BCI SENSORS

PRODUCT LINE INFORMATION

BCI

MULTIPURPOSE TRACK PROCESSOR
LOW-COST RADAR TRACK PROCESSING

System Features

- Configurable interfaces allow for integration with many radar types

- Scalable processing architecture to support high data rate / high scan rate radars

- Modular software processing algorithms
    - Pulse Compression / Matched Filtering
    - Sensitivity Time Control
    - Moving Target Indicator Processing
    - Constant False Alarm Rate Thresholding
    - Range / Angle Centroiding
    - Detection Crossgating

- Commercial computing hardware for low-cost implementation

The National Weather Radar Testbed (NWRT) is the official NSSL facility where phased array technology will be tested and evaluated. The radar system is based upon the US Navy's AEGIS AN/SPY-1 radar, a phased array radar that has been adapted for use as a weather research radar. This radar technology has the potential to provide revolutionary improvements in NWS tornado, severe storm, and flash flood warnings.
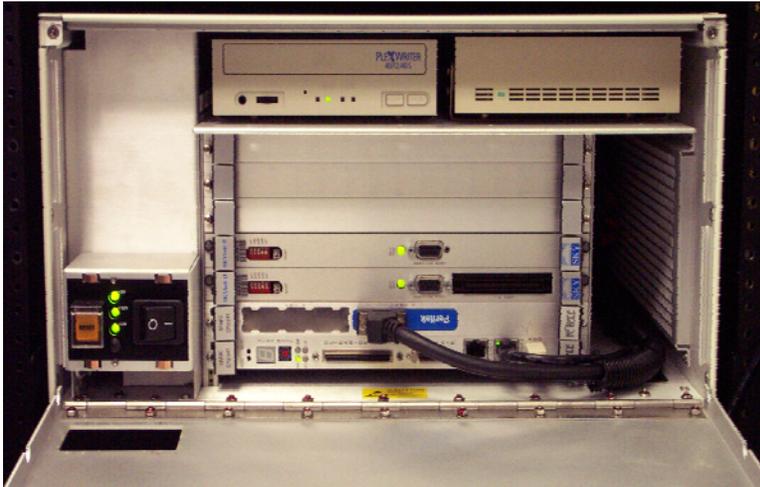
BCI Systems and Software Engineering, under contract to the FAA William J. Hughes Technical Center, has developed a real-time adjunct aircraft track processor that converts the raw radar return data into meaningful aircraft detection information. The passive interface from the radar to the Multipurpose Track Processor (MTP) means there is no impact on the normal weather scanning operation of the radar.

The MTP has been developed and tested for the NWRT radar. Other radar platforms can be augmented with an MTP with software and radar interface hardware modifications. Currently, BCI is developing a personal computer variant of the MTP for a small, low-cost commercial radar system.
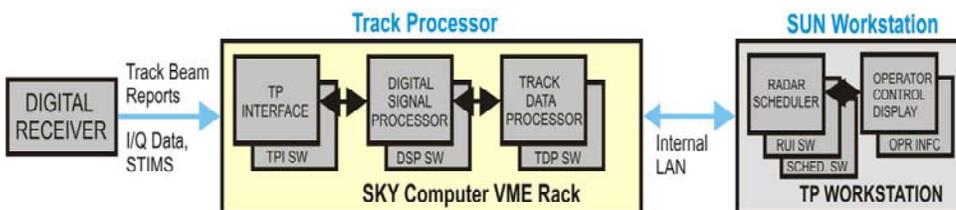
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PRODUCT LINE INFORMATION: *MULTIPURPOSE TRACK PROCESSOR*

The initial MTP for the NWRT radar was based on a commercial computer from SKY Computers, Inc. and was installed and tested at the NWRT site in Norman, Oklahoma, in September 2005. This unit consisted of 2 SKYbolt II 6U VME multi-processor boards with four 500 MHz PowerPC 7419 processors and 1 GB of memory each. The MTP provides a real-time implementation of Matched Filtering, STC, MTI Processing, CFAR Processing, Point Clutter Screening and Range Interpolation on the complex input radar data. The output detection data from the MTP is fed to a COTS UNIX computer for detection cross-gating, track generation / filtering and display.

BCI is currently re-hosting the MTP on commercial PC servers for reduced cost and performance improvements. The processing software is designed as a set of modular algorithms to allow for any level of customization for each target radar application. The MTP can interface to digital radar data through industry-standards such as Ethernet or serial or parallel Front Panel Data Port (FPDP). An RF receiver and digital receiver upgrade is also planned for future development.

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Multipurpose Track Processor (above) as configured for the National Weather Radar Testbed using single board multi-processor computers. The MTP processing architecture is shown below.

About BCI Sensors:
BCI Sensors is the research and development division of BCI, a small business based in Moorestown, NJ. BCI Sensors' engineering team has developed systems and products for defense, civil aviation, and local and state governments. Our primary lines of business include radar processing systems, communications systems, network information technology, and custom software solutions.