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## **SUB-CONTRACT PROGRAMMING & TEST SERVICE**

### Further Information -

CAD conversion into a Takaya Flying Probe test program is done via Tecnomatix-Unicam's "Test Expert®" software, or FABmaster® as it was previously known. Using this software, we are able to define what the Takaya uses for test access. This can be anything from specific test points, drilled PTH pads and via-holes, down to the solder fillets of fine pitch surface mount IC's.

Test Expert® software also generates vision tests (presence / polarity / letter recognition) for any parallel components that might otherwise go untested (e.g. decoupling capacitors). It will also add a vision test for any components that we cannot gain access to for an electrical test. By limiting the number of test points per net to one on each side of the PCB, we also check much of the tracking by testing a component from elsewhere on the net, rather than probing it's own pads.

If no CAD data is available, a test program can be made by using the Takaya's camera system to manually assign the probing points for each test. However, manual generation takes 2-3 times longer than CAD generation, and is hence more expensive.

Another advantage of Flying Probe test is that there is no fixturing or tooling to be made, therefore the only lead-time for the solution is the time taken to generate and prove the program. A 'ready-to-run' machine program will always be achieved within 1 week of receipt of PCB's and CAD data. If the CAD is received in advance, it's possible to have the program proven and boards tested and returned within a week.

As regards any defects we may find, we would endeavour to diagnose faults down to the component or defect causing the failure. Simple rework is undertaken, i.e. removal of solder-shorts, re-soldering of dry joints. If there were rework that requires the replacement of a component, we would consult you on how to proceed.

Pricing is dependant on the size and complexity of the PCB in question, and for program set-up this is split into a cost for processing the CAD data and generating the program, and a cost for "debugging" the program on our in-house machines with a sample of your PCB's. The cost for CAD conversion ranges from £400 - £1400, typically around £800, and depends on the complexity of the board. Machine debug costs are based on £750 per day, and vary according to the component count of the board. A typical debug is one day per side of the PCB. This means that a test solution for the average double-sided PCB could be as little as £2300, considerably less than the cost of a fixture, and without the wait.

The only other costs involved are a fixed £75 batch set-up for each batch of boards received, and the 'per-board' charge for test. This is solely dependent on the time taken to test each PCB, and is based on a rate of £200 per hour that the machine is in use. For example, if the test time is 12 mins, the per-board cost for test would be  $200/5 = £40$  per board.

For a quotation, or any further information, please contact - Graham South on 01732 363003.