Ten things to do, with a handheld radio

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This series of articles are intended to give the newcomer to ham radio an insight into some of the things you can do with a handheld dual band radio.

9: Hellschreiber

This mode of transmission dates back to the late 1920's and was designed as a simple

method to send text messages over radio. Unlike other message transmission systems which code and decode the text, this directly prints the characters onto the paper, or nowadays a screen. The characters are transmitted as a sequence of dots scanned vertically, a bit like a dot matrix printer. Ingeniously, the original machines printed characters twice, vertically, on a paper strip, so no matter what the speed synchronism was between transmitter and receiver, at least one letter showed perfectly. This is shown in Figure 2. Modern software now prints on screen and maintain perfect sync, and so they have no need for this feature.

Figure 1 A WW2 Hellschreiber machine
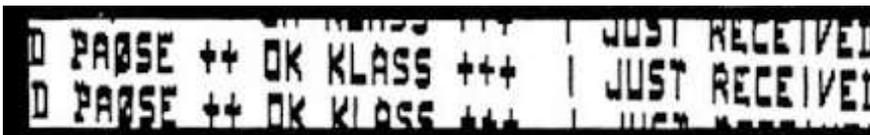
Figure 2 Hellschreiber characters printed on a paper strip

Creating the tones

Originally the Hellschreiber machines were mostly mechanical and just switched the radio carrier on and off, similar to CW (morse). Mostly it is used for long distance, worldwide HF amateur radio communication.
There have now been many new methods developed to convert the text into the modulation on a carrier, and a common method to carry the character dots is to generate tones, and we can connect these audio tones to our UHF or VHF handheld radio and have some fun with some simplex experimentation.
To use Hellschreiber, sometimes called Feld-Hell, or simply Hell, we will need some form of computer or mobile device to input and show the text. The software is mostly free,

and links to this are shown below. Oh yes, you will probably need another station to communicate with!

Connections to the radio

The laptop or mobile device that generates the audio tones will need to be connected to the radio transmitter/receiver. As this is just an audio connection, we can use the same microphone and speaker connections used for Slow Scan TV (see SSTV article in this series).

Experiments

With the software on a mobile phone, this mode can be taken into the field and tried over long distances. When the signal gets too weak to open the receiver squelch, turn the squelch off and you will see the text is still visible in the noise. This mode of operation has the advantage it uses the human eye to see what machines cannot. The example below shows how the text is still readable even when the signal fades to noise.
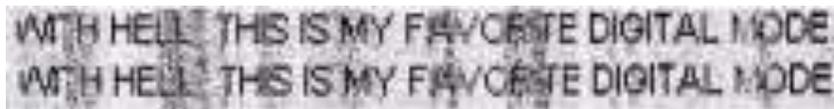
Figure 3 Noisy text

Further information

- A mine of Hellschreiber information:
  http://f6cte.free.fr/index_anglais.htm
- An excellent android app is available free, called "feld.hell".
- A desktop program MultiPSK is Feld-Hell capable but a little "busy".
- A complete list of software available is here:
  https://www.dxzone.com/catalog/Software/Hellschreiber/