

Stockholmradio Aviation Communication & Services
(Part of the Aviolinx Group)

Stockholmradio - Guide

This guide will help you understand the effects geomagnetic solar conditions and the time of day/year may have on HF communications, so that you can always be sure to get optimal communications when using Stockholmradio HF Radio. You will also be provided with information about services available and how you can register to use them.

How does HF Radio work?

Radio communications in the HF band (High Frequency band) are bounced off the ionosphere. The ionosphere is a section of the upper atmosphere which is ionized by solar radiation. This phenomenon influences *radio propagation* as the conditions constantly change. Since the ionosphere's existence is due to radiation from the sun striking the atmosphere, the effects on Radio communications in the HF-band will vary depending on the time of day (day or night), and also the time of year (winter or summer) as a result of solar radiation from sun spots.



Stockholmradio Aviation Communication & Services

Stockholmradio or '**STO Radio**' is part of **Aviolinx AB**, and is situated at Nacka Strand, a few km east of central Stockholm. We have been providing the international aviation community with HF radio communication services since the 1960's. Our history as a maritime Coast Radio Station dates back to the early 20th century.

When operating within STO Radio's service area of coverage, you can rely on our dependable, robust, long range HF-Radio communications platform, which utilises a number of remote-controlled, high-powered transmitters and associated receivers with various directional antennas at various locations.

STO Radio is available 24 hours day and 365 days a year.



STO Radio HF Services available

**Operational Phone Patches:
(Air-to-Ground /Ground-to-Air)**

Services open to all HF-equipped aircraft. Monitored frequencies (below) are intended for Operational Control traffic and for initial contact in case of other traffic.

Operational Message Relay:

We relay Position Reports, ARR/DEP messages, Re-dispatch /Acceptance messages, etc. Individual templates with pre-assigned addresses for quick and safe transactions. Additional addresses easily included when required. Messages relayed via SITA/AFTN, Email, fax or phone.

Flight Planning Messages:

STO Radio handle the following types of incoming messages: Type B: STOFWYF or AFTN: ESKRYFYW

- FPL (ATC Flight plans, ICAO format)
- Flight plan related messages:
 - MVT and MVA (Movements)
 - CHG (Change)
 - ARR (Arrive)
 - CNL (Cancel)
 - DEP (Departure)
 - DLA (Delay)

MET Info:

We can quickly provide crews with METARs and TAFs for most major stations.

Medical advice:

Flight Crews requiring medical advice can be patched through to MedLink or another similar service of your choice.

SELCAL:

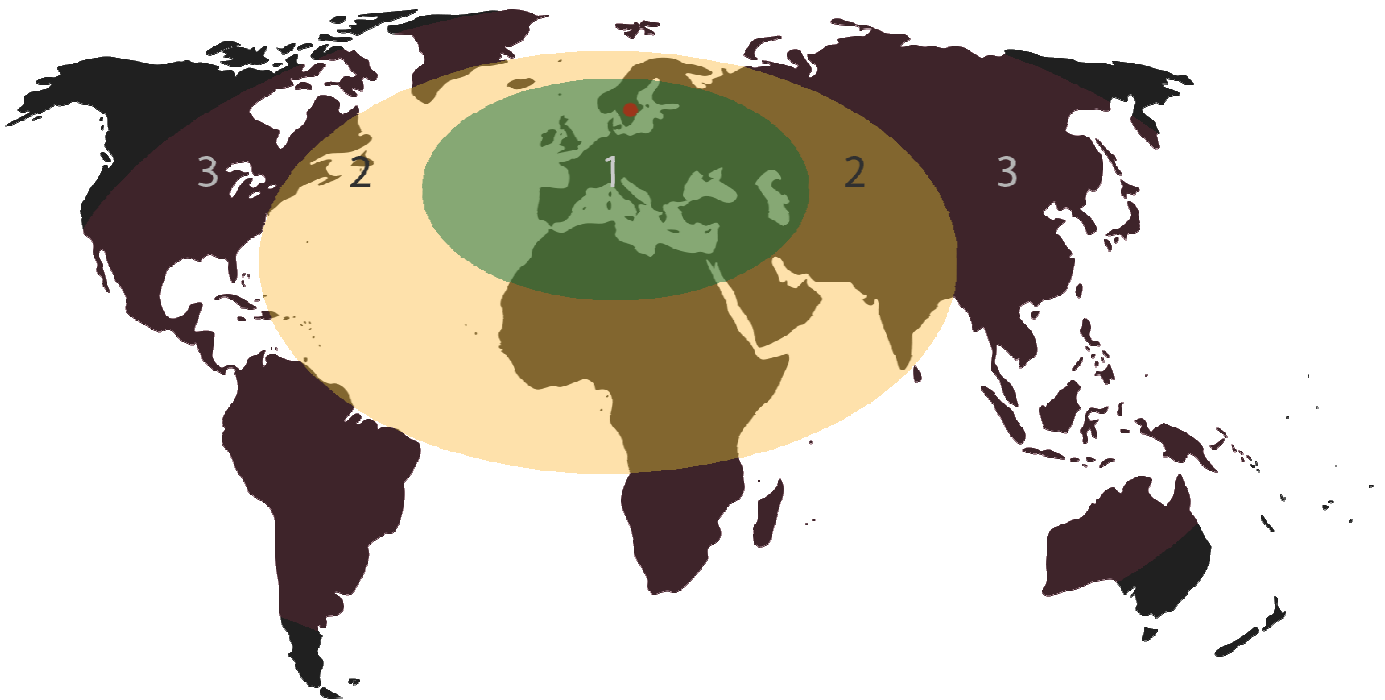
Whenever possible we suggest SELCAL guard to be maintained on a suitable frequency to ensure quick Ground-to-Air traffic. Please consult our Propagation Forecast and this document (see below) to select optimum frequency depending on location and time of day.

Option to send a message (via SITA or Email) to your Operations/Dispatch advising them that the flight has *Logged On*

Stockholmradio HF coverage

General rules:

- The higher the sun, the higher the frequency.
- The lower the sun, the lower the frequency.
- The longer the distance, the higher the frequency.
- The shorter the distance, the lower the frequency.



1/Green =Normally very good **2/Yellow** =Normally good **3/Light Red** =Occasional

HF radio conditions

This chart displays STO Radio's Approximate Service Area that can be expected under fairly normal conditions (see the pink and yellow coloured eclipsed areas on the map above). Of course it is possible to establish contact outside this area but this is very much dependent on: the changing conditions in the ionosphere, the current radio conditions and also the pilot's experience with using HF-radio. We can therefore not guarantee that communications will be viable with 100% readability at all times and we will not accept any liability for any inconvenience or cost caused thereby.

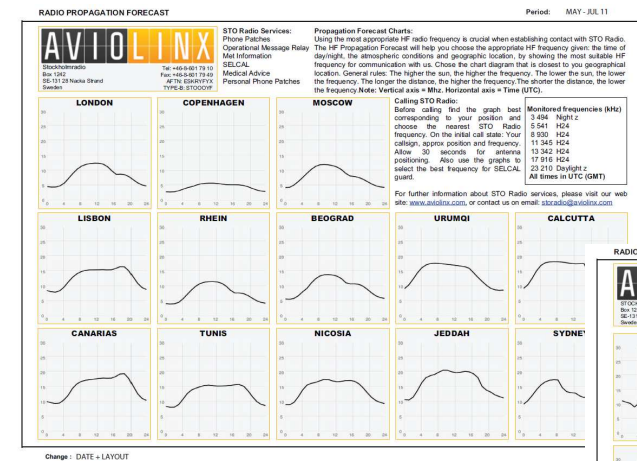
Note:

- During **night time** the frequencies 3494 / 5541 / 8930 mainly cover areas 1, 2 and 3.
- During **day time** the pilot must use the higher frequencies: 8930 / 11345 / 13342 / 17916 / 23210 in order to cover the same distance.

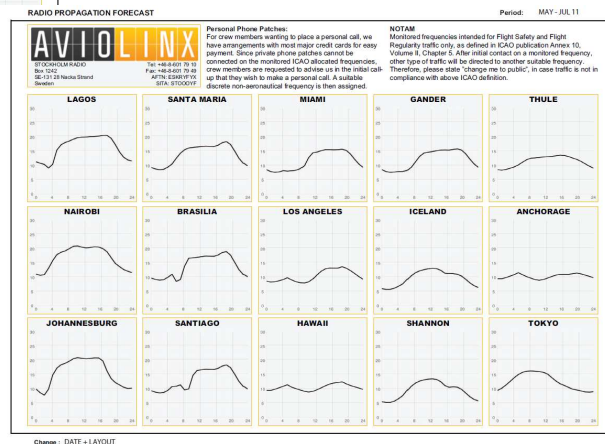
Monitored frequencies in kHz:	3494 5541 8930 11345 13342 17916 23210	Night only. Short/Medium range H24. Day: Short range. Night: Long H24. Day: Medium range. Night: Long H24. Medium/Long range. H24. Medium/Long range. H24. Long range. Daytime. Day only. Long range.
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Propagation Forecast

Using the most appropriate HF radio frequency is crucial when establishing contact with STO Radio. The HF Propagation Forecast will help you choose the appropriate HF frequency given: the time of day/night, the atmospheric conditions and geographic location, by showing the most suitable HF frequency for communication with STO Radio.

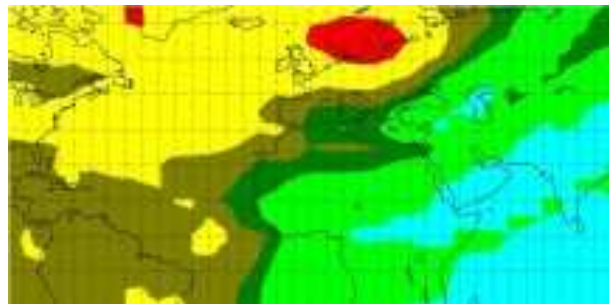


For illustration purposes only



You are free to reproduce Propagation Forecasts in full or in part to suit your own requirements. Propagation Forecasts are updated every three months and are available for download as PDF from our website at www.aviolinx.com – see: 'HF Propagation fcast'. They may also be available from your navigation chart provider.

Hourly updated radio propagation forecasts for Stockholmradio can also be found at our website, www.aviolinx.com under: 'Hourly radio propagation map.' These forecasts are produced by: IPS Radio and Space Services in Australia, and they are based on real time ionosphere conditions.



Communicating with STO Radio

The key to successful and reliable HF Radio communications is not only reliant on geomagnetic conditions and equipment. Pilot skills and experience are also very important, when adjusting to the conditions that can quickly change during the flight.

Always consult our HF Propagation chart, before contacting STO Radio. Locate the graph on the Propagation Forecast that best corresponds to your position and choose the nearest STO Radio frequency. Be persistent when trying to establish contact on HF-radio. By persistently trying alternative frequency bands and repeating unsuccessful calls after a few minutes can significantly extend the approximate coverage area available.

What should I do if I don't receive a response?

- First, try to call again a couple of times on the same frequency.
- Then, try another frequency.
- Then, try again in 15-30 minutes. (It is more likely then that a change in aircraft position or conditions will result in successful contact).

HF radio should *always* be in USB-mode (Upper Side Band) and *not* in AM mode. The radio talk must be as clear and concise as possible to avoid any misunderstanding. Use short sentences, and where necessary repeat your message to ensure that it is received and understood. When contacting STO Radio, always provide the following information:

- Flight number / Registration
- Approximate geographic location
- The HF frequency used to call.



This will enable the radio operator to select a suitable transmitter and expedite good communications. Please allow 30 seconds for antenna positioning. Our operators at STO Radio listen for voice calls on six monitored kHz frequencies: 3494/23210, 5541, 8930, 11345, 13342, and 17916. The calls are audible on several directional loudspeakers with at least three loudspeakers for each frequency.

The SELCAL function of the HF-radio is important. We recommend that the pilot makes an initial SELCAL check with STO Radio when departing and remain on *SELCAL Guard* with STO Radio. It is not necessary to constantly listen to the noisy HF-frequency. The volume can be turned down, but not off. The pilot will then be alerted by an optical or acoustic signal when Stockholmradio has traffic for him/her. The chosen frequency may sometimes only be good for a limited period during the flight as the contact frequency varies depending on the time of day and geographic location. We recommend that you periodically call STO Radio during the flight to check if it is necessary to choose a new frequency.

When STO Radio responds to a SELCAL check, our normal procedure is to send a message (via SITA or Email) to your Operations/Dispatch advising them that the flight has *Logged On* to STO radio and are contactable directly via SELCAL. Airlines that adopt this standard operating procedure rarely experience difficulties in contacting their flights through STO Radio. If SELCAL watch is not maintained on our frequencies, the crew may never be aware of STO Radio's efforts to call them. Also neglecting to adjust the frequency selection for SELCAL watch during flight will result in degraded or unavailable Ground-to-Air HF contact. This is especially important for long haul flights.

Air-to-Ground calls under normal solar/geomagnetic conditions are usually the easiest to accomplish. The pilot selects a frequency from our HF Radio *Propagation Forecast* and Calls STO Radio.

FAQ

Q: Why do I sometimes receive the transmissions from STO radio that are totally garbled?

A: The reason for this is most likely that your HF radio is set in "AM" mode. The setting should always be "USB" mode.

Q: Do I have to actually tune my HF radio in order to be able to receive your SELCAL transmissions?

A: The onboard SELCAL decoder is connected to the receiver of the HF equipment. That means you need to:

- Have the HF turned on.
- Be in USB mode.
- Have the frequency dials set on a suitable frequency (determined by your location and the time of day). Note: you don't have to tune the transmitter (by keying the microphone) until you actually need to call us.

Q: Why is it that you send me to another frequency when I read you perfectly OK on the first frequency?

A: The reason is simply to optimise the use of our equipment. We try to avoid blocking the monitored frequencies with phone patches in case other flights want to call in. Please remember to return to one of our monitored frequencies to resume SELCAL guard after completion of communications on the alternate frequency unless otherwise instructed.

Q: What are the charges for using STO Radio services?

A: Details of all charges are available at our website: www.aviolinx.com

Registering an account

Stockholmradio HF services are available for any registered customer. No formal contracts/agreements need to be signed to become a HF radio customer. We trust our customers will settle their accounts within 30 days from invoice date. If a signed contract is needed, this can of course be arranged on request.

Failing to settle invoices in a timely manner will result in your HF support account being suspended and access to our services will be blocked. When an account has been suspended, it will only be re-opened once all overdue payments have been settled and an additional re-activation fee has been paid.

For administrative purposes, we ask you to *always* inform us of any changes such as: Invoice address, email/phone contacts, changes in your fleet etc. This will help avoid unnecessary breakdown in communications, invoices not being received, or aircraft calling us not being recognized etc.

For details of charges and conditions, please see document: *General terms and conditions*.

To apply for an account with STO Radio, please complete the *application form* and send it to us (see Contact details below). We will then contact you with more information to get you started.

We look forward to providing you with our reliable HF communication service! Please visit our website for further information: www.aviolinx.com

Contact details

Postal address: Avioline AB, STO Radio, P.O Box 1242, 131 28 Nacka Strand, Sweden

Visiting Address: Avioline AB, STO Radio, Cyllindervägen 20, Nacka Strand, Stockholm, Sweden

E-mail: storadio@aviolinx.com

SITA: STOOOYF

AFTN: ESKRYFYX

Telephone: +46 8 601 7910

Fax: +46-8 601 7949

Website: www.aviolinx.com

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