

DOPPLER METEOROLOGICAL RADAR "DMRL-3"

Meteorological data received from purpose-designed meteorological radars serves as one of the components of information support for ATC AS, which provide more detailed air situation, determination of weather conditions within a radius of hundreds of kilometers and short-term (within 1-3 hours) changes of weather conditions.

One of the ways of ensuring meteorological observations is installation of high-resolution meteorological radars, which in addition provide detection of non-stationary atmospheric phenomena.

The "DMRL-3" is a small-size Doppler meteorological radar of 3 cm band with a capability to operate in dual-polarization mode.



PURPOSE

- » generation of maps of cloud top, horizontal and vertical cross-sections of radar parameters of meteorological phenomena (reflectivity, velocity, spectrum width, differential reflectivity, differential phase and cross-correlation factor);
- » obtainment of information on spatial structure and type of cloud cover and precipitations;
- » obtainment of information on hazardous weather phenomena (cloud cover, precipitations, thunderstorms, hail, squall) within 100-150 km radius;
- » estimation of hail probability, thunderstorm probability and cloud top development;
- » measurement of precipitation intensity on large areas;
- » measurement of direction and velocity of precipitation movement, as well as vertical and horizontal extents of precipitations;
- » measurement of radial velocities of meteorological phenomena;
- » operational estimation of velocity and zones of increased inhomogeneities of wind field of cloud systems;
- » output of radar data in the codegrams required by the data consumer.

COMPOSITION OF "DMRL-3"

- » antenna device;
- » transmitting, receiving and processing equipment (installed on rotary part of antenna device under radome);
- » rotation control device;
- » central control and computing complex;
- » temperature control system;
- » primary power supply system;
- » radome;
- » remote terminal;
- » emergency SPTA set.



SPECIFICATIONS OF "DMRL-3"

Parameter	Value
Operating frequency band, MHz	9550-9650
Output data	Z, V, W, Pol
Maximum operating range, km	
» "Detection" mode	60/125/250
» "Profile measuring" mode	5-20
Maximum measured velocity, m/s	
» up to 60 km range, at least	± 50
Spectrum width measurement range, m/s	up to 10
Antenna diameter, m (*specified at development stage)	2.0 / 1.5 / 1.0*
Antenna pattern width, deg.	1.2 / 1.7 / 2.2*
Side-lobe level, dB, at most	minus 27*
Antenna angle adjustment tolerance, deg.	±0.1
Maximum antenna movement velocity, deg/s	
» in horizontal plane	36
» in vertical plane	36
Transmitter type	Transistorized
Pulse power, kW	0.3-0.5
Sounding signal width, μs	0.2÷100.0
Sounding pulse repetition frequency, Hz	300÷7500
Receiver noise factor, dB	5
Transmitter stability, dB	50
Receiver dynamic range, dB, at least	90 (with consideration of linking)
Meteorological data update rate, s	5-300

VERSIONS OF "DMRL-3"



Mobile version installed on a truck chassis



Stationary version installed on a prefabricated tower

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