



Command Transmitter Systems (CTS)

370-550 MHz — 0.5 OR 25 WATT CW/FM

ECS's (formerly SPC) Command Transmitter Systems (CTS) provides remote control and Flight Termination functions through a fully redundant self contained solid-state system. At the core of the CTS is ECS's Exciter unit. This subassembly generates the RF carrier, modulates tones and tone sequences for remote commands. A ferrite isolator is used for RF output protection. The Exciter provides EFTS/IRIG functionality conforming to RCC 208 and providing .5 watt output power to drive a High Power Amplifier (HPA). For standalone operation, the unit is configured with a 25 watt amplifier.



The Exciter incorporates state-of-the-art direct-synthesis technology to simultaneously generate up to 8 of 20 available standard IRIG tones. Complete configuration and real time control is provided via a front panel user interface, which incorporates discrete tone and carrier switches with indicators. Additionally the Exciter provides full remote control functionality via an opto-isolated serial port (RS422/RS232 selectable) or a discrete logic level interface port.

CTS EXCITER SPECIFICATIONS

RF OUTPUT

Carrier Frequency Range	370MHz to 450MHz
RF Power Output	.5W minimum (optional 25 Watts with integrated amplifier)
Output Impedance	50 Ohm
Carrier Frequency Selection	25 KHz steps
Carrier Frequency Stability	+/-0.0005% / 24-hour duration
Carrier Rise and Decay Time	90% ≤ 5 ms
RF On/Off Ratio	120 dBc
Power Stability	±5%, in watts, of the selected level
Operational VSWR	Infinite VSWR load without damage
Carrier Control	Exciter front panel and remote interface

MODULATION

Modulation Type	Frequency modulated (FM) by internal and external sources Internal Modulation is RCC IRIG Tone and FSK EFTS
External Modulation Input	50 ohms, 600 ohms and 20K ohms unbalanced on rear panel BNC
Modulated Frequency Response	Flat within ±1.5dB from 1kHz to 100kHz
Baseband Composite Control	Adjustable from 0 to 2 Vpp into a matched load on front panel.
Baseband Composite Outputs	50 ohms, 600 ohms and 20K ohms, ±5% on rear panel BNC
Deviation	Adjustable 0 to ±300 kHz, 1 kHz to 100 kHz w/2 Vpp Mod input
Deviation Amplitude Stability	±5% / 24 hours
Rf Output Harmonic Distortion	≤2.0%
RF Output Inter-Modulation Distortion	≤1.0%
Harmonic Emissions	≤-50dBc
Spurious Emissions	≤-80dBc
Undesired Modulation	≤0.0005% of the carrier (1kHz to 100 kHz)
Incidental AM	≤2.5% of the preset power level

STANDARD RCC IRIG TONE MODULATION

Standard RCC IRIG Tones	20 tones, frequencies: 7.5, 8.46, 9.54, 10.76, 12.14, 13.70, 15.45, 17.43, 19.66, 22.17 25.01, 28.21, 31.83, 35.90, 40.49, 45.68, 51.52, 58.12, 65.56 and 73.95 kHz
Tone Activation	Activated by local or remote
Local Control	20 discrete switches on front panel
Remote Control	RS422/232 – or - 20 discrete input signals, +5 volts DC optically isolated
Tone Monitor Indicators	Tone activity reporting local and remote
Local	20 discrete indicators on front panel
Remote	RS422/232 - and - 20 discrete output signals
Tone Response Time	$90\% \leq 1.0\text{ms}$
Simultaneous Tones	8 tones simultaneous in any combination
Short Term Frequency Stability	$\pm 0.01\%$ tone frequency for 5-minute
Long Term Frequency Stability	$\pm 0.03\%$ tone frequency for 8-hour
Amplitude Stability	$\pm 10\%$ of its preset value
Amplitude Adjustment	$\pm 2\%$ of preset value $\pm 6\text{dB}$ of the preset value
Baseband Composite Signal	Linear addition of the activated IRIG tones or FSK EFTS message
Harmonic Distortion	$\leq 1.0\%$ for each individual tone
Inter-modulation Distortion	$\leq 1.0\%$ when 2 or more tones are activated

CTS EXCITER SPECIFICATIONS, *continued*

ADDITIONAL SPECIFICATIONS

RF Monitor Output	0.0 ±2.0 dBm, rear panel (non RF blanked)
Operating Time Meter	Electrical power ON, non-resettable
Operating Time Meter	RF carrier time ON, non-resettable
Reliability	MTBF ≥ 10,000 hours
Maintainability	MTTR ≤ 30 minutes, module/card level
EMI/RFI	Designed to meet MIL-STD-461C requirements
Physical Size	Standard 19" rack mount Height = 8.75", depth = 24"
Weight	45 lbs
Chassis Lids	¼ turn, quick disconnect fasteners
Prime Power	120/240 volts ±10% RMS, 47-63 Hz single phase, IEC-320
Grounding	Grounding point on rear panel
Overload Protection	Circuit breaker on front panel
Operational Environmental Conditions	Temperatures from 0° to 50°C Relative humidity from 10% to 95% Altitudes from mean sea level to 30,000 feet above MSL

