VUG NEWSLETTER

Number 1

OCTOBER 1974

Twenty-six Votrax users have responded affirmatively to the formation of a Votrax User's Group. Hopefully, I will receive further letters of interest. This newsletter is a result of this response and contains a list of owners of Votraxes, organized alphabetically by state. In order to help locate areas of mutual interest, I have included a small explanation of the applications for which the individuals are using their synthesizers. Hopefully, future newsletters will contain articles written by each member describing his use of the Votrax.

The response to the questionnaire indicates that the group should serve as a communications media to exchange information related to Votrax in several ways.

1. To exchange vocabulary and programs which automatically encode phonemes.
2. To inform interested users of the results of applications.
3. To exchange ideas about problem solutions and applications related to Votrax uses.

Additionally, there were suggestions to attempt to improve the intelligibility of Votrax and influence the quality and quantity of documentation available. One final suggestion was the establishment of a uniform phonetic representation. I believe this last suggestion's import should be obvious to all users of Votrax, especially when using a computer to drive the Votrax.

The extent to which this newsletter will serve these purposes depends upon you, the members of the VUG. I propose to structure the newsletter around these above functions, establishing a section for each. Within each section I hope to print responses and ideas obtained from you. Therefore, in order to insure frequent publication of the newsletter, you must keep in contact with me, either by phone or mail, with contributions.

Here's hoping our newsletter is a success.

Honey Elovitz

Vocabulary Exchange

This section of the newsletter will exchange "good" translations of words and sentences. Since Vocal Interface has recently introduced a new model of Votrax which has a slightly different keyboard, contributions to this section should include for which model the transcription was designed.

We should decide upon some notation to represent the transcription. I propose the following:

1. Inflection codes should be indicated prior to the mnemonic keyboard representation. If omitted, default of 2 is assumed.
2. Each phoneme should be separated by commas.
3. English text should accompany all submitted transcriptions.

To start everything off, here is a sample transcription for a Votrax model V:

2UH3, 3O, 3K, PA1, 2I, 2Z, PAO,
3S, 3T, 2R, 2UH, 1AW, 1NG, PA1,
1 AE1, 1EH2, 2N, 2D, PAO,
2AW, 2L, 1S, 1O, 1O, PAO,
1G, 1I, 1IH, 1V, 1Z, PAO,
3SH, 3A, 2AY, 1AY, 1D

Oak is strong and also gives shade.

I am open to suggestions as to the form this section should take. Please help with some ideas.

Vocalics

What does Votrax say (model V):

3M, 3A, 3AY, 3R, 2R, 2IE, 2E, 1H, 1AE, 1EHH, 1D, 2A, 2AY, PAO
3L, 3I, 3T, 3T, 3IH, 3L, 3L, 3AE, 3EHH, 3M, 3B, PAO
2L, 2I, 2T, 2T, 2IH, 2L,
2L, 2AE, 2EHH, 2M, 2B, PAO
3L, 3I, 3T, 4T, 4IH, 4L,
4L, 4AE, 4EHH, 4M, 4B, PA1
3M, 3A, 3AY, 3R, 2R, 2IE, 2E,
1H, 1AE, 1EHH, 1D, 2A, 2AY, PAO
3L, 3I, 3T, 3T, 3IH, 3L,
3L, 3AE, 3EHH, 3M, 3B, PAO
3I, 3IH, 3T, 3S, 2F, 2L, 2IE, 2E, 2S,
2W, 2AH, 2EHH, 2Z, PAO
3H, 3W, 3AH, 3IY, 3T, 2AE, 2EHH, 2Z,
1S, 1N, 1UH, 10

Standard Phonetic Representations

Most of you are probably aware of the International Phonetic Alphabet (IPA) used by many linguists. Most pronouncing dictionaries explain this alphabet and introduce the symbols. (See Kenyon, J. S., and Knott, T. A., A Pronouncing Dictionary of American English, G & C Merriam Company, Mass., 1953). Initially, this section could try to discuss a correspondence between this alphabet (or at least the symbols pertinent to the English language) and the mnemonic representation illustrated on the Votrax keyboard. Additionally, any work requiring a computer with standard ASCII input/output precludes the use of IPA notation because of the IPA's special symbols. Unfortunately, IPA is the only notation which is well defined for phonetics - at least that I know of. (If you know of others, please tell us.) I have found a correspondence to IPA for both two letter ASCII and one letter ASCII, thanks, I believe, to the Speech Communications Research Institute in California.

Included in this newsletter is a table of the ASCII representations.

Any comments and attempts at correspondences would be most welcome.

Programs and Applications

In this section, I hope to have several members of VUG describe their applications and programs for use of the Votrax. For this newsletter, I'll describe the system under development at the Naval Research Laboratory (NRL).

Currently, the hardware configuration of NRL's Speech Laboratory is illustrated in Figure 1. The TI 960A is used primarily as a large buffer area and translation mechanism to provide the experimenter with a convenient means to work with the synthesizer. Programs written in assembly language for the TI 960A permit the user to translate from the mnemonic keyboard codes entered through the CRT or TI 733 terminal as ASCII characters into bit codes to invoke speech from the synthesizer. Additionally, the TI 960A can translate input from the Votrax keyboard into ASCII codes for the CRT or TI 733. In this manner a user can easily enter a phoneme string from the Votrax keyboard, transfer it to the CRT and also hear the Votrax speak. Then the user can edit the string with the CRT and retransmit to the synthesizer, rather than re-entering the string via the keyboard.

NRL is developing an automatic text to speech translation program implemented in SNOBOL IV for the PDP-10. This program is currently being developed on the TYMSHARE timesharing system. The link shown in Figure 1 from the TI 960A to TYMSHARE will permit output of the SNOBOL program to be transmitted to the synthesizer when requested by the user. In this mode, the TI 960A acts as a cable, transmitting all information to and from the TI 733.

The SNOBOL program translates from text to IPA to Votrax keyboard codes. The translation is done using letter-to-sound rules and a small exception dictionary which is embedded in the rules.

Both the SNOBOL program and the speech laboratory are operational. We have just

COMPUTER PHONETIC REPRESENTATIONS

Phoneme	Computer Representation 1-Character	2-Characters	Example
i	i	IY	beat
I	I	IH	bit
e	e	EY	bait
ɛ	E	EH	bet
æ		AE	bat
a	a	AA	Bob
ʌ	A	AH	but
ɔ	c	AO	bought
o	o	OW	boat
U	U	UH	book
u	u	UW	boot
ə	x	AX	about
ɨ	X	IX	roses
ɝ	R	ER	bird
aU or aw	W	AW	down
aI or ay	Y	AY	buy
ɔI or ɔy	O	OY	boy
y	y	Y	you
w	w	W	wit
r	r	R	rent
l	l	L	let
m	m	M	met
n	n	N	net
ŋ	G	NX	sing
p	p	P	pet
t	t	T	ten
k	k	K	kit
b	b	B	bet
d	d	D	debt
g	g	G	get
h	h	HH	hat
f	f	F	fat
θ	T	TH	thing
s	s	S	sat
š or ʃ	S	SH	shut
v	v	V	vat
ð	D	DH	that
z	z	Z	zoo
ž or ʒ	Z	ZH	azure
č	C	CH	church
j or ʤ	J	JH	judge
ʍ	H	WH	which

received a model 6 Votrax. Further work will envolve devising a testing mechanism to determine what letter-to-sound rules should be changed, deleted, or added to provide a more accurate transcription. Additionally, we hope to devise experiments to test the intelligibility of the speech. Any ideas?

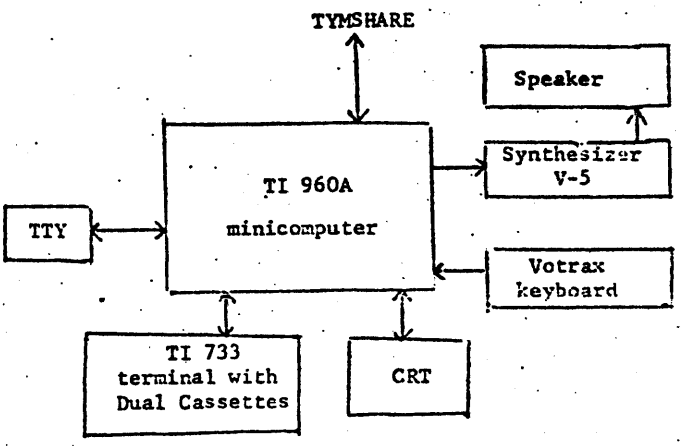

Figure 1

Pertinent Reports and References

There was interest expressed in the response to the questionnaire to have the VUG provide a means to exchange pertinent references. Until areas of interest are established, it is difficult to determine what types of reports would interest VUG members. Since my interest is automatic text translation, I can provide some references in that area. These are listed below:

1. Ainsworth, William A., "A System for Converting English Text into Speech", IEEE Transactions on Audio and Electroaccoustics, Vol. AU-21, No. 3, June 1973.

2. Allen, Jonathan, "Reading Machines for the Blind: The Technical Problems and the Methods Adopted for Their Solution", IEEE Transactions on Audio and Electroaccoustics, Vol. AU-21, No. 3, June 1973.

3. Allen, Jonathan, "Machine-to-Man Communications by Speech Part II", SJCC 1968, p. 339-344.

4. Ra'im', Morteza Amir, Eulenberg, John B., "A Computing Environment for the Blind", NCC, p. 121-124, 1974.

5. McIllroy, M. Douglas, "Synthetic English Speech by Rule", Bell Telephone Laboratories, Murray Hill, N. J., March 1974.

Hardware Corner

Within this section, I hope we can discuss hardware difficulties and improvements to Votrax. Edward Panofsky of Stanford University reported in the questionnaire that he had found a circuit design error in the TTL parallel interface board. Hopefully, more information on that error will be forthcoming. Also, I hope more members will provide this kind of information for distribution in the newsletter.

Final Note

This appears to be the end of our first newsletter. Hopefully, the next newsletter will be a product of the VUG members, so please send any comments, ideas, criticisms, contributions to

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Any offers of help to prepare the next newsletter will be greatly appreciated.

Finally, if you know of anyone not listed who either has a Votrax or is interested in belonging to the VUG, please encourage them to contact me.

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Application: Provide voice output to VM/370 users.

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Applications: Computer Aided Instruction

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Application: Psycology experiments, computer output, game playing

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Application: Voice output of computer to students using interactive computing. Also telephone inquiry system in administrative applications.

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Ronald L. Budworth
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Phone: 408-266-1944
Application: Used to provide a phonetic data translator with machine stenotype as input to provide an "automated note reader" to the judicial reporting field. Also text to speech conversion system

Donald S. Williams
JPL/Caltech 168-514
4800 Oak Grove Drive
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Phone: 213-354-7081/6508
Application: Used with a graphics terminal so that graphics are not obscurred with status information

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Phone: 1-714-286-5404
Application: To teach reading to Navy recruits

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Application: Touch tone and voice access to a time sharing system

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Application: Operator alert in real-time spacecraft control

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Application: Output digital air craft control communications to aircraft pilot

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Phone: 603-643-4000, ext 3556
Application: Machine verification of treatment setups in radiation therapy

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Phone: 201-582-3520
Application: Text to speech, also used in time sharing system

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Application: Touch tone voice response

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Application: Audio warning device in tracking telescope

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Phone: 716- 235-5000, ext 3512
Application: Voice response alarm messages

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Phone: 216-368-2936
Application: Research in speech processing

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Homer R. Warner
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Application: Automatic ordering and reporting of laboratory values to patient wards

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