ORIGINATED	PS	09-12-07	PERFORMANCE SPECIFICATION ACCELEROMETER (MODEL 7270A-XXX-ZZZM16)	PS7270AM16	
CHECKED	TAC	09-12-07		PAGE	1 OF 7
APPROVED	BP/DB GAP	09-12-07		REVISION	C
				ECN NUMBER	30565
CUSTOMER APPROVAL				DATE	05-13-17

1.0 DESCRIPTION

The ENDEVCO® Model 7270AM16 is a family of rugged undamped piezoresistive accelerometers designed for shock measurements. The highly efficient sensing system of the 7270AM16 is sculptured from a single chip of silicon, which includes the inertial mass and strain gages arranged in a four-active-arm Wheatstone bridge circuit (patent numbers 4,498,229; 4,605,919 and 4,689,600). The extremely small size and unique construction of the element allows exceptionally high resonant frequency. On-chip balance resistors provide low zero measurand output and low thermal zero drift. The light weight flat case is designed to reduce the effect of case resonance's for optimum frequency response.

2.0 PERFORMANCE (See Figure 1 and Note 1 for the relations between sensitivity, resonant frequency and range limitations)

	Sensitivity (microvolts/g)			Resonant Frequency (Kilohertz)		Range (g's)	Overrange Limit (g's)
MODEL	Min	Typ	Max	Min	Typ		
-20K	2.5	5.0	7.5	220	350	20 000	60 000
-6K	7.5	15	25	120	180	6 000	18 000
-2K	25	50	75	60	90	2 000	10 000

All specifications assume +75°F (+24°C) and 5 volts excitation.

2.1	AMPLITUDE LINEARITY	±2% of reading up to acceleration corresponding to the recommended range. Measurement uncertainties prevent stating this as a specification limit at accelerations above 10 000 g.
2.2	ZERO SHIFT DUE TO HALF SINE ACCELERATION CAUSING 200 mV AT FULL SCALE RANGE)	0.5 mV maximum

2.3	MOUNTED FREQUENCY RESPONSE [2]	MODEL ±5% Deviation at -20 K 50 kHz -6 K 20 kHz -2 K 10 kHz
2.4	TRANSVERSE SENSITIVITY	5% maximum
2.5	ZERO MEASURAND OUTPUT	±50 mV maximum at +75°F (+24°C)
2.6	THERMAL ZERO SHIFT	±5 mV typical, ±25 mV maximum, -30°F to +150°F (-34°C to +66°C) relative to +75°F (+24°C)
2.7	ZERO SHIFT DUE TO MOUNTING TORQUE	±2 mV maximum, 0 to 8 lbf-in
3.0	ELECTRICAL	
3.1	EXCITATION	5.00 Vdc, 12 Vdc maximum
3.2	RESISTANCE INPUT OUTPUT	 650 ±300 Ω 650 ±300 Ω
3.3	INSULATION RESISTANCE	100 MΩ minimum at 100 Vdc between the sensor (all leads tied together) and cable shield or case.
3.4	WARM-UP TIME REQUIRED TO MEET THE ABOVE SPECIFICATIONS	2 minutes maximum, 15 seconds typical
4.0	PHYSICAL	
4.1	CASE MATERIAL	17-4 PH CRES
4.2	WEIGHT EXCLUDING CABLE	1.5 grams
4.3	IDENTIFICATION	Serial Number on side of unit; "ENDEVCO 7270AM16" and Model (dash number) on lid. Patent label on end of cable.
4.4	MOUNTING [3]	4-40 high strength screws (supplied), 2X No. 4 washers (supplied), 2X Recommended mounting torque, 8 ±2 lbf-in (0.9 N-m)

5.0	ENVIRONMENTAL	
5.1	TEMPERATURE	
	Operating:	-67°F to +150°F (-55°C to +66°C)
	Non-operating:	-67°F to +250°F (-55°C to +121°C)
5.2	SHOCK LIMITS [3]	
	(In any direction)	Half-sine pulse at full scale range. Pulse duration should be the greater of 20 microseconds or five periods of the resonant frequency.
5.3	HUMIDITY	Epoxy sealed
5.4	BASE STRAIN SENSITIVITY	Typically less than 0.5 mV for 250 microstrain when tested per ISA 37.2, para 6.5.
6.0	CALIBRATION DATA SUPPLIED	(Taken at room temperature and 5.00 Vdc)
6.1	SENSITIVITY [4] [5]	Sensitivity per g taken at recommended range or 5000 g, whichever is smaller; Time history using 2925 POP Shock Calibrator at respective g level.
6.2	ZERO MEASURAND OUTPUT	Measured at 5.00 Vdc
7.0	ACCESSORIES	
7.1	SUPPLIED	
	EHW265	washers, 2X
	EH137	screws, 4-40 Allenoy Steel, 2X or equivalent Socket Head Cap Screw 1/4" long, 2X
7.2	OPTIONAL	
	7970	Triaxial Mounting Block
	136	DC Amplifier, 3 Channel Benchtop
	436	DC Amplifier, 3 Channel Rack Mount
	31167	Mounting Plate [6]

8.0 NOTES:

[1] The overrange limit is a design safety margin. Operating the unit above its rated range is not recommended.

IMPORTANT: Frequency content of shocks which exceed the overrange limits of the 7270AM16 often contains significant amplitudes well above 100 kHz. Signal conditioning with insufficient bandwidth may attenuate the signal and give significantly lower indicated peak accelerations.

[2] Frequency response should deviate by less than ±5% from dc to indicated frequency, based on predicted response of single degree of freedom system. Acceleration levels of conventional techniques are too low for accurate analysis of the frequency response of the 6kg and higher ranges. Measurement uncertainties above 10 kHz prevents stating ±5% as a specification limit for all but the 2000 g range.

NOTE: The sensor chip includes two masses, each with a separate resonant frequency. Both resonance's satisfy the specified minimum resonant frequency. If these resonance's are excited, the transducer output will exhibit a "beat" frequency.

[3] Use 8 ±2 lbf-in mounting torque, acoustic couplet and high strength steel screws to (1) insure intimate contact between accelerometer and mounting surface and (2) to prevent yielding of the screw and loss of preload force due to shocks, particularly those above 100 000 g. Loss of meaningful data and possible damage to the accelerometer due to rattling on its mounting surface can result from using either too high or too low a value of mounting torque.

The use of low strength mounting material (such as aluminum) is not recommended. However, if such is the case, epoxy should be used between the transducer and mounting surface to supplement the strength of the threads.

If large transverse shocks are anticipated, the use of liquid thread locking compounds is recommended to reduce loss of screw preload.

[4] Prior to final calibration, each accelerometer is given a shock in its sensitive axis approximately equal to its full scale output limit (using the ENDEVCO 2973A Shock Motion Accelerometer Calibrator described in ENDEVCO TP283).

[5] Calibrations are performed on ENDEVCO Model 2925 POP Shock Calibrator.

[6] Mounting Plate test fixture adapts unit to 10-32 stud mount.

[7] Model Number Definition:

7270A - XXX - ZZZ M16

- M16 — Modifier
- ZZZ — Cable length in inches (i.e.7270A-XXX-120M16 has a length of 120 inches). If no dash number is specified the default length is 48 inches.
- XXX — Full Scale Range in kg's
  - -2K = 2
  - -6K = 6
  - -20K = 20
- 7270A — Basic Model Number

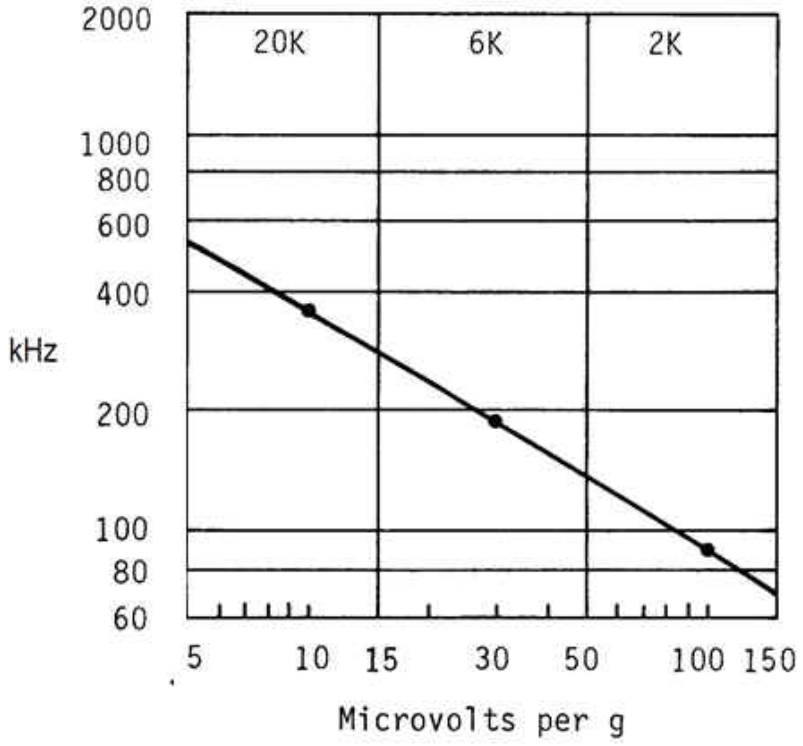
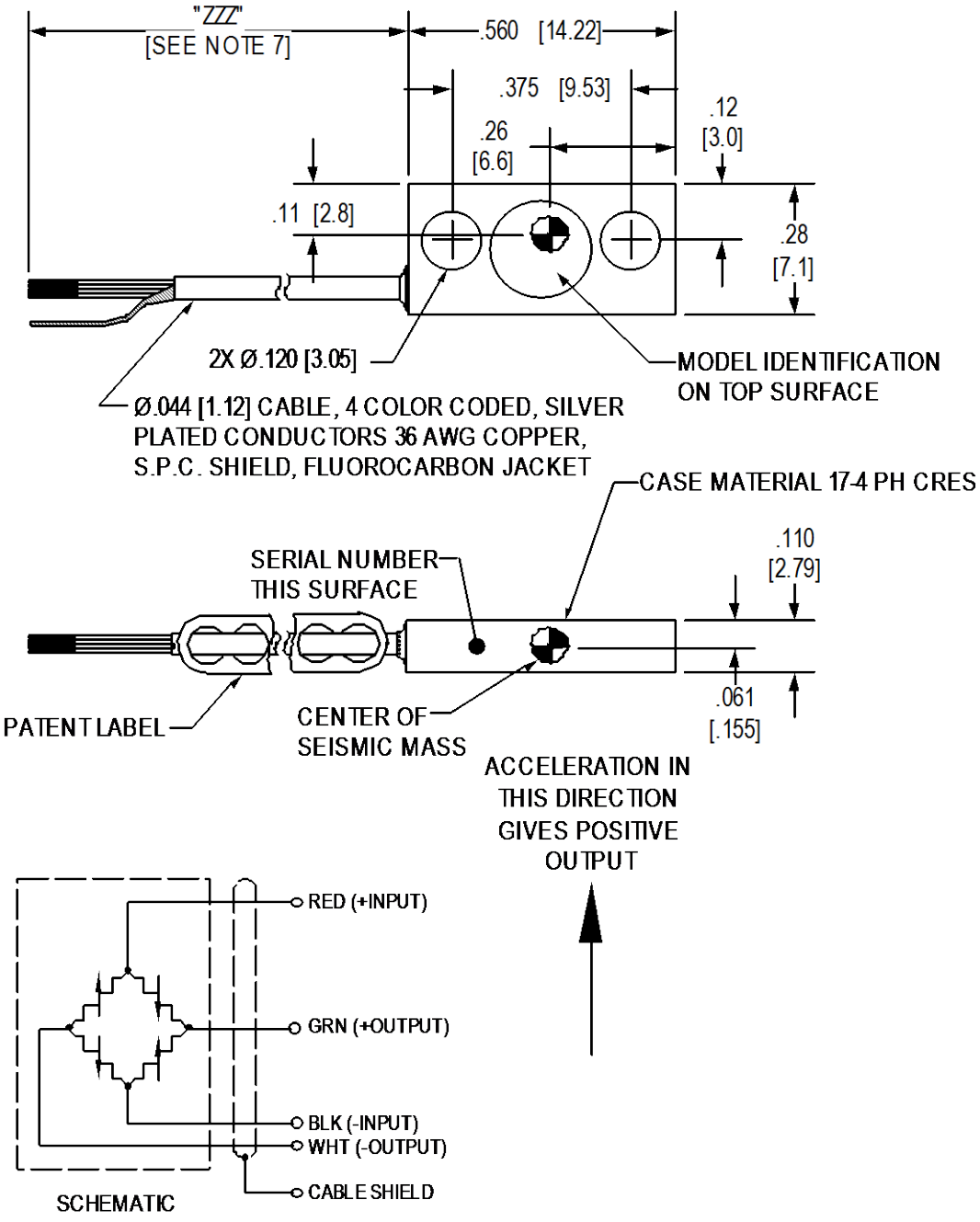


Figure 1

Typical Resonant Frequency vs Sensitivity



STANDARD TOLERANCE

INCHES	[MILLIMETERS]
.XX = ± .03	[.X = ± .8]
.XXX = ± .010	[.XX = ± .25]