# KEYPAD INTERFACE LANGUAGE:
## Digital Language Aids Hams and Others Too
### by WØLIQ and K9LTL -- 7/97

**SYNOPSIS**

ARDS Project was proposed earlier in the Proceedings of the 12th ARRL Digital Communications Conference (held in Tampa, FL, in '93). During that time, **I? &** D **was limited** to experiments with Model 12. We renamed ARDS Project Computer Assisted Communication (CAC). This system evolved by experimenting with more models. Model 17 **revealed compelling** reasons why FCC's 97 part rules need changes that would permit hams to use Keypad interface language with digital signals. (FCC's present objectives would not be affected by minor changes.)

**WHY SHOULD DIGITAL SIGNALS BE ILLEGAL ON HAM BANDS?**

**If a large** group of **literate** people gathered but no one attending could understand people there, communications would be meaningless! Hams cope with pidgin languages despite evidence **that** computers can **assist** them. **CAC** system's Model 17 offers hams substantive evidence that FCC's 97 part rules need changes so hams could exchange digi**tal** signals. Ham bands are finite (a fact emphasized recently by David Sumner, **K1ZZ** in QST, 8/97). More hams could interact with less bandwidth and translate languages. This idea may seem too easy to be true about something so hard. Marvin Minsky learned why minds are **fooled** while working on **artificial intelligence at MIT. In** his book (THE **SOCIETY** OF **MIND)** he advises how to keep our minds alive:

> **In** general, we're least aware of what our minds do **best. . . .**
> **It's** mainly when our other systems start to fail that we en-
> gage the special agencies involved with what we call **"concious-**
> ness. " Accordingly,** we're more aware of simple processes that
> don't work well than of complex ones that work flawlessly. This
> means that we cannot trust our offhand judgments about which of
> the things we do are simple, **and which require complicated ma-**
> chinery . Most **times,** each portion of the mind can **only** sense
> how quitely the other portions do their **jobs.    M. Minsky ('85)**

**ARE HAMS AWARE THAT KEYPAD SIGNS ARE COMMON DENOMINATORS?**

Keypads are common denominators for MATH **operations used in 20** countries . Hams **in** these countries speak and write languages with Indo-European origins. Their alphanumerics are **stored in** computers under **ASCII** codes. **ASCII** codes were not listed in an order suitable for cross-referencing. **ASCII** codes can be reordered by "converging" print and computer technologies. **Algorithms** can **make this** possible. LP (Language Processor) software is required to record and play-back language elements. **LPs** are analogous to **WPs** (word processors). A **basic distinction is: WPs** assist **WRITING** in different languages. **LPs assist** INTERACTING in different **languages. LPs record languages** so other interface **devices** (keyboards, **keypads, TDDs etc.) can be controlled via language using** keypad script. Computer hardware and operating **systems** are essential also. We promote **CAC** for Computer **Assisted Communication as** an **expression for** components **controlled** via Keypad **Interface** Language. CAC system enables hams to communi-**cate in foreign languages via directing use of computer's memories.**

CONVERGE **PRINT** AND COMPUTER **FILES (An Idea** Whose **Time Has** Come)
   **Word** processors are ideal for organizing language items in print files (for fast-easy referencing during conversations). Linguistic forms can be assigned indexes after contents of print **files will have** been compiled. Next, language processor software is employed to catalog all items processed earlier into playback type software. Print files provide CAC system's users with identical listings of data stored in databases under files, topics, and indexed records.
   Print and computer listings are correlated so that data will have identical listings with only minor exceptions **(exceptions** are noted in explanatory CAC system manuals). **In** effect, **print** and computer technologies become "converged' to make CAC system operational.

**COMMUNICATE** WITH **MARTIANS** VIA **KEYPAD INTERFACE LANGUAGE**
   Keypad interface language features script printed on keypads of full sized computer keyboards in over 20 countries. These keys are also available on notebook computers. Index numbers from one to four digits are assigned to virtual records stored in computer mem-**ory.** Records hold linguistic forms in sizes that range from alpha-numerics to paragraphs. CAC system users display records randomly on monitors at conversational rates. Non numeric signs function as commands. Those are inputted with indexes **(without** spaces **entered** between characters as via pressing spacebars, etc.),

COMMAND FUNCTIONS OF NON **NUMERIC** KEYPAD **SCRIPT:**
   | | |
   |---|---|
   | ˌ | Executes "data selected via indexes" and **file** changes. |
   | – | Joins indexes and other commands before executions. |
   | + | Switches processing modes from SPEL to DATA and vice versa. (Typewrite in SPEL mode; Process **stored data in DATA** mode.) |
   | / | Switches between data files (prefix for file **code** numbers). |
   | ( | Synonym for Enter key; erases in DATA mode and is used also for line feeds when typing in SPEL [sign **means press Enter].** |
   | * | Serves as prefix in SPEL mode (it means **use SPEL to** chat). |

NOTES: Keypad script has English words for numbers and commands. Three countries substitute math symbols for * and / signs. Modal use examples were listed in exercises **that follow.**

TELEPHONE NUMBER **AND** PUSH BUTTON **DIALING ANALOGY**
   **Telephone** users lookup names alphabetically to find telephone numbers and push numbers accordingly. This is a rather simple task even for children. Telephone callers are also asked to press num-bers, when **calling, to** reach parties wanted or to hear recordings.
   CAC users send indexes for the data stored in a receiving ham's computer memory. **Indexes** are executed by adding some commands. Hams can copy received **CW** or **voice** signals on computer keypads or key-**boards. CW** signals could be copied on keyboards by reading Morse signals deciphered on devices that have LCD type readouts, etc.
   **We** have not tried direct **connections** between CAC signals received and computer interfaces **(as** when using **RTTY). That seems practical only** if transmission facilities were to be private and thus secure. **Ham experiments can be conducted** only by using off-the-air methods because FCC's 97 part **rules forbid the use of digital signals.**

**TYPICAL FILE AND CYBERTEX EXAMPLES FOR ANALYSES**
**In** the brief **examples** that follow, you will be able to analyze how data is listed in print files, how data in **files** can be equated with respect to its meanings, and how Cybertex strings can be written to reference and/or record typical interactions.

A. EXAMPLES OF PRINTED **FILE LISTINGS**
Space does not permit more than a few examples on how **data items** can be listed in print files and exchanged **via** digital signals. **CAC** signals can be sent as Morse or English words (listed in Manuals). Word "Cybertex" is **CAC** system's name for written, digital strings.

| Indexes | English File Listings | Indexes | Spanish File Listings |
|---------|----------------------|---------|----------------------|
| 121 | Good morning! | 121 | Buenas **dias!** |
| 131 | Do you speak English? | 131 | **¿Habla usted** ingles? |
| 195 | My name **is** _ | 195 | Mi llamo- |

B. HOW **INDEXES** ABOVE CAN BE EQUATED, SENT, COPIED, AND DISPLAYED

| Cybertex | From English File EN1 | From Spanish File ES2 |
|----------|----------------------|----------------------|
| 121. | Good morning! | Buenas dias! |
| 131. | Do you speak English? | **¿Habla usted** ingles? |
| **195.+** | My name **is** _ | Mi llamo- |
| ROY GA+ | | |

**C.** HOW **INDEXES** ARE JOINED, FILES CHANGED, AND MODES **SWITCHED**
Cybertex String writing
121-10-131-/2-195-.+ROY+
Display of Cybertex strings after having been inputted:
Good morning!_Do you speak **English?**_ Mi llamo_
ROY+

**DATA PROCESSING DETAILS OF EXAMPLES ABOVE**
Notice in example A. **that English** and Spanish file listings have identical index numbers. Thus when accessing either **English** or **Spanish files,** the same **indexes** would be inputted and executed **as** in example **B**, and meanings will be equivalent. Cybertex in **C.** has **a** longer string (it displays on **two** lines). A minus [-] sign **is** used **to** join indexes. This **[/2]** combination moves data processing within English file to processing **it within** Spanish file. Sign [+] changes DATA mode **to** SPEL mode for **typewriting** (spelling out) name "ROY."
Operators can monitor Cybertex inputs, and send **signals** to cancel or correct input **mistakes.** Cybertex inputs are displayed briefly. Next, strings become replaced by data referenced. Printer outputs and digital speech are opt **ional** (speech requires extra software).

**APPLICATIONS FOR CAC SYSTEM AND OTHERS TOO**
Keypad language **enables** people to cross-reference between human memory and computer memory. CAC system allows new kinds of interactions **worldwide** because Language processor **tools** can be programmed **to** translate over **20 languages.** Linguistic forms in language can be organized, indexed, and accessed for conversations to interact in various contexts among which is the context of telecommunications. Standard **ENCRYPTION** KEYS are required by CAC users and governments. CAC system offers applications for persons who have handicaps also.
R.E. and M.S.