TEXAS INSTRUMENTS
HOME COMPUTER

TEXT TO SPEECH-ENGLISH

DISKETTE SOFTWARE

Requires the use of the Solid State Speech™ Synthesizer, the TI Memory Expansion unit, the TI Extended BASIC Solid State Cartridge, and the TI Disk Memory System (TI Disk Drive Controller and Disk Memory Drive) — not included.

Allows you to write programs that "speak" virtually any word in the English language.

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Author: Texas Instruments

Language: TI Extended BASIC

Hardware: TI Home Computer
           TI Solid State Speech^{TM} Synthesizer
           TI Memory Expansion unit
           TI Disk Drive Controller and Disk Memory Drive
           TI Extended BASIC Solid State Software^{TM} Command
           Module

Media: Diskette

Designed to operate with the TI Extended BASIC Command Module,
the TI Text-to-Speech (English) package makes it possible for
the computer to speak almost any word in the English language.
And the package offers an alternative to the TI Terminal
Emulator II Command Module, another method which gives a TI Home
Computer this same speech capability.

With the Text-to-Speech (English) package, you can:

o   Enter English words via the computer keyboard that the
     computer then speaks.

o   Construct words, phrases, and sentences which have the
     pitch contour, inflection, and pause characteristics you
     want, thus enabling you to create dialects, special or
     unusual words, and even sound effects.

o   Add any word or phrase to a TI Extended BASIC program
     instead of being limited to those words resident in the
     Speech Synthesizer.

The Text-to-Speech (English) package uses a type of speech
technology, referred to as text-to-speech, in which words are
broken down into parts of speech called allophones. An
allophone is one of two or more articulatorily and accoustically
different forms of the same phoneme. A phoneme is the smallest
unit of speech that distinguishes one utterance from another.
But you do not have to be a "speech expert" to use
Text-to-Speech (English). A list of the allophones used by TI
Text-to-Speech (English) and their numeric codes is contained in
Appendix A. All other information you need is described in the
step-by-step instructions and other appendices contained in this
manual.

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The Text-to-Speech (English) subroutine package contains three subroutines which allow you to create allophone strings from text strings. Thus, your task of adding speech to Extended Basic programs is as simple as using the XLAT routine to translate the English phrase into allophones and then using the SPEAK routine to speak the translated phrase. The English phrase may be a string variable, string constant, or string expression.

This section describes how you can access the
Text-to-Speech (English) system from a TI Extended BASIC
program. It explains how to initialize the system, how to
download the speech database, and how to access the
individual routines. With this feature, you can add speech
to games, educational programs, and many other
applications.

The subroutine package contains the following subroutines:
SETUP which is the Text-to-Speech (English) initialization
subroutine; XLAT which is the text-to-allophone translator;
SPEAK which is the allophone-to-LPC (Linear Predictive
Coding) translator. Briefly, the steps involved in using
these subroutines are initializing the system's expansion
memory, loading the Text-to-Speech (English) subroutines,
then calling and executing the subroutines.

    STEP 1.   Be sure that the Speech Synthesizer, the
                  Memory Expansion System, the Disk Drive
                  Controller, and the Disk Memory Drive are
                  connected to the computer and turned on and
                  that the TI Extended BASIC Command Module is
                  inserted into the console. (See the owner's
                  manuals for product details.) Set the volume
                  control on the computer monitor to mid-range.

    STEP 2:   Next, press any key to make the master
                  selection list appear. Then press the key
                  necessary to select TI Extended BASIC.

    STEP 3:   Insert the Text-to-Speech diskette into Disk
                  Drive 1.

    STEP 4:   Type the following to initialize the Memory
                  Expansion Unit and load the Text-to-Speech
                  (English) subroutines:

```
CALL INIT :: CALL LOAD("DSK1.S
ETUP","DSK1.XLAT","DSK1.SPEA
K")
```

                  and press ENTER.

                  Note: It will take 1-1/2 to 2 minutes for the
                  system to accomplish this because of the
                  length of the subroutines.

    STEP 5:   Next, call the routine SETUP by typing

```
CALL LINK("SETUP","DSK1.DATABASE")
```

and pressing ENTER. The indicated file,
DSK1.DATABASE, is loaded from the diskette
into the computer's memory. The general
format for a call to this routine is CALL
LINK("SETUP", filename) where   filename
is the name of the file from which to load the
database. This file is loaded into the
computer's memory.

In addition to the standard error messages for
the LINK routine, the following error messages
can result from the SETUP call:

Error Message	Description
Memory Full	There is not enough space left for the database. Reduce program size.
Incorrect Argument List	There is an incorrect number of arguments in call parameter list.
I/O Error	There was an I/O error during transfer of database. This could be caused by one of these two factors: (1) file or device doesn't exist; (2) file parameters do not agree with expected database parameters.

STEP 6: Now, call the XLAT routine to create an
allophone string from any given text string.
The general format of a call to XLAT is

CALL LINK("XLAT", text string, allophone
string)

In this call, the text-string is a string
expression giving the text string to be
translated; and allophone-string is a string
variable (or string array element) that
receives the resulting allophone string.

If the text string to be translated is longer
than 128 bytes, an error message "STRING
TRUNCATED" is returned. If the resulting
allophone string is longer than 255 bytes, an
error message "SPEECH STRING TOO LONG" is
returned.

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STEP 7   An example of the XLAT routine call is:

CALL LINK("XLAT", "PRESS Y FOR YES. PRESS N FOR NO", B$)

In this example, the routine XLAT creates the allophone string B$ for the text string "PRESS Y FOR YES. PRESS N FOR NO".

The XLAT routine can translate any standard English language text. In addition to the normal alphabetic characters, some special characters are recognized by the routine. If a special character is not recognized, it is ignored. It does, however, cause a word break, thereby terminating the current word.

The special characters recognized by the XLAT routine can be divided into four functional groups: numerical characters, pause and break characters, inflection symbols, and special symbols.

NUMERICAL CHARACTERS

The numerical character group consists of the standard numerical characters 0 through 9, and the symbols ",", ".", "-", and "+". The characters 0 through 9 are always pronounced in the usual way. The other symbols, however, are only recognized if they directly precede a numerical character. Then, and only then, it is pronounced.

PAUSE AND BREAK CHARACTERS

This character group consists of the characters ".", ",", "!", "?", ":", and ";". Note that the period and comma symbols must be followed by a space unless it is the last character in the string.

These characters generate a pause code, the length of which depends upon the character. The "," symbol causes a short break (2 frames), while all of the others cause a long break (9 frames). The duration of one frame is approximately 25 milliseconds.

Use the sample program Phrase and type in the
following example to hear the difference in
pause characters.

   THE COMMA IS A SHORT PAUSE, BUT THE PERIOD
   IS A LONG PAUSE. DID YOU HEAR THE
   DIFFERENCE?

In addition to generating pause codes, these
characters also affect the inflection contour
of the sentence if a primary stress point
(vocal emphasis) has been indicated. The ","
and "?" characters both specify rising contour
for the preceding phrase, while all other
codes generate the standard falling contour.
For more information, refer to Appendix D,
Speech Contouring Algorithms.

INFLECTION SYMBOLS

This group consists of two main symbols, the
"$\wedge$" and the " ", plus one other symbol, the
">". The "$\overline{\wedge}$" symbol denotes primary stress
and the " " symbol denotes secondary stress.
The ">" symbol is the shift indicator and is
used to shift the stress within a word or
phrase. When you input a word or phrase, for
example, the word IMPORTANT, without any
stress points, it will have the standard
falling contour. But if you want the primary
stress to be on the second syllable, then type
in "$\wedge$>IMPORTANT". The stress is shifted to
the second syllable.

The primary stress point triggers a rising or
falling pitch that starts at the inflection
symbol and continues to the end of the
phrase. The pause and break symbols within
the phrase determine whether the pitch rises
or falls. The "?" and "," make the pitch rise
and all other symbols make the pitch fall.
The following examples illustrate the use of
the primary stress point and the effect that
the pause and break characters have on those
stress points.

THE SUN RISES IN THE $\wedge$ WEST?

THE SUN $\wedge$ SETS IN THE WEST.

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If a secondary stress point is used, it forces
the specific syllable to be pronounced at a
higher pitch than the other syllables within
the word or phrase. If several secondary
stress points are used, then the first one
starts at a higher pitch and all subsequent
secondary stress points step down to a lower
pitch but still remain higher than the pitch
level of the syllables that have no stress.
Normally, if you use secondary stress points
within a phrase, you should use a primary
stress point also. If a primary stress point
is not used, then all syllables after the last
secondary stress point will take on a flat
monotone level. Also, only one primary stress
point can be used in a phrase   If you use
more than one primary stress point, then all
other primary stress points after the first
one will be changed to secondary stress points.

Below are more examples of the usage of the
inflection symbols.

∧PRACTICAL	Primary stress point on the first syllable
∧>OBSCURE	Primary stress point on the second syllable
∧>>GRAVITATION	Primary stress point on third syllable
_ONE _TIME ∧ ONLY?	Secondary stress points and primary stress point within a phrase with a rising contour.

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SPECIAL SYMBOLS

This group consists of the symbols "@", "$",
"%", "&", "*", "(", ")", "=", and "/". These
symbols are pronounced as follows:

Symbol	Pronounced as
@	at
$	dollar
%	percent
&	and
*	asterisk
(	open
)	close
=	equals
/	slash

You may also want to experiment with typing in
various letters and combinations of letters to
find out the unusual sounds it is possible to
create with Text-to-Speech (English). For
example, use the sample program Phrase and
type in the following letters to hear the
sounds they produce.

```
        WWWWW
        HCHCH
        XXXXX
        RFRFRF
        QQQQQQ
```

STEP 8:   After an allophone string has been created
          with the XLAT routine, the selected allophones
          can be spoken by the SPEAK routine. The
          general format to call the SPEAK routine is

          CALL LINK("SPEAK", allophone-string, pitch,
          slope)

          In this call, allophone-string is a string
          expression yielding the required allophone
          string; pitch is a numeric expression giving
          the pitch indicator; and slope is a numeric
          expression giving the slope value.

          The normal pitch value is 43.

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The <u>pitch</u> expression should yield a value in the range of 0 through 63. The <u>slope</u> expression is limited to a value of 0 through 255, although it actually indicates 32 times the slope increment used by the contouring algorithms. In general, the slope should be selected so that it is approximately 10% of the pitch value. For pitch equal to 40, the slope should be approximately 4 times 32, or 128. The multiplication factor of 32 has been selected to allow for fractional increments in integer-type variables.

Note that the only restriction to the slope parameter is that it not exceed these limits.

<u>slope</u> $<$ (<u>pitch</u>-1) * 16

<u>slope</u> $<$ (63-<u>pitch</u>) * 16

The reason for this is that if the selected slope is selected too large, inflection parameters cause the pitch parameter to cross the range of 0 to 63, either on the high or low side. The current allophone stringer automatically corrects the slope parameter to avoid that kind of a situation.

If the selected pitch level is selected too high (greater than 63), the pitch level is automatically limited to level 63. That means that any level above level 63 is treated as if level 63 had been specified.

Appendix A describes the standard allophone codes for TI Text-to-Speech (English). Appendix B lists frequency tables which indicate the pitch-interval to frequency relationship. Appendix C describes some special inflection codes. In general, all codes above 240 are reserved for special function codes. And Appendix D provides speech contouring algorithms.

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The following program called Phrase is an example of a program
that can be created using Text-to-Speech (English).

```
100 CALL INIT
110 CALL LOAD("DSK1.SPEAK","DSK1.XLAT","DSK1.SETUP")
120 CALL LINK("SETUP","DSK1.DATABASE")
130 LINPUT "PHRASE- ":A$
140 IF A$="" THEN 160
150 CALL LINK("XLAT",A$,B$)
160 CALL LINK("SPEAK",B$,43,128)
170 GOTO 130
```

The program lets you simply type a word, phrase, or sentence on
the computer. The input string can be 128 characters long, but
if that string is translated into a string longer than 255 you
will get an error "SPEECH STRING TOO LONG" which is generated by
the XLAT routine. If the input string exceeds 128 characters,
you will receive an error "STRING TRUNCATED". Then, when you
press the ENTER key, the computer speaks the words you entered.
This lets you have your computer speak a wide range of English
language words. And it allows you to alter the spelling of a
word to make it sound the way you want it to sound.

As you listen to the computer speak, you may decide that a word
is not spoken the way you want, or you may decide that you want
a longer pause between some words. You can change the
pronunciation of words in two ways. First, you can misspell the
word. For example, the computer pronounces the word break
breek. Therefore, change the spelling of break to brake and the
computer pronounces the word properly. Or you can spell great
as grreat, and the computer "stretches out" the r sound.
Misspelling the word silently as sssilently causes the computer
to pronounce the word with a longer s sound. You can experiment
with other misspellings to create the pronunciation you want.
Also, to achieve the pause duration you want, experiment with
pause and break characters as described in the "Pause and Break
Characters" section.

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The Text-to-Speech (English) system can be subdivided into two
distinct functional blocks as shown here.

```
        +---------+                    +------------+
        | Trans-  |                    | Allophone  |
Text =  |   lator | ==  Allophones ==  |            | =   ⊏⋈
        |         |                    |   stringer |
        +---------+                    +------------+     SPEAKER
             ↑                               ↑

        +---------+                    +------------+
        | Text to |                    | Allophone  |
        |  speech |                    |            |
        |   rules |                    |  Library   |
        +---------+                    +------------+
```
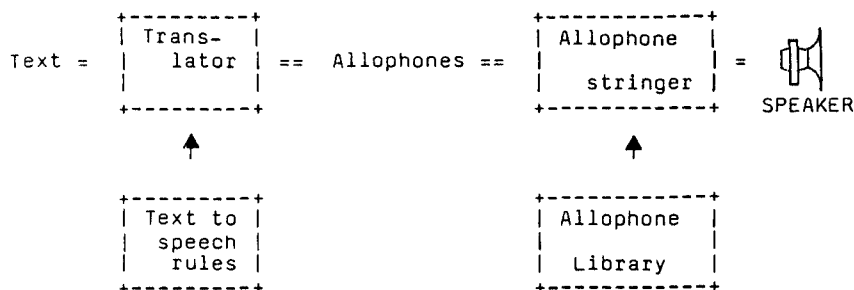
The first block (labeled translator) is the text-to-allophone
translator. This block is the main component in the
Text-to-Speech (English) system. It uses speech rules, stored
in a rules library in the system, to translate English text into
its allophonic equivalent. It also includes symbols for
sentence contouring. This block is implemented in a routine
called XLAT.

The second block (labeled allophone stringer) converts allophone
strings, which may include pitch contour modifiers, to LPC
strings. These strings are output directly to the system's
speech chip. Note that this means that the actual LPC data is
never completely in memory, thus saving space. This block is
implemented in a routine called SPEAK.

Allophone Code Description

This appendix provides a brief description of the code numbers
assigned to the allophones and the sound associated with each.

Allophone	Description
1 - AE1	as in ".A.ddition"
2 - AE1N	as in ".A.nnuity"
3 - AH1	as in " Delt.a."
4 - AH1N	as in " .O.n time"
5 - AW1	as in ".Au.tonomy"
6 - AW1N	as in "An.o.nimity"
7 - E1	as in ".E.liminate"
8 - E1N	as in ".E.nough"
9 - EH1	as in "Cont.e.xt"
10 - EH1N	as in "Anci.e.nt"
11 - ER1N	as in "West.e.rn"
12 - I1	as in "Synth.e.s.i.s"
13 - I1N	as in ".I.nane"
14 - OO1	as in "T.oo.k on"
15 - OW1N	as in "D.o.nation"
16 - U1	as in "Ann.u.al"
17 - U1N	as in ".U.nique"
18 - UH1	as in ".A.bove"
19 - UH1M	as in "Instr.u.ments"
20 - UH1N	as in ".U.nderneath"
21 - Y1	as in "Ros.e.s"
22 - Y1N	as in "Basem.e.nt"
23 - ER1	as in "Seek.e.r"
24 - OW1	as in "Rati.o."
25 - Y2	as in "Funn.y."
26 - AE2	as in "H.a.t"
27 - AH2	as in "H.o.t"
28 - AI2	as in "H.ei.ght"
29 - AR2	as in "C.a.rt"
30 - AU2	as in "H.ou.se"
31 - AW2	as in "S.ou.ght
32 - E2	as in "H.ea.t"
33 - EER2	as in "P.ie.rce"
34 - EH2	as in "S.e.t"
35 - EHR2	as in "Th.e.rapy
36 - EI2	as in "T.a.ke"
37 - ER2	as in "H.u.rt"
38 - I2	as in ".I.ssue"
39 - OI2	as in "Ch.oi.ce"

Allophone	Description
40 - OO2	as in "C.oo.k"
41 - OOR2	as in "P.oor.ly"
42 - OR2	as in "H.or.se"
43 - OW2	as in "B.oa.t"
44 - U2	as in "Sh.oo.t"
45 - UH2	as in "H.u.t"
46 - UU2	as in "B.oo.t"
47 - AE3	as in "H.a.d"
48 - AH3	as in ".O.dd"
49 - AI3	as in "H.i.de"
50 - AR3	as in "C.a.rd"
51 - AU3	as in "L.ou.d"
52 - AW3	as in "S.a.w"
53 - E3	as in "S.ee.d"
54 - EELL	as in "H.eel."
55 - EER3	as in "H.ear.
56 - EH3	as in "S.ai.d"
57 - EHR3	as in "Th.ere."
58 - EI3	as in "D.ay."
59 - ER3	as in "H.ear.d"
60 - I3	as in "H.i.d"
61 - ILL	as in "H.ill."
62 - ING2	as in "Th.ink."
63 - OI3	as in "B.oy."
64 - OO3	as in "C.ould."
65 - OOR3	as in "P.oo.r"
66 - OR3	as in "C.ore."
67 - OW3	as in "L.ow."
68 - U3	as in "Sh.oe."
69 - UH3	as in "M.u.d"
70 - ULL	as in "Sk.ull."
71 - UHL	as in "P.ull."
72 - UU3	as in "M.oo.n"
73 - L	as in ".L.ike"
74 - L-	as in "Bow.l."
75 - LL	as in "Awf.ul."
76 - M	as in ".M.ay"."
77 - MM	as in "Hu.m."
78 - N	as in ".N.ice"
79 - NN	as in "Sa.ne."
80 - NG1	as in "Thi.n.k"
81 - NG2	as in "Thi.ng."
82 - R	as in ".R.eal"
83 - W	as in ".W.itch"

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Allophone		Description
84	- WH	as in ".Wh.ich"
85	- Y	as in ".Y.ou"
86	- B	as in ".B.ad"
87	- BB	as in "Da.b."
88	- D	as in ".D.ig"
89	- DD	as in "Bi.d."
90	- G1	as in ".G.ive"
91	- G2	as in ".G.o"
92	- GG	as in "Ba.g"
93	- J	as in ".J.ug"
94	- JJ	as in "Bu.dge."
95	- THV	as in ".Th.is"
96	- THV-	as in "Clo.the."
97	- V	as in ".V.ine"
98	- VV	as in "Li.ve"
99	- Z	as in "Z.oo"
100	- ZZ	as in "Doe.s."
101	- ZH	as in "A.z.ure"
102	- ZH-	as in "Bei.ge."
103	- K2	as in "S.k.ate"
104	- KH	as in ".C.ase"
105	- KH-	as in "Ma.ke."
106	- KH1	as in ".K.ey"
107	- KH2	as in ".C.ough"
108	- P	as in "S.p.ace"
109	- PH	as in ".P.ie"
110	- PH-	as in "Na.p."
111	- T	as in "S.t.ake"
112	- TH	as in ".T.ie"
113	- TH-	as in "La.te."
114	- CH	as in ".Ch.ur.ch."
115	- F	as in ".F.at"
116	- FF	as in "Lau.gh."
117	- HI	as in ".H.it"
118	- HO	as in ".H.ome"
119	- HUH	as in ".H.ut"
120	- S	as in ".S.eem"
121	- SS	as in "Mi.ss."
122	- SH	as in ".Sh.ine"
123	- SH-	as in "Wa.sh."
124	-.THF	as in ".Th.ing"
125	- THF-	as in "Wi.th."
126	- Pause 1	short pause
127	- Pause 1	long pause

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Frequency Tables

This section indicates the pitch-interval to frequency
relationship for Text-to-Speech (English). The given values are
for a clock frequency of 8 kilohertz. The actual clock frequency
for the speech module may vary +/- 5% in respect to this standard
frequency.

Pitch	Freq.(Hz)	Pitch	Freq.(Hz)	Pitch	Freq.(Hz)
1	571.4	22	210.5	43	88.8
2	533.3	23	200.0	44	83.3
3	500.4	24	195.1	45	80.8
4	470.5	25	186.0	46	77.6
5	444.4	26	177.7	47	74.7
6	421.1	27	166.6	48	71.4
7	400.0	28	163.2	49	68.3
8	380.9	29	156.8	50	65.5
9	363.6	30	148.1	51	62.9
10	347.8	31	145.4	52	60.1
11	333.3	32	140.3	53	57.5
12	320.0	33	133.3	54	55.1
13	307.7	34	129.0	55	52.9
14	296.2	35	125.0	56	50.9
15	285.7	36	117.6	57	48.7
16	275.8	37	111.1	58	46.7
17	266.6	38	108.1	59	44.9
18	258.1	39	105.2	60	43.0
19	250.0	40	98.7	61	41.2
20	235.2	41	94.1	62	39.6
21	222.2	42	91.9	63	37.9

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Inflection Codes

In general, the allophone code space is subdivided into two
areas. The first one, ranging in numbers from 1 through 240, is
the actual allophone range. Presently, only 126 of those 240
codes are actually used.

The second range, from 241 through 255, is used for special
function codes. Each special function has up to two additional
numbers associated with it. This appendix describes the codes
currently used.

249   Secondary stress point. Depending on the state
       the stringer is in, the stress point will either
       be given the current vowel pitch level, and the
       vowel pitch will be incremented by a computed
       delta amount, or, after an upgoing primary stress
       point, the stress point will be raised one level
       above the current vowel pitch level, and the vowel
       pitch will be decremented by the computed delta
       amount.

250   Sentence break code. Resets parameters to default
       values given by SPEAK routine.

       This code is followed by two parameters: the
       number of secondary stress points before and after
       the primary stress point, respectively. If the
       primary stress point is a rising (question mark)
       stress, the second parameter indicates the number
       of vowels after the primary stress point. If the
       first parameter has either of the values 254 or
       255, the second parameter will indicate the total
       number of vowels in the phrase.

       A value of 254 or 255 for the first parameter
       indicates that the entire phrase should have a
       rising or falling tendency respectively. This
       tendency is spread out over at least 8 vowels, and
       slopes over 15% as indicated by the slope
       parameter in the SPEAK call.

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251   New default slope parameter. The number following
        this code indicates the new slope parameter to be
        used. As usual, the slope indicates 3 times the
        actual slope value, to allow for fractional values
        of the slope. Normally the slope parameter should
        be selected to be approximately 10% of the pitch
        parameter.

252   New default pitch parameter. The number following
        this parameter indicates the new default pitch
        level to be used. Notice that this pitch level is
        only valid for the current phrase. Permanent
        pitch level modifications have to be made using
        the parameters in the SPEAK routine.

253   Rising pitch contour. Used for question-type
        phrases at primary stress point. Will cause the
        next allophone to be gradually raised in pitch,
        starting below the current default level, and
        ending above the current default level.

        If no vowels are following the primary stress
        point, as indicated by the most recent 250 code,
        the allophone will be put at the standard pitch
        level, but along a gradually rising slope,
        starting at the current level (with the current
        stressed allophone), and rising to a higher level.

254   Falling pitch contour. Used for standard type
        phrases at primary stress point. Will cause the
        next allophone to be gradually lowered in pitch,
        starting at a higher than default level. The
        starting level is selected higher if secondary
        stress points are following the primary stress
        point, as indicated by the most recent 250
        indicator.

255   Temporary pitch level modification. Will modify
        the pitch level of the allophone following it to
        the level indicated in the second byte. This is
        useful in special applications like singing
        computers etc., although most of the effects can
        also be accomplished by using the permanent
        modifier code 252.

Speech Contouring Algorithms

Text-to-Speech (English) uses a pre-defined set of rules to
translate secondary and primary stress points into pitch
variations. This Appendix provides an explanation of how those
rules interpret the stress points, and what effects stress
points have on the pitch in a phrase.

Sentence profiles can be subdivided into two major groups:

1. Falling phrase mode

2. Rising phrase mode

Typically, a rising phrase mode occurs in sentences terminated
by a"," or a "?". The falling phrase mode prevails in any other
situation.

Stress points are only used for <u>vowel</u> allophones. These
allophones are all grouped in the range 1 through 73. All the
other allophones are not used for sentence profiling.

Falling Phrase Mode

A falling phrase centers around a falling pitch on the primary
stress point. If the primary stress point is followed by one or
more secondary stress points, the pitch on the primary stress
point will fall from above the average pitch level, back to the
average pitch level as illustrated here.

Average

S.S.   S.S.   P.S.   S.S.   S.S.
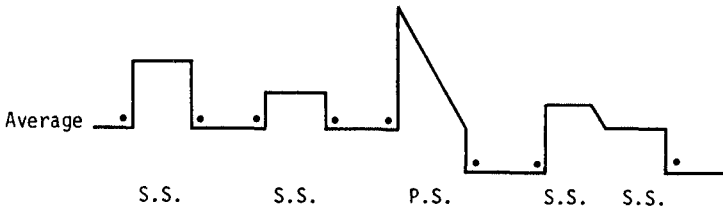
If the primary stress point is the last stress point in the
phrase, the pitch on this point will fall from above the average
pitch level to below the average pitch level as illustrated here
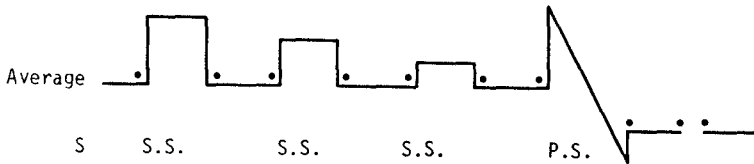

Notice that in both cases the default pitch level after the
primary stress is lowered.

The secondary stress points before and after the primary stress
point are treated in exactly the same way for falling phrase
mode.   The first secondary stress point is always positioned
above the default level.   Any further secondary stress points
are spread out evenly between a raised level and the default
level.   That means for two stress points, the first one will be
at the raised level, and the second one exactly between the
raised level and the average level.

Rising Phrase Mode

A rising phrase, like a falling phrase, is centered around the
primary stress point.   As the name implies, the primary stress
point will follow a rising contour.   However, if the primary
stress point is followed by one or more vowels, the rising
contour is spread out over all the vowels following it starting
at the default level for the primary stress point itself, and
ending above the default level for the last vowel as illustrated
here.

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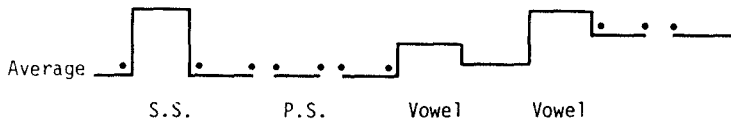
If no vowels are following the primary stress point, the primary
stress point has a gradual upswing, starting at a level below
the current default level, and rising to a level above the
current default level as illustrated here.

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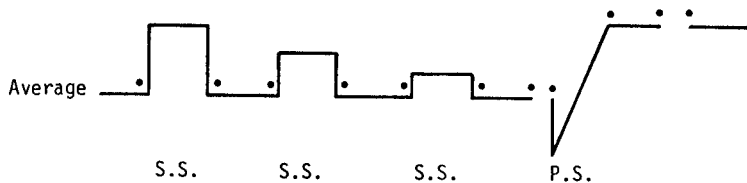
1. Be sure that the diskette you are using is the correct one. Use the Catalog command on your Disk Manager Command Module to check for the correct program.

2. If your computer does not respond to the RUN command, be sure to select TI Extended BASIC and then just type

        RUN "DSK1.PHRASE"

3. Ensure that your disk system is properly connected and turned on. See the owner's manuals for product details.

4. If your program does not appear to be working correctly, press CLEAR and remove the diskette from the disk drive. Reinsert the diskette, and follow the "User Instructions" carefully. If the program still does not appear to be working properly, remove the diskette from the disk drive, turn the computer off, wait several seconds, and turn it on again. Then load the program again.

5. If you are having difficulty operating the Home Computer or are receiving error messages, refer to the "Maintenance and Service Information" and "Error Messages" appendices in your User's Reference Guide for additional help.

6. If you continue to have difficulty with your Texas Instruments computer or the Text-to-Speech (English) package, please contact the dealer from whom you purchased the unit or package for service directions.

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              HOME COMPUTER SOFTWARE MEDIA
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in the accompanying book materials ("the Programs").

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DEFECTS IN MATERIAL OR CONSTRUCTION.

WARRANTY DURATION

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