

THE MONUMENT



**A Brief History of the Clock
and Lighting by Alan Brundrett**

INTRODUCTION

When invited to a meeting in October 2004 by Councillor Steve Povey to discuss his proposal that the eightieth anniversary of the unveiling of the Nicholson War Memorial should be commemorated, I realised that as I had been responsible for the clock's maintenance since 1970, I was probably the only person who had experience of all the changes made during this period, most of which were only committed to memory.

It seemed a good idea to me to list these changes before these memories faded and to put a copy on file at the Town Clerks office.

The list soon became a narrative, and I then found some old photographs and other photographs more recently taken were included, and so we had the making of a booklet that I hope may be of interest to some. It is not intended as a technical publication but more an anecdotal record of the events as I remember them.

The front cover is taken from an original pen & ink drawing by Brian Crombie.

“THE MONUMENT”

A brief history of the clock and lighting By Alan Brundrett.

The Monument was built in 1924-25 at a cost of £16000 of white Portland stone. It was paid for by Sir Arthur and Lady Nicholson whose son was killed in action at Ypres, Belgium in 1915 at the age of 24. It was designed by Messer's Thomas Worthington & Sons, Manchester, and stands some 80 feet high.

The clock mechanism and bells were by Gents of Leicester, the clock face is 6ft 9in in diameter and the 5 bells weigh 25.5cwt in total.

The clock was first started by Mr. W.E. Beecham, Surveyor to Leek Urban District Council in 1925.

The clock system was known as the “Gents Pulsynetic System” manufactured by Gents of Leicester and would have been at the cutting edge of technology for its day. It consisted of the following.

1. The “Master Clock”. An electro-mechanical device of reasonable accuracy and capable of driving or controlling other devices. This was located on the first floor in the tower.
2. The “Chiming and Striking” timer. A switching device driven from the master clock that controls the chiming and striking mechanism, located alongside the master clock on the first floor. This was not very reliable and could give rise to missed chiming or striking, but was probably typical of the technology at the time.
3. The “Chiming and Striking” mechanism. A mains electrical driven mechanism which operated the hammers on the bells, controlled by the chiming and striking timer and located on a balcony below the belfry. This was also not very reliable but again was typical of the technology of that time. The original motors would have been DC motors as the mains supply would have been DC in Leek at that time. They were replaced by AC motors in the 1950's.

4. The “Waiting-Train Turret Movement”. A mechanism situated behind the dials that drives the hands, it’s time keeping controlled by the master clock and containing contacts that synchronizes the chiming and striking timer with the hands. It derives its name of “Waiting Train” from the fact that having turned the hands a half minute division on the face in less than 30 seconds it would then “wait” for a signal from the Master Clock before continuing. This mechanism was powered by a short pendulum, driven by a solenoid controlled by a set of electrical contacts. These contacts could be a problem at times due to the arcing created as these contacts operated caused pitting and burning to their surfaces.

5. The “Bells”, five in number, are located in the Belfry immediately below the clock face chamber. The Hour Bell is 37inches in diameter and weighs 10cwt and is G sharp. The other bells are 32inches 6.5cwt B flat, 26inches 3.5cwt D sharp, 24inches 3cwt E Sharp and 22.5inches 2.5cwt F Flat. They bear the name Gents of Leicester but it is unlikely they were actually cast by Gents.

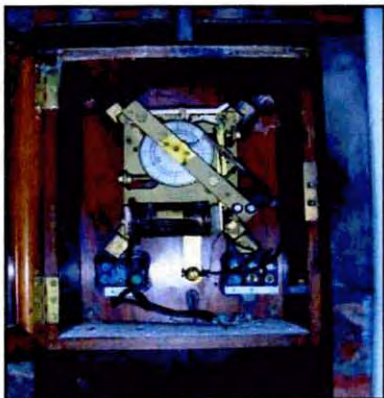
6. The “Power Supply”. The whole of the timekeeping mechanism was powered by lead acid batteries in two banks giving 30 volts per bank. These banks were run alternately, one bank in operation the other bank charging. This was controlled by a panel, consisting of switches and meters, with lamp holders into which carbon filament lamps could be inserted to vary the charging current. This was a unique system only found on DC supplies. A trickle charger later replaced this when the supply became AC.



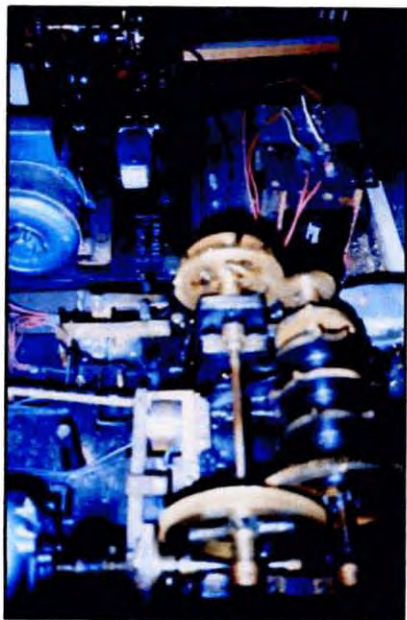
The Master Clock and the Striking & Chiming timer.



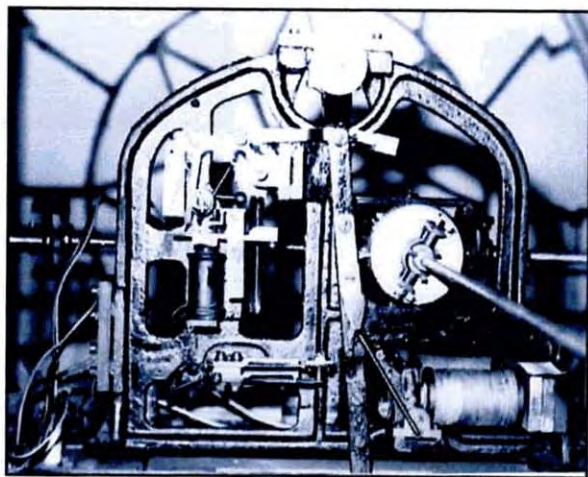
Close up of Master Clock.



Close up of Timer.



Chiming & Striking mechanism.



Waiting-Train movement.

Over the years the chiming and striking mechanisms had been a constant source of problems and for many years were abandoned. Several efforts were made at repairs, but these proved unsuccessful,

In 1986 it was decided to reinstate the chimes and the original chiming and striking timer was replaced by an electronic timer, and the chiming and striking mechanism was also completely replaced by Smiths of Derby. This gave a very accurate and reliable system but had the disadvantage that the chimes were not automatically synchronised with the hands.

The cost of this was £7000 and was put into operation by the then Mayor of Leek the Hon. John Plant, in July of 1987.

I feel it was short sighted not to have done a complete restoration at this time but it could well have been financial constraints that prevented this at the time.

In March 1990 I reported to the Leek Town Council that there were problems with the batteries and the contacts on the turret movement and difficulties in obtaining spares. No action was taken on this report and I reported the problems again in March 1991.

In 1991 the Council received proposals and quotations from three companies, with three totally different approaches to the problem. These were Smiths of Derby, Beardmoor Engineering of Leek, and A. J. Nichols of Bristol.

I presented a report to Leek Town Council setting out the merits of each proposal and concluding that I would recommend the Smiths of Derby proposal. The Council, however awarded the job to A.J.Nichols of Bristol. Cost £1305.

The A.J.Nichols modifications only went part way to alleviating the problems and a report appeared in the Leek Post & Times in July 1995 that the Leek Town Council were to spend £2750 on work to prevent the clock from gaining seven minutes a day and stopping at noon. The clock did not in fact gain or stop as reported and I wrote a letter to the paper, which they published, stating this and also that had my recommendations been followed this extra expenditure would not have been necessary.



The restored Charging Panel.



The cabinets that would have held the Batteries, right and the Charger, left.

Work was carried out in July 1995 by Smiths of Derby to replace the Waiting-Train Turret Movement with a synchronous motor driven unit powered from the mains with an inverter and battery operated back up system in order to power the clock in the event of a power failure. Cost £2750. This system has run very efficiently to this date, the only disadvantage being that the hands are not automatically synchronised with the chimes and striking and these have to be adjusted at the changes of British Summer Time (BST), and Greenwich Mean Time (GMT).

To summarise the present set up in the clock tower, the fingers are driven by one single phase synchronous motor through a gearbox and a set of bevel gears situated in the chamber at the rear of the faces. This is normally powered direct from the mains, but a control unit constantly monitors the mains and in the event of a mains failure switches to a battery powered inverter system, the battery for which is on permanent trickle charge. This would be capable of powering the clock for 30hrs. The system also contains a computer chip which is programmed with a 100 year calendar. This enables the system to make the necessary changes between British Summer Time and Greenwich Mean Time automatically at the correct times each year. At this time the clock will stop for the required time to effect the hour correction. At the time the computer chip was programmed the stipulated time for BST to end was the Sunday following the fourth Saturday in October, but the legislation was changed in 1998 to bring the UK into line with Europe and the change now takes place on the last Sunday in October. This means that in some years the change will not take place on the correct weekend. At some time in the future when a "final" decision is made on the future of BST this chip could be reprogrammed. This inverter unit is located on the first floor. The chiming and striking timer is electronically controlled, powered from the mains but with its own battery backup system. It has facilities for manually switching off the chiming or striking mechanisms and also the facility to select for them to be automatically switched off from 11pm to 7am. This is also located on the first floor. The chiming and striking mechanism is a Smiths of Derby system powered by AC motors and activated by the chiming and striking timer. When activated it operates the hammers on the bells through a system of rods and levers and plays the Westminster Chimes.

LIGHTING

Evidence suggests that the original lighting in the clock face consisted of lamp holders wired with flexible wire suspended from insulated hooks in the brickwork surrounding the faces, three lamps per face, probably tungsten filament lamps. At a later date these were replaced with similar lamps but wired in electrical conduit and with four lamp holders per face. These are still in place today, but not in use. These were again replaced at some point with a single 500w tungsten filament lamp suspended in the middle of the clock face chamber. I replaced this in 1972 by four 80w fluorescent fittings mounted vertically on a frame in the middle of the clock face chamber. This gives a good and even light distribution to the faces and is in use to this day.

The outside lighting consisted of four bronze columns 5ft high and constructed of 13 separate pieces, located one at each corner of the surrounding walls. A steel pipe was built into the wall and the 13 pieces assembled around this pipe with a lock nut at the top to hold it all in place. They were surmounted by glass opal spheres some 15inches in diameter and illuminated by 150w tungsten filament lamps. The supply ran underground in steel pipes from an underground chamber just inside the main door. At some time in the early 1970s one of these columns toppled over and it was discovered that the steel pipe retaining the whole assembly had rusted through. This gave great concern for the safety of the other columns and they were removed, all were found to be rusting through. These lights had not worked for many years and it was found that the wiring was also defective.

The whole system was rewired with steel wire armoured cable in the existing steel pipes where possible but in places this had rusted away and excavations had to be made in the concrete below the paving in order to get the cable through. The bronze columns were chemically cleaned, varnished and re-assembled onto new steel pipes welded onto steel plates that could be bolted down to the walls.

They then remained in lighting until 1994 when the varnish had deteriorated and the bronze become discoloured. It was decided to remove them and have them cleaned and this was undertaken by Boltions of Froghall but was not a success. It was then decided to paint them black and gold, as they are today. The spheres were also changed for poly carbonate ones and the lamps for 20w compact fluorescent low energy lamps.

In 2004 history repeated itself when one of the columns collapsed, and on inspection it was found to be the same problem of rust at the base of the fixing pipe. All the columns were removed for safety. New fixing pipes were made by Klucznik's agricultural engineers at no cost but this time they were galvanized. The columns were repainted by volunteers from Leek Town Council and reassembled and put back into lighting by Protech electrical contractors on the 15th October 2004.

There is photographic evidence that some form of floodlighting was installed prior to 1949, that consisted of some form of tubular light fittings suspended just below the roof and shining down the walls. How these were supplied or when they were removed is not known.

Floodlights were installed, possibly in 1953 for the Queen's Coronation, as they were on many buildings for this occasion. They consisted of four large floodlights situated one in each corner of the surrounding walls, lit by 500w tungsten filament lamps. The electrical supply was run in steel conduit over the surface of the flagstones and entered the tower through holes drilled through the door frame which can be seen to this day. These fell into disrepair over the years and were removed for safety reasons in the late 60's. They did however continue to give good service as emergency lighting for the Leek Urban District Council Highways Department for many years, used for example when the road collapsed at the bottom of Sneyd St. and the supermarket fire at the bottom of Shoobridge St.

New floodlighting was installed in the mid 70's consisting of 500w Quartz Halogen floodlights situated one in each corner of the surrounding walls and one on top of a lighting column on the traffic island to illuminate the top of the tower. These were very prone to vandalism and were eventually removed.



Gilding the weather vane with gold leaf, 1970s.



Working on the face, 1970s.



Derby St with the old Baths still standing.

Both photographs taken from the weather vane of the Monument.



Looking over Bath St towards the old Town Hall.



Smithfield Centre, note the smoky atmosphere.



Looking over towards the Buxton Road.

IN CONCLUSION

What of the future?. Most of the equipment removed during the various improvements has been retained in the clock tower, and I believe every effort should be made to restore this equipment to a working condition, with a view to displaying it in a museum or heritage centre at such time that Leek is fortunate to get one. The Charging Panel has already been restored and is at present stored in the Monument.

I feel sure that any restoration would get the backing of The Antiquarian Horological Society who visited the clock in 2001, and many other interested parties.

The main stumbling block would be the Waiting Train & Turret Movement. When the clock was converted to a synchronous motor drive the original frame and bevel gears were used, which would mean that these would now have to be replaced with an entirely new frame and bevel gears in order to release the original ones for restoration.

The Master Clock and the Chiming & Striking Timer are in their original condition and would not present much of a problem to restore.

The Chiming & Striking mechanism has been disassembled and may or may not be complete and the parts are in a poor condition. However I am sure that there is enough expertise in the local area to overcome any problems that would arise.

All of this equipment is of historic interest, and if left in its present state will continue to deteriorate or worse be disposed of and be lost forever. If funding could be found this work could be undertaken by local volunteers, enrolling the help of the younger generation perhaps at the Leek College. To see this equipment working in a museum environment would be fascinating to people of all ages, and a sight few people have had the opportunity to see in its working life.

ADDENDUM

In July 2006 the corner light nearest to the Talbot Hotel on Ashbourne Road was vandalised and it was found that replacement spheres of this type and size were no longer available.

This required the purchase of four complete light fittings and the modification of the existing bronze columns to accommodate the new fittings.