United States District Court, W.D. Texas, Austin Division.

#### **The BOARD OF REGENTS OF the UNIVERSITY OF TEXAS SYSTEM,** Plaintiff.

V.

# BENQ AMERICA CORP., et al,

Defendants.

Nos. A:05CA181 SS, A:05CA198 SS, A:05CA333 SS

April 25, 2006.

Court-Filed Expert Resumes

## JURY DEMANDED

### KARL BAYER, Special Master.

# **REPORT AND RECOMMENDATION OF THE SPECIAL MASTER REGARDING** UNITED STATES PATENT NO. 4,674,112

Attached hereto is the Special Master's Report and Recommendation to United States District Judge Sam Sparks regarding the construction of claims in United States Patent No. 4,674,112.

The Special Master notes that during the course of the pre-hearing and post-hearing briefing, the parties reached agreement on certain terms initially identified as being in dispute. Proposed constructions for the remaining terms are attached hereto.

In light of the parties' primary reliance on intrinsic evidence in developing their claims construction positions, which has in turn informed the Special Master's proposed constructions, the parties' respective motions to exclude evidence as well as the Plaintiff's Supplemental Offer of Exhibits are likely moot.

Thus, the Special Master recommends the admission of all the evidence submitted by the Parties with the caveat that an item's admissibility does not necessarily mean it carries any significant weight for claims construction purposes. *See* Domestic Fabrics Corp. v. Sears Roebuck & Co., 212 F.Supp.2d 489, 493 (E.D.N.C.2002) (declining to apply strict rules of evidence in *Markman* proceedings and instead excluding evidence only when the evidence was "objected to [and] its probative value was too marginal to justify the time it would take to receive it").

The parties may file written objections to the recommendations made in this report within ten (10) days from the date of their receipt of it, as discussed at the conclusion of the *Markman* hearing.

### SPECIAL MASTER'S RECOMMENDED CONSTRUCTIONS

| Claim Term   | Special Master's Recommended Construction  |
|--|--|
| syllabic element   | A syllabic element is a one-syllable letter group that either comprises a word or can be combined with other one-syllable letter groups to form a word.  |
| one or more pre-programmed codes   | No construction.   |
| communicating  | No construction.   |
| signalgenerating keyboard  | No construction.   |
| inputting a word into said<br>keyboard by depressing a single<br>key for each alphabetic<br>character of said word | This phrase requires all the alphabetic characters of the word to be input,<br>with each character to be input by a single key depression. However, there<br>is no requirement that all of the alphabetic characters be inputted before the<br>other steps in the method may commence. |
| transmitting signals generated<br>by the key depressions   | The "signals" identified in this phrase cannot consist of binary code.<br>Otherwise, no construction is necessary.   |
| receiving said transmitted<br>signals and decoding the signals<br>into binary code                                 | No construction.   |
| matching said binary code with<br>one or more pre-programmed<br>codes  | Comparing the binary code with one or more pre-programmed codes until<br>one or more corresponding pre-programmed codes is identified.   |
| each pre-programmed code<br>being representative of a<br>syllabic element  | No construction.   |
| forming a representation of the<br>word from the one or more<br>syllabic elements                                  | No construction.   |
| in a form perceptible to user  | No construction.   |
| in a visually perceptible form   | No construction.   |

## SPECIAL MASTER'S RECOMMNEDED CLAIM CONSTRUCTION

"*syllabic element*" in Claim 10

| Plaintiff's<br>Proposed<br>Construction | Plaintiff's Support              | Defendants'<br>Proposed<br>Construction | Defendants' Support                    | Special Master's<br>Construction                        |
|---|----------------------------------|---|--|---|
| Plaintiff<br>proposes                   | Plaintiff's Intrinsic<br>Support | It is Defendants'                       | Defendants'<br>Intrinsic Support       | A syllabic element is<br>a one-syllable letter<br>group |
| that the term                           |                                  | position that the                       |  | that either comprises<br>a word or can be<br>combined   |
| "syllabic                               | "stored vocabulary comprising a  | term "syllabic                          | '112 patent col.<br>col. 2:11-17 ("The | with other one-<br>syllable letter groups               |

|                           |  |                                 |  | to form a |
|---------------------------|--|---------------------------------|--|-----------|
| <b>element</b> "<br>means | plurality of syllabic elements, each             | element" is                     | controller<br>advantageously has<br>a                          | word.     |
| "a letter-group           | being representative of one or more              | indefinite.                     | recognition means<br>which matches the                         |           |
| comprised of any          | alphabetic characters" Col. 8, ll.               |                                 | series of codes received with a                                |           |
| number of                 | 16-19.   | In the alternative              | programmed code sequence indicative                            |           |
| alphabetic                |  | only, should the                | of the particular word. Once the                               |           |
| characters, each          | "the vocabulary<br>stored in the<br>preferred    | Court determine                 | particular word is identified, a signal                        |           |
| such letter-<br>group     | embodiment,<br>includes common<br>letter-groups, | that this term is not           | representative of<br>the particular word<br>is                 |           |
| forming a word<br>or      | suffixes, prefixes,<br>single                    | indefinite, the<br>term         | passed to an<br>indicating means<br>which                      |           |
| part of a word."          | letters, and a few complete words,               | "syllabic                       | displays the word to the receiving                             |           |
|                           | genericly [sic]<br>referred to as<br>'syllabic   | element" could<br>be            | person."); <b>2:21-28:</b><br>("The                            |           |
|                           | elements.' " Col. 5,<br>11. 9-19.                | defined as "a one               | microcomputer<br>fetches the word or                           |           |
|                           |  | syllable letter                 | syllabic element<br>vocabulary from                            |           |
|                           | "[t]he syllabic<br>elements can<br>comprise      | group which can                 | memory and begins<br>comparing the<br>binary                   |           |
|                           | any number of alphabetic characters              | be combined with                | code with th e vocabulary. The                                 |           |
|                           | (for example, from 1 to 9 alphabetic             | other syllabic                  | controller<br>constructs a<br>particular word                  |           |
|                           | characters)." Col. 1,<br>ll. 65-68.              | elements to form<br>a<br>word." | correspondin g to<br>the received binary<br>code and generates |           |
|                           | "there are a limited<br>number of large          |                                 | a signal to the<br>mdicating<br>mechanism<br>representaive of  |           |

| syllabic elements of 5 to 9 characters                       | that particular<br>word."), <b>2:40-48</b><br>("The         |
|--|---|
| which are used to identify words that                        | binary code is<br>matched wit h a                           |
| are difficult to separate into                               | pre-programmed<br>vocabulary code                           |
| unambiguous short<br>syllabic elements."                     | representative of an alphabetic                             |
| Col. 6, ll. 33-36.   | character string,<br>such as a word or<br>syllabic element  |
|  | The word is then  |
| "[t]he binary code<br>[representative of a                   | output to the receiving person.                             |
| word] is matched<br>with a                                   | Although the<br>preferred<br>embodiment                     |
| preprogrammed<br>vocabulary code                             | anticipates using<br>the apparatus<br>hereof                |
| representative of an alphabetic                              | as a receiving unit,<br>it will be                          |
| character string,<br>such as a word or<br>syllabic element " | appreciated that the<br>apparatus can be<br>easily modified |
| Col. 2, 11. 40-43.   | within the scope of<br>the                                  |
|  | present invention<br>to act as a                            |
| "[f]orming a<br>representation of the<br>word                | transmission<br>unit."), <b>4:68-5:19</b><br>("In           |
| from the one or<br>more syllabic                             | practice, storing<br>complet e word                         |
| represented by the matched one or                            | and ASCII<br>representations in                             |
| more pre-<br>programmed codes                                | was found to limit<br>word recognition                      |
| <br>Col. 9, ll. 6-8.   | capability to the stored word                               |

vocabulary, and

|   | even then, large                |
|---|---------------------------------|
| "in a broad sense.                            | memory size was                 |
| the apparatus 10                              | necessary. In the               |
| could incorporate a                           | preferred                       |
| stored vocabulary                             | embodiment.                     |
| stored voedbalary                             | "syllabic                       |
| word codes and the                            | elements" are                   |
| corresponding                                 | stored in memory                |
| conception                                    | and                             |
| ASCII   | combined to create              |
| representation for                            | the words For                   |
| each word in                                  |                                 |
| a memory look-up                              | example the                     |
| table " Col 4 11                              | "CON" letter group              |
|   | in                              |
| 47-49   | contest silicon                 |
| -1/-1/  | conference                      |
|   | contact                         |
|   | etc. is such a stored           |
|   | syllabic element                |
| " word code' is used                          | Thus the                        |
| to denote the key                             | vocabulary stored               |
| to denote the key                             | in the                          |
| sequence for a                                | preferred                       |
| particular word: that                         | embodiment                      |
| is  | includes                        |
| $\frac{13}{1357}$ is the word                 | common letter                   |
| code for the word                             | groups suffixes                 |
|   | profixes single                 |
| HELF. COI. 4, II.                             | letters, and a few              |
| 02-03.  | complete words                  |
|   | generically referred to         |
| Saa also Figuras 6                            | as "avilable                    |
| and 7 and Abstract                            | as sylladic<br>elements "In the |
| and 7, and Rostract.                          | preferred                       |
|   | embodiment it was               |
|   | found                           |
| Plaintiff's Extrinsia                         | most afficient to               |
| I taining s Exirmisic                         | include several                 |
| Support                                       | letter                          |
|   | attings which                   |
|   | sumgs willon<br>provide and     |
|   | enhance                         |
| "aullabia" is defined                         | word recognition                |
| synable is defined                            | word recognition                |
| as $\mathbf{I} \cdot \mathbf{O} \mathbf{I}$ , | capaointy;                      |

pertaining to, or consisting of a syllable or syllables." The American Heritage College Dictionary, 2nd Ed.

1985.

"syllabic" is defined as "1. of,

pertaining to, or consisting of a syllable or syllables." Webster' Encyclopedic Unabridged Dictionary of the English Language, 1989.

"syllabic" is defined as "**la.** Of or

consisting of a syllable or syllables." The American Heritage College Dictionary, 4th Ed.2004.

"element" is defined as "1. A

therefore the vocabulary of syllabic elements in the preferred embodiment includes elements having one alphabetic letter to as many as nine alphabetic letters. Most syllabic elements have a three to six letter group size."), 5:57-58 ("The program (FIGS.5-8) and stored ssyllabic element vocabulary are fetched from ROM 42."), 5:59-6:48

("The word recognition process is initiated as soon as an entire word code is received (as indicated by the asterisk input). Turning to FIG. 4, the

recognition search is initiated in the segmented look-up table that contains the key codes in the four bit format for the syllabic element

|                       | vocabulary. The         |  |
|-----------------------|-------------------------|--|
| fundamental.          | look-up table is        |  |
| essential, or         | segmente d              |  |
| irreducible           | according               |  |
| constituent a         | to syllabic element     |  |
| composite entity."    | size with the size      |  |
| The                   | of                      |  |
| American Heritage     | the word to be          |  |
| College Dictionary    | decoded                 |  |
| conege Diedonaly,     | determining             |  |
| 2nd Ed 1985           | the point of entry      |  |
| 2nd 14.1703.          | into the look-up        |  |
|                       | table. In the preferred |  |
|                       | embodiment,             |  |
| "element" is defined  | there are nine          |  |
| as " <b>1.</b> a      | segments in the         |  |
|                       | look-up                 |  |
| component or          | table corresponding     |  |
| constituent of a      | to syllabic             |  |
| whole or              |                         |  |
| into which a whole    | elements ranging        |  |
| may be resolved by    | from one to nine        |  |
| analysis: Letters are | characters in size.     |  |
| the elements out      | For words having        |  |
| of which all our      | more than nine          |  |
| words are formed."    | characters, the         |  |
|                       | search is               |  |
| Webster's             | initiated in the        |  |
| Encyclopedic          | ninth segment and       |  |
| Unabridged            | a                       |  |
| Dictionary of the     | new word code           |  |
| English Language,     | corresponding to        |  |
|                       | the                     |  |
| 1989.                 | first nine              |  |
|                       | keystrokes (key         |  |
|                       | codes) of the           |  |
|                       | word is formed          |  |
|                       | (see also FIG. 6).      |  |
|                       | Of                      |  |
| "element" is defined  | course, the size of     |  |
| as " <b>1.</b> A      | the syllabic            |  |
|                       | element                 |  |
| fundamental,          | is known upon           |  |
| essential, or         | entry into a given      |  |
| irreducible           |                         |  |

| constituent a      | segment, therefore   |
|--------------------|----------------------|
| The                | bytes                |
| American Heritage  | required to store    |
| College Dictionary | the key codes for    |
| Conege Diedonary,  | each                 |
| 4th Ed 2004        | of the syllabic      |
|                    | elements will also   |
|                    | be                   |
|                    | known. Although      |
|                    | the word code        |
|                    | typically occupies   |
|                    | more than one        |
|                    | byte,                |
|                    | only the first byte  |
|                    | is checked for a     |
|                    | match initially. The |
|                    | other bytes are      |
|                    | checked only when    |
|                    | a match occurs for   |
|                    | all the previous     |
|                    | bytes for the given  |
|                    | syllabic element. If |
|                    | no match is          |
|                    | 6detected, the       |
|                    | search proceeds to   |
|                    | the                  |
|                    | next syllable        |
|                    | element in the       |
|                    | the table. If no     |
|                    | metch is found in    |
|                    | the                  |
|                    | segment of the       |
|                    | table for the        |
|                    | syllabic             |
|                    | element size equal   |
|                    | to the size of the   |
|                    | word, the search is  |
|                    | continued in the     |
|                    | segment of the next  |
|                    | lower size. That     |
|                    | is, the word code is |
|                    | recomputed to        |
|                    | exclude the last     |

received key code for later use in the recognition process. This procedure is repeated until a match occurs. At the latest, a match will occur upon entering the single character segment of the look-up table. After the first syllabic element is identified, the search is repeated using a reduced word code. The reduced word code comprises the original word code less the first N characters, where N is the size of the first syllabic element identified. This cycle is repeated until the complete word is identified. Most words are identified by connected syllabic elements 2 to 4 characters in size. However, there are a limited number of large syllabic elements of 5 to 9 characters which

| are                   |
|-----------------------|
| used to identify      |
| words that are        |
| difficult             |
| to separate into      |
| unambiguous short     |
| syllabic elements.    |
| Some syllabic         |
| elements have the     |
| same word code        |
| and                   |
| therefore can have    |
| <br>multiple          |
| interpretations. Such |
| multiple meaning      |
| syllabic elements     |
| are specially         |
| flagged               |
| in 1 the look-up      |
| table and stored in   |
| a                     |
| way that the most     |
| frequently            |
| occurring             |
| interpretation is     |
| decoded first. If the |
| element displayed     |
| on the LCD display    |
| 50 does not make      |
| sense to the reader,  |
| he can replace the    |
| string with the       |
| alternate             |
| interpretation by     |
| pressing a            |
| retry button (such    |
| "O" here) Of          |
| O Key). Of            |
| coses                 |
| the user con          |
| interpret such        |
| alternative           |
| interpretations       |
| from the context of   |
| from the context of   |

| the                            |
|--------------------------------|
| other syllabic                 |
| elements forming               |
| the                            |
| word or other                  |
| words in the                   |
| message ")                     |
| <b>7.24_28.</b> ("In           |
| practice the                   |
| apparatus 10                   |
| recognizes the                 |
| entered words as               |
| fast as                        |
| the words can be               |
| entered by the                 |
| sender                         |
| Thus, the apparatus            |
| 10 is real time                |
| displaying the de              |
| coded word on the              |
| LCD display 50                 |
| less than 1 second             |
| after the asterisk             |
| key is depressed "):           |
| <b>7.18 7.78</b>               |
| 2:10-2:20:<br>("Preferably the |
| receiving                      |
| mechanism                      |
| amplifies the                  |
| ampintos de                    |
| tone and decodes               |
| the tone into binary           |
| and The binomy                 |
| code is passed to              |
| the                            |
| controller which is            |
| preferably a                   |
| preprogrammed                  |
| microcomputer. The             |
| microcomputer                  |
| fetches the word or            |
| svllabic element               |
| vocabulary from                |
| memory and begins              |
| comparing the                  |
|                                |

binary code with the vocabulary. The controller constructs a particular word corresponding to the received binary code and generates a signal to the indicating mechanism representative of that particular word."), 2:34-2:43 ("The preferred communication method of the present invention contemplates inputting a word or series of words into a standard "Touch-tone" telephone keyboard by depressing a single key for each alphabetic character of the word. The characters are thus transmitted as a series of tones which are decoded by the apparatus hereof into a binary code. The binary code is matched with a preprogrammed

vocabulary code representative of an alphabetic character string, such as a word or syllabic element. The word is then output to the receiving person.")

| Prosecution History,<br>Response to |  |
|-------------------------------------|--|
| Office Action,                      |  |
| dated August 11,                    |  |
| 1986                                |  |
| pages 9-10: ("In                    |  |
| contrast to the                     |  |
| Rabiner reference,                  |  |
| the present                         |  |
| invention                           |  |
| contemplates an                     |  |
| almost                              |  |
| unlimited                           |  |
| vocabulary in a                     |  |
| standard                            |  |
| language i.e.                       |  |
| English. Rabiner                    |  |
| describes a data                    |  |
| base comprises a                    |  |
| limited vocabulary                  |  |
| of complete words.                  |  |
| In contrast, the                    |  |
| present invention                   |  |
| employs a data                      |  |
| base of syllabic                    |  |
| elements (i.e.                      |  |
| syllable-like letter                |  |
| groups) which are                   |  |
| combined to form a                  |  |
| word of standard                    |  |
| English text, giving                |  |
| an almost                           |  |
| unlimited                           |  |
| vocabulary                          |  |
| Dahiner adapts the                  |  |

| straight formund                 |
|----------------------------------|
| straight forward                 |
| approach of using a              |
| lookup table                     |
| vocabulary,                      |
| comprising names                 |
| or                               |
| words. In such an                |
| approach, every                  |
| possible choice                  |
| must be included                 |
| in the                           |
| vocabulary                       |
| Thus, in Rabiner,                |
| there is <i>a one-to-</i>        |
| one                              |
| correspondence                   |
| between stored                   |
| words and                        |
| vocabulary                       |
| size. It will be                 |
| appreciated that                 |
| either                           |
| the word choice                  |
| must be very                     |
| limited                          |
| or the vocabulary                |
| must be very large               |
| to                               |
|                                  |
| possible shoise                  |
| The                              |
| memory requirements              |
| for such a                       |
| system would be                  |
| very limiting. In                |
| very minung. m                   |
| Contrast [10<br>Debiner] eleim 1 |
|                                  |
| as                               |
| amended (original                |
| ciann 10) provides               |
| a                                |
| structure and                    |
| methodology for                  |
| identifying the                  |
| actual letter groups             |

while removing the potential ambiguity arising from multiple letters on each Touch-Tone key. The letter groups (syllabic elements) are identified one group at a time in a flexible manner. The present invention links the syllabic elements together as each is identified to form the word. Thus, from a limited set of stored syllabic elements, a very large vocabulary of words can be identified.") (Emphasis in original). Defendants' Extrinsic Support

Defendants will also rely upon the testimony and/or affidavit of designated expert witness Professor I. Scott MacKenzie and designated expert witness Professor Stanley Peters.

"one or pre-programmed codes" in Claim 10

| Plaintiff's Propose<br>Construction | edPlaintiff's Support  | Defendants'<br>Proposed<br>Construction | Defendants' Support   | Special Master's<br>Construction |
|-------------------------------------|--|---|---|----------------------------------|
| Plaintiff proposes                  | Plaintiff's Intrinsic<br>Support   | It is Defendants'                       | Defendant's Intrinsic<br>Support  | No construction.                 |
| that the term<br>" <b>pre-</b>      |  | position that the                       |   |                                  |
| programmed                          |  |   |   |                                  |
|                                     | "being<br>representative of a<br>syllabic  | term " <b>one or</b><br>more            | '112 patent col. col.<br>2:11-17 ("The  |                                  |
| code" means "an                     | element" Col. 9,<br>ll. 4-5.   | pre-programmed                          | controller<br>advantageously has<br>a   |                                  |
| electronically                      |  | codes" means "a                         | recognition means<br>which matches the  |                                  |
| stored                              | "stored vocabulary comprising a  | database of pre-set                     | series of codes received with a   |                                  |
| representation of a                 | plurality of syllabic elements, each   | codes in which                          | programmed code sequence indicative   |                                  |
| syllabic<br>element."               | being representative of one or more  | each of the codes                       | of the particular word. Once the  |                                  |
|                                     | alphabetic characters<br>" Col. 8, ll.   | represents a                            | particular word is identified, a signal   |                                  |
|                                     | 16-19.   | syllabic element,                       | representative of the particular word is  |                                  |
|                                     |  | wherem the                              | passed to an<br>indicating means<br>which   |                                  |
|                                     | "a preprogrammed vocabulary code   | database cannot                         | displays the word to the receiving  |                                  |
|                                     | representative of an alphabetic  | include more than                       | person."); <b>2:18-</b><br><b>2:28:</b> ("Preferably,<br>the                      |                                  |
|                                     | character string, such as a word or  | a few complete                          | receiving mechanism amplifies the   |                                  |
|                                     | syllabic element."<br>Col. 2, ll. 41-43.   | words."                                 | ambiguous tone and<br>decodes the tone<br>into binary code.<br>The binary code is |                                  |
|                                     | "syllabic element<br>vocabulary [is<br>fetched] from<br>memory." Col. 2, ll.<br>22-23. |   | passed to the<br>controller which is<br>preferably a<br>preprogrammed             |                                  |
|                                     |  |   |   |                                  |

|                       | microcomputer. The     |
|-----------------------|------------------------|
|                       | microcomputer          |
|                       | fetches the word or    |
|                       | syllabic element       |
| "                     |                        |
| programmed            | vocabulary from        |
| vocabulary is stored  | memory and begins      |
| on                    |                        |
| the ROM." Col.        | comparing the          |
| 3,11.56-57.           | binary code with the   |
|                       | vocabulary. The        |
|                       | controller constructs  |
|                       | a                      |
| "controller           | particular word        |
| advantageously has    | corresponding to the   |
| a                     | conceptonenng to une   |
| recognition means     | received binary code   |
| which matches the     | and generates a        |
| series of codes       | singal to the          |
| received with a       | indicating             |
|                       | mechanism              |
| programmed code       | representative of that |
| sequence indicative   | particular             |
| of the particular     | word ") 2:34-2:43      |
| word " Col 2 II 11-   | ("The preferred        |
| 14                    | ( The preferred        |
| 1                     | communication          |
|                       | method of the          |
|                       | nresent                |
|                       | invention              |
|                       |                        |
|                       | contemplates           |
|                       | inputting a            |
| Col. 4, II. 63-65: "a | word or series of      |
| stored vocabulary     | words into a           |
|                       | standard               |
| of word codes and     | "Touch-tone" key-      |
| the corresponding     | board by               |
| ASCII                 | depressing a single    |
| representation for    | sky for each           |
| each word in          |                        |
| a memory look-up      | alphabetic character   |
| table." Col. 4, 11.   | of the word. The       |
| 47-49: " 'word code'  | characters are thus    |
| is used to denote     | transmitted as a       |
| the key sequence for  | series to tones which  |
|                       |                        |
| a particular word:    | ar e decoded by        |

word code for the word 'HELP.' "

Col. 5, 11. 5-6: " 'syllabic elements' are stored in memory." Col. 5, ll. 9-12: "[t]hus, the vocabulary stored in the preferred embodiment includes common lettergroups, suffixes, prefixes, single letters, and a few complete words, generically [sic] referred to as 'syllabic elements.' "

Plaintiffs Extrinsic Support

"syllabic" is defined as "**1**. Of, pertaining to, or consisting of a syllable or syllables." The American Heritage College Dictionary, 2nd Ed.1985.

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int o a binary code. The binary code is matched with a preprogrammed vocabulary code representative of an alphabtic

character string, such as a word or syllabic element. The word is then

output to the receiving person."); 2:40-48("The binary code is matched with a preprogrammed vocabulary code representative of an alphabetic character string, such as a word or syllabic element. The word is then output to the receiving person. Although the preferred embodiment anticipates using the apparatus hereof as a receiving unit, it will be

appreciated that the apparatus can be easily modified within

the scope of the

present invention to act as a transmission unit."), **4:68-5:19** ("In pertaining to, or consisting of a syllable or syllables." Webster's Encyclopedic Unabridged Dictionary of the English Language, 1989.

"syllabic" is defined as "**la.** Of or consisting of a syllable or syllables." The American Heritage College

Dictionary, 4th Ed.2004.

"element" is defined as "**1.** A fundamental, essential, or irreducible constituent a composite entity." The American Heritage College Dictionary,

2nd Ed.1985.

"element" is defined as "1. a

component or

practice, storing complete word codes

and ASCII representation s in memory was found to limit word recognition

capability to the stored word vocabulary, and even then, large memory size was necessary. In the preferred embodiment, "syllabic elements" are stored in memory and example, the "CON" letter group in combined to create the words. For example, the "CON" letter group in contest, silicon, conference, contact, etc. is such a stored syllabic element.

Thus, the vocabulary stored in the

preferred embodiment includes common lettergroups, suffixes, prefixes, single letters, and a few complete words, generically referred to as "syllabic

| const<br>whol<br>into<br>may<br>analy<br>the e<br>whick<br>are f<br>Web<br>Ency<br>Unat<br>Dicti<br>Engl | tituent of a<br>e or<br>which a whole<br>be resolved by<br>vsis: Letters are<br>lements out of<br>h all our words<br>formed."<br>ster's<br>vclopedic<br>oridged<br>tonary of the<br>ish Language, | elements." In the<br>preferred<br>embodiment, it was<br>found most<br>efficient to include<br>several letter strings<br>which provide and<br>enhance word<br>recognition<br>capability; therefore<br>the<br>vocabulary of<br>syllabic elements in   |
|--|---|---|
| 1989   |   | the<br>preferred<br>embodiment<br>includes  |
|  |   | elements having one a alphabetic letter   |
| "elem<br>as "1<br>funda<br>esser<br>irred<br>const<br>comp<br>The<br>Ame<br>Colle<br>4th E               | nent" is defined<br>L.A<br>amental,<br>itial, or<br>ucible<br>tituent a<br>posite entity."<br>rican Heritage<br>>ge Dictionary,<br>3d.2004.   | to as many as nine<br>alphabetic letters.<br>Most syllabic<br>elements have a<br>three to<br>six letter group<br>size."), <b>5:57-58</b><br>("The<br>program (FIGS.5-8)<br>and stored<br>syllabic element<br>vocabulary are<br>fetched<br>from ROM 42."),<br><b>5:59-6:48</b> ("The<br>word recognition<br>process is initiated<br>as<br>soon as an entire<br>word code is<br>received<br>(as indicated by the<br>asterisk input).<br>Turning to FIG. 4,<br>the recognition<br>search is initiated in |

| the segmented          |
|------------------------|
| look-up table that     |
| contains the key       |
| codes in the four bit  |
| format for the         |
| syllabic element       |
| vocabulary. The        |
| look-up                |
| table is segmented     |
| according to           |
| syllabic element size  |
| with the size of       |
| the word to be         |
| decoded determining    |
| the                    |
| point of entry into    |
| the look-up table. In  |
| the preferred          |
| embodiment, there      |
| are                    |
| nine segments in the   |
| look-up table          |
| corresponding to       |
| syllabic elements      |
| ranging from one to    |
| nine characters in     |
| size. For words        |
| having more than       |
| nine                   |
| characters, the        |
| search is initiated in |
| the                    |
| ninth segment and a    |
| new word code          |
| corresponding to the   |
| first nine             |
| keystrokes (key codes) |
| of the word is         |
| FIC () Of course       |
| the size of the        |
| une size of the        |
|                        |
| known upon entry       |
| into a given           |
| sagmant tharatara      |

segment, mercioie the number of bytes required to store the key codes for each of the syllabic elements will also be known. Although the word code typically occupies more than one byte, only the first byte is checked for a match initially. The other bytes are checked only when a match occurs for all the previous bytes for the given syllabic element. If no match is detected, the search proceeds to the next syllabic element in the segment of the table. If no match is found in the segment of the table for the syllabic element size equal to the size of the word, the search is continued in the segment of the next lower size. That is, the word code is recomputed to exclude the last received key code for later use in the recognition process. This procedure is repeated until a match occurs. At the

| latest, a match        |
|------------------------|
| will occur upon        |
| entering the single    |
| character segment of   |
| the look-up table.     |
| After the first        |
| syllabic element is    |
| identified, the search |
| is repeated using      |
| a reduced word         |
| code. The reduced      |
| word code comprises    |
| the original word      |
| code less the first N  |
| characters, where      |
| N is the size of the   |
| first syllabic         |
| element identified.    |
| This cycle is          |
| repeated until the     |
| complete word is       |
| identified. Most       |
| words are identified   |
| by connected           |
| $\frac{1}{2}$          |
| abaractors in size     |
| However, there are     |
| a limited number of    |
| large syllabic         |
| elements of 5 to 9     |
| characters which are   |
| used to identify       |
| words that are         |
| difficult              |
| to separate into       |
| unambiguous short      |
| syllabic elements.     |
| Some syllabic          |
| elements have the      |
| same word code and     |
| therefore can have     |
| multiple               |
| interpretations. Such  |
| multiple meaning       |
|                        |

|  | syllabic elements are    |
|--|--------------------------|
|  | specially flagged        |
|  | in 1 the look-up         |
|  | table and stored in a    |
|  | way that the most        |
|  | frequently occurring     |
|  | interpretation is        |
|  | decoded first. If the    |
|  | element displayed on     |
|  | the LCD display          |
|  | <b>50</b> does not make  |
|  | sense to the reader,     |
|  | he can replace the       |
|  | string with the          |
|  | alternate interpretation |
|  | by pressing a            |
|  | retry button (such as    |
|  | the operator or          |
|  | "O" key). Of course,     |
|  | in many cases the        |
|  | user can interpret       |
|  | such alternative         |
|  | the context of the       |
|  | ather explanation        |
|  | oliments forming the     |
|  | word or other words      |
|  | in the message ")        |
|  | <b>7.24-28.</b> ("In     |
|  | practice the             |
|  | apparatus 10             |
|  | recognizes the           |
|  | entered words as         |
|  | fast as                  |
|  | the words can be         |
|  | entered by the           |
|  | sender.                  |
|  | Thus, the apparatus      |
|  | 10 is real time,         |
|  | displaying the de-       |
|  | coded word on the        |
|  | LCD display 50 less      |
|  | than 1 second            |
|  | after the asterisk key   |
|  | is depressed.").         |

| Prosecution<br>History, Response<br>to<br>Office Action, |
|--|
| dated August 11,<br>1986                                 |
| pages 9-10: ("In<br>contrast to the<br>Rabiner reference |
| the present  |
| invention  |
| contemplates an  |
| almost   |
| unlimited  |
| standard   |
| language i.e.  |
| English. Rabiner   |
| describes a data base                                    |
| comprises a  |
| of complete words  |
| In contrast, the   |
| present invention  |
| employs a data base                                      |
| of syllabic  |
| elements (i.e.   |
| groups) which are  |
| combined to form a                                       |
| word of standard   |
| English text, giving                                     |
| an almost unlimited                                      |
| vocabulary<br>Rebiner adopts the                         |
| straight forward   |
| approach of using a                                      |
| lookup table   |
| vocabulary,  |
| comprising names or                                      |
| words. In such an  |
| possible choice must                                     |
| be included in the                                       |

vocabulary .... Thus, in Rabiner, there is a *one-to-one* correspondence between stored words and vocabulary size. It will be appreciated that either the word choice must be very limited, or the vocabulary must be very large to encompass every possible choice. The memory requirements for such a system would be very limiting. In contrast [to Rabiner], claim 1 as amended (original claim 10) provides a structure and methodology for identifying the actual letter groups while removing the potential ambiguity arising from multiple letters on each Touch-Tone key. The letter groups (syllabic elements) are identified one group at a time in a flexible manner. The present invention links the syllabic

| alamanta tagathar ag   |
|--|
|  |
| each is identified   |
| to form the word.  |
| Thus, from a limited   |
| set of stored syllabic   |
| elements, a very   |
| large vocabulary of  |
| words can be   |
| identified.")  |
| (Emphasis in   |
| original).   |
| 8).  |
| Defendants   |
| Defendanis<br>Extringio Support  |
| Exirmsic Support   |
| From Oxford  |
| Fralish Distionary   |
| 2nd  |
| Edition 1000.  |
| Edition, 1989:   |
| ("preprogram: to   |
| program (a computer  |
| or calculator)   |
| beforehand.").   |
|  |
|  |
| Defendants will also   |
| Defendants will also rely upon the   |
| Defendants will also<br>rely upon the<br>testimony and/or  |
| Defendants will also<br>rely upon the<br>testimony and/or<br>affidavit of  |
| Defendants will also<br>rely upon the<br>testimony and/or<br>affidavit of<br>designated expert                         |
| Defendants will also<br>rely upon the<br>testimony and/or<br>affidavit of<br>designated expert<br>witness Professor I. |

### TERMS FOR WHICH DEFENDANTS PROPOSE A CONSTRUCTION AND PLAINTIFF DOES NOT BELIEVE REQUIRE CONSTRUCTION

**A. Plaintiffs Statement:** Plaintiff asserts that, at most, only two terms in the asserted claims require construction. The remainder of the language is clear and capable of being understood by a person of ordinary skill in the art without additional construction. The Court will note that Defendants are requesting the Court to construe the majority of the terms in these two claims. The Court should reject Defendants' invitation to over-construe the claim terms. Claim construction is necessary only when the meaning or scope of technical terms and words of art is unclear and in dispute. U.S. Surgical Corp. v. Ethicon, Inc., 103 F.3d 1554, 1568 (Fed.Cir.1997); Biotec Biologische Naturverpackungen GmbH & Co. KG v. Biocorp, Inc., 249 F.3d 1341, 1349 (Fed.Cir.2001). As the Federal Circuit has repeatedly emphasized, claim construction "is not an obligatory exercise in redundancy" and the trial court need not "repeat or restate every claim term in order to comply with the [*Markman*] ruling." *Id.* Accordingly, district courts routinely ignore artificial

claim constructs and refuse to construe claims when the plain and ordinary meaning of the claim terms is clear to a person of ordinary skill in the art. *See e.g.*, Zip Dee, Inc. v. Dometic Corp., 63 F.Supp.2d 868, 872 (N.D.III.1998); Starpay.com LLC v. Visa Int'l Serv. Ass'n, No. 3-03-CV-976-L, 2005 WL 17776, at (N.D.Tex., Jan.4, 2005); Advanced Med. Optics, Inc. v. Alcon Inc., 361 F.Supp.2d 370, 378-79 (D.Del.2005). Claim terms such as "each," "word," "keyboard," "signal," "communicating," "transmitting," "receiving," and "visually perceptible" are amply clear to anyone, especially a person of ordinary skill in the art, and require no special construction by this Court. With the exception of the two claim terms noted above ("syllabic element" and "pre-programmed code"), the following constructions set forth by the Plaintiff are provided in the alternative only, and subject to and without waiver of the Plaintiff's position that these terms do not require construction.

**B. Defendants' Preliminary Response to Plaintiff's "Statement":** Defendants request that the Court disregard the argument set forth as "Plaintiff's Statement" above. It is inappropriate to include argument in this jointly filed statement which is meant to set forth the parties positions on the construction of terms without argument. Although the parties have been negotiating the contents of this Joint Statement for weeks, Plaintiff provided the above argument as part of their portion of the joint statement for the first time at approximately 8:00 p.m. CT tonight. While such a late submission, in addition to being inappropriate, does not afford Defendants a reasonable opportunity to respond, the Court should be aware that Defendants disagree with Plaintiff's contention that the following claim terms need not be construed. The best and most obvious proof of this is that the parties disagree as to what the "ordinary" meaning of these terms should be. If no constructions. Accordingly, construction of the below listed terms is appropriate in this matter. Defendants will provide the Court with a further response to Plaintiff's argument in their *Markman* submission.

| Plaintiff's Proposed | Plaintiff's Support                        | Defendants' Proposed | Defendants' Suppor                    | t Special                |
|----------------------|--|----------------------|---------------------------------------|--------------------------|
| Construction         |  | Construction         |                                       | Master's<br>Construction |
| Plaintiff proposes   | Plaintiff's Intrinsic<br>Support           | Defendants           | Defendants'<br>Intrinsic Support      | No construction.         |
| that the term        |  | propose that the     |                                       |                          |
| "communicating"      | "The present<br>invention relates to<br>an | term                 | '112 patent col.<br>1:7-1:19: ("The   |                          |
| means "conveying     | apparatus and method for                   | "communicating"      | present invention relates to an       |                          |
| information."        | communicating by manual entry on a         | means "conveying     | apparatus and method for              |                          |
|                      | keypad using a<br>minimum of key<br>stroke | information from     | communicating by manual entry on a    |                          |
|                      | entries." Col. 1, ll.<br>7-9.              | one user to          | key-pad using a minimum of key        |                          |
|                      |  | another."            | stroke entries.<br>More particularly, |                          |

"A method of *communicating*, utilizing a *signal-generating keyboard* where at least some of the keys represent two or more alphabetic characters, comprising the steps of" in Claim 10

|                     |   |                      | the   |
|---------------------|---|----------------------|---|
| Plaintiff proposes  | "The preferred<br>communication<br>method                                   |                      | invention relates to<br>an apparatus and                                |
| that the term       | of the present<br>invention<br>contemplates                                 | Defendants           | method for use by<br>the hearing or                                     |
| "signal             | inputting a word or<br>series of words<br>into                              | propose that the     | speech impaired to communicate over                                     |
| generating          | a standard "Touch-<br>tone" telephone                                       | term " <b>signal</b> | the telephone<br>network using a<br>standard                            |
| keyboard" means     | keyboard by<br>depressing a single<br>key                                   | generating           | twelve key, dual<br>tone, multi-<br>frequency                           |
| "a keyboard that is | for each alphabetic character of the  | keyboard" means      | telephone. 2.<br>Description of the<br>Prior                            |
| capable of          | word." Col. 2, ll. 34-38.   | "a device that       | Art For the hearing or speech impaired                                  |
| generating a        |   | includes a set of    | to effectively<br>communicate over<br>a long                            |
| signal."            | "Another important alternative is to  | keys that produces   | distance, several methods have been                                     |
|                     | utilize the<br>apparatus and<br>method for                                  | a non-binary         | devised which<br>enable nonverbal                                       |
| Plaintiff proposes  | other modes of<br>communication.<br>For                                     | waveform in          | communication<br>over a<br>communications                               |
| that the term       | example, the<br>apparatus and<br>method                                     | response to the      | network, such as a telephone grid."),                                   |
| "keyboard"          | hereof can be<br>incorporated into a  | depression of its    | <b>1:28-30:</b> ("It has been recognized that                           |
| means "a set of     | paging system<br>network, radio   | keys."               | it is desirable to<br>use a standard 12<br>key,                         |
| keys."              | telephone network,<br>or practically any<br>communications<br>network where |                      | dual tone multiple<br>frequency (DTMF<br>or Touch-tone)<br>telephone to |

| Plaintiff proposes | ambiguity            | communicate               |
|--------------------|----------------------|---------------------------|
|                    | resolution is        | between the               |
|                    | necessary            | hearing or                |
| that the term      | because of limited   | speech impaired.").,      |
|                    | keystroke inputs."   | <b>4:20-24:</b> ("The     |
| "signal" means     | Col. 2, 11. 53-59.   | initial problem           |
|                    |                      | addressed by the          |
| "an indicator"     |                      | present invention         |
|                    |                      | was to provide a          |
|                    | "Of course, the      | simple method for         |
|                    | apparatus 10 hereof  | the hectoring or          |
|                    | equally adaptable    | speech impaired to        |
|                    | for use in many      | communicate using         |
|                    | other                | communicate using         |
|                    | situations. For      | standard "Touch-          |
|                    | example, with a      | tone" telephones          |
|                    | paging               | •                         |
|                    | system where         | without the need          |
|                    | space is limited, a  | for complicated           |
|                    | small                |                           |
|                    | number of keys       | equipment, such as        |
|                    | could be             | teletypes, etc."),        |
|                    | incorporated         |                           |
|                    | to efficiently send  | 2:28-2:33:                |
|                    | a message using      | ("Preferably, the         |
|                    | the                  | indicating .              |
|                    | single character     | means comprises a         |
|                    | of                   | liquid crystal diode      |
|                    | the present          | display which             |
|                    | invention " Col      | visually represents       |
|                    | 7.11. 32-            | the                       |
|                    | 38.                  | word or message to        |
|                    |                      | the user. In another      |
|                    |                      | embodiment, a             |
|                    |                      | speech synthesizer        |
|                    | "The apparatus 10    | audibly                   |
|                    | could also be used   | communicates the          |
|                    |                      | wors or                   |
|                    | for consumers to     | message to the            |
|                    | enter orders to a    | user"), <b>3:16-3:49:</b> |
|                    | vendor's computer.   | ("Turning now to          |
|                    | Many variations      | the drawings, a           |
|                    | exist; the apparatus | communications            |

| 10 and $10 = 4h$      | annanatur 10 in         |
|-----------------------|-------------------------|
| To enabling the       | apparatus <b>10</b> is  |
| entry of messages     | illustrated in FIG.     |
| easily into a         |                         |
| computer or           | with a telephone        |
| practically any       | network naving a        |
| message               |                         |
| receiver." Col. $/,$  | sending telephone       |
| 11.05-07.             |                         |
|                       | telephone. $52:6-$      |
|                       | <b>30:</b> (In use, the |
| Still another         | receiving               |
| he to                 | attach the              |
| be to                 | attach the              |
| 10 of the present     | 26 to the ear           |
| invention for         | 20 to the ear           |
| remote computer       | piece 16 (see FIG       |
| control               | piece 10 (see FIG.      |
| by non                | 1) The sending          |
| handicapped           | individual simply       |
| individuals." Col.    | individual simply       |
| 7.11.49-51.           | enters the desired      |
|                       | alphabetic letters of   |
|                       | the desired message     |
|                       | on the touch-tone       |
| "A communication      | telephone 12            |
| apparatus and         | sequentially."),        |
|                       | 5:40-41:                |
| method designed to    | ("As can be seen        |
| interface with a      | from <b>FIG</b> 3, the  |
| standard, twelve      | series of tones         |
| key, dual tone,       | constituting each       |
|                       | word                    |
| multiple frequency    | are decoded into a      |
| telephone, which      | binary code."),         |
| allows easy, non-     | <b>7:30-32:</b> ("This  |
| verbal entry of a     | represent a             |
| 41.1 1                | significant             |
| message. Although     | advance as a            |
| particularly          | communication aid       |
| designs of features 1 | for the                 |
| designed for use by   | nandicapped.").         |
| the hearing and/or    |                         |
| speech impaired       |                         |
| with a dual tone      |                         |

telephone, the apparatus is equally adapted for use with practically any communication network where a

keyboard with a limited number of keys is utilized and ambiguity

resolution necessary." Abstract

"outputs a signal indicative of ..." Col. 2,11. 9-10.

"1. A communications apparatus comprising: receiving means operably connectable to a telephone or the like for receiving a series of transmitted tones corresponding to an input word and for decoding '112 patent col. 2:1-2:20: ("Generally speaking, the apparatus hereof includes a receiving mechanism coupled to a telephone which receives as eries of transmitted tones corresponding to an inputted word. With a standard

'Touch-tone' telephone, each tone received by the receiving mechanism represents three alphabetic characters. The receiving mechanism translates each tone into a code-a series of

codes corresponding to a word. A controller receives the series of codes

and outputs a signal indicative of a particular word which corresponds

to the series of

| the tones into a      |
|-----------------------|
| series                |
| of codes " Col. 8,11. |
| 1-5                   |

"12. The method of claim 10, wherein, the signal generated by the keyboard is a dual tone multiple frequency and the keyboard comprises a touchtone telephone." Col. 9, 11. 15-17.

"The controller constructs a particular word corresponding to the received binary code and generates a signal to the indicating mechanism representative of that particular word." Col. 2,ll. 25-27.

"A controller receives the series

codes. The controller advantageously has a recognition means which matches the series of codes received with a programmed code sequence indicative of the particular word. Once th e particular word is identified. a signal representative of the particular word is passed to an indicating means which displays the word to the receiving person. Preferably, the receiving mechanism amplifies the ambiguous tone and decodes the tone into binary code."), 2:18-2:28: ("Preferably, the receiving mechanism amplifies the ambiguous tone

and decodes the

into binary code. The binary code is

tone

| of                    |                        |
|-----------------------|------------------------|
| codes and outputs     | passed to the          |
| a signal Once         | controller which is    |
| the                   |                        |
| particular word is    | preferably a           |
| identified, a signal  | preprogrammed          |
| representative of     | microcomputer.         |
| the particular word   | The microcomputer      |
| is                    | _                      |
| passed to an          | fetches the word or    |
| indicating            | syllabic element       |
| means"                |                        |
| Col. 2, 11. 8-16.     | vocabulary from        |
|                       | memory and begins      |
|                       | comparing the          |
|                       | binary code with       |
|                       | the                    |
| "It has been          | vocabulary. The        |
| recognized that it is | controller             |
|                       | constructs a           |
| desirable to use a    | particular word        |
| standard 12 key,      | corresponding to       |
| dual                  | the                    |
| tone multiple         | received binary        |
| frequency (DIMF       | code and generates     |
| or                    |                        |
| Touch-tone)           | signal to the          |
|                       | markanism              |
| between the           |                        |
| bearing or speech     | that particular        |
| impaired Utilizing    | word ") <b>2·34-48</b> |
| such a standard       | ("The preferred        |
| "Touch-tone"          | communication          |
| telephone would be    | method of the          |
| 1                     | present                |
| inexpensive and       | invention              |
| provide a partial     | contemplates           |
| <b>* *</b>            | imputting a            |
| solution to the       | word or series of      |
| problem of            | words into a           |
| transporting          | standard               |
| bulky                 | 'Touch-tone'           |
| communication         | telephone keyboard     |
| equipment. A          | by                     |
| nrimary difficulty    | depressing a single    |

with using such "Touch-tone" telephones is that the industry standard telephone keypad utilizes 12 keys. Ten of the keys

represent a single numeric character,

while 8 of the keys each represent 3 alphabetic characters." Col. 1, 11. 27-39.

"As can be seen from FIG. 2, the standard industry key pad 18 presents twelve keys containing alphabetic and numeric characters, as well as the

asterisk (\*) and number ("# ") characters. FIG. 2 differs slightly from the industry standard in that in a standard touch tone telephone, the alphabetic characters "Q" and "Z" are

ucpiessing a single key for each alphabetic character of the word. The characters are thus transmitted as a series of tones which are decoded by the apparatus hereof into a binary code. The binary code is matched with a preprogrammed vocabulary code

representative of an alphabetic character string, such as a word or syllabic element. The word is then output to the receiving person.

Although the preferred embodiment anticipates using the apparatus hereof as a receiving unit, it will be appreciated that the apparatus can be easily modified

within the scope of the present invention to act as a transmission unit."), **9:1-2** (Receiving

| omitted. In FIG. 2,        | said transmitted                 |  |
|----------------------------|----------------------------------|--|
| the letters "Q" and        | signals and                      |  |
|                            | decoding                         |  |
| "Z" are carried by         | the signals into                 |  |
| <br>the key                | binary code.").                  |  |
| representative of          |                                  |  |
| numeral "1"." Col. 3,      |                                  |  |
| 11.24-31.                  | Defendants'                      |  |
|                            | Extrinsic Support                |  |
|                            |                                  |  |
| Plaintiffs Extrinsic       | From IEEE                        |  |
| Support                    | Standard                         |  |
|                            | Dictionary of                    |  |
|                            | Electrical and                   |  |
|                            | Electronics                      |  |
|                            | Terms, 3rd                       |  |
| "communicate" is           | Edition, 1984:                   |  |
| defined as "1. a.          | ( <b>"signal:</b> (1) (data      |  |
| То                         |                                  |  |
| make known;                | transmission): (A)               |  |
| impart;                    | A visual, audible                |  |
| communicate                | or                               |  |
| information." The          | other indication                 |  |
| American Heritage          | used t o convey                  |  |
| College Dictionary,        | information. (B)                 |  |
| 2nd Ed.1985.               | The intelligence,                |  |
|                            | message or effect                |  |
|                            | to be conveyed                   |  |
|                            | over                             |  |
| "communicate" is           | a communication                  |  |
| defined as "la. 10         | system. (C) A                    |  |
|                            | signal                           |  |
| convey information         | wave; the physical               |  |
| about, make                | embodiment of a                  |  |
| Known; impart."            | message. (7)                     |  |
| The American               | (circuits and                    |  |
| Harita an Callana          | systems). A                      |  |
| Distinger 4th Ed           | phenomenon<br>(visual audible or |  |
| Dictionary, 4th Ed. $2004$ | (VISUAL, AUGIDIE OI              |  |
| 2004.                      | ounerwise) used to               |  |
|                            | information                      |  |
|                            | The signal is often              |  |
|                            | coded such as a                  |  |
| "lowboard" is              | modulated and a                  |  |
| Keyboard Is                | modulated code, so               |  |
| defined as "A set<br>of        | that it requires     |
|--------------------------------|----------------------|
| kevs, as on a                  | decoding to be       |
| piano, an organ, or            | intelligible.").     |
| a                              | 8 /                  |
| typewriter." The               | ("signaling (1)      |
| American Heritage              | (data transmission); |
| College Dictionary,            | The production of    |
| 2nd Ed.1985.                   | an audible o r       |
|                                | visible              |
|                                | signal at a station  |
|                                | or switchboard by    |
| "keyboard" is                  | means of an          |
| defined as "1. A               | alternating or       |
| set of                         | pulsing              |
| keys, as on a                  | current. In a        |
| computer terminal,             | apy of               |
| typowritor or                  | any of               |
| niano " The                    | used to alert        |
| American                       |                      |
| Heritage College               | subscribers or       |
| Dictionary, 4th Ed.            | operators or to      |
|                                | establish            |
| 2004.                          | and control          |
|                                | connections.").      |
| "signal" is defined            | Defendants will      |
| as (1) (data                   | also rely upo n the  |
| transmission). (A)             | testimony and/or     |
| A visual, audible              | affidavit of         |
| or                             |                      |
| other indication               | designated expert    |
| used to convey                 | Witness Professor I. |
| Information." IEEE<br>Stondard | Scott Mackenzie.     |
| Distingery of                  |                      |
| Electrical and                 |                      |
| Electronics                    |                      |
| Terms 3rd Edition              |                      |
| 1984.                          |                      |
| "signal" is defined            |                      |
| as " <b>1. a.</b> An           |                      |
| indicator, as a                |                      |
| gesture or                     |                      |

mechanical device, serving as a means of communication. b. A message communicated by such means. 2. Something that incites action: The execution was the signal for mass protests. 3. *Electronics*. An impulse or fluctuating electric quantity, such as voltage, current, or electric field strength, whose variations represent coded information. **4.** The sound, image, or message transmitted or received in telegraphy, telephony, radio, television, or radar." The American Heritage College Dictionary, 2nd Ed.1985.

| "signal" is defined as<br>" <b>la.</b> An indicator, |  |  |
|--|--|--|
| such as a gesture<br>or colored light,<br>that       |  |  |
| serves as a means of communication.                  |  |  |
| <b>b.</b> A message communicated by such             |  |  |
| means. <b>2.</b><br>Something that                   |  |  |

| incited               |  |  |
|-----------------------|--|--|
| action. 3.            |  |  |
| Electronics An        |  |  |
| impulse or a          |  |  |
| fluctuating electric  |  |  |
| quantity, such as     |  |  |
| voltage, whose        |  |  |
| variations represent  |  |  |
| coded information.    |  |  |
| <b>4.</b> The sound,  |  |  |
| image, or message     |  |  |
| transmitted or        |  |  |
| received in           |  |  |
| telegraphy,           |  |  |
| telephony,            |  |  |
| radio, television, or |  |  |
| radar." The           |  |  |
| American Heritage     |  |  |
| College Dictionary,   |  |  |
| 4th Ed.2004.          |  |  |

## "inputting a word into said keyboard by depressing a single key for each alphabetic character of said word" in Claim 10

| Plaintiff's<br>Proposed | Plaintiff's Support                   | Defendants'<br>Proposed      | Defendants' Support                               | Special Master's<br>Construction                          |
|-------------------------|---------------------------------------|------------------------------|---|---|
| Construction            |                                       | Construction                 |   |   |
| Plaintiff<br>proposes   | Plaintiff's Intrinsic<br>Support      | Defendants                   | Defendants'<br>Intrinsic Support                  | This phrase requires<br>all the alphabetic<br>characters  |
| that the term           |                                       | propose that the             |   | of the word to be<br>input, with ea ch<br>character to be |
| "inputting a<br>word    | "A prime advantage of the method and  | term " <b>inputting</b><br>a | ' <b>112 patent</b><br>Abstrace: ("The<br>message | input by a single key<br>depression. However,<br>there    |
| into said               | apparatus 10 is that single character | word into said               | sender depresses a single key which               | is no requirement that<br>all of the alphabetic           |
| keyboard"               | entry is sufficient                   | keyboard"                    | corresponds to the                                | characters be inputted                                    |
| means                   | for communication."                   | means                        | alphabetic letter in                              | before the other steps<br>in the                          |
| "entering letters of    | Col. 7, 11. 28-30.                    | "the act of a user           | the word being sent-because most                  | method may commence.                                      |
| a word by<br>manual     |                                       | entering all of the          | keys on a<br>telephone represen<br>t three        |   |
| entry with a            | "The present                          | alphabetic                   | letters, such a word                              |   |

|                              | invention relates to an                        |                      | is ambiguous when                            |
|------------------------------|--|----------------------|--|
| keyboard."                   | apparatus and method for                       | characters for a     | sent. The apparatus receives the             |
|                              | communication by manual entry on a             | word and an end of   | ambiguous word<br>and resolves the           |
| Plaintiff<br>proposes        | keypad using a<br>minimum of key<br>stroke     | word incicator into  | ambiguity in favor<br>of a<br>preprogrammed  |
| that the term<br>" <b>by</b> | entries." Col. 1, 11.<br>7-9.                  | the signal-          | word which is<br>displayed to the<br>person  |
| depressing a                 |  | generating           | receiving the<br>message. Although<br>the    |
| single key for               | "The preferred<br>communication<br>method      | keyboard."           | apparatus can be<br>programmed to            |
| each<br>alphabetic           | of the present<br>invention<br>contemplates    |                      | recognize words,<br>the apparatus is         |
| character of<br>said         | inputting a word or series of words into       | Defendants           | programmed with a vocabulary of              |
| word" means                  | a standard "Touch-<br>tone" telephone          | propose that the     | syllabic elements<br>which are used to       |
| "where for each              | keyboard by<br>depressing a single<br>key      | term "word"          | reconstruct the word."). Col. 1:59-68:       |
| alphabetic                   | for each alphabetic character of the           | means "a<br>complete | ("Because each<br>keystroke can<br>represent |
| character that is            | word." Col. 2, 11. 34-38.                      | word."               | three possibilities,<br>each keystroke       |
| input via the                |  |                      | transmitted-and therefore the                |
| <b>keyboard,</b> a single    | "In a broad sense,<br>the present<br>invention | Defendants           | composite word-is inherently                 |
| key is<br>depressed."        | recognizes the possibility of using a          | propose that the     | ambiguous. The apparatus hereof              |
|                              | microprocessor-<br>based device to<br>enable   | term " <b>each</b> " | receives the<br>ambiguous word<br>and        |
|                              | a single keystroke                             | means "every."       | reconstructs and                             |

| per alphabetic        | displays the word              |
|-----------------------|--------------------------------|
|                       | based upon a                   |
|                       | preprogrammed                  |
| letter." Col. 4, 11.  | ambiguity                      |
| 36-38.                | resolution. To                 |
|                       | simplify                       |
|                       | operation and                  |
|                       | memory size the                |
| "[T]he method and     | apparatus                      |
| annaratus hereof      | recognizes a                   |
| apparatus notoor      | narticular word                |
| provides for a        | in terms of syllabic           |
| single keystroke to   | elements. The                  |
| identify which        | aullabia alamanta              |
| alphabatic abaracter  | syllable elements              |
|                       | can comprise any               |
| 15<br>desired " Cel 1 | eventor of                     |
| 11 57 50              |                                |
| 11.37-39.             | alphabetic<br>observators (for |
|                       |                                |
|                       | example, from 1 to             |
|                       | 9 alphabetic                   |
| "The message          | characters).");                |
| sender depresses a    | Figure 6; co 1.                |
|                       | 2:1-1/:                        |
| single key which      | ("Generally                    |
| corresponds to the    | speaking, the                  |
|                       | apparatus                      |
| alphabetic letter in  | hereof includes a              |
| the word being        | receiving                      |
|                       | mechanism                      |
| sent" Abstract.       | coupled to a                   |
|                       | telephone which                |
|                       | receives                       |
|                       | a series of                    |
|                       | transmitted tones              |
| "[W]ith a paging      | corresponding to               |
| system where space    | an inputted word.              |
| is                    |                                |
| limited, a small      | With a standard                |
| number of keys        | 'Touch-tone'                   |
| could                 |                                |
| be incorporated to    | telephone, each                |
| efficiently send a    | tone received by               |
| -                     | the                            |
| message using the     | receiving                      |

single character

entry recognition of the present invention." Col. 7, 11. 34-38.

"It has been recognized that it is desirable to use a standard 12 key, dual tone multiple frequency (DTMF or Touch-tone) telephone to communicate between the hearing or speech

impaired.... A primary difficulty with using such "Touchtone" telephones is that the industry

standard telephone keypad utilizes 12 keys. Ten of the

keys represent a single numeric character, while 8 of the keys each represent 3 alphabetic characters.

To utilize such a standard "Touch-

mechanism represents three possible alphabetic characters. The receiving mechanism translates each tone into a code-a series of codes and outputs a signal indicative of a particular word which corresponds to the series of codes. The controller advantageously has a recognition means which matches the series of codes received with a programmed code sequence indicative of the particular word. Once the particular word is passed to an indicating means which displays the word to the receiving person."), 2:34-48 ("The preferred communication metho d of

the present invention contemplates

inputting a word or

series of words

tone" telephone for nonverbal communication, past solutions have

used multiple keystroke entries to identify a particular alphabetic letter. For example, a first depression

identifies which key the desired letter appears on and a second depression identifies which letter of the three possibilities is desired for input.

The necessity for depressing two keys

to identify one letter, is of course a major impedimate [sic] to effective

telecommunication using a standard

"Touch-tone" telephone." Col. 1, 11. 27-50. into a standard 'Touchtone' telephone keyboard by depressing a single key for each alphabetic character of the word. The characters are thus transmitted as a series of tones which are decoded by the apparatus hereof into a binary code. The binary code is matched with a preprogrammed vocabulary code representative of an alphabetic character string, such as a word or syllabic element. The word is then output to the receiving person. Although the preferred embodiment anticipates using the apparatus hereof as a receiving unit, it will be

appreciated that the apparatus can be easily modified within the scope of the

"Therefore in the

progent instantion

|                        | present invention        |
|------------------------|--------------------------|
| past, a single letter  | to act as a              |
| has been input         | transmission             |
| using two              | unit."), <b>4:20-43:</b> |
| keystrokes.            | ("The                    |
| For example, to        | initial problem          |
| input the alphabetic   | addressed by the         |
| letter "H" in the word | present invention was    |
| "HELP", the            | to provide a             |
| Operator would first   | simple method for        |
| push the number        | the hearing or           |
| "4" key (row 2         | speech impaired to       |
| column 1) followed     | communicate using        |
| by                     | C                        |
| the "0" key (row 4,    | standard "Touch-         |
| column 2) to           | tone" telephones         |
| designate the          | without the need         |
| second character on    | for complicated          |
| the                    | 1                        |
| number "4" kev."       | equipment, such as       |
| Col. 4, 11. 29-35.     | teletypes, etc.          |
|                        | Several devices          |
|                        | and methods have         |
|                        | been                     |
| Plaintiff's Extrinsic  | devised which            |
| Support                | allow for effective      |
|                        | communication            |
|                        | but are slow and         |
| "keyboard" is          | difficult to use: a      |
| defined as "A set of   | large number of          |
| keys as on a piano     | keystrokes are           |
| an organ or a          | involved in              |
| un organ, or a         | inputting a              |
| typewriter " The       | message As can           |
| American Heritage      | he seen from FIG         |
| American Heritage      | 2                        |
| College Dictionary     | -,<br>most keys          |
| 2nd Ed 1985            | represent three          |
| 211d Ed.1705.          | alphabetic               |
|                        | letters Therefore        |
|                        | in the past a single     |
| "kayboard" is          | letter has been          |
| defined as "1 A set    | input using two          |
| of                     | input using two          |
|                        | kovetrokog For           |
| keys, as on a          | keystrokes. For          |
| computer terminal,     | example, to input        |

| the                                 |  |
|-------------------------------------|--|
| typewriter, or alphabetic letter    |  |
| piano." The "H" in the word         |  |
| American                            |  |
| Heritage College "HELP", the        |  |
| Dictionary, 4th Ed. Operator would  |  |
| first push                          |  |
| 2004. the number "4" key            |  |
| (row 2 column 1)                    |  |
| followed by the "0"                 |  |
| key (row 4,                         |  |
| column 2) to                        |  |
| designate the                       |  |
| second                              |  |
| character on the                    |  |
| number "4" key. In                  |  |
| a                                   |  |
| broad sense, the                    |  |
| present invention                   |  |
| recognizes the                      |  |
| possibility of using                |  |
| a                                   |  |
| microprocessor-                     |  |
| based device to                     |  |
| enable                              |  |
| a single keystroke                  |  |
| per alphabetic                      |  |
| letter.                             |  |
| That is, it has been                |  |
| found that most                     |  |
| English words are                   |  |
| identified by the                   |  |
| keystroke sequence                  |  |
| required to enter                   |  |
| the letters of the                  |  |
| word-a character                    |  |
| pattern recognition.                |  |
| Of course, the                      |  |
| Invention is<br>actually applicable |  |
| to the                              |  |
| identification of                   |  |
| words in other                      |  |
|                                     |  |
|                                     |  |

("For example, to enter the word "HELP" the numbered keys '4,2,5, and 7' are depressed followed by a ' \* '. The ' \* ' key is used to delineate the end of a word. The term 'word code' is used to denote the key sequence for a particular word; that is '4357' is the word code for the word "HELP."), 4:65-5:12 ("When a sequence of word codes is entered followed by an " \* ", a search could be initiated in memory which points to the correct ASCII characters to be displayed. In practice, storing complete word codes and ASCII representations in memory was found to limit word recognition capability to the stored word vocabulary, and even then, large memory size was

| necessary. In the         |
|---------------------------|
| preferred                 |
| embodiment,               |
| "syllabic                 |
| elements" are stored      |
| in memory and             |
| combined to create        |
| the words For             |
| example the               |
| "CON" letter group        |
| in                        |
| contest silicon           |
| conference                |
| contact                   |
| eta is such a             |
| etc., is such a           |
| stored synable            |
|                           |
| I nus, the                |
| vocabulary stored         |
|                           |
| preferred                 |
| embodiment                |
| includes                  |
| common letter-            |
| groups, suffixes,         |
| prefixes, single          |
| letters, and a few        |
| complete words,           |
| generically referred      |
| to                        |
| as "syllabic              |
| elements."), <b>5:30-</b> |
| 5:36                      |
| ("The asterisk key '      |
| * ' is used as a          |
| space to separate         |
| words. The number         |
| key '# ' is used          |
| before or after any       |
| information that          |
| should be                 |
| interpreted               |
| as numeric                |
| information. Of           |
| course, the               |
| conder connet use         |

senuel cannot use abbreviations. The apparatus responds in real time, beginning the recognition process as soon as the space key is received."), 5:47-50 ("The word code comprises a series of key codes entered between the asterisk '\*' and in

the I CD display

|  | the preferred               |  |
|--|-----------------------------|--|
|  | ambodiment con              |  |
|  | occupy up to 7              |  |
|  | bytes                       |  |
|  | accommodating               |  |
|  | word sizes up to            |  |
|  | fourteen                    |  |
|  | characters ") <b>5.50</b>   |  |
|  | <b>61</b> ("The             |  |
|  | word recognition            |  |
|  | process is initiated        |  |
|  | as                          |  |
|  | soon as an entire           |  |
|  | word code is received       |  |
|  | (as indicated by the        |  |
|  | asterisk input).")          |  |
|  | 7:24-7:28 ("In              |  |
|  | practice, the               |  |
|  | apparatus                   |  |
|  | <b>10</b> recognizes the    |  |
|  | entered words as            |  |
|  | fast                        |  |
|  | as the words can            |  |
|  | be entered by the           |  |
|  | sender. Thus, the           |  |
|  | apparatus <b>10</b> is real |  |
|  | time, displaying            |  |
|  | the decoded word            |  |
|  | on                          |  |

less than 1 second after the asterisk key is depressed."). Figure 6, Decision Tree ("WAS IT END OF WORD (\*) KEY?" [IF] "YES"-"FORM WORD CODE TO FACILITATE DECODING").

Prosecution History, Response to Office Action, dated August 11, 1986, page 9: ("In contrast to the Rabiner reference, the present invention contemplates an almost unlimited vocabulary in a standard language i.e. English. Rabiner describes a data base comprises a limited vocabulary of complete words. In contrast, the present invention employs a data base of syllabic elements (i.e. syllable-like letter groups) which are combined to

| <i>form</i> a word of<br>standard English<br>text, |
|--|
| giving an almost                                   |
| vacebulery ")                                      |
| (Emphasis in                                       |
| (Emphasis m<br>original)                           |
| nage <b>10</b> ("In                                |
| page IV ( III<br>contrast [to                      |
| Rahmerl  |
| claim i as amended                                 |
| (original claim 10)                                |
| provides a   |
| structure and                                      |
| methodology  |
| for identifying the                                |
| actual letter groups                               |
| while removing the                                 |
| potential ambiguity                                |
| arising from                                       |
| multiple letters on                                |
| each   |
| Touch-Tone key.                                    |
| The letter groups                                  |
| (syllabic elements)                                |
| are identified one                                 |
| group at a time in                                 |
| a flexible manner.                                 |
| The present  |
| invention links the                                |
| syllabic   |
| elements together                                  |
| as each is   |
| identified   |
| to form the word.                                  |
| Thus, from a                                       |
| limited  |
| set of stored                                      |
| synable elements, a                                |
| very   |
| large vocabulary of                                |
| identified ")                                      |
| identified. ).                                     |

Defendants' Extrinsic Support

From Chambers 20th Century Dictionary, New Edition, 1983: ("each:" every one separately considered."

Defendants will also rely upon the testimony and/or affidavit of

| designated expert    |  |
|----------------------|--|
| witness Professor I. |  |
| Scott MacKenzie      |  |

## "transmitting signals generated by the key depressions" in Claim 10

| Plaintiff's<br>Proposed | Plaintiff's Suppor                              | rtDefendants'<br>Proposed | Defendants' Support                     | Special Master's<br>Construction                          |
|-------------------------|---|---------------------------|---|---|
| Construction            | $\mathbf{D}^{1}$                                | Construction              | Defendantal Interiorie                  | The """ - " - "   |
| proposes                | Plaintijj's<br>Intrinsic<br>Support             | Defendants                | Support                                 | identified in this<br>phrase cannot                       |
| that the term           |   | propose that the          |   | consist of binary<br>code. Otherwis e,<br>no construction |
| "transmitting"          | "That is, the<br>method and<br>apparatus        | term                      | '112 patent Figure 1; col.<br>col. 2:1- | is necessary.   |
| means<br>"sending."     | hereof provides<br>for a single<br>keystroke    | "transmitting             | <b>2:20:</b> ("Generally speaking, the  |   |
|                         | to identify<br>which<br>alphabetic<br>character | siguals<br>generated      | apparatus hereof includes a receiving   |   |
|                         | is desired.<br>Because each<br>keystroke can    | by the key                | mechanism coupled to a telephone        |   |
|                         | represent three<br>possibilities,<br>each       | depressions"              | which receives a series of transmitted  |   |

| keystroke<br>transmitted-and<br>therefore   | means "sending        | tones corresponding to an inputted       |
|---|-----------------------|--|
| the composite<br>word-is<br>inherently      | the no-binary         | word. With a standard<br>'Touch-tone'    |
| ambiguous."<br>Col. 1. 11. 57-<br>61.       | waveforms             | telephone, each tone<br>received by the  |
|   | corresponding to      | receiving mechanism represents three     |
| "Generally<br>speaking, the<br>apparatus    | the inputted word     | alphabetic characters. The receiving     |
| hereof includes<br>a receiving<br>mechanism | from the signal-      | mechanism translates each tone into a    |
| coupled to a<br>telephone which<br>receives | generating            | code-a series o f codes<br>corresponding |
| a series of<br>transmitted<br>tones         | keyboard to a         | to a word. A controller receives the     |
| corresponding to<br>an inputted<br>word."   | separate<br>receiving | series of codes and outputs a signal     |
| Col. 2, 11. 1-4.                            | device."              | indicative of a particular<br>word which |
|   |                       | of codes. The                            |
| "The preferred<br>communication<br>method   |                       | controller advantageously has a          |
| of the present<br>invention                 |                       | recognition means which matches the      |
| inputting a word<br>or series of            |                       | series of codes receive d with a         |
| a standard<br>"Touch-tone"<br>telephone     |                       | programmed code<br>sequence indicative   |
| keyboard by<br>depressing a<br>single key   |                       | of the particular word.<br>Once the      |

| for each           | particular word is                    |
|--------------------|---------------------------------------|
| alphabetic         | identified, a signal                  |
| character of the   |                                       |
| word. The          | representative of the                 |
| characters are     | particular word is                    |
| thus               | 1, 1, 1,                              |
| transmitted as a   | passed to an indicating means         |
| which              | which                                 |
| are decoded by     | displays the word to the              |
| the apparatus      | receiving                             |
| hereof             | loooling                              |
| into a binary      | person Preferably, the                |
| code." Col 2, 11.  | receiving                             |
| 34-40.             | 6                                     |
|                    | mechanism amplifies the               |
|                    | ambiguous                             |
| "The message       | tone and decodes the tone             |
| sender depresses   | into binary                           |
| a                  |                                       |
| single key         | code."), <b>2:33-2:39:</b> ("The      |
| which              | preferred                             |
| corresponds to     |                                       |
| the                |                                       |
| alphabetic letter  | communication method of               |
| in the word        | the present                           |
| beenig sent        | invention contemplates                |
| of the keys on a   | inputting a                           |
| telephone          | mputing a<br>word or series of word s |
| represent three    | into a standard                       |
| letters, such a    |                                       |
| word is            | "Touch-tone" telephone                |
| ambiguous          | keyboard by                           |
| when sent."        | 5                                     |
| Abstract.          | depressing a single key for           |
|                    | alphabatic character of the           |
|                    | word. The                             |
| <i>Plaintiff's</i> | characters are thus                   |
| Extrinsic          | transmitted as a                      |
| Support            |                                       |
|                    | series of tones which are             |
|                    | decoded by                            |
| "transmit" is      | the apparatus hereof into a           |

| defined as "5a.  | binary                             |
|------------------|------------------------------------|
| Flectronics To   | code") <b>3.15-3.23</b>            |
| send (a signal)  | ("Turning now to the               |
| schu (a signal), | ( Turning now to the               |
| as by            | 1 .                                |
| wire or radio."  | drawings, a                        |
| The American     | communication s apparatus          |
| Heritage         |                                    |
| College          | <b>10</b> is illustrated in FIG. 1 |
| Dictionary, 2nd  | in                                 |
| Ed.1985.         |                                    |
|                  | conjunction with a                 |
|                  | telephone netword                  |
| "transmit" is    | having a sending telephone         |
| defined as "5a   | 12 and                             |
| Flastronias To   | receiving telephone 14             |
| Electronics 10   | Each talanhana                     |
| send (a signal), | Each telephone                     |
| as by            |                                    |
| wire or radio."  | 12, 14 has a hand piece 16         |
| The American     | and a twelve                       |
| Heritage         |                                    |
| College          | key "Touch-tone" key pad           |
| Dictionary, 4th  | <b>18.</b> Each                    |
| Ed.2004.         |                                    |
|                  | telephone 12, 14 represents        |
|                  | a common,                          |
|                  | industry standard touch            |
|                  | tone system in                     |
|                  | which a key closure                |
|                  | generates two                      |
|                  | terrer coording to take dual       |
|                  | tones according to ten dual        |
|                  |                                    |
|                  | multiple frequency                 |
|                  | standard."), <b>4:44-4:46</b>      |
|                  | ("For example to enter the         |
|                  | word                               |
|                  | "HELP" the numbered                |
|                  | keys <b>'4,2,5, and</b>            |
|                  | 7' are depressed followed          |
|                  | by a ' * '.                        |
|                  | The ' * ' key is used to           |
|                  | delineate the end                  |
|                  | of a word") 5:30-5:36              |
|                  | ("The asterisk                     |
|                  | key ! * ! is used as a space       |
|                  | to soperato                        |
|                  |                                    |

| words. The number key '# '   |
|--|
| is used  |
| before or after any  |
| information that should be   |
| interpreted as numeric   |
| information. Of course, the  |
| sender   |
| cannot use abbreviations.  |
| The  |
| apparatus responds in real   |
| time,  |
| beginning the recognition  |
| process as soon as   |
| the space key is   |
|  |
| 5:59-6:61 ("The word   |
| recognition  |
| process is initiated as soon   |
| as an entire   |
| indicated by   |
| the asterisk input) ") 7.24  |
| <b>7.28</b> ("In   |
| practice the apparatus <b>10</b>   |
| recognizes   |
| the entered words as fast  |
| as the words   |
| can be entered by the  |
| sender. Thus, the  |
| apparatus 10 is real time,   |
| displaying   |
| the decoded word on the  |
| LCD display  |
| less than 1 second after the   |
| asterisk key   |
| is depressed."), Figure 6,   |
| Decision   |
| Tree ("WAS IT END OF   |
|  |
| $ \begin{array}{c} KE \mathbf{I} : : \\ IF \end{bmatrix} : IES : -> \\ IEODM W \\ ODD \\ \end{array} $ |
|  |
|  |
| DECODING").  |

Defendants' Extrinsic Support

From American National Dictionary for Information Processing Systems, 1984: ("transmit: To send data from one place for reception elsewhere.").

From Dictionary of Computers, Data Processing, and Telecommunication, 1984: ("transmit: (1) To send data from one place for reception elsewhere.").

**From IEEE Standard Dictionary of Electrical and Electronics** Terms, 3rd Edition, 1984: ("transmit (computing machines): To move data from one location to another location."), ("transmission: (data transmission): The electrical transfer of a signal, message, or other form of intelligence from one location to another."). Defendants will also rely upon the testimony and/or affidavit

of designated expert witness Professor I.

Scott MacKenzie.

|                         | <i>binary code</i> " in Clai                   | m 10                    |   | ~                |
|-------------------------|--|-------------------------|---|------------------|
| Plaintiff's<br>Proposod | Plaintiff's Support                            | Defendants'<br>Proposed | Defendants' Support                                       | Special Master's |
| Construction            |  | Construction            |   | Construction     |
| Plaintiff               | Plaintiff's Intrinsic                          | Defendants              | Defendants' Intrinsic                                     | No construction  |
| proposes                | Support  | Derendunts              | Support   |                  |
| that the term           |  | propose that the        |   |                  |
| "decoding the           | "With a standard<br>"Touch-tone"               | term "receiving         | ' <b>112 patent col. 2:1-</b><br><b>2:18:</b> ("Generally |                  |
| signals into            | telephone, each tone received by the           | said transmitted        | speaking, the<br>apparatus hereof<br>includes             |                  |
| binary code"            | receiving<br>mechanism<br>represents three     | signals and             | a receiving<br>mechanism coupled to<br>a                  |                  |
| means<br>"converting    | possible alphabetic characters. The            | decoding the            | telephone which receives a series of                      |                  |
| the signals into        | receiving<br>mechanism<br>translates each      | signals into            | transmitted tones corresponding to an                     |                  |
| binary code."           | tone into a code-a series of codes             | binary code"            | inputted word. With a standard                            |                  |
|                         | corresponding to a word. A controller          | means "receiving        | 'Touch-tone'<br>telephone, each tone                      |                  |
|                         | receives the series<br>of codes and<br>outputs | the transmitted         | received by the receiving mechanism                       |                  |
|                         | a signal indicative<br>of a particular word    | signals at the          | represent s three alphabetic characters.                  |                  |
|                         | which corresponds to the                       | receiving device        | The receiving<br>mechanism translates<br>series of        |                  |
|                         | codes." Col. 2, ll. 4-<br>11.                  | and translating         | each tone into a code-<br>a series of                     |                  |
|                         |  | them into a binary      | codes corresponding to a word. A                          |                  |
|                         | "The characters are thus transmitted as        | code representing       | controller receives the series of codes                   |                  |
|                         | a series of tones<br>which are decoded         | the inputted word."     | and outputs a signal indicative of a                      |                  |

"receiving said transmitted signals and decoding the signals into binary code" in Claim 10

| by                    |                              |
|-----------------------|------------------------------|
| the apparatus hereof  | particular word which        |
| into a binary code.   | corresponds to               |
| The binary code is    | the series of codes.         |
| matched with a        | The controller               |
| preprogrammed         | advantageously has a         |
| vocabulary code       | recognition                  |
| representive [sic] of | means which matches          |
| an alphabetic         | the series of                |
| character string,     | codes received with a        |
| such as a word or     | programmed                   |
| syllabic element."    | code sequence                |
| Col. 2, 11. 38-43.    | indicative of the            |
|                       | particular word. Once        |
|                       | the particular               |
| "The output of the    | word is identified, a        |
| automatic gain        | signal                       |
| control (1.5 volts p- | representative of the        |
| p) is led to a lifter | particular word is           |
| S3525A integrated     | means which                  |
| circuit) to separate  | displays the word to         |
| the high and low      | the receiving                |
| dual tone multiple    | person."), <b>2:34-2:40:</b> |
| frequency bands.      | ("The preferred              |
| As shown in FIG. 6,   | communication                |
| the high and low      | method of the present        |
| group filter outputs  | invention                    |
| are fed to a tone     | contemplates                 |
|                       | inputting a                  |
| decoder 34 (e.g.,     | word or series of            |
| Mostek MK-5102).      | words into a standard        |
| The tone decoder 34   | "Touch-tone"                 |
| provides a four-bit   | telephone key-board          |
| hinary and to the     | depressing a single          |
| controller means 22   | key for each                 |
| for each signal       | alphabetic character         |
| received at its       | of the word. The             |
| input."               |                              |
| Col. 2, 11. 43-50.    | characters are thus          |
|                       | transmitted as a             |
|                       | series of tones which        |
|                       | are decoded by               |
| "As can be seen       | the apparatus hereof         |

from FIG. 3, the series of tones constituting each word decoded into a binary code. In the preferred embodiment each key depression represents a "key code" indicative of the key depressed. Two key codes are entered per byte, thus, the first byte contains the four bit binary code representation of the first two key codes of a word. The word code comprises a series of key codes entered between the asterisk " \*," and in the preferred embodiment can occupy up to 7 bytes, accommodating word sizes up to fourteen characters." Col. 5, 11. 41-50.

"Preferably, the receiving mechanism amplifies the

into a binary code.'), **3:35-50:** ("In more detail, the are receiving means 20 includes an inductive pick-up 26 attachabl e to the ear portion of the hand piece 16 by a suction cup. In the preferred embodiment, a preamp 28 provides a fixed gain of 60 dB to the automatic gain control amplifier **30.** The automatic gain control amplifier 30 has a gain range of 0.1-20 dB resulting in a total gain for the amplifier section (28, 30) in the range of 30-100 dB. The output of the automatic gain control (1.5 volts p-p) is fed to a filter section

**32** (AMI S3525A intergraded circuit)

to separate the high and low dual tone

multiple frequency bands. As shown

in FIG. 6, the high

ambiguous tone and decodes the tone into binary code." Col. 2, 11. 18-19.

The binary code is passed to the controller..." Col. 2, 1. 20.

Plaintiff's Extrinsic Support

"decode" is defined as "To convert from code into plan text." The American Heritage College Dictionary, 2nd Ed.1985

"decode" is defined as "1. To convert

from code into plain text." The American Heritage College Dictionary, 4th Ed.2004.

"binary code" is defined as "(1) a code in which each code element may be either of two distinct kinds or values."

and low group filter outputs are fed to a tone decoder 34 (e.g., Mostek MK-5102). The tone decoder **34** provides a four-bit binary code to the controller means 22 for each singal received at its input."), **5:04-41:** ("As can be seen from **FIG 3**, the series of tones constituting each word are decoded into a binary code.").

Prosecution History, Response to Office Action, dated August 11, 1986 page 10: ("In claim 1, a random message of English text can be entered into the communication apparatus and reconstructed into a message for the user.").

Defendants' Extrinsic Support

From Chambers 20th Century Dictionary, New Edition, 1983: IEEE Standard Dictionary of Electrical and Electronics Terms, 3rd Ed., 1984. ("**receiving**: to take, get, or catch, usu.

More or less passively: to have given or delivered to one: to experience: to take in or on: to

admit: to accept ....").

## From Dictionary of Information Technology, 2nd Edition, 1986:

("**receiver:** In communications and broadcasting, a device used for detecting and decoding information transmitted down a line, or optical fiber, or as a radiated electromagnetic wave.").

From Chambers 20th Century Dictionary, New Edition, 1983: ("decode: v.t. to translate from a code -n. a decoded message.").

IEEE Standard Dictionary of Electrical and Electronics Terms, 3rd Edition, 1984:

("**binary code:** (1) a code in which

| each code element<br>may be either of<br>two distinct kinds or<br>values, for<br>example, the presence<br>or absence of a<br>pulse. (2) a code that<br>makes use of an<br>alphabet containing<br>exactly two |
|--|
| characters, usually 0 and<br>1. The binary   |
| number system is one<br>of many binary<br>codes.").  |
| Defendants will also<br>rely upon the<br>testimony and/or<br>affidavit of<br>designated export   |
| witness Professor I.<br>Scott MacKenzie.   |

"matching said binary code with one or more pre-programmed codes, each pre-programmed code being representative of a syllabic element" in Claim 10

| Plaintiff's Propos                | edPlaintiff's Support                      | Defendants'              | Defendants' Support                            | t Special Master's  |
|-----------------------------------|--|--------------------------|--|---|
| Construction                      |  | Proposed<br>Construction |  | Construction  |
| Plaintiff<br>proposes             | Plaintiff`s<br>Intrinsic Support           | Defendants               | Defendants'<br>Intrinsic Support               | "matching said binary<br>code with one or more<br>preprogrammed |
| that the term                     |  | propose that the         |  | codes" means comparing<br>the bina ry                           |
| "matching said                    | "The<br>microcomputer<br>fetches the word  | term " <b>matching</b>   | ' <b>112 patent col.</b><br>col. 2:11-17 ("The | code with one or more pre-programmed codes                      |
| binary code<br>with               | or syllabic<br>element<br>vocabulary from  | said binary<br>code      | controller<br>advantageously<br>has a          | until one or more<br>corresponding pre-<br>programmed           |
| one or more<br>pre-<br>programmed | memory and<br>begins comparing<br>the      | with one or<br>more      | recognition means<br>which matches the         | codes is identified.  |
|                                   | binary code with<br>the vocabulary.<br>The | pre-<br>programmed       | series o f codes received with a               |   |

| codes" means               | controller<br>constructs a<br>particular word   | codes, each pre-<br>programmed | programmed code<br>sequence<br>indicative           | The rest of the terms and phrases require no |
|----------------------------|---|--------------------------------|---|--|
| "comparing the             | corresponding to<br>the received<br>binary      |                                | of the particular word. Once the                    | construction.                                |
| <b>binary code</b><br>with | code" Col. 2,<br>11.21-24.                      | code being                     | particular word is identified, a signal             |  |
| one or more                |   | representative<br>of           | representative of<br>the particula r<br>word is     |  |
| preprogrammed              | "The controller<br>advantageously<br>has a      | a syllabic                     | passed to an<br>indicating means<br>which           |  |
| <b>codes</b> until one or  | recognition<br>means which<br>matches the       | element" means                 | displays the word<br>to the receiving               |  |
| more                       | series of codes received with a                 | "each time a                   | person."); <b>2:21-</b><br><b>28:</b> ("The         |  |
| corresponding              | programmed<br>code sequence<br>indicative       | binary code is                 | microcomputer<br>fetches the word<br>or             |  |
| preprogrammed              | of the particular<br>word." Col. 2.,<br>11. 11- | matched against<br>a           | syllabic element<br>vocabulary from                 |  |
| codes is                   | 14.   | pre-programmed                 | memory and<br>begins comparing<br>the bi-           |  |
| identified."               |   | code, each such                | nary code with the vocabulary. The                  |  |
|                            | "the<br>microcomputer<br>40 begins the          | matched pre-                   | controller<br>constructs a<br>particular word       |  |
|                            | search process<br>until a match is              | programmed code                | corresponding to<br>the received<br>binary          |  |
|                            | formed." Col. 7,<br>11. 14-15.                  | represents a                   | code and<br>generates a signal<br>to the            |  |
|                            |   | syllabic<br>element."          | indicating<br>mechanism<br>representative of        |  |
|                            | "Some syllabic<br>elements have<br>the same     |                                | that particular<br>word."), <b>2:40-48</b><br>("The |  |
|                            |   |                                |   |  |

| word code and<br>therefore can                        | Defendants                  | binary code is<br>matched with a  |  |
|---|-----------------------------|---|--|
| have<br>multiple<br>interpretations.<br>Such multiple | propose that the            | preprogrammed<br>vocabulary code  |  |
| meaning syllabic<br>elements are<br>specially         | term<br>" <b>matching</b> " | representative of<br>an alphabetic  |  |
| flagged in the look-<br>up table and stored           | means "a                    | character string, such<br>as a word or  |  |
| in a way that the<br>most frequently                  | comparison to               | syllabic element.<br>The word is then   |  |
| occurring<br>interpretation is<br>decoded             | identity                    | output to the receiving person.   |  |
| first." Col. 6, ll.<br>37-41.                         | of items."                  | Although the<br>preferred<br>embodiment<br>anticipates using<br>the apparatus<br>hereof |  |
| "the recognition<br>search is initiated<br>in         |                             | as a receiving<br>unit, it will be  |  |
| the segmented look-up table that                      |                             | appreciated that<br>the apparatus can<br>be   |  |
| contains the key<br>codes in the four<br>bit          |                             | easily modified<br>within th e scope<br>of the  |  |
| format for the<br>syllabic element                    |                             | present invention<br>to act as a<br>transmission  |  |
| 5, ll. 62-65  |                             | unit."), <b>4:68-5:19</b><br>("In   |  |
|   |                             | practice, storing<br>complete word<br>codes   |  |
| "entering the<br>mapping table<br>with                |                             | and ASCII<br>representations in<br>memory   |  |
| reference to the<br>key depressed on<br>the           |                             | was found to limit<br>word recognition  |  |

keyboard for capability to the each character of stored word the matched one or vocabulary, and more syllabic even then, large elements ...." Col. 9, 11. memory size was 28-30. necessary. In the preferred embodiment. "syllabic elements" are Plaintiff's Extrinsic Support stored in memory and combined to create the words. For "binary code" is example, the "CON" letter defined as "(1) a group in code in which each contest, silicon, code element conference, may be contact. either of two etc. is such a distinct kinds or stored syllabic values." element. **IEEE Standard** Thus, the Dictionary of vocabulary stored Electrical in the and Electronics preferred Terms, 3rd Ed., embodiment 1984. includes common lettergroups, suffixes, prefixes, single letters, and a few complete words, generically referred to as "syllabic elements." In the preferred embodiment, it was found most

efficient to

include several letter strings which provide and enhance word recognition capability; therefore the vocabulary of syllabic elements in the preferred embodiment includes elements having one alphabetic letter to as many as nine alphabetic letters. Most syllabic elements have a three to six letter group size."), 5:57-58 ("The program (FIGS.5-8) and stored syllabic element vocabulary are fetched from ROM 42."), 5:59-6:48 ("The word recognition process is initiated as soon as an entire word code is received (as indicated by the asterisk input). Turning to FIG. 4, the recognition search is initiated in the segmented look-up table that contains the key and an the four

|   | bit format for the<br>syllabic element |  |
|---|--|--|
|   | look-up                                |  |
|   | table is segmented                     |  |
|   | according to                           |  |
|   | syllabic element                       |  |
|   | size with the size                     |  |
|   | of                                     |  |
|   | the word to be                         |  |
|   | decoded<br>determining the             |  |
|   | point of ontry into                    |  |
|   | the look-up table                      |  |
|   | In                                     |  |
|   | the preferred                          |  |
|   | embodiment, there                      |  |
| - | <br>are                                |  |
|   | nine segments in the                   |  |
|   | look-up table                          |  |
|   | corresponding to                       |  |
|   | synable elements                       |  |
|   | to nine characters                     |  |
|   | in                                     |  |
|   | size. For words                        |  |
|   | having more than                       |  |
|   | nine                                   |  |
|   | characters, the                        |  |
|   | search is initiated                    |  |
|   | in the                                 |  |
|   | ninth segment and                      |  |
|   | a new word code                        |  |
|   | the first nine                         |  |
|   | keystrokes (key                        |  |
|   | codes) of the word                     |  |
|   | is                                     |  |
|   | formed (see also                       |  |
|   | FIG. 6). Of                            |  |
|   | course,                                |  |
|   | the size of the                        |  |
|   | synabic element is                     |  |
|   | into a given                           |  |
|   | into a given                           |  |

| segment, therefore                  |
|-------------------------------------|
| the number of                       |
| bytes                               |
| required to store                   |
| the key codes for                   |
| each                                |
| of the syllabic                     |
| elements will also                  |
| be                                  |
| known. Although                     |
| the word code                       |
| typically occupies                  |
| more than one                       |
| hyte                                |
| only the first byte                 |
| is checked for a                    |
| match initially                     |
| The other bytes                     |
| are                                 |
| checked only                        |
| when a match                        |
| occurs for                          |
| all the previous                    |
| bytes for the given                 |
| avilabia alamant                    |
| Synable element.                    |
| In no match is                      |
| detected, the                       |
| the                                 |
|                                     |
| alement in the                      |
| segment of                          |
| the table. If no                    |
| metable. If ho<br>metablic found in |
| the                                 |
| account of the                      |
| table for the                       |
|                                     |
|                                     |
| to the size of the                  |
|                                     |
| word, the search is                 |
| continued in the                    |
| segment of the next                 |
| iower size. I nat                   |

| is, the word coo |
|------------------|
|------------------|

is recomputed to exclude the last received key code for later use in the recognition process. This procedure is repeated until a match occurs. At the latest, a match will occur upon entering the single character segment of the look-up table. After the first syllabic element is identified, the search is repeated using a reduced word code. The reduced word code comprises the original word code less the first N characters, where N is the size of the first syllabic element identified. This cycle is repeated until the complete word is identified. Most words are identified by connected syllabic elements 2 to 4 characters in size. However, there are a limited number

| of large syllabic<br>elements of 5 to 9<br>characters which<br>are |
|--|
| used to identify<br>words thata re<br>difficult                    |
| to separate into<br>unambiguous                                    |
| short  |
| syllabic elements.   |
| Some syllabic  |
| elements have the  |
| and  |
| therefore can have   |
| multiple   |
| interpretations.   |
| meaning  |
| syllabic elements are  |
| specially flagged  |
| in 1 the look-up   |
| a and stored in  |
| way that the most  |
| frequently   |
| occurring  |
| interpretation is<br>decoded first. If                             |
| the  |
| element displayed  |
| on the LCD   |
| display  |
| SU does not make<br>sense to the                                   |
| reader,  |
| he can replace the   |
| string with the  |
| alternate  |
| pressing a   |
| retry button (such   |
| as the operator or   |
| "O" key). Of   |

course, in many cases the user can interpret such alternative interpretations from the context of the other syllabic elements forming the word or other words in the message."), 7:24-28: ("In practice, the apparatus 10 recognizes the entered words as fast as the words can be entered by the sender. Thus, the apparatus 10 is real time, displaying the decoded word on the LCD display 50 less than 1 second after the asterisk key is depressed."); 2:18-2:28: ("Preferably, the receiving mechanism amplifies the ambiguous tone and decodes the tone into binary code. The binary code is passed to the controller which

| is preferably a       |
|-----------------------|
| preprogrammed         |
| microcomputer.        |
| The                   |
| microcomputer         |
| fetches the word or   |
| syllabic element      |
| vocabulary from       |
| memory and            |
| begins comparing      |
| the                   |
| binary code with      |
| the vocabulary.       |
| The                   |
| controller            |
| constructs a          |
| particular word       |
| corresponding to      |
| the received          |
| binary code and       |
| generates a signal    |
| to                    |
| the indicating        |
| mechanism             |
| representative of     |
| that particular       |
| word."), <b>2:34-</b> |
| <b>2:43</b> ("The     |
| preferred             |
| communication         |
| method of the         |
| present               |
| invention             |
| contemplates          |
| inputting a           |
| word or series of     |
| words into a          |
| standard              |
| "Touch-tone"          |
| telephone key-        |
| board by              |
| depressing a          |
| single key for        |
| eacn                  |
| alphabetic            |
character of the word. The characters are thus transmitted as a series of tones which are decoded by the apparatus hereof into a binary code. The binary code is matched with a preprogrammed vocabulary code representative of an alphabetic character string, such as a word or syllabic element. The word is then output to the receiving person.")

## Prosecution History, **Response to** Office Action, dated August 11, 1986 pages 9-10: ("In contrast to the Rabiner reference, the present invention contemplates an almost unlimited vocabulary in a standard language i.e. English. Rabiner describes a data base comprises a limited vocabulary of

complete words. In contrast, the present invention employs a data base of syllabic elements (i.e. syllable-like letter groups) which are combined to form а word of standard English text, giving an almost unlimited vocabulary.... Rabiner adopts the straight forward approach of using a lookup table vocabulary, comprising names or words. In such an approach, every possible choice must be included in the vocabulary .... Thus, in Rabiner, there is a one-toone correspondence between stored words and vocabulary size. It will be appreciated that either the word choice must be very limited, or the vocabulary must be very large to

| en  | compass every      |
|-----|--------------------|
| ро  | ossible choice.    |
| Th  | ne                 |
| m   | emory              |
| rec | quirements for     |
| su  | ch a               |
| SV  | stem would be      |
| ve  | ry limiting. In    |
| со  | ntrast [to         |
| Ra  | abiner], claim 1   |
| as  |                    |
| an  | nended (original   |
| cla | aim 10)            |
| pro | ovides a           |
| str | ructure and        |
| me  | ethodology for     |
| ide | entifying the      |
| ac  | tual letter        |
| gr  | oups               |
| wh  | nile removing      |
| the | e potential        |
| an  | nbiguity           |
| ari | ising from         |
| m   | ultiple letters on |
| ea  | ch                 |
| To  | ouch-Tone key.     |
| Th  | ne letter groups   |
| (sv | vllabic            |
| ele | ements) are        |
| ide | entified one       |
| gru | oup at a time in   |
| at  | flexible manner.   |
| Th  | ne present         |
| in  | vention links the  |
| sy  | llabic             |
| ele | ements together    |
| as  | each is            |
| ide | entified           |
| to  | form the word.     |
| Th  | nus, from a        |
| lin | nited              |
| set | t of stored        |
| sy  | llabic elements,   |
| a   | very               |
| lar | rge vocabulary     |
|     |                    |

of words can be identified.") (Emphasis in original).

Defendants' Extrinsic Support **From Chambers** 20th Century **Dictionary**, New **Edition**, 1983: ("match: n. that which tallies or exactly agrees with another thing: an equal: one able to cope with another: а condition of exact agreement, compatibility or close resemblance ...").

From American National Dictionary for Information Processing Systems, 1984: ("match: (1) A comparison to determine identity of items.").

From American Heritage Dictionary of the English Language, 4th Edition, 2000: ("matching: la. To be exactly

like; correspond exactly.").

From The **McGraw-Hill** Illustrated **Dictionary of** Personal **Computers**, 4th Edition, 1990: ("matching: A technique used to verify coding. Individual codes can be compared by machine against master codes to detect any that are invalid ...."). **From Oxford** English **Dictionary**, 2nd Edition, 1989: ("preprogram: to program (a computer or calculator) beforehand.").

Defendants will also rely upon the testimony and/or affidavit of

|  | designated expert<br>witness Professor I. |  |
|--|---|--|
|  | Scott MacKenzie.                          |  |

*"forming a repressentation of the word from the one or more syllabic elements"* in Claim 10

| Plaintiff's Proposed | Plaintiff' Support | Defendants' | Defendant's Support Special |
|----------------------|--------------------|-------------|-----------------------------|
| Construction         |                    | Proposed    | Master's                    |

|                     |  | Construction            |  | Construction     |
|---------------------|--|-------------------------|--|------------------|
| Plaintiff proposes  | Plaintiff`s Instrinsic<br>Support                    | Defendants              | Defendants'<br>Instrict Support  | No construction. |
| that the term       |  | propose that the        |  |                  |
| "forming a          | "The controller<br>constructs a particular           | term " <b>forming a</b> | '112 patent<br>Figures 4-7; col.<br>7:11-23  |                  |
| representation of   | word corresponding to the received                   | representation of       | ("FIG. 4 illustrates the recognition   |                  |
| the word" means     | binary code and generates a signal to                | the word from<br>the    | process for the word "HELP". The   |                  |
| "forming a          | the indicating mechanism                             | one or more             | word code, "4357"<br>is passed to the<br>four  |                  |
| representation of a | representative of that particular word."             | syllabic elements"      | character segment<br>of the look-up<br>table.  |                  |
| word                | Col. 2, 11. 24-27.                                   | means "forming          | As previously discussed, the   |                  |
| corresponding to    |  | the inputted word       | microcomputer 40 begins the search   |                  |
| the received binary | "The apparatus hereof receives the                   | from the one or         | process until a<br>match is formed.<br>The   |                  |
| code."              | ambiguous word and reconstructs and                  | more syllabic           | matched word code points to a letter   |                  |
|                     | displays the word<br>based upon a pre-<br>programmed | elements."              | positio n mapping code (LPMC) byte.  |                  |
|                     | programmed<br>ambiguity resolution."                 |                         | As illustrated iN<br>FIG. 4, the first<br>letter                                     |                  |
|                     | Col 1, ll. 61-64.                                    |                         | position code<br>(LPC) in the letter<br>positioning<br>mapping code<br>(LPMC)        |                  |
|                     | Plaintiff's Extrinsic<br>Support                     |                         | byte has the binary<br>code (10 for "2"<br>which is the letter<br>position of "H" on |                  |
|                     | "bindary code" is<br>defined as "(1) a code          |                         | the number "4"<br>key. The LPC is<br>used  |                  |
|                     | in which each code                                   |                         | as the column  |                  |

| element may be         | pointer in the        |
|------------------------|-----------------------|
|                        | ASCII                 |
| either of two distinct | mapping table with    |
| kinds or values."      | the key code used     |
| IEEE Standard          | as the row pointer    |
| Dictionary of          | to identify the       |
|                        |                       |
| and Electronics        | "Н".).                |
| Ternis, 5rd Ed., 1984. |                       |
|                        | Prosecution           |
|                        | History, Response     |
|                        | to                    |
|                        | office Action,        |
|                        | dated August 11,      |
|                        | 1986,                 |
|                        | page 9: ("In contract |
|                        | to the Rabiner        |
|                        | reference, the        |
|                        | present invention     |
|                        | contemplates an       |
|                        | almost unlimited      |
|                        | vocabulary in a       |
|                        | standard language     |
|                        | 1.e.                  |
|                        | English. Rabiner      |
|                        | describes a data      |
|                        |                       |
|                        | comprises a limited   |
|                        | vocabulary of         |
|                        | complete words. In    |
|                        | contrast, the         |
|                        | present invention     |
|                        | base                  |
|                        | of sullabia           |
|                        | elements (i e         |
|                        | svllable_like         |
|                        | letter groups)        |
|                        | which are             |
|                        | combined to           |
|                        | form a word of        |
|                        | standard English      |
|                        | text.                 |
|                        | giving an almost      |
|                        | 517115 un unitost     |

unlimited vocabulary.") (Emphasis in original), page 10 ("In contrast [to Rabiner], claim 1 as amended (original claim 10) provides a structure and methodology for identifying the actual letter groups while removing the potential ambiguity arising from multiple letters on each Touch-Tone key. The present invention links the syllabic elements together as each is identified to form the word. Thus, from a limited set of stored syllabic elements, a very large vocabulary of words can be identified.").

Defendants' Extrinsic Support

Defendants will also rely upon the testimony and/or affidavit of designated expert witness Professor I. Scott MacKenzie.

| "in a form pero                         | ceptible to the   |   |  |                                  |
|---|---|---|--|----------------------------------|
| Plaintiff's<br>Proposed<br>Construction | Plaintiff's Support   | Defendants'<br>Proposed<br>Construction | Defendants' Support  | Special Master's<br>Construction |
| Plaintiff                               | Plaintiff's Intrinsic   | Defendants                              | Defendants' Intrinsic  | No construction.                 |
| proposes                                | Support   |   | Support  |                                  |
| that the term "in                       | * *   | propose that the                        |  |                                  |
| a                                       |   |   |  |                                  |
| form                                    | "[T]he invention  | term "in a form                         | '112 patent col. 1:7-  |                                  |
| perceptible                             | relates to an apparatus   |   | 1:14: ("The  |                                  |
| to the user"                            | and method for use by the hearing or  | perceptible to the                      | present invention relates to an  |                                  |
| means "in a                             | speech impaired to communicate over   | user" means "in a                       | apparatus and method for   |                                  |
| manner that can be                      | the telephone<br>network using a<br>standard                                      | manner that can be                      | communicating by annual entry on a   |                                  |
| discerned by the                        | twelve key, dual<br>tone, multi-<br>frequency                                     | discerned by a user                     | key-pad using a minimum of key   |                                  |
| user."                                  | telephone." Col 1,<br>ll. 10-13.  | at the receiving                        | stroke entries. More particularly, the   |                                  |
|   |   | device who                              | invention relates to<br>an apparatus and   |                                  |
|   | "Although the present invention   | receives the                            | method for use by the hearing or   |                                  |
|   | contemplates that the sender will   | communication                           | speech impaired t o communicate over   |                                  |
|   | simply use a standard touch-tone  | from the inputting                      | the telephone<br>network using a<br>standard   |                                  |
|   | telephone and the<br>receiver will utilize<br>the apparatus 10,<br>roles could be | user."                                  | twelve key, dual<br>tone, multi-frequency<br>telephone."), <b>2:28-</b><br><b>2:33</b> ("Preferably, |                                  |
|   | reversed. The<br>apparatus 10 can be<br>used as a sending                         |   | the indicating means<br>comprises a liquid<br>crystal diode display                                  |                                  |
|   | device which<br>incorporates a<br>speech synthesizer.<br>That is, the sender      |   | which visually<br>represents the word<br>or messag e to the<br>user. In another                      |                                  |
|   | would couple the  |   | embodiment, a  |                                  |

device 10 to the mouth section of hand piece 16 of the sending telephone 12 and generate the message on the key pad 18. Apparatus 10 would generate synthetic speech audibly conveyed to the receiving telephone 14." Col. 7,11. 39-48.

"The apparatus could also be used for consumers to enter order to a vendor's computer. Many variations exist; the apparatus 10 enabling the entry of messages easily into a computer or practically any message receiver." Col. 7,11.63-67.

"Preferably, the indicating means comprises a liquid diode display which visually represents the word or

speech synthesizer audibly communicates the word or message to the user."), 3:16-3:19 ("Turning now to the drawings, a communications apparatus 10 is illustrated in FIG. 1 in conjunction with a telephone network having a sending telephone **12** and receiving telephone."), **3:60-68:** 

("Preferably, the indicating means 24 includes a liquid

crystal diode (LCD) display 50 capable of displaying two rows of alpha numeric characters of twenty

characters per row. A character generator 52 is couple d to the R AM 44 and the LCD display 50 to generate standard 65 dot matrix characters on the display 50. The LCD display 50 also addresses the RAM 44 to periodically scan ASCII character data message to the user. In another embodiment, a speech synthesizer audibly communicates the word or message to the user." Col. 2, 11. 28-32.

Col. 2, 11. 48-52: "the apparatus can be modified to utilize a speech synthesizer, with the message sender inputting a word or series of words into the telephone with the apparatus converting the input into an audible message."

"Preferably, the indicating means 24 includes a liquid crystal diode (LCD) in the RAM 44.").

Defendants' Extrinsic Support

From Merriam Webster's Collegiate Dictionary, 10th Edition, 1997:

("**perceptible:** capable of being perceived by the senses.").

Defendants will also rely upon the testimony and/or affidavit of designated expert witness Professor I. Scott MacKenzie.

|   | crystal diode (LCD)   |  |  |
|---|-----------------------|--|--|
|   | display 50 capable of |  |  |
|   | displaying two        |  |  |
| 1 | rows of               |  |  |
| ; | alphanumeric          |  |  |
|   | characters of         |  |  |
| 1 | twenty characters     |  |  |
|   | per row. A            |  |  |
|   | character             |  |  |
|   | generator 52 is       |  |  |
|   | coupled to the        |  |  |
|   | RAM 44                |  |  |
|   | and the LCD           |  |  |
|   |                       |  |  |

display 50 to generate standard dot matrix characters on the display." Col. 3, ll. 61-66.

Col. 8, ll. 24-26: "indicating means for receiving said signal and communicating the signal in a form perceptible to the user."

"The apparatus according to claim 1, wherein said indicating means includes a visual display for communicating said particular word." Col. 8, 11. 36-38.

"The apparatus according to claim 5, wherein said indicating means comprises a liquid crystal display module." Col. 8, ll. 39-41.

"A communication apparatus and method designed to interface with a standard, twelve

| key, dual tone,                      |  |  |
|--------------------------------------|--|--|
| multiple frequency                   |  |  |
| talaphona which                      |  |  |
|                                      |  |  |
| allows easy, non-                    |  |  |
| verbal entry of a                    |  |  |
| message. Although                    |  |  |
| particularly                         |  |  |
| designed for use by                  |  |  |
| the hearing and/or                   |  |  |
| snaach impaired                      |  |  |
| speech impaired                      |  |  |
| with a dual tone                     |  |  |
| telephone"                           |  |  |
| Abstract.                            |  |  |
|                                      |  |  |
| See also Figures 1                   |  |  |
| 3 7 and 8                            |  |  |
| <i>5</i> , <i>7</i> , and <i>0</i> . |  |  |
|                                      |  |  |
| Plaintiffs Extrinsic                 |  |  |
| Support                              |  |  |
|                                      |  |  |
| "perceptible" is                     |  |  |
| defined as "Capable                  |  |  |
| of                                   |  |  |
| baing paraaiyad                      |  |  |
| diagomible by the                    |  |  |
| discernible by the                   |  |  |
| senses or mind."                     |  |  |
| The American                         |  |  |
| Heritage College                     |  |  |
| Dictionary, 2nd Ed.                  |  |  |
| 1985.                                |  |  |
|                                      |  |  |
|                                      |  |  |
| "perceptible" is                     |  |  |
| defined as "Capable                  |  |  |
| of                                   |  |  |
| being perceived by                   |  |  |
| the senses or the                    |  |  |
| mind                                 |  |  |
| SYNONYMS                             |  |  |
| appreciable                          |  |  |
| noticeable                           |  |  |
| discornible "                        |  |  |
|                                      |  |  |
| The American                         |  |  |
| Heritage College                     |  |  |
| Dictionary, 4th                      |  |  |

Ed.2004.

| "perceive" is                            |
|--|
| defined as "1. To                        |
| become                                   |
| aware of directly through any of the     |
| senses, esp. sight or<br>hearing." The   |
| American Heritage<br>College Dictionary, |
| 4th Ed.2004.                             |

| " <i>in a visually</i> ' <i>perceptible</i><br><i>form</i> " in Claim 11 |   |   |   |                                  |
|--|---|---|---|----------------------------------|
| Plaintiff's Propose<br>Construction                                      | d Plaintiff's Support                           | Defendants'<br>Proposed<br>Construction | Defendants' Support                                 | Special Master's<br>Construction |
| Plaintiff proposes   | Plaintiff's Intrinsic<br>Support                | Defendants                              | Defendants'<br>Intrinsic Support                    | No construction.                 |
| that the term " <b>in</b><br>a   |   | propose that the                        |   |                                  |
| visually   | "Preferably, the indicating means               | term " <b>virtually</b>                 | '112 patent col.<br>3:61-3:68:                      |                                  |
| perceptible<br>form"   | comprises a liquid<br>diode display which       | perceptible form"                       | ("Preferably, the indicating means <b>24</b>        |                                  |
| means "in a  | visually represents<br>the word or              | means "in a                             | includes a liquid<br>crystal diode (LCD)            |                                  |
| manner that can<br>be  | message to the<br>user." Col. 2, ll. 28-<br>30. | manner that can be                      | display <b>50</b> capable of displaying two         |                                  |
| seen"  |   | seen by a user at                       | rows of alpha<br>numeric characters<br>of           |                                  |
|  | "Preferably, the indicating means 24            | the receiving                           | twenty characters<br>per row. A<br>character        |                                  |
|  | includes a liquid<br>crystal diode (LCD)        | device."                                | generator <b>52</b> is coupled to the RAM <b>44</b> |                                  |
|  | display 50 capable of displaying two            |   | and the LCD<br>display <b>50</b> to<br>generate     |                                  |
|  | rows of<br>alphanumeric<br>characters of        |   | standard dot matrix<br>character s on the           |                                  |

twenty characters per row. A character

generator 52 is coupled to the RAM 44 and the LCD display 50 to generate

standard dot matrix characters on the display." Col. 3, ll. 61-66.

"The apparatus according to claim 1, wherein said indicating means includes a visual display for communicating said particular word." Col. 8, 11. 36-38.

"The apparatus according to claim 5, wherein said indicating means

comprises a liquid crystal display

module." Col. 8,11.39-41.

"A communication apparatus and method designed to interface with a display **50.** The LCD display **50** also addresses the RAM **44** t o periodically

scan ASCII
character data in
the RAM
44."), FIG. 1, Item
24.

Defendants' Extrinsic Support

From IEEE Standard Dictionary of Electrical and Electronics Terms, 3rd Edition, 1984: ("visual perception

(2) (light emitting diodes) The interpretation of impressions

transmitted from the retina to the brain in terms of

information about a

physical world displayed before the

eye.").

Defendants will also rely upon the testimony and/or affidavit of standard, twelve key, dual tone, multiple frequency telephone, which allows easy, nonverbal entry of a message. Although particularly designed for use by the hearing and/or speech impaired with a dual tone telephone...."

"The apparatus could also be used for consumers to enter order to a vendor's computer. Many variations exist; the apparatus 10 enabling the entry of messages easily into a computer or practically any message receiver." Col. 7, 11. 63-67.

See also Figures 1, 3, 7, and 8.

Plaintiff's Extrinsic Support

"perceptible" is defined as "Capable of being perceived; discernible by the

| •                                |  |  |
|----------------------------------|--|--|
| senses or mind." The<br>American |  |  |
|                                  |  |  |

designated expert witness Professor I. Scott MacKenzie.

Upritago Collago

Dictionary, 2nd Ed. 1985.

"perceptible" is defined as "Capable of being perceived by the senses or the mind ... SYNONYMS ... appreciable, noticeable, discernible...." The American Heritage College Dictionary, 4th Ed.2004.

"perceive" is defined as "1. To become aware of directly through any of the senses, esp. sight or hearing." The American Heritage College Dictionary, 4th Ed.2004.

"visual" is defined as "1. Serving, resulting from, or pertaining to the sense of sight. 2. Capable of being seen by the eye; visible." The American Heritage College Dictionary, 2nd Ed. 1985.

"visual" is defined as "1. Of or relating to the same of sight

| 2. Seen or able to  |  |  |
|---------------------|--|--|
| be seen by the eye; |  |  |
| visible." The       |  |  |
| American Heritage   |  |  |
| College Dictionary, |  |  |
| 4th Ed.2004.        |  |  |

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