Rural Training Center – Thailand (RTC-TH)

FOCUS

Community-based Environmental Education for the Self-sufficiency and Sustainability of Small Rural Family Farms

Grassroots Emergency Communications Operations
Non-Radio Ground-to-Air Signals
#2 Selected GTA Signals

Rural Training Center-Thailand Emergency Communications

GECO NRGTA-2 / 3

This is an RTC-TH EmComm GECO presentation

GECO stands for Grassroots Emergency Communications Operations. It is an all volunteer people-to-people effort to provide information about emergency communications to those living in remote rural areas.   In most cases the lessons can be self-taught or adapted to elementary school students. The idea is to use GECO to also help improve rural education.

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The Non-Radio GTA Signals Series

A three part series about non-radio ground-to-air signals for emergency communications.

These methods can be used to communicate with aircraft when no GTA radio is available or when radio equipment fails.

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Learn more about the RTC-TH in Note#1 after this presentation.

Educational Note

This presentation is formatted for individual study or viewing on a single computer screen by a few people.
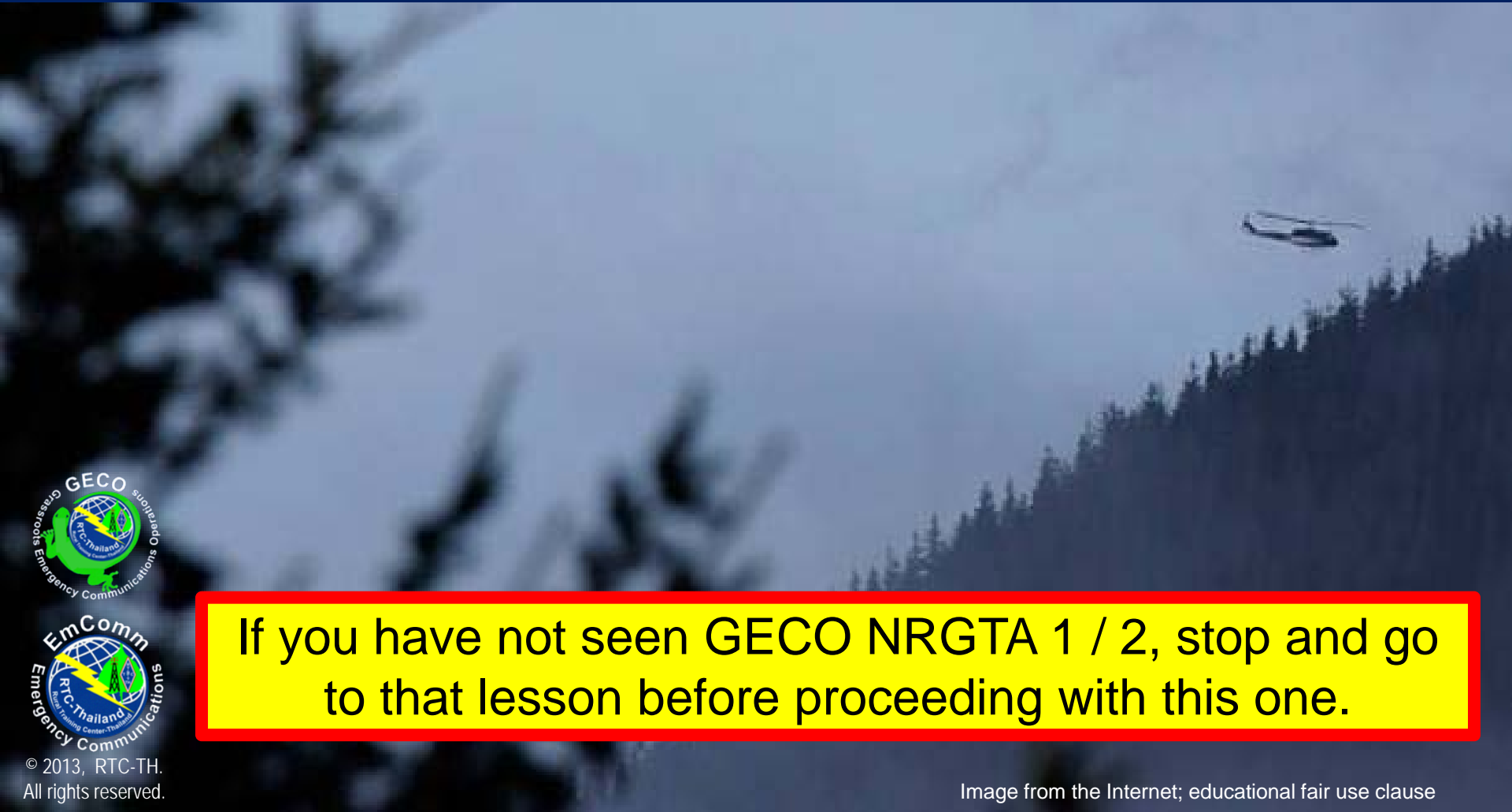
If showing this presentation to a larger group, a narrator must be available to read some of the slides with text which may not be legible to the majority of the audience.

Photo courtesy of N7YLA

Disasters and Helicopters

The first lesson in this series taught you how to attract an aircraft.

If you have not seen GECO NRGTA 1 / 2, stop and go to that lesson before proceeding with this one.

Image from the Internet; educational fair use clause

About This Lesson

This lesson is about
- Some basic non-radio ground-to-air (GTA) signaling methods
- How make selected GTA signals
- When to use those signals.

Assumptions

- You have seen the first lesson in this series, GECO NRGTA 1 / 3.
- When disaster strikes, helicopters may be the first outside help to arrive.
- Air search aircraft fly about 330-1000 m AGL in the search area.
- They may fly ~150-270 m AGL for a closer look; they have15 minutes to see you.
- Many people in remote rural areas have no way to communicate with aircraft.
- If you have a CB or ham radio, most aircraft are unable to talk with those radios.

If these don't apply to you, this lesson may not be very useful.

Assumptions

- EmComm involves both radio and non-radio methods. Effective EmComm uses an appropriate method suited to the circumstances.
- EmComm teams should be ready to use non-radio GTA signals if / when radio equipment fails or malfunctions.
- These signals must be robust and simple to be useful in an austere disaster setting.
- Night flight operations are unlikely in remote areas (especially mountainous regions).
- There should always be a back-up plan.

If these don't apply to you, this lesson may not be very useful.

Disasters and Helicopters

When disaster strikes in remote areas, helicopters may be the first outside help to arrive.

Most survivors have no way to communicate with helicopters

They can learn to make and use basic non-radio ground-to-air (GTA) signals.

Ground Panel / Symbol Basics

These are photos of a 5 m X 5 m signal panel.

Seen from 660 m AGL

- Bigger is better (W to L ratio 1:6)
- Angles are better than curves.
- Solid color better than multi-color.

Seen from 270 m AGL

- High contrast to background is best.
- High spot better than low spot.
- Placement along a linear feature is best.

Non-Radio GTA Signals

Your current environmental conditions affect your choice & use of signals.

Method	Time	Fair WX	Cloudy WX	Rainy WX	Snow	Fog
Smoke	☀️	Y	Y	N	Y	N
Mirrors		Y	?	N	Y	?
Symbols		Y	Y	Y	Y	?
Signal Panels		Y	Y	Y	Y	?
Gestures		Y	Y	Y	Y	?
	🌙	?	?	?	?	?
Fire		Y	Y	?	Y	?
Morse Lamp		Y	Y	Y	Y	?

Y = Yes	? = Maybe	N = No

Night signals are included as a backup even though we assume no night flight ops. *Be prepared.*

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When to Use Non-Radio GTA Signals

Smoke and mirror flashes attract attention at a distance. Use symbols, panels, and gestures to communicate once they have seen you.

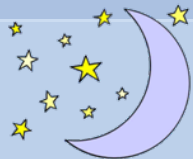See Note #2 after the end of the lesson to learn about aircraft acoustic detection.

Method	Use	First Hear Aircraft	Aircraft Locates You
Smoke		Light smoke fire	Keep fire out of LZ
Mirrors		Flash toward aircraft	**Stop using Mirror**
Symbols		Set out before	Make high contrast
Signal Panels		Set out	Keep out of LZ
Gestures		Too far away	Keep in clear view
			Need flashlights
Fire		Light fires	Keep fire out of LZ
Morse Lamp		Flash toward aircraft	**Stop flashing**

Avoid blinding the pilot when using a mirror or light to signal.

Making & Using GTA Signals as Elementary School Lessons

A project to make and use these signals integrates many different school subjects into a more practical, holistic lesson.

Method	Use	Math	Science	Geography	Language	Technology
Smoke		X	X	X	X	X
Mirrors		X	X	X	X	X
Symbols		X	X	X	X	X
Signal Panels		X	X	X	X	X
Gestures		X	X	X	X	X
Fire		X	X	X	X	X
Morse Lamp		X	X	X	X	X

The materials could be used as bilingual lessons to help improve English education in rural areas. Students make GTA signal kits as learning activities and as community service projects

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Advisory Note

PLAN YOUR OWN RESCUE

- Check with local emergency authorities. Get a copy of the non-radio GTA signals they use. If none are available, we suggest using the following signals.
- Give authorities a copy of the GECO non-radio GTA signals your village plans to use. This way the authorities can know the meaning of your signals.

Over the years, many groups and training manuals use different GTA signals and gestures for different purposes. We suggest the following GTA signals for GECO villages.

Non-Radio Signaling Method: Smoke

Green vegetation, oily rags, animal dung, used motor oil or a combination of these can make dense smoke to catch attention.

Image from the Internet; educational fair use clause

Be careful not to start a fire that become a threat to yourself and other survivors.

How to Make Smoke Signal Fire

Lots of dead, dry twigs or kindling for quick-starting, fast-burning fire.

Evergreen Boughs
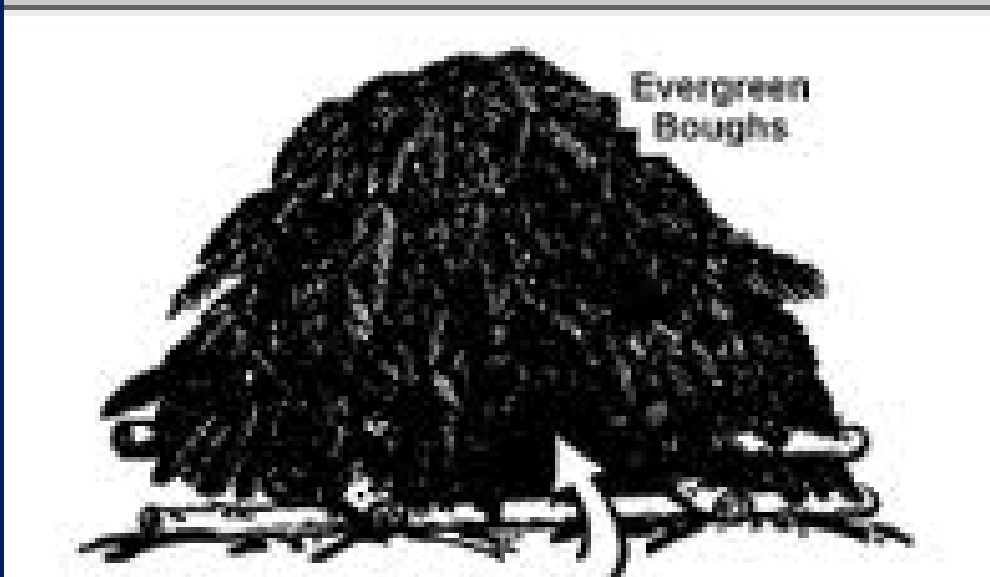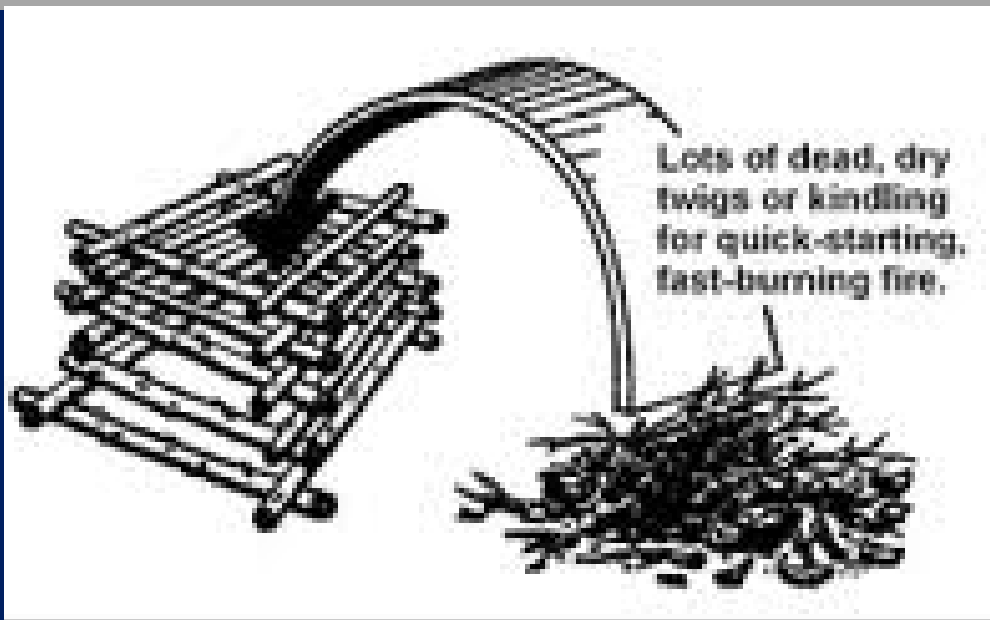
Small Opening for Lighting Fire

- Big amount of dry tinder
- Green vegetation, oily rags.
- Prepare ahead of time; stay close by; light tinder at first sound of an aircraft

Do not build signal fires within 90-120 m of a helicopter landing zone. Rotor downwash can blow embers and start accidental fires.

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Smoke as a Practical Science Lesson

Students can learn:
- the Fire Triangle (fuel, air, ignition source) to make and control fires.
- different ways to light fires.
- which local materials are combustible and which are suited for making smoke signals in different seasons.
- learn seasonal changes in the locality affecting the contrast background for smoke signals.
- acoustic and visual aircraft detection

Non-Radio Signaling Method: Mirror Flash
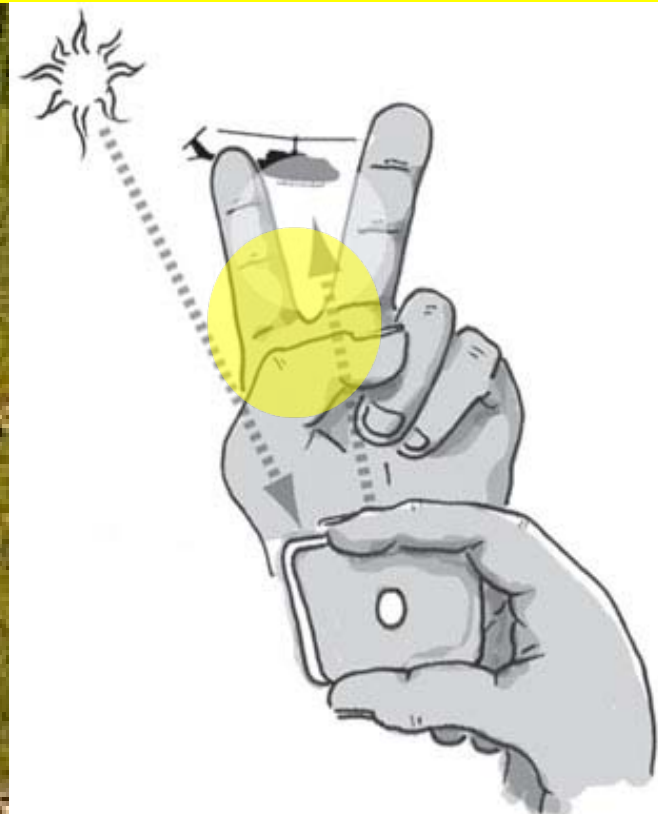
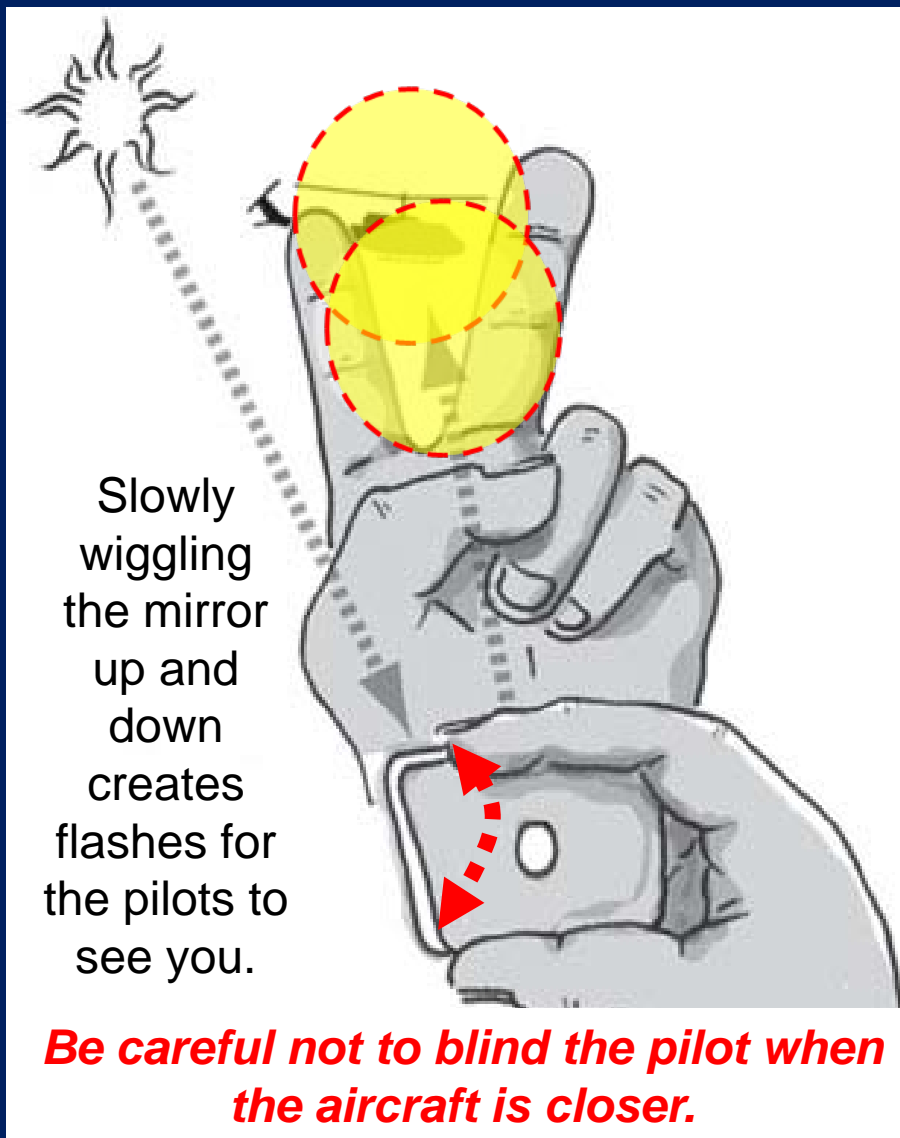Images from the Internet; educational fair use clause

Under ideal conditions, a small mirror flash can be detected more than 30 km away.

Use a mirror "flash" to signal an aircraft at a distance; but don't blind the pilot when they get closer.

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How to Use a Signal Mirror

Slowly wiggling the mirror up and down creates flashes for the pilots to see you.

Be careful not to blind the pilot when the aircraft is closer.

- Hold up one hand; make a "V" with two fingers.
- Sight the aircraft between your fingers.
- Reflect sunlight onto your hand; between two fingers
- Shift the bright spot of light up and down between your fingers aimed at the aircraft.

Image from the Internet; educational fair use clause

Use the Mirror Even If No Plane is Heard

Mirror flashes can be seen for long distances.
- Get to a high spot.
- Send mirror flashes in all directions.
- Flash in repeated, regular intervals; 3 flashes; pause for 1 minute.

Image from the Internet; educational fair use clause

There are many natural causes for "flashes". But a pattern of repeated regular intervals is not natural. It just might attract an aircraft.

A Signal Mirror for Practical Math & Science

Students can learn:
- acoustic and visual aircraft detection
- seasonal changes in solar azimuth and solar altitude relative to using a signal mirror.
- about reflection, the angle of incidence, and the angle of return
- aiming a signal mirror in terms of aircraft azimuth and altitude
- estimating aircraft distance (when to stop signaling an approaching helicopter)

Non-Radio Signaling Method: Symbols

Image from the Internet; educational fair use clause

"SOS" is a well-known distress symbol

Make Symbols

The bigger the symbol, the easier it is to see it from the air.

- Make a large SOS using material in strong contrast to the background.
- The larger the symbol, the more material needed, and the longer to set it up.

Images from the Internet; educational fair use clause

Other Symbols You Can Make

- SOS is an internationally recognized distress symbol.
- Aircrews are trained to recognize other ground symbol codes. You can also try to make the codes in the next section to communicate with rescue aircraft.

A larger symbol is better.
You must decide on the balance of time, energy, and materials to make the symbol.

Symbols as Practical Lessons

Students can learn:
- team building
- interpersonal communications
- leadership
- geometry when making the symbols
- visual contrast depending on the materials used and the background surface

Non-Radio Signaling Method: Signal Panels

Solid color, straight panels, in a clearing, in high contrast to the background, in an angular pattern are eye catching from the air.

"V" is a signal used by ground search party meaning "need assistance"

Image from the Internet; educational fair use clause

Various groups/manuals use similar panel patterns. Avoid confusion. Get a copy of the panel patterns your village will use to the authorities.

Signal Panel Patterns

ITU Survivor Ground-to-Air Signal Panels

Need doctor / serious injuries	I	Yes	Y
Need medical supplies	II	No	N
Need food / water	F	Don't Understand	JL
Going in this direction	→	Each panel is 1 m wide x 6 meters long. A minimum of 4 panels are needed for a set.	

There are many more panel patterns in various training manuals. Keep it simple and stick to these for GECO.

Advisory Note

There are many signal panel patterns in various training manuals for different groups (e.g. military, search and rescue, survivors, ground search teams, etc.). Some signal patterns are similar / alike but have different meanings.
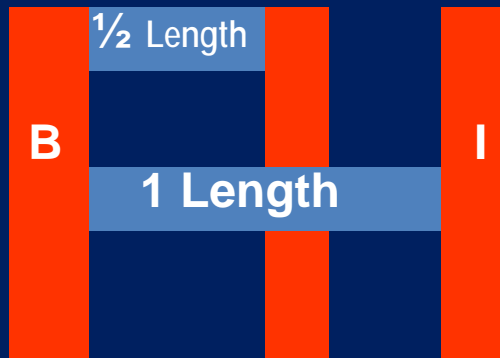
Avoid confusion. Keep it simple.
Use these for GECO.
Send a copy to emergency authorities so they understand your signals.

Setting Signal Panels

One panel is the "**B**ase" to form signals. The "**I**ndex" panel is the last put down and first removed when changing signals.

½ Length

B   I

1 Length

Secure all panels to keep the wind from blowing them away

Panel signal area
Flat, clear, open, no shadows; 13 m X 30 m; 90-120 m from the LZ / DZ; panels must have strong color contrast against the ground in the signal panel area

Panels are 1 m X 6 m (minimum). A set of 4 panels are needed for GECO panel patterns. Spacing is either ½ or 1 panel length.

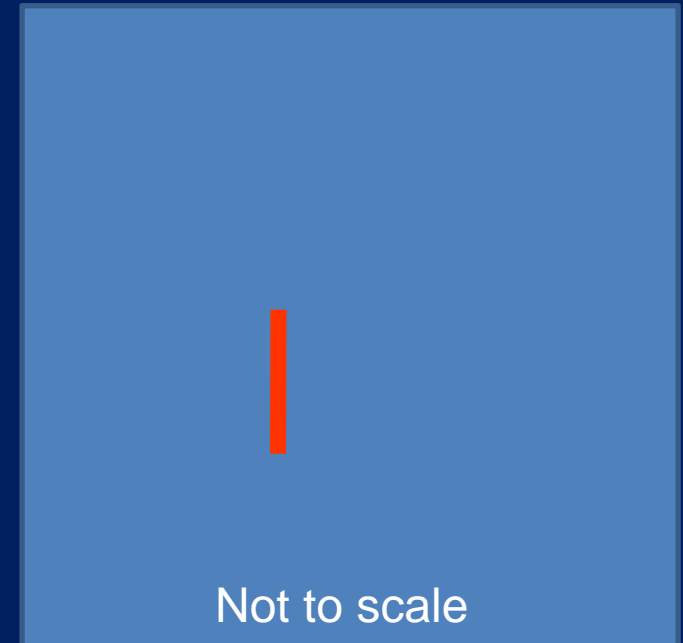# Setting Signal Patterns

Need doctor / serious injuries

B

Place "Base" panel slightly off center; leave space for adding panels above and to the right.
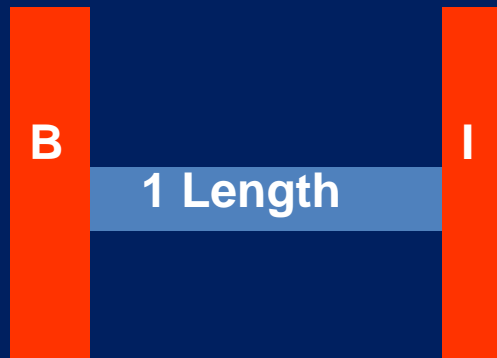
Not to scale

Remember to secure the panels to the ground so the wind or helicopter rotor downwash won't blow them away.

Setting Signal Patterns
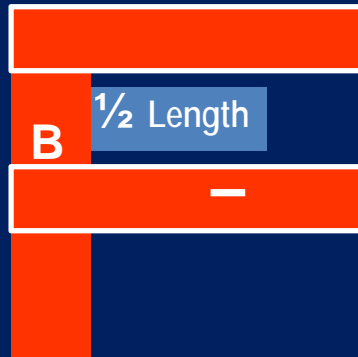
Need medical supplies

B   1 Length   I

- Place "Base" panel
- Put the "Index" panel parallel to "Base" panel; spaced 1 panel length apart.

Remember to secure the panels to the ground so the wind or helicopter rotor downwash won't blow them away.

Setting Signal Patterns

Need Food / Water

- Lay out the "Base" panel
- At the top of the "Base", place a panel at right angles to the "Base" pointing to the right;
- Put the "Index" panel parallel to the second panel ½ panel length apart (or less as needed) to form the letter "F".
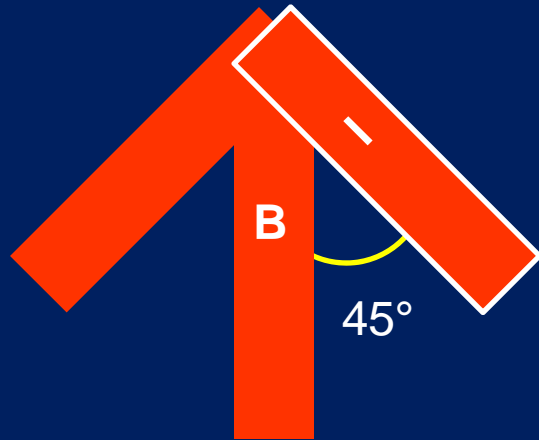
Remember to secure the panels to the ground so the wind or helicopter rotor downwash won't blow them away.
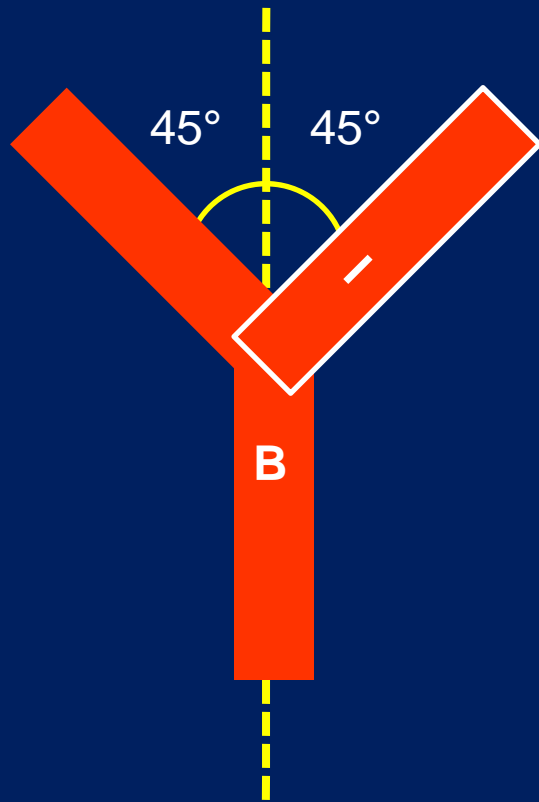
Setting Signal Patterns

Going this Direction

- Lay the "Base" along the azimuth desired.
- Add 2 panels to the "Base" each rotated 45° to the base to form an arrow pointing in the direction desired.

Remember to secure the panels to the ground so the wind or helicopter rotor downwash won't blow them away.
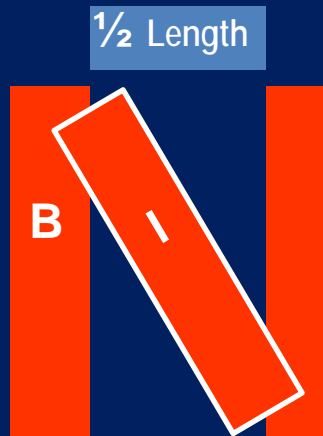
Setting Signal Patterns

Yes

45°   45°

B

- Lay out the "Base" panel.
- Extend a guide line beyond the top of the panel.
- Lay out 2 additional panels to form a "Y".
- Each rotated 45° from the guide line as the arms of the "Y".

Remember to secure the panels to the ground so the wind or helicopter rotor downwash won't blow them away.

Setting Signal Patterns

No

½ Length

B I

- Lay out the "Base" panel.
- Set a panel parallel to the "Base" panel ½ panel length away.
- Set the "Index" panel at an angle from the top of the "Base" panel to the bottom of the second panel to form the "N"

Remember to secure the panels to the ground so the wind or helicopter rotor downwash won't blow them away.
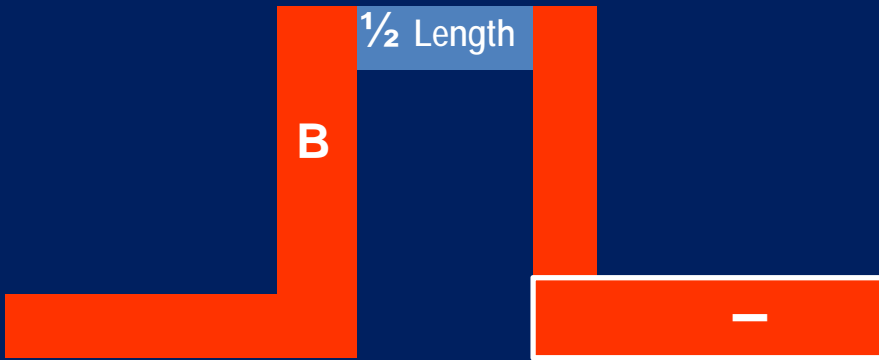
Setting Signal Patterns

Don't Understand

- Lay out the "Base" panel and a second panel parallel to it ½ panel length apart.
- Set a third panel at right angles to the Base, pointing to the left.
- Set the "Index" panel at right angles to the parallel panel; point it to the right.

Panels are 1 m X 6 m (minimum). A set of 4 panels are needed for GECO panel signals. Spacing is either ½ or 1 panel length.

Panel Visibility Computer Simulation

Possible appearance from 1000 m AGL

Aircraft fly ~330–1000 m AGL over the search area. They can fly lower to briefly investigate a point of interest.

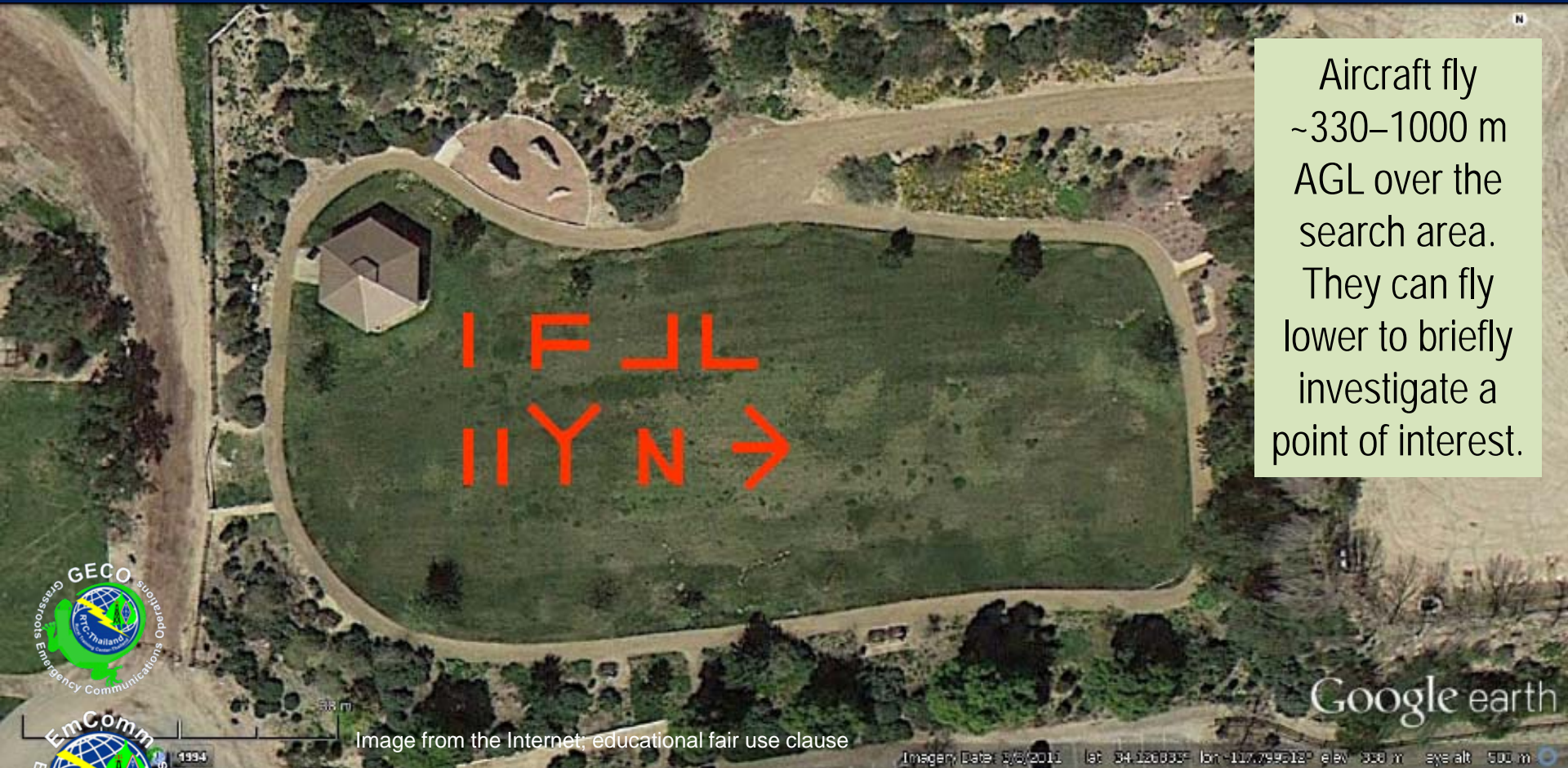Image from the Internet; educational fair use clause

GTA panels (1m X 6m) were scaled, set in prescribed patterns, and placed on Google earth images selected at estimated air search altitudes.

Panel Visibility Computer Simulation

Possible appearance from 500 m AGL

Aircraft fly ~330–1000 m AGL over the search area. They can fly lower to briefly investigate a point of interest.

Image from the Internet; educational fair use clause

GTA panel patterns were scaled and placed on Google earth images selected at estimated air search altitudes.

Panel Visibility Computer Simulation

Possible appearance from 400 m AGL

The ground image quality deteriorated below 400 m AGL and was not clear enough to continue the simulation.

Aircraft fly ~330–1000 m AGL over the search area. They can fly lower to briefly investigate a point of interest.

Image from the Internet; educational fair use clause

GTA panel patterns were scaled and placed on Google earth images selected at estimated air search altitudes.

Panel Visibility Computer Simulation

This simulation suggests that GTA signal panels strongly contrasting to their background can be readily seen from common range of air search altitudes with clear conditions.

Aircraft fly ~330–1000 m AGL over the search area. They can fly lower to briefly investigate a point of interest.

Image from the Internet; educational fair use clause

Google earth

FFI: See Note #4 regarding the small sized VS 17 GTA signal panel.

Making Signal Panels

- Each panel is 1 m wide X 6 m long.
- These panels can be made of locally available fabric.
- Use colors that contrast vividly with the natural background. Consider how they may appear from the air in different seasons.

Consider how seasonal changes in your area affect the color contrast of the GTA panels to the background.

Signal Panels as Practical Lessons

Students can learn:

- measuring, cutting, sewing
- simple geometry to set signal panels in the code patterns.
- learn about visual contrast and visual perception under different lighting conditions.
- how seasons affect color contrasts

Signal panels must be securely fastened to the ground to keep them from blowing away.
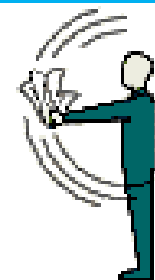
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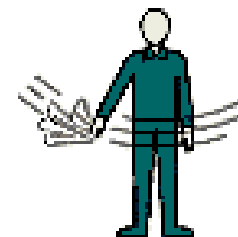
Non-Radio Signaling Method: Body Gestures

Certain body gestures are internationally understood ground-to-air signals *from* survivors.
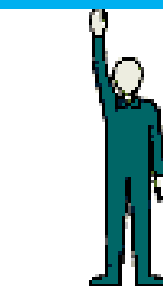
All OK,

Yes (affirmative).

No (negative).

At night, use the same gestures holding lights.

Or you can stand in a lighted area where the aircrew can see you.

Need medical assistance urgently.

Image from the Internet; educational fair use clause

Various groups/manuals use different gestures. Avoid confusion. Get authorities a copy of these body gestures your village will use.

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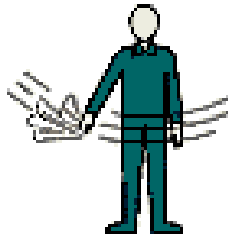RTC-Thailand
Rural Training Center-Thailand

Suggested Body Gestures

All OK,

Yes (affirmative).

No (negative).

At night, use the same gestures holding lights.

Or you can stand in a lighted area where the aircrew can see you.

Need medical assistance urgently.

- Get to a clear area where you can be seen against a contrasting background.
- Perform these gestures slowly and deliberately; exaggerate them so they are obvious to the aircrew.

There are many more body gestures in various training manuals. Keep it simple and stick to these for GECO. Be sure to give a copy to local authorities. They can use it to brief aircrews to understand your signals.

Be Careful When Waving to Helicopters

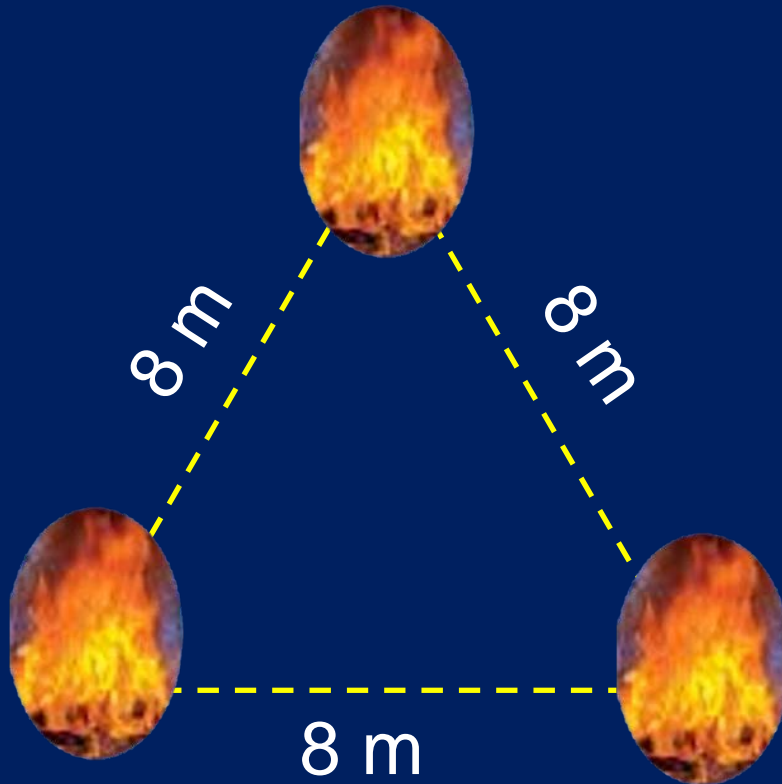Teach everyone ***not*** to wave with 2 arms over their head when they see helicopters approaching

This is the signal UNSAFE ;DO NOT LAND. They may turn around and leave you.

Image from the Internet; educational fair use clause; modified for this presentation

Non-Radio Signaling Method: 3 Fires

At night, 3 fires spaced 8 m apart in a triangle is an international distress signal

8 m

8 m

8 m

Even though we don't expect night flight operations, night GTA signals are included. These can also be used to signal ground rescuers from a distance if the signals are set up on high ground.

Be careful not to start a fire that become a threat to yourself and other survivors.

Flame image from the Internet; educational fair use clause

How to Make Signal Fires

8 m

8 m

8 m

8 m
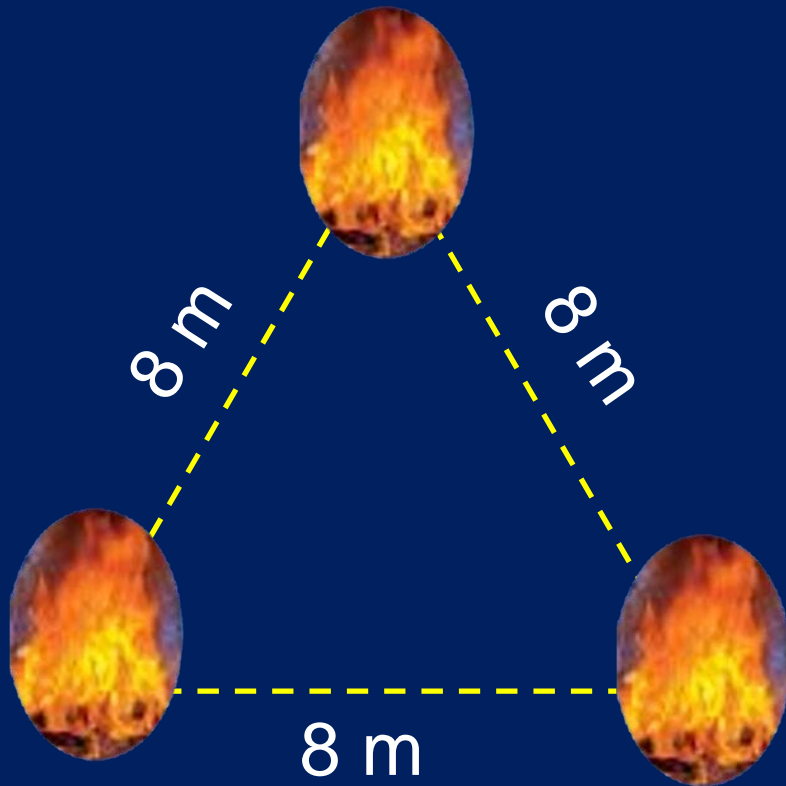
- Make 3 fires the same size laid out in a triangle. Use lots of dry tinder and wood so fires start fast and burn bright.
- The triangle is 8 m per side.
- Do this in a clear area to avoid starting other fires.
- Light fires when first hearing aircraft.

Do not build signal fires within 90-120 m of a helicopter landing zone. Rotor downwash can blow embers and start accidental fires.

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Signal Fires as Practical Lessons

Students can learn:

- the Fire Triangle (fuel, air, ignition source) to make and control fires.
- different ways to make a fire in wet or dry conditions.
- which local materials are combustible and which are suited for making bright fires
- learn seasonal changes in the locality affecting the fire making materials
- acoustic and visual aircraft detection

Non-Radio Signaling Method: Morse Lamp

Images from the Internet; educational fair use clause

Use a flashlight and Morse code to send "SOS" is an effective at night distress signal

Being able to send "SOS" is the key (not sending lengthy messages).

Morse Lamp to Send SOS

Needed:
- Flashlight
- Spare batteries
- Morse Code Chart

Goal: Practice to send "SOS" by flashlight.

Aim the flashlight at the aircraft. Then send the SOS signal by turning the light on / off. Repeat at 1 minute intervals.

To send SOS using a flashlight, remember a dash is 3 times longer than a dot.

Image from the Internet; educational fair use clause

Teach Morse Code as a Language

International Morse Code

1. The length of a dot is one unit.
2. A dash is three units.
3. The space between parts of the same letter is one unit.
4. The space between letters is three units.
5. The space between words is seven units.

A ● ▬
B ▬ ● ● ●
C ▬ ● ▬ ●
D ▬ ● ●
E ●
F ● ● ▬ ●
G ▬ ▬ ●
H ● ● ● ●
I ● ●
J ● ▬ ▬ ▬
K ▬ ● ▬
L ● ▬ ● ●
M ▬ ▬
N ▬ ●
O ▬ ▬ ▬
P ● ▬ ▬ ●
Q ▬ ▬ ● ▬
R ● ▬ ●
S ● ● ●
T ▬

U ● ● ▬
V ● ● ● ▬
W ● ▬ ▬
X ▬ ● ● ▬
Y ▬ ● ▬ ▬
Z ▬ ▬ ● ●

1 ● ▬ ▬ ▬ ▬
2 ● ● ▬ ▬ ▬
3 ● ● ● ▬ ▬
4 ● ● ● ● ▬
5 ● ● ● ● ●
6 ▬ ● ● ● ●
7 ▬ ▬ ● ● ●
8 ▬ ▬ ▬ ● ●
9 ▬ ▬ ▬ ▬ ●
0 ▬ ▬ ▬ ▬ ▬

Motivated students can learn Morse code as a "foreign" language. They would be better prepared for emergency communications and for getting their ham license.

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Communication involves a Sender and a Receiver

So far, we have talked about sending a message from the ground-to-air

How do you know they understand your message?

Helicopter image from the Internet; educational fair use clause
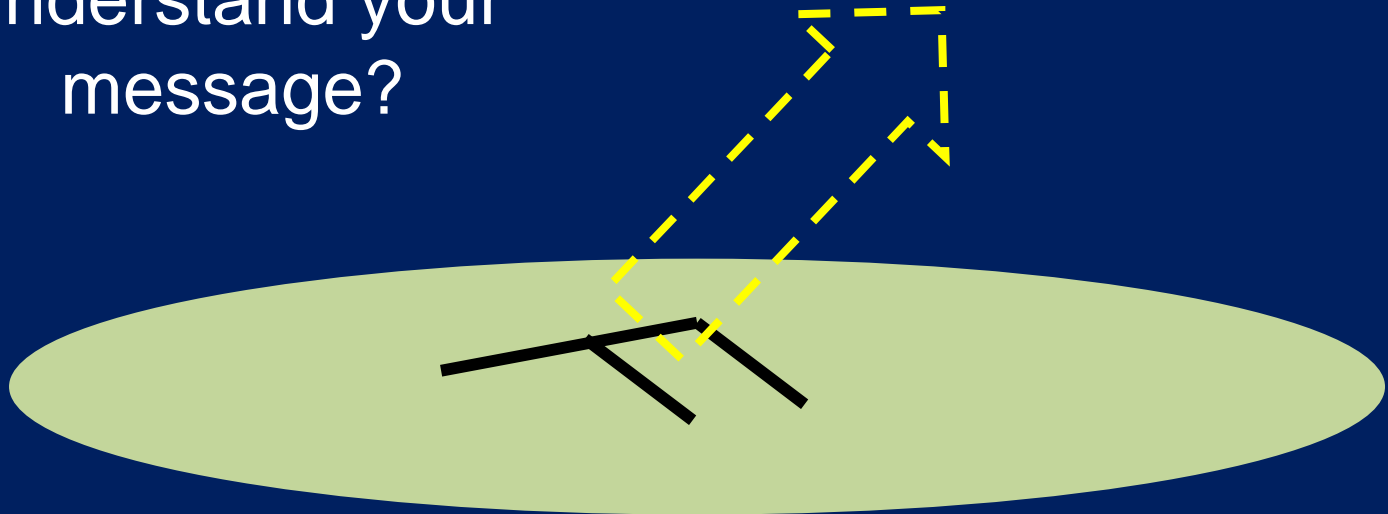
Aircraft Responses to GTAs

During daylight, helicopters may get low enough for aircrews to gesture to you or drop a message.

Watch the aircrew for signals; the pilot is busy flying.

Image from the Internet; educational fair use clause

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Possible Aircraft Responses to GTA Signals

During daylight, helicopters may be low enough for aircrews to gesture to you or drop a message.

These are ("unofficial") common familiar hand signals that may be used.

Yes   No

OK   Stop/Wait

Watch the aircrew for signals; the pilot is busy flying.

Possible Aircraft Responses to GTA Signals

Fixed wing aircraft can also drop messages.

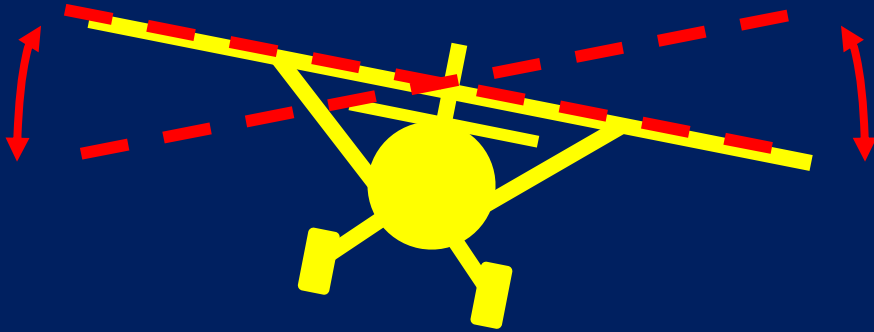An air dropped message has a colored streamer for higher visibility.

Depending on the message, it may be possible to respond by GTA signal panels or body gestures.

Images from the Internet; educational fair use clause

Fixed Wing Aircraft Responses to GTAs

Although we expect helicopters in relief operations, fixed wing aircraft can be used in air searches as well.

Signal Received; Understood
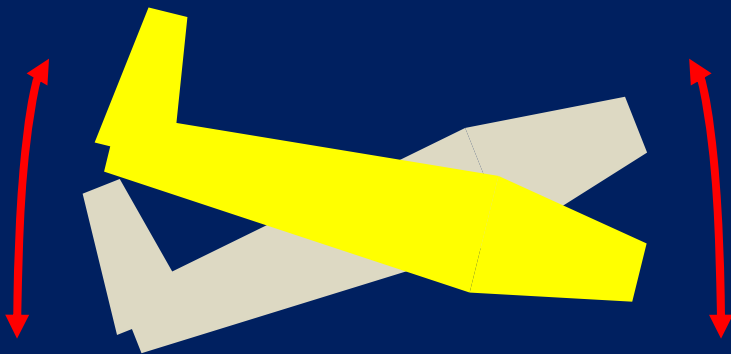
Pilot rocks wings up and down.

Signal Received; Not Understood

Pilot turns plane in a full circle to the right

Fixed Wing Aircraft Responses to GTAs

Although we expect helicopters in relief operations, fixed wing aircraft can be used in air searches as well.

Yes
Pilot dips plane up and down.

No
Pilot skids plane left and right

The Next Lesson in This Series

Grassroots Emergency Communications Operations
Non-Radio Ground-to-Air Signals
#3 Basic LZ / DZ Support

Rural Training Center-Thailand Emergency Communications
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GECO NRGTA-3 / 3

Learn the selected basic non-radio GTA signaling methods for basic LZ / DZ operations.

Questions or Comments

We are always trying to improve our lessons. Your constructive comments and suggestions are welcomed.

You may contact us by e-mail:
hs0zhm@gmail.com

Please tell us how you heard about us and the lessons of interest to you.

For More Information about RTC-TH EmComm Lessons

Contact
Greg Lee

RTC-TH Co-founder

Author / Mentor

Geography Professor Emeritus

Via E-mail
hs0zhm@gmail.com

Via Skype video
conference call: rtc_th

Lesson Archives: www.neighborhoodlink.com/RTC-TH_Tech/pages

FFI: Other *free* RTC-TH lessons see Note #19 after the end of this presentation.

Community-based Environmental Education for

The End

Continue past this slide to get to the Notes mentioned in the presentation.

Note #1: About the
Rural Training Center-Thailand (RTC-TH)

We are an all volunteer organization providing community-based environmental education for self-sufficiency and sustainability of small rural family farms. We receive no government or outside funding.
We believe in what we do.
We spend our own money to do it.

www.neighborhoodlink.com/org/rtcth

E-mail: rtc2k5@gmail.com

The Rural Training Center-Thailand was created to honor the life and memory of Mr. Tang Suttisan (a father of one of our co-founders), farmer and former custodian of Ban Na Fa Elementary School who appreciated and valued education.

The RTC-TH EmComm Program

is a volunteer effort to provide emergency amateur radio communications for local community self-sufficiency and sustainability in times of need.

E-mail: hs0zhm@gmail.com

The RTC-TH EmComm GECO Program

is a volunteer effort to provide remote rural area hams without formal EmComm training a bare bones guide for single-handed emergency communications operations.

When disaster strikes, a lone rural hobbyist ham may suddenly become an "accidental" EmComm ham. GECO strives to give the "accidental" ham some minimal systematic EmComm operating guide lines.

E-mail: hs0zhm@gmail.com

The Gecko in GECO

We admire the ability of this lizard to cling tenaciously to walls and ceilings.
We hope grassroots emergency communication operators will be equally tenacious in serving their communities.

Note #2: Aircraft Acoustic Detection

WW II historic photos of early aircraft detection methods inspired us. We decided to make a smaller version using a discarded plastic cup.

Jiffy Fresh Cool

Making a "Bat Ear" from a Discarded Cup

We carefully cut the bottom out of the cup.

Just hold it up to your ear and point it in the general direction of the aircraft to amplify the sound.

You can also use it as a megaphone when organizing GTA signal teams at the LZ / DZ.

Note #4: VS 17 Signal Panel Visibility Simulation

The RTC-TH EmComm kit contains a set of four VS 17 military surplus GTA signal panels.

VS 17 panel:
0.5 m Wide x
1.8 m Long

The VS 17 panel is smaller than the suggested 1 m X 6 m GECO GTA signal panel. The VS 17 panels have high visibility orange on one side and high visibility pink on the other.

Image from the Internet; educational fair use clause

The larger 1m x 6m panels are to the left. VS 17 panels are to the right (both high visibility orange and pink).

The VS 17 panel is 0.5 m Wide x 1.8 m Long (smaller than the suggested 1 m x 6 m GECO GTA signal panel.)

The VS 17 panel images may be slightly larger than scale for this altitude. Some VS 17 patterns are more easily read than others.

VS 17 Signal Panel Visibility Simulation: 500 m AGL

The larger 1m x 6m panels are to the left. VS 17 panels are to the right (both high visibility orange and pink).

The VS 17 panel is 0.5 m Wide x 1.8 m Long (smaller than the suggested 1 m x 6 m GECO GTA signal panel.)

All panels are legible. It is evident when making non-radio GTA symbols and panels, bigger is better.

The larger 1m x 6m panels are to the left. VS 17 panels are to the right (both high visibility orange and pink).

Image from the Internet; educational fair use clause

The VS 17 panel is 0.5 m Wide x 1.8 m Long (smaller than the suggested 1 m x 6 m GECO GTA signal panel.)

This simulation shows the GTA panels are legible and get the message out.

Note #4: Other Free RTC-TH Lessons

The Rural Training Center-Thailand has a diverse catalog of lessons for rural families at http://www.neighborhoodlink.com/RTC-TH_Tech/pages

Community-based Education: Alternative learning methods for teachers, parents, students;

Applied Geography: Field survey methods for local villagers and students

Other Free RTC-TH Lessons

Save Our Individual Livelihood: Lessons for the self-sufficiency and sustainability of small rural family farms

Mobile Emergency Weather Station: Systematic weather observations *from* remote disaster sites to support relief helicopter flight operations

GECO stations should seriously consider using MEWS. It can also be useful for sustainable agriculture.

MEWS Lesson Series

Orientation

Basic

Advanced

The Emergency Preparedness Lesson Series

Completed and available

In Development

EP-1   EP-2   EP-3   EP-4

EP-5   EP-6   EP-7   EP-8

EP-9   EP-10   EP-11   EP-12

All lessons can be adapted to any location on Earth using the Geographic Systems Model.

Community-based Environmental Education for

The End

www.neighborhoodlink.com/org/rtcth

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