

ANNEX A : CEOI

Time Zone: ZULU

1. GENERAL

a. Definitions

- (1) Team: A team is defined as a single HF radio station manned by any number of operators simultaneously or in shifts. The intent is for military units or civilian organizations with multiple stations to register these as distinct and separate teams;
- (2) Assignment / Centre Frequency: Center of the frequency band assigned to a station. Unless otherwise specified, the frequencies given below in these CEOs are Assignment Frequencies. All channels will operate at 3kHz bandwidth for the duration of the Exercise; and
- (3) Window / Dial frequency: For certain radio equipment, the frequency which is displayed on the front panel of a radio may reflect the suppressed carrier frequency and not the frequency which carries the signal in SSB (either slightly higher or lower depending on LSB or USB operation). For Exercise NOBLE SKYWAVE 2021 (Ex NS 21) this will be 1.5 kHz lower than the Assignment frequency.

b. Call-signs. Call-signs for each team will be distributed via APPENDIX 1 – Comms Card which will be published on the Ex NS 21 web app after registration closes and no later than 222359Z0CT21. Teams will be assigned random call-signs based on their location and cannot expect to receive the same call-sign they may have had in a previous year.

c. Loss of Contact

- (1) Should a station lose contact with the net after the initial check in with the Net Control Station (NCS) on day one, the following drill is used:
 - (a) Check and adjust antennas and cables, both internal and external;
 - (b) Check frequency and CEOs;
 - (c) Turn radio “OFF”, then “ON” and attempt to re-establish communications; and
 - (d) Attempt to make radio contact with NCS on the following frequencies:
 - i. 2.44750 MHz;
 - ii. 6.78550 MHz;
 - iii. 13.88150 MHz; and

iv. 20.97750 MHz.

- (2) The NCS will monitor a various HF radio frequencies (including the above loss of contact frequencies) primarily in SSB. The NCS can also operate in 2G ALE HF however this is a secondary means available on request;
- (3) If a team is having difficulty contacting the NCS via radio, the team can request the NCS to move to a different frequency based on propagation prediction;
- (4) If a team is unable to contact the NCS via radio or chat room of the Web Application (web app) located at: <https://nobleskywave.ca/>, the team can contact the NCS via email: cafnoleskywave@gmail.com or via phone: 1-613-541-5010 ext. 3869.

2. REPORTING CONTACTS

- a. All contact reports will be logged and scored via the Ex NS 21 web app which will be hosted at <https://nobleskywave.ca/> no points will be awarded for contacts that are not logged through the web app. Ships that do not have access to internet may call the NCS every two hours to report their contacts;
- b. Each team will sign up on the web app NLT 192300Z OCT 21 IOT gain access to the Ex NS 21 Contact Report interface for the various challenges. Any teams that have not registered on the web app will have to contact NCS to gain access to web app or they will not be scored during the competition;
- c. Individual contact reporting for each of the challenges will be unlocked within the web app in accordance with the timing provided in phase 2.1, 2.2, 2.3 and 2.4. Teams will be able to report a contact for each challenge once that challenge has started;
- d. The web app will automatically calculate score for all contacts reported it. The scoring scheme is different by challenge/phase (2.1 Establish a Net, 2.2 Free Play, 2.3 Team Contact Challenge and 2.4 Back to the Future). Points will only be allocated once both teams have reported the same contact on the web app. For instance, if team A reports a contact with team B, the web app will not award the points until team B reports the same contact from their end. There is a 5 min time limit for the second team to send in the report after the first report is received. The order in which the teams report a contact is unimportant;
- e. Teams may only report ONE contact with each team during each challenge. No points will be awarded for a second contact with the same team. For instance, if during, challenge 2.2 “Free Play”, teams A and B report a contact over SSB, even if they subsequently manage a successful contact over 3G ALE they will only be rewarded the points for the SSB contact. Therefore, it is encouraged to try to make contact over the higher scoring modes before reporting a contact;
- f. The web app contains a scoreboard which will be available at all times for teams to consult. Scoring will be done in real time as the contact reports are being logged in the web app;

- g. The web app scoring will automatically calculate distance between teams as well as other parameters. It is imperative that teams provide accurate information when registering for the web app as this feeds the log book and scoring system. Web app administrators will be confirming all data entered from each of the team’s Ex NS 21 registrations;
- h. Ex NS 21 chat rooms (hosted via SLACK) will be available through the web app for teams to synchronize and coordinate their communication efforts; and
- i. Teams having difficulty to sign up on the Web App or SLACK should contact the Ex NS 21 planning team at cafnobleskywave@gmail.com.

3. COMPETITION BREAKDOWN

a. Phase 2.1 - Establishing the Net

(1) Timings

- (a) 270600ZOCT21 – 271359ZOCT21.

(2) Execution

- (a) Phase 2.1 will be conducted entirely in SSB for HF Radio communication. Communication via web app will be done via the Ex NS 21 SLACK channels (registration for the SLACK channels is available via the “Chat” tab);
- (b) The NCS will have two Harris QRT systems (1x RF-5800, and 1x RF-7800), and a Babcock 36 channel HF monitor receiver system, all setup for SSB;
- (c) Multiple antennas will be used by the NCS to accommodate as many participants as possible including: Delta, LPH-89J, LFH 230/1 (Fanlite), and AS-5216 Whip; and
- (d) NCS will be monitoring the following 16 SSB frequencies.

(3) Scoring

Mode		TX	RX	points
SSB Analog	voice	1.5 via radio	1.5 via radio	3
SSB Analog	voice	1.5 via radio	0.5 via Web App	2
Web App	Web App	0.5 via Web App	0.5 via Web App	1
No contact		0	0	0

- (a) Three (3) Points: a completed radio check conducted by C/S and NCS, conducted strictly by voice over HF;
- (b) Two (2) Points: Half radio check conducted. A team contacts the NCS via voice over HF, NCS receives and responds, but the team can't hear the NCS. After 2 minutes of NCS trying to contact C/S, there is no response, the NCS will respond via Web App. Then only a total of 2 points are awarded;
- (c) One (1) point: C/S contacted NCS via Web App and NCS responded via Web App. No successful contact over HF; and
- (d) Zero (0) points: no contact was made with the NCS.

(4) Frequencies

Establishing the Net (mhz) SSB
2.01150
2.42750
2.70150
3.39050
4.87150
4.95150
5.21050
5.90050
6.84450
7.97650
9.94250
10.93250
14.3860
16.03550
20.2695
27.91150

b. Phase 2.2 - Free Play

- (1) Timings. 271400Z OCT21 – 280159Z OCT21.
- (2) Execution. This phase is open to all types of HF radio communications to attempt to make contact with as many teams as possible using all available frequencies listed below. The planning team are aware not all teams will have the capability to operate in various modes, the subsequent challenges will even the playing field for teams limited in transmission mode:

- (a) During this phase teams are highly encouraged to attempt communications in different HF radio modes including but not limited to:
 - i. SSB – analog or digital;
 - ii. 2G ALE, 3G ALE, 3G+ ALE; and
 - iii. Sending data.
- (b) Use of the SLACK channels to directly coordinate attempts with other teams is highly encouraged.

(3) Scoring

Mode of connection	Type of transmission	Points
SSB	Voice	1
SSB	Data	2.5
2G ALE	Voice	2
2G ALE	Data	3.5
3G(+) ALE	Voice	3
3G(+) ALE	Data	4.5

- (a) Teams are responsible to report scores via Web App as soon as possible after the contact is made. Remember there is a 5 min time limit between each team reporting a contact;
- (b) Should a team successfully contact all stations on all modes, teams are still highly encouraged to continue to participate IOT develop HF operator skills and capabilities; and
- (c) Only one contact can be reported for each team contacted. Therefore it is encouraged to try higher scoring contact types before reporting the contact. If you report an SSB voice contact with a team, you will not be able to report a 3G ALE contact with the same team during this challenge.

(5) Frequencies

Free Play Frequencies			
2.0115	2.0165	2.0365	2.2735
2.3515	2.4275	3.20650	2.4555
2.4755	2.5355	2.7015	3.2815
3.3215	3.3905	4.0235	4.6065
4.6415	4.815	4.90150	4.8665
4.8715	4.92	4.9515	5.0365
5.1565	5.2105	5.3015	5.4015

5.8015	5.84650	5.9005	4.5765
6.8015	6.8115	6.8445	6.9815
7.3115	7.3515	7.5215	7.7015
7.9015	7.9765	9.9425	10.1965
10.2855	10.2915	10.5625	10.9325
11.5395	12.1165	13.4165	13.5685
13.5855	13.8815	13.9545	14.3745
14.3860	14.8425	14.9625	15.7345
16.0355	18.2055	18.7275	18.91650
20.0195	20.2695	20.3015	20.9015
20.9775	23.0015	23.1015	24.5015
24.7015	25.2655	25.4015	26.5015
26.9015	27.7315	27.8115	27.9115

c. Phase 2.3 – Team Contact Challenge – SSB, 2G ALE, or 3G ALE

- (1) Timings. 280200ZOCT21 – 281359ZOCT21.
- (2) Execution. For this challenge, teams will be organized into groups based on their transmission capabilities and geographic area. Each team will attempt to make contact with as many of the teams in their group as possible. For this challenge, teams will have to identify on which category they wish to compete in during their initial registration on the Ex NS 21 web app (SSB-Only, 2G ALE, or 3G ALE). The web app will only allow the reporting of contacts with teams that registered in the same category. Group assignments (and team call-signs) will be distributed via APPENDIX 1 – Comms Card which will be published on the Ex NS 21 web app after registration closes and no later than 222359ZOCT21:
 - (a) SSB-Only. Teams will attempt to make contact with as many other SSB-only teams as possible on the SSB-Only assigned frequencies below;
 - (b) 2G ALE Capability. 2G ALE teams will attempt to make contact with as many other 2G ALE teams as possible within their assigned group below:
 - i. 2G ALE capable teams shall program their radios with the contacts and associated frequencies from their group only. All 2G ALE groups will include the NCS as a contact.
 - (c) 3G ALE Capability. 3G ALE teams will attempt to make contact with as many other 3G ALE teams as possible within their assigned group only;
 - (d) Teams will be placed in groups containing an equal number of teams. Groups will be balanced with regard to difficulty and geography; and

- (e) Use of the web app chatroom (SLACK), as well as email, to directly coordinate attempts with the other teams is highly encouraged.

(3) Scoring

- (a) Scoring for the Team Contact Challenge will be separate from the overall competition scoring this year. Three categories will be made; one for SSB, one for 2G ALE and one for 3G ALE. The first team to contact all the other teams in their group (groups will be defined in APPENDIX 1 – Comms Card) will win in their category. If no team manages to contact all the other teams in their group the team with the most contacts in their group will win. The mode which you submitted in the web app registration portal will be used to assign your team to a category.

(4) Frequencies

- (a) 2G ALE Teams

2G ALE Net Call Sign – NS1/NS2

Dial freq (mhz) 2G NS1	Dial freq (mhz) 2G NS2
2.27350	2.03650
2.45550	2.47550
4.64150	4.02350
4.90150	4.81500
5.40150	5.30150
5.84650	5.80150
6.98150	6.80150
7.35150	7.52150
10.28550	10.5625
13.41650	13.56850
15.73450	14.3745
18.91650	18.72750
20.30150	20.90150
24.50150	24.70150
27.73150	27.81150

(b) 3G ALE Teams

3G ALE Net Call Sign – 3GNS1

Dial freq (mhz) 3G 3GNS1
2.35150
3.32150
4.86650
5.03650
6.81150
7.31150
7.70150
10.19650
11.5395
13.58550
14.96250
18.20550
23.00150
25.26550
26.90150

(c) SSB Only Teams

SSB-only Frequencies

Dial freq (mhz) SSB
2.01650
2.53550
3.28150
4.60650
4.92000
5.15650
7.90150
10.2915
12.11650
13.95450
14.84250
20.01950

23.10150
25.40150
26.50150

d. Phase 2.4 – Back to the Future Challenge

- (1) Timings. 281400ZOCT21 – 281759ZOCT21.
- (2) Execution. Each team will utilize SSB voice or data to attempt to make contact with as many teams as possible.
 - (a) The greater the distance between the two teams or the mode of transmission the greater the points; and
 - (b) Use of Web App chat room or email to contacts to directly coordinate attempts with the other teams POCs is highly encouraged.
- (3) Scoring

Distance in KM	Mode	Points
0 to 1000	Voice	1
	Data	1.5
1000 to 3000	Voice	2
	Data	2.5
3000 to 5000	Voice	3
	Data	3.5
5000 to 7000	Voice	4
	Data	4.5
More than 7000	Voice	5
	Data	5.5

- (a) Scoring:
 - i. 1 point awarded for each successful contact being 0 km to 1000km;
 - ii. 2 points awarded for each successful contact of more than 1000 km but less than 3000 Km;
 - iii. 3 points awarded for each successful contact of more than 3000 Km but less than 5000 Km;
 - iv. 4 points awarded for each successful contact of more than 5000 Km but less than 7000km;

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- v. 5 points awarded for each successful contact of 7000km or more; and
 - vi. An additional half-point will be awarded for transmitting data.
- (b) Teams are responsible to report scores to the NCS on Web App as soon as possible. Ships that do not have access to internet may call the NCS to report their contacts.
- (c) Upon reaching all stations, teams are still highly encouraged to continue to participate IOT develop HF operator skills and capabilities.

(4) Frequencies:

Back to the Future dial freq (mhz)			
2.0115	2.0165	2.0365	2.2735
2.3515	2.4275	3.20650	2.4555
2.4755	2.5355	2.7015	3.2815
3.3215	3.3905	4.0235	4.6065
4.6415	4.815	4.90150	4.8665
4.8715	4.92	4.9515	5.0365
5.1565	5.2105	5.3015	5.4015
5.8015	5.84650	5.9005	4.5765
6.8015	6.8115	6.8445	6.9815
7.3115	7.3515	7.5215	7.7015
7.9015	7.9765	9.9425	10.1965
10.2855	10.2915	10.5625	10.9325
11.5395	12.1165	13.4165	13.5685
13.5855	13.8815	13.9545	14.3745
14.3860	14.8425	14.9625	15.7345
16.0355	18.2055	18.7275	18.91650
20.0195	20.2695	20.3015	20.9015
20.9775	23.0015	23.1015	24.5015
24.7015	25.2655	25.4015	26.5015
26.9015	27.7315	27.8115	27.9115

e. Phase 2.5 – End Ex

- (1) Timings. 281800ZOCT21 – 281900ZOCT21.
- (2) Execution. The NCS will tally the scoring and announce the winner for each category.
 - (a) The winner will be announced to all via HF on the Loss of Contact frequencies and <https://nobleskywave.ca/> chat room as per section 1.a.1.d of this document;
 - (b) Winners will be announced as per the following categories:
 - i. 1 to 150W: Overall score from Establish the Net, Free Play and Back to the Future;
 - ii. 150 to 400W: Overall score from Establish the Net, Free Play and Back to the Future;
 - iii. More than 400W: Overall score from Establish the Net, Free Play and Back to the Future. If the winning team from a lower power category wins, the higher power category will not be announced;
 - iv. SSB Category winner for the Team Contact Challenge;
 - v. 2G ALE Category winner for the Team Contact Challenge; and
 - vi. 3G ALE Category winner for the Team Contact Challenge.
 - (c) The full Ex NS 21 Scoreboard will remain up on the website for two weeks after the competition.

Appendix 1: Comms Card – To Be Issued