

The A R D S PROJECT

By WØLIQ and K9LTL -- 7/93

INTRODUCTION--ARDS is an acronym for Amateur Radio Data Syntheses. Three kinds of systems can be synthesized: manual, computer-aided, and automated. We have only tested models of the first two via using simulation. Meanwhile, we're awaiting permission from the F.C.C. to try over-the-air tests. Part 97 amateur radio rules forbid secrecy. A secrecy waiver is necessary because **ARDS'** radio signals cannot be deciphered without ARDS systems. This paper **reveals** how **computer-**aided systems work and how they can supplement ham communications.

ARDS PROJECT INITIATION--Creativity has been defined as the ability to see **CONNECTIONS** between things. Inspiration for ARDS **came** from an account on how the Rosetta stone was discovered and interpreted by French scholars to decipher Egyptian hieroglyphics. (The account can be researched easily in libraries). Decipherment became possible by using **Demotic**, an intermediate language, to find connections between hieroglyphics and Greek. The Stone had been inscribed during 196 BC. We wondered, why couldn't one develop a computer-assisted language **to translate** English into Latin-based languages and vice-versa? The increasing availability of personal computers made it an attractive possibility to explore. We know hams have more connections between languages and cultures than the general population. ARDS project was based on those insights in 1989. The project has progressed since then beyond our expectations. Research has been aided by support from several other hams who volunteered to help us.

Meanwhile, we've read reports **about commercial translational** aids which employ "artificial, intermediate" languages. However, we don't anticipate they will be practical for ham **useage**. Also we have analyzed several translational aids developed **BY** hams **FOR** hams. We are unaware of any publications of this sort which were designed to utilize digital processing technologies.

ARDS' COMPUTER-AIDED SYSTEM STATE--Our Model **12** has the following system components: 1. Datascript digital alphabet; 2. **Hamtalk** language with tutorial plus nomenclature; 3. Printed **AND** software **files** which list indexed text data; 4. **CHAT** and **DATA** modes for operations; and, 5. P/C computer hardware with DOS 3.3 or higher **O/S**. (**Item 5**. is user-provided because ARDS is computer-hardware independent).

ARDS' COMPUTER-AIDED SYSTEM PROCESS--Model 12 enables hams to communicate conventionally in the **CHAT** mode to initiate contacts. **DATA** mode is entered to exchange remote control signals. Those consist of Morse code or English words. Automated systems have potential for development (assumes international **ARDS'** standards could be set).

FUNDAMENTAL SYSTEM CONCEPTS---If hams **obtained** data files which will correspond with each other's data records, then that data could be referenced **via** remote-control. In other words, only **DATA INDEXES** or (**DI**s) must be exchanged. This **OLD IDEA** has been **demonstrated** in part **by Q-codes**, **ARL** numbered messages, etc. Importantly, personal computers make **it quite** practical to store **text** and other data in forms which can be manipulated. Text can be **joined together** quickly and displayed on monitors, on printers, or spoken over audio speakers.

FUNDAMENTAL SYSTEM CONCEPTS (Continued)

In conventional communications (conducted in CHAT mode), **or voice signals** are exchanged **letter** by letter or word by word. But in DATA mode, DATA INDEXES are exchanged to access, retrieve, and manipulate pre-stored data. This data synthesizing process displays messages in upper and lower case letters on monitors and/or print-outs. With **optional** software, text data can be heard as speech.

These data need not be limited to text messages (assuming F.C.C. approval). Multimedia data could **also** be synthesized in an analogous **manner**. Four character control signals can generate lengthy messages **almost** instantly and in real time. "Hamtalk" language is composed of "Datascript" alphanumeric strings. By selection, they are the SAME characters you'll find positioned on keypads of 101 style computer keyboards (U.S., South American, and Western European).

The electronic age was born when Lee De Forest announced that he could control electron flow in diode tubes with grids. De Forest enabled engineers to incorporate GAIN into circuitry. Analogously, microprocessor inventions and programming techniques now **enable system designers to exploit** "DATA GAINS and DATA ACCELERATIONS". These new **exciting** phenomena may someday be appreciated as **REVOLUTIONARY**. Present and future digital technologies make the **phenomena** possible.

DATA FILE ORGANIZATION--Model 12 "demo" file includes Q-codes, **QN-**codes, ARL numbered messages, alphanumerics, and other topics which have **popular utility** for ham activities. Brief numeric indexes were **assigned to full** sentences, partial sentences, questions, words, and **alphanumerics** for convenient referencing. They're delimited by using **mnemonic** punctuations (periods terminate data; hyphens bring data together). Text data records **hold** up to 40 characters. Records **will** be **printed consecutively** if more characters are needed. This feature is **critically** important for text overflow from translations. A **TOPIC MENU helps** users find data **via** topics and data indexes via ranges.

EXAMPLES OF **COMPUTER-AIDED OPERATIONS--Initial** contacts will be made **conventionally** in CHAT mode by sending **protocols** analogous to those in practice now. **File** sync codes must be announced **during CQs**. Upon **making** contact, operators **will** begin and end transmissions **in** CHAT mode. Also, they may TOGGLE into DATA mode by **exchanging signals** for the **plus** key (+ is a character in **Datascript** alphabet). For **example**, CW or SSB **signals** can be **copied to display** VDT messages as follows:

	chat mode	data mode	chat mode
/CW MORSE/		QSL DE KSLTL +121.123. + QSL?	
or			
/SSB HAMSPEAK/		QSL DE KSLTL, ADD, ONE TWO ONE, POINT, ONE TWO THREE, POINT, PLUS, QSL?	
[VDT DISPLAY]	QSL DE KSLTL + Can you copy me? I copy you solid! QSL?		vdt details [CHAT mode copy] [Data Index 121] [" " 123] [CHAT mode copy]

DETAILS: Hamtalk digital language can be exchanged as Morse CW or in the form of "Hamspeak", a voice option for SSB **usage**. The VDT **display** will be the same **if either signals will** be inputted. Plus symbol is signaled by "ADD or PLUS" to toggle DATA mode **"On"** or "Off".

NUMBERS SYNTHESIZED ON-THE-FLY (Use of RAM Buffer)

Data records for numbers (1, 2, 3, etc.) were assigned the same data indexes. Therefore, numbers can be sent as is, OR, increased in value by synthesizing them on-the-fly with hyphens as follows:

	chat mode	data mode	chat mode
/CW MORSE/	R R DE	K9LTL +203.207-5-7-9-. +	QSL?
			vdt details
[VDT DISPLAY]	R R DE	K9LTL +	[CHAT mode copy]
	I'll	send signal report later.	[DI 203]
	Your report is	QSA/RST_579	[DIs 207 etc.]
	QSL?		[CHAT mode copy]

DETAILS: On 101 keyboards, the QWERTY sides function as electronic typewriters in CHAT mode. **Hamtalk** signals are copied on keypads in DATA mode. Minus and decimal keys can be used for hyphen and period keys. Calculate your character gains by comparing CW characters with those actually displayed on VDTs. Text "accelerations" can only be appreciated by pressing decimal keys. Period "print commands" cause messages to explode on VDTs. The underline after "RST" is a spelling device which provides a space and prompts "data must follow". Also, observe that displays are printed in upper and lower case letters. A CHAT/DATA mode prompt keeps operators informed of mode status on the bottom line of monitor screens.

ARDS AS A TRANSLATIONAL AID--If files are translated into foreign languages, they can be understood by foreign hams...and vice-versa. This principle was tested via simulation with XEICFO in Mexico. A cassette tape was furnished with **Hamtalk** Morse signals. Carlos was able to interpret **Hamtalk** by referencing a printed file written in Spanish. He completed a questionnaire which verified that he fully deciphered **Hamtalk** language. Here's an example of how English and Spanish computers display the same CW Morse signals in both modes:

	chat	data	chat
/CW MORSE/	XEICFO DE	K9LTL +733. + ?	
[ENGLISH VDT]	XEICFO DE	K9LTL +	[CHAT mode]
	OSB-Signal is fading.		[DI 733]
	?		[CHAT mode]
[SPANISH VDT]	XEICFO DE	K9LTL +	[CHAT mode]
	OSB-La señal está desapareciendo.		[DI 733]
	?		[CHAT mode]

DETAILS: The Spanish translation happens to be longer than than the message in English. If longer than 40 characters, a second record would have been displayed on the next line to complete the message.

CONCLUSIONS: We have proven to our satisfaction that ARDS systems have potential as communicative tools. Important questions remain. Can we reach an agreement on ARDS standards? Will there be data censorship arising from governmental regulations? Once questions are resolved, we expect ARDS developments will continue. For more ARDS' details, send questions and a S.A.S.E as follows: Roy Ekberg, WØLIQ, 2111 E. Santa Fe, S 346, Olathe KS 66062. (Tel: 913+242-8287)