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INTRODUCTION

Comtech EF Data's HPKST-12000 is a high-power, high-performance, Ku-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 Ku-band satellite networks.

APPLICATIONS

When used in conjunction with Comtech EF Data modems, the HPKST-12000 is ideal for single or multiple carrier systems within a bandwidth of ± 18 MHz .

MONITOR AND CONTROL (M&C)

The HPKST-12000 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 HPKST-12000 system has been specifically designed for outdoor 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 HPKST-12000 is available in either a TWTA or SSPA.

Once the TWTA or SSPA selection has been made, the integrated HPKST-12000 outdoor system includes the following:

- Ku-band TWTA or SSPA
- F filters
- Self-contained cooling system
- Control inputs
- Monitor output signals

RADIO FREQUENCY TERMINAL (RFT)

The RFT-1200 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 120°K, which is excellent performance at minimal cost. An optional LNA noise temperature equivalent of 85°K is 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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Comtech EF Data reserves the right to make changes to specifications of products described in this data sheet at any time without notice and without obligation to notify any person of such changes.

TRANSMIT CHARACTERISTICS

Frequency Range	14.0 to 14.5 GHz (in 2.5 MHz steps)			
Tx IF Input Level Range	-35 to -25 dBm			
Rated Output Power (min.)	100W	300W	40W	80W
System Gain:				
Nominal, Small Signal	TWTA	TWTA	SSPA	SSPA
Nominal, Large Signal (TWT)	72 dB	78 dB	76 dB	79 dB
	66 dB	73 dB	-	-
Gain Adjust Range (from Nominal)	± 10 dB (for all options)			
Tx IF Input Bandwidth at -1 dB	70 MHz, ±18 MHz			
Gain:				
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)	< 10 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 with Carrier Off	-40 dBc min. (≤ 2.048 MHz inform. rate)			
	-50 dBc min. (> 2.048 MHz inform. rate)			
	-24 dBm max. (anywhere in sat. band)			
Intermode Spurious with 2 Equal Carriers at -6 dB backoff from P1 dBm	100W	300W	40W	80W
	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			

RECEIVE CHARACTERISTICS

Input Frequency Range (Options)	10.95 to 12.75 GHz
	10.95 to 11.7 GHz
	11.7 to 12.2 GHz
	12.25 to 12.75 GHz
	(2.5 MHz step size; optional 1.0 MHz)
Frequency Sense	No inversion
Input Level	-127 to -80 dBm
Rx Gain	Variable at 0.5 dB from 70 to 95 dB with LNA
Rx Freq. Stability	± 1 x 10 ⁻⁸ at 23°C
Life Rx Freq. Drift	± 1 x 10 ⁻⁷ at 23°C
Gain Flatness	± 1.0 dB/36 MHz, ± 0.5 dB/4 MHz
Rx IF Output Bandwidth	70 MHz, ± 18 MHz at 1 dB
Noise Figure	120°K (options to 85°K)
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)	10 ns
Synthesizer Lock Time	< 1 sec.
Spur at 0 dBm Rx IF Outpt	-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
	40W SSPA: 110/220 VAC (universal)
	80W SSPA: 110 or 220 VAC (must specify)
	100W TWTA: 110 or 220 VAC (must specify)
	300W 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-1200 (100W TWT)	9" H x 9" W x 16" D
HPA-1200 (300W TWT)	10" H x 11" W x 21" D
SSPA-1200 (40W)	9" H x 21" W x 28" D
SSPA-1200 (80W)	11.7" H x 21" W x 30.6" D
RFT-1200	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



Notes:

- For specifications on the TWTAs and HPCs, refer to the *High Power TWTA Satellite Terminal Installation and Operation Manual*.
- For specifications on the SSPAs, refer to the *High Power SSPA Satellite Terminal Installation and Operation Manual*.
- For specifications on the LNA and M&C, refer to the *KST-12000 Ku-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*.