

# WEATHERMAN

*Everything you need for NOAA APT reception in a single package!*

**Les Hamilton**

*Vierling Communications GmbH*, based in Ebermannstadt, some 50 km north of Nurnberg in Germany, have recently launched a new product called *WEATHERMAN*, a complete APT weather satellite station. *WEATHERMAN* is aimed at mobile users as well as the home and education markets and comprises a 137 MHz APT receiver with power supply unit, connecting leads and a QFH antenna kit plus recording, imaging and control software.

I have been using *WEATHERMAN* daily since early August and have found it to produce excellent images from all the NOAA satellites. In the case of NOAA-18 it is only marginally outperformed by the RX2 regarding its ability to reject UK pagers on 137.91 MHz. For readers thinking of investing in a new APT system, or even just a quality receiver or QFH, *Vierling* equipment is well worth considering.

## The Package - What you get

*WEATHERMAN* is delivered in a package that includes the 40 x 1500 mm alloy mounting mast and the four brass filars of the quadrifilar helical antenna (QFH) kit. Three boxes contain the APT receiver, its 9-volt plug-top power supply unit and the various bits and pieces required to complete construction of the QFH. One end of the 15-metre length of antenna download comes ready fitted with tags to attach it to the filars and there is a standard bayonet connector at the other to mate it with the receiver—no soldering is required. The supplied CD installs all necessary software and PDF user guides for setting up the system.

## The Receiver

The *Vierling* APT receiver is housed in an attractive plastic case 155 x 80 x 35 mm. At its lower end are a 9-volt power input socket and a 9-pin D-type serial port connector for computer control; at the upper end are the bayonet antenna connector and two 3.5 mm jack sockets. One socket connects the signal from the receiver to the 'line-in' socket of the computer soundcard while the other can accommodate headphones to monitor the satellite signal. The fascia supports a green power-on LED and an orange LED that illuminates when a satellite signal is being received. An LCD status display indicates the frequency being received.

The receiver has a 30 kHz bandwidth and includes automatic frequency correction (AFC) circuitry to compensate for the Doppler frequency offset of the satellites as they orbit. The receiver has a very high input sensitivity which renders a mast-top pre-amplifier unnecessary with an outdoor antenna. Tuning runs in 100 kHz steps from 137.10 MHz to 137.90 MHz, with additional 137.62, 137.85 and 137.91 MHz frequencies for NOAA-17, Russian

Meteor (almost certainly obsolete) and NOAA-18 (these frequencies are programmed into a PIC).

The 9V power supply has a European 'shuko' 2-pin mains fitting so you will need an appropriate adaptor to use it; because it is also fitted with a non-standard 9-volt connector, you cannot readily substitute a typical PSU designed for UK use.

## The Antenna

The QFH antenna comes disassembled, as a kit, but is easily constructed in under an hour. Everything is screwed or bolted in place—you don't have to solder anything at all. The QFH is of the 'tall/narrow' design with each filar making a half-turn around the mast. Don't make the mistake that I did first time by giving the filars only a quarter-turn. The centre-left photograph at right shows a part-built QFH with two of the filars correctly located. Being of all-metal construction (alloy/brass), and with the download connections protected by a weatherproof cap, this antenna should prove ideal for outdoor use.

## Setting up WEATHERMAN

Setting up *WEATHERMAN* for use took just a few minutes. For initial tests I attached the QFH to the top of a 2.5 m tall washing post in a clear situation near the foot of my garden. The antenna download, PSU and audio lead from the 'signal' jack were all connected and, within seconds, the receiver's LCD screen stated 'NOAA scan-mode' and displayed the frequency stepping through the pre-programmed settings. As soon as a NOAA satellite arrived within range the orange LED lit up, scanning ceased, and the LCD pronounced 'NOAA aktiv'. When a set of headphones (or a small speaker) was attached, the comforting NOAA 'clip-clop' tone was clearly heard.

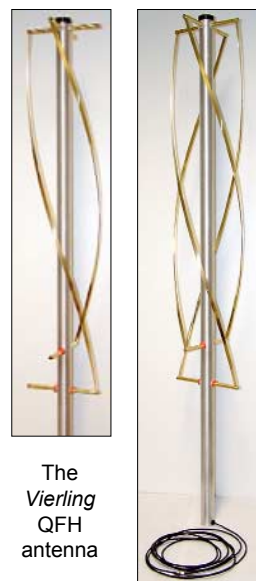
The *Vierling* receiver possesses no manual controls although a specific frequency can be selected under software control from the PC (see Appendix A). In practice I found the default scanning mode to be perfectly adequate for almost every situation; software control is only required to select between two satellites when their passes overlap.

## Software

The software includes *WaveTrace*, *Vierling's* own wave-file recording program and *WetterSat*, the receiver control software. Also supplied are David Taylor's *Satsignal* for converting the saved WAV files into images and *WXtrack* for tracking the satellites and predicting their passes. These provide the novice with a fairly foolproof method of producing images (see Appendix B). However, if you already have your own recording and imaging programs installed on your PC, you can continue to use these with *WEATHERMAN*.

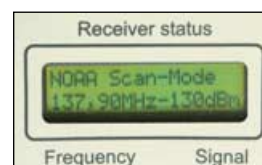


The *Vierling* APT receiver

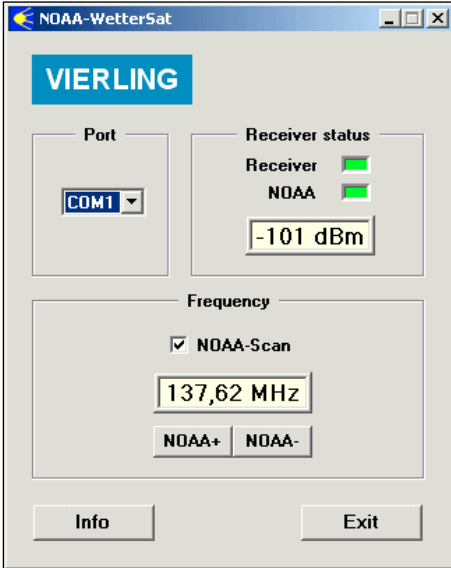


The *Vierling* QFH antenna

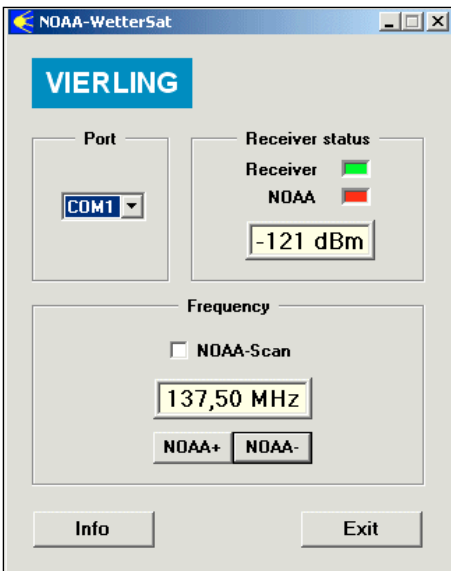
During construction (left), showing the half-turn of each filar and completed (right)



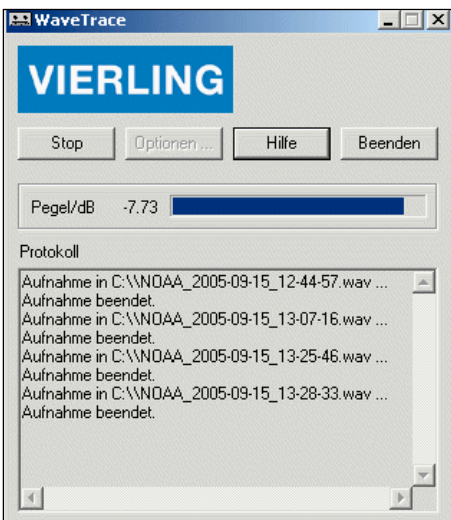
Close-up of the LCD display on the *Vierling* APT receiver



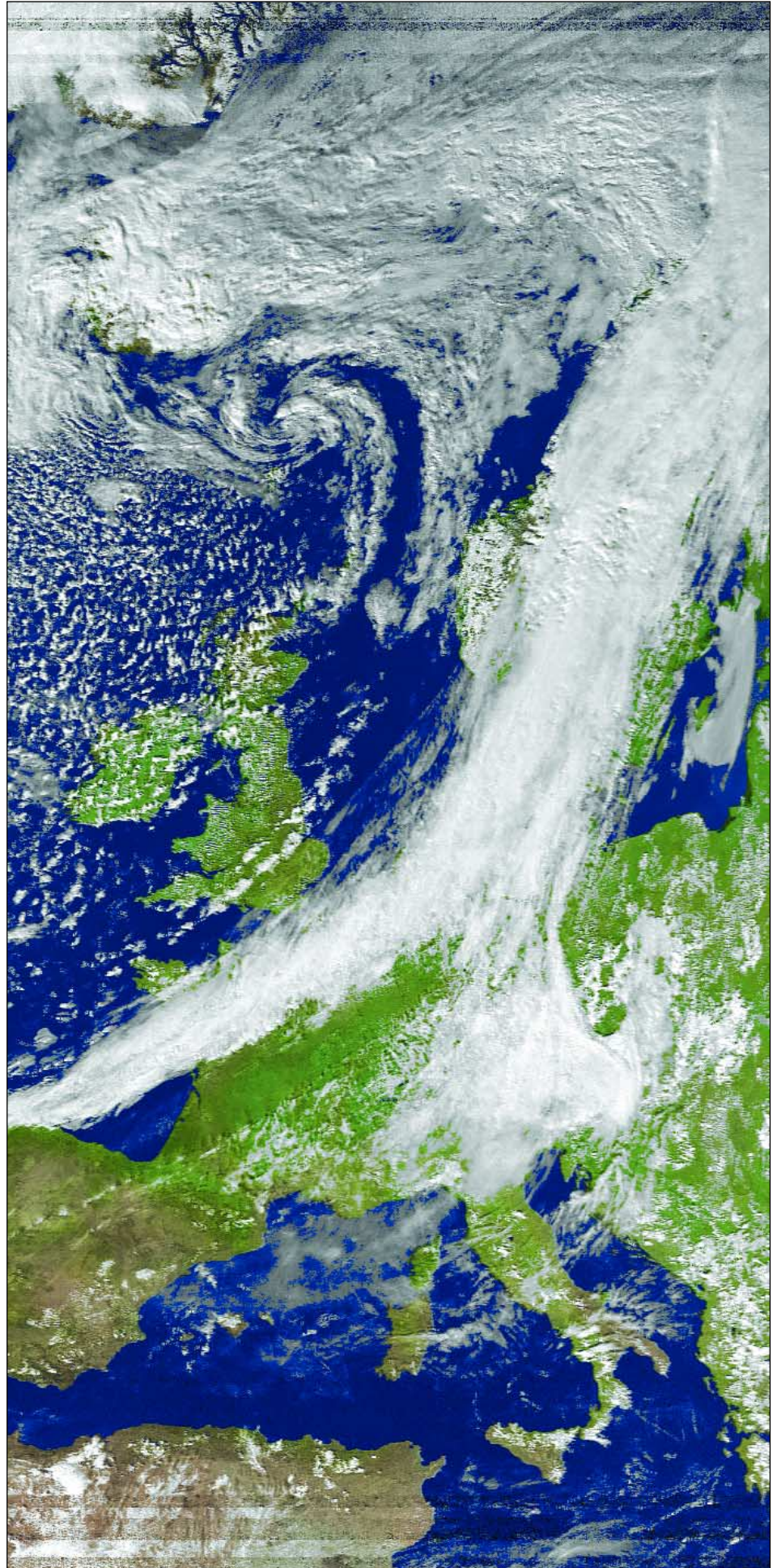
**Wettersat**, in scanning mode, has locked on to a 137.62 MHz NOAA-17 pass. Both 'NOAA' and 'Receiver' windows show green.



**Wettersat**, set to 137.50 MHz under computer control awaits NOAA 12. The green 'receiver' window shows that the receiver is active on this frequency; the red 'NOAA' window shows that the satellite signal is not yet being received.



**Wavetrace** in action

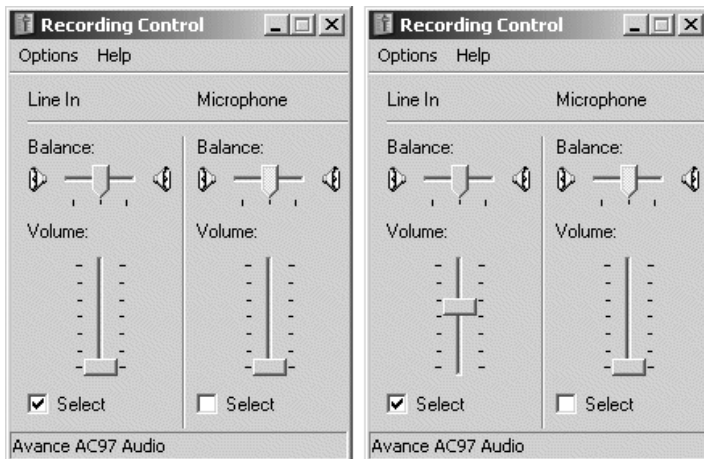


The NOAA 18 pass from 13:04 UT on September 27, 2005, captured in Aberdeen, Scotland using WEATHERMAN (Vierling APT receiver with outdoor QFH antenna) and processed with WXtoImg.

## Setting the Recording Level

It is vital that the recording level of your PC soundcard is set up correctly. If it is too high the images will be too white and clouds in particular become 'bleached'; too low and images will be very dark.

Recording level is adjusted using a program called *sndvol32.exe*. Click on your computer's START button; select 'Run' and type 'sndvol32' in the 'Open:' field. Click 'OK' and the program will open with the legend 'Volume Control' in its title-bar. Click <Options> then <Properties> and check the 'Recording' radio-button; make sure that the 'line-in' and 'microphone' options are ticked then click 'OK' to reveal the Recording Control panel (below).



The soundcard recording control showing the 'line-in' input muted by the volume slider (left) and activated (right).

*WEATHERMAN* will normally be connected to the soundcard's 'line-in' socket, so this must be activated by checking the 'Select' box in the 'Line-in/Balance' panel and then raising the volume control slider to around mid-scale. Once a live NOAA signal is being received, observe the blue audio-level bar in *WaveTrace*; adjust the 'line-in' volume slider in *Recording Control* until this stretches approximately 80% across the *WaveTrace* window (if this bar touches the far edge of the window, your level is too high).

If you find that the signal level remains low even with *Recording Control* at maximum you can, instead, connect the 'headphone' output from *WEATHERMAN* to the soundcard 'line-in' socket. In this case the audio level can be adjusted both at the receiver (using a small screwdriver to adjust the recessed 'volume' grub-screw immediately above the 'Power' LED on the front panel) and in *Volume Control*.

With some soundcards you may find that you get better results by connecting to the 'microphone' input socket instead (be sure to click its 'Select' box to activate this audio channel).

## Producing Weather Satellite Images

The most rewarding and exciting way of imaging from weather satellites, specially for newcomers to the hobby, is to use soundcard software that actually displays the images on the PC screen at the same time as the satellite is passing overhead. If you already have soundcard capture software such as *WXtoImg*, *WXsat*, or *APT Decoder* installed on your PC, I would certainly recommend that you continue using it instead of *WaveTrace*. All these programs decode both WAV files and images. This means that a particularly good pass may be reprocessed following capture using any of these programs, or *SatSignal*, to produce images of the highest quality.

## The Results

As far as reception and imaging from the NOAA satellites that use the 137.50 and 137.62 MHz frequencies are concerned, there are

# My Experiences with the Vierling 'Weatherman'

Clive Finnis

I have used the Vierling receiver in place of my RX2 for a few days of passes now. I have not used the QFH antenna that comes with it but stuck to the Paul Hayes QFH I have installed in my loft. Due to planning regulations around here I cannot use an external antenna.

## Initial Impressions

The Vierling receiver is supplied in a small, almost hand held size case, which looks very neat and professional, and gives confidence that it will be reliable in use.

## In Use

The first problem was that the Vierling does not supply d.c. at the aerial socket to power a preamplifier (the RX2, Timestep Proscan and Dartcom receivers all have this facility). I know that preamps are seen as unfashionable, but with my antenna being indoors I find that a Dartcom Preamp close to the QFH definitely gives me longer passes and better quality images. I climbed to the loft and disconnected the preamp.

Two alternatives present themselves if you really want to use a pre-amp with the Vierling receiver:

- 1 use a bias-T close to the receiver (Minicircuits do them for about \$30 to \$80 each) or
- 2 provide a separate d.c. feed to the pre-amp via a feedthrough capacitor.

I did neither and relied on a straight through connection from Antenna to receiver.

Second problem: Using the 'Line In' socket on my sound card, I could barely get enough input for *WXtoImg* despite setting the Volume Control on Windows Control Panel to maximum.

Changing to the 'Mic In' socket I reduced the Volume Control to minimum, yet still got an overload on *WXtoImg*. *Catch22*—too little on one, too much on the other (see the main article for a possible solution).

A third problem was the software bug Les discovered: the software crashes if the Vierling is connected during a re-boot. Hopefully this will prove an easy fix for Vierling.

## Results

Unfortunately, mine were disappointing. When I first unpacked the Vierling I was so impressed that I was reaching for my cheque book to buy one; but I now think the good old RX2 will continue to be my mainstay for the time being. The main problems were reduced lengths of passes and serious pager interference, possibly due to the lack of a pre-amp to compensate for the indoor antenna, I suspect.

I suffer very minor NOAA18 pager interference here with my RX2, showing only at the start and end of the passes. With the Vierling it was all the way through the pass. This cannot be due to the download or the aerial as these were unchanged. It could be the lack of Dartcom Preamp, or it could be a problem with the Vierling receiver itself.

## Conclusion

I would like to spend more time with the Vierling and investigate some options regarding the pre-amp and input levels to the PC. It seems such a nice piece of kit and I feel it should give better results than I achieved. Unfortunately I've had to do it on a 'five minutes here, five minutes there' basis due to various home and work commitments.

no issues. *WEATHERMAN* produces results comparable with any other receiver I have used—bar none! Even with NOAA-18 at 137.91 MHz, results are very good indeed.

The colour composite **NOAA-18** image reproduced on page 20 was captured from a pass with a maximum elevation of 70° using *WEATHERMAN* with the QFH mounted outdoors. It provides a full eleven minutes of flawless imagery. True, the extremities of the pass—where the satellite signal is at its weakest—show distinct evidence of pager breakthrough: over north Africa and to the Far North where a hillside further compromises my horizon—but I'll accept this any day! My **RX2** receiver, also fed from an outdoor QFH, imaged the same pass and showed exactly the same pager bands (though marginally less prominently).

*The performance of WEATHERMAN, as with my RX2, is dependent on receiving the strongest possible signal from NOAA-18. Anything that attenuates the satellite signal seems to increase pager intrusion (here in the UK). When the QFH was mounted in my loft, beneath the eaves of the house, there was a major increase in pager interference with both receivers. I also discovered that passes with a maximum elevation below 20° suffered severe pager banding over most of their length.*

Clive Finnis evaluated the *WEATHERMAN* system from his home in Dorset (see right-hand panel on page 3) and made similar observations.

### Conclusions

*WEATHERMAN* is the only complete APT weather satellite imaging solution currently available. If you are starting out on the hobby for the first time, it comes strongly recommended, with a high-quality computer-controllable receiver and a durable all-metal QFH antenna. A CD of useful software is also provided.

Overall, I was extremely impressed with the *Vierling* APT receiver which produced images every bit as good as those from any of my other receivers under identical conditions. Even for NOAA-18, which has defeated the efforts of a number of high-quality receivers (see our review of the excellent German-built *R2FX* APT receiver in our previous issue), results were surprisingly good. Before testing it I had feared that the *Vierling* receiver might struggle on this frequency but my doubts were almost completely dispelled as it came a very close second to my **RX2**, widely considered to be the best receiver at 137.91 MHz.

### Appendix A

Software control of the *Vierling* receiver can be achieved by means of the small program called *Wettersat.exe*. After installing all the *WEATHERMAN* software, you should find this in the **<Program files\Weatherman>** folder on your PC. It is a good idea to drag this on to the Desktop using the right mouse button and creating a shortcut there.

To use the program you will require a 9-pin D-type serial lead to connect the receiver to your PC. By default, *Wettersat* opens in 'scan' mode. The 'receiver' window shows green to indicate that *WEATHERMAN* has been detected; the 'NOAA' window will also change from red to green as soon as a satellite signal is received (see the upper left-hand image on page 20).

To select a particular frequency, uncheck the 'scan' box and click either the 'NOAA+' or 'NOAA-' button to cycle through the stored list to the one that you require. The receiver will remain tuned to this frequency until you alter it once more. If the receiver is powered off (by unplugging its PSU), it always starts up again in 'scan' mode. The centre image on page 20 shows the receiver awaiting a satellite on 137.50 MHz.

### Warning

At the time of writing there is a 'bug' in this software. If the Vierling receiver is already powered on and connected to the PC while the latter is booted up, a 'port not available' error occurs. The simple solution is to remove either the power lead or the serial lead from the receiver while the PC boots up then reconnect once the computer is running.

### Appendix B

The *Wavetrace* program can also be found in the **<Program files\Weatherman folder>** on your PC. Create a shortcut for ease of use. The *WaveTrace* screen window is illustrated in the bottom left illustration on page 20. Detailed help is available on clicking the button labelled 'Hilfe'. [This help is in English](#), and in common with all the *WEATHERMAN* documentation, is an Acrobat PDF file—so you need *Acrobat Reader* installed on your computer.

I used the program without modification and results were excellent. All you require to do is click the 'Start' button; everything else is automatic, and every time a satellite is picked up by *WEATHERMAN*, an audio wave (WAV) file is saved on the hard drive.

The *WEATHERMAN* installation includes a shareware copy of David Taylor's *SatSignal* to convert your WAV files into images. (It is located inside the **<Program files\Weatherman\WXtrack>** folder). Run *SatSignal*, load one of the saved WAV files, then watch your images unfold. (For a more detailed article on the use of *SatSignal*, see GEO Quarterly No 3, page 46).

### Obtaining WEATHERMAN

At the time of writing, *WEATHERMAN* can be ordered from Vierling, through their website. The direct link appears at the foot of this page. If you follow the link '*Information material*' you will be able to download an English-language version of the *WEATHERMAN* brochure (1.5 Mb PDF file).

If you require further information, or wish to enquire about ordering from Vierling, click the link '*Prices & more information*' to e-mail your request/order to them. There is no problem with language, as the Vierling team are proficient in English.

Prices for GEO Members are as follows:

Item	Prices	
	Euro (ex VAT)	Sterling (inc VAT)
Complete WEATHERMAN (No. 70351.001)	336 euro	£280
Vierling Receiver only (No. 70351.002)	215 euro	£180
QFH Antenna only (No. 70351.6003)	150 euro	£125

To complete payment for my system I had to pay an additional £22 bank charge for the currency conversion and cash transfer. However, by the time you read this, GEO may be able to supply *WEATHERMAN* through the GEO Shop, which would allow payment by credit card or personal cheque and avoid these charges.

**Do check the GEO Shop page on our website (or send the Shop an e-mail) before ordering.** The URL is:

**<http://www.geo-web.org.uk/shop.html>**

Above prices in euros are as quoted to GEO by Vierling, and do not include VAT. Approximate prices in Sterling, including VAT are listed for comparison. All prices include P&P.