



1 to 3 Channel Configuration

The VLF PTS series of analog field telemetry system represents a flexible means for transmitting seismic signals through analog transmission (telephone or radio). It is a full featured high performance system, that includes an amplifier, crystal stabilized VCO, multiplexer with signal conditioning (for single repeater applications), highly temperature stable regulated power supply, and temperature compensated battery charger with solar panel input. The PTS series offers many features unavailable on other models. It has the highest dynamic range available for analog telemetry, featuring a standard bi-gain amplifier with integral anti-alias filtering and RF interference filtering. A crystal referenced phase locked VCO eliminates center frequency drift caused by temperature changes and component aging. It is very low power, easy to use, easy to field repair or upgrade. A rugged and well-shielded enclosure makes it perfectly suitable for portable and rapid deployment applications in addition to permanent monitoring. All internal modules are conservatively designed and include ample transient suppression and noise filtering. Coupled with the low noise discriminators (model TC-20DS) at the central site, this field system offers the user a simple, easy to maintain, cost effective transmission system. Other system components include external multi channel multiplexer (Model PTS-9MX), lightning suppression systems (Model LPS-x), external signal band pass, high pass, or low pass filters (Model TC-70X), central site digitizing and recording systems (Model PMD6102), and analysis

Specifications subject to change without notice. 06/03

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## PTS-3BGx SPECIFICATIONS:

<b>Number of Input Channels:</b>	1 through 3 (“x” indicates number of channels)
<b>High Dynamic Range option:</b>	2 through 6 output channels (high/low gain)

### Amplifier (AS-110BG-SE or DIF)

<b>Input configuration:</b>	Single-Ended (SE) or Differential (DIF)
<b>Input Voltage:</b>	±5.0 V
<b>Output voltage:</b>	±5.0 V nominal, ±5.5 V Maximum
<b>Input impedance:</b>	10K ohm differential or 100K ohm single ended
<b>Input noise:</b>	0.25 $\mu$ V rms, 0.6 $\mu$ V p-p Maximum (.05 to 25 Hz Bandwidth)
<b>1<sup>st</sup> Stage Gain:</b>	Single Ended: 0 to 48 dB in 6 dB steps, switch selectable Differential: 24 to 48 dB in 6 dB steps, switch selectable
<b>High-Low Gain Output Separations:</b>	0, 24, 30, 36, or 42 dB, switch selectable
<b>Maximum Gain:</b>	90 dB
<b>Minimum Gain:</b>	Single Ended: 0 dB Differential: 24 dB
<b>Gain accuracy:</b>	± 0.35dB
<b>High pass filter:</b>	2 pole, .05 Hz/pole (20 seconds), fixed, other values available by special order
<b>Low pass filter:</b>	Standard 25Hz, 6.25, 12.5, and 50 Hz with other val- ues available by special order.
<b>Low pass filter type:</b>	5 pole Butterworth, other responses available by special order
<b>RF suppression:</b>	2 poles 1.5 KHz
<b>Transient suppression:</b>	1 stage
<b>Input voltage Maximum:</b>	10 Vp-p (±5V)
<b>Supply current at 12.8 VDC:</b>	1.2 mA per amplifier board
<b>Adjustments:</b>	High and low gain dip switches

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## PTS-3BGx SPECIFICATIONS continued:

### Voltage Controlled Oscillator (TC-10XV)

<b>VCO Type:</b>	Crystal stabilized phase locked
<b>Input modulation voltage:</b>	±5.00 VDC for ± 125 Hz
<b>Deviation:</b>	±125 Hz (other deviations available)
<b>Linearity:</b>	1% or better
<b>Center frequencies:</b>	341.33 Hz spacing, 682.3 Hz to 3072 Hz, (higher frequencies available)
<b>Center frequency stability:</b>	±1Hz over full temperature range
<b>Residual FM:</b>	0.05 Hz
<b>Dynamic range:</b>	Single: 66 dB Maximum Bi-gain: 108dB Maximum
<b>Output amplitude:</b>	0 to 3.5 Vp-p adjustable
<b>Output waveform:</b>	Digitally generated sine wave
<b>Output Harmonic distortion:</b>	0.1% or less
<b>Output Residual AM :</b>	1% or less
<b>Supply current at 12.8VDC:</b>	2-3 mA (frequency dependent)
<b>Adjustments:</b>	Lock range, Deviation, Output amplitude

### Sensor Calibrator (TC-205SC)

<b>Calibration type:</b>	Pulse current
<b>Recurrence rate:</b>	12 or 24 Hr switch selectable
<b>Recurrence rate accuracy:</b>	15 seconds/day
<b>Output pulse width:</b>	10 seconds
<b>Output current:</b>	From 0.5 to 31.5 mA, switch selectable in 0.5 mA increments
<b>Supply current at 12.8 VDC:</b>	0.3mA quiescent, 32mA max during calibration
<b>Output Voltage:</b>	12V maximum
<b>Transient Suppression:</b>	1 stage output
<b>Adjustments:</b>	Recurrence rate, cal current, clock reset

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## PTS-3BGx SPECIFICATIONS continued:

### Multiplexer (included on TC-60PS)

<b>Type (standard):</b>	Local channels plus external receiver/telephone signal
<b>Optional</b>	External PTS-9MX up to 8 channels
<b>Output voltage:</b>	15 Vp-p maximum
<b>Output Impedance:</b>	600 ohm
<b>Output coupling:</b>	Transformer (user defined ground)
<b>Harmonic Distortion:</b>	0.1% or better
<b>External Receiver coupling:</b>	Transformer (user defined ground)
<b>Receiver Input voltage:</b>	10 Vp-p Maximum
<b>Receiver input impedance:</b>	600 ohm
<b>Multiplexer gain:</b>	Adjustable 0 to 5
<b>Transient suppression:</b>	2 stage
<b>Supply current at 12.8VDC:</b>	1.5 mA.
<b>Adjustments:</b>	Output level

### Multiplexer External Input Signal Conditioning (Optional TC-70-x & TC-80)

<b>Filter Types</b>	Bandpass, low pass, high pass.
<b>Line Amplifiers</b>	Passive attenuator, or adjustable gain to a maximum 10 (20 dB)

### Solar regulator and battery low voltage disconnect (Model SR-10)

<b>Type:</b>	Temperature compensated for 12V lead acid battery.
<b>Maximum input voltage:</b>	22 VDC
<b>Maximum input current:</b>	7A (replaceable fuse)
<b>Solar panel blocking diode:</b>	High efficiency Schottky
<b>Output voltage:</b>	13.5 VDC at 70°F
<b>Temperature compensation:</b>	-18mV per °C
<b>Output voltage adjustment range:</b>	13 VDC to 14 VDC
<b>Maximum charge voltage:</b>	14.75 VDC
<b>Input output differential at 7A:</b>	1.1V max
<b>Transient protection:</b>	1 stage
<b>Charge indicator:</b>	Yellow LED, Lit above 14.5 VDC
<b>Low Voltage disconnect:</b>	Removes power from telemetry box and external connected loads
<b>Cutout Voltage:</b>	11.5 VDC, adjustable from 11.3 to 12.3 VDC

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## PTS-3BGx SPECIFICATIONS continued:

### Solar regulator and battery low voltage disconnect (Model SR-10)--Continued

<b>Switch Hysteresis:</b>	+0.5VDC above cutout voltage
<b>Maximum output current:</b>	1A (replaceable fuse)
<b>Switch voltage drop at 1A:</b>	80mV
<b>Power good indicator:</b>	Green LED
<b>Supply current:</b>	3.5 mA
<b>Adjustments:</b>	Charge Voltage, Low voltage disconnect

### Regulated Internal Power Supply (Model TC-60PS)

<b>Input voltage range:</b>	11 to 15 VDC
<b>Output voltage:</b>	±6.500 VDC, 20 mA max
<b>Output voltage stability:</b>	±5 mV over full temperature range
<b>Supply current at 12.8 VDC:</b>	5mA
<b>Adjustments:</b>	Positive and negative output voltage.

### Reference oscillator (included on TC-60PS)

<b>Oscillator type:</b>	Miniature Quartz tuning fork crystal
<b>Oscillator base frequency:</b>	25.6 KHz
<b>Internal reference frequency:</b>	853.3Hz
<b>Reference frequency stability:</b>	±0.25 Hz over full temperature range
<b>Output voltage:</b>	13 Vp-p
<b>Supply current at 12.8VDC:</b>	1.5 mA

### System specifications (Model PTS-3BG1 thru 3)

<b>Dimensions:</b>	9" W x 9"D x 4.5" H
<b>Box style:</b>	NEMA 4X die cast painted aluminum
<b>Supply Current for G1 system</b>	16 mA nominal
<b>Sensor input mating connector:</b>	PT06A-12-10S
<b>Solar panel input:</b>	2-way banana style binding post
<b>Battery Input:</b>	2-way banana style binding post
<b>Receiver Input mating connector:</b>	PT06A-8-4S
<b>Transmitter Output mating connector:</b>	PT06A-8-4P
<b>Operating Temperature Range:</b>	-30°C to +65°C
<b>Operating Humidity:</b>	0-100% RH

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