



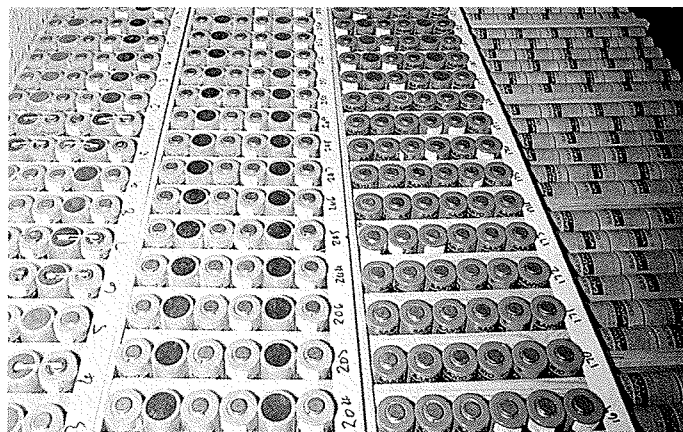
# PERFORMANCE PLUS

## A GREAT BRITISH COMPANY

Galeforce is a name that has started to feature more prominently in the results charts of all electric racing during the past season. Indeed success has been achieved at home, in Europe and on the world scene. The Galeforce system has been developed during the past two years by top 1/12 and current double BRCA 1/10 track champ Dave Gale.

When the much maligned Sanyo 1700 SCE first appeared it soon became apparent that the available matching/selecting processes in use, developed for the more robust 1200 SCR cells, were not suited to the performance characteristics of the new high capacity cells. In his full time capacity as an electronics, software development engineer specialising in prototype work, David Gale was the ideal person to undertake a project to develop a system of computerised cell matching.

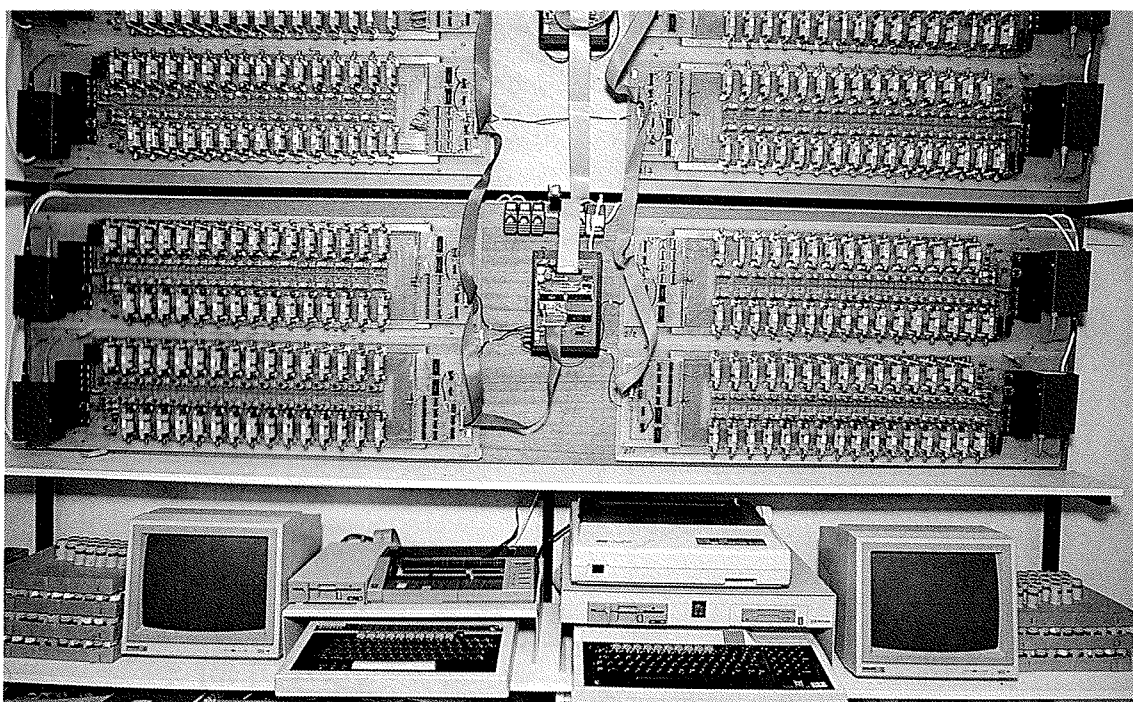
This system was commissioned by Mick Langridge in April 1988 and a small prototype unit was running in September of that year. This was used to accumulate data



Packs are assembled to order as Stick or Saddle Packs.

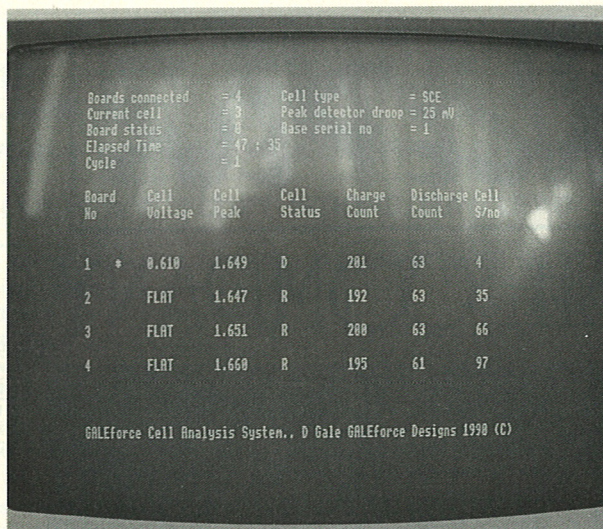
and evaluate the software. All data collected was in order to achieve the desired aim of matching as accurately and consistently as possible. A full working system was finally given the go-ahead in May 1989 and was ready to run in December.

The Galeforce system is made up of eight power boards, each holding 31 cells controlled and monitored by a pair of powerful and reliable BBC Master computers. Each batch of 248 cells undergoes a 54 hour period of charge/discharge cycles, this is monitored by both computers during all stages of the process. Each cell is



248 Cells are processed during each cycle. Charge and Discharge is monitored by 2 BBC Master Computers.





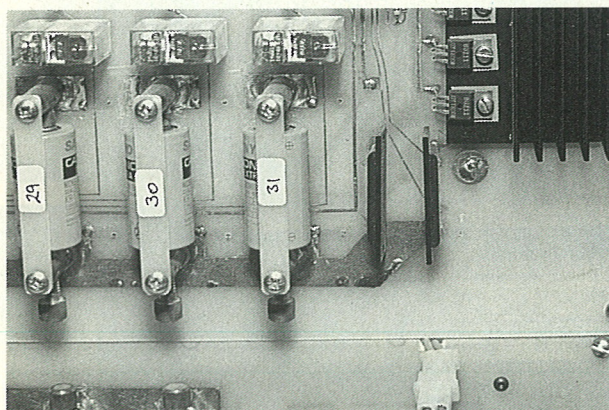
BBC Master controls and monitors charge & discharge cycle.

individually charged to it's peak, discharged and rested for a measured period of time before the cycle repeats. The data generated (almost one megabyte!) is then transferred to a Tandon PC and stored on hard disc until the data from each batch is recalled for selection and matching.

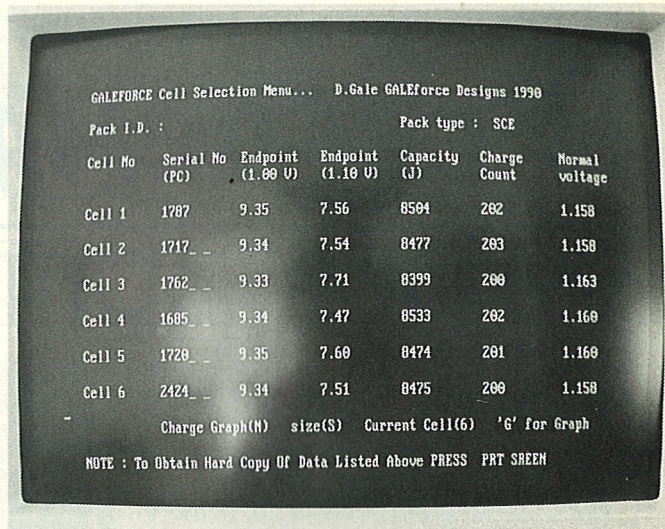
An I.D. label is produced for each cell giving an individual serial number and readings for charge and discharge. Cells are then graded using these figures and then each cell has it's discharge capacity, charge time, voltage and Kilojoules compared to ensure that the match of each six cell pack is as even as possible.

When asked why this amount of time and trouble was taken the answer we got was straight to the point. Grading cells into performance bands, rather than exact charge and discharge readings is really not good enough! Any pack of cells is only as good as the weakest cell, this will be continually overcharged, will gradually loose it's capacity and weaken the performance of the whole pack. As this process speeds up the pack performance will rapidly deteriorate to the point where the pack becomes unusable.

When a pack of cells is new initial performance will always be good, it is only as the cells are used and the charge/discharge imbalance slowly weakens the pack that the benefits of this system



Each cell is separately charged and discharged under FET Control. During this cycle each cell has it's own Power Supply & Discharge Circuit.



Cells are selected and their match is checked using Charge Count, Discharge, Voltage & Kilojoules.

really show up. Again long term testing and acquired data show that deterioration of this type is slowed considerably using the Galeforce system.

The computer graph included with every pack of Galeforce cells shows the capacity of the pack in Kilojoules. Again it was quickly pointed out that it was not possible to guarantee the minimum capacity of Galeforce competition packs as the quality and consistency cells vary from batch to batch. Galeforce have also established from their data that cells with identical charge/discharge readings do not necessarily have the same capacity or voltage, the reason why each pack is selected and checked. An added advantage of this data is that packs can be selected for optimum performance for the diverse needs of specific classes. That is to say duration for 1/12 drivers and sheer power for the buggy racer.

Galeforce take as much care in preparing all the packs that leave the works whether they be competition packs or clubmans. The clubman pack is ideal for the thrifty driver offering a good working life, especially when the very hot motors are avoided.

Performance Plus reckon that the Galeforce system and the packs that it provides are the best around, you don't have to take their word for it, look at some of the results clocked up so far this year. European buggy champ, a host of 1/10 circuit wins and second place in the 1/12 worlds has convinced Phil Davies that switching to Galeforce was a good move. David Gale has continued to dominate the BRCA circuit championships again this year as well as taking many 1/12 wins.

Yes Britain has long been regarded as leaders in the field of computerised cell matching, Galeforce under the guiding force of Mick Langridge and the considerable knowledge of David Gale, look set to carry this tradition into the 90's



**GALE FORCE POWER**

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