Weather Radar Upgrade/Enhancement Capabilities

There are a number of situations where upgrading an existing radar may be more cost effective than replacing it, particularly if that radar has not reached the end of its economical life. Radtec has extensive experience in upgrading S, C and X-band weather radar systems from several manufacturers including EEC. In addition, Radtec's collaboration with Sigmet provides a full range of signal processing and software upgrades.

There are several reasons that upgrading may be desirable:

- Optimize the investment in existing facilities
- Reduce operating costs:

  Upgrading to a solid state modulator eliminates the periodic replacement of thyratron tubes, and improves the overall reliability of transmitter operation.

  Upgrading to a common software across all radars simplifies and reduces the cost of training operators/technicians and supporting the radar system.

  Adding a remote diagnostic capability enables the efficiency of centralized support services.

- Taking advantage of new technology. There have been significant advances in weather radar technology in recent years. Radtec upgrades can apply those advances to existing radars from most manufacturers.

  Doppler wind velocity measurement permits earlier detection of many severe weather systems. Doppler also permits the use of velocity based clutter filters to significantly improve clutter rejection, giving a clearer view of all radar weather images.

  A solid state modulator using Insulated Gate Bipolar Transistor (IGBT) technology improves the accuracy and precision of transmitted pulses.

  A digital receiver with a digital Coherent Oscillator (COHO) capability improves the accuracy of Doppler data, and hence improved operation of clutter filters.

  The combination of an IGBT modulator and a digital receiver gives a magnetron radar precision and accuracy approaching that of a fully coherent Klystron radar, at a lower cost.

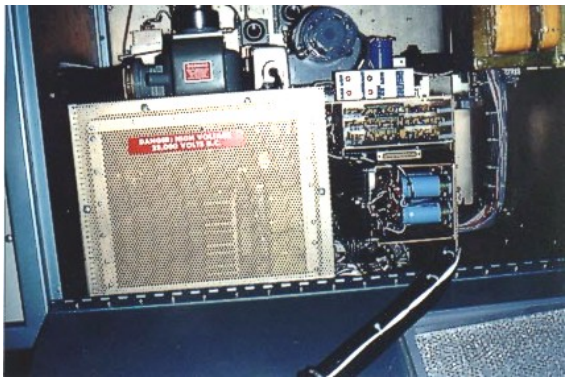
- Add capabilities to meet new requirements, such hydrology rainfall data for water management, or wind shear detection for aviation safety.

The attached pages provide a summary of the most commonly installed capabilities Radtec can provide.

Weather Radar Upgrade/Enhancement Capabilities

Modulator Upgrade

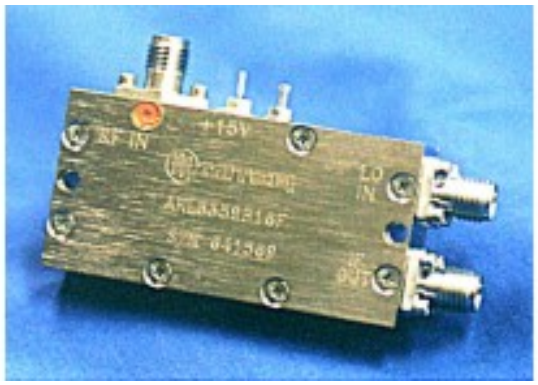
- Modern IGBT (Insulated Gate Bipolar Transistor) technology
- Lower operating cost; no expensive thyratron tubes to replace
- Better reliability; fully solid state
- Better pulse stability; more accurate data
- Improved Doppler accuracy and better clutter rejection



IGBT Modulator Installed In EEC Radar

Receiver Upgrade

- Improved sensitivity; detect/measure weak precipitation reliably
- Improved accuracy and dynamic range with optional digital I/F; detect and measure both weakest and strongest precipitation accurately
- Optional automatic calibration; maintain consistent accuracy



Integrated Front End (LNA & Mixer)

Antenna Upgrade

- Offset feed antenna; available in 2m (6'), 3m (10') and 4.3m (14') sizes
- Typical first side lobe suppression 35 dB (one way)
- Improved clutter rejection
- Rejects clutter from moving targets (vehicles, taxiing aircraft, sea surface, etc.) as well as stationary clutter (buildings, water towers, etc.)

Offset Feed Antenna & Pedestal

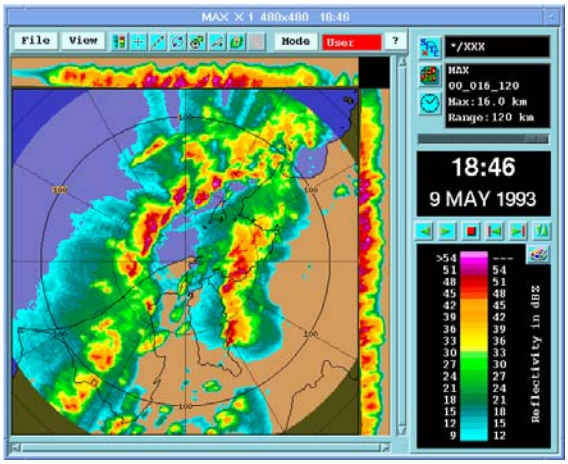
Signal Processor Upgrade

- Choice of Sigmet or Gamic signal processors
- Digital I/F receiver/signal processor
- Advanced digital receiver technology
- Digital COHO improves velocity accuracy and clutter rejection
- Provides real-time processing of reflectivity, velocity and spectrum width
- Eliminates need for log channel, improves accuracy and simplifies calibration
- Ultra high performance PC based
- Open system software (Linux)
- Improved sensitivity and dynamic range

RVP8 Installed In Radar System Cabinet

Software Upgrade

- Choice of Sigmet IRIS or Gamic FROG/MURAN
- Linux/PC based, high performance on industry standard platform
- Doppler and volume scan capability
- Sophisticated products; storm tracking, wind shear detection, hydrology, etc.
- Networking of multiple radars
- Easy automatic distribution of data products to remote users
- Remote control of radar and diagnostics
- Consistent software on all radars; lower training and support cost
- Widely used, commercial products, low risk



Sample IRIS Image

Doppler Radar Applications