

APPENDIX

ERROR COUNTING UTILITIES module

A full description of this module is available in the *TIMS Advanced Module User Manual*. This should be essential reading before the module is used.

Before use it is necessary to check the settings of the on-board switches SW1 and SW2, and the jumper J1.

Briefly, the module consists of two sub-systems:

X-OR gate

This has two modes:

1. *pulse mode*: with a clock signal connected. Acts as a gated sub-system. Somewhere near the middle of each clock pulse it makes an X-OR decision regarding the two TTL inputs. Its output is a TTL HI if they are different, otherwise a LO. In the present application it compares each bit of the regenerated received signal with a reference generator. Differences - which represent errors - are counted by the FREQUENCY COUNTER in COUNT mode.
2. *normal mode*: with no clock input

gate timing pulse

This clocked sub-system, on receipt of a trigger pulse - manual or electronic - outputs a pulse of length (number of clock periods) determined by the front panel switch PULSE COUNT, the toggles of the on-board switch SW2, and jumper J1.

In this experiment the trigger pulse is initiated by the front panel TRIG push button.

The GATE output pulse (a LO, selected by toggle 2 of the on-board switch SW1) is used to activate the FREQUENCY COUNTER, in COUNT mode.

on-board settings for this experiment

<i>switch/jumper</i>	<i>toggle</i>	<i>position</i>	<i>comments</i>
J1		NORM	
SW1	1 - TRIG	HI - to left	suits press button
SW1	2 - GATE	LO - to right	counter activated on LO
SW2	1	ON - to right	PULSE COUNT switch settings times unity
SW2	2	ON - to right	

