

**VHDD-550S TRANSMITTER  
AND  
RECIEVER TECHNICAL  
CHARACTERISTICS**

# TECHNICAL CHARACTERISTICS OF THE VHDD-550S RADAR SYSTEM

## 1.0 System Overview

The VHDD-550S Radar System consists of a fully coherent transmitter, receiver, digital signal processor and a horizontally polarized 1 degree pencil shaped beam antenna with the capability to be scanned over a hemispherical volume consisting of 360 degrees in Azimuth and 0 to 90 degrees in elevation. The digital signal processor employs algorithms to process weather events for display, including “rainfall rate”, “radial wind velocities”, “turbulence”, and rainfall accumulation. These weather data are made available to the Meteorologist for analysis and dissemination.

## 2.0 Technical Characteristics

The following tables describe the technical characteristics of the VHDD-550S Radar System Transmitter and Receiver:

### 2.1 Transmitter Characteristics

<i>Nomenclature</i>	<i>Comments</i>
Transmitter Type	Coaxial Magnetron
Operating Frequency	Adjustable from 2700MHz to 2900MHz
Duty Cycle	.001%
PRF	Preset Modes, ranging from 250pps to 1500pps
Pulse Widths	Preset Modes, ranging from .4μs – 2.0μs
Pulse Peak Power	550 kW
TR Switch	3-port Circulator with Solid-State TR limiter

Fig. 1

### 2.2 Receiver

<i>Nomenclature</i>	<i>Comments</i>
Receiver Type	Super heterodyne Coherent on Receive Only, employing up conversion from a 60MHz source in the Signal Processor
Noise Figure	2dB Maximum
Digital Stalo	Digitally Tuned Phase Lock Loop

Intermediate Frequency	60MHz stable frequency
IF Processor	IF is Digitized to 14-bits and coupled to the digital signal processor, Digitizer rate is ~74MHz
Receiver Bandwidth	Matched Filter of $1/\tau$ implemented digitally by the signal processor
Dynamic Range	Dependent on receiver bandwidth, ranges from 90dB to 100dB
Sensitivity	As low as -114dB in wide pulse

Fig. 2