

# INTEGRATED TRACKING SYSTEM FOR SATELLITE AUTO TRACK

Integrated Tracking System (ITS ) has been designed, developed and made operational in remote sensing satellite ground station at NRSC. With the advent of this system, a new methodology has been adopted for deriving the tracking error information from single channel mono pulse tracking feed for precision satellite tracking. The Integrated Tracking System is a Digital Signal Processor based tracking system. The system amplitude demodulates the tracking IF signal consisting of tracking video and extracts Elevation and Azimuth DC errors. These error signals are then fed to servo control system for correcting the antenna position and track the satellite automatically. Earlier to this development, a total of 5 subsystems were used to realize all the functions required for satellite auto track. The ITS has brought out technology change, cost effectiveness and miniaturization in satellite ground station Design and Engineering.



Fig1.Integrated Tracking System

## Salient features:

- Miniaturization obtained by this Integrated Tracking System.
- DSP, FPGA based technology.
- Double channel X-band tracking receiver(input:720MHz)-one LHCP, another RHCP.
- Single channel S-band tracking receiver (input:70MHz)
- Auto diversity in channel selection.
- Built in error demodulator.
- Tracking chain optimization for phase shift.
- Scan code pulse generation.
- Multi mission tracking capability and storage of optimized parameter for various missions.
- Flexibility in changing the parameters for optimization purpose.

## **Application:**

Mono pulse analog signal processing is done in IF domain to estimate elevation and azimuth pointing errors and auto track the satellites. The analog RF electronics involved are dual channel X-band Tracking Receivers for X-band, single channel S-Band Tracking receiver, Phase Shifter controller unit, scan code pulse generator and Tracking Demodulator Unit. All the above functions have been designed and realized in digital domain by using the state of the art technology of DSP and embedded systems as Integrated Tracking System.

## **Technology Transfer from NRSC/ISRO**

NRSC/ISRO is willing to transfer the knowhow of this technique to academics/industries that deal with natural resource assessment from satellite data. Interested individuals/party (s) may write to the address given below stating the end use of the technology or diversification of the existing technology, if any.

*Director  
National Remote Sensing Centre  
Indian Space Research Organisation  
Dept. of Space, Govt. of India  
Hyderabad - 500 037 (AP)*