

# Converting Imaging Radiometers to Focal Plane Arrays

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## THE CHALLENGE:

Pratt & Whitney needed to convert from scanner-type imaging radiometers to focal plane array (FPA) imagers, but had no manpower to devote to radiometric software development for the FPAs. To ease the conversion from scanners to FPAs, they hoped to have the user interfaces for data acquisition and data processing have an appearance similar to, and flexibility similar to, their legacy systems, while at the same time providing them with enhanced capability. Plus, they needed to have a bug-free product in use within one year.

## THE SOLUTION:

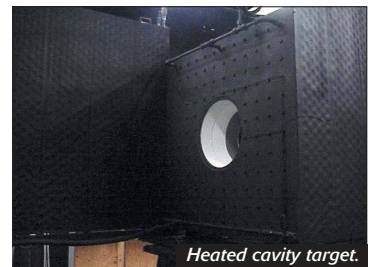
The solution was to procure a commercial off-the-shelf (COTs) software package, RTools, that provided infrared radiometric capability and a transition from their older scanner systems to the new FPA systems. In particular, RTools provided calibrated image pixel values in units of radiance and radiant intensity. RTools also provided additional features and increased flexibility, and reduced the number of operator keystrokes. The latter was important because their data operations required many images to be processed—software that enabled bulk processing would reduce operator fatigue and chance for errors.

## THE TOOLS USED:

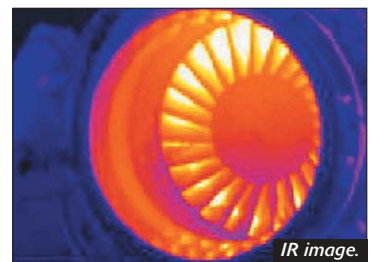
They chose RTools Radiometric Software Suite, a package developed for engineers and scientists to acquire, calibrate, process and analyze data from various digital infrared camera systems. The RTools toolkit is comprised of several stand-alone modules: RDac for camera acquisition, RCal for IR camera calibration, REdit for file archival and maintenance and RView for data review and analysis. Created for flexible and extensible use in data archiving, RTools utilizes the Air Force's Standard Archive Format (SAF).



*Indigo Merlin FPA.*



*Heated cavity target.*



*IR image.*

*Above: The imaging radiometer viewing a heated cavity target, one of the applications for which the software was applied.*

## THE DIFFERENCE IT MADE:

The software provided a near-seamless transition between old technology (scanners) and new technology (FPAs), saving on personnel training expenses, and accelerating the implementation of the FPAs by six months. RTools allowed the company to perform in-house radiometric calibrations, saving over \$25K/yr. Lastly, the software enabled a path both for processing legacy data and operating legacy equipment with PCs rather than obsolete, unsupported controller devices.

