

# Arpabet

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**Arpabet** is a phonetic transcription code developed by Advanced Research Projects Agency (ARPA) as a part of their Speech Understanding Project (1971–1976). It represents each phoneme of General American English with a distinct sequence of ASCII characters. Arpabet has been used in several speech synthesizers, including Computalker for the S-100 (Altair) system, SAM for the Commodore 64, SAY for the Amiga and TextAssist for the PC and Speakeasy from Intelligent Artefacts (see ST\_Robotics) which used the Votrax SC01 speech synthesiser IC. It is also used in the CMU Pronouncing Dictionary.

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## Symbols

In Arpabet, every phoneme is represented by one or two capital letters. Digits are used as stress indicators and are placed at the end of the stressed syllabic vowel. Punctuation marks are used like in the written language, to represent intonation changes at the end of clauses and sentences. The stress values are:

### Stress

Value	Description
0	No stress
1	Primary stress
2	Secondary stress

### Vowels

### Monophthongs

Arpabet	IPA	Word examples
AO	ɔ	off (AO1 F); fall (F AO1 L); frost (F R AO1 S T)
AA	ɑ	father (F AA1 DH ER), cot (K AA1 T)
IY	i	bee (B IY1); she (SH IY1)
UW	u	you (Y UW1); new (N UW1); food (F UW1 D)
EH	ɛ	red (R EH1 D); men (M EH1 N)
IH	ɪ	big (B IH1 G); win (W IH1 N)
UH	ʊ	should (SH UH1 D), could (K UH1 D)
AH	ʌ	but (B AH1 T), sun (S AH1 N)
		sofa (S OW1 F AH0), alone (AH0 L OW1 N)
AX	ə	discus (D IH1 S K AX0 S); note distinction from discuss (D IH0 S K AH1 S)
AE	æ	at (AE1 T); fast (F AE1 S T)

## Diphthongs

Arpabet	IPA	Word Examples
EY	eɪ	say (S EY1); eight (EY1 T)
AY	aɪ	my (M AY1); why (W AY1); ride (R AY1 D)
OW	oʊ	show (SH OW1); coat (K OW1 T)
AW	aʊ	how (HH AW1); now (N AW1)
OY	ɔɪ	boy (B OY1); toy (T OY1)

## R-colored vowels

Arpabet	IPA	Word Examples
ER	ɝ	her (HH ER0); bird (B ER1 D); hurt (HH ER1 T), nurse (N ER1 S)
AXR	ɝ	father (F AA1 DH ER); coward (K AW1 ER D)
EH R	ɛr	air (EH1 R); where (W EH1 R); hair (HH EH1 R)
UH R	ʊr	cure (K Y UH1 R); bureau (B Y UH1 R OW0), deter (D IH0 T UH1 R)
AO R	ɔr	more (M AO1 R); bored (B AO1 R D); chord (K AO1 R D)
AA R	ɑr	large (L AA1 R JH); hard (HH AA1 R D)
IH R <i>or</i> IY R	ɪr	ear (IY1 R); near (N IH1 R)
AW R	aʊr	<i>This seems to be a rarely used r-controlled vowel. In some dialects flower (F L AW1 R; in other dialects F L AW1 ER0)</i>

## Consonants

### Stops

Arpabet	IPA	Word Examples
P	p	pay (P EY1)
B	b	buy (B AY1)
T	t	take (T EY1 K)
D	d	day (D EY1)
K	k	key (K IY1)
G	g	go (G OW1)

### Affricates

Arpabet	IPA	Word Examples
CH	tʃ	chair (CH EH1 R)
JH	dʒ	just (JH AH1 S T); gym (JH IH1 M)

### Fricatives

Arpabet	IPA	Word Examples
F	f	for (F AO1 R)
V	v	very (V EH1 R IY0)
TH	θ	thanks (TH AE1 NG K S); Thursday (TH ER1 Z D EY2)
DH	ð	that (DH AE1 T); the (DH AH0); them (DH EH1 M)
S	s	say (S EY1)
Z	z	zoo (Z UW1)
SH	ʃ	show (SH OW1)
ZH	ʒ	measure (M EH1 ZH ER0); pleasure (P L EH1 ZH ER)
HH	h	house (HH AW1 S)

### Nasals

Arpabet	IPA	Word Examples
M	m	man (M AE1 N)
EM	ɱ	keep 'em (K IY1 P EM)
N	n	no (N OW1)
EN	ɳ	button (B AH1 T EN)
NG	ŋ	sing (S IH1 NG)
ENG	ŋ̥	Washington (W AO1 SH ENG T EN)

### Liquids

Arpabet	IPA	Word Examples
L	ɫ	late (L EY1 T)
EL	ɸ	bottle (B AO1 DX EL)
R	r <i>or</i> ɹ	run (R AH1 N)
DX	ɹ	wetter (W EH1 DX AXR)
NX	ɹ̥	wintergreen (W IY2 NX AXR G R IY1 N)

## Semivowels

Arpabet	IPA	Word Examples
Y	j	yes (Y EH1 S)
W	w	way (W EY1)
Q	ʔ	glottal stop (uh-oh - ʔʌʔoʊ)
(missing)	hw <i>or</i> ɹ̥	"when" etc. in some dialects

## References

- The CMU Pronouncing Dictionary (<http://www.speech.cs.cmu.edu/cgi-bin/cmudict>)

## See also

Other ASCII phonetic codes:

- SAMPA, language-specific
  - X-SAMPA, encoding the whole International Phonetic Alphabet
- WorldBet

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