AOS TECHNOLOGY

OPERATIONAL MANUAL

Document:	**Phase Generator Board**
	Operations Manual-
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COMMERCIAL IN CONFIDENCE

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1 INTRODUCTION

The Phase Generator Board was designed as part of a complete four-channel phase detection system aimed as a measurement solution for the derivative spectroscopy market. The complete system consists of three printed circuit boards that can be mounted in a piggyback fashion in order to form a compact measurement solution.

The system consists of the following printed circuit boards;

- **Phase Generator Board;** The function of this pcb is to generate stable TTL pulse trains that can be used to control the Phase Sensitive Detector circuitry. In addition an 8 bit sine wave function synchronously locked to the fundamental TTL pulse train is made available for laser current modulation.
- **Phase Sensitive Detector Board;** The function of this pcb is to provide four channel phase sensitive detection of incoming signals.
- **Laser Driver Board;** An OEM laser diode driver module is utilised on this pcb to provide suitable drive currents for laser diodes and SLEDs.

The three boards can either be mounted in a compact piggyback format or used individually as OEM modules in customer equipment.

This operation manual deals with use of the Phase Generator board.

2 CIRCUIT LAYOUT

The main components on the Phase Generator board can be seen in Figure 1 below.

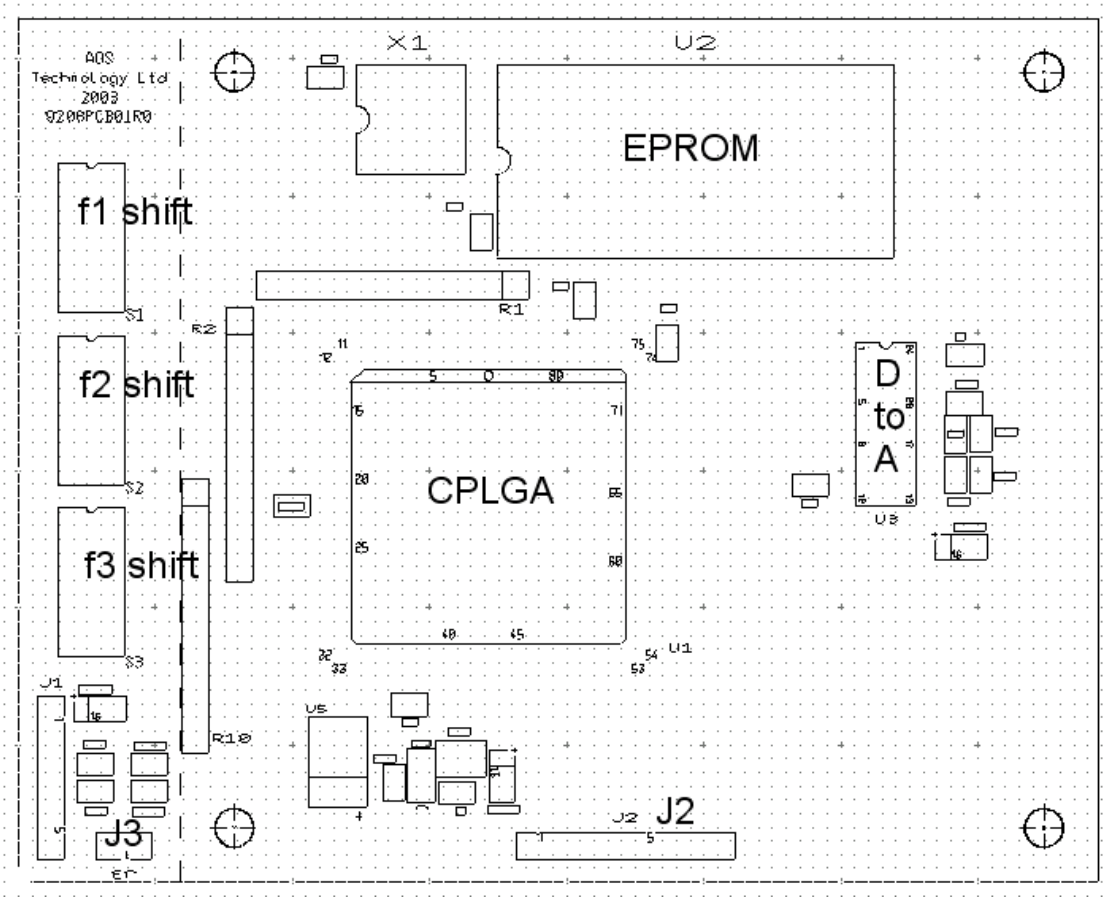

Figure 1. Schematic outline of the Phase Generator Board

3 CIRCUIT DESCRIPTION

The function of the Phase Generator board is to produce a number of digital pulse trains synchronously referenced to a known frequency standard, in this case a high-precision crystal oscillator (X1). In addition, an analog voltage waveform synchronously linked to the crystal is also available via the EPROM and D to A circuitry.

Although the magnitude and shape of this analog waveform may be modified,

by suitable manipulation of the EPROM address values, a simple sine waveform is available as standard.

The board produces three different frequency outputs;

The fundamental frequency at ~6.5kHz
A first overtone frequency at ~13kHz
A second overtone frequency at ~19.5kHz

In total there are six available digital outputs, two at each frequency. Of the two outputs at each frequency one has a static fixed phase relationship referenced to the frequency standard while the other can be varied using a bank of dil switches.

There are three banks of dil switches, one bank for each frequency. Although there are ten switch positions only nine are utilised, the tenth playing no part in phase control of the pulse trains. The nine bit switch banks provide 360 degrees of digital phase control with approximately 0.7 degrees resolution (360degrees/512) The uppermost (as in the diagram above) switch in each bank is switch 1 and is the LSB.

All the digital and analog output signals are available on connector J2.

Connector J3 is used to power the board. The board requires +5 volts d.c. at approximately 150mA. **NB THE SUPPLY VOLTAGE MUST NOT EXCEED 5.3V**

Connector J1 should not be used.

4 CONNECTOR DESCRIPTIONS

J2 Output Connector

Pin	Description
1	Fundamental 6.5kHz (no phase control)
2	Fundamental 6.5kHz (phase controlled by bank1)
3	First Overtone 13kHz (no phase control)
4	First Overtone 13kHz (phase controlled by bank2)
5	Second Overtone 19kHz (no phase control)
6	Second Overtone 19kHz (phase controlled by bank3)
7	2 volt pk-pk analog voltage
8	0 volts (output – no connection necessary)

J3 Power Connector

Pin	Description
1	0 volts pin closest to the corner of the pcb
2	+5 volts d.c.