CH/Doc/93/09

Electronics

Amplifier and Control Costings

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Estimates for Channel Amplifier and Control

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Introduction

A Channel Amplifier and Channel Control unit are being developed in a two stage operation. In the first stage a set of 32 prototype channels will be constructed followed by the production of 320 channels. The estimates shown here are based on component and production costs for a quantity of 320 channels using the prototype component and production costs as a guide.

In the prototype development the Amplifier and Control function have been separated with the modules arranged vertically in a 16 position standard Eurocrate. The prototype amplifiers are almost identical to the existing amplifiers but with reduced width and additional features to control gain, discriminator, and pole zero settings. The pile-up detection circuit has been removed to the channel control unit.

32 prototype Amplifiers have been built in a standard length single height Eurocard with a separate detachable circuit for the control. For the second production phase these will be rearranged on extended length Eurocards to match the Control module. It may be an advantage to group all the analogue functions around the amplifier by moving the integrate/sample-hold electronics from the Control into the Amplifier. This should not change the pattern of these estimates since the amplifier PCB will need to be relaid for either option and the integrate/sample-hold function has been costed separately.

Each group of 16 channels is interfaced to the LeCroy 2277 TDC and also to the LeCroy 4532 Majority Logic unit via a single height Euro module on the right hand side of the crate. This interface has not been defined in detail and therefore any cost estimate is a rough approximation.

The prototype Channel Control is sufficiently advanced for the estimates of all component costs and production to be predicted. In the current model either the Silena sample-hold circuit or an Integrator could be plugged in to condition the analogue input. These costs have been shown separately from the Channel Control since it is not clear at the moment just how many of each type may be required. The Silena cost is based on a smaller quantity (100) and there is also the possibility that we could build a replacement sample/hold at a cost similar to the Integrator.

Amplifier

The component and production costs for building an Amplifier are estimated at $161 for each unit. This includes the charge of $3200 for rearranging the PCB layout and manufacture of 320 boards. The total cost of building 320 Amplifiers is then $51520

Channel Control

The component cost is $93 and the ancillary cost is $51. The PCB artwork is estimated at $20 and the final assembly cost is $15. These estimates give a unit cost of $179 and a total cost of $57280 for 320 units.

Channel Interface

The component cost of this module is expected to be less than a Control module at $60 and the ancillary cost higher at $55. PCB artwork is estimated at $20 assembly $15 and the total unit cost is then $150 giving a final cost for 20 units $3000

Sample-hold/Integrator

We have been quoted $63 for the Silena Sample/Hold sub-circuit based on a quantity of 100 and it is estimated that for a quantity of 320 the price might be reduced to $45. An alternative Integrator board is costed at $25 based on a quantity of 320 units.

Powered Crates

The component costs for building a crate with power supply is estimated at $1149 component and ancillary costs and $500 for production giving a unit cost of $1649. Since 20 units will be required to house 320 channels this yields a total cost of $32980.

Summary

Channel Amplifier	$161	320 off	$51520
Channel Control	$179	320 off	$57280
Channel Interface	$150	20 off	$3000
Powered Crate	$1649	20 off	$32980
Sub total			$144780
	either		
Sample/Hold Silena	$45	320 off	$14400
	or		
Integrator	$25	320 off	$8000

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