

Technical advice for private radio in the region of Förderverein der Verkehrs-Versuchsanlage Horstwalde e.V. (FKVV)

For technical support of annex 5 of contract: Guide operating private radio in the area of the Förderverein der Verkehrs-Versuchsanlage Horstwalde e.V. (FKVV), the observance of this advice is recommended.

1 Use of hand-held radio technology



Controls GP-Class Motorola: Left: On/off and volume switch, center: Channel selector switch



The PTT key is usually operated with the index or middle finger



So please don't

The flexible antenna contains sensitive electronic components inside, so hand held radios must NOT be carried by the antenna.

Optionally, a speaker/microphone unit can be connected remotely via a helical cable.

The helical cable should also be handled gently.

2 Frequency management

The map shows the range of both radio networks UHF (70 cm frequency band) and VHF (2 m frequency band).



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The following matrix supports the usages for the speech paths and where to use them:

| | Repeater UHF | Repeater VHF | Mobile frequencies UHF | Mobile frequencies VHF |
|--|--------------|---|---|---|
| FKVV area Horstwalde | yes | yes | yes , in mobile use with each other if no VHF radio on board | yes , in mobile use with each other if no UHF radio on board |
| Schlechtwegstrecke (SWS) Gottow | no | yes , long range radio via channel 1 | no , no end-to-end links over SWS Gottow | yes , in mobile use with each other on site |
| former military airfield Sperenberg | no | yes , long range radio via channel 1 | yes , but not recommended while VHF radios on board | yes , in mobile use with each other on site |
| Convoys out of FKVV on highways | no | no | yes , nationwide, but not near the border lines with neighboring states, see BNetzA certificates | |

Remarks: Interlink to BAM-Relay only one time mobile use with Motorola GP380 (VHF) and one time fixed use with Motorola DM1400 in the office FKVV. Don't use the mobile frequency near 148 MHz inside 50 km around Horstwalde please.

The 2x2 **mobile frequencies** (2x VHF/2x UHF) are **not exclusively** assigned, i.e. foreign radio points can be encountered. In such a case, please dodge each one. If foreign radio

remote points are found on the channel and they do not respond to speech, then the "interferer" can be hidden by selecting a channel with pilot tone (see PL in Chapter 5 and the hardware compatibility list). Practically, one remains on the affected physical frequency, however, the loudspeakers only open to internal radio transmissions.

Channel change must be done uniformly on all radio devices in the network and must be announced before switching over the entire team.

The use of high-performance and wide-range frequencies in professional use is regulated by the Federal Network Agency (BNetzA) through frequency licences. The documents are to be demonstrated at any time at the request of the police or BNetzA staff. Copies of the certificates are located in the radio folder in the building 501 (branch office FKVV).

3. Radio with remote magnetic base antenna

The UHF radio network of the FKVV is optimized for operation with hand-operated radios in vehicles. Vehicles with special protection can also be impenetrable for UHF radiation. In such cases, the mobile devices must be connected via coaxial cables with externally mounted magnetic base antennas. Mobile radio devices have a BNC-adapter/socket at the factory. In the case of using handheld radio devices, the flexible antenna must be replaced by a BNC-adapter. A coaxial cable is then connected via the BNC-adapter, see photo:



Typical wireless technology, from left to right: Mobile device CM 340 with handheld microphone for use in vehicles (12 V electrical system); Handheld radio GP 380 with flexible standard antenna; GP 380 with BNC-adapter and GP 380 with BNC-adapter / plug and coaxial cable for connection to a remote antenna

On request, magnetic base antennas and coaxial cables can be provided in lengths of 0.5-10 meters. The mobile devices Motorola CM 340/360 have a 12 V connection via a car-board connector. If the customer's vehicles have higher on-board voltages, then for the mobile devices please bring corresponding DC-voltage converters.

The magnetic base antennas differs in the diameter/adhesion and in the spotlight. The heavy foot (left) tolerates driving speeds of up to 120 km/h and antenna lengths/-heights up to 1.6 m. The Light foot (right) should only be used at low to moderate speed and with antenna lengths to 0.6 m. The usual UHF emitters have a length/height of 0.57 m.

Permanent magnets receives their adhesion by storing them on ferritic surfaces (e.g. steel sheet). Austenitic steels (Niro, stainless steel) and plastic bodies are NOT ferromagnetic and therefore not suitable as a base for magnetic base antennas.



4 Fixed radio station (3rd network) on the tower

The optional fixed radio station on the observation tower is described in detail in the "short operating instructions for the fixed radio station (Control Panel Major 5a)". Due to the frequency usage of 4XY.15 MHz by Polish radio points, this frequency is not suitable due to the height of the antenna. For this reason, 4XY.47 MHz should be used to operate the fixed radio station, see Chapter 5.

5 Radio operation with different types of mobile phones

The FKVV customers can choose out of mobile (car-)radios and handheld radios. This fleet consists GP330, GP344 without display and GP380, GP388 with display. When mixing the types in the joint operation, the overview table "display /programming different types of VHF/UHF radio devices" has to be observed.

Radio traffic is only achieved, if all participants use the same channel (frequency and pilot tone). Always make a speech test before leaving the base (building 501 Office FKVV).