HUGHES NETWORK SYSTEMS

TRUNKING EARTH STATION (TRES™)

LOW COST, FLEXIBLE SATELLITE EARTH STATION

THE TRES™ PROVIDES A VERSATILE AND COST EFFECTIVE SOLUTION FOR TODAY'S SATELLITE COMMUNICATIONS APPLICATIONS.

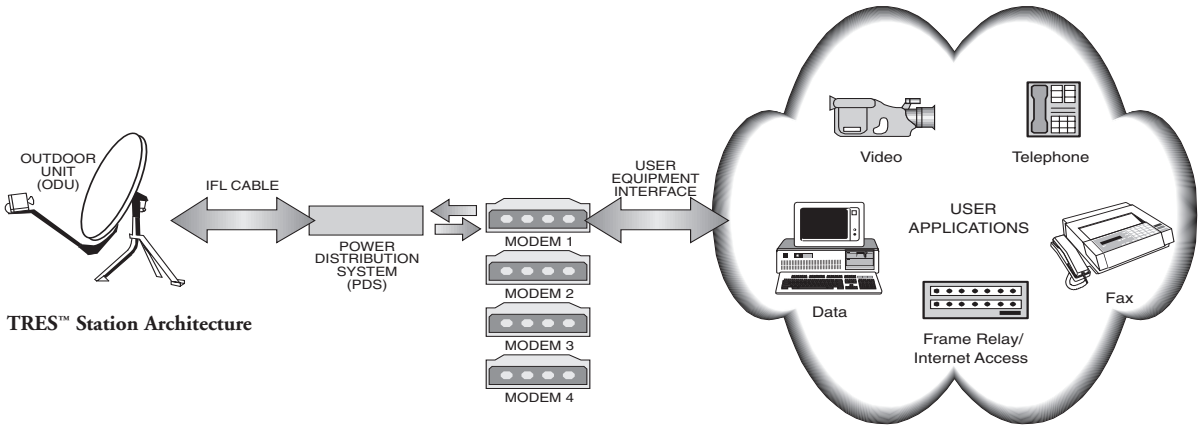
The TRES™ incorporates proven Hughes Network Systems (HNS) technology and innovation into a versatile and cost effective solution for today's satellite communications applications. The TRES provides data rates from 32 Kbps to 2.048 Mbps, flexible station sizing, excellent performance and outstanding value. The TRES is used in point-to-point and star networks. HNS leads the world in VSAT networking and TRES continues this tradition of leadership through innovation, performance and value.

TRES™ FEATURES

- Low cost VSAT stations
- Carrier spacing of 1.1 x symbol rate (less than 0.1 dB degradation with identical carriers)
- Data rates from 32 Kbps to 2.048 Mbps, in 32 Kbps increments, plus 1.544 Mbps
- Better than Intelsat BER specifications
- Antenna alignment with DC voltmeter (Pointing Mode)
- Single IFL Cable
- No outdoor AC power for 5W C-band and 2W Ku-band ODU
- Upgrades for 20W C-Band and 8W Ku-Band
- RF equipment controlled from inside facility
- Integrates with other HNS VSAT products
- Designed for multicarrier operation with up to four TRES modems on a single low cost radio

TRES STATION ARCHITECTURE

The TRES is provided either as a standalone modem with a 70 MHz Transmit and L-band Receive interface, or, alternately, the TRES can be provided in a complete Earth Station configuration. The Earth Station configuration consists of a Modem, Power Distribution System (PDS), Outdoor Unit (ODU) and Antenna. The indoor equipment consists of a Modem and PDS. The Modem provides the functions associated with modulation, forward error correction and demodulation. The PDS provides DC power, a high stability frequency reference and HF/LF combining and multiplexing over a single cable to the ODU. The outdoor equipment consists of RF equipment and an antenna. The RF equipment provides frequency conversion and amplification functions. The outdoor equipment is available in a variety of frequency bands and station sizing configurations. For multicarrier operation, simply combine up to four TRES modems to one PDS.



TRES™ Station Architecture

SYSTEM SPECIFICATIONS

Station Performance:

C-Band Extended:

Antenna

Size	G/T	5W EIRP	20W EIRP
1.8M	14.2dB/K	45.5dBW	51.5dBW
2.4M	16.8dB/K	48.0dBW	54.0dBW
3.8M	21.8dB/K	52.0dBW	58.0dBW

Note: G/T@30 elevation, mid band, 65K LNB, Linear Antenna

Ku-Band:

Antenna

Size	G/T	2W EIRP	8W EIRP
1.8M	21.7dB/K	49.3dBW	54.8dBW
2.4M	24.4dB/K	52.0dBW	57.5dBW
3.8M	28.7dB/K	56.0dBW	61.5dBW

Note: G/T@30 elevation, mid band, 150K LNB

Modem:

- Modulation: QPSK and BPSK
- Forward Error Correction: Viterbi, Concatinated (Viterbi-Reed Solomon)
- Coding Rates: 1/2, 3/4
- Data Rates range: 32 kbps to 2.048 Mbps and 1.544 Mbps
- Data Rate step size: 32 Kbps
- Carrier spacing: 1.1 x symbol rate (<0.1 dB degradation with identical carriers)
- User Equipment Interface: RS-422...EIA530 25 pin D connector
- Elastic buffer: Up to 16,384 bytes

Interfacility Link (IFL):

One coaxial cable, terminated with type "N" male connectors

Outdoor Unit (ODU):

C-band

- Frequency range:
  - Transmit 5.85 - 6.425 GHz
  - Receive 3.625 - 4.2 GHz
- Transmit power levels: 5 watts at 1 dB compression

Ku-band

- Frequency range:
  - Transmit 14.0 - 14.5GHz
  - Receive 11.7-12.2 GHz, 12.25-12.75 GHz or 10.95-11.7 GHz
- Transmit power levels: 2 watts at 1 dB compression

Physical:

TRES Modem

Dimensions: W=13 in., H=2.6in., D=10.7in. (W=33.0cm, H= 6.6cm, D=27.2cm)

Weight: 3.2 lbs. (1.5 kg)

PDS

Dimensions: W=13in., H=2.6in., D=9in. (W=33.0cm, H= 6.6cm, D=22.9cm)

Weight: 5.9 lbs. (2.7 kg)

IDU

Operating Temperature: 0 to 50°C

ODU

Operating Temperature: -40 to 55°C

Monitor and Control:

Terminal Interface command set (for use with ASCII terminal)

Front panel LED status indicators

MS Windows based GUI M&C Software

Power Requirements:

Modem: 90-240 Vac

PDS: 90-240Vac

Optional HPA: 90-240 Vac

Frequency: 47 to 63 Hz

Options:

- Overhead channel for remote monitor and control
- 70 MHz TX IF TRES Modem with L-band RX
- 20 watt amplifier, C-band
- 8 watt amplifier, Ku-band
- Antenna deicing
- Antenna non-penetrating mount (1.8 M and 2.4 M)
- Plenum IFL cable
- 50°K LNB for C-band and 70°K LNB for Ku-band
- INTELSAT H and K standard earth stations

For more information, call HNS today, or send email to TRES@hns.com.

HUGHES™
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