

RTC-TH EmComm Sparky Operations Guide



Ready to Serve and Sustain Our Community



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RTC-TH EmComm Mobile / Portable Operations Guide

RTC-TH EmComm functions are:

- English language local emergency relay;
- MEWS Observations and reporting via radio;
- Recon Scouting within 10 km radius of RTC-TH licensed amateur radio stations: Ban Wangwa, Thawangpha Sub-district; Ban Na Fa, Jompra Sub-district (both in Thawangpha District, Nan Province).

Operator and equipment safety are a top priority on all RTC-TH EmComm operations. We have limited personnel, equipment and budget. We must protect and maintain our EmComm resources if we are to be "Ready to Serve and Sustain Our Community". Normally the HF and mobile VHF radios remain at the Wangwa EchoLink-Link Station.

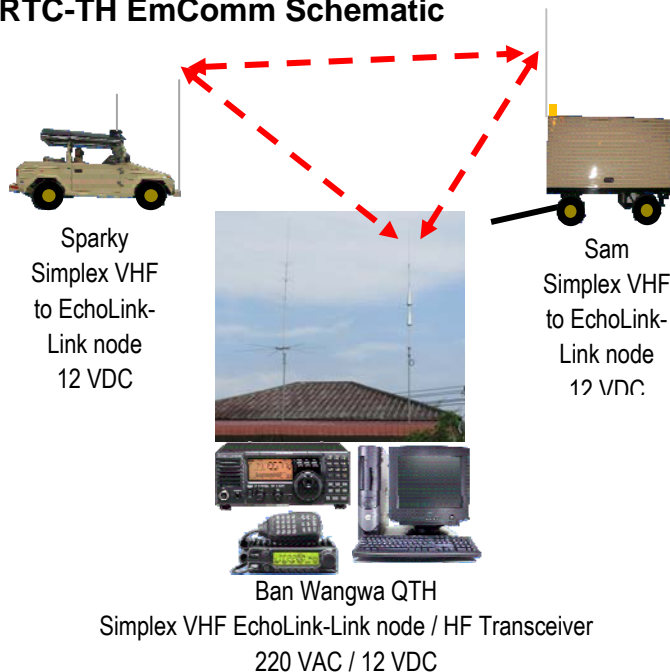
RTC-TH EmComm is based on VHF simplex radio links to our EchoLink®-Link node for local radio traffic. International traffic goes through our Wangwa station via EchoLink® (if the Internet is available) or HF. This EmComm radio net can only work if sufficient licensed volunteer operators are available. Vehicle battery charging is done at the Wangwa station.

Sparky has a maximum range of 40 km (1-way) but is kept to a 10 km radius around RTC-TH EmComm Stations. We keep the vehicle battery power as a reserve for our EmComm radios. Sam

is our portable EmComm / MEWS station. It can be placed in our operating area as needed.

Sparky and Sam need 220 VAC line power to recharge their batteries. Full recharging time is usually completed overnight. The vehicle battery charger requires a fully grounded 3-prong socket.

RTC-TH EmComm Schematic



A series of maps / diagrams showing our location in Nan Province, Thawangpha District, etc. are found in the RTC-TH EmComm General Operations Guide.

RTC-TH EmComm Modes		
Pedestrian and Bicycle modes are used for local area scouts. EmComm operators should be paired with another licensed operator or a non-radio operator. Avoid sending an EmComm operator out alone. Personal safety is critical due to limited of volunteers.		
Item	Pedestrian	Bicycle
# Radio Operators	1	1
Operating range	1-3 km	4-6 km
Est Duration	1 day	1 day
Radio		Yaesu FH-912 w/ coax adapters
Power Supply	Standard	(2) NiCd / NiMH, (1) AAA battery pack
	Optional	12 VDC gel pack (Yaesu FH-912 can use its adapter cord)
Antennas	Prime	Comet SMA 24 or Diamond SRHF40A; w/ Tiger Tail
	Optional	• 450Ω Slim Jim + nylon cord & coax • Arrow 4 element Yagi (needs blue mast & coax)
	Back-up	OEM rubber duck
	Other Equipment	General
	MEWS	Basic MEWS kit w/ PWIS (Kestrel 3500 w/ spare batteries if available)

RTC-TH EmComm Modes (cont'd)				
Sparky is a mobile EmComm recon scout vehicle. Operating range is limited to keep battery power in reserve for radio operations. Sam is a portable station as back-up if a fixed base station fails or if a station is needed elsewhere in the community.				
Item		Sparky	Sam	
# Radio Operators		1	1	
Operating range		8-10 km♦	10-20 km♦	
Est Duration		1 day◇	1 day +◇	
Radio		Yaesu FH-912 w/ coax adapters		
Power Supply	Standard		12 VDC vehicle power via Yaesu FH-912 adapter cord	
	Optional		(2) NiCd / NiMH, (1) AAA battery pack	
Antennas	VHF	Vehicle	Hustler UGM	Tram 1150 NMO
			Kenji DP CL2E	Kenji DP CL2E▽
		Mast	450Ω Slim Jim	Thai Slim Jim
			Slingshot (small)	Slingshot (large)
	HF	Vehicle mounted	Spring Ball Whip+wire #1■	
			OPEK HVT400▽	
			Super Antenna MP-1▽	
			1-wire dual NVIS▽	
	Yellow shading = default antenna ▽= shared between vehicles; ■=each has one			
	Optional	• Arrow 4 element Yagi (needs blue mast)		
Back-up		• Comet SMA 24 or Diamond SRHF40A; w/ Tiger Tail • OEM rubber duck		
	Other Equipment	General	Equipment / supply packs kept on board.	
MEWS		Advanced MEWS kit w/ PWIS (Kestrel 4500 w/ spare batteries shared)		
Push-up Masts		Blue: adjusts from 1.23 m – 3.35 m Silver: adjusts from 1.4-4.9 m		

Before Deploying to the Field

Every operator is an individual with unique circumstances. Use this checklist to guide your decision to "GO / NO GO" point. Binary scoring. Yes = 1; No=0

#	Question		
1	Is your family / property safe and secure?		
2	Is all of your equipment in good operating condition to go?		
3	Do you have all necessary current radio / ID documents?		
4	Do you know the operating bands / frequencies?		
5	Will you be going on the deployment with others?		
6	Do you know the Deployment Area (DA)?		
7	Do you have maps of the DA?		
8	Has the DA been scouted and mapped?		
9	Do you know the present DA conditions?		
10	Do you know who is in charge in the DA?		
11	Are you familiar with the route to the (DA)?		
12	Is there an alternate route to/from the DA?		
13	Do you have transport and fuel for a round trip to the DA?		
14	Do you know how long you will be gone?		
15	Can you afford to pay your own way for the duration of the deployment?		
16	Do you have sufficient emergency power to operate for the term of the deployment?		
17	Do you have sufficient supplies to be self-sufficient for the term of the deployment?		
18	Do you have a Plan B if it will be longer?		
0-12	13-14	15	16-18
NO GO; to close to 50-50	Maybe NO; odds are against a GO	Maybe GO; but carefully weigh the odds	Go; but carefully weigh items answered NO

Before Deploying to the Field (cont'd)

Serving well under stressful and chaotic conditions of a disaster requires full concentration. Any distractions can be costly in terms of money and lives...even your life.

When being called to volunteer and leave your safe area, go through the checklist on the left. Any "NO" answers should give you pause to consider deployment. You can only serve if you are in a position to do so. This means you have:

- **A safe base** from which to operate. When your family and home are secure, you won't be worrying about them while trying to deal with the disaster.
- **A self-sufficient capability** to operate independently on full emergency power. This means you will not become a burden to the disaster survivors or relief workers.
- **An ability to afford to serve without pay or compensation.**

There is no shame in staying at home and being a dependable radio relay station for emergency traffic.

RTC-TH EmComm Deployment Guidelines

The goal is to be able to get “on the air” within 60 minutes from the time of the first notification call. The summary table below lists critical information needed before deployment.

Deployment Information Checklist


Notification Call	Date	TH	Time	TH
		UTC		UTC
Rec'd by:				
From:	Name		Title:	
	Ph		Call Sign	
Op Contact	Priority		Frequency	
	Primary			
	Secondary			
	Tertiary			
	<input type="checkbox"/> More information on separate pages			
Event	<input type="checkbox"/> Storm <input type="checkbox"/> Flood <input type="checkbox"/> Landslide <input type="checkbox"/> Fire <input type="checkbox"/> Crowd Control			
	Accident <input type="checkbox"/> Traffic <input type="checkbox"/> Boating/Drowning <input type="checkbox"/> Plane			
	<input type="checkbox"/> Medical emergency <input type="checkbox"/> Animal Control <input type="checkbox"/> Search/Rescue			
	<input type="checkbox"/> Other (specify)			
Logistical Support:	Est Duration:			
	<input type="checkbox"/> 220 VAC access <input type="checkbox"/> Batteries or recharging access			
	<input type="checkbox"/> Drinking water <input type="checkbox"/> Food <input type="checkbox"/> Shelter			
	<input type="checkbox"/> Other (specify)			
Flight Ops	<input type="checkbox"/> Wing <input type="checkbox"/> Helo		Amateur VHF available? <input type="checkbox"/> Yes	
	<input type="checkbox"/> No <input type="checkbox"/> Yes		Frequencies:	
Specific Duties / Actions:				

RTC-TH EmComm Documents


The following documents must be in the vehicle at all times when operating mobile / portable. All licenses must be current / valid.

Radio Operator	NTC Amateur radio operator; Intermed.	
	FCC Amateur radio operator; General	
	Passport (w/ Thai visa)	
	Thai Driver's License	
Station	NTC Ban Wangwa Station License	
Licenses	NTC Ban Na Fa Station License	
Equipment Licenses	Yaesu FH-912 #1	Assigned to Sam / Na Fa
	Yaesu FH-912 #2	Assigned to Sparky / Wangwa
	ICOM 2200T	Assigned to EchoLink®-Link at Wangwa Station but can be reassigned as needed
	ICOM 718	Assigned to Wangwa Station but can be reassigned as needed.
RTC-TH EmComm Guides	Mobile / Portable Operating Guide	
	Station Operating Guide	
	VHF Operating Guide	
	HF Operating Guide	
	General Operating References	


Sparky: Specifications									
Dimensions			H	L	W				
Exterior	Body		1.8 m	3.0 m	1.37 m				
	Overall		2.1 m	3.7 m	1.86 m				
Wheel / Tires			Ground Clearance: 16 cm						
Wheels		Wheel base: 2.27 m		Wheel track: 1.45 m					
Turn Radius		2 m	Slope: 15-20° (27-37%)						
Tires	Number		Size		Pressure				
	4		175-70 13" Tubeless		F: 14 R 18-22				
Vertical Clearance	Car Mounted	Mobile	Warning Beacon			1.86 m			
			VHF	Hustler UGM			2.200 m		
				Kenji DL CL2E			2.070 m		
		Park 'n Op	HF	Spring / Ball Mt. w/ stinger			2.100 m		
	OPEK HVT400			3.220 m					
	Super Ant MP-1			3.77 m					
	Mast	VHF	450Ω Slim Jim		Blue push-up mast	5.85 m			
			Slingshot (small)			5.16 m			
	Electrical	Batteries		(8) 6 VDC, wet cell @225 Ah; (Σ1800 Ah)					
Lights		Headlight		(2) High / Low clear		Would like to replace with LEDs to reduce power consumption			
		Turn Signals		(4) amber					
		Tail / Brake		(2) red					
		Back-up		(2) clear					
Extra Radio Batt		12 VDC AGM Deep Cycle 75 Ah							
Power panel		12 VDC; Rigrunner 4010S							
Fuses		Motor 175 A; Lights 10A; Control/Relay 10A							




Front



Rear



Driver's Side



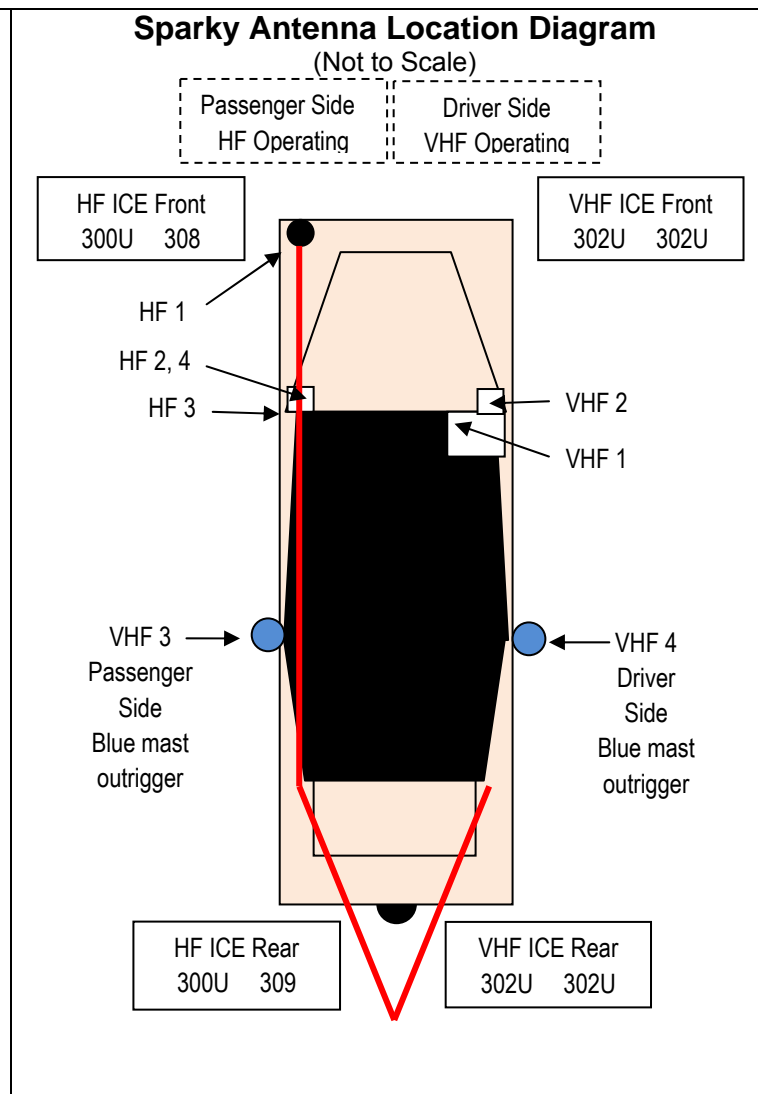
Passenger's Side

Duty Cycles / Full Battery Charge						
Sparky (Radio)	Mx Power Draw		3:1 Duty cycle (4 hrs)	Battery Discharge Level Duty Cycles / Op Hrs		
				30%	40%	50%
Yaesu FH-912	RX	0.165A	1.995A	67.67	90.23	128.7
	TX	1.5A		270.6 8h	360.9 2h	8 515.1 2h
ICOM 2200T	RX	1A	8.5A	15.88	21.18	26.47
	TX	5.5A		63.52 h	84.72 h	105.8 8h
ICOM 718	RX	2A	26A	5.19	6.92	8.65
	TX	20A		20.76 h	27.68 h	34.6h
Based on (2) X 6 VDC 450Ah wet cell battery.						
	Standard practice; recharge battery		Ready reserve to extend ops before recharging		Dire emergency; max allowable discharge before recharging	

Example: You operate at 3:1 duty cycle, 8 hrs / day. Your battery rated at 100 Ah and is fully charged (12 VDC); a 30% discharge rate = 30 Ah of available power. An ICOM 2200T; TX 5.5A at 10W; RX mx audio 1A.

A duty cycle of 3:1 = 4 hours (listen for 3, talk for 1)
Operating 8 hrs / day = 2 duty cycles
Radio power (3:1 duty cycle) 6.5A; 2 duty cycles = 13 A

Battery available: 30Ah; divided by 13A = about 2.3 days (8 hrs/ day) of operating before battery needs recharging.



Sparky VHF Antennas / Radios				
<i>Be Sure Antenna is Connected Before Using Radio</i>				
Antenna	Hustler UGM	Kenji DP CL2E▽	450Ω Slim Jim	Slingshot (small)
	Fixed coax BNC male	PL-259 on Ant. base	SO-239 at Ant. Feed point	
Air choke	None		Part of coax feed line	
Mounting (see diagram)	Vehicle	SO-239	Blue Mast	
	VHF 1	VHF 2	VHF 3	VHF 4
Coax Ant.- ICE unit	Fixed coax BNC male	PL-259 / RG8U coax / PL-259		
Adapter	BNC female / PL-259	None		
ICE 302	Ant	SO-239	SO-239	SO-239
	Radio	SO-239	SO-239	SO-239
Feed Line ICE - Ant. Swtch	PL-259 RG8X PL-259		PL-259 RG8U PL-259	PL-259 RG8U PL-259
VHF Ant Swtch	Post #1	Post #2	Post #3	Post #4
Ant. Switch jumper to Radio PL-259 RG8X coax PL-259 Connect only 1 VHF radio at a time.				
Adapter	SO-239 to SMA-male		None	
Radio	Yaesu FH-912 Ant: SMA-female		ICOM 2200T Ant: SO-239	
12 VDC Power	12 VDC adapter cord		ICOM power cord w/ fuse	
	12 VDC socket			
	Rigrunner 4010S			
	Post #5		Post #1	
(2) X 6 VDC batteries				
Ground Bond	None		AWG12 copper stranded insulate to station ground bus bar	

Sparky HF Antennas / Radios				
<i>Be Sure Antenna is Connected Before Using Radio</i>				
Antenna	Ball/Spring Whip+wire	NVIS 1-wire dual band	OPEK HVT400	Super Ant. MP-1▽
	1-wire	1-wire	PL-259 base	SO-239 base
Air choke	None			
Mounting (see diagram)	Bumper	Roof Rack	SO-239	Ant. clamp
	HF 1	HF 3	HF 2	HF 4
Feed Line Ant.- ICE unit	1-wire	1-wire	RG8U PL259	PL259 RG8X PL259
	Connect 1 or the other		Connect 1 or the other	
Adapter	None			
ICE	Ant	308	Screw terminal	SO-239
	Radio		Screw terminal	SO-239
Coax ICE - Ant. Switch	1-wire to ICOM AH4 ▽w/ coax PL-259		PL-259 RG8U PL-259	
HF Antenna Switch	Post #1		Post #2	
	Reserved for future HF antennas			
	Post #3 to rear ICE 300		Post #4 to rear ICE 309	
Ant. Switch jumper to Radio PL-259 RG8X coax PL-259				
Adapter	None			
Radio	ICOM 718 ▽Ant: SO-239			
12 VDC Power	ICOM power cord w/ fuse			
	Rigrunner 4010S: "Master" Post (2) X 6 VDC batteries			
Ground Bond	None		AWG12 copper stranded insulate to station ground bus bar	
Note: ▽ If not assigned to another RTC-TH station/site.				

Rapid Deployment Check List

Sparky					
1	□ Check/record car battery voltage.	=>50	Full charge; 20 km round trip		
		>45-<50	Stay local; 8 km round trip		
		=<45	Recharge vehicle (~8 hrs+)		
	□ Check/record tire pressures. Adjust as needed.		Tires 175-70, 13"	Front 14 psi	
				Rear 18-20 psi	
	□ Test car lights/signals.		Lights	Left	Right
	Front	Head Lights	High		
			Low		
		Parking Lights			
		Turn Signal Lights			
	Rear	Tail Lights			
		Brake Lights			
Turn Signal Lights					
Back Up Lights					
Top	Warning Beacon				
2	□ Check/record radio battery voltage.	=>12	OK ~ 75 Ah		
		=<9.6	Recharge battery ~8 hr+		
	□ Connect 12 VDC AGM battery to Rigrunner 4010s				
3	□ Check ALL coax connectors				
	□ Set VHF Antenna Switch to #1 (Hustler UGM);				
4	□ Connect Yaesu FH-912 to 12 VDC power onboard				
5	□ Double check ALL Hustler UGM antenna to radio coax connections				
6	□ Turn on radio				
	□ Set TX power and operating frequency				
	□ Make test call to confirm operating status				
7	□ Ready to roll				
8	If deploying Sam: Go to Sam's Rapid Start-Up Check List				

Notes:

- If HF operation is needed, remove the radio from the Wangwa Station and install it in Sparky or Sam.
- All vehicle batteries and the dedicated radio battery in Sparky have their charge status monitored monthly to maintain full charge status.
- Sparky is deployed in 2 modes:
Recon Scout: Day trip maximum 20 km from the Wangwa station; return at night to recharge vehicle batteries. Maximum duration 2 days away from station.
Tow Sam to Site: Maximum 1 way tow is 40 km IF 220 VAC power for battery recharging is available at destination.

[Notes:

- Sparky's battery charger must be carried;
- Site must have a properly grounded 3-prong socket available.
- **DO NOT USE a 2-PRONG ADAPTER with Sparky's battery charger.**

Sparky Radio Power-Up Check List				
Step 1	Decide if operating VHF or HF.			
	VHF	Yaesu FH-912	Go to Step 1A	Radio Must Have an Antenna
		ICOM 2200T	Go to Step 1B	
HF	ICOM 718	Go to Step 1C		
Step 1A	Yaesu FH-912	Use HT whip. Go to Step 1A1		
		Use vehicle antenna. Go to Step 1A2		
Step 1A1	<ul style="list-style-type: none">Be sure radio is turned OFF.Confirm the high gain antenna & Tiger Tail are firmly attached. Go to Step 1A3			
Step 1A2	<ul style="list-style-type: none">Be sure radio is turned OFF.Remove and properly stow the high gain antenna & Tiger Tail.Set the VHF antenna switch to Ant #1.Attach the VHF Antenna switch coax jumper to an SO239 / SMA-male adapter; then to the radio. Radio Must Have an Antenna. Go to Step 1A3.			
Step 1A3	<ul style="list-style-type: none">If using station power, attach 12 VDC adapter to radio, plug into power socket on the radio rack→	Press [F], then [0/Set] get Menu Dial to "Set Menu 12" DC VLT		
	<ul style="list-style-type: none">Go to Step 2.If battery attached, turn radio "ON"; check battery voltage. Have spare battery handy. Recharge battery if needed.-→Go to Step 3.	Press [F] Press [PPT] to see TX voltage drop Press [F] then [PTT] to return to Normal		

Sparky Radio Power-Up Check List (cont'd)	
Step 1B	ICOM 2200T (Only possible if EchoLink®-Link Station is inactive and this radio is not assigned to another RTC-TH EmComm unit or station.)
	Install ICOM 2200T in Center Console <ul style="list-style-type: none">Fit radio into bracket; tighten mounting screws.Connect ground bonding wire to station bus bar.Set VHF antenna switch to Ant #1.Connect the VHF antenna switch coax jumper to the radio. Radio Must Have an Antenna.Connect VHF external speaker to radio jack.Connect ICOM HM-133V microphone.Connect radio power cord to Rigrunner 4010S. Got to Step 3.
Step 1C	ICOM 718 (Only possible if this radio is not assigned to another RTC-TH EmComm unit or station.)
	Install ICOM 718 in Center Console <ul style="list-style-type: none">Fit radio into bracket; tighten mounting screws.Connect ground bonding wire to station bus bar.Set HF antenna switch to Ant #1.Connect the HF antenna switch coax jumper to the radio. Radio Must Have an Antenna.Connect HF external speaker to radio jack.Connect ICOM HM-36 microphone.Connect radio power cord to Rigrunner 4010S. Got to Step 3.

Sparky Radio Power-Up Check List (cont'd)			
Step 2	Connect and Check Station Power:		
	Connect the dedicated radio battery cord to the Rigrunner 4010S and check the status light.		
	Red LED	OK to turn ON Rigrunner 4010S; power goes to radio rack. Go to Step 3.	
	Alarm	Battery is LOW. Plug 12 VDC power cord from Sparky to R4010S. Go to Step 3.	
Step 3	Radio Power Up / Set TX Power		
	Radio must be connected to an Antenna		
	Yaesu FH-912	Turn radio ON; Set TX Power	Go to Step 3A
	ICOM 2200T		Go to Step 3B
ICOM 718	Go to Step 3C		
Step 3A	Yaesu FH-912 Set TX Power		
	Low (0.5 W): On site monitoring		Press [F], then [3/LOW]
	Med: (2 W) Off site RF Ops nearby		Turn dial to set: HIGH 5W, MID 2W, LOW 0.5W. Press [PTT] to complete setting.
	High: (5 W) RF remote monitoring while mobile or portable if 2W is not enough		
	Go to Step 4.		
Step 3B	ICOM 2200T Set TX Power		
	MID	10 W	Pres [DUP/LOW] several times to select TX power. Watch lower left LCD for setting
	LOW	5 W	
	Go to Step 4.		

Sparky Radio Power-Up Check List (cont'd)		
Step 3C	ICOM 718 Set TX Power	
	Continuously selectable from in 101 steps (2W or less -100W)	Push [SET] for 1 sec for quick set mode Push [▲ UP] / [▲ DN] one or more times to select "RF Power" Turn Main Dial to desired TX Output level. Push [SET] to exit quick set mode.
	Go to Step 4.	
Step 4	Start Radio Ops	
	Radio must be connected to an Antenna.	
	Remote RF VHF EchoLink®-Link Ops: Go to Step 4A. VHF RF Ops: Go to Step 4B. HF Ops: Go to Go to Step 4C.	
Step 4A	Remote RF VHF EchoLink® Ops:	Monitor the frequency. When clear, transmit following proper protocols and call sign ID.
	<ul style="list-style-type: none">• Turn on VHF radio.• Set to RTC-TH EmComm EchoLink®-Link Simplex frequency →	
Step 4B	VHF RF Ops:	
	<ul style="list-style-type: none">• Turn on VHF radio.• Set to desired Simplex frequency -→	
Step 4B	HF Ops:	
	<ul style="list-style-type: none">• Turn radio ON• Set to desired operating frequency-→	
SPARKY IS READY FOR MOBILE RADIO OPERATIONS		

While In Transit:

- **Sparky's Battery Status:** Monitor the voltage.

Voltage (static)	Notes
=>50	Full charge; 20 km round trip
>45-<50	Stay local; 8 km round trip
=<45	Recharge vehicle (~8 hrs+)
Yellow Light ON	Sufficient power for 3 km distance.

- **Do Not Drive Into Water:** Water can hide many hazards to the vehicle. Low ground clearance puts batteries, cables, and Sparky's electric motor in danger. Get to higher ground and wait it out.
- **Avoid Downed Power Lines:** Assume all downed lines are energized. Any downed line can be re-energized. Avoid all contact with any downed lines. Assume ALL of them are power lines. Keep away from them. A phone line may not normally be dangerous BUT it could be touching an energized downed power line. It is especially important to avoid people and antennas contacting downed lines.
 - **10 m Stand-Off:** Keep 10m away from any downed line.
 - **Water is a channel for electricity.** If the ground is wet, keep out of the water.
 - **Vehicles in contact with power line.** Stay in the vehicle; **Do Not Touch Any Metal.**
- **Overhead Clearance:** Drive slowly and carefully to avoid damage to any vehicle mounted antennas from trees and overhead obstructions.

RTC-TH EmComm Vehicle Vertical Clearances

Vehicle	Antenna		Height (m)
Sparky	VHF	Hustler UGM ><	2.200
		Kenji DP CL2E	2.070
	HF	Whip+Wire	2.100
		OPEK HVT400	3.220
Sam 2.0 m	VHF	Tram 1150	3.125
	HF	Whip+Wire	3.380
		Super Antenna MP-1	4.010

Yellow shading indicates the antennas that may mounted on the vehicles when in motion.

>< Adapter is in place or kept onboard

When Parking:

A good portable EmComm operating site has as many of the following general characteristics as possible:



- **Free of any common local geo-hazards,** especially flooding and landslides. Once set up here, you don't want to have to move again to avoid another hazard.
- **Multiple access routes.** Do your best to avoid sites with only one road in or out.
- **Good radio contact** with vehicle mounted antennas. (These sites will be even better with mast mounted antennas.)
- **Large open area (80 m x 120 m),** for an emergency helicopter landing zone or facilities for a community emergency shelter

Parking Site Slope Survey Procedure (cont'd)		Sample Site Sketch Map (Not to Scale)					
Step 7	Site Access / Landmarks/Features:	Site Name _____ Date _____					
	Site Access	Survey by: _____ Follow-up Map date: _____					
	<ul style="list-style-type: none"> Document road names/numbers and route to the site Note any fences, gates (w/ or w/out locks) 	GPS	EPE m	Latitude N	Longitude E	Altitude? m	
	Site Landmarks / Facilities	Slope		N	E	S	W
	<ul style="list-style-type: none"> Take photos and record names, locations of landmark features to help others recognize the site. Note any buildings, power access, etc. 	<input type="checkbox"/> Helicopter LZ potential		Radials are 18 m long			
Step 8	Nearest Village / Town & Facilities						
	<ul style="list-style-type: none"> Name and distance (by road and LOS) to nearest town Get location and contact information for hospital, police box / station, government offices 						
Final Site Survey: Assign a "name" for the site. If it is level, follow up by: <ul style="list-style-type: none"> Get a topographic map and road map to/from the site Conduct radio contact tests. 							
Note: If the site is level and the size of a football field (80 m x 120 m), it has the potential to be an emergency helicopter landing zone. Make a note of it on your Site Sketch Map. A specific field survey can be done later to give to authorities for evaluation. See the specific survey procedures and required criteria for helicopter landing zones.							

Park 'n Op EmComm Operations

Vehicle Parking Procedures

The vehicle should be parked in a level open area (clear of vertical and horizontal obstructions) in accordance to the specific parking site criteria.

Step 1	Park vehicle facing North for easy vehicle mounted wind vane orientation and solar PV orientation reference.	
Step 2	<ul style="list-style-type: none"> Set parking brake (if available); post warning tag. Set wheel chocks; post warning tag. 	
Step 3	<ul style="list-style-type: none"> If site ground rod (SGR) available, connect vehicle ground bonding cable; post warning tag. In no SGR, go to Park 'n Op Procedures. 	

Park n' Op EmComm uses a VHF radio and vehicle mounted antennas. This permits rapid re-positioning of Sparky or Sam. HF radio operations requires transferring the ICOM 718 from the Wangwa station to either Sparky or Sam.

Setting up antennas on push-up masts will require 15-30 minutes depending on the type of antenna / mast combination. Push-up masts are normally NOT guyed. If conditions get windy, the first defense is to lower the mast to a safer operating height. We want to keep the option of rapid re-positioning as a priority.

The table below shows the available Park 'n Op Antennas. As of (May 2012) antennas for push-up masts are limited to VHF EmComm operations. We have no mast mounted HF antennas. This is an area for future development.

		Vehicle Mounted	Mast Optional
Sparky	VHF	Hustler UGM ><	450Ω Slim Jim♦B
		Kenji DP CL2E♦	Slingshot (small tube)♦B
	HF	Spring Ball Whip+wire #1	
		OPEK HVT400♦	
		1-wire dual NVIS♦	
Sam	VHF	Tram 1150 NMO	Thai Slim Jim♦S
		Kenji DP CL2E▽	Slingshot (large tube)♦S
			Arrow 4 Element Yagi♦><S
	HF	Spring Ball Whip+wire #2	
		Super Antenna MP-1♦	
		OPEK HVT400▽	
♦ Antenna is carried onboard and can be set up for use. B = Blue push-up mast (adjustable from 1.23-3.35m) S = Silver push-up mast (adjustable from 1.4-4.9 m) ▽ Antenna can be transferred if not used on Sparky >< Adapter is in place or kept onboard			
Sparky Park 'n Op Procedures			
Step 1	Set up station log book, message pad; set station clock. Issue on air announcement starting operations. If an operating schedule is set, announce it.		
Step 2	If MEWS observations are needed set up vehicle mounted wind vane, get out Kestrel 4500 and make initial measurements recording data on the MEWS log form.		
Step 3	If the Hustler UGM antenna is not effective, put up the Kenji DP CL2E antenna. This keeps Sparky ready for rapid re-positioning or mobile operations. If the Kenji is ineffective, use another antenna with a push-up mast.		
Step 4	Decide if an omni-directional or directional antenna is needed. See VHF Antenna / Mast Combinations reference table for appropriate antenna connections. If a		

Sparky Park 'n Op Procedures (cont'd)				
Step 4	a directional antenna is used, get the appropriate azimuth reference chart for the operating site.			
Continue monitoring the EmComm radio using the vehicle mounted antenna until completing the set up of the selected antenna / mast.				
RTC-TH EmComm VHF Antenna/Mast Combinations				
Sparky (Blue Mast)			Omni-directional	Directional use magnetic compass
Position / Height (AGL)			450Ω Slim Jim	Slingshot (small)
Top	3.35 m	Ant top	5.85 m	5.16 m
		Feed Point	4.35 m	3.86 m
Mid	2.30 m	Ant top	5.03 m	4.05 m
		Feed Point	3.44 m	3.02 m
Base	1.23 m	Ant top	4.19 m	3.15 m
		Feed Point	2.61 m	2.12 m
Use Mast Bracket/Outrigger			Passenger side	Driver's side
Use PVC Mast Top Insert			plain	w/ locking pin
Use PVC Stalk to Antenna			2 m	1 m
Coax (feed line) to use			6 m	5.5 m
Coax connects to VHF ICE			VHF 302 #3	VHF 302 #4
Connects to Antenna Switch			VHF #3	VHF #4
Sparky Blue Mast Set-up Tools				
2-way Post Level			Flat-blade Screwdriver	
Pencil erasers			NoAlox anti-oxidant	
If Mast Guys Are Needed				
For each mast		<ul style="list-style-type: none">• Magnetic compass or protractor• 3 Spiral stakes w/ safety flagging• 3 guy lines w/ safety flagging		

Antenna Radio Configurations

Be Sure Antenna is Connected Before Using Radio

Antenna Direct Connect to Radio

High Risk Lightning Hazard

Antenna Connected to ICE Lightning Arrestor to Radio



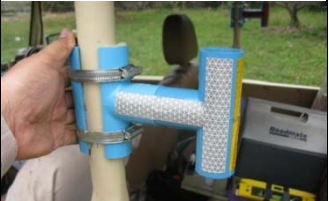






Check if a connector/adaptor is needed to connect SO-239 on ICE unit to Antenna Switch to radio

Antenna Inactive. Mast-mounted

When not in use, protect antennas by grounding feed lines to the station ground bus panel.

Selected Antenna Connectors

SMA male / female PL259 / SO239 BNC male / female

Sparky Blue Mast Set-up Procedures			Sparky Blue Mast Set-up Procedures		
Step 1	Get Mast set-up tools, Blue Mast, the selected antenna and related PVC insert / stalk / extensions, and feed line listed in the reference table.		Step 7	<ul style="list-style-type: none"> Use the eraser to clean the center pin of the coax PL259 fittings of the selected antenna feed line. 	
Step 2	Slide the PVC Base Cup onto the under frame mounting bracket			<ul style="list-style-type: none"> Remove the antenna SO239 dust cap and stow it. Put NoAlox on the PL259 center pin and connect it to the antenna. 	
Step 3	Use the screw driver to loosen the hose clamp of the appropriate mast outrigger. Position the outrigger at 90° to the side of the vehicle.		Step 8	Repeat Step 8 for the appropriate ICE VHF unit, PL259 connectors on the antenna and the VHF antenna switch coax jumper. Update the VHF Antenna Switch indicator card for the antenna name and switch number.	
Step 4	Remove the white end cap of the Blue mast. Slide the blue mast down through the outrigger guide to the Base Cup.				
Step 5	Use the 2-way post level to align the mast to be vertically plumb. Tighten the hose clamp to secure the outrigger. Post Mast warning tag.		Step 9	Double check all antenna / coax connections for:	
Step 6	Assemble the antenna and its associated PVC mast insert / stalk and join it to the Blue mast. Insert any appropriate locking pin.			<ul style="list-style-type: none"> Correctness: <ul style="list-style-type: none"> □ Antenna using proper coax □ Antenna feed line connect to proper VHF ICE unit □ ICE unit jumper connects to proper Antenna Switch and position number. 	

Sparky Blue Mast Set-up Procedures (cont'd)


Step
9
cont'd

- Antenna switch indicator card correctly posted
- **Tightness:** Hand tighten connectors only. Do not use tools to tighten fittings.



Step 10

Measure the current wind speed. Refer to the Wind Velocity Calculations and Reference Tables to know the wind loadings on the mast / antenna / vehicle system. Be aware of the operational constraints BEFORE raising the antenna / mast combination.



Step 11

- Contact another station and ask them to monitor you for the change in operating antenna.
 - Switch to the new antenna and call the helping station.
 - You must confirm the mast mounted antenna is working better than the vehicle mounted antenna.



Notes:

Warning Tags: These are important reminders NOT to move the vehicle until cables are disconnected, masts, equipment, etc. are properly stowed for travel.

Sparky Blue Mast Set-up Procedures (cont'd)

Notes (cont'd):

Monitor Wind Conditions: Prevent wind damage to antennas / masts by watching wind conditions and lowering masts accordingly. Helicopter rotor downwash can be close to hurricane force winds.

RTC-TH Mast Guy Guidelines

- Set guys at the mast top and midpoint
- See mast height in table to get stake radius
- Set spiral guy stakes set 120° apart
- Keep people away from masts and guys

Mast	Setting	Mast Ht (m)	Mast mid pt (m)	Guy radius (m)	Guy line length (m)	
					top	mid
Blue mast (Sparky)	Top	3.35	1.68	2.65	4.27	3.13
	Mid	2.30	1.15	1.82	2.93	2.15
	Base	1.23	0.62	0.97	1.57	1.15

Green shading: guying not usually needed.

Orange shading: quying may be needed.

Maximum Wind Velocity Data: Thawangpha	
--	--

Year	Km/ph	Date	Year	Km/ph	Date
2011	18.3	27 Jul	2006	16.5	14 Jul
2010	22.2	16 Mar	2005◇	25.9	21 Jun
2009	25.9	12 Jul	2004	48.2	22 Jun
2008	37.0	15 Apr	2003	27.8	16 Sep
2007	24.1	12 Apr	2002◇	21.7	24 Apr

◇ Annual record is incomplete (months missing)

Wind Velocity for Antenna Calculations

Use the reference tables on the following pages to help complete the various Moment calculation worksheets below.

Antenna / Mast Moment Calculation Worksheet

Step 1.1	Antenna Name	A 1.1 Wind Profile (sq m)
Step 1.2	Mast Color / Height	B 1.2 Wind Profile (sq m)
Step 1.3	Wind Velocity	C 1.3 Wind Psu (kg/sq m)
Step 1.4	Multiply Step A1.1by Step C1.3; enter result →	(kg/sq m)
Step 1.5	Multiply Step B1.2 by Step C1.3; enter result →	(kg/sq m)
Step 1.6	Add Step 1.4 & Step 1.5 results; enter result ->	(kg/sq m)

Vehicle Moment Calculation Worksheet

Step 2.1	Vehicle Name	A2.1 Vehicle Weight (kg)
Step 2.2	Wind Pressure from Step C1.3	C1.3 Wind Psu (kg/sq m)
Step 2.3	Multiply Step 2.1 by Step 2.2; enter result →	(kg/sq m)
Step 2.4	Step 2.4 should be 5 X Step 1.6 to reduce the possibility of vehicle movement due to mast wind load.	

Horizontal Brace Moment Calculation Worksheet

Step 3.1	Vehicle Name	Horz Brace Ht (m)
Step 3.2	Wind Pressure from Step 1.3	Wind Psu (kg/sq m)
Step 3.3	Multiply Step 3.1 by Step 3.2; enter result →	(kg/sq m)

Antenna / Mast Reference Tables

VHF Antennas		Ht (m)		Sfc Area (m²)
450Ω Slim Jim		1.48 m		0.02712
Slingshot (small tube)		1.05 m		0.626000
Mast	Wind	Height (m)		Sfc Area (m²)
Blue (Sparky)	Calm –Light Air	High	3.35 m	0.09557
	Lt – Gentle Breeze	Mid	2.30 m	0.06932
	Mild Breeze or >	Low	1.23 m	0.03936

Wind Velocity / Pressure Table

Wind Term	mph	km/ph	knots	kg/sq m
Calm	<1	<1.5	<0.9	0.003059
Light air	1-3	1.5-6	1-3	0.014280
Light breeze	4-7	7-12	4-6	0.693400
Gentle breeze	8-12	13-20	7-10	1.835000
Mild breeze	13-18	21-29	11-16	3.977000
Fresh breeze	19-24	30-39	17-21	7.342000
Strong breeze	25-31	40-50	22-27	12.13000
Near gale	32-38	51-61	28-33	18.66000
Gale	39-46	62-74	34-40	27.33000
Strong gale	47-54	75-87	41-47	37.93000
Storm	55-63	88-101	48-55	51.39000
Violent storm	64-72	102-114	56-63	67.30000
Hurricane	>73	>115	>63	>67.300000

Note: If unable to measure wind velocity, use the RTC-TH modified Beaufort Wind Velocity

Vehicle Data

Vehicle	Weight (kg)	Brace Height (m)
Sparky		1.40
Sam	Front	1.80
	Rear	1.76

Thailand HF Band Plan

TH Approved Bands / Freqs		Freq Allocations	Mode
160 m	1.800 - 1.825 MHz	1.800 - 1.825 MHz	CW
80 m	3.500 - 3.540 MHz	3.500 - 3.530 MHz	CW
		3.525 - 3.540 MHz (3.530 - 3.540 MHz)	SSB
		⊘ 3.600 MHz	EmComm CoA (All modes +/- 0.005 MHz)
40 m	7.000 - 7.200 MHz	7.000 - 7.040 MHz	CW
		7.110 MHz	EmComm CoA (All modes +/- 0.005 MHz)
		7.030 - 7.300 MHz (7.060 - 7.200 MHz)	SSB
		7.040 - 7.060 MHz	Digital mode
30 m	10.100 - 10.150 MHz	10.100 - 10.140 MHz	CW
		10.140 - 10.150 MHz	Digital mode
20 m	14.000 - 14.350 MHz	14.000 - 14.070 MHz	CW
		14.070 - 14.100 MHz	Digital mode
		14.100 - 14.350 MHz (14.101 - 14.350 MHz)	SSB
		14.300 MHz	EmComm CoA (All modes +/- 0.005 MHz)
17 m	18.068 - 18.168 MHz	18.068 - 18.095 MHz	CW
		18.095 - 18.120 MHz	Digital mode
		18.110 - 18.168 MHz (18.120 - 18.168 MHz)	SSB
		18.160 MHz	EmComm CoA (All modes +/- 0.005 MHz)

Thailand HF Band Plan (cont'd)

TH Approved Bands / Freqs		Freq Allocations	Mode	
15 m (PEP 100)	21.000 - 21.450 MHz	21.000 - 21.070 MHz	CW	
		21.070 - 21.150 MHz	Digital mode	
		21.125 - 21.450 MHz (21.150 - 21.450 MHz)	SSB	
		21.360 MHz	EmComm CoA (All modes +/- 0.005 MHz)	
12 m (PEP 75)	24.898 - 24.990 MHz	24.890 - 24.915 MHz	CW	
		24.915 - 24.931 MHz	Digital mode	
		24.930 - 24.990 MHz (24.931 - 24.990 MHz)	SSB	
10 m (PEP 50)	28.000 - 29.700 MHz	28.000 - 28.070 MHz	CW	
		28.070 - 28.190 MHz	Digital mode	Satellite downlink
		28.225 - 29.300 MHz		
		29.300 - 29.510 MHz		
		28.300-29.300 MHz	SSB	
		29.320 - 29.520 MHz		
		28.190 - 28.225 MHz	Beacon NO TX allowed	
29.520 - 29.800 MHz	SSB / FM			
	Indicates voice ops allowed			
	Red Text: IARU R3 EmComm Freqs Center of Activity			
	⊘ Not in Thailand band plan			
	(PEP#) = RF Safety Evaluation required over indicated PEP #			
Different frequencies reported:				
• Top set from Band Plan from http://www.qsl.net/rast/text/HFbandplan.html (set in parentheses) from Re: Thailand Ham Frequency Allocations				
• RTC-TH will follow the more restrictive settings to avoid possible violations of the band plan.				

General HF Band Characteristics			
Band	Frequency	Day	Night
160 m	1.800 - 1.825 MHz	Local-Regional out to 100-200 mi	Local DX beset near sunrise / sunset at 1 or both ends of contact
80 m	3.500 - 3.540 MHz		
40 m	7.000 - 7.200 MHz	Local-Regional out to 300-400 mi	Short (20-30 mi) and mid-DX (150 mi)
30 m	10.100 - 10.150 MHz		
20 m	14.000 - 14.350 MHz	Regional DX open at/near sunrise/end of night	20 m often open to west at night maybe 24 hrs
17 m	18.068 - 18.168 MHz		
15 m	21.000 - 21.450 MHz	DX (1000 mi+) open to East after sunrise; to west in afternoon	10 m often local 24 hrs / day
12 m	24.898 - 24.990 MHz		
10 m	28.000 - 29.700 MHz		
Note	Green shading = Thai band with voice allocations		

Thai Band Plan (Voice) / IARU R3 EmComm HF Bands					
Band	TH Voice	Int HF ALE	IARU-R3		
	UTC +7	----	----		
80 m	3.530 - 3.540 MHz		3.600 MHz		
40 m	7.060 - 7.200 MHz		7.110 MHz)		
20 m	14.101 - 14.350 MHz	14.3460 MHz	14.300 MHz		
17 m	18.120 -18.168 MHz	18.1175 MHz	18.160 MHz		
15 m	21.150 - 21.450 MHz	21.4375 MHz	21.360 MHz		
12 m	24.931 - 24.990 M Hz	24.9320 MHz			
	29.320 - 29.520 MHz 29.520 - 29.800 MHz	28.3125 MHz			
2 m	145 MHz				
Note: As of Jun 2012, Thailand has no HF EmComm frequencies IARU-R3 HF EmComm frequencies are (+/- 0.005 MHz)					
IARU R3 Member EmComm HF Bands					
Band	China	Japan	Korea	Australia	New Zealand
	UTC +8	UTC +9		UTC +8/10	UTC +12
80 m			3.525 MHz	3.600 MHz	3.500 MHz
40 m					
20 m	14.100 MHz			14.125 MHz	
17 m				18.150 Mhz	
15 m	21.200 MHz			21.190 MHz	
12 m				24.950 MHz	
10 m	28.2 MHz		28.30 MHz	28.450 MHz	
2m	141, 145 MHz	141, 145, 145.5 MHz	145, 145.5 MHz	145.2 MHz	

Thailand HF Band Plan vs. RTC-TH Antennas

TH Approved Bands / Freqs		Diamond CP6	OPEK HVT 400	Super Antenna MP-1	Spring/ball whip + wire	1-wire Dual Band NVIS	Loop Skywire
160 m	1.800-1.825 MHz						
80 m	3.500-3.540 MHz	X	X		X	X	(X)
40 m	7.000-7.200 MHz		X	X	X	X	(X)
30 m	10.100-10.150 MHz			X			(X)
20 m	14.000-14.350 MHz	X	X	X	X		(X)
17 m	18.068-18.168 MHz	X		X	X		(X)
15 m	21.000-21.450 MHz	X	X	X	X		(X)
12 m	24.898-24.990 MHz			X	X		(X)
10 m	28.000-29.700 MHz	X	X	X	X		(X)
Notes	Blue shading = Wangwa station						
	Orange shading = Mobile/Portable stations						
	Yellow shading = Planned antenna Na Fa station						
	Green shading = Thai Bands with voice allocations						

Sparky Radio / Antenna Ops RF Safety

Thai Maximum TX Power HF = 200W / VHF = 10W		Spring/ball whip + wire	OPEK HVT 400	Super Antenna MP-1	1-wire Dual Band NVIS	RF PEP (W) Limit
RTC-TH Radios Max TX HF ICOM 718 = 100W VHF ICOM 2200T = 10W VHF Yaesu FH-912 = 5W						
TH Approved Bands / Freqs						
160 m	1.800-1.825 MHz					500
80 m	3.500-3.540 MHz	X	X		X	500
40 m	7.000-7.200 MHz	X	X	X	X	500
30 m	10.100-10.150 MHz			X		425
20 m	14.000-14.350 MHz	X	X	X		225
17 m	18.068-18.168 MHz	X		X		125
15 m	21.000-21.450 MHz	X	X	X		100
12 m	24.898-24.990 MHz	X		X		75
10 m	28.000-29.700 MHz	X	X	X		50
2 m	144.0000 - 146.0000 MHz					50
Notes	Green shading = Thai Bands with voice allocations					
	Orange shading = Radio TX over PEP limits requires RF Environmental Evaluation; Best to NO operate over these limits for these bands / frequencies.					

Thailand VHF 2m Band Plan			RADIOTELEPHONE PROCEDURE WORDS AND PHRASES (cont'd)		
Bnds /Frqs	Freq Allocations		ICAO (International Civil Aviation Organization)		
144.0000 - 146.0000 MHz	144.0000 - 144.0625 MHz	(Earth-Moon-Earth: EME)	Acknowledge: "Let me know that you have received and understood this message."		
	144.000 - 144.080 MHz	CW	Affirmative: "Yes" or "permission granted."		
	144.080 - 144.180 MHz	(Earth-Moon-Earth: EME)	Break: "I hereby indicate the separation between portions of the message." (To be used when there is no clear distinction between the text and other portions of the message.)		
	144.0750 - 145.0125 MHz	Simplex Channels; 12.5 KHz spacing	Correction: "An error has been made in transmission (or message indicated). The correct version is..."		
	144.180 - 145.600 MHz	SSB / FM	Go Ahead: Proceed with your message		
	144.9000 MHz	General announcement and calling	How Do You Read: Unreadable, readable now and then, readable but with difficulty, readable, perfectly readable.		
	144.9375 MHz	RAST Net Frequency	I Say Again: Self-explanatory		
	145.0000	Emergency Distress Channel	Negative: "No" or "permission not granted" or "That is not correct."		
	145.0250 - 145.1125 MHz	Frequencies for Repeaters	Read Back: "Repeat all, or the specified part, of this message back to me exactly as received."		
	145.1250 - 145.4875 MHz	Simplex Channels; 12.5 KHz spacing	Over: "My transmission ended, and I expect a response from you."		
	145.5000 - 145.6125 MHz	Assignment for Digital Working (See Separate Packet Band Plan)	Out: "This conversation is ended and no response is expected."		
	145.600 - 145.800 MHz	Repeater	Roger: I have received all of your last transmission." (Under no circumstances to be used as an affirmative.)		
	145.6250 - 145.7125 MHz	Frequencies for Repeaters	Say Again: "Repeat all, or the following part, of your last transmission."		
	145.7250 - 145.8000 M Hz	experimental work	Speak Slower: Self-explanatory		
	145.8000 -146.0000 MHz	Amateur Satellite Service assignment. This 2 m assignment can be used for uplink and downlink transmissions	Standby: Self-explanatory		
Sources: http://www.qsl.net/rast/text/2mbandplan.htm ; Re: Thailand Ham Frequency Allocations			That Is Correct: Self-explanatory		
Nan VHF Frequencies of Interest			Verify: "Check coding, check text with the originator and send correct version."		
Station		Your Radio	Wilco: "Your last message (or message indicated), received, understood, and will be complied with."		
Nan Repeater HS5AN	TX 145.6375 MHz	RX 145.6375 MHz	Words twice: (1) As a request: "Communication is difficult. Please send every word twice." (2) As information: "Since communication is difficult, every word in this message will be sent twice."		
	RX 145.0375 MHz	TX 145.0375 MHz			
RTC-TH EchoLink-Link HSØZHM-L	14____ MHz (TBD) Simplex				

Distress Call: Hearing / Responding		Distress Call: Making a Call	
Action	Response	Action	Notes
You hear a distress call	<ul style="list-style-type: none"> Write down date, time, frequency. Get call sign, name Listen to see if other stations respond 	Say " MAYDAY, MAYDAY, MAYDAY , this is [say your call sign AND spell using NATO alphabet]"; Then give: <ul style="list-style-type: none"> your precise location the nature of the emergency the specific help you need (e.g. medical team, firemen, policemen, ambulance, etc.) 	Do not transmit names of victims or give personal information on the air.
IF another station responds	<ul style="list-style-type: none"> Monitor the call Write down all call signs, times, critical information Standby in case you can help 	Critical Emergency Information to Give <ul style="list-style-type: none"> Call sign, your name Location (Latitude, Longitude or specific street address; get details) Nature of the emergency (any lives in danger? From what?). Type of assistance you want. 	
If no other station responds	Say "[call sign of distress call] this is [give your call sign and spell it using NATO Alphabet]---I hear your distress call. What is your situation? Over."		
Critical Emergency Information to Get <ul style="list-style-type: none"> Call sign, contact name Location (Latitude, Longitude or specific street address; get details) Nature of the emergency. Type of assistance needed. 		Repeat your distress call several times. Pause to listen for any responses.	If no other station responds, don't give up. Others may be able to hear you but you may not hear them. Continue transmitting.
Distress station gives critical information	<ul style="list-style-type: none"> Ask them to stand by while you contact authorities. Follow instruction from authorities. Be prepared to relay information to the distressed station. Report back to the distressed station Monitor the frequency as long as you can 	If a station responds, get this critical information from them: <ul style="list-style-type: none"> Call sign, contact name Frequency (and alternate frequency if contact is broken) Contact schedule (if you or they have limited power, etc.) 	
Note: Consider using a tape recorder to record the call. It may help to recover important information.		Note: <i>Your personal safety is critical.</i> If you are hurt or injured, you may not be able to help anyone.	

RTC-TH Time Reporting Standards

Any mention of time and date in an emergency message must give the following information: Time, Time Zone Letter, and Date (day number, month, and year).

- **Time (using the 24-hour format).** The RTC-TH uses the NATO 24-hour time format to report the hours / minutes as a 4 digit set of numerals. Midnight (end of the day is reported as 2400 hrs (two-four-zero-zero hours). Midnight as the start of a new day is reported as 0000 hrs (zero-zero-zero-zero hours). The time 0001 (aero-aero-aero-one) is the first minute of the new day. **[Note:** To conform to the 4-digit time format, a leading zero is used for single number hours (e.g. 0100 is zero-one-zero-zero meaning the first full hour after midnight). Using the 24-hour format avoids any confusion between the designation of AM or PM. (See the NATO pronunciation guide on a previous page.)
- **Time Zone Identifier** using the appropriate NATO Alphabetic Time Zone letter (see table on the next page). This system assigns a single letter to each standard time zone. For Thailand, standard time zone identifier letter is “G” (Golf).
- **Date:** Report the date by saying the 2 digits for the calendar day, the name of the month, and the 4-digit number of the year. Example: 4 June would be spoken as “zero-four June”. This

avoids confusion over any all numerical date format where 4/6/2012 could mean April 6 to Americans or 4 June to Europeans.

Examples (for time / dates reported in Thailand):

To report 11 PM, June, 4, 2012; write 2300 hrs, 04 June 2012. Say: “Two-three-zero-zero hours Golf, zero-four June, two-zero-one-two.”

To report 12 AM (midnight, end of the day), May 10, 2010; write 2400 hrs for 10 May. Say: “Two-four-zero-zero hours Golf, one-zero May two-zero-one-zero”

To report 12 AM (midnight, start of the day), May 11, 2010; write 0000 hrs (midnight, start of the day) for 11 May 2010. Say: “Zero-zero-zero-zero hours Golf, one-one May two-zero-one-zero”.

Additional Discussion about Juliet Time:

The RTC-TH EmComm policy is to NOT use “J” (Juliet) time in radio messages. When in doubt, always report the time / date using the NATO alphabetic letter “G” (Golf) for the +7 hour standard time zone. This way it is very clear what the time / date are at your station. You avoid making mistakes in time conversions. Your transmitted message is concise and clear.

Learn and Use the NATO Alphabetic / Numeric Standard Characters and Pronunciation.

See the reference tables on the previous pages.

Time Conversion Table					NATO Alphabetic World Time Zone Identification			
Thai to UTC		Thailand in UTC+7 (-D = previous calendar day, +D = next calendar day)	UTC to Thai		Time Zone Name	Time Zone Letter	UTC Offset	Major Place Name
0100	1800-D		0100	0800	Yankee	Y	UTC -12	
0200	1900-D		0200	0900	X-ray	X	UTC -11	
0300	2000-D		0300	1000	Whiskey	W	UTC -10	Honolulu
0400	2100-D		0400	1100	Victor	V	UTC -09	Anchorage
0500	2200-D		0500	1200	Uniform	U	UTC -08	Los Angeles
0600	2300-D		0600	1300	Tango	T	UTC -07	Denver
0700	2400		0700	1400	Sierra	S	UTC -06	Chicago, Mexico City
0800	0100		0800	1500	Romeo	R	UTC -05	New York, Lima
0900	0200		0900	1600	Quebec	Q	UTC -04	Halifax, Caracas
1000	0300		1000	1700	Papa	P	UTC -03	Greenland, Rio de Janeiro
1100	0400		1100	1800	Oscar	O	UTC -02	
1200	0500		1200	1900	November	N	UTC -01	
1300	0600		1300	2000	Zulu	Z	UTC -/+ 00	London
1400	0700		1400	2100	Alfa	A	UTC + 01	Berlin
1500	0800		1500	2200	Bravo	B	UTC +02	Istanbul, Cape Town
1600	0900		1600	2300	Charlie	C	UTC +03	Moscow, Addis Ababa
1700	1000		1700	2400	Delta	D	UTC +04	
1800	1100		1800	0100+D	Echo	E	UTC +05	
1900	1200		1900	0200+D	Foxtrot	F	UTC +06	
2000	1300		2000	0300+D	Golf	G	UTC +07	Bangkok
2100	1400		2100	0400+D	Hotel	H	UTC +08	Beijing, Perth
2200	1500		2200	0500+D	India	I	UTC +09	
2300	1600		2300	0600+D	Kilo	K	UTC +10	Guam, Sydney
2400 / 0000	1700		2400 / 0000	0700+D	Lima	L	UTC +11	Tokyo, Vanuatu
					Mike	M	UTC +12	Kamchatka, Christchurch
					Note: "J" (Juliet) is not used for a standard time zone. "J" (Juliet) is used to indicate the radio operator's local time. RTC-TH EmComm practice is to NOT use Juliet; report "Golf" for Thai time to avoid any confusion at all.			

Sparky Radio Power-Down Check List			
The station is shut down after normal operations or when severe storms with lightning activity occur. At the first sign of thunder or lightning, stop operating and shut down the station. <i>Step 3 is critical for any antenna not equipped with an ICE lightning arrestor.</i>			
Step 1	End Radio Ops	Sign off with final call sign ID	Remote RF VHF EchoLink®-Link Ops: Go to Step 2A.
			VHF RF Ops: Go to Step 2B.
			HF Ops: Go to Go to Step 2C.
Step 2A	Remote RF EchoLink® / VHF RF Ops Shut Down		
	Yaesu FH-912	<ul style="list-style-type: none">If on batteries, check and record battery level before shutting down. (See Power-Up Step 1B.)Turn radio OFF.Complete Contact Log.Properly stow the radio for its next use. If it will be idle, remove the battery. Put a date / battery level tag on the battery. Store it properlyIf using 12 VDC power, unplug the power adapter and stow it properly. Replace the battery if the radio will be used. Otherwise, store it properly.	
	ICOM 2200T	<ul style="list-style-type: none">Turn the radio OFF.Complete Contact Log.Go to Step 3.	

Sparky Radio Power-Down Check List (cont'd)			
Step 2B	HF Ops Shut Down		
	<ul style="list-style-type: none">Turn the radio OFF.Complete Contact Log.Go to Step 3.		
Step 3	Disconnect Station 12 VDC Power Supply		
	<ul style="list-style-type: none">Unplug the battery cable to the Rigrunner 4010S.Use a voltage meter to check and record the status of the dedicated radio battery		
	=>12 VDC	Battery is fully charged. Shut down is complete.	
	<12 VDC	<ul style="list-style-type: none">Charge the battery in a well ventilated area.Connect A & A battery charger to battery.Set toggle switch to 1A.Plug charger into 220 VAC line power.Turn battery charger ON. Note: This is a smart charger and can be left charging unattended overnight.Shut down is complete.	
Step 4	Disconnect Antenna Switch Coax from Radio		
	<ul style="list-style-type: none">Remove and stow an radio antenna adapters.Connect Antenna Swtich coax to grounding cables from the station ground bus bar.Disconnect any grounding cables from radio.Inventory all radio parts; properly stow radios and microphones.Stow all external antennas, masts, etc.		

RTC-TH EmComm Operating Sites				
	Wangwa	Na Fa (farm)	Hill Top	Na Fa (house)
Status	Licensed Stations		Portable sites	
	EchoLink®-Link	(farm portable)		
Latitude	19.121511N	19.0702083N	19.0723306N	19.074591N
Longitude	100.8123806E	100.8753667E	100.8643556E	100.866357E
Altitude	232 m	264 m	258 m	251.5 m
Dist to W		8.69 km	7.61 km	7.66 km
Az to W		311°	314°	313°
Az from W		131°	134°	133°
Power	220 VAC	220 VAC		220 VAC
Internet	X			Possible
SGR	X			
VHF Ant	X			
HF Ant	X			
Facilities	House	(house)		House
Note: The plan is to develop an Intermediate level station at the farm. It would have an SGR, VHF and HF antenna, solar charged 12 VDC battery. Sam could serve as the Na Fa Station. Other portable sites maybe possible, but the sites listed above are under the sole control of the RTC-TH.				
Other Possible EmComm Operating Sites				
	Na Fa Elem	Nan Riv Park		
Status	Public School	Public Park		
Latitude	19.0762194N	19.1224278N		
Longitude	100.8838028E	100.88100361E		
Altitude	253 m	226 m		
Dist to W	7.37 km	0.31 km		
Az to W	313°	104°		
Az from W	133°	284°		
Power	220 VAC	220 VAC		
Internet	X			
SGR				
VHF Ant				
HF Ant				
Facilities	School	Pavilion		

The RST System		
Readability	1	Unreadable
	2	Barely readable, occasional words distinguishable.
	3	Readable with considerable difficulty
	4	Readable with practically no difficulty.
	5	Perfectly readable.
Signal Strength	1	Faint signals, barely perceptible.
	2	Very weak signals.
	3	Weak signals.
	4	Fair signals.
	5	Fairly good signals.
	6	Good signals.
	7	Moderately strong signals.
	8	Strong signals.
	9	Extremely strong signals.
Tone (CW only)	1	Sixty cycle a.c or less, very rough and broad.
	2	Very rough a.c., very harsh and broad.
	3	Rough a.c. tone, rectified but not filtered.
	4	Rough note, some trace of filtering.
	5	Filtered rectified a.c. but strongly ripple-modulated.
	6	Filtered tone, definite trace of ripple modulation.
	7	Near pure tone, trace of ripple modulation.
	8	Near perfect tone, slight trace of modulation.
	9	Perfect tone, no trace of ripple or modulation of any kind.
	If the signal has the characteristic steadiness of crystal control, add the letter X to the RST report. If there is a chirp, the letter C may be added to so indicate. Similarly for a click, add K. The above reporting system is used on both cw and voice, leaving out the "tone" report on voice	

NATO Alphabetic Pronunciation

Clear, effective communication occurs with the sender and receiver use the same language. Learn and use the NATO Alphabet.

Character	Morse Code	Telephony	Pronunciation
A	• -	Alpha	AL-FAH
B	- • • •	Bravo	BRAH-VOH
C	- • - •	Charlie	CHAR-LEE
D	- • •	Delta	DELL-TAH
E	•	Echo	ECK-OH
F	• • - •	Foxtrot	FOKS-TROT
G	- - •	Golf	GOLF
H	• • • •	Hotel	HOH-TELL
I	• •	India	IN-DEE-AH
J	• - - -	Juliet	JEW-LEE-ETT
K	- • -	Kilo	KEY-LOW
L	• - • •	Lima	LEE-MAH
M	- -	Mike	MIKE
N	- •	November	NO-VEM-BER
O	- - -	Oscar	OSS-CAH
P	• - - •	Papa	PAH-PAH
Q	- - • -	Quebec	KEH-BECK
R	• - •	Romeo	ROW-MEE-OH
S	• • •	Sierra	SEE-AIR-RAH
T	-	Tango	TANG-GOH
U	• • -	Uniform	YOU-NEE-FORM
V	• • • -	Victor	VIK-TAH
W	• - -	Whiskey	WISS-KEY
X	- • • -	Xray	EKS-RAY
Y	- • - -	Yankee	YANG-KEY
Z	- - • •	Zulu / Zed	ZOO-LOO / ZEDD

NATO Numeric Pronunciation

Clear, effective communication occurs with the sender and receiver use the same language. Learn and use the NATO Numbers.

Character	Morse Code	Telephony	Pronunciation
0	- - - - -	Zero	ZEE-ROW
1	• - - - -	One	WUN
2	• • - - -	Two	TOO
3	• • • - -	Three	TREE
4	• • • • -	Four	FOW-ER
5	• • • • •	Five	FAI-FF
6	- • • • •	Six	SICK-SS
7	- - • • •	Seven	SEV-ENN
8	- - - • •	Eight	ATE
9	- - - - •	Nine	NAI-NER

ARRL Communications Procedures

Voice	Situation
Go ahead	Used after calling CQ, or at the end of a transmission, to indicate any station is invited to transmit.
Over	Used after a call to a specific station, before the contact has been established. Used at the end of any transmission when only the specific station contacted is invited to answer.
Stand by or wait	A temporary interruption of the contact.
Roger	Indicates a transmission has been received correctly and in full.
Clear	End of contact. Then give the final call sign identification.
Leaving the air or closing the station	Indicates that a station is going off the air, and will not listen or answer any further calls. Ends with final call sign identification.