

Operational procedure for ARDF event VHF and HF transmitter control setting

Overview

The purpose of this document is to describe the operations that take place to synchronize and set the transmitters into the field on both the 2011 region II ARDF championships VHF and HF event day.

Credits

Unless noted photos and graphics are by WB8WFK

Chapter 1

Setup operating procedure

Overview

All transmitter setters will go to the finish area and pickup there designated transmitters, receive maps and GPS waypoints.

Before the start of this sequence, all 5 transmitters MUST be synchronized according to the instruction manual for each transmitter (OHIO VHF and Albuquerque HF transmitters). A copy of each transmitter manual will be on site. All SI stations will also have been synchronized with PC clock.

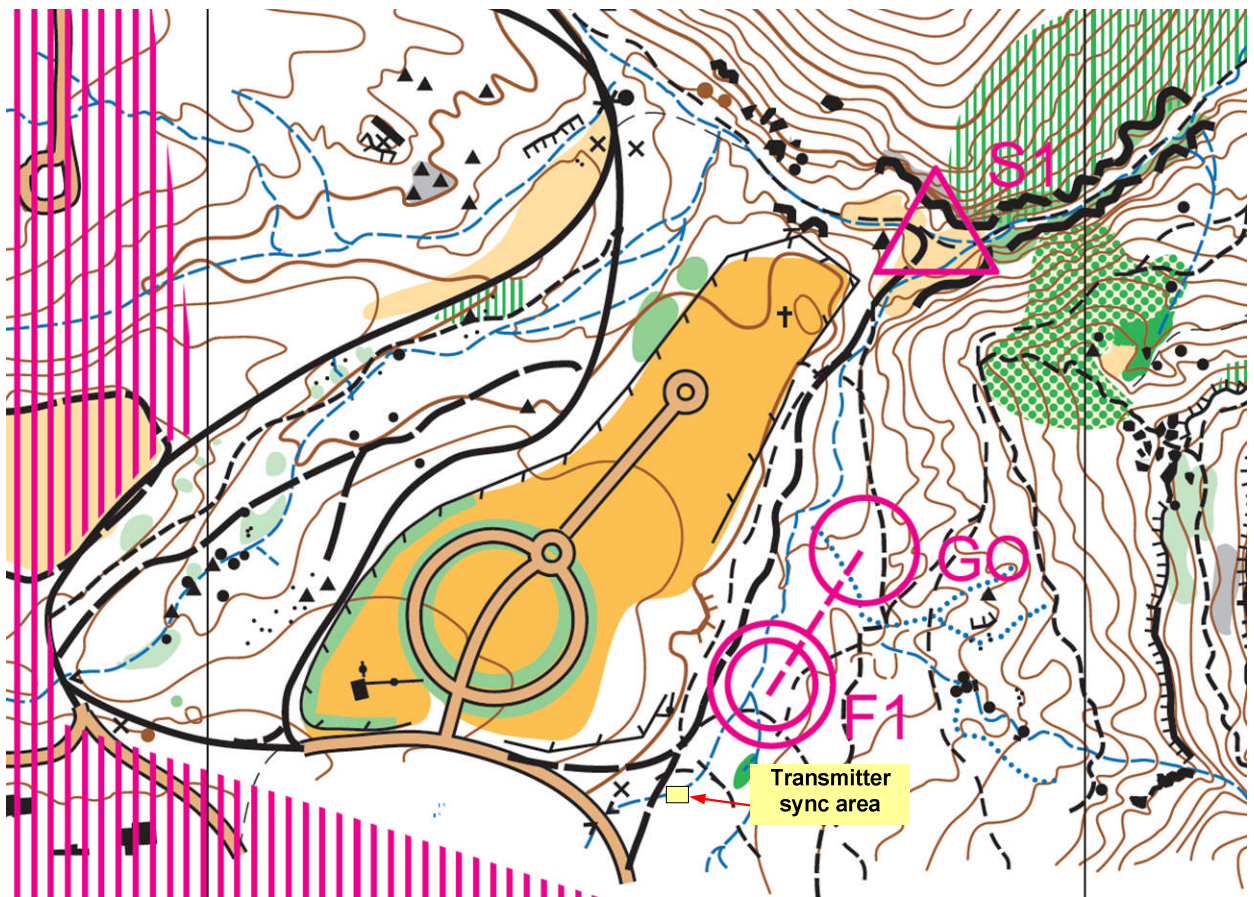


Figure 1 day one transmitter sync and pickup

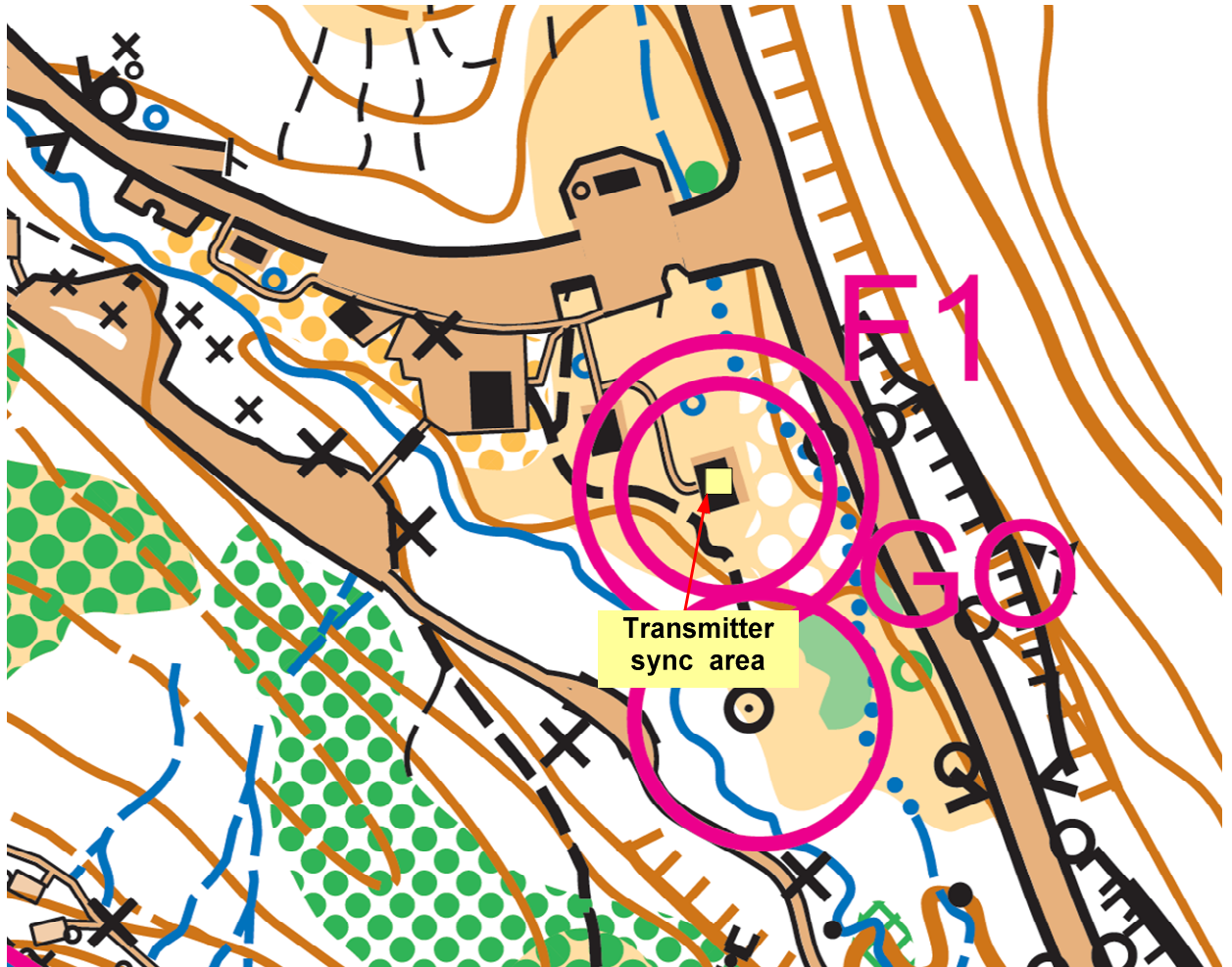


Figure 2 day 2 transmitter sync and pickup area (doc long group shelter)

Each transmitter setter will receive the following items:

VHF (Day 1)

SI station and stand

Orienteering Control flag, punch with transmitter ID (MOE MO5 etc).

Ohio VHF transmitter and antenna rod transport tube.

Map with marked transmitter location

UTM GPS position of transmitter.

HF

SI station and stand

Orienteering Control flag, punch with transmitter ID (MOE MO5 etc).

Albuquerque HF transmitter, matchbox and antenna wire packaged in ammo can.

Map with marked transmitter location.

UTM GPS position of transmitter.

Minimum required staff

Each transmitter station requires at least 1 persons with one being a ham operator (if no cell phone service) to communicate with net control. Would be best if 2 persons to provide buddy system.

Responsibilities for staff at this station are:

Person 1 and 2

Transport transmitter from sync area and Place transmitter in field at designated location. Stay on site and track bib numbers as each runner arrives at transmitter location. At 3 hours from last start course closes, remove transmitter and return all equipment to sync location.

Operating procedure for transmitter stations is as follows.

Note: Equipment will be handed out after transmitter synchronization is done by Jerry Boyd. There will be a demonstration as how to set up the equipment at the control site (Transmitter, antenna, SI station and control flag).

Step 1 hand out transmitters,

After setup demonstration Hand out the equipment to each setter.

Step 2 hike to assigned transmitter location and place transmitter.

Locate antenna at marked rail tape location (note sometimes trail tape gets removed by unexpected persons as tape was place servile weeks in advance of eh meet). Use GPS locations

for each transmitters form blow tables. Each transmitter is on an orienteering map feature to aid in locating if the trail tape has been removed.

Note locate the control marker and SI station at least 10 feet away from the transmitter, This reduces the risk of someone getting snagged in the antenna (more of an issue for the HF transmitter) and prevents RF from interfering with the Sport Ident station. Also do not operate a cell phone within 3 feet of the transmitter of SI station. This reduces the risk of EMI interference.

VHF transmitters UTM positions (Saturday)

H R DATUM

M E WGS 84 100 0.0000000E+00 0.0000000E+00 0 0 0

H COORDINATE SYSTEM

U UTM UPS

F ID	Zne	Eastng	Northng	Symbol	T Alt(m)	Comment
W MOE	13S	383524	3974713	Waypoint	I 2152.5	18-JUN-11 10:31:19AM
W MOS	13S	384421	3974898	Waypoint	I 2136.9	18-JUN-11 11:21:12AM
W MOH	13S	385938	3975223	Waypoint	I 2122.5	18-JUN-11 2:02:48PM
W MO5	13S	385357	3974340	Waypoint	I 2151.5	18-JUN-11 12:45:13PM
W MOI	13S	384301	3974212	Waypoint	I 2169.3	18-JUN-11 11:59:29AM

HF transmitters UTM positions (Sunday)

H R DATUM

M E WGS 84 100 0.000000E+00 0.000000E+00 0 0 0

H COORDINATE SYSTEM

U UTM UPS

F ID----- Zne Eastng Northng Symbol----- T Alt(m) Comment

W 001	13S 373913 3892716	Waypoint	I	2293.6	30-JUL-11 8:05:12AM
W MOI	13S 374446 3892069	Waypoint	I	2258.2	30-JUL-11 8:52:52AM
W MOH	13S 374831 3892677	Waypoint	I	2231.8	30-JUL-11 12:37:12PM
W MOS	13S 375429 3892128	Waypoint	I	2152.7	30-JUL-11 12:02:22PM
W MOE	13S 374276 3890960	Waypoint	I	2236.1	30-JUL-11 10:00:30AM
W MO5	13S 375203 3890722	Waypoint	I	2216.9	30-JUL-11 10:48:54AM

Step 2 during meet.

Keep track of all bib numbers as runners arrive at the control station. Record bib number and time in note book.

Stay in contact with communications net and relay runner information back to net control.

Step 3 post event

1. Post event is defined as time of last stat plus 3 hours.
2. Turn off transmitters (per below notes), Pack up all equipment and return to sync point.

Day 1 (VHF event) TO prevent possible damage to the RF power amplifier turn off the VHF transmitters before removing the arrow antenna elements. After removing the antenna elements place them back into the transport tube before transport back to the designated equipment return location.

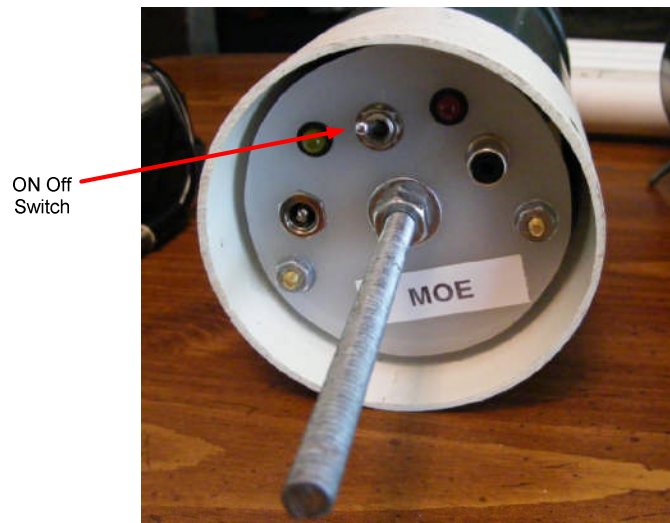


Figure 3 OHIO transmitter on off switch

On day 2 (HF event) open ammo can and unplug power pole connectors between battery and controller. Pack up all equipment and return to designated return Location.

Note in the event of an approaching electrical storm or forest fire the Net control station will instruct all setters to pack up equipment and exit the site. A return or meet location will be communicated by the net control station.

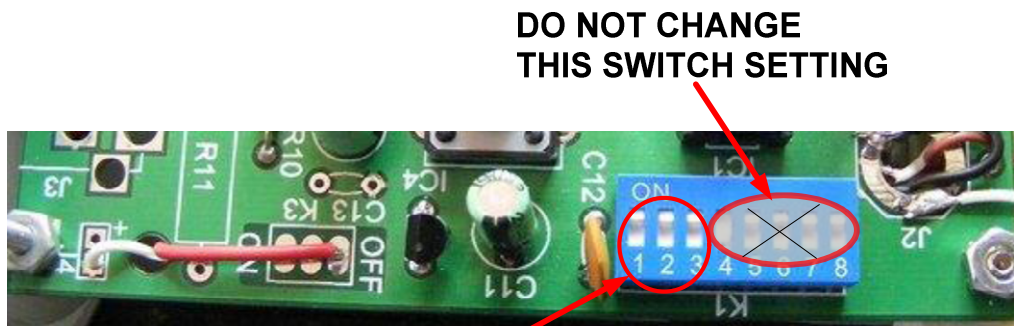
Appendix

If a transmitter is found to be out of sync the following is done.

On Day 1 (VHF) For OHIO transmitters.

Delayed start was used and will need to be disabled to have restart without programmed delay.

Step 1 Open transmitter case and set dip switches to zero delay option. Do not change settings of switch 4 to 8 as this will change transmitter number and modulation mode!! Only change settings of switches 1,2 and 3 per the below figure.



Jumper K4 sets the modulation type – Jumper for either AM or FM – default is AM.

Trimmer CT1 sets the fine microprocessor timing – adjust only if needed to account for drift.

Switch bank K1 sets the operational parameters. The function of the switches is as follows:

<u>1</u>	<u>2</u>	<u>3</u>	<u>set the startup delay in 30 minute increments</u>
On	On	On	no delay, instant start

Figure 4 OHIO Transmitter dip switches (from OHIO manual)

Step 2. Turn off transmitter

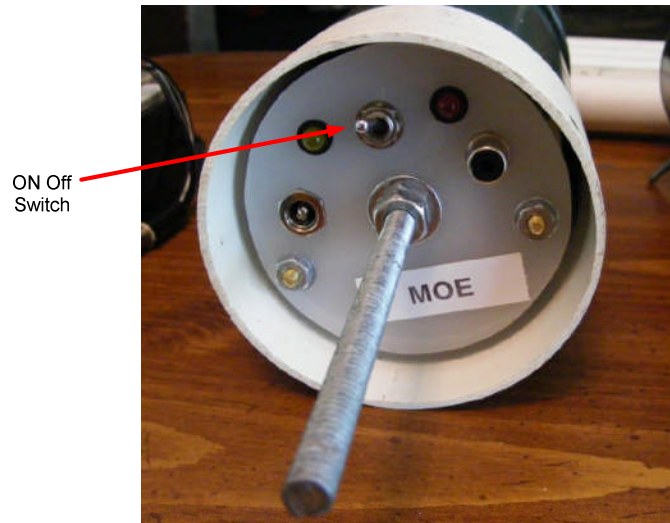


Figure 5 Ohio transmitter on off switch location (from Ohio transmitter manual)

Use GPS time to reset transmitter by turning transmitter back on at the beginning of each ARDF cycle per the below cycle table. Note only MOE will instant start when transmitter is powered up at beginning of cycle. All other transmitters will turn on a there designated cycle slots per the below table. Re-assemble transmitter after-start and operation is verified.

Time (min)	Transmitter	Reset event (at start of cycle) GPS or atomic clock time
0	MOE (1)	push reset switch and release at once
1	MOI (2)	
2	MOS (3)	
3	MOH (4)	
4	MO5 (5)	
5	MOE (1)	at 4:50 push reset switch, release at 5
6	MOI (2)	
7	MOS (3)	
8	MOH (4)	
9	MO5 (5)	
10	MOE (1)	at 9:50 push reset switch, release at 10
11	MOI (2)	
12	MOS (3)	
13	MOH (4)	
14	MO5 (5)	
15	MOE (1)	at 14:50 push reset switch, release at 15
16	MOI (2)	
17	MOS (3)	
18	MOH (4)	
19	MO5 (5)	
20	MOE (1)	at 19:50 push reset switch, release at 20
21	MOI (2)	
22	MOS (3)	
23	MOH (4)	
24	MO5 (5)	
25	MOE (1)	at 24:50 push reset switch, release at 25
26	MOI (2)	
27	MOS (3)	
28	MOH (4)	
29	MO5 (5)	
30	MOE (1)	at 29:50 push reset switch, release at 30
31	MOI (2)	
32	MOS (3)	
33	MOH (4)	
34	MO5 (5)	
35	MOE (1)	at 34:50 push reset switch, release at 35
36	MOI (2)	
37	MOS (3)	
38	MOH (4)	
39	MO5 (5)	
40	MOE (1)	at 39:50 push reset switch, release at 40
41	MOI (2)	
42	MOS (3)	
43	MOH (4)	
44	MO5 (5)	
45	MOE (1)	at 44:50 push reset switch, release at 45
46	MOI (2)	
47	MOS (3)	
48	MOH (4)	
49	MO5 (5)	
50	MOE (1)	at 49:50 push reset switch, release at 50
51	MOI (2)	
52	MOS (3)	
53	MOH (4)	
54	MO5 (5)	
55	MOE (1)	at 54:50 push reset switch, release at 55
56	MOI (2)	
57	MOS (3)	
58	MOH (4)	
59	MO5 (5)	

Figure 6 ARDF GPS time cycle chart

Note in the wording "push reset switch" is for the Albuquerque microfox HF transmitters.

For Albuquerque HF transmitters.

Step 1. Open ammo box lid and Remove power.

Step 2. re-apply power at start of 5 minute cycle per the above ARDF cycle table. No dip switch changes are required as delayed start was not used.

Step 3. Verify operation and close ammo box lid.