



SIGNALLING ON THE WATERCRESS LINE

by Clive Jackson

INTRODUCTION

With four London and South Western (LSWR) type I signal boxes in preservation, all of which are used for their intended purpose of signalling trains, and the two stations of Alresford and Ropley signalled using LSWR pattern lower quadrant arms mounted on lattice posts, the Mid-Hants Railway has the premier collection of pre-grouping LSWR signalling equipment, as well as an excellent collection of SR/BR(S) signalling equipment. Medstead & Four Marks station is signalled to SR/BR(S) standards as is some of the recently introduced signalling at Ropley, while the system commissioned at Alton in 2010 represents a small IBR colour light signalling installation of the 1950's, and incorporates an extensive relay interlocking system.

THE SIGNAL BOXES

Traditional signalling, as we recognise it today, with block working and centralised control from interlocked signal boxes was installed during the last two decades of the 19th century and heralded a significant improvement in the safety of train travel. In this period, signal boxes were installed at the stations of Alton, (which had previously been totally rebuilt to accommodate the Mid-Hants line), Ropley, Alresford, and Itchen Abbas . Boxes were also provided at Winchester Junction, where the Mid-Hants line joined the main line to Southampton and Butts Junction, at the western end of Alton, where the Meon Valley line, and later the Alton & Basingstoke Light Railway diverged from the Mid-Hants route. A further box was added at Medstead station, as Medstead & Four Marks was originally called. The section between Alton and Butts Junction boxes was worked as double track – the only part of the route ever to be doubled. The boxes at Alton, Butts Junction and Winchester Junction were brick constructions designated as LSWR type IV boxes. Surviving examples can currently be seen at Farnham and Aldershot. The remaining boxes on the Mid-Hants route were all of LSWR type I as seen on the Railway today.

In the 1930's, the Southern Railway decided that the traffic on the route did not warrant the expense of manning and maintaining so many signalling installations, and removed the passing loops at Ropley and Itchen Abbas, allowing the signal boxes at these locations to be abolished, ground frames being installed to permit access to the goods yards at these stations. Having managed to close the unprofitable light railway to Basingstoke, the Southern Railway also closed Butts Junction box, all pointwork and signals being removed from the junction and the Mid-Hants and Meon Valley lines being worked as parallel single lines from Alton station to the former Butts Junction. Although much overgrown, the track bed of the former Meon Valley line can still be traced diverging from the Mid-Hants route at this point. A new housing development now occupies the area where the Alton & Winchester Light Railway curved away on an embankment. Although roofless and in a poor state, the brickwork of the locking room of Butts Junction box still stands at this point.

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With the regular passenger services crossing at Alresford, there was little need for the box at Medstead and Four Marks, but this did provide the ability for additional trains to be run on the line, such as goods workings, and also allowed trains to be diverted via the MHR from the main line to accommodate engineering works.

Significant numbers of diversions occurred in the 1960s, when the main line to Southampton was being electrified, but once this work was complete, Medstead box was closed – being demolished only a few years before the line was purchased by the preservationists.

In the 1970s, the line to Alton – at this stage a terminus – was singled, and the signalling and track layout remodelled so that Bentley and Alton stations could be operated remotely from Farnham signal box. The remodelled track layout also made provision for the extension of the heritage line to Alton, allowing the steam services to be operated totally independently of the trains on the “big railway”. The type IV box at Alton closed as a result of these changes, but its locking room survives in use as a storage facility on platform 1.

REPLACING THE LOST SIGNAL BOXES

From the above, it will be realized that the only MHR box to survive into the preservation era was Alresford. Fortunately the Railway was able to acquire suitable replacement boxes from elsewhere on the ex-LSWR system. All three of these boxes were LSWR type I boxes, the box at Medstead being externally virtually indistinguishable from the original, although the 21 lever frame is larger than that of the original box. This box came from Wilton South on the LSWR main line to the west. Of course it is only practical to move the wooden upper storey, known as the operating floor. The brick locking rooms had to be built specially to the original design. The existing Medstead signal box does actually contain one component of the original. At the time the original box was demolished, a local resident rescued the locking room window and subsequently donated it to the Mid-Hants Railway.

The box at Ropley was moved from Netley, near Southampton. As built, this box was a similar size to the other boxes on the Railway, but during its pre-preservation life its length was extended by 50% in order to accommodate a larger lever frame. If you look carefully you can see the join! Today this box houses a 30 lever frame, providing control over sufficient signals to provide the flexibility required at the station which tends to be the hub of galas and other special events.

Alton box was originally one of two provided at Bentley – the next station towards London. These boxes were replaced by one larger box, and the wooden upper story of one of the redundant type I boxes was moved to Alton Platform 1, where it served (at platform level) as a station master’s office. This box therefore had only to be moved around 100 yards to its new location. This box is the only signal box on the MHR not to be mounted on the platform, and thus has a higher locking room structure, the operating floor being reached by means of a dog-leg staircase. With a run round loop in the station and a passing loop outside (the Watercress Line has access to only one platform at Alton) the running track



layout at Alton is the most complicated on the Railway. As a result the 20 lever frame fitted in Alton box was inadequate for the needs of the station, and this, coupled with the need for semi-automatic operation, dictated that Alton box was equipped with a small panel working colour light signals and power operated points.

SINGLE LINE WORKING

All three single line sections on the MHR are worked using Tyer's Electric Key Token (EKT). Prior to the commissioning of the colour light signalling system, The Medstead-Alton section was worked on the One-Engine-in-Steam (OES) method, there being no operational signal box at Alton and the points being worked from ground frames released by the train staff.

With OES working, there was no need for a signaller to be stationed at Alton, the points being worked by the station staff, guard or loco crew. For intensive services, where trains needed to cross at Alton, signallers were based there and the section was worked by a simplified version of Staff and Ticket. Although it was very basic in nature, the old system worked very effectively, and during galas, up to two trains and four engines could sometimes be under the control of Alton Box. However, the arrangement was very labour intensive and required up to three signallers to operate it.

Both methods of working have been replaced by EKT working, with the introduction of the new signalling system at Alton. However, there is still a need to operate the Railway with only three signallers, as it is not always possible to find sufficient volunteers to open all four boxes.

The Alton signalling system permits this as it includes an "auto-working" facility that provides for the signals and points to work semi-automatically when the box is switched out. Only one train at a time can be in the Medstead-Alton section when auto-working is in operation, and not all the movements possible when the box is open are available under auto-working. Nevertheless, in addition to the normal locomotive run round, the system can accommodate multiple unit workings where no run round is required, and also permits access to the sidings in the station area – for example to shunt the Alton coaching set into or out of its siding.

ALTON AUTO-WORKING SYSTEM

EKT working normally requires the agreement of the signallers at both ends of the single line section before a token can be released. When Alton box is closed, this is obviously not possible. Under auto-working, a long plunge on the Medstead-Alton instrument by Medstead signaller causes the auto-working system to release a token, the withdrawal of which causes the Medstead Up starting signal to be released so that it can be cleared for the passage of an Alton bound train. On arrival at Alton, the signals and points work automatically for the run round, but the loco crew have to press a plunger under signal AT



55 in order for the calling on signal to clear into the platform. An alternative plunger allows the crew to select the loop line instead, which according to the lie of the lever operated siding hand points allows access to either of the sidings in the station area. When the train is ready to return to Medstead, the driver inserts the token into a special instrument on Alton platform, which causes the Down starting signals AT 50 and AT 54 to clear.

MORE THAN A MUSEUM

While the MHR's signalling installation provides a unique working museum of historical importance, it is at the same time a vital component of the Railway's ability to run frequent and interesting train services. When Alton is worked as a block post during major events such as steam and diesel galas, four or five trains can be operated to provide a 35 minute service over the entire length of the line. This can be matched by few heritage lines of a similar length and represents a considerable increase over the traffic that the line would have seen prior to preservation.

Some recent steam galas, based on the experience gained operating the old style mid-week Thomas timetable, have employed a mixture of through "express" workings, often non or limited stop, coupled with "local" workings which start at each end of the line and terminate at Ropley. Additionally, occasional goods workings are sometimes incorporated. Such events capture some of the atmosphere of the line in its role as a diversionary route for Southampton and Bournemouth trains and, with five or more trains in operation plus shunting of the terminating trains at Ropley, provide plenty for the visitor to ride on, watch and photograph. They also provide a busy day for the signalmen, particularly the one at Ropley! The one or two coach shuttles also provide an opportunity for the line to host small engines such as the Beattii Well tank and Brighton Terriers, which are normally too small to operate over the Mid-Hants' gradients.

ROPLEY ENHANCEMENTS

It is primarily to accommodate gala and Thomas events, which can require considerable shunting at Ropley in conjunction with a busy timetable of through trains that the additional signals are required at this station. The outer home and advance starter signals at each end of the station allow shunting to take place safely even when trains are approaching the station in both directions, while additional flexibility is provided by both platforms being signalled bi-directionally. Due to the limited amount of ex-LSWR signalling equipment available, Ropley now has a mix of LSWR lower quadrant signals and SR upper quadrant ones.

With Alton box in auto-working, a three train service of up to 40 minute interval can be provided, as is currently the case for the Thomas events, War on the Line etc, but for normal operations, a two train, hourly service is adequate to accommodate passenger requirements. This provides spare paths for footplate experience engines, and various non-



revenue earning workings for engineering purposes or to support carriage cleaning and maintenance operations.

LSWR SIGNALLING PRACTICE

The LSWR originally installed Stevens' Flap signals for shunting purposes, these being replaced subsequently by the Westinghouse type disc signals which are used extensively on the MHR. The Railway has two examples of the rare Stevens' pattern signals, but these are currently not in use.

The LSWR, in common with the other pre-grouping companies used lower quadrant signals (horizontal for stop, down for clear), but in the early 1920's the society of signalling engineers, decided that it would be better to standardize on upper quadrant signals (horizontal for stop, up for clear), and it was thus this type that was adopted by the Southern Railway, only the Great Western opting to stay with the lower quadrant type.

Nevertheless, traditional signalling lasts a long time (some traditional boxes on the "big railway" have outlasted two generations of MAS signalling systems!) and where there was no need to replace it, pre-grouping lower quadrant equipment remained in place for many years – I came across a Great Western pre-grouping balanced arm signal still in use on the main line to Truro in the 1990's and it wouldn't surprise me if it was still there! Medstead and Four Marks was converted to upper quadrant in the 1950's, while photographic evidence appears to show that the LSWR signalling at Alresford outlasted the demise of steam, although replacement upper quadrant signalling was in place by the time that the line passed into preservation.

The view is sometimes expressed that upper quadrant signalling is safer than lower quadrant because in the event of the signal wire breaking, the upper quadrant arm will drop to "stop", while the lower quadrant arm will drop to "clear". This is actually incorrect, almost everything about signalling being "fail safe". In fact both systems are pulled to the "clear" or "off" position by the wire, and return to "stop" or "Danger" by gravity, balance weights being incorporated to ensure this. With the design of the Stevens' equipment used by the LSWR, the heavy spectacle plate casting will ensure the signal arm returns to Danger even if the drive rod to the arm were to fracture. The primary cause of risk associated with lower quadrant signals, and the cause of a tiny number of accidents in freak weather conditions, is that an excessive build up of ice and snow on the arm can add sufficient additional weight to overcome the balance weight. However, such accidents have never occurred in the South of England, and the MHR would be unlikely to be running in such adverse conditions, so we can continue to use our lower quadrant equipment in perfect safety!

It was the practice of the LSWR to provide few if any shunting signals at country stations, with the result that the commonly used Type 1 signal box in its basic size, while ideal for accommodating their original frames of 10 or so levers, offered limited capacity for expansion. As a result, lever saving techniques were employed extensively, particularly in relation to shunting signals. The primary technique, also adopted by the Southern Railway,



was to use a single shunt signal to read over several routes. This also saved on the signals themselves, resulting in far simpler signalling installations than other companies would have used in similar situations. Additionally, three position levers were commonly used by the LSWR, the lever being “pulled” from its central “normal” position to clear the signal authorising movements in one direction over a crossover or siding, and “pushed” to authorise movements in the other direction.

The Down Inner Home gallows signal at Alresford, originally used at Swanwick, near Southampton, demonstrates this. The left and right hand lower quadrant running arms read into platforms 2 and 1 respectively. Instead of Calling On arms being provided, the Westinghouse dummy can read into both platforms and the cattle dock. The lever working this signal, also works the cattle dock exit dummy, thus only three levers are used where other companies might have employed six. There is thought to be only one other example of a 3 position lever in an operational signal box. This is in the newly restored box at Corfe Castle on the Swanage heritage railway. However, this box, with its tiny frame in what was originally the porters’ room, was actually a replacement for the original box at this station, and it is understood that in the long term the Swanage Railway intends to rebuild a replica box in its original position on the Down platform at Corfe. Because it is no longer permitted to install new three position levers, it is likely that from this point, lever No. 5 at Alresford will become the sole surviving operational example of this once common feature of Southern Railway signalling.