

Precision Simulators from...



ATC-1200Y3

TRANSPONDER/DME TEST SET

The ATC-1200Y3 Transponder/DME Test Set permits simulation of the ground station and airborne environment on the bench.

- Crystal-controlled, digital selection of distance and velocity
- 0.01 mile digital ranging steps from -1 to 999.89 NM
- 10 KT velocity steps from 0 to 9990 KTS
- Echo on DME mode
- Suppressor pulse output in XPDR and DME modes
- Measures peak power and transmitter freq.
- Crystal-controlled, leveled L Band generator
- All present and future DME channels
- Paired VOR (108.0 — 139.95 MHz) or direct frequency (950 — 1225 MHz) readout
- Two-year limited warranty

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TRANSPONDER/DME TEST SET

GENERAL:

The ATC-1200Y3 Test Set includes a built-in crystal-controlled signal generator, attenuator and modulators. It is designed to operate in conjunction with a dual trace oscilloscope to provide a complete bench test of the essential characteristics of civil ATC Transponders and DME sets. The ATC-1200Y3 system is capable of simulating a DME or Transponder ground station.

The Test Sets include all the RF hardware to test a DME or Transponder. This hardware includes a circulator to direct the transmitter power to a dummy load and power monitor, and to direct the signal generator to the receiver in the DME or Transponder. RF monitors are included for viewing the transmitter output and the input to the receiver. A diode switch in series with the signal generator is used to modulate the signal generator to obtain over 80 dB on-off ratio for the transponder interrogation; in DME Mode, over 80 dB on-off ratio is obtained.

SPECIFICATIONS:

Transponder specifications and test functions are as follows:

- a An accurate PRF generator variable from 50 to 5000 Hz. In the DME Mode, this generator controls the average rate of random squitter.
- b Selectable sync pulse outputs:
 - 1. T_0 , leading P_1 by 2 to 5 microseconds, to permit viewing the entire interrogation train
 - 2. T_D , in phase with P_3 to permit viewing the entire reply train
- c Interrogation pulse generator to produce precisely timed pulses for P_1 , P_2 and P_3 in mode A, B, C and D. A/C interrogation mode for reply mode interlace tests
- d Variable width for P_1 , P_2 and P_3 , from 0.4 to 1.2 microseconds
- e Variable spacing for P_2 and P_3 ± 1.2 microseconds
- f Crystal-controlled frequency check of Transponder transmitter
- g Three pulse side lobe suppression modulation pulse to signal generator which permits varying P_2 from +1 to -10 dB relative to P_1
- h Hot carrier diode slide-back type peak power measurement which permits measuring Transponder and DME peak power outputs from 10 watts to 2.5 kW. Accuracy of better than 15% at 1.0 kW and 25% at 50 watts
- i Provision for simultaneously monitoring both the interrogation and the reply
- j Diode switch modulator for the signal generator (interrogator) which provides over 80 dB on-off ratio so that high received signal level tests can be performed

SPECIFICATIONS CONTINUED

k Crystal-controlled calibrator output to permit precise calibration of pulse spacings or oscilloscope sweep speed. Calibration pulses can be spaced at 1.0 microsecond or 1.45 microsecond. Amplitude can be set to provide 1 volt across 51 ohm load. Phase of calibration pulses can be adjusted to align with interrogation or reply pulse trains.

l Measures percent reply of Transponder

m In the Gz Mode, the signal generator frequency readout is in MHz, and the generator covers the band of 950 to 1225 MHz in one MHz steps.

n Suppressor pulse output in coincidence with P_1 of the interrogation train

DME specifications are as follows:

a Precision crystal-controlled distance — 1 to 999.89 NM in 0.01 NM digitally selectable increments. Distance accuracy ± 0.025 miles $\pm .005\%$ of range

b Precision crystal-controlled digital velocity system with digitally selectable increments of 10 KTS. Velocities from 0 to 9990 KTS with accuracy of 0.02%

c Velocity range 0 to 300 KTS with meter readout. Electrical range slewing 0 to 300 NM in 6 sec.

d Echo pulse pair injection 30 miles from time of interrogation. The echo pulse pair can be varied in amplitude +1 dB to -10 dB relative to the normal reply pulses.

e Provides shaped pulses to meet FAA reply pulse requirements, and gating pulses to build-in diode switch to provide over 80 dB on-off ratio, (FAA requires 70 dB).

f Noise controlled squitter generator with comparator counter provides random distribution with calibrated average count. Average squitter rate variable from 50 to 5000 Hz

g All solid state Ident generator — keyer provides 1350 Hz tone or "IFR" every 30 seconds

h Provides random percent reply to DME interrogations selectable from 100 to 20%

i Reply pulse spacing adjustable from nominal 12 or 30 μ s spacing in ± 0.5 μ s, ± 3 , ± 4 , ± 5 , ± 6 μ s steps

j Tacan Signals are simulated by amplitude modulating the DME reply and squitter pulses with 60 Hz. Modulation level is variable from 0 to 50%.

k The frequency selection of the signal generator may be in either VOR paired channels from 108.00 to 135.95 MHz, or direct frequency indication from 950 to 1225 MHz. X or Y pulse spacing is automatically switched in the paired mode, and is always X spacing in Gz mode.

l A CW switch provides constant RF output at any attenuator setting.

m Shaped modulation is available on the front panel to modulate an IF generator.

n Suppressor pulse output at a constant rate controlled by the squitter rate control

o R-NAV pulse outputs: P_1 at time of interrogation and P_2 at time of reply, for testing area-nav systems. A self-interrogate function is provided so use of an external DME is not required for R-NAV tests.

p Warning lamps to warn if Ident, R-NAV, or Echo circuits are enabled

q Variable frequency controls to sweep the generator frequency continuously from 950 to 1225 MHz. 10-turn course and fine adj. controls allow easy frequency adjustment.

PHYSICAL CHARACTERISTICS:

The 1200Y3 model is housed in a cabinet 16 $\frac{3}{4}$ " wide by 7 $\frac{1}{2}$ " high by 18 $\frac{3}{8}$ " deep. The weight of the complete instrument is 36 lbs. for the 1200Y3. Optional 19" rack adapters are available.