



STO Radio

(a trademark under Aviolinx Communication & Services)

HF Radio Refresher Training



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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**.



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STO Radio HF Services

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.

MET information

We quickly provide crews with the latest METARs, TAFs, ASHTAMs etc for most major stations.

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STO Radio HF Services Cont.

Flight Planning Messages

STO Radio handles the following types of incoming messages sent via **Type B** (STOFWYF) **AFTN** (ESKRYFYW) or **Email** (fpl@aviolinx.com)

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

Medical Advice

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

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STO Radio HF Services Cont.

SELCAL

Whenever possible we suggest SELCAL guard to be maintained on a suitable frequency to ensure quick Ground-to-Air or vice versa traffic.

Please consult our Propagation Forecast (see below) and other documents to select optimum frequency depending on location and time of day.

We offer an option to send a message (via SITA or Email) to your Control Center, Operations or Dispatch advising them that the flight has Logged On.

Private Pilot Call Service

All you need to do is call us and we will create a STO Radio Account for you, as we speak. Right after that you are ready to start making private calls any time of the day or night, H24.

So if you want to call home and wish your daughter happy birthday, congratulate a loved one, or let your wife know when you will arrive home, try our Private Crew Calls service.

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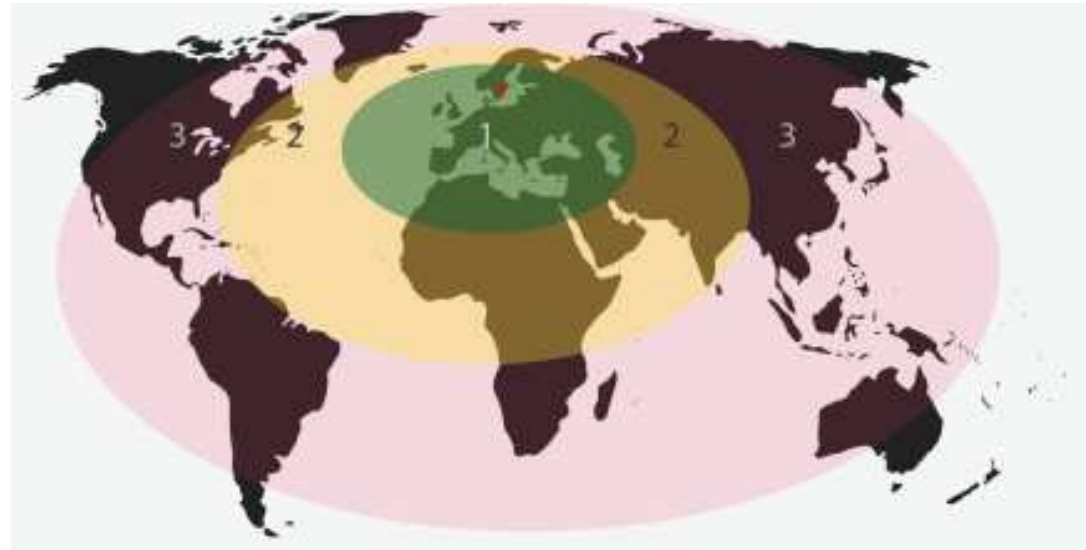
STO Radio HF Coverage

HF radio conditions

The chart displays STO Radio's approximate service area that can be expected under fairly normal conditions.

Of course it is possible to establish contact outside these areas, but then it's very much dependent on the changing conditions in the ionosphere, current radio conditions and also the pilot's experience with using HF-radio.

Understandably we cannot guarantee that communications will be viable with 100% readability at all times.



Green = Very good coverage,
Yellow = Normally good coverage
Pink = Often coverage

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STO Radio HF Coverage (continued)

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.

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



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Propagation charts

Using the most appropriate HF radio frequency is crucial when establishing contact with STO Radio.

To get an idea of what frequency will be optimum, please go to our web site www.aviolinx.com, and click the “STO Radio”-tab.

In the right hand side margin you will find links:

- “PROPAGATION FORECASTS”
- “Hourly radio propagation map”
- “Daily radio propagation map”



The screenshot shows the Aviolinx website interface. At the top is the Aviolinx logo with the tagline "TAKING AIRLINES HIGHER". Below the logo is a navigation menu with tabs for HOME, ABOUT US, PRODUCTS, CUSTOMERS, NEWS, SUPPORT, and CONTACT. The main content area is titled "STOCKHOLMRADIO" and features a sub-menu with tabs for Stockholmradio, Services, Coverage, Communication, and Customers. Under the Stockholmradio tab, there are sub-tabs for Private Calls, Fees, and Sign up. The main text describes Stockholmradio as part of Aviolinx, located at Nacka Strand, and provides information about its history and services. On the right side, there are sections for "READ MORE", "DOCUMENTS" (including links to STO Radio Pilot Training, STO Radio Guide, and General terms and Conditions), "EXTERNAL LINKS" (including MedLink, Hourly radio propagation map, and Daily radio propagation map), "PROPAGATION FORECASTS" (with links for AUG - OCT 2014 PDF TIFF and NOV - JAN 2015 PDF TIFF), and "MONITORED FREQUENCIES" (listing 3494/23210, 5541, 8930, 11345, 13342, and 17916 kHz, USB - Upper Side Band).

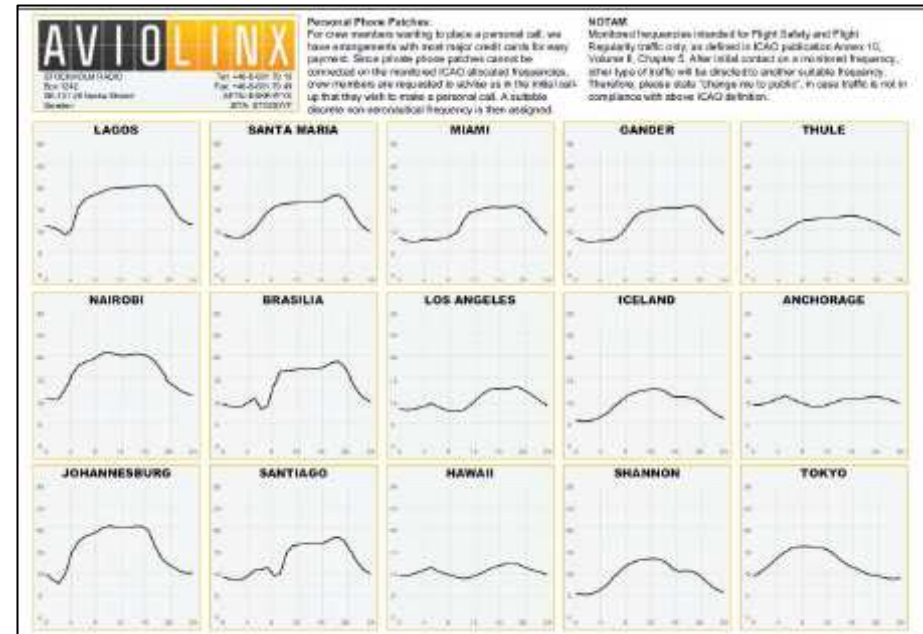


Propagation Forecasts

Every quarter of the year we publish a prediction of suitable frequencies for coming quarter. The forecast is set up for a number of worldwide stations. Choose the one/ones closest to you and use as a first indication.

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 communicating with STO Radio.

So: these Propagation Forecasts are updated every three months and are available for download as PDF from our website at www.aviolinx.com – see: ‘HF Propagation forecast’. They might also be available from your navigation chart provider.



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Hourly and Daily Propagation charts

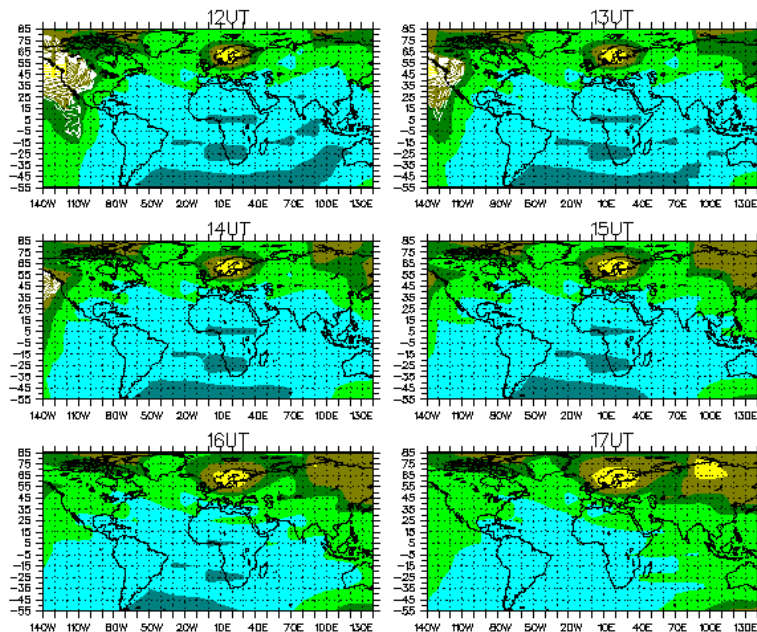
These propagation maps will show the calculated optimum frequency for each time of day: “**Daily**” will show for your selected time spectre, while “**Hourly**” will show for the prevailing hour. These are produced for us by **IPS Radio and Space Services** in Australia, and are based on real time ionosphere conditions.

Daily Radio Propagation Map

Updates: Every 24 hours

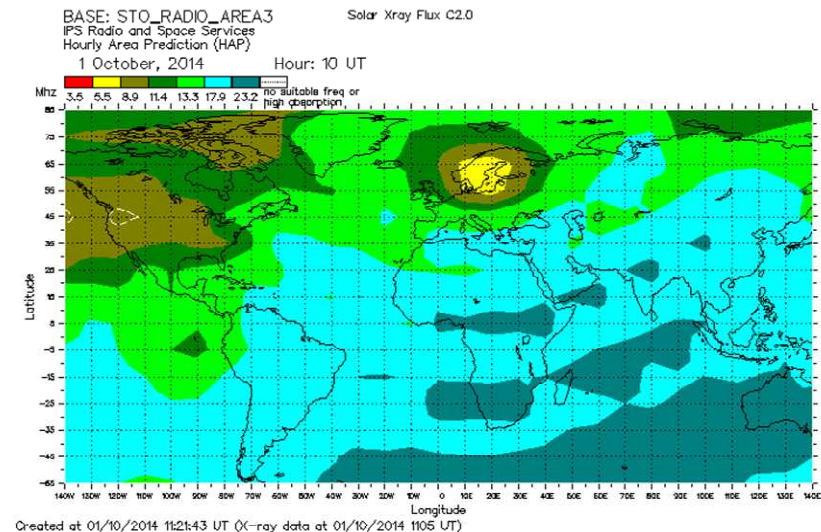
BASE: STO_RADIO_AREA3 Date: 1 October, 2014
IPS Radio and Space Services
Hourly Area Prediction (HAP)

Mhz 3.5 5.5 8.9 11.4 13.3 17.9 23.2 no suitable freq or high absorption



Hourly Radio Propagation Map

STO RADIO AREA3



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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, by adjusting to the conditions that can quickly change during the flight. (We recommend you to always consult our HF Propagation chart, before calling up STO Radio on the 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 every few minutes can significantly extend the approximate coverage area available.

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 STORadio, always provide the following information:

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

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Communicating with STO Radio

The crew should try the frequencies close to the one shown as optimum, depending on time of day, distance, solar fluxes, etc etc.

*So, for instance: at 12.30 UTC try first 13 342, and then these:
17 916 kHz / 23 210 kHz or 11 345 kHz.*

*We need some **time** to find and tune in on each frequency, so be patient.*

You must be aware that we listen to 6 frequencies at the same time and need to:

- 1. locate the frequency used (to use correct transmitting frequency)*
- 2. locate the aircraft (to direct receiving and transmitting antennas)*
- 3. identify the aircraft or flight (to find data on the customer)*

Apart from that crews should use this pattern for calling us:

"STO Radio, STO Radio.

This is Speedbird 744 (or GBIAN) overhead Belgium (or "on ground BRU").

Calling STO Radio on 13 342" (or applicable frequency).

*Again, keep in mind that **we need time** to locate each call.*

*Also, before even transmitting check that the frequency is clear and that no other conversation is in progress. If so, we will try to silence a disturbing call by "Break, break IJM779, ongoing conversation". **In that case try another frequency, or wait.***

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Communicating with STO Radio

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 STO Radio 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.

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Communicating with STO Radio

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.

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Who is STO Radio / Aviolinx

Stockholm Radio or '**STO Radio**' is part of **Aviolinx AB**, and is situated at Nacka Strand, a few km east of the city center of 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 per day, 365 days per year.

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Frequently Asked Questions

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.

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Frequently Asked Questions Cont.

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

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Contact Us

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