

**CUBIC. COMMUNICATIONS, INC.***A member of the Cubic Corporation family of companies*

August 5, 1999

Federal Aviation Administration
Spectrum Engineering Division
800 Independence Ave. SW
Washington DC 20591

Attn: Mr. J. Markey

Dear Sir,

This letter is to notify the Federal Aviation Administration that Cubic Communications Inc. is submitting its ATC-1000 Air Traffic Control Transceiver to the Federal Communications Commission for certification. We are submitting this notification in accordance with Section 87.147(d) of the FCC rules and Regulations.

The ATC-100 is a DSP designed unit that operates in the ATC band between 118 to 137.0 MHz. The exact characteristics of the ATC-100 are contained in the attached table that is part of the maintenance manual.

Should you require any additional information, please contact the undersigned at 858-643-5814, fax: 858-643-5803, e-mail: david.godfrey@cubic.com.

Sincerely,

David A. Godfrey
Director, ATC Business Development
CUBIC COMMUNICATIONS INC.

cc: FCC
TUV
Engineering Files

ATC-100 TECHNICAL MANUAL



Table 1-1 ATC-100 Specifications-Cont.

Item	Specification
Harmonic Distortion (@ 90%mod)	Line <10%
Audio Level Control (ALC)	Automatic ALC holds level modulation within 1 dB over 30 dB input range.
Ultimate SNR (weighed to Psophometric filter)	≥ 45 dB (mod = 90% at $f_m = 1$ kHz)
Test Generator	Built-in 1 kHz tone for test remotely controllable
GENERAL DATA	
Power Requirements	90 - 260 VAC, 47 -63 Hz, 225 W
Dimensions	19" (48.26 cm) wide, 3.5" (8.89 cm) high, 16" (40.64 cm) deep
Weight	16.7 lbs. (6.2 kg) (Unpackaged)
Temperature Range	-20 to +50°C Operating, -20 to +70°C Storage.
BITE	<p>Internal diagnostics provide 95% of fault detection. Fault detectors continuously monitor voltage levels and phase lock. Serial BUS messages regarding BITE control and status are available by using the Radio Command and Status Message listed in Chapter 3.</p> <p><i>Remote BITE Test provides Forward Power, Reflected Power, VSWR, Modulation Percentage & Sensitivity Measurements.</i></p>
Reliability	50,000 hours MTBF
OPTIONS	
DC Power	20V to 32V negative pole to ground

Table 1-1 ATC-100 Specifications-Cont.

Item	Specification
AF Control: RF AGC; for input voltages -107 dBm to -7 dBm, 30% mod, 1 kHz	+ 1 dB/-3 dB referred to -47 dBm input
Harmonic distortion: For 90% AM, 1 kHz, -87 dBm to -7 dBm EMF	$\leq 5\%$
Ultimate S/N ratio, 60% AM, 1 kHz (Weighted to Psophometric filter)	≥ 50 dB
Squelch:	Programmable C/N = 0-99 dB, Level -103 dBm to 0 dBm
Squelch Response Time	≤ 10 msec
TRANSMIT FUNCTION (MODE 0)	
Channel Spacing	25 kHz
Control	Remote RS-232/485
TX Channel Characteristics	Frequency offset, power (high/low)
Load VSWR Capacity	Operates into any passive load
Transmitter Distortion	Distortion at 90% AM does not exceed 10% over the frequency range 600 Hz to 6 kHz
Spurious Emissions	When the transmitter is modulated and terminated in a resistive load equal to the nominal output impedance, the power of any spurious emission at the output of the transmitter does not exceed: 80 dB below carrier for 25 kHz $< f < 500$ kHz 90 dB below carrier for $ f > 500$ kHz (non-harmonic) 80 dB below carrier, harmonically related
Wide Band Noise	Noise power measured on an unmodulated Carrier shall be less than -135 dBc/Hz at $f = \pm 500$ kHz from center frequency and decreases at the rate of not less than 5 dB per octave to at least -150 dBc/Hz
Modulation	AM (A3E) (up to 90%)
RF Carrier Power	Unmodulated carrier 25W
P_{high} and P_{low}	Set in 1 watt increments
Operation	Continuous with single fan (auto temperature sense)
Backdoor Intermodulation	> 15 dB below interfering signal at -20 dBc
Frequency Response	@ 25 kHz 300 to 3400 Hz: ≤ 4 dB (+1, -3 dB/ref 1 kHz) ≤ -19 dB at 100 Hz: ≤ -20 dB at 5000 Hz

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Table 1-1 ATC-100 Specifications.

Item	Specification
FREQUENCY	
Tuning Range	118 MHz - 136.975 MHz
Tuning Time	Can tune to any of the 25 kHz channels within 100 ms
Channel Spacing	25 kHz
Frequency Stability	2 ppm (-20°C to 50°C) after a 4 minute warmup
External Reference Frequency	10 MHz (Automatically switches to external reference when external reference signal is applied)
DETECTION MODES	Mode 0: 300 Hz to 3.4 kHz (Data with external modem) Mode 1, 2, 3, & 4 upgradable
RF SECTION	
Antenna Impedance	50 ohms nominal
Antenna VSWR	1.5:1 (typical) 2.0:1 (maximum)
Sensitivity	-97 dBm (Mod 0, 30% AM)
Protection	Will not suffer permanent damage when subject to a signal of +21 dBm in-band, or +27 dBm out-of-band.
Preselection	4 Selectable bandpass filters with an additional FM Reject filter.
RECEIVER FUNCTION (Mode 0)	
Channel Spacing	25 kHz
Control	Remote RS232/485
Type of Modulation	AM (A3E) for voice
Sensitivity: For (S+N)/N = 10 dB, weighted to Psophometric filter, 1 kHz, Mod = 30%	-97 dBm typical
DSP IF bandwidth/selectivity with 25 kHz channel spacing: 6 dB/80 dB	≥ 15 kHz/≤ 50 kHz
AF Outputs: Impedance Frequency Range: 25 kHz spacing Frequency response pass band Frequency response stop band	600 Ohms 300 to 3400 Hz + 1 dB/-2 dB referred to 1 kHz -10 dB at 100 Hz /6000 Hz referred to 1 kHz