

# RFDS 3

## MULTIPURPOSE DETECTION SET

### Instruction Manual

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Multipurpose detection set RFDS-3 is a unique equipment designed for identification and localization of all types RF fields and hidden wires. All elements of the set are fulfilling professional requirements and the metal casing ensures high degree of mechanical resistance. All components of the set are placed in a diplomat type suitcase with two mechanical and code locks. Each device has a slot in a plastic inset and there is an additional space for documents and tools in a cover of the suitcase. The RFDS-3 consists of the RFD-5 radio frequency detector, a telescope antenna, an external probe, dynamic earphones, the WHG wide-band generator, two wire antennas for WHG and the line and telephone adapter LTA-2.

## Description of the RFDS-3 devices

### RFD-5

RFD-5 is a high sensitive wide band RF detector working from MHz to tens of GHz. In the MEASURE mode the LCD indicator displays RF level. In the earphones is a demodulated signal and the AUDIO switch enables variable localization tone. The unique feature of RFD-5 is the ability to record emitted signal level, measured at certain situations. The exact record is enabled by reading of the LCD display. The read-out of LCD (000-250) can be compared with the diagram LEVEL/DISTANCE from which the distance and effective radiated power (ERP) can be calculated. (ERP is the ideal power radiated by a half wave dipole tuned on the generator frequency).

There are two different types of antennas. A telescope antenna is determined to a quick examination of subjects and persons, comparison of radiated power [ERP], testing of transmitters, feeders and antennas, monitoring of RF field strength in closed rooms etc. External probe disconnects the internal detector and a very sensitive probe circuit placed in the top of folding laminate bar is activated. The frequency limit of the probe detector exceeds 20 GHz and the probe bar can be folded up to 2,4 m length. The length of 2,4 m makes possible a very fast sweeping of rooms including ceilings even in places normally unattainable. For a quick assembly of the laminate bar all terminations are marked by a color strip.

For effective separation of strong legal signals the usage of earphones is recommended. TV signal is producing 50 Hz and AM broadcast clear sound. If any microwave signal is detected, there are deep differences in the LCD reading when moving the detector. The microwave signal can enter the detector even if the antenna is pushed-in. The microwave detection diode is just behind the plastic front panel. If the LCD displays more than 200 the length of the telescope antenna should be reduced.

For detection and localization of pulse transmitters use the mode PROTECT. In this mode any signal or peak signal stronger than originally stored background level is written to the memory. During the time period when the instant level is higher than background the user is warned by a beep.

Battery or accumulator is behind bottom lid, change or charge it when "LOW BATT" warning appears.

**WARNING** : Extremely sensitive inputs are not designed to detect high power signals. The telescope antenna or the top of the external probe should not be directly coupled to a transmit antenna radiating more than 1 Watt RF power. The user should avoid static electric discharges.

## WHG

WHG is a wide band multisignal internally FM and AM modulated power generator which together with an appropriate antenna activates hidden wires and makes them visible for RFD detector. The function is based on the antenna principle it means that no non-linear elements are required for a positive response. The result is that any wire leading in or out from the inspected area (room) can be discovered. Best results are achieved when WHG is placed and its antenna installed in the area of probable wires [cables] outlet from an object.

Good results are achieved when the antenna of WHG is directly connected to mains or telephone installation. WHG must always be placed or connected in the next room! If the WHG is in the same room with RFD-5 the 1 kHz localization tone is heard everywhere and to find the increase near the wires is always problem.

After installation and switching on the WHG all walls, ceiling and floor should be carefully checked by RFD-5 in MEASURE mode with earphone plugged. An approach to any hidden wire or cable increases the 1 kHz acoustic tone produced by the WHG generator. For an exact determination of a wire route it is useful to change the position of WHG and its antenna to provide better coupling into the suspected wire. It is matter of course that a legal installation like mains and telephone cables will be easily detected and the user has to decide if it is a legal or suspected installation.

The battery voltage is checked by LED - ON. If the voltage drops below 7 V the LED goes OFF, but WHG is still working. If LED is OFF, the battery should be replaced as soon as possible. To replace 2 pcs. of IEC 3R12(4.5V flat type) the bottom lid of WHG must be unscrewed.

## LTA-2

LTA-2 is line and telephone adapter which can be connected to EXT.PROBE input of RFD-5. In AUDIO mode the telephone and other suspected wires could be checked for presence of any audio signal to detect connected loudspeakers, modified telephones, microphones etc. The green plug is ground, white is active. In the detect mode AM and FM detector is activated and the band switch (kHz) is selecting frequency ranges (band of filtering) 20-50 kHz, 50-90 kHz, 90-160 kHz. These frequencies are often used for low frequency line listening systems on telephone or mains wires.

During inspection (sweeping) all room out-coming wires must be checked in pairs and in multi-pair or multi-wire systems also in the separate wires combinations.

## Technical specification

### RFD-5

- sensitivity: 0.06 uW EPR (400MHz/5cm/level=5)
- frequency range: 0.5 MHz to 25 GHz
- external probe: 10 MHz to 25 GHz
- pulse memory: 99 events, 16 alarms
- Geiger click indication

### WHG

- multisignal, AM/FM modulated wide band generator
- audio modulation 1 kHz
- output voltage 8 V p-p
- power 9 V, 2 x battery IEC 3R12 or equivalent
- current consumption 29 mA
- low voltage indicator, indicates drop below 7 V

### LTA-2

- Audio sensitivity: 0.3 mV 10Hz to 10 kHz
- LF sensitivity: 20 kHz - 160 kHz 0.4 to 12 mV ef.
- isolation: Ground (green) 100 nF / 275 V AC  
Active (white) 1 nF / 440 V AC