MeteoCom 6

Operating Manual

www.meteoserver.net

Content

The first steps

In the package you will find one CD, one or two switch boxes, an audio cable and this manual.

Basic requirements:

An operating system: Windows 2000/XP or Windows NT 4.0 SP3

An IBM compatible PC with Intel® Pentium III- CPU 450 MHz or better and a 16 Bit soundcard with a line-in or microphone jack.

Other minimum requirements are stipulated by the system:

There are several different versions of MeteoCom 6

1. The 1-channel version with one radio
2. The 2-channel version with two radios

A Navtex antenna can be connected to either one of these configurations to permanently receive Navtex. This Navtex antenna is available through us as an optional extra.

Installing the switch box

Depending of the version you purchased the package contains one audio cable and one or two BONITO switch boxes.

The NautiCom switchbox works with all radios except the ICOM IC-PCR1000.
The switchbox for the IC-PCR1000 is called ProMeteo switchbox and only works with this radio.

Connect the Switchbox (NautiCom/ProMeteo) to the COM-port/Serial interface. MeteoCom automatically finds the COM-port. Therefore, the port must be free and not blocked by any other programs. Otherwise MeteoCom will not start. Programs that like to use the COM-port are usually mobile phone and PDA applications. Please deactivate those before using MeteoCom.

!!! IMPORTANT for PCR1500 / 2500 users !!!

If you want to use an ICOM PCR1500, read the ICOM Manual carefully and follow ALL the instructions until it's completely installed.
After the succeed Installation, the ICOM Driver change the Soundcard settings and you can't hear other Sounds anymore from your System.
To change it back, go to: ***Start\Setting\Control Panel\Sounds+Multimedia***
Click *"**AUDIO**" and choose under "**Sound Playback**" the Soundcard of the PC and do the same with "**Sound Recording**".*

The ICOM PCR1500 is a USB Device, but you still have to plug the BONITO Switchbox to a separate free Comport. You also have to connect the audio cable like it is explained in the Chapter *"Connecting the audio cable"* on Page 6.

DON'T USE THE ICOM SOFTWARE WHILE USING METEOCOM!!!

Installation

Insert the CD and select your radio from the „Channel 1 radio selection" list.

If your radio does not appear in the list, we recommend that you install the YAESU FRG-100.

With „COM-port Selection" you can now select the correct COM-port, in case MeteoCom was not able to find it and displays an error message. „Find serial port"will prompt MeteoCom to search for the switchbox. *„Test serial port"*enables you to test the connectivity of the COM-port. „Select serial port"assigns a concrete COM-port number to a particular device.

When you have completed your selections you are ready to press the „install"button. MeteoCom will now install. When the installation is complete, this operating manual and a connection layout will open automatically in PDF format.

You will have two icons on the Windows desktop.

Important! LOWE Radios are not supported when using Windows NT / 2000 or XP! In this case please select the Yaesu FRG100!

The installation program is capable of even more. If you should ever change to a different radio, reinstall or update MeteoCom via the internet, you can do so with this CD.

Changing the radio: Simply insert the CD and select a different radio in „Channel selection". Close the installation program.

Reinstall: Insert the CD. Go to „keep adjustments"and select whether audio or fax skew were okay. Press „install".

Update service: You can update MeteoCom via the internet. Insert the CD and press the "update service" button. MeteoCom automatically downloads the required updates and installs them.

MeteoViewer Network Installation: You can also install MeteoViewer on other PCs and access weather data on the PC that runs MeteoCom with a connected radio. To use this feature please enter the correct network address.

Connecting the audio cable

Connect the audio cable as follows: Insert the red stereo plug (two rings) into the "line-in/microphone" jack of your PC. Insert the mono plug (one ring) into the "speaker/line-out" jack of your SSB radio. If there is a control cable, please plug it into the back of the switchbox and the respective interface of the SSB radio. The wire connections for various radios are indicated on the CD in the "technical service" menu and are available on our website at **www.bonito.net**

Connecting an antenna to the SSB radio

If you have an amplified antenna please connect it in the proper way. If you want to use a backstay or longwire please do the following:

Backstay: (ideally 12m isolated). String the coax cable (RG58U) to the backstay. Remove the insulation of the coax cable and connect the inner conductor directly to the uninsulated backstay wire. You can remove the outer conductor of the coax or ground it.

Longwire antenna: Please follow the procedure on page 19.

2-channel operation

With a special version of MeteoCom 6 it is possible to operate two radios at the same time. MeteoCom uses the stereo outlet of the sound card and decodes each channel separately. This way you can receive a fax message on one channel while a RTTY signal is decoded on the other. Timer operation is no longer necessary.

If you bought the version for two radios, simply connect the second radio in the same way you did the first one. Just use the special audio cable which should be included in the package. There is a stereo plug on one end of the cable and two mono plugs on the other. Now insert the stereo plug (two rings) into the line-in/microphone jack of the computer and connect the mono plugs in the respective outlets of your radios.

Later you should make sure that the correct channel is connected to the respective radio. The simplest way to check this, is to have radio 1 receive fax while radio 2 receives RTTY. If you find out that the connection is wrong, simply swap the audio wires.

Connecting a Navtex Receiver

With MeteoCom 6 you have the opportunity to connect an optional Navtex receiver such as the SNX 15. That way you are able to receive Navtex continuously without the need for a timer. This Navtex receiver supplies data in serial format and needs to be connected to an additional COM-port. With this it is possible to receive weather data from three sources simultaneously.

It is also possible to use equipment of other manufacturers such as SILVA, NASA or Trapp. For more information on this please select the respective item in the installation menu.

Update/Data-Service:

The Program MeteoCom must be switched off!

Open the MeteoCom Setup:
[Start] [(All) Programs] [Bonito MeteoCom] [Setup MeteoCom]

MeteoCom is using some Recourse (for example Frequency lists, Timer lists and Program updates), that you can download without extra costs via the internet. There you simply have to click "Update" and the following window appears.

Now, you have to register your self. Please click the Button "Registration". If you ignore the entries, you cannot be identified and the service is always lost in the case of a problem. If you want to remain anonymous, set under name, road and city your own passwords. If no email will register, but only @ and one point, you'll not receive an email with the access code, with which you can re-activate a registration or transfer the code to another computer.

The computer saves the access code in the Windows registry. You can see and copy and keep it surely at any time, in order to be able to realize a reactivation of the Registration.

The suffix changes after each Internet update. This should be absolutely considered, if you uninstall the program or operate it on several computers.
For such a change or the error message "SUFFIX_OPEN_ERR" the manual activation must be called and the access code be entered by hand, because a Registration by Internet is only possible one time.
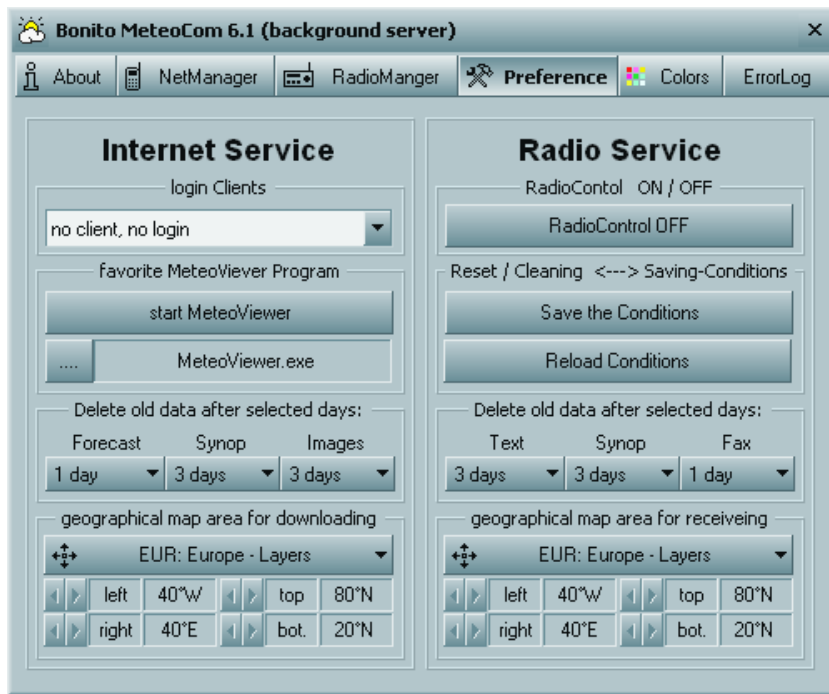

If the suffix should have been lost, it is possible to use a wrong suffix, in order to eliminate this problem. However this could happen only 8 times within 90 days.

Starting the program:

At first, turn on your SSB radio!

Double click on the [icon] symbol to start MeteoCom.
The MeteoCom window (Background Server) appears:

Preferences

Here you can make basic adjustments to the program. These adjustments are divided into two areas: *„Internet service"* and *„Radio Service".*

Internet Service

On the *„Internet Service"* page you make adjustments for internet service only. You need a user account to use this service. You have to register at *www.meteoserver.net* to receive account data. There you will receive all the necessary information including the service range, prices, etc.

Login Clients

Select your MeteoServer account data which the program should use to connect to MeteoServer.

MeteoViewer Program Favorite

Here you can start the BONITO MeteoViewer (preinstalled) or a viewer of a third-party producer by clicking the *„Start MeteoViewer"***button**. The small window indicates the type of viewer you are using, in this case MeteoViewer.exe.

Deleting old data after selected days:

In order to prevent a build-up of old data on your computer you can have certain data deleted at certain times. The preselected value serves as a good average.

Geographic map area for download

If you want to curb the amount of data downloaded from the server it is necessary to adjust the geographical area covered. You will find a number of preselected areas in the dialog box. You can reshape these areas by clicking and dragging the arrows.

Radio Service

On the radio service page you can make adjustments to SSB/shortwave operation.

RadioControl On / Off

*„RadioControl OFF"*toggles the entire radio page. For home use, without a SSB radio for example, it is unnecessary to run the radio service. This would merely use up processing resources of your PC.

Reset / Cleaning saving the conditions (settings)

*„Save the conditions"*saves the current adjustments into a file. You should be using this function only when all adjustments have been made properly.
If, later on, adjustments get lost or involuntarily changed, you can reset the system to the original configuration with *„Reset / Reload sa…"*

Deleting old data after a selected day

In order to save memory space on your computer you can delete certain data at certain points in time. The preselected value serves as a good average.

Geographical map area for radio reception

As with the internet service, here you can shape the intended area of coverage. You will find a number of preselected areas in the dialog box. You can reshape these areas to your individual needs by clicking and dragging the arrows.

NetManager

NetManager controls and arranges the download and processing of internet weather data from MeteoServer. Your computer must be set up for internet connection prior to using this service.
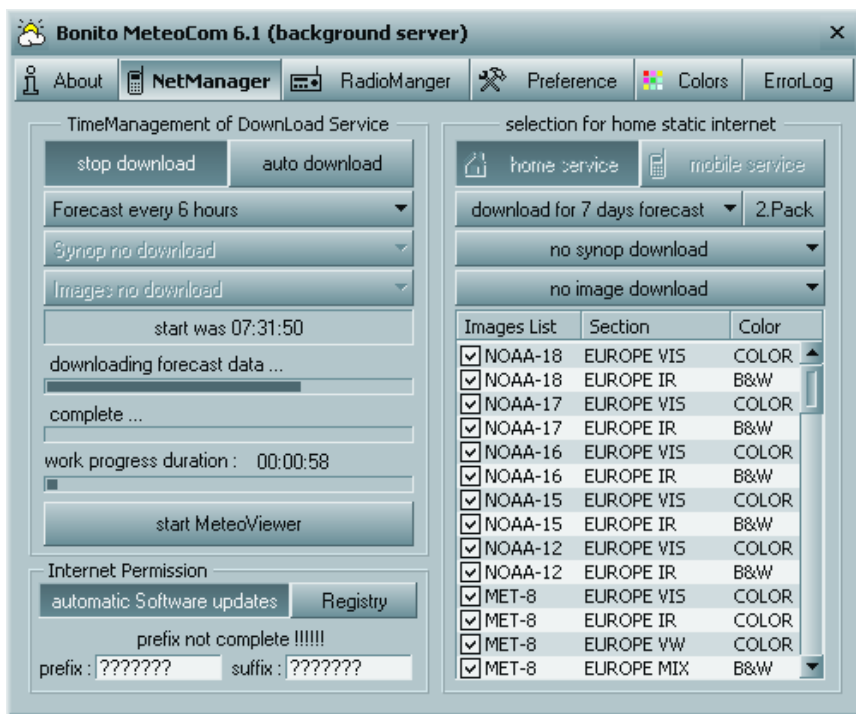
Time Management of Download Service

„Force download" creates an internet connection to MeteoServer, downloads weather data and processes them in such way that they can be viewed and evaluated in MeteoViewer.

If you activate the *„Auto Download"* function, MeteoCom automatically creates an internet connection to MeteoServer.

In submenu *„Forecast every…"* you can set the interval at which MeteoCom automatically downloads weather data. The small clock indicates the reference time.

Tip:
Due to high traffic on MeteoServer we recommend that you do your downloads at a time when the server is less busy. For example 7.39 AM instead of 8.00 AM.

Status Bars

The status bars *„Internet Download", „Computing"* and *„Work progress duration"* show the up-to-date status of the respective process.

Permission

Here is where you have to enter your admission data to MeteoServer. If you select the check box, the program will check for new updates every time you download data from MeteoServer. The updates are then installed automatically.

Selection for home based internet

Since you can use MeteoCom at home as well as on the go, and want to keep the data volume low when mobile, you have the option to toggle between „Home Service" and „Mobile Service". You can select an entirely different configuration for each service mode. For example, you can select to receive satellite pictures and forecasts for up to six days, whereas when mobile you can waive on the satellite pictures and just receive forecasts for three days and even keep it down to the first package only.

The MeteoServer weather data consist of two packages. The first package contains the more important values. The second one contains less important ones. You can disable the second package if you so choose.

| **1st Package:**	**2nd Package:**
Wind: Strength and Direction	Relative Air Humidity
Wave: Height and Direction	Water Temperature
Barometric Pressure: at Sea Level	Convective Clouds
Air Temperature: 2 m above ground	Waves: 1st and 2nd Swell and Direction
Clouds: Altitude and Ceiling	Precipitation: Snow Cover
Precipitation: by Type	

In *„Download for xxx Days forecast"* you can select how many days worth of forecasts you would like to receive. We recommend three or five days.

„Synop data" are measurement values, not forecast values. They are the basis of all forecasts and indicate the values that you are or have been surrounded by. You can receive this data not only with your SSB radio but also download them from MeteoServer. In *„Synop download"* you can download the Synop data of the past 72 hours.

Another function of MeteoServer is to provide satellite pictures which MeteoCom uses to create animations. Since these pictures are not forecasts you can select the time frame for satellite pictures in the "load pictures for..." selection box. The maximum amount is 72 hours.

In the *„Image List"* you select the pictures of the satellites you want to download.

Colors
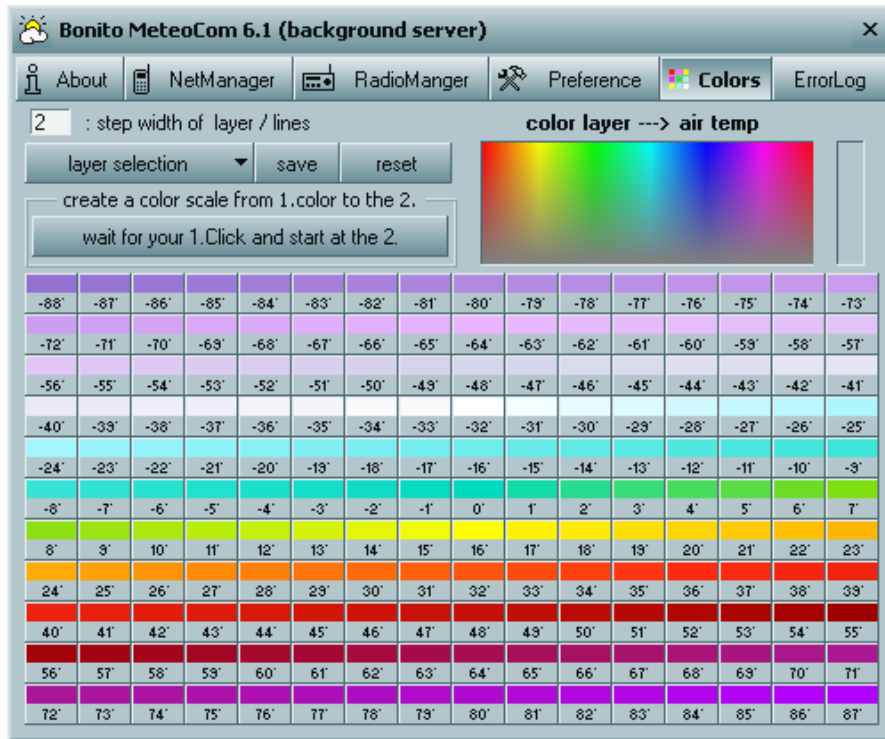
In this part of the program you can alter the coloration of the different MeteoViewer layers. We recommend the use of this option to advanced users only. If you accidentally change colour settings to undesired values, you can reset the settings with "set default".

Each individual value (°C, Hektopascal, Beaufort) is represented by a specific colour. First you select the layer to be changed *„Layer section"*. Select a colour or value from the scale and adjust the value to your desired colour by using the RGB controller. You can repeat this procedure with a second colour or colour value, if you wish to use scaling.

Click on *„Mark the 1st Colour"*. Select a different colour or colour value and then click on the colour or value you wish to be used for scaling. Click on "Save" to save the scale.

RadioManager
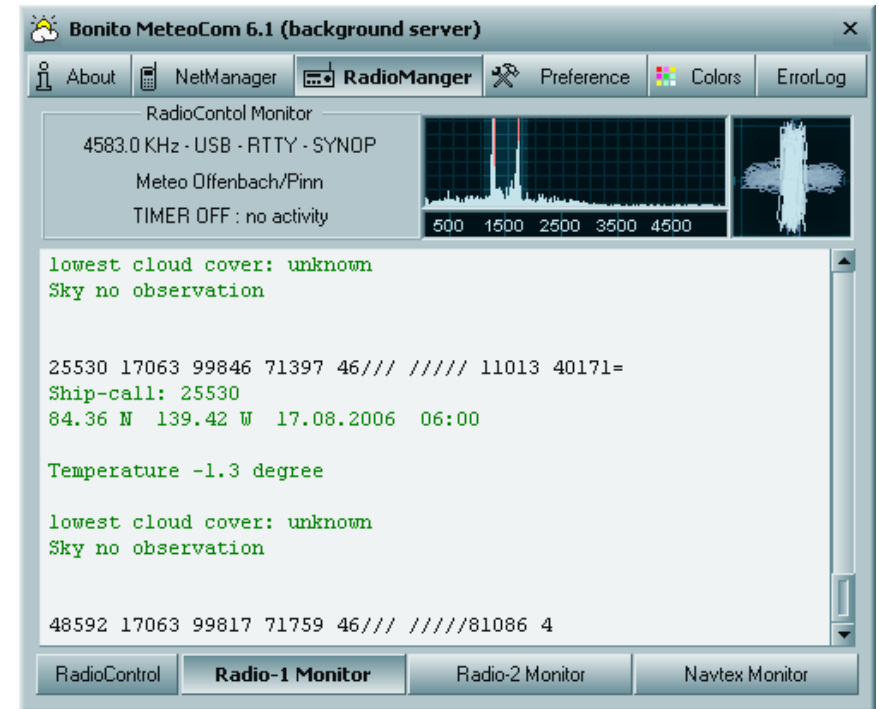
„RadioManager" controls the live reception. After the installation of optional program parts MeteoCom is able to control up to two SSB radios and receive one Navtex Receiver Antenna simultaneously.
In oder to manage these capabilities we have incorporated the *„Monitor-Mode"* into MeteoCom (see image). This mode only displays the timer status and the momentary reception. There are no further adjustments possible here.

By selecting *„Radio-1 Monitor"*, *„Radio-2 Monitor"* and *„Navtex Monitor"* you can check if everything works properly and what is being received on the respective channel.

By clicking *„RadioControl"* you get to the *„RadioControl-Mode",* where you can make adjustments to weather data reception via shortwave.

This function will be explained on the following pages.

RadioControl
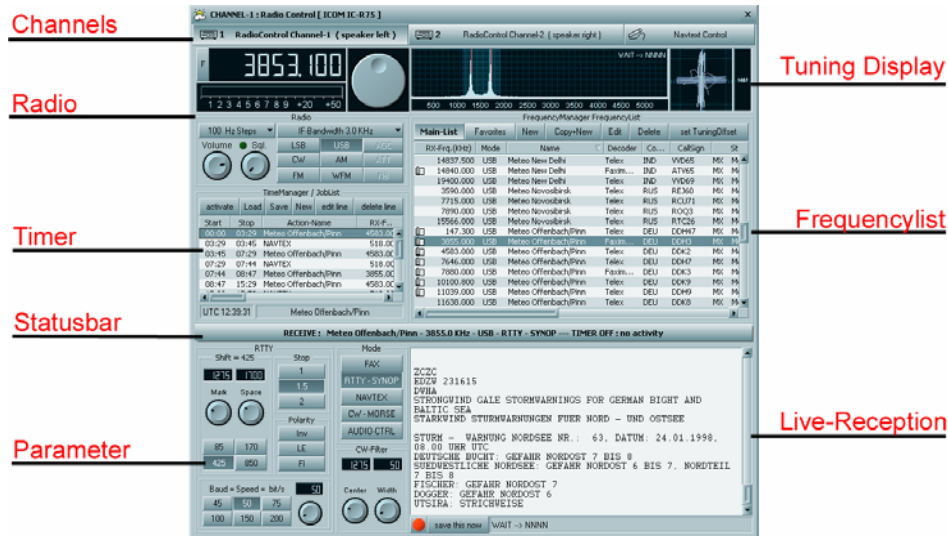
"*RadioControl*" controls the SSB reception. After correct adjustment, this program part can work fully automatically. There is a number of possible adjustments. The received data and pictures are displayed in MeteoViewer.

MeteoCom is able to receive several channels at once. You can select each individual channel for adjustments using the channel tabs.

The "*Radio*" display shows you various adjustment possibilities, depending on the type of radio being used. This way you can make manual adjustments to your radio. Make sure to acquaint yourself with the functions of your radio beforehand. Frequencies are decreased or increased by clicking the tuning knob in the respective direction. The frequency step

width is selected in "*Steps*". You can click on the frequency readout with your mouse (right click + / left click -). The segment you click on will be increased or decreased by one step. Clicking on the "*F*" button will open a window in which you can manually enter a frequency.

"*NB*" is a noise blanker which serves the suppression of cracking noises. "*AGC*" is an automatic gain control which adjusts the receiver depending on the signal strength. The signal strength is indicated on the S-meter. If a signal becomes stronger than S7 you can activate the signal attenuator "*ATT*". The attenuator protects the receiver from excessively strong signals.

The "*USB*", "*LSB*", "*CW*", "*AM*", "*FM*" and "*WFM*" buttons switch between operation modes. For normal weather data reception we recommend to use "*USB*" at a bandwidth of 3 KHz IF. "*AM*" is used for normal broadcast reception at 6 KHz IF. "*WFM*" is used for the VHF broadcast band on frequencies between 87 and 106 MHz and an IF bandwidth setting of 50 KHz.

"*SQL*" is the squelch, which suppresses receiver noise in the absence of a signal. "*VOL*" is the volume adjustment of the radio. This control should never be set to zero, because that would prevent a signal from getting through to the computer. We recommend to set the volume control to "*AUDIO-CTRL*".

Soundcard Adjustments

Which audio connections does my computer have?

For notebooks there are two possible varieties: The first one has three jacks "*Line- IN*", "*Mikrophone*" and "*Loudspeaker*". Type 2 only has two jacks, "*Mikrophone*" and "*Loudspeaker*". MeteoCom automatically looks for the "*Line-IN*" connection and usually finds it.

Activating the microphone jack:

If your computer only has a microphone jack, it first has to be set up as a source for reception. Click on "*AUDIO-CTRL*" in the "*RadioControl*" tab to get to the audio adjustments.
The lower part of the window will look like this:
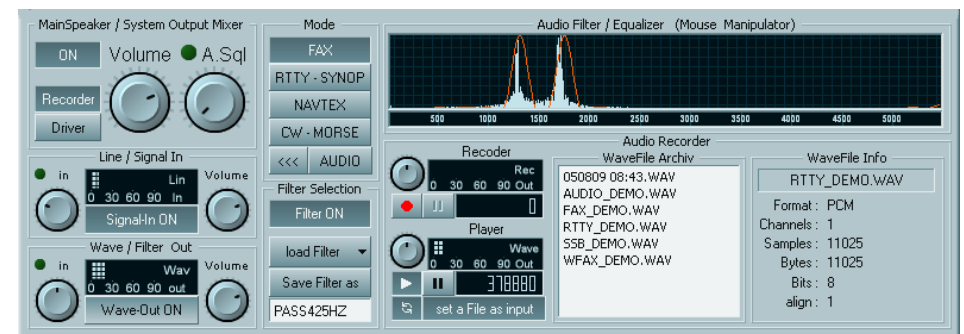
In "*AUDIO-CTRL*" you can make changes to all necessary audio adjustments. "*Mainspeaker on*" toggles the speaker for monitoring. "*Volume*" controls the volume of your PC.

In the "*Line/Signal IN*" area you can adjust the volume of the incoming signal. It is important to adjust the signal in such way that there is no distortion (red area). In the "*Wave/Filter Out*" area you can hear the filtered signal. In this case it makes sense to deactivate "*Signal-In ON*".

Click on "*Driver* to open the *"Audio Mixer Driver Selection"* to choose the microphone connection.

AudioDriver Config

You can change the Audio settings easily here.

If you click the dropdown menu "*Input Select*" you can choose a different Input source like "Microphone" instead "Line-In" for example.
The denomination may vary depending on the soundcard.

Caution!
Since most microphones are very sensitive, adjust the gain button to the lower 25% range. Some soundcards offer a microphone boost function. This function must be deactivated!

Audio-Recorder

MeteoCom can also record spoken weather reports. Just double-click on a broadcast service that transmits spoken language (e.g. Deutsche Welle) in the frequency list. If you want to listen to a recording simply double-click an entry in the *„Wavefile-Archive"*.

Adjusting the *„Equalizer"* works like drawing with your mouse. Click and hold the mouse button and then draw the filter curve to your liking. With this you can notch out interferences and unwanted noises very effectively while audio recording.

Frequency Manager

This list comprises all necessary data for the reception of weather reports. With a double mouse click the radio station is tuned in on the radio with the correct frequency shift and the reception program is started with all parameters.

Easy frequency selection: When you have chosen a list entry and press the space bar, the frequency of the radio will be switched. This way you can check whether there is any usable reception.

However, if you press Enter or double-click on the list entry the frequency will be tuned in, the reception program will be launched and the necessary reception parameters transferred. The reception program is now ready and will start decoding data.

There are two available lists: *„Main-List"* and *„Favourites"*. You can arrange the favourites list easily by deleting all radio stations that are not applicable to your area.

Arranging and Sorting Lists:

If you point your mouse arrow on the dividing lines between the upper bar and the list, a cross will appear. If you capture the cross with the left mouse button and pull to the left or right you can adjust the display width. Clicking on the list areas *„RX-Frq", „Mode", „Name"* etc., will sort the list respectively. This will help you find a particular radio station.

The Context Menu:

Clicking the right mouse button will open the context menu. This menu is also used in other parts of the program and allows you to make additional adjustments. You can enter a radio station, copy, sort or delete. If this icon 📖 appears in front of a station entry, there is an entry about this station in the *„BONITO ScheduleList“*.

BONITO ScheduleList

To set up a timer you first have to know the frequency of the correct radio station and the time of transmission. The „*BONITO ScheduleList*" is the proper tool. Since MeteoCom 6 this tool is no longer limited to weather fax but has been expanded to include RTTY and NavTex.
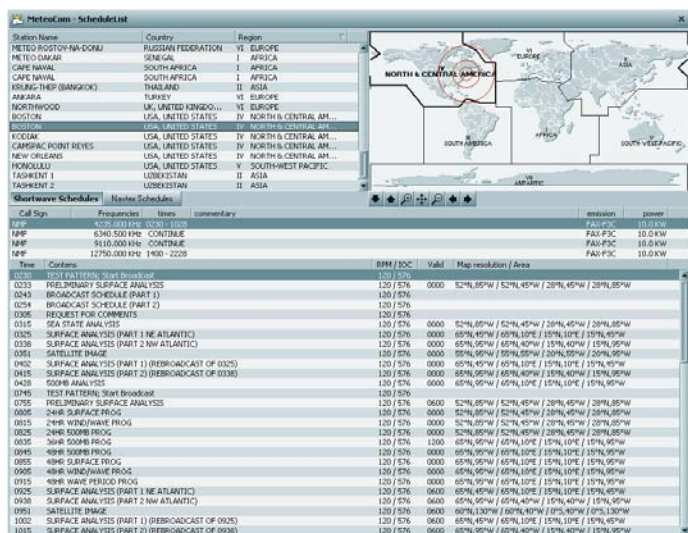
If you press this button in front of a frequency, the *„BONITO ScheduleList"* will open. This allows you to receive a Fax Transmitter at your position. Now expand your area on the global map. The radio stations you can receive in your area are automatically marked in the list. If you select one of these stations, all frequencies of this station will be displayed, including all transmitting times. Clicking on one time slot in the transmission schedule will show you the map area covered by this particular transmission. All times indicated are UTC.

Creating a Timer

You can select, drag and drop the desired radio station from the Frequency list into the timer list window.
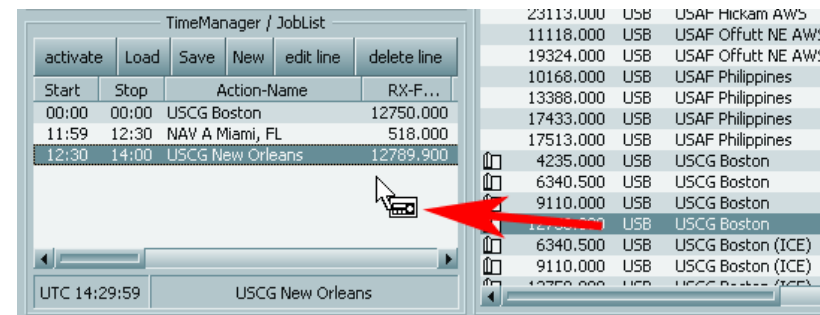
If you double-click the entry, a new window opens, indicating the station adjustments. In this window you can adjust the start and stop time. Please make sure to use UTC at all times.

If you are ready, save the Timer by using the "save" button.

Now you can "active" the timer and MeteoCom starts working automatically.

Tip:
Your computer should always be set to the time zone and local time of your actual location. The MeteoCom timer calculates the UTC based on your set time. If you independently set UTC to any time zone on your computer, the timer will not work.

Active: This activates the current timer.

Load/Save: Here you can load or save a pre-configured timer.

New: Creates a new list.

Edit Line: Edits an entry (same as double-click).

Delete Line: Deletes the selected entry.

Closing the Program

This program always runs in the background. Pressing the „*Close*" button does not end the program but merely hides it. It will show itself only by displaying a small cloud icon in the info tab of the task bar, next to the clock. If you wish to close MeteoCom altogether there are two ways to achieve it:

Select the „*About*" tab in MeteoCom and click on the red „*Close MeteoCom*" button in the lower left corner of the screen. This will end the program.


Or:

Click on the MeteoCom symbol in the task bar with the right mouse button. A context menu will pop up. Select „*Exit / Close*". MeteoCom is now switched off.
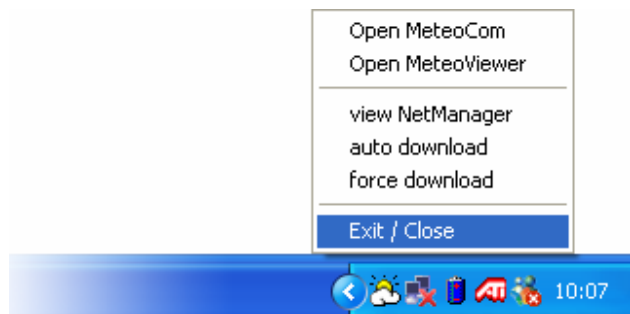
Reception and Antenna

Everything depends on the quality of reception and the antenna is the most crucial part of the receiving system. It is not difficult to make a good antenna. Simply take a piece of wire six meters in length (20 ft) and connect it to the
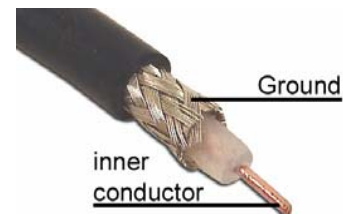

inner conductor of a coax cable. Then you take another piece of wire of the same length and connect it to the outer conductor of the coax cable. Now you string up the wires horizontally, with the coax hanging down in the center. Twelve meters (40 ft) or 18 meters (60 ft) are even better. A different wire length is not advisable for the reception of weather frequencies. A simple wire antenna is still a reference antenna for all other types of antennas.

The conclusion is clear: **„We have never been offered a better antenna!"**

It is also common to use the backstay as an antenna. There are various other compromises in case you are not able to string a wire on your boat. Active antennas (amplified antennas) on boats should be considered with caution. These antennas often amplify interferences, not usable signals. We are offering a special antenna, but would never claim that it is better than a perfectly strung wire. Our antennas are simply better than all other compromises, in cases where no decent wire antenna can be erected. Most importantly, our antenna has been tested.
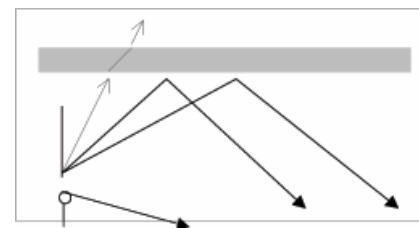
In contrast to VHF transmitting stations, short wave stations are mainly emitted into the ionosphere. The ionospheric layer reflects the signals back to earth. Therefore, it is possible to bridge large distances. This also means that a horizontally erected antenna offers the best reception. Direct reception of the radio station is only possible in relative proximity to the station antenna. The space that extends between direct and indirect reception areas is called skip zone. Here reception is either strongly inhibited or altogether impossible. That's why in these cases a station on a different frequency should be selected.

Tip:
The further away you are from the received radio station the higher the selected frequency should be. If, for example, you are in the German area of the Baltic Sea, you will receive „Meteo Offenbach" very well on 147,3kHz or 4553kH. If you are cruising in the Mediterranean you need to tune your receiver to 13885kHz or 14467kHz.

The first test should always start with a clear reception. If you don't receive any usable signals you need to improve the antenna. You can also wait for the

reception to improve. If you ignore this rule and try with a very weak signal, it will be difficult to interpret the tuning elements and their function properly. This is not to say that it won't work at all. A knowledgeable individual can still use a signal that seems unintelligible.

How am I supposed to adjust something that I can't see or hear?

Once you have tuned a signal under good receiving conditions it can still be decoded in less favourable circumstances. Since tuning and parameters are saved in the frequency list, it can be reloaded in exactly the same way later on. It is therefore not necessary to do the tuning procedure again. This is where the decoder shows off its real capabilities. It still decodes the signal because it does not "hear" the interferences the same way you do with your ears. The electronic components are able to filter through the unwanted parts of the signal and pick out the essential ones. The loudspeaker on the other hand simply reports what is being received. You will hear all kinds of things which make it impossible for the human ear to ascertain whether there still is a usable signal or not.

Backstay

If you own a sailing boat the installation of an antenna is often very simple. In most cases you can use the backstay. It would be advantageous if the length of the isolated wire would be 6, 12 or 18 meters (20ft, 40ft or 60ft). Attach the inner conductor of the RG58U coax cable to the isolated wire part of the backstay and the outer conductor below the insulator. It is possible to use hose clips to attach the wires.

If there is no isolated wire piece in the backstay, simply attach the inner conductor of the coax to the backstay and leave the outer conductor as is.
You can use another hose clip to attach the coax itself to the backstay and thereby relieve the tension on the coax.
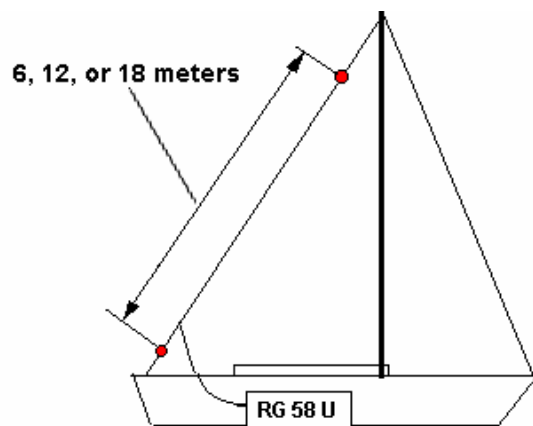
Tuning a signal – What is a usable signal?

In order to tune a signal it is useful to be able to distinguish the tone signals of the various operation modes.

There is a demo version on your CD. Open the demo, bring up the frequency list and double-click on a frequency. The reception window will open, as it will in the full version. You can now hear the signal and also observe how MeteoCom processes the different tones, in a weather fax map for example.

A signal is composed of tones with varying pitch, which are decoded differently. The spacing between the first tone and the last is called band width. All decodable signals have one thing in common: If you have doubts that the signal is usable, it usually isn't. Intelligible signals are always discernable and stand out of the general noise and other indefinable signals. Now we need to find out whether the signal is Morse code, RTTY or FAX. The MeteoCom demo CD will help you with that.

Distinguishing the various RTTY signals, however, is a little bit more complicated. „BordTerminal" only analyzes Navtex and RTTY. There are other forms of RTTY that are not picked up by the software even though they are received by the radio. That's why not every intelligible signal is a usable signal in the context of maritime use. There are also signals that are decoded properly but don't make any sense. This could be the case when you pick up a station from an Arab country that uses different letters.

In order for the receiving program to work properly, you will need assistance for correct tuning. The tuning assistant shows you where the signal is and how much interference there is in its neighbourhood. There are two different tuning assistants for RTTY: the frequency spectrum and the X/Y tuning assistant. For Fax you only have the frequency spectrum.

If you control your radio using the software, all frequencies and parameters are set perfectly. If the radio is stable there should be no deviations and the program should be starting to decode right away. In this case the tuning assistants are used merely to monitor the signal.

Receiving Weather data

Receiving Radio Teletype (RTTY, Navtex, and Synop)


```
ZCZC
EDZW 231615
DWHA
STRONGWIND GALE STORMWARNINGS FOR GERMAN BIGHT AND
BALTIC SEA
STARKWIND STURMWARNUNGEN FUER NORD – UND OSTSEE

STURM –  WARNUNG NORDSEE NR.:   63, DATUM: 24.01.1998,
08.00 UHR UTC
DEUTSCHE BUCHT: GEFAHR NORDOST 7 BIS 8
SUEDWESTLICHE NORDSEE: GEFAHR NORDOST 6 BIS 7, NORDTEIL
7 BIS 8
FISCHER: GEFAHR NORDOST 7
DOGGER: GEFAHR NORDOST 6
UTSIRA: STRICHWEISE
```
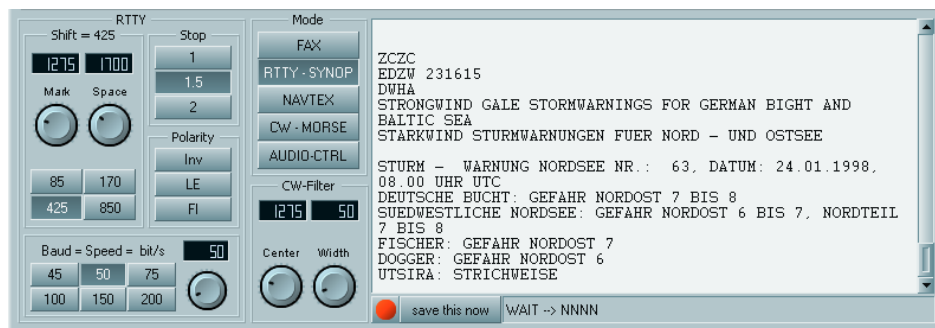
This is the RTTY surface. The text window displays the received message. Usually you will see the lowest row, meaning the one being received at that moment. If you want to read text that has scrolled off the screen and is no longer visible, click on the screen once. To reverse the process click onto the title bar above the text screen.

Tuning RTTY

Usually, the tuning displays process the tones received by the radio in such way that you can observe the way the radio tunes the signal. These displays should help you understand how the tuning process works. As a first test it may be useful to just turn the main tuning knob of your radio to acquaint yourself with it. If, later on, you want to tune more precisely, you need to use the „Receiver-Control" because your radio doesn't report to MeteoCom when you tune your radio manually.

Frequency-Spectrum

This is a display showing all tone frequencies up to 2500 Hz from left to right. The height corresponds with the volume (amplitude). The amplitude is dependent upon the tone's frequency. You should always try to find the tone frequency yielding the strongest amplitude. There are precise technical standards which specify at which tone a signal is tuned properly. In real life, however, all this depends on the filters used in your radio. The filter curves are not always the way they should be. This means that the frequency list is always a theoretical tool and not adapted to your specific radio.
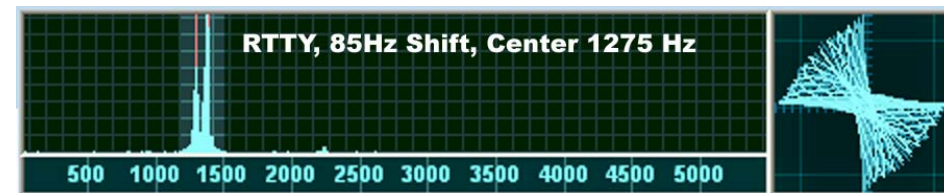

Make sure that both amplitudes are lined up exactly with the red lines. The spacing between the red lines corresponds with the band width (shift). The position on the scale is the tone's frequency or pitch. The height shows the volume. This picture shows an RTTY signal with two different tones. One for "mark" and one for "space". Both tones should be lined up with the vertical red lines. In case of a Fax signal, the bandwidth is usually greater, meaning that the two vertical lines are further apart and there is almost always only one bar at the red line on the right. The tuning process is explained in detail later on.

X/Y-Tuning Display (Tuning Cross)

The previous page showed an example for a RTTY-signal. The exact tuning possibilities are indicated here on the X/Y display. This tuning tool is used only for RTTY. Before using the tuning cross you should tune the signal with the frequency spectrum in such way that it lines up with the red vertical markers. Only after that should you try to use the tuning display and establish a cross shape. If this should not work initially, try playing with the bandwidth (page 25). If the bandwidth is correct the tuning display will show a cross. Now make sure that the lines forming the cross shape are straight, meaning aligned with the X-axis and Y-axis respectively.
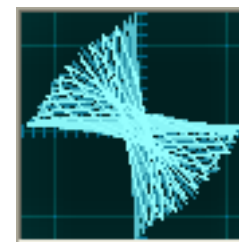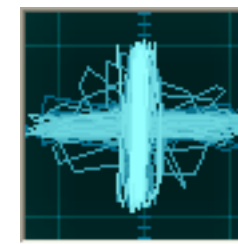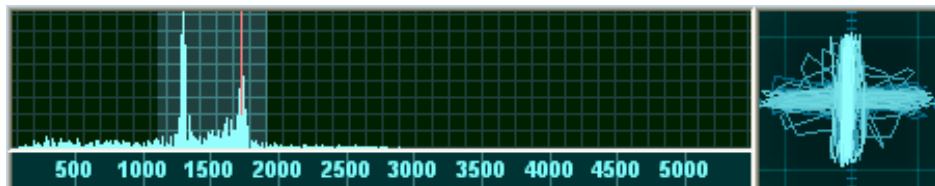

85 Hz bandwidth   425 Hz bandwidth

Tuning

If you can make out the two signals clearly, then you can also read the bandwidth.

Using the „Receiver-Control" tune the radio in such way that both of the green colored signal amplitudes line up with the red markers or the lines of the tuning cross are exactly perpendicular. Also refer to page 17 (X/Y tuning display (tuning cross) or frequency analyzer.

Operation Modes

Baudot:

This operation mode usually concerns common teletype text and is an asynchronous mode. It is often used by press and weather services. SYNOP messages are also broadcast in this mode.
Asynchronous means that the characters are marked with a start- and stop bit, because they are transferred in an irregular way.

Sync. Baudot:

Baudot is an asynchronous mode. But it can be assumed that today's broadcasters use automatic machines for their transmissions. If the reception of the signal is distorted the program presumes that the start and stop bits are transmitted at a certain expectable position. It is therefore likely that there really are start and stop bits at those positions, even though they are not received properly. This logic contributes to a low amount of reading errors. Should a message be transmitted by a manually operated typewriter, this mode of operation should not be selected.

Sitor-B:

This is a synchronous mode which is different from Baudot. But it does use the same logic. This mode is much less affected by distortion. Sitor is used for Navtex and is then always at 100 Baud.

Adjusting the Baud rate

The speed of the individual bits in teletype is called Baud rate. Baud rate is derived from BAUDot. The most frequently used Baud rates for normal Baudot are usually 50 Baud, sometimes 75 Baud (Meteo Bracknel). On rare occasions you may encounter 100 Baud (Meteo Grengel). Navtex always uses 100 Baud, in mode Sitor-B, however.

Shift + Marker frequency

The spacing of the two chirpy warbling sounds is the shift. The sounds indicate the bit status of a RTTY bit. The shift is represented by two red markers in the frequency analyzer. The marker frequency governs the position of the markers. Meteo Offenbach 147.3 for example transmits at an 85 Hz shift. Navtex uses a 170 Hz shift. Above 3 MHz Radio Offenbach uses 425 Hz. Meteo Moscow and Meteo Roma both use 850 Hz.

Polarity

If reception is clear but the received characters don't appear to make sense, try switching the polarity to improve readability. Navtex for example always transmits with an inverted polarity. But there may be other reasons for an unreadable signal. It is possible that the message text includes a character which causes the decoder to only read digits and other data.

In this case you should try using the LE-mode to improve readability. Activate FI only in a contrary situation when Synop 5-digit groups are turned into groups of letters.

Stopbits

Baudot normally uses 1.5 stop bits. But it is possible to come across a station using 2 stop bits. That is why there is an adjustment possibility. Adjustment is not necessary in Sitor mode, since this mode does not use stop bits.

WeatherFax
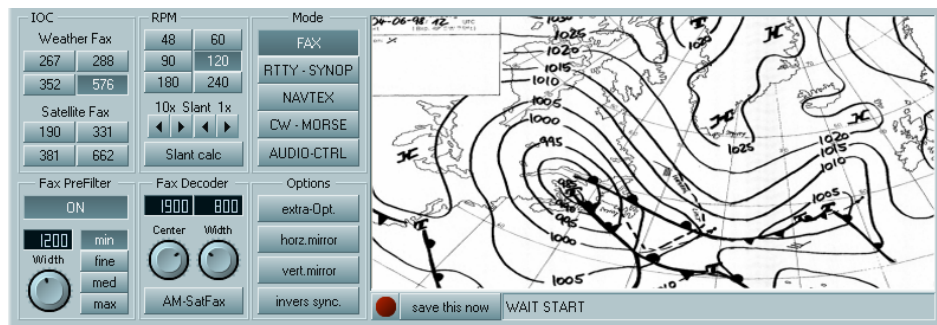
Weather maps are broadcast using „WeatherFax". WeatherFax is the most frequently used way of broadcasting processed weather data.

Normally there is no need for adjustments because all parameters are set automatically when doubleclicking the frequency. If, however, you still wish to make adjustments, you may use the following procedures:

IOC

There are several different image formats that can be used to receive Fax. They are called modules. In our case module 576 is used most often, sometimes module 288.

Modul 288:   Small weather map module, approx. 800 pixels wide.

Modul 352:   Press images, approx. 1100 pixels.

Modul 576:   Large weather map module, approx. 1800 pixels.

Drum Speed RPM

The drum rotation speed of a fax is denominated in revolutions per minute (rpm). A normal weather fax uses 120 rpm. Weather maps from Russia and Japan may come at varying speeds such as 60, 90 or 120 rpm.

Shift & Center frequency Fax Decoder

It is important to shift the tuning from high frequency tones to lower frequency tones in order to avoid interference. This means you are shifting the red markers in the frequency spectrum along the horizontal scale.

Fax PreFilter

„Width" is the spacing between the lowest and highest tone frequency of a signal. That is the spacing between the two red markers in the spectrum display. The filter should be the same width. Filter adjustments that are narrower or wider may also improve the reception.

Start/Stop Frequencies

Start- and Stop frequencies are sounds played at the beginning and end of an image. Normally there would be a 450 Hz tone for start and a 300 Hz tone for stop. After the start tone MeteoCom starts recording the fax and saves it to the hard drive after the stop tone.

Spectrum- Analyzer

This is the display for tuning the tone frequency (also page 16). In most cases a fax signal USB shows more activity on the right side that degrades towards the left end of the bandwidth (red marker).
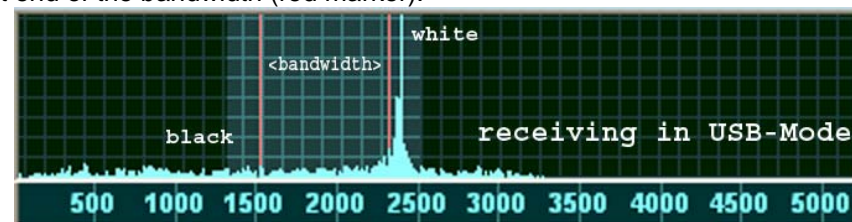
In order to receive good, clear images, the main signal activity bar should always be just in front of the red marker. In case of distortion you can shift the IF to the left or right, narrow the bandwidth or manipulate the filter.

Slant Correction

During the first test the image will come out skewed. In this case you can rectify the image by using the „<" and „>" buttons. Always use the button that points in the opposite direction of the skew (e.g. the right button in the case shown in the image below). You can use the **10x** function to do large step correction or **1x** for fine corrections. After completing the correction click on *"Slant Calc"* which will apply these values to all other modules and fax frequencies.
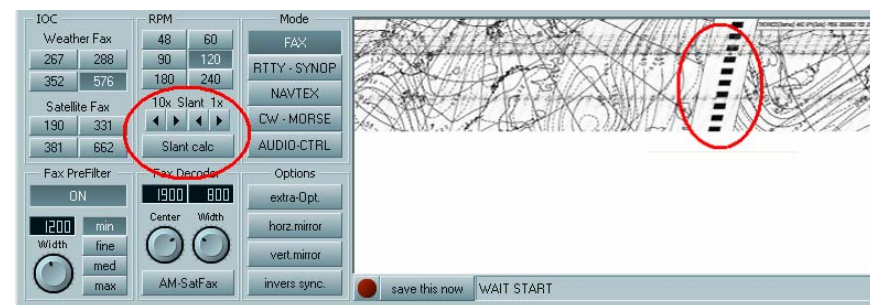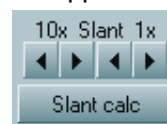
Recommendation: If you are located in Europe, we recommend to use the „Northwood RN London" broadcast station for skew correction. This station transmits a synchronizing signal which can be used as a marker (red circle on right hand side of the image above).

MeteoViewer
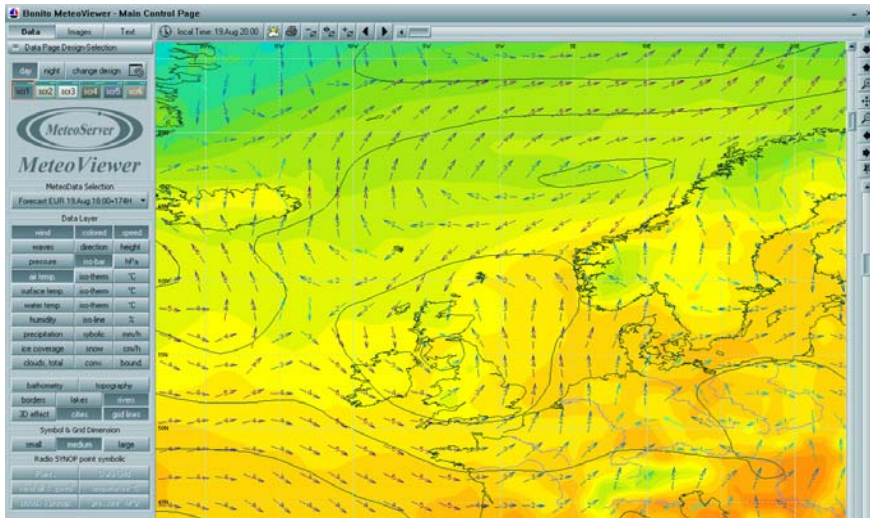
This is where weather data are displayed, irrespective of whether they are received in SSB or downloaded via the internet. There are three categories: *„Data"*, *„Images"* and *„Text"*.

Data

„Data" displays weather data from the internet and Synop data received on SSB.

In *„MeteoData Selection"* you can choose the desired time period you would like to be displayed.

You navigate the map using the up/down and left/right buttons. You can also use the black arrows on the right. The button below the arrows switches the map back to the overview. The image can be zoomed in or out using the magnifying glass symbols. You can also select a portion of the image with your mouse. Point your mouse pointer to the upper left corner of the area you would like to select, click the mouse button and then pull the mouse to the lower right until the desired area is inside the marked area. Release the mouse button. MeteoViewer will zoom into the selected area.

Below the navigation bar there is a slider which makes zooming even easier. Point your mouse to your position and click on the right mouse button. A context menu will open. Select "Set fixpoint". If you now use the zoom slider, you will always zoom back to the selected position. Even when you are zooming into other areas you simply need to touch the slider to get back to where you were before.

DataLayer

Depending on what you have downloaded, several or all data layers will be active. Simply choose the layers you want to be displayed. For example, wind, barometric pressure, waves, etc. You can also combine layers. Layers that cannot be combined will automatically be displayed with the proper layer.

Symbol Display

Data are shown as small icons. Under „Details" you can select clouds, wind, pressure or temperature. Clicking an icon will open a window displaying information. It will show wind as an instrument, temperature and pressure as a scale. Additionally, there is an arrow symbol indicating the pressure trend.

Data Symbol bar

The symbol bar comprises the following icons:

MeteoCom

Brings the MeteoCom background server to the foreground.

Print

Here you can print your own weather maps.
You choose when and which data and areas should be printed. Maps are printed in high definition quality.

Speed controller

This controller sets the speed at which animations are played. The speed is also dependent upon the processing speed of your PC.

Play

Forward and backward.

Switching local time to UTC

Weather data are always in UTC. To get a better overview of the forecast you can switch to local time.

Clock

Sets the time of forecast.

Time slider

By moving this slider to the left or right you can move data manually.

Synop

MeteoCom displays received Synop data as weather symbols on a world map. Clicking one of these symbols opens a window with information in English text. Every new station message is displayed if it is inside the selected reporting period. Messages can also be displayed for one time slot.

Radio Synop Symbols

Dots on/off

This toggles the display of synop data.

Grid on/off

You can render your image with a wind grid or a temperature grid. Average values are calculated across the displayed area. Wind is indicated as a small arrow, pressure and temperature as color rendering.

Wind direction and speed

Shows symbols with wind direction (arrows) and wind speed in Beaufort.

Temperature °C

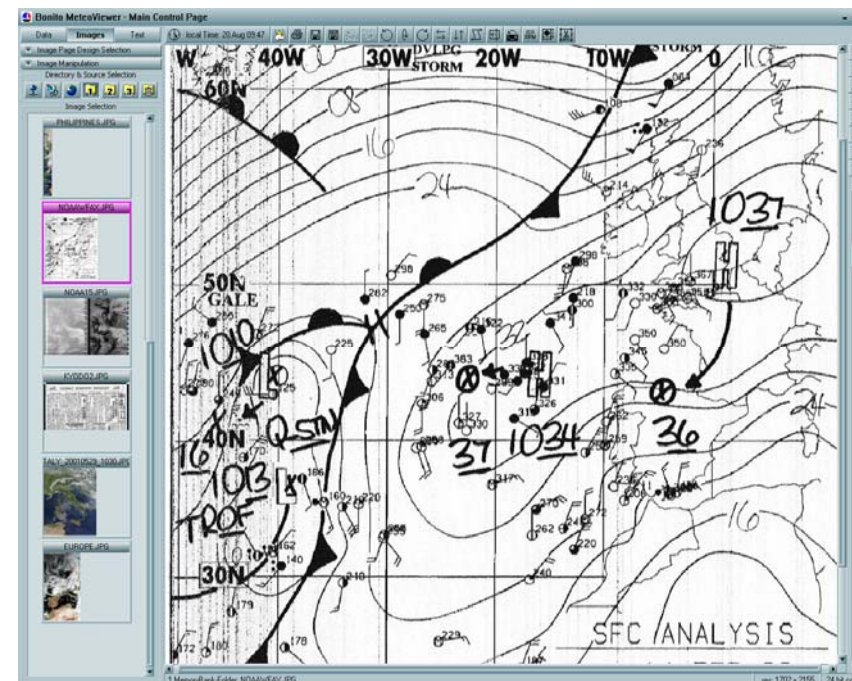Shows the air temperature in degrees centigrade (°C) on the map.

Clouds and precipitation

Shows symbols for cloud cover and precipitation.

Air pressure

Shows the barometric pressure in Hektopascal (hPa).

Images

Here all types of images are displayed, those downloaded from the internet and those received in SSB. The navigation is the same as in „*Data*".

Directory and source selection

This is where the sources of the various images are:

Weather maps from the internet, weather maps received on the radio, satellite images, saved and deleted images.

If you would like to archive images, simply drag and drop them to one of the „banks". Images saved there will not be deleted by the "automatic deleting routine".

„*Images selection*" contains images sorted by date. Double-clicking an image will bring it up in the large window on the right where it can be viewed and edited.

Image Maniputation
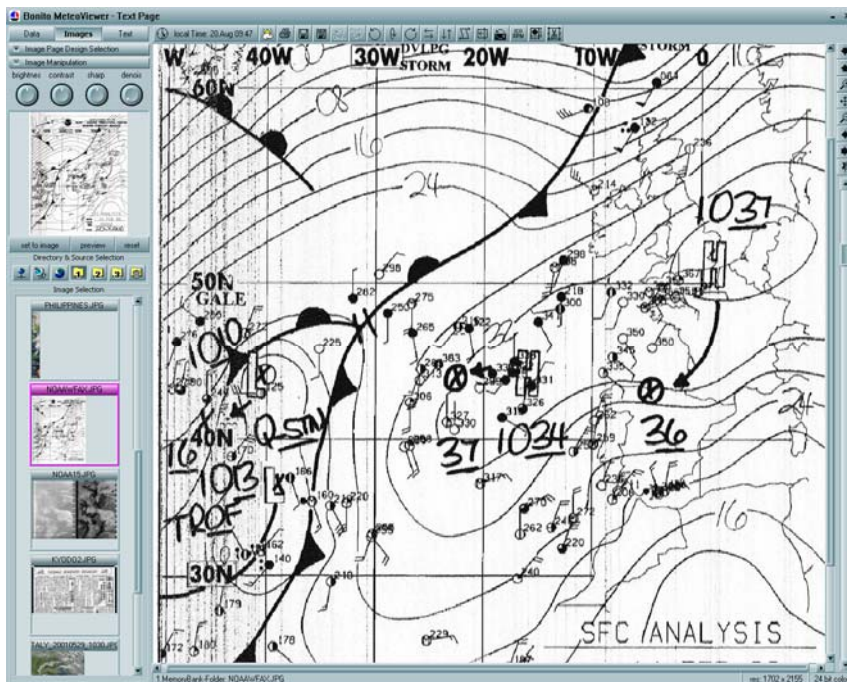
A received weather map is an image that can usually be edited with common Windows programs. However, there are no special tools that would enable you to improve fax reception. With this program you can rotate and synchronize fax images much more quickly because they are designed specifically for MeteoCom.
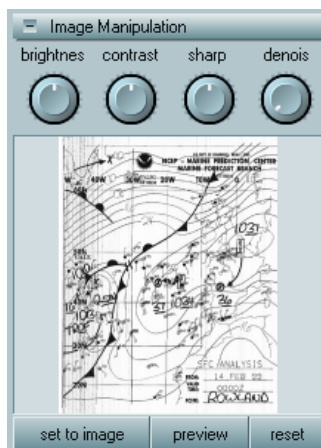
 Save and print FAX

The image can be saved and printed. The regular processing windows appear without any special attributes.

Slide bar +/- Zoom

The image can be enlarged or minimized using the „plus" and „minus" buttons. In overview mode you can select a certain area with your mouse. This is possible only once.

 Synchronize

If you have received an image where the left edge is displayed in the center of the image, you can use this function for subsequent synchronization. First click on the button. Now select the exact spot where you want the edge to be.

 Skew correction

Use this function when an image comes in skewed.
Click on the upper edge of the image and draw a line along the skewed edge of the image. Clicking again will correct the image.

 Crop image

Click on the button. Then click your left mouse button and draw a rectangle around the area you want to crop. Release the mouse button. You can now still manipulate the area by clicking on the edges and pulling them to a different position. Clicking the right mouse button will finalize the crop.

 Invert image

You can receive a fax image in LSB reverse. You do that to improve image quality. The image will be received inverted. This function will revert the image to normal.
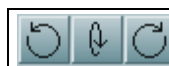
 Rotate image

If the image is arranged wrongly you can rotate it here.

ICO RPM:

If a fax has been recorded with a wrong module or at the wrong speed, it can be turned into readable form here.

Contours, Soften, Sharpen, Brightness

„*Contour*" displays lines such as isobars more clearly. If a line has been drawn very softly you can enhance it with this effect. "Soften" and "Sharpen" add a softening or sharpening effect to the image. "Brightness" controls the contrast of the image.
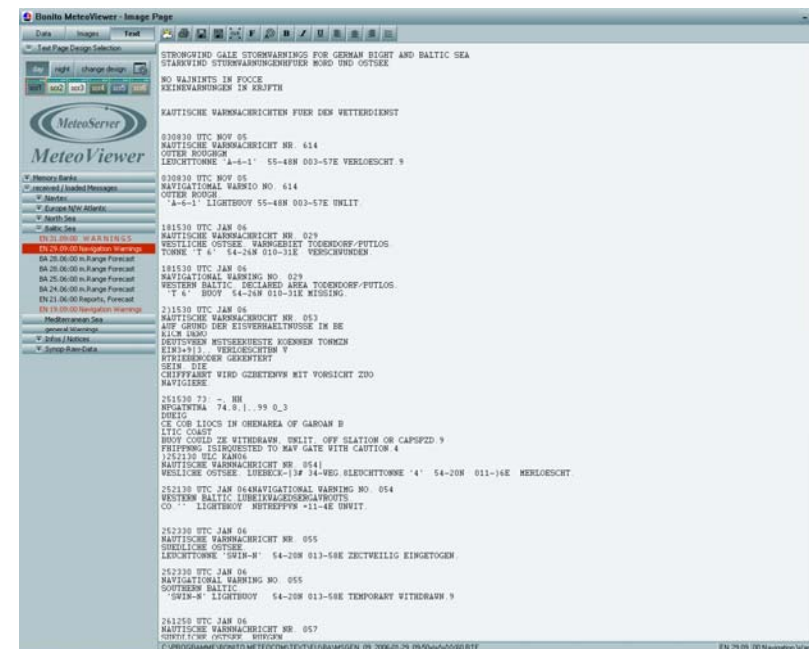

Undo / Redo

Use the UNDO command to reverse the last editing action, if possible.
Use the REDO command to reverse the UNDO command.

This is where all received text messages such as forecasts, warnings, NavTex etc. are displayed. Texts belongs to certain areas will be stored in the respective folders. Forecasts for the Mediterranean can only be found in that folder. This makes finding the proper forecast much easier.

Icon bar Text
This bar contains the following symbols:

MeteoCom
Brings MeteoCom Server to the foreground

Print
This will print text messages

Save + Save as
Here you can save a text or overwrite it.

CLR
Delete the text.

Format
This is where you can format a text.

NAUTICOM

Wiring

The NautiCom interface controller is housed in a small box and fitted with a 9-pin SUB-D socket and a 9-pin SUB-D plug. The socket is connected to a computer COM port. The plug connects to a large variety of devices. The plug does not have a normed RS-232 wiring used to control the following devices:

Radio control for various types of receivers:

1. YAESU CAT-control (and ICOM)
2. ICOM- Radios
3. Conventional serial control as is used in:

   KENWOOD, AOR, NRD, etc. ....

ICOM, YAESU, Kenwood, AOR, TenTec and many more types can be connected without using an additional RS-232 modem. The NautiCom switchbox already contains the necessary electronics.

SUB-D

The necessary plug

 (viewed from behind, on the solder side).
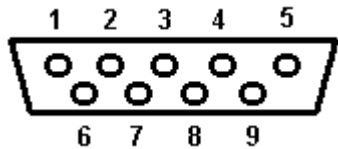
Pin - 3,5,7,9 = GND

Pin - 1 = RX of Computer

Pin - 2 = TX of Computer

Pin - 4 = LOWE-HF-150 for connection to the keypad connector

Pin - 6 = YAESU-FRG100 for connection to CAT connector-pin 3

Pin - 6 = ICOM for connection to remote socket (replaces CT-17 modem)

Various cables and connectors

The connectors described above are available ready-made. You can also make the connectors yourself. The connection schematics for all supported radios are shown on the CD under "Technical Service" or on our website at *www.bonito.net*

Connecting other radio receivers

A proper connection must be established to the type of receiver used (refer to RS-232 connection in your receiver's manual). Only the TX is used (from the computer). RX is not used and should remain unconnected. The handshake wires are used for controlling the NautiCom electronics and cannot be used to control a radio. The handshake wires may be replaced (cross wiring) as described. The following description only looks at this from a general standpoint.

NautiCom   RS-232-connection on the radio

Pin-3 ....GND........................... Signal GND

Pin-2 .... RS-232-TX from the computer................. to RX / DATA-IN (RD)

Handshake is rarely necessary. If it must be used, proceed as follows:

RS-232-connection on the radio

                          25-pin -SUB-D   9-pin SUB-D
          Handshake....... Pin 5 with 4 and 6 with 20   Pin 7 with 8 and 6 with 4

Using USB-Serial Adapters:

For Maritime applications you can never have enough COM-ports (serial interfaces). Unfortunately, some notebook manufacturers terminated the use of this interface altogether.

In such cases you can overcome the problem by using a USB serial adapter. This turns a USB connection into a serial port. Theoretically you can create more than 100 COM-ports in this fashion. We have configured MeteoCom in such way that it will recognize such adapters.

MeteoCom routinely browses the first 16 COM-ports. When using a USB serial adapter you should make sure to install it in such way that it is set up as a port between 1 and 16 (**1-9 under WinXP**).

Some makers of USB serial ports provide outdated drivers. That's why we recommend to check the website of the manufacturer to see whether a newer driver available. If there is one, you should install it.

We are also able to directly provide you with USB-Serial-Adapters.

FAQs

Error message: „COM-Port not found"

Check the configuration of your COM-port in the device manager. If you are not sure which configuration is correct, press the „reset standard" button under „connection configuration".

Mobile phone and PDA programs like to use the COM-port and are active, even though the hardware is not connected. This happens because the respective software is started when the computer boots. Most of the time these programs are indicated in the info part of the task bar, next to the clock in the lower right corner of the screen. Click the symbol with your right mouse button and select "exit". This will clear the COM-port until the next boot.

Make sure you have the proper switchbox to your radio because MeteoCom specifically looks for it. If a wrong switchbox is connected the above mentioned error message will appear. The ProMeteo switchbox only works with the ICOM IC-PCR1000, PCR1500 and 2500. The NautiCom switchbox works with all other radios. There is a list of radios and their respective switchbox on the CD and on our homepage under "technical service".

No signal

Check if the radio is switched on and the connector cable is plugged into the correct outlets (audio and control cable).

Check the sound card configuration as described on page 2. If you are unsure about the audio connection of your computer please refer to the PC manual.

The timer records at the wrong time

Check the system time. It should always be set to the time zone and local time of your location. The MeteoCom timer then calculates the UTC. If you put in the UTC time yourself, the timer will not function properly.