



## Alternative communication systems in disaster – torchlight Morse code communication in Mizoram

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### ABSTRACT

In Mizoram, there is a practice of an alternative system of propagation of messages called torchlight Morse code communication. It is an indigenous technology, by improvising the existing W/T based on Morse code communication into Mizo language. Morse code encodes the Roman alphabet, the Arabic numerals and a small set of punctuation and procedural signals as standardized sequences of short and long "dots" and "dashes", or "dits" and "dahs". In the Mizo method, hand-held portable torchlight was used to transmit Morse code by light signal and the receiver could easily interpret the message using the same code. This mode of communication augured well in the folded belt of Mizoram trending in N-S direction and most of the villages/town exists on the top of the hillocks. Most of the village built signal tower in the elevated places and any person who was well versed in the system was on duty by rotation to received, reply and forwarded the message. This practice, which was banned and became dormant when Mizoram was declared as a Disturbed Area according to Armed Forces (Assam & Manipur) Acts, 1958 in 1966, is now revived by Disaster Management Centre, Administrative Training Institute, Mizoram in collaboration with Mizo Signal Corps by training NGOs and Mizoram Police Radio Organization personnel. With its advantages and limitations, it may also be applicable in other part of India, especially in other hilly, vulnerable and inaccessible area.

**Key words:** Communication lines; alternative communication; torchlight; morse code; alphabets; numbers; procedure.

### INTRODUCTION

During disasters, communication links are lifeline and the only linkage of the affected area with the rest of the country. The information

about the situation report, damage and need assessment, and those of response team have to be communicated as fast as possible to the relevant levels of authorities for timely, effective and coordinated response (short and long term) to be taken in the right direction. While communication links are the only hopes and means of survival, it is these that are usually disrupted during

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disaster. Communication lines are often knocked out altogether or if not they were either overloaded or sketchy or busy since many people were using the available line after the devastation struck. The poles and cable of telephone landline and WWL are liable to be damaged by the impact of hazards rendering them useless. Heavy communication traffic may also block it and makes it impractical.

Wireless system is the obvious choice when normal telephone and mobile phone does not exist or if it exists it is disrupted due to natural calamities. Wireless radio communication is based on radio waves either using the terrestrial or satellite system. Radio frequency spectrum covers very low to extremely high frequencies. These bands are used by hand-held wireless sets (walkie-talkie). They are thus useful means of communication, but this wireless communication is meant only for the military or police or official purposes and not for civilian uses.

Cellular phones too have become important means of communication. But the system has its limitations. Their lines get disrupted during emergencies and it also gets overcrowded and jammed or get a busy tone. In many instances cellular phones were useless due to damaged towers thus weakening the signal and the batteries in the tower or hand-set may be downed due to unavailability of power supply for a long period after a calamity.

Communication satellites are radio relay stations in space and are also referred to as COM-SAT, SATCOMS and SATPHONE etc. By virtue of being in space the communication satellites do not get affected by calamitous events on earth and enable us to have uninterrupted communication the world over. In times of disaster, satellite telephones use low earth-orbit satellites. These phones are very efficient and reliable for voice and data communication and are handy. Government of India is planning to equip districts of disaster prone areas with such places for establishing and maintaining an alternative communication link in case of failure of the other system. But it is expensive and cannot be easily accessed by the people.

Amateur radio or HAMS works successfully in areas where other communications cannot and can be very helpful in emergencies. This is because it does not require ground based infrastructure and does not have much need for power requirements, either batteries or generators are sufficient. They have used space technology and used satellites to provide wide services. During Orissa cyclone in 1999 and Gujarat earthquake in 2001, they rendered excellent services. The government has encouraged the establishment of amateur radio stations at various places and also provides necessary training to those interested in being amateur station operators. A micro satellite (HAMSET) has been developed by the Indian Space Research Organization (ISRO) to provide satellite-based radio amateur services to Indian as well as international HAM (Amateur Radio Operator) community. But in a region like Northeast India, the use of HAM is restricted and one has to get permission from the concerned ministry and also there has to be at least another hammer in the vicinity.

Therefore, we have to look beyond all these systems to find alternative mode of communication systems aim at providing simple, strong, reliable and disaster resilient communication links between various concerned agencies. In other words, alternative communication systems act as a tool in decision making for response, search and rescue, relief and medical aids, link between various levels of government authorities (central, state and local), guide and direct the NGO's volunteers about the kind of help required and where and when it should be delivered and save losses in terms of human lives, livestock and property. As such, alternative mode of communication could be a last resort when disaster disrupts all other modes of communication system.

In the state of Mizoram, there exists a device or system of propagation of messages throughout the length and breadth of the state; the geomorphology, topography, structure, relief and settlements etc., that make different village highly inaccessible to each other greatly add to

the relevant and utility of the system.

## TORCHLIGHT MORSE CODE COMMUNICATION

This is an indigenous initiative of Mizo people after some army retired personnel improvised the existing wireless telegraph based on Morse code communication into Mizo language and formed Mizo Signal Corps in 1945. Morse code is a method of transmitting textual information as a series of on-off tones, lights, or clicks that can be directly understood by a skilled listener or observer without special equipment. The International Morse Code encodes the Roman alphabet, the Arabic numerals and a small set of punctuation and procedural signals as standardized sequences of short and long "dots" and "dashes", or "dits" and "dahs". In torchlight Morse code communication method, hand-held portable torchlight was used to transmit Morse code by light signal and the receiver could easily interpret the message using the same CODE.

This mode of communication augured well since the folded belt of Mizoram comprises a series of sub-parallel arcuate elongated doubly plunging folds arranged en echelon with asymmetric and tight anticline and broad syncline and trending in an average N-S direction with a slight convexity towards the west. Not only that, the relief is high, the terrain are rugged which is filled with thick forest and vegetation, and there is a lack of road or river communication and most of the villages/town exists on the top of the hillocks i.e. settlement is on the hill top.

Therefore, this system was very useful for propagating message and information all over Mizoram within a very short time for example, dissemination and warning of untoward development like dead, accident, sickness, injuries, loss and found, forewarning of arrival of guest and events. Most of the village built signal tower of at least 10 ft height in the elevated places (so called light house) and any person who was well versed in the system was on duty by rotation or

if there is any urgent distress signal from the neighboring village was noticed, anyone expert in the system was called upon to received, reply and forwarded the message.

The alphabets and numbers and simple procedure followed in this system are :-

### MORSE CODE

A = ●-	B = -●●●	C = -●-●
D = -●●	E = ●	F = ●●-●
G = --●	H = ●●●●	I = ●●
J = ●---	K = -●-	L = ●-●●
M = --	N = -●	O = ---
P = ●-●●	Q = ---●-	R = ●-●
S = ●●●	T = -	T = ----
U = ●●-	V = ●●●-	W = ●--
X = -●●-	Y = -●--	Z = --●●

### NUMBERS

1 = ●---	2 = ●●---	3 = ●●●---
4 = ●●●●-	5 = ●●●●●	6 = -●●●●
7 = -●●●●	8 = ---●●●	9 = ---●●●
0 = ----		

### PROCEDURE

VE	=	I like to send message
K	=	I am ready, start sending
RU	=	Who are you
AA	=	Mention your village
Q	=	Please wait
R	=	OK/Over
SS	=	Slow down the message.
SQ	=	Speed up the message
OU	=	Very serious/urgent matters
G	=	Re-send the message as it is
NA	=	I can no longer send
D	=	Very important message
N	=	I did not received
X	=	Any other words?
C	=	All right.
B	=	Did you received my letter?
SB	=	Counting the syllable
TOL	=	Shut down another light near to you
AR	=	I finished
AAA	=	That's all (.)
Y	=	Get to the point/Don't beat about the bush

- W = Your light is very dim, use better light
- T = Ok, if not understand the message, don't send T, and the sender will re send the words
- E (8 times) = I commit a mistake, I will re-send the word
- V = Differentiate between sender and reciever, e.g. Lala V Zuala
- VET = The message is to propogate further
- VE ZIIT = The message is for your village and to convey to other village
- VEZ = There is a long message is for your village
- IMI = If send by the Sender-let me repeat, if send by Receiver- please repeat the message

Note: A line above the alphabet indicate combination and to be sent it continuously without any breakage.

The International Standard Morse Code System is as follows:

### International Morse Code

1. A dash is equal to three dots.
2. The space between parts of the same letter is equal to one dot.
3. The space between two letters is equal to three dots.
4. The space between two words is equal to seven dots.

A	•• —	U	•• —
B	—•••	V	••• —
C	—• —•	W	• — —
D	—•••	X	—•••
E	•	Y	—• —•
F	•• —•	Z	—• —•
G	—•••		
H	••••		
I	••		
J	• — — —		
K	—•• —	1	• — — — —
L	• —••	2	•• — — —
M	— —	3	••• — —
N	—•	4	•••• —
O	— — —	5	•••••
P	• — —•	6	—••••
Q	—• —• —	7	—• —•••
R	• —••	8	—• —• —••
S	•••	9	—• —• —• —•
T	—	0	—• —• —• —• —•

## DISCUSSION

The Mizo Signal Corps has so far established 24 sub headquarters and 300 duty stations all

over Mizoram, a song titled *Signal-a inbia keini pawl* (We're, communicated by signal) was composed by a famous Mizo poet Pu Rokunga. Unfortunately, this practice was banned and dormant after Mizoram was declared as a Disturbed Area according to Armed Forces (Assam & Manipur) Acts, 1958 in 1966 till the signing of Memorandum of Settlement in 1986. But it is now revived by Disaster Management Centre, Administrative Training Institute, Mizoram in collaboration with Mizo Signal Corps by training NGOs and Mizoram Police Radio Organization to ensure that communication is maintain even after a severe disaster strike when all forms of modern communication system fails considering a worst case scenario.

### Advantages

The advantages of this system is that alphabet, numbers and procedure are simple and easy to interpret. And the material viz. torchlight and batteries are inexpensive, easily available, light weight (hand-held) yet it can transmit and received message to and from far off places.

### Disadvantage and remedy

The disadvantage and remedial measure are

1. It cannot be used during day time (but can be replicated by sound or using sun reflection in a mirror/glass)
2. It is possible only when two person understand the system (Same case with HAM and W/T)
3. Misinterpretation of the message may leads to confusion (Same case with other system)
4. It is very slow and time consuming (If the sender and receiver are experience, the flow of message is not that slow)

## CONCLUSION

Disaster Management Centre, Administrative Training Institute has so far conducted 5

Training workshops in collaboration with Mizo Signal Corp covering 45 government official and equal numbers of NGO volunteers. Strategy and standard forms for situation and Damage and Needs Assessment Report has been work out for the states. The system needs further upgradation to tune with the wireless telegraph system of police (MPRO). It is envisage that more training programme may be conducted for more official and NGO to cover participation from all the villages of the state. This alternative mode of communication system may also be applicable in other part of India, especially in other hilly, vulnerable and inaccessible area.

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