always</u> omitted. Page "ii" is the page following the title/cover page, followed by page "iii", "iv", "v", "vi", etc. All forward-matter page numbers are centered at the bottom of the page. Use the WordStar ".fo" feature for these page numbers.

The first page of text is always "page 1". This page number may be omitted or placed at the bottom center of the page. It should <u>not</u> be placed at the top of page 1. Pages which start new chapters should also have the page number centered at the bottom of the page - not at the top. This rule may be waved when use of headings that include the page number adds clarity to a long document (chapter-numbered format, in particular).

 Sequential page numbering starts with page one as the first page of text and continues through the final page of the document. With the exception of Page 1 and new chapter pages, all subsequent page numbers are placed on the top-line header of each page of the document, right-margin justified.

Chapter page numbering is highly recommended for long documents in which each chapter is written as a separate computer file. Chapter page numbering shall use the format "PAGE X-y" where "X" is the chapter number and "y" is the page number, starting at "1" for the first page of the chapter.

The page numbering format shall use the ".he" WS header feature, placing "PAGE #" at the upper right-hand corner of each page (except the first page). Chapter numbering shall use the format "PAGE 1-#". Note that both of these formats require re-definition of the header at the bottom of page 9 to maintain right-hand justification of the page number on page 10 and higher.

8.0 PAGE BREAKS, "ORPHANS", AND TEXT CONTINUITY

Page breaks shall be used whenever required to improve the clarity of the document. New chapters shall <u>always</u> be started on new pages. There is <u>no</u> requirement to fill all available lines of the page with text.

Page breaks shall be inserted to avoid "orphans". An "Orphan" is a short phrase or partial sentence at the end of a paragraph that the automatic word processor page break causes to be moved to the following page. "Orphans" can be very confusing to the reader.

When a long paragraph must be split between two pages, the shortest segment of the paragraph should be two lines or longer. If not, adjust the page break manually. It is highly recommended that an entire paragraph be placed on the same page whenever possible.

When a tabular list extends beyond a page break, the table headings shall be repeated on the new page.

 9.0 SPACES

Spaces shall be inserted as required for clarity, but shall follow standard printing practice. Additional spaces may be automatically inserted between words when full ("even-right") justification is used.

> a. A period (.) at the end of a sentence is <u>always</u> followed by <u>two spaces</u> (no exceptions).
>
> b. A comma (,), semi-colon (;), and colon (:) are <u>always</u> followed by <u>one space</u>.
>
> c. A decimal point is <u>always</u> typed as a period and is not followed by a space.
>
>   EXCEPTION: A size or weight specification for <u>European customers</u> may use a comma for the decimal point. For example: 23,22 cm.
>
> d. Text within parenthesis does <u>not</u> include a space after the opening bracket "(", "[", or "{" nor before the ending bracket ")", "]", or "}".
>
> e. A space shall always be used between a number specifier and a following descriptor. For example:
>
>>   115 VAC, 23 dBm, 7 VDC, 620 ohms
>>   EXCEPTIONS: 10%, 62K ohms ("ohms" is optional)
>
> f. Leading descriptors usually do not have a space between the descriptor and the number. For example:
>
>>   +2 dBm, $\pm$10%, $\leq$0.2 dBm

10.0 HYPHENATION AND DASHED PHRASES

Hyphenation shall be avoided as much as possible. In particular, automatic word processor hyphenation must be viewed with distrust. When a word must be hyphenated, the hyphen shall be placed between syllables as defined in a recognized dictionary. The shortest hyphenated fragment created shall not be less shorter than three characters. If a "dashed phrase", number, or specification occurs at the end of a line, words or spaces should be adjusted to place the <u>entire</u> "dashed phrase" on the same line to prevent confusion between "dashed phrases" and hyphenation. In general, turn all automatic hyphenation features OFF.

11.0 ABBREVIATIONS AND ACRONYMS

All acronyms must be defined at least once before use. Periodic redefinition, especially at the start of new chapters is highly recommended. For example:

    Quality Assurance (Q/A)
    Critical Design Review (CDR)

Technical abbreviations may be used, but must follow IEEE and other accepted standards. The general guideline is that letters originated in honor of a person (i.e., H for Hertz or Henry, B for Bell) should be capitalized. Some commonly used electronic abbreviations are:

Hz - Hertz ("cycles-per-second")   uV - microvolt
mHz - millihertz   mV - millivolt
kHz - kilohertz   V   - volt
MHz - megahertz   pA - picoampere
mW - milliwatt   nA - nanoampere
W   - Watt   uA - microampere
kW - kilowatt   mA - milliampere
MW - megawatt   A   - ampere
dB - decibel   ps - picosecond
dBm - decibel, referenced to 1 mW   ns - nanosecond
uHy - microhenry   us - microsecond
mHy - millihenry   ms - millisecond
Hy - henry   s   - second
pF - picofarad
nF - nanofarad
uF - microfarad
F   - farad

By HAL standard, some abbreviations shall always be all-capital letters. For example:

    ON, OFF - (switch action or position)
    MARK, SPACE
    AC, DC, ACV, V AC, DCV, V DC, ACVM, DCVM
    LPF, BPF, HPF, SCF
    CW, RTTY, USB, LSB, FSK, PSK, MSK, ASK, SSB
    KOS, USOS, AF IN, AF OUT, WRU, SYNC
    XMIT, TX, RX, RCVE, ANT, GND, COM

LOS, AOS, CD, TXD, RXD, CTS, RTS, DTR, DSR,
RS (as in RS-232), MIL (as in MIL-STD-188-110 or MIL-188)

CPS = Characters Per Second (not Cycles Per Second).

12.0 FORWARD MATTER

Each document longer than 10 pages shall include forward matter placed between the title/cover page and the first page of text. This forward matter shall include the following sections:

    TABLE OF CONTENTS
    LIST OF TABLES
    LIST OF ILLUSTRATIONS

The TABLE OF CONTENTS shall use an indented outline format and include page numbers. All document sections and sub-sections shall be listed. The complete title or a very clear abbreviation of the title shall be included for each outline section. The title shall be followed by two spaces and then a line of periods that lead to the page number. The page number shall be preceded by at least one blank space between the period leaders and the number. Page numbers shall be right-justified to the right-hand page margin. Outline indenting shall be adjusted with spaces so that all similar level sections and their titles align vertically. The Table of Contents shall use a blank line between each chapter listing and single-line spacing with a given chapter. For example:

TABLE OF CONTENTS:

 The LIST OF TABLES and LIST OF ILLUSTRATIONS should be shown in the order the tables or figures appear in the document. For example:

LIST OF TABLES:

LIST OF ILLUSTRATIONS:

Table and figure titles may be all capital letters or mixed upper and lower case, but <u>must</u> appear in the same format in the "forward matter" as in the document itself.

13.0 TITLE PAGE:

The title page shall be the first page of all HAL documents and shall include the following information:

   Name of Product
   Model Number of Product
   Name of Document (Instruction Manual, Technical Manual, etc)
   HAL copyright statement
   Document part number (870-xxxxx)
   Month and year of printing (January, 1990 Printing)
   Other data as may be required by HAL's customer.

Unless prohibited by HAL's customer, the following HAL copyright statement shall be used <u>verbatim</u> on all documents:

"Copyright   1990 by HAL Communications Corp., Urbana, Illinois. Printed in the United States of America. Contents of this publication may not be reproduced in any form without the written permission of the copyright owner."

The title page may also serve as the cover page when a cover is not printed or when a "window cover" is used.

14. INDEX:

Inclusion of an INDEX at the end of the document is optional. Index preparation is time consuming. Unless an index is required by HAL's customer or necessary to improve the usability of the document, creating an index should be <u>avoided</u>.

15. APPENDICES:

When required, one or more APPENDIX may be added at the very end of the document. Appendices should be lettered - capital letters starting with "A". Appendix page numbers should always use the chapter-numbering format with the appendix letter in place of the chapter number (Page A-1, A-2, etc.).

An appendix should be restricted to one narrow topic and be as short as possible. An outline format should be used on long or involved appendices, but avoided if at all possible. When an outline format must be used, it shall be of the form:

APPENDIX A: SPECIFIC RADIO CONNECTIONS
    A.1 TS-940S Transceiver
        A.1.1 FSK Option
        A.1.2 Mode Selection
        A.1.3 Filter Selection
    A.2 FT-1000 Transceiver
        A.2.1 FSK Option
        A.2.2 Mode Selection
        A.2.3 Filter Selection

The above form shall be used when constructing an appendix outline and listing of that outline in the TABLE OF CONTENTS.

APPENDIX A
USE OF WORDSTAR:

WordStar is the recommended HAL word processing program.

A.1 Dot Commands

WordStar uses "dot-commands" to set-up page parameters. All dot-commands <u>must</u> be left-justified - the leading period must be in column one of the screen. Dot-commands generate action but are <u>not</u> printed. With the exception of headers and footers, text on the same line as a dot command is <u>not</u> printed. These lines may, however, be used to insert non-printing comments, if desired. Some of the more common dot-commands are:

.op   - omit page numbers (but page counter continues)

.pn x   - assign new page number; "x" = new number

.ul ON (OFF) - turn continuous underline ON (OFF)

.cw xxx   - set character "width"; "xxx" = width in n/120"

.lm xx   - set left margin at "xx" column

.rm xxx   - set right margin at "xxx" column

.ps ON (OFF) - turn proportional spacing ON (OFF)

.oj ON (OFF) - turn right justification ON (OFF)

.he   - define header - all text on this line appears at
              top of all <u>following</u> pages. Type .he and two
              spaces to delete header on <u>following</u> pages.

.h1 .h2 .h3 - multiple header commands. .h1 text is above .h2
              and .h3 text. Type .f2 followed by two spaces
              to leave blank line between .h1 and .h3 text.

.fo   - define one footer; all text on this line appears
              at bottom of this and all following pages.

Type .fo and two spaces to delete footer on <u>this</u>
and all following pages.

.f1 .f2 .f3 - multiple footer commands. .f1 text appears above
.f2 and .f3 text lines. Type .f2 with two spaces
to insert blank line between .f1 and .f3.

.pm xx   - set left margin for all paragraphs

.po xx   - set left margin page offset

.cp xx   - conditional page break - keep next "xx" lines on
same page.

Dot commands set parameters that start on the entry page and continue until revised or defeated. Once entered, dot commands will be followed each time the document is edited or printed. However, dot commands do <u>not</u> carry-over from file to file.

The .pm and .lm commands may be used together to produce "negative indenting" for justified lists. For example:

.lm 8
.pm 5

1. This is an example of a list format that uses negative indenting. The first line is indented 4 spaces; lines two and later are indented 8 spaces. To end this format:
.lm 1
.pm 0

Recommended header and footer formats are as follows:

(Left Margin)   (Right Margin)
 | |
.heST-8000A OPERATOR'S MANUAL   PAGE #

.fo901124   HAL COMMUNICATIONS CORP.

Header: The document title should be placed at the top left corner of the page. The page number should be justified to the right margin. WordStar interprets "#" as

"insert page number".

Footer: The date code <u>of the preparation date</u> should be placed at the lower left corner of the page. Use the Military "yymmdd" (year/month/day) format shown.

NOTES:

1. The WordStar column counter does <u>not</u> indicate correct position when the .he and .fo commands are in place. Set-up the text exactly as desired <u>before</u> inserting .he or .fo at the start of the line.

2. When proportional printing is enabled, the column position for the start of "Page #" and "HAL Communications Corp." must be fixed by using the Ctrl-P @ command (^@ shows on screen).

A.2 Ctrl- Key Commands

"Ctrl-" keys are used to produce special on-page formats. Some of the more common commands and their uses are: (^ = Ctrl key)

^P @ Force fixed position printing; use for tables and fixed positioning when proportional printing is enabled. Bold **^@** shows on screen.

^P A Change to alternate printer pitch. Bold **^A** shows on screen.

^P N Change to normal printer pitch. Bold **^N** shows on screen.

^P B Change to **boldface** type. Bold **^B** shows on screen. Toggle command: 1st ^B = ON; 2nd ^B = OFF. F6 key = ^P B non most HAL WS computers.

^P S Underline following characters. Shows bold **^S** and following underlined characters on screen. Toggle command: 1st ^S = ON; 2nd ^S = OFF. F5 key = ^P S on most HAL WS computers.

^P T Superscript following characters (10^6). Shows bold **^T** and following characters on screen. Toggle command: 1st ^T = ON; 2nd ^T = OFF.

^P V Subscript following characters (F_1). Shows bold **^V** and following characters on screen. Toggle command: 1st ^V = ON; 2nd ^V = OFF.

^P Y Italicize following characters. Shows bold **^Y** and following characters on screen. Toggle command: 1st ^Y = ON; 2nd ^Y = OFF. This command does not work with some type faces and printers.

^P   Display print control menu. Second letter may then be selected or Enter to cancel ^P.

^B   Reformat paragraph. Place cursor at top left corner of paragraph and type ^B; also Shift-F10.

^Q U   Reformat or align all following paragraphs of the document - a continuous ^B.

^S   Move cursor one character left (also left-arrow).

^A   Move cursor one word left (also Ctrl-left-arrow).

^D   Move cursor one character right (also right-arrow).

^F   Move cursor one word right (also Ctrl-right-arrow).

^X   Move cursor down one line (also down-arrow).
^E   Move cursor up one line (also up-arrow).

^Z   Scroll screen down one line; does not change cursor.

^W   Scroll screen up on line; does not change cursor.

^G   Delete cursor character; same as Del key.

^H   Delete character to left of cursor; same as Rub-Out.

^T   Delete characters from cursor to end of word (next space).

^Y   Delete line - all characters; also Shift-F3.

^Q Y Delete all characters in line to right of cursor, also Shift-F4.

^U   Restore previous delete operation; also Shift-F2.

^V   Toggle Insert mode ON/OFF; same as Ins key.

^Q   Display on-screen "Quick Command" menu. Enter second letter to select option or Esc to exit.

^Q A Find and replace specified text stream with second stream; may be global or one-time; also Shift-F1.

^Q F Find specified text stream; also F1.

^Q C Move cursor to end of file; also Ctrl-End.

^Q D Move cursor to end of line; also F4.

^Q R Move cursor to beginning of file; also Ctrl-Home.

^Q E Move cursor to beginning of screen; also Home.

^Q X Move cursor to bottom of screen; also End.

^Q I Move cursor to specified page number.

^Q S Move cursor to beginning of current line, also F3.

^Q L Check word spelling from cursor position to end of document; stop with ^U.

^Q N Check spelling of cursor word only.

^Q O Check spelling of word to be entered.

^Q M Enter mathematics menu.

^Q Q Repeat next letter typed continuously at rate 0-9 until stopped. Stop by typing any key.

^O   Display "On Screen" menu. Enter second letter to select option or Esc to exit.

^O C Center text between current left and right margins.

^O G Set temporary left margin at first tab stop. Remains in effect for current paragraph. Use multiple ^O G to select further tab stops.

^O H ON/OFF toggle for automatic hyphen. <u>Leave OFF</u>.

^O I Set new tab stops.

^O N Clear tab stops indicated.

^O J ON/OFF toggle for left-side justification; OFF = "ragged right" format; defaults to ON.

^O L Set left margin; <u>not</u> saved in file - use .lm command.

^O R Set right margin; <u>not</u> saved in file - use .rm command.

^O S Set spacing between lines; 2 = double spaced.

^O P Turn "preview" ON/OFF (default = OFF). When ON, dot commands are <u>not</u> shown; also Shift F9.

^K   Display Block & Save Menu. Enter second letter to select option or Esc to exit.

^K B Mark beginning of block; shows reverse-video <B>. Type second ^K B to remove. <u>Must be paired with and ahead of ^K K</u>. Use F7 on most HAL WS computers.

^K K Mark end of block; shows reverse-video <K>. Type second ^K K to remove. <u>Must be paired with and follow ^K B</u>. Use F8 on most HAL WS computers.

^K V Move marked block to present cursor position. <u>Block must be marked in advance</u>. Use Shift-F7 on most HAL WS computers.

^K C Copy marked block to present cursor position. <u>Block must be marked in advance</u>. Use Shift-F8 on most HAL WS computers.

^K Y Delete marked block. <u>Block must be marked in advance</u>. Use Shift-F5 on most HAL WS computers.

^K S Save file to disk and resume editing. Cursor remains at previous position. <u>USE OFTEN!</u> Also F9.

^K D Save file to disk and end edit session. Normal end of edit session; also F10.

^K Q Quit editing <u>without</u> saving file. <u>All modifications will be lost</u>.

^K X Saves current file to disk and exits WS to DOS.

^K W Write marked block to specified file. Block must be marked in advance.

^K R Read and load another file into document at cursor position. Use to combine and insert previously written files.

^K E Rename a file.

^K J Delete a file.

^K O Copy a file to a new file name.

^K L Change "logged" disk drive or directory. Use to access a file not located in current directory. "Logged" location remains set until changed.

^K N ON/OFF toggle for column mode. Default = OFF; also Shift-F6.

^K P Print a file while remaining in edit mode. Caution! If printing same file as editing, the previously saved version will be printed; you cannot save the newly edited version until after printing is complete.

The above is a shortened list of those WordStar commands frequently used at HAL Communications Corp. Please refer to the WordStar Reference Manual for further details of each command. The default condition of many of these commands and the operation of all function keys may be set or revised via the WSCHANGE file.

The commands listed are for "Release 4" of WordStar. Later versions may have slight variations. Consult your WordStar Manual!