

kṭāi MwZṭeM

fvgKv

kā w̄wZ̄vcK gvaṭgi gṭa" chṭmṭg mstKvPb | cṭwīṭYi dtj mṑ Ab%N° Zi½| kṭāi teM,
gvaṭgi w̄wZ̄vcKZv | RoZv aṭgṑ Dci wbfṑ Kṭi | GRb" wewfbægvaṭg kṭāi teM wewfbænq| G
BDwṭU kṭāi teṭMi Dci Pvc, ZvcgvĪv, Av`Zv BZ`w̄i cṭvṭe Avṭj wPZ nṭe| GQvov | kṭāi
KṭúvstKi Dci Dm | ṭkṭZvi AvṭcuṭK teṭMi cṭve GLvṭb eYṭv Kiv nṭe|

cW-1

ktãi tel mûûq vDUtbi mF, M'vm gva'tg ktãi tel mûûKZ vDUtbi mF cZcv`b, ল্যাগ্ৰাংমি iûKiy|

Df'ik"

GB cW tkfI Avcib-

- (1) ktãi tel mûûKZ vDUtbi mF eYûv KitZ cvi'teb,
- (2) vDUtbi mF cZcv`b KitZ cvi'teb,
- (3) vDUtbi mF'i ল্যাগ্ৰাংস KZR.iûKiy mûûKZej tZ cvi'teb|

19.1.1 t ktãi tel mûûKZ vDUtbi mF (Newton's Formula for Velocity of Sound)

ueÁvbx m'vi AvBR'vK vDUtbi gtZ tkvb gva'tg ktãi tel H gva'tgi w'wZ'vcK , YvSK I NbZji mvt_ mûûKZ' | vDUtbi mF'vbyvti gva'tgi w'wZ'vcK , YvSK E Ges NbZjip ntj ktãi tel

$$v = \sqrt{\frac{E}{\rho}} \text{ ----- (19-1)}$$

Kw/b c`vt_ E = Bqs Gi , YvSK, Y

$$\therefore v = \sqrt{\frac{Y}{\rho}} \text{ ----- (19-2)}$$

Zij ev evqexq c`vt_ P t'f'f' E = AvqZb , YvSK, K

$$\therefore v = \sqrt{\frac{K}{\rho}} \text{ ----- (19-3)}$$

M'vmxq gva'tgi t'f'f' vDUtbi gtZ, kã m'Avj tbi mgq gva'tgi Zvcgv'vi tkvb cwi'eZû NtU bv| vDUtbi t' Lvb th, Gt'f'f' M'vmxq gva'tgi AvqZb , YvSK K= P

[P = M'vtmi Pvc]

mZ'isvs M'vmxq gva'tg ktãi tel, $v = \sqrt{\frac{P}{\rho}}$

M'vmxq gva'tg ktãi tel mûûq vDUtbi mF cZcv`b

mg DòZvq M'vtmi t'f'f' PV = a'e| GLv'tb P = M'vtmi Pvc, v = AvqZb

v Gi mvtçt'f' Aš'ixKiY (Differentiation) Kfi cvB,

$$\frac{d}{dv} (PV) = 0$$

$$\therefore P + v \frac{dP}{dv} = 0$$

$$eV, P = - \frac{dP}{dV}$$

GLv`b dP tK P`tc`i cwi eZ` = c`rob

$$\frac{dV}{V} = GKK AvqZ`bi Rb` AvqZb cwi eZ` eV AvqZb iekwZ.$$

$$P = - \frac{dP}{dV} = M`v`mi AvqZb , Y`sk$$

FYvZK iPy (-) Øviv tevSvq Pvc ewx tctj AvqZb nvm c`te |

$$\therefore P = K$$

$$\therefore v = \sqrt{\frac{K}{\rho}} = \sqrt{\frac{P}{\rho}} \text{ ----- (19-5)}$$

~rfimeK Zvcgv`Iv I P`tc` (N. T. P) k`ãi teM t

$$\sim rfimeK Zvcgv`Iv = 0^0 C$$

$$\sim rfimeK Zvcgv`Ivq evqj NbZj = 1.293 \text{ kg/m}^3$$

$$\sim rfimeK Pvc = 76 \text{ cm cwi} \sim \text{Pvc}$$

$$= 0.76\text{m} \times 13596 \text{ kg/m}^3 \times 9.81 \text{ m/sec}^2$$

$$\therefore v = \sqrt{\frac{76 \times 13596 \times 9.81}{1.293}} \text{ m/sec}$$

$$= 280 \text{ m/sec}$$

hv cix`iYi gva`tg c`B dtj i tP`q Kg |

19.1.2 t`nã`mi i`k (Laplace's Correction)

19.1.1 Abt`Q` i`bDU`bi m`F c`Zciv`tb Avgiv t`tLw` th M`v`mi Ae`vi mgxKiY PV = a`eK e`envi Kiv ntqtQ | t`nã`mi gtZ kã c`v`ni mgq evqj mstKvPb I c`nvi Y GZ `Z NtU th evqj e`Yv I cwi c`v`Zvi m`Zv`tc`i Av`vb c`vb m`½ m`½ nq bv, A`M`v`miq gva`tg k`ãi i`e`-i` ifxZvcvq (Adiabatic) c`Uqvq NtU | G Ae`vi cwi t`c`v`Z M`v`miq Ae`vi mgxKiY

$$PV^\gamma = a`eK |$$

$$GLv`b \gamma = \frac{w`i P`tc` M`v`mi Av`tc`v`K Zvc C_p}{w`i AvqZ`b M`v`mi Av`tc`v`K Zvc C_v}$$

v Gi m`v`tc`v` G mgxKiY Aš`xKiY Kti c`vB,

$$\frac{d}{dV} (PV^\gamma) = 0$$

ল্যাঙ্গ্রামি ইন্স : evqexq gva`tg ktāi tetMi mgxKiY, $v = \sqrt{\frac{\gamma p}{\rho}}$

চিৎVvĒi gj`iqb

(K) beঐPK cĳœ

mĳK DĒti ĳK ĳy (√) ĳ b

1. kā Zi½ tKvb gva`tg cĳvvnZ nq bv?

(K) Kĳvb gva`g

(L) Zij gva`g

(M) M`vmxq gva`g

(N) kb` gva`g

2. M`vmxq gva`tg ktāi tetMi mgxKiY tKvbU? (ল্যাঙ্গ্রামি ইন্স mn)

(K) $v = \sqrt{\frac{p}{\rho}}$

(L) $v = \sqrt{\frac{\rho}{p}} = aĳœK$

(M) $v = \sqrt{\frac{\gamma p}{\rho}} = aĳœK$

(N) $v = \sqrt{\frac{\gamma}{\rho}} = aĳœK$

(L) msĳĳB cĳœ

1. ktāi teM m`úĳKĳ ĳbDUtbi mĳ ĳj Lĳ|

2. ktāi teM m`úĳKĳ ĳbDUtbi mĳĳi Dci ল্যাঙ্গ্রামি ইন্স Dĳĳx Ki`b|

3. kā mĳĳtbi mgq M`vmxq gva`tgi cĳi eZĳ ĳf`Zvcxq tKb?

M) ĳPbvĳj-K cĳœ

1. M`vmxq ktāi teM m`úĳKĳ ĳbDUtbi mĳĳU Drcv`b Ki`b|

2. evqexq gva`tg ktāi teM ĳbĳfĳY ĳbDUtbi mĳĳi Dci ল্যাঙ্গ্রামি ইন্স mgxKiYmn e`vL`v Ki`b|

$$eV, v \propto \sqrt{T} \dots \dots \dots (19-11)$$

A_# M'im gva'tg ktai teM gva'tgi cig Zicgrivi eMgtj i mgvbyvZK|

$$GLb T = (t + 273) K \quad | \quad T_0 = 273 K$$

$$\begin{aligned} \therefore \frac{v_t}{v_0} &= \sqrt{\frac{T}{T_0}} \\ &= \sqrt{\frac{t + 273}{273}} = \sqrt{1 + \frac{t}{273}} = \left(1 + \frac{t}{273}\right)^{\frac{1}{2}} \end{aligned}$$

$\frac{t}{273}$ Ly #Z'ntj

$$eV, \frac{v_t}{v_0} \left(1 + \frac{1}{2} \cdot \frac{t}{273}\right) \text{ [w0c`x mTvblyvqx]}$$

$$\begin{aligned} \therefore v_t &\cong v_0 \left(1 + \frac{t}{546}\right) \\ &= v_0 (1 + 0.00183 t) \end{aligned}$$

0°C G evqjZ ktai teM 332 m/sec. aiv ntj t°C G,

$$\begin{aligned} v_t &= 332 (1 + 0.00183 t) \\ &= (332 + 0.61 t) \dots \dots \dots (19-12) \end{aligned}$$

∴ 1°C DòZv epx i Rb ktai teM 0.61 m/sec

eV 61 cm/sec epx cvq|

D`niY 1 t ub#nj uLZ DcvEmg#ni wfwEtZ evqjZ ktai teM ubYq Ki`b Zicgrivi 10⁰ C

Pvc 760 wgw cvi` - #Pvc

$$cvi\#`i NbZj = 1359 \text{ kgm}^{-3}$$

$$gva`iKI PRibZ Zj Y_g = 9.81 \text{ ms}^{-2}$$

mgvab t 0°C Zicgrivi I wfwK Pvc evqjZ ktai MuzteM

$$v_0 = \sqrt{\frac{\gamma p}{\rho}}$$

$$\begin{aligned} eV, v_0 &= \sqrt{\frac{1.41 \times 0.76 \times 1359 \times 9.81}{1.293}} \\ &= 332.5 \text{ m/sec} \end{aligned}$$

10⁰ C Zicgrivq ktai teM v ntj ,

$$v = v_0 \left(1 + \frac{1}{2} \alpha t\right) \quad \left[\alpha = \frac{1}{273} = 0.00366\right]$$

$$= 332.5 \left(1 + \frac{1}{2} \times 0.00366 \times 10\right) \text{ m/sec}$$

$$= 338.6 \text{ m/sec.}$$

**(N) Av`Zvi c`ve (Effect of Moisture) t Rj`xq er`ú evqyA`c`q`v` n`v` K`v` e`j` evqy` m`½` Rj`xq er`ú`
 ugk`Z` _v`K`j` evqy` Nb`Z`i` n`m` c`v`q`|` t`h`n`Z`z`M`'m` g`v`a`'g` k`ã`i` t`e`M` M`'m` g`v`a`'g`i` Nb`Z`i` e`M`g`j`i`
 e`"`b`g`m`Z`K` Z`v`B` evqy` Av`Z`v` e`x` t`c`j` k`ã`i` t`e`M` e`r`to`|` k`ã`i` t`e`M` i`"`I` Av`"evqy`Z` h`_v`m`tg`**

v_{dry} | v_{moist} aiv`n`j` ,

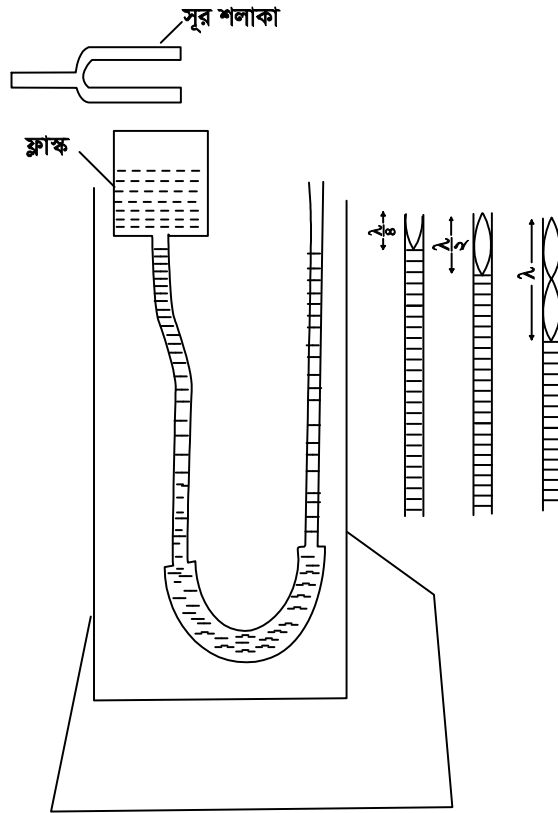
$$\frac{v_{\text{moist}}}{v_{\text{dry}}} = \sqrt{\frac{\rho_{\text{dry}}}{\rho_{\text{moist}}}} \quad \left[\text{mgxKi Y 19-7 n} \frac{v_1}{v_2} = \sqrt{\frac{\rho_2}{\rho_1}} \right]$$

$$\text{ev, } v_{\text{moist}} = v_{\text{dry}} \sqrt{\frac{\rho_{\text{dry}}}{\rho_{\text{moist}}}} \dots \dots \dots (19-13)$$

**(O) evqy`c`v`ni c`ve t k`ã`i` M`u`Z` evqy`c`v`ni` M`u`Z`i` w`"K` e`x` c`v`q` Ges evqy`c`v`ni` w`c`i`x`Z` n`m`
 c`v`q`|` Z`te` k`ã`i` M`u`Z`i` w`"K`i` m`g`"K`v`Y` evqy`c`v`n` _v`K`j` k`ã`i` M`u`Z` c`v`i` e`w`Z`Z` n`q` b`v`|`**

19.2.2 t Ably` evqy`c`x`w`Z`Z` k`ã`i` t`e`M` w`b`Y`q`

**c`q`v`R`b`q` h`š`i` t` "B` g`y` t`L`j`v` G`K`u` K`u`P`i` b`j`i` w`b`P`i` c`u`š`-j` e`f` i`v`e`r`t`i`i` b`j` j`w`M`t`q` Z`v`i` t`k`l` c`u`š`-
 G`K`u` K`u`P`i` d`v`"`j` v`M`v`B` Ges m`g`M`ö`e`"`w`u` u` w`D`t`e`i` Av`K`u`Z`Z` উল্লেখভা`te` G`K`u` K`v`V`i` t`d`g` G`g`b`f`i`te`
 Av`U`K`v`B` t`h`b` K`u`P`i` d`v`"`w`u` I` V`i`f`v`-b`v`g`v`b`v` h`v`q`|`**



ৱপী t (19-1) Ablyn` evqy#çc×wZ

KivVi tçtg GKwU wglvi t`çj jvMv#bn _v#K| KçPi d#ç`ç cwb t`qn nq| d#ç`wU lVv-bvgn Kçi Kvb#tj i tçZi evqy#çç` `Nç l cwiçZ# Kiv hviq (ৱপী 19-1) | GLv#b d#ç`wU Rj vavi wntm#te KivR Kçi | Gevi Rvbn KçúvSK wwkó GKwU mj kjvKv Kç# b#tj i g#L KçúvZ Kçi Ges KivP b#tj i tçZi evqy#çç` `Nç nwm-ew# Kçi Ablyn` m#ç Kiv nq| b#tj i g#ç` cwb i wK Dç#i Z#tj w#ç` `wç`yl b#tj i g#L m#çú` wç` ym#ç nq| G#ç#ç#ç evqy#çç` `ç#wçK KçúvSK = mj kjvKvi KçúvSK n

$$\therefore l = \frac{\lambda}{4} \text{ ev } \frac{3\lambda}{4} \text{ ev } \frac{5\lambda}{4} \text{ BZ`w` n#tj Ablyn` tkvbn h#çte Ges tRv#i kã tkvbn h#çte|}$$

$$\text{avi, } l_1 = \frac{\lambda}{4} \text{ ev, } 4 l_1 = \lambda \text{ [GLv#b } \lambda = Zi \frac{1}{2} \text{ `Nç l = evqy#çç` `Nç]}$$

$$l_2 = \frac{3\lambda}{4} \text{ ev, } \lambda = \frac{4}{3} l_2$$

$$l_3 = \frac{5\lambda}{4} \text{ ev, } \lambda = \frac{4}{5} l_3$$

$$\text{Avgi v Rwb k#çi tel } v = n\lambda$$

$$= n \cdot 4 l_1 \dots \dots \dots (19-14)$$

$$\text{Abj#ç } v = n \times \frac{4}{3} l_2 \dots \dots \dots (19-15)$$

$$Ges v = n \cdot \frac{4}{5} l_3 \quad BZ`w` |$$

AZGe mijkjvKv KúZ Kti evqy# KúQ aítj tRviti ká tkvbn tMj l₁, l₂ BZ`w`i `N`gvcv nq| Gfite ktái teM wYq Kiv hvq|

cŃs-mstkvab (End Correction) t Ably` mŃó Kvix myúÚ w`yKúPi bítj i gyl bv ntq mvgvb` Dcti ntq _tK| GRB` mstkvabZ evqy# `N`l' = (1 + 0.6r) aiv nq|

$$[GLvrb r = KvPbtj i e`vmaP$$

Aek` cŃs-mstkvab Qovl i`xvite ktái teM wYq Kiv hvq|

$$thgb \ 1g \ Ably` \ nj \ l_1 + x = \frac{\lambda}{4} \quad x = cŃs-mstkvab$$

$$2q \ Ably` \ nj \ l_2 + x = \frac{3}{4} \lambda$$

$$\therefore l_2 - l_1 = \frac{\lambda}{2}$$

$$\therefore v = n\lambda$$

$$= 2n(l_2 - l_1) \dots \dots \dots (19-16)$$

n, l₁ l₂ Gi gvb t_tK ktái teM wYq Kiv hvq|

D`niY 2 t 1080 Kúvsk wéikó GKwU mij kjvKvi mivvth` evqy#cixŃvq t`Lv tMj cŃg l wZiq Ably` nq h_vtq 7.65 cm l 22.95 cm evqy# `N`l' ktái teM wYq Ki`b|

mgvaib t t`lqv AvtQ, cŃg Ably` evqy# `N`l' l₁ = 7.65 cm ev .0765 m; wZiq Ably` evqy# `N`l' l₂ = 22.95 cm ev 0.2295m

$$\begin{aligned} Avgi v Rvb ktái teM, v &= 2n(l_2 - l_1) \\ &= 2 \times 1080 (0.2295 - 0.0765) \\ &= 330.48 \text{ m/sec.} \end{aligned}$$

mvi mstŃc

- (K) M`vixq gva`tg ktái teM gva`tgi NbZji eMŃtj i e`v`vbgvZK
- (L) M`vixq gva`tg ktái teM gva`tgi Prtci eMŃtj i mgvbgvZK
- (M) M`vixq gva`tg ktái teM gva`tgi cig ZvcgvŃvi eMŃtj i mgvbgvZK
- (N) i`e` evqy#AvtŃv Av`evqy#Z ktái teM tekx|

[c0qRb1q mg1KiY]

$v \propto \sqrt{\frac{1}{\rho}}$; GL1tb $\rho = gra\text{'tgi NbZi}$

$v \propto \sqrt{\frac{\gamma P}{\rho}}$; GL1tb $P = gra\text{'tgi Pvc}$

$\gamma = \frac{C_p}{C_v}$

$v \propto \sqrt{T}$; $T = cig\ t\text{'tj Zvcg1\hat{v}}$

$v_{moist} = v_{dry} \sqrt{\frac{\rho_{dry}}{\rho_{moist}}}$ $\rho_{dry} = i^{\text{0}}\ evqj\ NbZi$

$\rho_{moist} = Av\text{'}\ evqj\ NbZi\ |$

cvVvEi gj\`vqb

(K) be03K c0at m1WK DEti w1K w1y (v) w b t

1. ktai teM m1útk0K1v1U w1K?

(K) ktai Nb1Zi mgvb0mZK

(L) evqj Nb1Zi e\`vb0mZK

(M) evqj Nb1Zi eM0tj i e\`vb0mZK

(N) evqj Nb1Zi e1M0 mgvb0mZK |

2. Ab1v\` evqj001 \`\`N0bq tK1v1U?

(K) $\frac{\lambda}{4}$

(L) $\frac{\lambda}{2}$

(M) $\frac{3\lambda}{4}$

(N) $\frac{5\lambda}{4}$

(L) msu1B c0ce

1. Ab1v\` evqj001 t1t1\` Ab1v\` i Rb\` evqj001 %0tN0 i w1kgvj v wY0 Ki\`b |

2. evqy#4 c0š-mstkvab KvK etj ?

cW-3

**Wcjvi cĕve : Dm I tkĕZvi AvtcwĕK MvZi KvĕY ktāi ZxĕZv
cwieZĕ|**

Dĕĕk

G cW tkĕI Avcĕb-

- | Wcjvi cĕve wK Zv RvĕZv cĕĕeb
- | ktāi ZxĕZv cĕwieZĕbi wmwve KĕZv cĕĕeb|

19.3.1 t Wcjvi cĕve (Doppler effect) t Kwĕqvb Bĕqmvb Wcjvi (Christian Johan Doppler) 1842 Lĕ÷vĕā GB gĕg^o wĕ AvKlĕ Kĕib th tKvb kĕ Zi½ DrcbKvix Dm Ges tkĕZvi gĕā AvtcwĕK MvZ _vKĕj , tkĕZv ktāi ZxĕZv A_ĕ Ziĕi Kĕúvsk Dm nĕZ DrcbĕcKZ.ZxĕZv ev Kĕúvsk t_ĕK wfbĕAbĕĕe Kĕib| GB Ae`vĕK Wcjvi cĕve ejv nq| Wcjvi cĕve mKj cĕKvi Ziĕi Rb` cĕhvR`|

$$n_1 = n \left(1 - \frac{v_0}{v}\right)$$

∴ $n_1 < n$ Ges tkîZv kîâi ZxŋîZv Kg Abyfe Ki te|

∴ Drm wîi wKŞzîkîZv MwZkxj nîj tj Lv hvq,

$$n_1 = n \frac{v \pm v_0}{v} \dots \dots \dots (19-20)$$

tkîZv Drîmi wîK Avmîj avîZK (+) wPý I Drm tîK `îi tMîj FYvZK wPý (-) e`envi KiîZ nîe|

(3) Drm I tkîZv DfîqB MwZkxj (Source and Listener both in motion)t hLb Drm I tkîZv DfîqB wîi ZLb awi kîâi Kûvsk n| Avevi Drm MwZkxj nevi KviîY mgîKiY (19-18) Abîvqx tkîZvi KîîQ cîKZ.Kûvsk n tkîvî hvîe n_1 wîmîe|

$$thLvîb \quad n_1 = \frac{v}{v \pm v_s} n \dots \dots \dots (19-21)$$

Avevi tkîZv MwZkxj nevi Rb` n_1 Kûvsk tkîvî hvîe n_2 wîmîe Ges mgîKiY (19-20) Abîvqx,

$$\begin{aligned} n_2 &= n_1 \frac{v \pm v_0}{v} \\ &= \frac{v}{(v \pm v_s)} \cdot n \cdot \frac{v \pm v_0}{v} \\ &= \frac{v \pm v_0}{v \pm v_s} \cdot n \dots \dots \dots (19.22) \end{aligned}$$

t`Lv hvîQ Drm wîi nîj $v_s = 0$

$$\therefore n_2 = \frac{v + v_0}{v} \cdot n ; hv mgîKiY (19-20) Gi mgîv$$

Avevi tkîZv wîi vKîj $v_0 = 0$

$$\therefore n_2 = \frac{v}{v \pm v_0} \cdot n ; hv mgîKiY (19-21) Gi mgîv$$

Avevi Drm I tkîZv wîi vKîj $v_s = 0$ Ges $v_0 = 0$

$$\therefore n_2 = \frac{v}{v} n = n$$

A`K KûvstîKi tkîv cîieZî nîe bv|

D`vniY `îfc aiv hvK GKıU tUb 13.4 m/sec. teîM AvmîQ Ges GK e`w³ 4.47 m/sec. teîM tUîbi wîK `vîo î`Şto| tUbıUîZ 400 Hz KûvstîK evîkx evîRîQ| kîâi MwZîeM 330 m/sec. nîj H e`w³i KîîQ evîkxi Kûvsk KZ gîb nîe?

1. k̄āi M̄wZ̄tēM m̄x̄t̄Ü w̄bDŪt̄bi m̄F̄ w̄j L̄ly Ges लसप्रतिमि īw̄x̄KiY eȲt̄v Ki"b|
2. M̄v̄m̄x̄q ḡv̄āt̄g k̄āi t̄ēt̄Mi Dci M̄v̄t̄mi NbZ; Pvc, Z̄vcḡv̄Īv, Av̄Z̄vi c̄f̄ve eȲt̄v Ki"b|
3. Ab̄l̄v̄` ēv̄q̄ȳx̄c̄x̄w̄Z̄t̄Z k̄āi t̄eM w̄bȲt̄q̄i c̄x̄w̄Z eȲt̄v Ki"b|
4. W̄cj̄vi c̄f̄ve w̄K̄ w̄ek` f̄īt̄e ēv̄L̄v̄ Ki"b|

M̄w̄v̄Z̄K m̄gm̄v̄

1. 384 Hz K̄x̄úv̄sK̄ w̄ēw̄kó GK̄w̄Ū m̄j̄ k̄j̄v̄K̄vi m̄v̄n̄v̄t̄h" k̄āi t̄eM w̄bȲt̄q̄ Kīt̄Z̄ w̄M̄t̄q̄ t̄`Lv̄ t̄M̄j̄ c̄Ūḡ Ī w̄ŪZ̄x̄q̄ Ab̄l̄v̄` n̄q̄ h̄_v̄μ̄t̄ḡ 0.08 m I 0.51 m ēv̄q̄ȳx̄c̄x̄w̄Z̄t̄Z̄ k̄āi t̄eM w̄bȲt̄q̄ Ki"b|
2. GK̄w̄Ū ḡj̄j̄ ēv̄n̄x̄ t̄Ūb̄ 15 m/sec. t̄ēt̄M̄ 400 Hz K̄x̄úv̄sK̄ w̄ēw̄kó ēt̄k̄x̄ēv̄R̄īt̄Z̄ ēv̄R̄īt̄Z̄ Q̄ȳt̄Q̄| GK̄B̄ m̄ḡq̄ w̄ēc̄īx̄Z̄ w̄`K̄ t̄_̄t̄K̄ GK̄w̄Ū h̄v̄Īx̄ēv̄n̄x̄ t̄Ūb̄ GK̄B̄ t̄ēt̄M̄ ḠīM̄t̄q̄ Āv̄m̄t̄Q̄| h̄v̄Īx̄ēv̄n̄x̄ t̄Ūt̄bī h̄v̄Īx̄ ḡj̄j̄ ēv̄n̄x̄ t̄Ūt̄bī ēv̄k̄x̄ī K̄x̄úv̄sK̄ K̄Z̄ īb̄t̄Z̄ c̄v̄t̄e?