

## **REMTECH RADIO ACOUSTIC SOUNDING SYSTEM (RASS) FOR REMOTE SENSING OF TEMPERATURE**

### **1. RASS TECHNICAL SPECIFICATIONS**

#### **1.1 Radar Part**

RADAR ANTENNA (2 at 5 meters separation)

- Diameter : 2000 mm
- Focal length : 658 mm
- Source type : circular polarization

SOURCE OSCILLATOR

- Frequency : 915 MHz or 1290 MHz

POWER AMPLIFIER

- Type : solid state
- Protection : any load and phase
- Power : 20 W (60W optional)

FILTER

- Type : band pass filter
- Bandwidth (at - 3 dB) : 3 MHz
- Rejection : better than 60 dB

#### PREAMPLIFIERS

- Total gain : 39 dB

- Noise figure : 2 dB

#### MIXER

- Isolation LO/RF : 20 dB min.

- Conversion loss : 8.5 dB max.

### 1.2 Acoustic part

PA5 antenna

### 1.3 Type of processing

By Fast Fourier Transform of the signal received after mixing and use of techniques similar to those developed for processing of the SODAR signal.

## 2. RASS/TOWER COMPARISON RESULTS

Tests were conducted at the K.F.K (Kernforschungszentrum Karlsruhe) in F.R.G during the month of March 1989. Since then more than 25 REMTECH RASS have been installed (see our customers reference list).

**RASS COMPARED TO TOWER DURING DAY**

(7h00 to 19h00)

HEIGHT	N	DT	C	SDev	Corr
100	239	-1.02° C	1.09° C	0.38° C	0.975
160	214	-0.32° C	0.52° C	0.41° C	0.972
200	198	-0.32° C	0.54° C	0.44° C	0.965

N : Number of points

DT : Bias or averaged difference of temperature between RASS and tower

C : Comparability or root mean square difference of temperature

SDev : Precision or standard deviation of difference of temperature between RASS and tower

$$(C^2 = SDev^2 + DT^2)$$

**RASS COMPARED TO TOWER DURING NIGHT**

(19H00 to 0H00 and 0H00 to 7H00)

HEIGHT	N	DT	C	SDev	Corr
100	221	-1.22° C	1.30° C	0.46° C	0.964
160	207	-0.34° C	0.45° C	0.30° C	0.983
200	194	-0.16° C	0.36° C	0.32° C	0.983

N : Number of points

DT : Bias or averaged difference of temperature between RASS and tower

C : Comparability or root mean square difference of temperature

SDev : Precision or standard deviation of difference of temperature between RASS and tower

$$(C^2 = SDev^2 + DT^2)$$