

C/TT-600 SOFTWARE-DEFINED RADIO

Modular, multiband software-defined radio

L3Harris' C/TT-600 is a modular, multiband software-defined radio with a flexible parts program designed to support a wide range of applications and orbits including LEO, MEO, GEO, Cislunar and deep space. Designed with the user in mind, C/TT-600's "sliced" architecture approach enables selection of a variety of configurations which can be purchased off-the-shelf or customized for unique mission requirements.



BACKGROUND

C/TT-600 is the culmination of over 60 years of design experience providing UHF-, S-, X- and Ka-band high reliability, mission-critical communications equipment for spacecraft applications spanning LEO to deep space. C/TT-600 is derived from high-TRL radio designs with spaceflight heritage and is specifically tailored to meet the demands of the Artemis generation.

MODULARITY AND FLEXIBILITY

The modular design consists of a base power supply and digital processing module forming the base radio. RF band conversion modules attach to the base radio, providing frequency agility within a desired band. C/TT-600 is designed with architecture flexibility in mind, including support for external power and low noise amplifiers. C/TT-600 also provides internal SSPA options for UHF- and S-band.

MULTI-ORBIT PRODUCT SERIES

Designed with flexible parts program to support multiple orbits:

- > LEO
- > MEO
- > GEO
- > Cislunar
- > Deep space (coming soon)

NETWORKS

Designed to support new and legacy network standards:

- > Near Space Network (NSN) and LunaNet
- > Ground Network (GN)
- > Deep Space Network (DSN)
- > TDRSS SA/MA standards (450-SNUG)
- > CCSDS standards
- > C2V2 mode (NASA SSP-50934)
- > And more

KEY FEATURES AND BENEFITS

Designed to support new and legacy network standards:

- > Software-defined radio with modular and flexible design
- > RF band conversion support UHF, S, X, Ka and others
- > Flexible parts program supports multiple orbits
- > On-orbit reconfigurable radio
- > On-orbit frequency agility within a band
- > Transparent/regenerative ranging
- > Optional embedded AES-256 encryption
- > Planned product lifecycle capability updates
- > Derived from high-TRL heritage products C/TT-520, C/TT-524, T-748, T-751, Electra-Lite, Universal Space Transponder

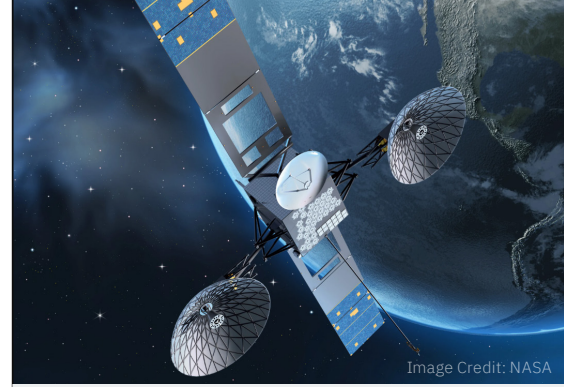


Image Credit: NASA

C/TT-600

A MODULAR, MULTIBAND
SOFTWARE-DEFINED RADIO

APPLICATIONS

- > TT&C
- > RPO and docking
- > Mission data
- > Intersatellite relays
- > EVA communications
- > Surface operations



Image Credit: NASA



Image Credit: NASA



(SSPA not included in above images)

TRANSMITTER	UHF-BAND	S-BAND	X-BAND	KA-BAND
Center Frequency	390 – 450 MHz	2200 – 2300 MHz	8025 – 8500 MHz	25.25 – 27.5 GHz
Frequency Stability	+/- 2 ppm (TBR)			
Phase Noise	TBD	TBD	TBD	TBD
EVM	< 9% (TBR)			
Data Rate	Up to 12 Mbps	Up to 6 Mbps	Up to 200 Mbps	Up to 1 Gbps
Modulation	CPFSK, BPSK, QPSK	BPSK, (O)QPSK, SQPN, SS-UQPSK, PM/BPSK, PCM/PM/PSK	BPSK, (O)QPSK, 8-PSK, 16-APSK	BPSK, (O)QPSK, 8-PSK, 16-APSK

RECEIVER	UHF-BAND	S-BAND	X-BAND	KA-BAND
Center Frequency	390 – 450 MHz	2025 – 2110 MHz	7145 – 7235 MHz	22.55 – 23.55 GHz
Data Rate	Up to 10 Mbps	Up to 3 Mbps	Up to 100 Mbps	Up to 600 Mbps
Modulation	CPFSK, BPSK, QPSK	SQPSK, (SS-)BPSK, SS-UQPSK, PM/BPSK, PCM/PM/PSK, SQPN	BPSK, (O)QPSK, 8-PSK	BPSK, (O)QPSK, 8-PSK
Tracking Rate/Range	TBD	TDRSS & C2V2; 70 Hz/s (125 bps); 380 Hz/s (>1 kbps); GN; 35 kHz/s	TBD	TBD
Input RF Signal	-130 dBm to -70 dBm	-137 dBm to -17 dBm	TBD	TBD

TRANSCEIVER	UHF-BAND	S-BAND	X-BAND	KA-BAND
Mission Life	Up to 10 years (parts grade scalable to mission)			
Parts Grade	EEE-INST-002 Level 2 (parts grade scalable to mission)			
Radiation	C/TT-600 Base: 50 kRad(Si); 44 MeV-cm ² /mg SEL LET (supports operation in LEO) C/TT-600 Hardened: 100 kRad(Si); 75 MeV-cm ² /mg SEL LET (supports operation in MEO/GEO/CISLUNAR)			
Fatigue Lifetime	100,000 cycles			
Bus Voltage	+22 V to +36 VDC			
EMC/EMI	MIL-STD-461F (tailored)			
Data/Clock Interface	RS-422, LVDS, Gigabit Ethernet			
Control/Status Interface	RS-422, Gigabit Ethernet			
DC Power	< 15 W	< 15 W	< 45 W	< 45 W
Dimensions (LxWxH)	< 9 L x 5 W x 5 H in	< 9 L x 5 W x 5 H in	< 9 L x 7 W x 5 H in	< 9 L x 7 W x 6 H in
Mass	< 7 lbs	< 7 lbs	< 9 lbs	< 12 lbs

SSPA	UHF-BAND	S-BAND	X-BAND	KA-BAND
RF Output Power	8.5 W	20 W	12 W	1 W
DC Power	< 25 W	< 70 W	< 75 W	< 25 W
Operating Temp	-34°C to +70°C			
Dimensions (LxWxH)	< 9 L x 2 W x 5 H in	< 9 L x 2 W x 5 H in	< 8 L x 8 W x 3 H in	< 4 L x 5 W x 2 H in
Mass	< 5 lbs (TBR)	< 5 lbs (TBR)	< 5 lbs (TBR)	< 5 lbs (TBR)

Notes: Product currently in development. Specifications are estimates and subject to change. Additional C/TT-600 product configurations and custom requests available upon inquiry. Export classifications may vary.

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