

Chapter 1

DESCRIPTION OF THE XT300 and XT300/S

1.0 INTRODUCTION

This manual contains technical information about the XT300 and XT300/S excitors. For more simplicity we will always refer to the XT300, unless specified for clarity.

1.1 GENERAL DESCRIPTION

The XT300 is housed in a 3U, 19" rack-mounting container comprising a number of interconnected modules mounted internally on the main chassis, facilitating removal and substitution. The power output control, audio input level control and analog meter for measurement of the operating parameters, are all mounted on the front panel. The AC line power, audio input, RF output and telemetry connectors are mounted on the rear panel.

1.2 ELECTRICAL DESCRIPTION

The XT300 is an exciter working in the 87.5 to 108 MHz band, programmable in steps of 10 KHz. Its power output is continuously adjustable from 10W to 300W into a 50 Ohm load. The XT300 incorporates a stereo coder card which guarantees excellent stereo separation together with low harmonic distortion (only for Stereo Version). It also accepts two SCA Signals.

A front panel switch allows stereo operation (only for Stereo Version) or "mono/mpx" operation which excludes the stereo encoder and uses the "right" input as the mono input and the "left" input as the wideband composite input.

The specifications feature low audio distortion and intermodulation figures (typically 0.03%) and a high signal-to-noise ratio (typically -80dB).

1.3 METERS AND INDICATORS

The operating parameters of the exciter can be monitored using the analog multimeter situated on the front panel. The parameter to be measured is selected by the rotary selector switch.

The frequency control allows frequencies to be selected in steps of 10 KHz. Three red alarm LEDs indicate VCO unlock, excess VSWR on the output and excessive temperature, and the shutdown condition, programmed by a remote command.

Three green LEDs indicate the presence of +12V, +15V and +28V voltages which are used to power the various cards inside the exciter. A selector switch allows selection between Mono/Mpx and Stereo functions and another selector switch provides a choice of level input signal. Trimmers are provided for adjustment of left and right channels and a switch allows the stereo subcarrier to be enabled or disabled.

1.4 AUTOMATIC FREQUENCY CONTROL

The operating frequency is governed by a thermally-compensated, reference oscillator working within a phase locked loop (PLL). The XT300 reaches frequency lock within a maximum of 30 seconds.

1.5 CONTROL CIRCUITS

The control circuits allow automatic control of the output power (internal and external), maintaining the chosen power level across the entire operating band. Furthermore, another circuit protects the final stage against excessive VSWR or short circuits and excessive temperature. Then, there are other protection circuits that act to limit the maximum output power and to protect the equipment against a power supply's overvoltage.

1.6 R.F. POWER AMPLIFIER

The RF amplifier is a broadband design and guarantees an adjustable power output of 10 to 300 Watts across the entire band. A low pass filter enables the XT300 to be used as a low power transmitter, connected directly to an antenna.

1.7 SPECIFICATIONS

Please refer to Table (A) for the electrical specifications and Table (B) for mechanical specifications.

TABLE A
ELECTRICAL SPECIFICATIONS

Power supply	117-230V +/- 10 %, 50-60 Hz single phase
Power Consumption	approx. 600 W
Cooling	Forced ventilation
Frequencies	87.5 to 108 MHz in steps of 10 KHz
Output power	adjustable from 10 to 30 W
Automatic Output Level Control	Stabilizes the set RF output level
Output Impedance	50 Ohm
Output Connector	Standard N-type
Harmonic Suppression	> -65 dB
Spurious Signal Suppression	> -80 dB
Mono Intermodulation Distortion	0.05 % or less, measured at 1 KHz and 1.3 KHz, ratio 1:1 at 100 % modulation
Frequency Stability	+/- 500 Hz (typically +/- 300 Hz) from 0 deg to 50 deg C
Modulation Type	Direct frequency modulation of the RF oscillator at the fundamental frequency
Frequency Deviation	+/- 75 KHz nominal
Harmonic Distortion	< 0.05 % (typically 0.01 %)
FM Signal-to-Noise Ratio	> 75 dB mono, > 70 dB stereo measured with 75 KHz deviation in the 30 Hz to 15 KHz band RMS.
Residual AM (asynchronous)	Approx. 0.05 % + 65 dB RMS

Residual AM (Synchronous)	0.1% = 60dB
Pre-emphasis	50 μ s +/- 2% or 75 μ s +/- 2% selectable
Audio Input Impedance	10 KOhm balanced or 5K Ohm unbalanced (600 Ohm on request)
Audio Input Level	Selectable from -9 to +6 dBm in five steps Continuous from -12 to +9 dBm
Audio Frequency Range	30-15000 Hz, MONO input 30-100000 Hz, MPX input
Audio Input Filter	> 45 dB at 19 KHz (Mono) > 40 dB from 20 KHz to 100 KHz
Mono Frequency Response	+/-0.3 dB from 30 Hz to 15KHz
MPX Frequency Response	+/-0.5 dB from 30 Hz to 75KHz
Stereo Separation	> 45 dB (typically 50 dB)
Pilot Tone Frequency	19 KHz +/- 1 Hz
Pilot Tone Level	-20 dBm adjustable
Number of SCA inputs	2
SCA Input Impedance	1 KOhm unbalanced
SCA Input Level	0 dBm for +/- 7.5 KHz of deviation
SCA Input Response	+/- 0.5 dBm from 40 KHz to 100 KHz

TABLE B
MECHANICAL SPECIFICATIONS

Rack dimensions	483.0 mm (19.0") W 132.5 mm (5.20") H 500.0 mm (19.7") D
Operating temperature	from -10 deg C to 45 deg C
Humidity	95 % max. non-condensing
Weight	22 Kg