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INTRODUCTION

Comtech EFData's HPCST-5000 is a high-power, high-performance, C-band satellite earth station terminal which may be configured for single thread or 1:1 redundant systems.

The integrated high-power transceiver system consists of a traveling wave tube amplifier (TWTA) or solid state power amplifier (SSPA). These all-weatherized units are designed for the harsh uncontrolled outdoor environment typical of antenna mounting.

This completely integrated system meets the requirements for private, regional domestic, and international C-band satellite networks.

APPLICATIONS

When used with Comtech EFData modems, the HPCST-5000 is ideal for single or multiple carrier systems within a bandwidth of ± 18 MHz.

MONITOR AND CONTROL (M&C)

The HPCST-5000 system has been designed with a self-contained local M&C system for low-cost applications. This powerful M&C system enables the user to locally or remotely control functions through the use of one of the following:

- Optional keypad (installed on the RFT front panel)
- External hand-held keypad

The system also provides for a remote M&C function from indoor units such as control terminals.

The TWTA may also be monitored and controlled from the High-Power Controller (HPC), an optional indoor rack-mounted unit.

INSTALLATION

The HPCST-5000 system has been specifically designed for outside mounting. A standard cabling package is available, which is based on typical cable lengths between assemblies.

Prime power of 110 or 220 VAC for both the amplifier (TWTA or SSPA) and RFT are required. An optional DC unit is available.

HIGH POWER SELECTION

The high-power ("HP") section of the HPCST-5000 is available in either a TWTA or SSPA.

Once the TWTA or SSPA selection has been made, the integrated HPCST-5000 outdoor system includes the following:

- C-band TWTA or SSPA
- RF filters
- Self-contained cooling system
- Control inputs
- Monitor output signals

RADIO FREQUENCY TRANSCEIVER (RFT)

The RFT-500 contains the up and down converters, standard 70 MHz (± 18 MHz) interface, and a microprocessor-controlled system with local (optional) or remote control operation.

LOW NOISE AMPLIFIER (LNA)

The LNA provides a standard noise temperature equivalent of 65°K, which is excellent performance at minimal cost. Optional LNA noise temperature equivalents down to 35°K are available. In addition, single or redundant configurations are available.

REDUNDANCY SWITCH UNIT (RSU)

For 1:1 redundant systems, the RSU-503L provides for complete system switch-over to the redundant thread. Remote M&C is also controlled from the RSU.

HIGH POWER CONTROLLER (HPC)

The HPC-1200, an optional high-power TWTA controller for single thread systems, is an indoor rack-mounted unit used to monitor and control the status of the TWTA.

The HPC-1110 is an optional TWTA controller for 1:1 redundant systems. It provides an Auto mode for automatic operation when switched from offline to the online system.

Each indoor controller provides a manual selection for local control or remote site control.



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TRANSMIT CHARACTERISTICS

Frequency Range	5.845 to 6.425 GHz (2.5 MHz step size)			
Tx IF Input Level Range	-35 to -25 dBm			
Rated Output Power (min.)	140W	350W	75W	125W
System Gain:	TWTA	TWTA	SSPA	SSPA
Nominal, Small Signal	72 dB	78 dB	79 dB	81 dB
Nominal, Large Signal (TWT)	66 dB	73 dB	-	-
Gain Adjust Range (from Nominal)	± 10 dB (for all options)			
Tx IF Input Bandwidth at -1 dB Gain:	70 MHz, ± 18 MHz			
Stability (over Temp.)	± 1.0 dB at fixed frequency			
Flatness	± 1.5 dB/36 MHz			
Variation	± 2.0 dB max.			
Group Delay (any 36 MHz)	< 30 nsec.			
Tx Freq. Stability	± 1 x 10 ⁻⁸			
Tx Synthesizer Lock-up Time	< 1 sec.			
Spurious (not Intermods):	IESS-309 (Paragraph 3.2.1)			
at 6 dB backoff from P1 dBm	-40 dBc min. (≤ 2.048 MHz inform. rate)			
with Carrier Off	-50 dBc min. (> 2.048 MHz inform. rate)			
	-24 dBc max. (anywhere in sat. band)			
Intermode Spurious with 2 equal Carriers at -6 dB backoff from P1 dBm	140W	350W	75W	125W
	TWTA	TWTA	SSPA	SSPA
	-18 dBc	-18 dBc	-32 dBc	-32 dBc
Harmonic (Out of Band)	60 dBc at 6 dB backoff from P1 dBm max.			
Tx Phase Noise (SSB) at:				
10 Hz	-30 dBc/Hz			
100 Hz	-60 dBc/Hz			
1 kHz	-70 dBc/Hz			
10 kHz	-75 dBc/Hz			
100 kHz	-80 dBc/Hz			

NOTES:

- For specifications on the TWTAs and HPCs, refer to the *High-Power TWTA Satellite Terminals Installation and Operation Manual*.
- For specifications on the SSPAs, refer to the *High-Power SSPA Satellite Terminals Installation and Operation Manual*.
- For specifications on the LNA and M&C, refer to the *CST-5000 C-Band Satellite Terminal Installation and Operation manual*.
- For specifications on the RSU-503L, refer to the *RSU-503 Redundancy Switch Unit Installation and Operation manual*.

RECEIVE CHARACTERISTICS

Input Frequency Range (Options)	3.625 to 4.200 GHz (2.5 MHz step size)
Frequency Sense	No inversion
Rx Gain:	Variable at 0.5 dB from 70 to 95 dB with LNA
Stability (over Temp.)	± 2.5 dB
Flatness	± 1.0 dB/36 MHz, ± 0.5 dB/4 MHz
Rx Freq. Stability	± 1 x 10 ⁻⁸ at 23° C
Life Rx Freq. Drift	± 1 x 10 ⁻⁷ at 23° C
Rx IF Output Bandwidth	70 MHz, ± 18 MHz
Noise Figure	65° K (others optional)
Transmit Freq. Reject	60 dB
Receive Image Rejection	-45 dBc
Linearity (Third Order Intercept)	-35 dBc for 2 tones at -86 dBm pin (with LNA)
Group Delay (any 36 MHz)	< 30 ns max.
Synthesizer Lock Time	< 1 sec.
Spur at 0 dBm Rx IF Output	-40 dBc
Inband Overdrive	No damage to 0 dBm
Third Order Intercept	+24 dBm min.
Rx IF Output at 1 dB Compr	+17 dBm min.

COMMON

Power Requirements	110 or 220 VAC, ± 20%, 47 to 63 Hz
	75W SSPA: 220 VAC only
	125W SSPA: 110/220 VAC (universal)
	140W TWTA: 110 or 220 VAC (must specify)
	350W TWTA: 110/220 VAC (universal)

Environmental (Outdoor Units):

Operating Temperature	-40 to +50° C
Survival Temperature	-50 to +70° C

Size:

HPC-1200	4.1" H x 19" W x 6.5" D
HPC-1110	3.5" H x 19" W x 18" D
HPA-500 (140W)	9" H x 9" W x 16" D
HPA-500 (350W)	10" H x 11" W x 21" D
SSPA-500 (75W)	26.5" H x 12.7" W x 9.3" D
SSPA-500 (125W)	21.5" H x 13" W x 9" D
RFT-500	9.3" H x 11" W x 20" D
RSU-503L	8" H x 11" W x 8" D

OPTIONS

KP-10 Hand-Held Keypad

