

MORCOM Weather Satellite Systems

NOAA POES HRTP SERIES

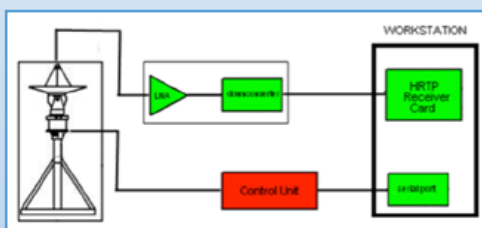
The High Rate Picture Transmission (HRPT) service installed on the NOAA POES satellites and on polar orbiting satellites from other countries has for some two decades been the main source of high quality data from polar orbiting meteorological satellites at major user stations throughout the world.

The data stream not only contains full resolution images in digital format from the AVHRR instrument but also the atmospheric information from the suite of sounding instruments.

Through HRPT reception the user site can acquire data from two or more consecutive overpasses twice each day from each satellite, giving high resolution data coverage of a region extending to about 1500 km radius from the user station. The imagery gives a snapshot of the meteorological conditions and can also be used for many land and ocean applications, while the sounding data gives detailed atmospheric data that may be processed and used in regional Numerical Weather Prediction (NWP) models.

Morcom is an integrator of direct readout weather satellite systems. Our HRPT signal reception system is based on a 1.8 meter L-band prime focus antenna, which will perform reception of the 1701.3 or 1707 MHz HRPT carrier. After reception the HRPT signal is amplified by the LNA, and then it is down converted from L band to the VHF band between 130 MHz and 160 MHz. Both the LNA and down converter are integrated in the antenna feed.

The VHF signal is sent to the indoor area of the station where the HRPT



receiver is housed. The maximum distance between the Antenna and the receiver using low attenuation RF cables is 300 ft (100 m).

The antenna chosen for the HRPT signal is an L-band receive only antenna. It consists of a 1.8 dish on a pedestal with AZ and EL motors. The tracking is performed automatically by our program tracking. The motorization provides 180° degrees of freedom in elevation (from -5° to 185°) and 360° degrees of freedom in Azimuth.



All parts related to the antenna pedestal are made in aluminum materials. The dish antenna is finished in anodized black and the mounting pole in anodized gray aluminum.

The antenna controller is designed by using well-known servo control techniques like the PID controller (P:proportional, I: integral and D: derivative) which assures a correct antenna pointing and tracking of the satellite. The motors are DC type with a control which is provided by the PWM. The PWM amplifiers are protected against short circuit, overload etc.

The optical encoders permits to obtain enough accuracy, and they are located directly on the antenna axis. There is one motor per axis. The antenna will be stopped in case of motor failure.

Power supply can be selected for 120V or 220V switch on the back of the control unit.

The integrated Feed/LNA downconverter is packaged in a weatherproof enclosure for outdoor applications which is placed at the antenna feed.



The L-band to VHF-band down converter consists of an L-band amplifier, a band pass filter, a mixer with a local oscillator working at 1560 MHz, and a VHF amplifier. The input and output impedance are of 50 ohms.



The tracking unit is able to control and monitor antenna motorization (limit switches, etc.). The tracking unit will be able to point antenna towards the appropriate satellite according to orbital parameters. The tracking unit is connected to the

workstation via a DB25 connector. The tracking software computes the antenna tracking file to control the antenna positions.

The ingest and visualization software interfaces to a tracking controller and predicts time and location of Polar Orbiting Environmental Satellites (POES) and tracks these satellites during the pass. It also ingests and stores the data ready for network requests for it.

SPECS

Parabolic Tracking Antenna

6 –foot parabolic antenna (4-mesh panel) finished in anodized black aluminum Positioner/Rotor unit Integrated feed/LNA download converter unit.

Ingesting and Tracking System

Control Unit

Azimuth/Elevation Low voltage Tracking Controller with Asynchronous Serial Control link.

Workstation

Data ingest and visualization software: POES Box
Pass Position tracking software
NOAA H RTP DSP Receiver card

Operating System: SuSe Linux 9.1 or greater distribution based on Linux 2.6.X kernel on all computers (Windows solution available as well).

MORCOM — Your source for quality weather information solutions

- Weather Satellite Ground Stations (GVAR, HRPT, LRIT, Eumetsat)
- WIFS/GIFS Systems
- Meteorological Communications (GTS)
- GOES Direct Readout Ground Systems
- Future-proof GOES-R Compatible hardware (antenna and processor)



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