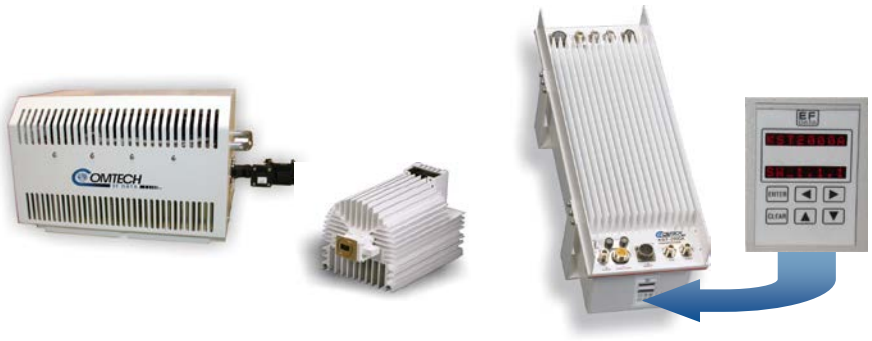
KST-2000A/B Ku-Band Satellite Transceiver

Transceivers



Overview

Our KST-2000A/B Ku-Band satellite earth station transceiver is a full-featured, high-performance transceiver available in several application-specific configurations. Performance highlights include the following:

- 13.75 to 14.5 GHz TX (available ≤ 40 W)
- 14.0 to 14.5 GHz TX optional (available ≤ 80 W)
- 10.95 to 12.75 GHz RX with wide band LNA (KST-2000A)
- 10.95 to 11.70 GHz, 11.70 to 12.20 GHz or 12.25 to 12.75 GHz RX (KST-2000B)
- 70 or 140 MHz IF input/output
- Transmit only option available

A KST-2000A/B consists of three distinct functional areas:

Converter
The converter portion of the system controls external SSPAs. The converter unit is a convection cooled, up/down converter with an internal power supply and microprocessor-based Monitor and Control (M&C).

Receive Options
The KST-2000A model includes a Low Noise Amplifier (LNA), while the KST-2000B offers a choice of Low Noise Block converters (LNB). Both the LNA and LNB are feed-mounted with or without a Transmit Reject Filter (TRF).

Power Amplifier
Power amplifiers are available in a selection of output capabilities. Automatic Gain Control (AGC) provides power output stability for 40 W or less.

Features

- Feedhorn-mounted SSPA (2, 4, or 8 W)
- Lightweight units (intended for spar mount)
- Modular construction for ease of upgrades
- FSK control from selected CEFD modems
- Built-in Display and Keypad option (available)
- External LED indicators for Power, TX RF, and Fault
- Power-factor-corrected power supplies
- L-Band receive monitor output
- High-stability internal frequency reference or an external reference
- Built in redundancy controller

Installation

The KST-2000A/B can be mounted behind the reflector of small antennas, on the feed boom of offset feed antennas, or within the hub of larger antennas. Two coaxial cables connect the converter unit to the separate SSPA and the LNA or LNB assembly. Additionally, the SSPA connects to the converter unit with a separate M&C cable. For SSPAs of 8W or less, the M&C cable supplies power directly from the converter unit. For applications above 8W, the SSPA contains a separate power supply. Connection to indoor equipment, such as modems, is accommodated via two low-cost 70 or 140 MHz coaxial cables. A twisted pair may be used for M&C functions.

Specifications

Converter Transmit Characteristics

Output Frequency	13.75 to 14.5 GHz, in 1.0 MHz steps
Input Frequency	50 to 90 MHz (100 to 180 MHz optional)
Input Power Level(operational)	-25 to -45 dBm Standard, -5 to -45 dBm optional
Gain	42 dB nom. at mid-range attenuator setting. 35 dB optional @ 0 dB attenuation
Gain Variation with Frequency	
± 20 MHz	2 dB peak to peak
Entire Band	3 dB peak to peak
User Attenuator Range	0 to 20 dB, in 1 dB steps(base unit) plus external amplifier attenuation range(0 to 20 dB, .25 dB steps, typ.)
Power Output at 1dB Compression	+15 dBm minimum
Transmit Phase Noise	Exceeds requirements of IESS-308/309

Converter Receive Characteristics

Input Frequency	
KST-2000A	10.95 to 12.75 GHz
KST-2000B	950 to 1700 MHz
	(All tunable in 1.0 MHz steps)
Output Frequency	50 to 90 MHz (100 to 180 MHz optional)
Gain	35 dB (KST-2000B); 45 dB (KST-2000A) minimum @ 0 dB attenuator setting
User Attenuator Range	0 to 20 dB, in 1 dB steps
Gain Variation with Frequency	At a fixed temperature
Any 40 MHz Band	2.0 dB peak to peak
Entire Operating Band	3.0 dB peak to peak
Power Output @ 1 dB Compression	+16 dBm minimum
Power Output Stability over Temp.	4.0 dB peak to peak at a fixed frequency
Phase Noise	Exceeds requirements of IESS-308/309
Spurious Signals	
Signal Related	-50 dBc at -5 dBm output
	-35 dBc at < 250 kHz from carrier
Non Signal Related	-87 dBm max. referred to converter input
Third Order Products	-33 dBc for two carriers each at +6 dBm
Auxiliary Output Monitor	
Frequency	950 to 1700 MHz
Gain	20 dB relative to the carrier input
Connector	Type N female, 50 Ω
KST-2000A LNA	
Noise Temperature Option	110 or 85°K
Gain Option	50 or 60 dB
KST-2000B LNB	
Frequency Option	10.95 to 11.70 GHz
	11.70 to 12.20 GHz
	12.25 to 12.75 GHz
Noise Figure	1.0 dB max.

General Converter Characteristics

Prime Power	85 to 264 VAC, 47 to 63 Hz, < 200 W
	48 VDC Optional
Frequency Stability	1.5 x 10^{-9}/24 hrs
	1 x 10^{-8}/Rated Temp
Serial Data Interface, User-Selectable	EIA-232
	EIA-485, half-duplex
	EIA-422, half-duplex
Serial Data Baud Rate (user-selectable)	300, 600, 1200, 2400, 9600, 19200
Discrete Alarm Outputs: Uplink Summary Alarm, Downlink Summary Alarm, System Summary Alarm	Form "C" relay contacts
LED External Indicators	Prime Power On/TX RF On Summary fault
IF Input/Output Connectors	Type N female, 50 Ω
TX Output/RX Input Connectors	Type N female, 50 Ω
Dimensions (height x width x depth)	21.75" x 8.25" x 8.0" (55.2 x 21 x 20.3 cm)
Weight	35 lbs (16 kg) KST-2000A
	30 lbs (14 kg) KST-2000B
Environmental (Convection Cooled)	
Temperature	-40 to +55°C operational
	-50 to +75°C storage
Humidity	0 to 100% RH

General SSPA Characteristics for ≤ 40 W

Frequency Range	13.75 to 14.5 GHz	14.0 to 14.5 GHz
Power Output (at 1 dB Compression, at 25ºC)	+33 dBm for 2 W unit +36 dBm for 4 W unit +39 dBm for 8 W unit +42 dBm for 16 W unit +44 dBm for 25 W unit +45 dBm for 32 W unit +46 dBm for 40 W unit +47 dBm for 50 W unit	+33 dBm for 2 W unit +36 dBm for 4 W unit +39 dBm for 8 W unit +42 dBm for 16 W unit +44 dBm for 25 W unit +45 dBm for 32 W unit +46 dBm for 40 W unit +47 dBm for 50 W unit
Third Order Intercept Point (9 dB OPBO single carrier, 6 dB OPBO total)	+41 dBm for 2W unit +44 dBm for 4W unit +47 dBm for 8W unit +50 dBm for 16W unit +52 dBm for 25W unit +53 dBm for 32W unit +54 dBm for 40W unit +55 dBm for 50W unit	+41 dBm for 2W unit +44 dBm for 4W unit +47 dBm for 8W unit +50 dBm for 16W unit +52 dBm for 25W unit +53 dBm for 32W unit +54 dBm for 40W unit +55 dBm for 50W unit
Gain (Nominal)	+27 dB for 2W unit +30 dB for 4W unit +33 dB for 8W unit +36 dB for 16W unit +38 dB for 25W unit +39 dB for 32W unit +40 dB for 40W unit +41 dB for 50W unit	+27 dB for 2W unit +30 dB for 4W unit +33 dB for 8W unit +36 dB for 16W unit +38 dB for 25W unit +39 dB for 32W unit +40 dB for 40W unit +41 dB for 50W unit
Gain Variation Over Frequency	2.0 dB peak to peak at 25°C	
Input Connector	Type N female, 50 Ω	
Output Connector	WR-75 waveguide flange	
Input Power	+9.75 VDC from converter for 2, 4, and 8 W units 85 to 264 VAC, 47 to 63 Hz or 48 VDC up to 40 W SSPA Optional 16, 25, 32, 40 W units 16 W 180 W 25 W 360 W 32 W 380 W 40 W 390 W	

SSPA Characteristics for ≥ 80 W

Refer to HPOD SSPA Product Line

System Transmit Characteristics with Comtech EF Data SSPA for ≤ 50 W

Gain Stability over Temp, Fixed Frequency	3.0 dB peak to peak maximum 2.0 dB peak to peak typical
Gain Variation with Frequency	
± 20 MHz	2.0 dB peak to peak
Entire Band	3.0 dB peak to peak
Spurious Signals (13.75 to 14.5 GHz)	
Signal Related	-50 dBc at 6 dB below P1dB
< 250 kHz	-35 dBc at 6 dB below P1dB

System Gain Calculations with CEFD SSPA

System Gain = Transceiver + SSPA Gain

2114 West 7th Street, Tempe, Arizona 85281 USA
Voice: +1.480.333.2200 ● Fax: +1.480.333.2540 ● Email: sales@comtechefdata.com