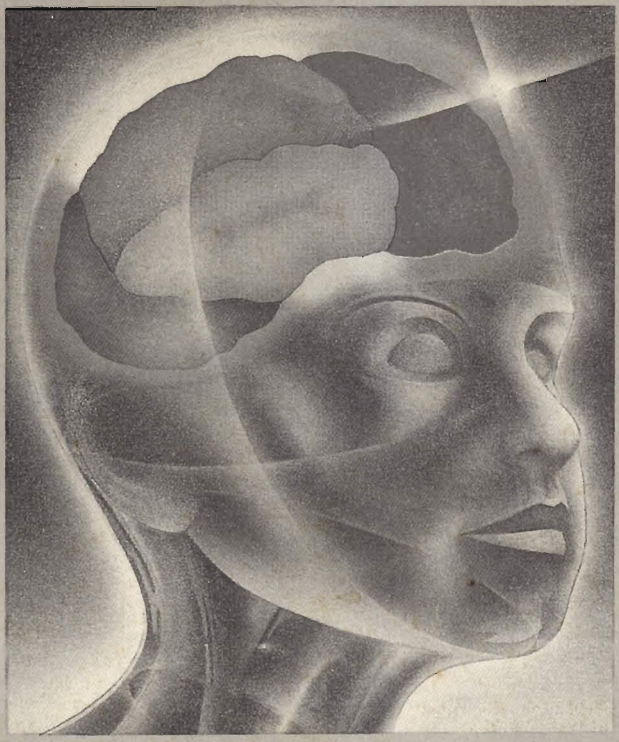
HEARSAY 1000™



INSTRUCTION MANUAL

HEARSAY INC.

Commodore 64 HEARSAY 1000

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INTRODUCTION

Welcome to the exciting world of voice interactive computing. The HEARSAY 1000 is both a voice synthesizer and a voice recognition system. Now you can talk to your computer and have it respond to you.

Just plug the HEARSAY 1000 unit into the expansion port of the Commodore (make sure the computer and all peripherals are turned off first!). If you are using a COMMODORE 128 make sure it is in the 64 mode. Connect the DIN plug into the video port (refer to the Commodore's Users Guide for location of ports). If you are using a video monitor, connect the DIN plug from the monitor into the DIN socket of the HEARSAY 1000. Now turn on the computer and all peripherals connected to it and you're ready to go.

The remainder of this manual describes how to use the HEARSAY 1000 with your application programs (an application program is the program or game that you will be running on the computer, ie. ZORK, Success with Math, ...). Synthesis and recognition can be turned on or off before you load and run the application program or while the application program is running.

HOW TO USE THIS MANUAL

Certain conventions were used while writing this manual. When you see upper case characters enclosed in brackets, like <RETURN>, it means to press the key within the brackets. For example, <CTRL-C> means to hold down the control key while pressing the C key. <COM-F1> means to hold down the Commodore Logo key while pressing F1. <A> means to press the A key and <SHIFT-A> means to hold down the shift key while pressing the A key. The only exception to this rule is for the four function keys (F2, F4, F6, F8) which need the SHIFT key. For example, when you see <F2>, you need to hold down the shift key while pressing the F1 key. When you see lower case characters enclosed in brackets, like <filename>, you have to substitute a string. For example, <filename> means to enter the filename.

A lot of work has gone into designing and testing the HEARSAY 1000 unit and writing this manual to make your job of using it as easy as possible. Please read this manual thoroughly before deciding that something is wrong with the unit. If you need further assistance, our customer service department will be glad to help. But please remember we cannot be a consulting service to solve problems you encounter while working with special systems, programs, interfaces and set-ups.

DEMO DISK

Included with the HEARSAY 1000 package is a demo disk. It demonstrates segments of various programs offered by HEARSAY Inc. and how the HEARSAY 1000 can enhance other manufacturers' software. This disk also contains the necessary programs needed to edit the synthesis vocabulary (see Speech Editor page 7).

To see the demonstrations, type LOAD "DEMO",8,1 <RETURN>. A menu will apear on the screen with options 1 to 6, these are the six demos. WARNING, DO NOT PRESS THE <RESTORE> KEY WHILE RUNNING THE DEMO PROGRAM OR THE SPEECH EDITOR PROGRAM!

Option 1 is a demonstration of Aqua's Circus. Aqua's Circus is a 2-way voice interactive program that teaches children colors, shapes and numbers. This demo will show you how easy and fun it is for a child to use Aqua's circus. To see the demo, press <1>. After about 2 and a half minutes a clown will appear in a classroom and ask you to choose the game you want. There are three games: shapes, colors and numbers. To choose one of the games, press the space bar when the name of the game is spoken. Shapes is chosen automatically if no game is picked. The clown will then ask you to press the space bar and say each object. This is the training portion of the game where the HEARSAY 1000 learns how you say the object's name. After training each object twice, the game goes into the testing mode. The objects will apear on the screen one at a time and the clown will ask you to say the object's name. YOU MUST PRESS THE SPACE BAR BEFORE SPEAKING! After correctly identifying each object the game ends and you are returned to the demo menu. You can also return to the demo menu by pressing <F1> instead of the space bar while in the testing portion of the game.

Option 2 is a demonstration of Think Bank. This program is a 2-way voice interactive memory game designed to build a child's retention skills in mathematics, spelling and matching pairs in a highly effective, fun-filled way. Press <2> to see this demonstration. After about 2 and a half minutes the game screen will appear and you will be asked to press the space bar and say the words used in this demo. You will then by asked to choose a row. Press the space bar and say a number from 1 to 5. Do the same for a column. The object of the game is to match the equation with the answer. To return to the demo menu, press <CTRL-R> about four times.

Option 3 is a demonstration of Rhyme & Reason. This is a 2-way voice interactive program that teaches children about animals, body parts, clothing, the calendar, direction, family members and time in a highly effective way that makes learning fun. To see this demo, press <3>.

Option 4 is a short demo of the Intelligent Talking Terminal. The Intelligent Talking Terminal is an advanced telecomunications package that will allow you to communicate with other computers or database networks over the telephone lines. This demonstration will show you that with speech recognition, you can verbally give commands, like telling which database network to connect to, instead of typing them on the keyboard. Also with speech synthesis, text that is sent over the phone lines to your computer can now be spoken. To see the

demonstration, press <4>. You will then be asked to press the space bar and say the words that will be used in this demo. This training procedure is necessary in order for the HEARSAY 1000 to learn how you say these words. After training the words, you will enter the Intelligent Talking Terminal and be asked which database network to connect to. Say either COMPUSERVE or MCI MAIL. After choosing the database network, the demo program will show you how the Intelligent Talking Terminal program would have automatically dialed the telephone number and connected you to the service you chose. The first page of the database network will be displayed and spoken then you will be returned to the demo menu. If you wish, you can press the <F1> key any time after the training procedure to exit to the demo menu.

Option 5 shows how the HEARSAY 1000's synthesis and recognition capabilities can enhance most other manufacturers' software, like the game of ZORK (ZORK is a trademark of Infocom Inc.). Press <5> to view this demo. After a few seconds you will see a prompt on the screen asking you to press the space bar and say 'OPEN'. What is happening is that the demo is asking you to train the words (OPEN, MAILBOX, READ and LEAFLET) that will be used in this demonstration. After training the words you will go into a short version of ZORK. When Zork prompts you for input, say 'OPEN' then 'MAILBOX'. After Zork opens the mailbox and prompts for more input, say 'READ' 'LEAFLET'. You have just seen how synthesis and recognition can be a great enhancement to your programs. After you say 'LEAFLET' you are returned to the demo menu. You can also exit to the demo menu by pressing <F1> while in the ZORK game.

Option 6 is a demonstration of the HEARSAY 1000's advanced synthesis features. Press <6> to see this demo.

SCREEN ECHO

With the HEARSAY 1000, text that is printed on the screen can now be spoken. This adds a new dimension to adventure games as well as educational and productivity software.

To activate speech synthesis:

1. Press the <RESTORE> key. This brings you into the HEARSAY 1000 Main Menu. The computer will respond by saying 'HEARSAY 1000'.

2. Press the <S> key. This brings you into the Screen Echo Menu. The computer will respond by saying 'SCREEN MODE'.

3. Press the <F7> key. This will activate screen echo and bring you back to the Main Menu. The computer will respond by saying 'SCREEN TEXT WILL NOW BE SPOKEN'.

4. Press the <RETURN> key to return to the application program.

To de-activate speech synthesis:

1. Press the <RESTORE> key. This brings you into the HEARSAY 1000 Main Menu. The Computer will respond by saying 'HEARSAY 1000'.

2. Press the <S> key. This brings you into the Screen Echo Menu. The computer will respond by saying 'SCREEN MODE'.

3. Press the <F7> key. This will de-activate screen echo and bring you back to the Main Menu. The computer will respond by saying 'SCREEN TEXT IS NOW SILENT'.

4. Press the <RETURN> key to return to the application program.

To have punction characters (ie. ? ! @ # $ ...) spoken:

1. Press the <RESTORE> key. This brings you into the HEARSAY 1000 Main Menu. The computer will respond by saying 'HEARSAY 1000'.

2. Press the <P> key. Now when screen synthesis is active, punctuation characters will be spoken. The computer will respond by saying 'PUNCTUATION CHARACTERS WILL NOW BE SPOKEN'.

3. Press the <RETURN> key to return to the application program.

To de-activate punctuation characters:

1. Press the <RESTORE> key. This brings you into the HEARSAY 1000 Main Menu. The computer will respond by saying 'HEARSAY 1000'.

2. Press the <P> key. Now when screen synthesis is active, punctuation characters will not be spoken. The computer will respond by saying 'PUNCTUATION CHARACTERS ARE NOW SILENT'.

3. Press the <RETURN> key to return to the application program.

To change the voice of screen synthesis:

1. Press the <RESTORE> key. This brings you into the HEARSAY 1000 Main Menu. The computer will respond by saying 'HEARSAY 1000'.

2. Press the <S> key. This brings you into the Screen Echo Menu. The computer will respond by saying 'SCREEN MODE'.

3. Press the <F3> key. The computer will respond by saying 'ENTER SCREEN VOICE'.

4. Enter new voice (1-64) followed by <RETURN>. The computer will respond by saying 'ENTERED'. One is the highest voice and 64 is the lowest. The common range is from 1 to 20 where 10 is the normal voice.

5. Press the <RETURN> key to return to the application program.

To change the pitch of screen echo:

1. Press the <RESTORE> key. This brings you into the HEARSAY 1000 Main Menu. The computer will respond by saying 'HEARSAY 1000'.

2. Press the <S> key. This brings you into the Screen Echo Menu. The computer will respond by saying 'SCREEN MODE'.

3. Press the <F1> key. The computer will respond by saying 'ENTER SCREEN PITCH'.

4. Enter new pitch (1-255) followed by <RETURN>. The computer will respond by saying 'ENTERED'. One is the highest pitch and 255 is the lowest. The common range is from 30 to 100. The normal pitch is 87.

5. Press the <RETURN> key to return to the application program.

To change the speed of screen echo:

1. Press the <RESTORE> key. This brings you into the HEARSAY 1000 Main Menu. The computer will respond by saying 'HEARSAY 1000'.

2. Press the <S> key. This brings you into the Screen Echo Menu. The computer will respond by saying 'SCREEN MODE'.

3. Press the <F5> key. The computer will respond by saying 'ENTER SCREEN SPEED'.

4. Enter new speed (1-4) followed by <RETURN>. The computer will respond by saying 'ENTERED'. One is the fastest speed and 4 is the slowest. 3 is the normal speed.

5. Press the <RETURN> key to return to the application program.

Speech Editor

Nothing is perfect, not even the HEARSAY 1000. Although every effort has been made to make the HEARSAY 1000 as accurate as possible, still some words will not be pronounced correctly. Even human beings are not consistent with the way they pronounce some words. For example, in Boston the word BAUD may be pronounced as BAAAUD, and in New York it may be pronounced BORD.

To help in understanding what the HEARSAY 1000 is saying, we have included a SPEECH EDITOR program on the DEMO disk. With this program, you can create a dictionary file to tell the HEARSAY 1000 how to pronounce some words. When this file is loaded into the computer, the HEARSAY 1000 will say the words in the dictionary the way you told the HEARSAY 1000 to say them. But before you can create a dictionary, some theory on speech synthesis must be explained first.

If every letter of the alphabet had only one sound, then speech synthesis would be simple. We would just send each letter to the HEARSAY 1000 unit and the HEARSAY 1000 would say that letter's sound. But unfortunately, a single letter can have many sounds. For instance, the letter 'E' in 'set' has a different sound then in 'seat'. We need to create a new alphabet where every letter has only one sound. Since this new alphabet is based on phonemes, the letters of this alphabet will be called allophones.

The HEARSAY 1000 converts letters into allophones based on a set of rules which use the letters that precede and follow that letter. The rules for the letter 'E', for instance, may say that if 'E' is followed by another vowel, then the allophone for the long 'E' is used. But the rules are not always correct, for this reason you might like to use the SPEECH EDITOR to change how a particular word is pronounced.

To use the SPEECH EDITOR, you must first reset the computer by turning it off then on. Then insert the HEARSAY 1000 DEMO DISK into the disk drive and type LOAD "SPEECH EDITOR",8,1. In about 60 seconds, you will see three windows: TEXT, ALLOPHONES, and COMMAND. The TEXT window is where you will prepare your text to be processed by the HEARSAY 1000. After the text is processed, the allophones will be displayed in the ALLOPHONES window. Here you can edit the allophones until the text is pronounced the way you like it. The COMMAND window is where you will give commands to the editor and where the editor will display status messages.

The SPEECH EDITOR has basically three modes of operation: ALLOPHONE EDITING, TEXT EDITING, and INSERTING TEXT. The following is a list of commands to be used in these three modes. The mode you are in is determined by how many red arrows are on the screen. If only a single arrow is displayed on the screen and that arrow is in the ALLOPHONE window, then you are in the ALLOPHONE EDITING mode. If two red arrows are displyed, one in the ALLOPHONE window and one in the TEXT window, then you are in the TEXT EDITING mode. If three red arrows are displayed, one in the ALLOPHONE window and two in the TEXT window, then you are in the INSERTING TEXT mode.

ALLOPHONE EDITING COMMANDS

COMMAND	DESCRIPTION
Allophones	The allophones listed in appendix A maybe entered directly by name to create any word or phrase. These will be inserted where the red arrow is pointing in the ALLOPHONE window.
SHIFT-T	Allows you to enter the TEXT EDITING mode. A red arrow will apppear (>) in the TEXT window. This is the left position pointer. From here you can enter any TEXT EDITING command.
RETURN	Speaks the allophones in the ALLOPHONE window.
CURSOR-LEFT	Moves the position pointer (>) left one allophone at a time.
CURSOR-RIGHT	Moves the position pointer (>) right one allophone at a time.
DELETE	Deletes the allophone pointed to by the position pointer (>).
HOME	Moves the position pointer (>) to the left of the first allophone in the window.
CLEAR	Deletes all the allophones after the arrow.

TEXT EDITING COMMANDS

COMMAND	DESCRIPTION
RETURN	Returns you to the ALLOPHONE EDITING mode. All arrows disappear from the TEXT window and you are placed in the ALLOPHONE window.
CURSOR-LEFT	Moves the position pointer (>) left one character.
CURSOR-RIGHT	Moves the position pointer (>) right one character.
DELETE	Deletes the character to the right of the position pointer (>).
INSERT	Allows you to enter the INSERT TEXT mode. Two arrows will appear in the TEXT window and any text you type will be inserted between the two arrows.

HOME	Moves the position pointer to the beginning of the text in the window.
CLEAR	Deletes all text to the right of the position pointer (>).

INSERT TEXT COMMANDS

COMMAND	**DESCRIPTION**
Text	Any text you enter will be inserted between the two arrows.
RETURN	All text between the two arrows will be processed by the TEXT-INTO-SPEECH algorithm and the allophones will be inserted after the arrow in the ALLOPHONE window. You will then be returned to the ALLOPHONE EDITING mode and the two arrows in the TEXT window will disappear.
CURSOR-LEFT	Moves the right arrow (<) left one character.
CURSOR-RIGHT	Moves the right arrow (<) right one character.
DELETE	Deletes the character to the left of the right arrow (<).
INSERT	Returns you to the TEXT EDITING mode. The right arrow (<) disappears and the left arrow (>) is moved to where the right arrow (<) used to be.
HOME	Moves the right arrow (<) to the right of the left arrow (>).

After editing the allophones for a word or phrase you will want to store that word in the dictionary. The following commands will help you create and store your dictionary.

DICTIONARY COMMANDS

COMMAND	**DESCRIPTION**
SHIFT-A	The allophones in the ALLOPHONES window will be stored in the dictionary. You will be prompted for the word to give these allophones. From now on, the TEXT-INTO-SPEECH algorithm will replace the word with those allophones. You cannot add a word that already exists in the dictionary. You must first delete the word from the dictionary,

then add the word with the new allophones.

SHIFT-D Deletes a word from the dictionary.

SHIFT-C A catalog of the words in the dictionary will be displayed on the screen 20 words at a time.

SHIFT-E Erases all the words in the dictionary. You will be prompted to confirm this first before any words are erased.

SHIFT-S Saves the dictionary file to disk. You must save the dictionary to disk and then reload the dictionary with the DICTIONARY LOADER program from the DEMO DISK. To load the dictionary into the HEARSAY 1000's memory, type LOAD "DICTIONARY LOADER",8,1 then enter the filename of the dictionary to load. You can store as many dictionary files as there is room on your disk, but you can not store them on the HEARSAY 1000 DEMO disk.

SHIFT-L Loads a dictionary file from disk into the editor's memory. Only one dictionary file can reside in the editor's memory at one time. Loading a dictionary file will erase any existing dictionary that may have been in the editor's memory.

OTHER COMMANDS

COMMAND	DESCRIPTION
SHIFT-F	Lists a directory of all the files contained on your disk.
SHIFT-K	Used to send commands to the disk drive, (eg. S:Filename to scratch a particular file, etc.)
SHIFT-H	Help screen. When in doubt of which command to use, consult the help screen for easy look-up.
SHIFT-N	Lists the allophones and their corresponding decimal codes in two columns for easy access and look-up. To be used for machine language programs. Depressing any key will return you to the windows.
SHIFT-X	Exits the SPEECH EDITOR. The dictionary in the editor's memory will be erased, so make sure that it is saved to disk before exiting the editor.

Dictionary files have other uses besides correcting mispronounced words, you can also read initials. For example, some programs use abreviations like MR. and DR. By placing 'MR' in the dictionary, the HEARSAY 1000 can say 'MISTER' instead of trying to say 'MR'. The following procedure will show how easy it is to create a dictionary file.

1. Insert the Demo disk into the disk drive and load the editor by typing LOAD "SPEECH EDITOR",8,1 <RETURN>.
2. Press <SHIFT-T> to enter the text window.
3. Press <INSERT> to begin entering text.
4. Type MISTER.
5. Press <RETURN> to convert the text into the appropriate allophones. You are now returned to the allophone window.
6. Press <RETURN> to hear the allophones. If it doesn't sound right to you, then edit the allophones until it sounds perfect.
7. Press <SHIFT-A> to add these allophones to the dictionary. Enter MR <RETURN> when asked for the word. Now MR is in the dictionary as the allophones for MISTER.
8. Press <HOME> then <CLEAR> to clear the allophone window.
9. Press <SHIFT-T> <HOME> then <CLEAR> to clear the text window.
10. Press <INSERT> then type MR <RETURN>.
11. Press <RETURN> to hear how it sounds, if it did not sound right, then press <SHIFT-E> then <Y> to erase the dkctionary, press <HOME> then <CLEAR> to clear the allophone window, press <SHIFT-T> <HOME> then <CLEAR> to clear the text window, press <RETURN> to return to the allophone window and go back to step 2.
12. To save the dictionary, insert your own formatted disk into the disk drive then press <SHIFT-S> <filename> <RETURN>.
13. To exit the editor, press <SHIFT-X>.
14. To load the dictionary into the HEARSAY 1000's memory, insert the DEMO disk again and type LOAD "DICTIONARY LOADER",8,1.
15. Insert your own disk containing the dictionary file and enter <filename> when asked for the filename of the dictionary file to load.
16. Now load and run your application program.

The same procedure can be used to add any word, phrase or initials to the dictionary.

NOTE: All new disks must be initialized before use. To initialize a new disk, refer to the INITIALIZE DISK section of your disk drive's user's manual.

KEYBOARD ECHO

Another feature of the HEARSAY 1000 is that it can echo the keys on the keyboard while they are being pressed. This is useful for the blind user or just someone who wants to hear the keyboard speak.

To activate keyboard echo:

1. Press the <RESTORE> key. This brings you into the HEARSAY 1000 Main Menu. The computer will respond by saying 'HEARSAY 1000'.

2. Press the <K> key. This brings you into the Keyboard Echo Menu. The computer will respond by saying 'KEYBOARD MODE'.

3. Press the <F7> key. This will activate keyboard echo. Now any key you type, while in the application program, will be spoken. The computer will respond by saying 'THE KEYBOARD WILL NOW SPEAK'.

4. Press the <RETURN> key to return to the application program.

To de-activate keyboard echo:

1. Press the <RESTORE> key. This brings you into the HEARSAY 1000 Main Menu. The computer will respond by saying 'HEARSAY 1000'.

2. Press the <K> key. This brings you into the Keyboard Echo Menu. The computer will respond by saying 'KEYBOARD MODE'.

3. Press the <F7> key. This will de-activate the keyboard echo. The computer will now respond by saying 'THE KEYBOARD IS NOW SILENT'.

4. Press the <RETURN> key to return to the application program.

To change the voice of keyboard echo:

1. Press the <RESTORE> key. This brings you into the HEARSAY 1000 Main Menu. The computer will respond by saying 'HEARSAY 1000'.

2. Press the <K> key. This brings you into the Keyboard Echo Menu. The computer will respond by saying 'KEYBOARD MODE'.

3. Press the <F3> key. The computer will respond by saying 'ENTER KEYBOARD VOICE'.

4. Enter new voice (1-64) followed by <RETURN>. The computer will respond by saying 'ENTERED'. One is the highest voice and 64 is the lowest. The common range is from 1 to 20 where 10 is the normal voice.

5. Press the <RETURN> key to return to the application program.

To change the pitch of keyboard echo:

1. Press the <RESTORE> key. This brings you into the HEARSAY 1000 Main Menu. The computer will respond by saying 'HEARSAY 1000'.

2. Press the <K> key. This brings you into the Keyboard Echo Menu. The computer will respond by saying 'KEYBOARD MODE'.

3. Press the <F1> key. The computer will respond by saying 'ENTER KEYBOARD PITCH'.

4. Enter new pitch (1-255) followed by <RETURN>. The computer will respond by saying 'ENTERED'. One is the highest pitch and 255 is the lowest. The common range is from 30 to 100. The normal pitch is 81.

5. Press the <RETURN> key to return to the application program.

To change the speed of keyboard echo:

1. Press the <RESTORE> key. This brings you into the HEARSAY 1000 Main Menu. The computer will respond by saying 'HEARSAY 1000'.

2. Press the <K> key. This brings you into the Keyboard Echo Menu. The computer will respond by saying 'KEYBOARD MODE'.

3. Press the <F5> key. The computer will respond by saying 'ENTER KEYBOARD SPEED'.

4. Enter new speed (1-4) followed by <RETURN>. The computer will respond by saying 'ENTERED'. One is the fastest speed and 4 is the slowest. 3 is the normal speed.

5. Press the <RETURN> key to return to the application program.

SPEECH SCREEN EDITOR

The HEARSAY 1000 can not only read the text as it is being printed on the screen, but can also read the text that is already on the screen. By moving an imaginary cursor around the screen, you can have the letter, word or line under that cursor read to you, or the entire screen can be read to you if you like. The following is a list of the commands used to read the screen. You must be in the HEARSAY 1000 Main Menu to use these commands. To enter the Main Menu from the application program, press the RESTORE key. The computer will respond by saying 'HEARSAY 1000'. To return to the application program, press the RETURN key while in the Main Menu. The imaginary cursor is located under the real cursor when you first enter the Main Menu. (The real cursor is the blinking square on the screen that shows you where the text you type will be placed).

KEY	DESCRIPTION
CURSOR UP	Moves the imaginary cursor up one line.
CURSOR DOWN	Moves the imaginary cursor down one line.
CURSOR LEFT	Moves the imaginary cursor left one character.
CURSOR RIGHT	Moves the imaginary cursor right one character.
UP ARROW	Moves the imaginary cursor to the top line on the screen.
LEFT ARROW	Moves the imaginary cursor to the first character on the line.
AT SIGN (@)	The line and column position of the imaginary cursor is read to you.
HOME	The imaginary cursor is moved back to where the real cursor is.
F1	Reads the entire screen.
F3	Reads the line under the imaginary cursor.
F5	Reads the word under the imaginary cursor.
F7	The character under the imaginary cursor is spoken followed by the PETASCII code for that character. For example, if the character under the imaginary cursor was 'SPACE' the HEARSAY 1000 would say 'SPACE 32'. Refer to Appendix C in the Programers Reference Guide for the PETASCII codes.

RECOGNITION

One of the greatest features of the HEARSAY 1000 is the ability to replace keyboard entry with verbal commands. Up to 17 keys can be replaced by a single verbal command. And up to 64 verbal commands can be stored in the computer's memory at one time.

The HEARSAY 1000 incorporates speaker dependent, isolated word recognition. Speaker dependent because only the person who trained the commands can receive 100% accuracy. And isolated because the user must pause before and after giving the verbal command.

Since the concept of speech recognition is a bit complicated, we will go through a simple example to demonstrate how easy it is to use. Lets assume that we are in the middle of playing an adventure game and want to give the command 'GO NORTH' verbally. First we need to train the two words 'GO' and 'NORTH' then activate recognition. The following is a step by step outline of the training procedure:

1. Press the <RESTORE> key. This brings you into the HEARSAY 1000 Main Menu. The computer will respond by saying 'HEARSAY 1000'.

2. Press the <T> key. This starts the training procedure. The computer will respond 'YOU HAVE ZERO WORDS TRAINED. ENTER NUMBER OF WORD TO TRAIN'.

3. Enter the number of the word to train (1-64). Since there are no words trained, this is the first word. Press <1> followed by <RETURN>. The computer will respond by saying 'PRESS SPACE THEN SAY WORD'.

4. Press <SPACE> then say 'GO'. The computer will respond by saying 'PRESS SPACE THEN SAY WORD AGAIN'.

5. Press <SPACE> then say 'GO'. You have now trained the word 'GO'. The computer will now respond by saying 'WORD TRAINED. ENTER THE COMMAND SEQUENCE'.

6. Type <G> <O> <SPACE> <RUN/STOP>. The computer will respond by saying 'ENTERED'. The command sequence is what the HEARSAY 1000 will return to the computer when it recognizes the word. In this case, 'GO ' will be returned to the computer whenever the HEARSAY 1000 recognizes the word 'GO'. The 'RUN/STOP' is used to indicate the end of the command sequence.

We have trained the first word 'GO'. Now we will train the second word 'NORTH'.

7. Press <T>. The computer will respond by saying 'YOU HAVE ONE WORD TRAINED. ENTER NUMBER OF WORD TO TRAIN'.

8. Press <2> then <RETURN>. The computer will respond by saying 'PRESS SPACE THEN SAY WORD'.

9. Press <SPACE> then say 'NORTH'. The computer will respond by saying 'PRESS SPACE THEN SAY WORD AGAIN'.

10. Press <SPACE> then say 'NORTH'. The computer will respond by saying 'WORD TRAINED. ENTER COMMAND SEQUENCE'.

11. Enter <N> <O> <R> <T> <H> <RETURN> <RUN/STOP>. The computer will respond by saying 'ENTERED'.

We have now trained the second word 'NORTH'. Whenever the HEARSAY 1000 recognizes the word 'NORTH', it will return 'NORTH' followed by a return to the computer. We are now ready to activate recognition and play the game. Press <R> to turn recognition on. The computer will respond by saying 'RECOGNITION IS NOW ON'. Then press <RETURN> to return to the game. Now when you say one of the words we have trained, its command sequence will appear on the screen just as if you typed it.

You can also turn recognition off at any time by going into the HEARSAY 1000 Main Menu, by pressing <RESTORE>, and pressing <R>. The 'R' key toggles recognition on and off. After pressing the 'R' key, the HEARSAY 1000 tells you whether recognition is now on or off by saying 'RECOGNITION IS NOW ON' or 'RECOGNITION IS NOW OFF'.

There are two modes of recognition, 'CONTINUOUS' and 'PRESS TO TALK'. In 'CONTINUOUS' mode, the HEARSAY 1000 is always listening for your voice. When the computer is turned on, the HEARSAY 1000 is in continuous mode.

In 'PRESS TO TALK' mode, the HEARSAY 1000 can only hear you when the space bar is held down. This is useful when using recognition in a noisy environment. To enter a 'space' while in 'PRESS TO TALK' mode, just press then release the space bar without speaking; or you can use <SHIFT-SPACE> instead. To select one of the recognition modes, press the <M> key. This toggles between the two modes (CONTINUOUS or PRESS TO TALK).

WARNING. Training a word while recognition is in 'PRESS TO TALK' mode may cause the application program to CRASH! To avoid this, put recognition in 'CONTINUOUS' mode first, by pressing <M>, then exit the HEARSAY 1000 main menu, by pressing <RETURN>, and re-enter the HEARSAY 1000 main menu, by pressing <RESTORE>, then train your words.

The 'I' key erases all recognition words. This is useful if you want to restart recognition with a clean slate without reseting the computer or turning the computer off then on.

After training all your words, you can save them to disk for later use. Press the <F> key from the HEARSAY 1000 Main Menu then enter the filename. Make sure their is sufficient room on the disk and you use a filename that does not already exist on the disk. Do not use the HEARSAY 1000 Demo Disk!

To load the recognition words from disk, press <L> and enter the filename of the file containing the words. Make sure the disk with the file on it is in the disk drive.

WARNING. Recognition must be off when loading words from disk or the computer may crash. To toggle recognition, press the <R> key while in the HEARSAY 1000's MAIN MENU.

APPENDIX A

ALLOPHONE	SAMPLE WORD
SILENCE (pauses)	
- (dash)	- before b, d, g, and j
' (apostrophe)	- before b, d, q, and j
(space)	- before p, t, k, and ch
, (comma)	- between clauses and sentences
. (period)	- end of sentences
*** SHORT VOWELS**	
*i	- sitting, stranded
*e	- extend, gentlemen, end
*(eh)	- extract, acting, ha
*(uh)	- cookie, full, book
*o	- talking, song, ought
*u	- lapel, instruct, succeed
*a	- pottery, cotton, hot
LONG VOWELS	
(ee)	- Treat, people, penny, see
(aa)/(ay)	- great, statement, tray, beige
(ii)	- kite, sky, mighty
(oy)	- noise, toy, voice, boy
(ou)	- after clusters with y and (yy): computer
(ouu)	- in monosyllabic words: two, food
(oo)/(eau)	- zone, close, snow
(ow)	- sound, mouse, down
(ll)	- little, angle, gentlemen
R-COLORED VOWELS	
(er)	- letter, furniture, interrupt
(err)	- monosyllables: bird, fern, burn
(or)	- fortune, adorn, store
(ar)	- farm, alarm, garment
(ear)	- hear, earing, irresponsible
(aer)	- hair, declare, stare
RESONANTS	
w	- we, warrant, linguist
(rr)	- initial position: read, write, x-ray
r	- initial cluster: brown, crane, grease
l	- like, hello, steel
y	- clusters: cute, beauty, computer
(yy)	- initial position: yes, yarn, yo-yo

VOICED FRICATIVES

v	- vest, prove, even
(dth)	- word-initial position: this, then, they
(dth2)	- bathe
z	- zoo, phase
(zh)	- beige, pleasure

VOICELESS FRICATIVES

*f	- food
*(th)	- thin
*s	- sit
(sh)	- shirt, leash, nation
h	- before front vowels: (ear), (ee), i, (aa), e, (aer), (eh) - he, hen, hit, hear, heat, hay, hair
(hh)	- before back vowels: (ou), (uh), (oo), (or), (ar) - hue, hook, hoe, hoist, hawk
(wh)	- white, whim, twenty

+VOICED STOPS

b	- final position: rib; between vowels: fibber, bleed, brown
(bb)	- initial position before a vowel; beast
d	- final position: played, end
(dd)	- initial position: down; clusters: drain
g	- before high front vowels: (ear), (ee), i, (aa), e, (aer): guest
(gg)	- before high back vowels: (ou), (uh), (oo), (oy), u: and clusters: green, glue
(ggg)	- before low vowels: (eh), (ow), (ii), (ar), a, o, (or), (er); and medial clusters: anger; and final position: peg

+VOICELESS STOPS

p	- pleasure, ample, trip
t	- final clusters before ss: tests, its
(tt)	- all other positions: test, street
k	- before front vowels: (ear), (ee), i, (aa), e, (aer), (ii), (eh), (er), u initial clusters: cute, clown, scream
(ck)	- final position: speak; final clusters: task
c	- before back vowels: (ou), (uh), (oo), (oy), (or), (ar), o; initial clusters: crane, quick, clown
(ch)	- church, feature
j	- judge, injure
m	- milk, alarm, ample
n	- before front and central vowels: (ear), (ee), i, (aa), e, (aer), (eh), (er), u, (ow), (ii), (ou); final clusters: earn

(nn)	- before back vowels: (uh), (oo), (oy), (or), (ar), a: no
(ng)	- string, anger, anchor

*These allophones may be doubled for initial position and used singly in final position.

+Requires a pause before these allophones.

NOTE: Underlined letters indicate allophone sounds.

APPENDIX B

HEARSAY 1000 COMMANDS

KEY	DESCRIPTION
CURSOR UP	Moves the imaginary cursor up one line.
CURSOR DOWN	Moves the imaginary cursor down one line.
CURSOR LEFT	Moves the imaginary cursor left one character.
CURSOR RIGHT	Moves the imaginary cursor right one character.
UP ARROW	Moves the imaginary cursor to the top line on the screen.
LEFT ARROW	Moves the imaginary cursor to the first character on the line.
AT SIGN (@)	The line and column position of the imaginary cursor is read to you.
HOME	The imaginary cursor is moved back to where the real cursor is.
F1	Reads the entire screen.
F3	Reads the line under the imaginary cursor.
F5	Reads the word under the imaginary cursor.
F7	The character under the imaginary cursor is spoken followed by the PETASCII code for that character. For example, if the character under the imaginary cursor was 'SPACE' the HEARSAY 1000 would say 'SPACE 32'. Refer to Appendix C in the Programers Reference Guide for the PETASCII codes.
S	Enters the Screen Echo Menu. From here you can enter: **F1** - Screen pitch (0-255) **F3** - Screen voice (0-63) **F5** - Screen speed (1-4) **F7** - Toggle Screen Echo (On/Off)
P	Toggles punction characters (On/Off)
K	Enters the Keyboard Echo Menu. From here you can enter: **F1** - Keyboard pitch (0-255) **F3** - Keyboard voice (0-63) **F5** - Keyboard speed (1-4) **F7** - Toggle Keyboard Echo (On/Off)

KEY	DESCRIPTION
R	Toggles Recognition (On/Off)
T	Trains a word
I	Initializes Recognition and erases all words and commands
L	Loads a recognition word file from disk
F	Saves recognition words to a file on disk
M	Toggles recognition mode (continuous or press space bar to talk

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CBM 1000