

Jackson Brothers

INTRODUCTION

“*They’re still trading?*“ was my first reaction when I noticed a recent advertisement in RadCom announcing that the new management at *Linear Amp UK* now use Jackson Bros components in the latest generation of their products.

I would imagine that the name “Jackson Bros” is immediately recognized by all RAOTA members, and indeed any of our generation, licensed or not, as being synonymous with tuning capacitors. But perhaps it is a surprise to many of you that the company still exists. Indeed it seems to be thriving, after being purchased by *Mainline Electronics* in November 1998, despite a troubled period in its history immediately prior to that, and a devastating fire shortly afterwards.



Fig 1

Current model from “*Linear Amp UK*” which uses Jackson Bros capacitors, ball drives, panel bushes, couplers, and extension spindles.

A brief search of the web produced surprisingly little in the way of information about Jackson Bros history, aside from a link to the website of *Mainline Electronics*. I decided to contact them with a view to preparing a potted history of Jackson Bros, before the historical details were lost forever. My email produced an enthusiastic response from Jim Parker, their technical manager, who kindly sent me a copy of articles that had appeared in *Radio Byegones* (Feb & April 1994).

I’m aware that one edition of the Jackson Bros catalogue (produced by Mainline) contained a history of the company, and a few of you may have picked one up at a rally. Quite by chance I found a ‘hidden’ page on the *Mainline* website (<http://www.mainlinegroup.co.uk/jacksonbrothers/index.htm>) which contained a version of the magazine article, and this put me in a bit of a quandary. The information was already available, but would not be accessible to any of our members without internet access. Although *Radio Byegones* is still available as an online magazine (<http://www.epemag3.com>) the back issue CDROM does not go back before 2000.

The fact that I didn’t have access to original photos (Mainline has lost touch with the family that founded Jackson Bros) was none too encouraging either. It was going to be difficult to avoid merely repeating what had already been published, but with the help & encouragement of Jim Parker I decided to go ahead.

THE FOUNDERS

Jackson Brothers was founded in 1923, by Leonard & Louis Fillmore. The company name was mainly to do with their father, Walter Fillmore. He was an archetypal Victorian and having provided most of the startup money believed it was his right to choose the name of the company. The name he chose was, perhaps predictably, John Bull & Co. After lengthy debate the two brothers persuaded him against it, on the understanding that the name would fit the initials JB (for John Bull) used as their company logo.

'Jackson' was considered to be an acceptably 'English' name by Walter and so "Jackson Brothers" was born.



Fig 2. LEFT : The original JB logo, based on the letters 'JB'.

Fig.3 RIGHT : A Fillmore family photo, taken circa 1918.

Walter & his eldest son Louis at the rear. Elizabeth, Walters wife, with her sister Dorothy to her right. At the centre, and Leonard at the front.



Leonard Fillmore was fascinated by wireless from a very early age. From the moment he heard about Marconi's successful transmission across the atlantic he read anything he could find on the subject. In 1917, and just 14 yrs old, he gained an apprenticeship at Vauxhall Motors in their machine shop and tool-room. Training that would later serve "Jackson brothers" well. By the end of the following year he had constructed a wireless receiver and transmitter in the attic of his parents house, and strung various lengths of wire around the garden.

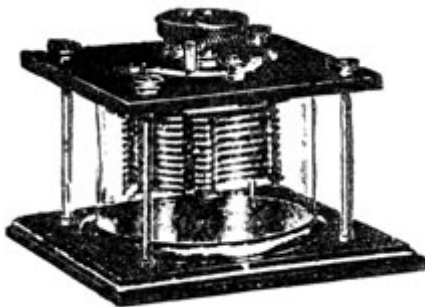


Fig 4. A typical variable capacitor of 1914 era. The vanes are enclosed in a glass case. Manufacturing quality and tolerances on these professional devices were to the highest standard, and was reflected in their price.

One of the difficulties he encountered while building the equipment was the high cost of tuning capacitors. Although they were available by 1918 they were precision units for the professional market with a price that reflected this. Purchasing them was not a practical proposition by the vast majority of amateurs so home construction of the components was required. Overlapping plates with a dielectric spacer between them were a common construction method, as were concentric tubes. Vauxhall Motors tool room facilities unwittingly played a crucial role in turning an idea of Leonard's into a practical solution. He mounted a number of semicircular plates, accurately spaced, on a spindle that he could rotate between rectangular plates fixed to a Bakelite base. After some refinement & further development he was ready to go into production of capacitor kits.

With the debate about the company name resolved, the Fillmore brothers and their father rented rooms above a shop at 8 Poland St, Soho, selling via mail order direct to home constructors. It was not long before the brothers realised that many home constructors were not able to assemble the parts correctly, so they decided to start selling pre-assembled components. This change of direction required rationalization of their product line into the series of 'standard values' which we are so familiar with today. They were then able to expand their sales routes to component stockists, and suppliers of complete receiver kits.

There were no pre-built set makers at this time and it would be several years before Jacksons orders from commercial set makers provided a significant part of their trade. Their early reliance on home constructors caused problems. Building wireless sets at home was usually done during the winter. Trade

disappeared almost completely during the summer, but in autumn & winter the demand increased to the point where 12 or 18 hour days were often required.

As increased demand from commercial set makers grew, it provided a more consistent year-round demand so the brothers felt confident enough to move into a new factory near London Bridge railway station. Makers like Bush, Murphy, and Ekco were regular customers by then.



Fig 5. An Ekco 'round radio' of the 30's, with a Bakelite case.

When combined with a wood flour filler, phenol formaldehyde, known by its trade name 'Bakelite' after its inventor Leo Baekeland, forms a useful mouldable plastic, with very good electrical insulating properties.

It was the first plastic to be used for making radios, and was ideal for the Art Deco-style designs of the 1920s and 1930s.



Fig 6. In the late 20s and early 30s the best known JB products for the home constructor were what they referred to as their 'Perfect Five' group.

This consisted of direct-drive and slow-motion tuning capacitors of 150pF and 500pF (straight-line and logarithmic versions) together with a concentric tube neutralizing capacitor for triode RF amplifiers.

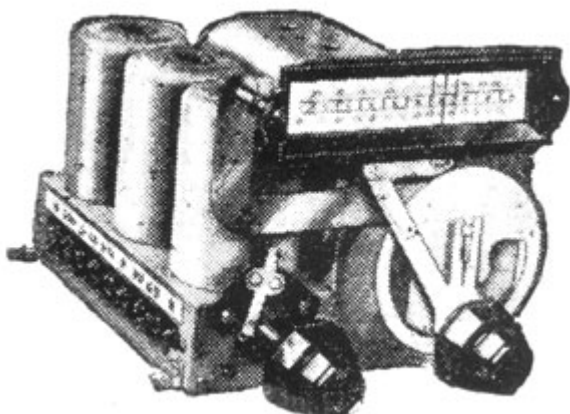


Fig 7. The 'Linacore' tuning unit was introduced at the 1937 electronics show.

It included reaction control and provision for gramophone pickup. Suitable for use with mains or battery valves.

Having your components specified in the more prestigious home construction projects in the wireless magazines of the day was crucially important to their reputation. Getting 'specified' in the first place required the quality to genuinely be high. No marketing 'spin' or 'hype' back then.

Scott-Taggart specified JB components in the design of the drive for the ST800 in 1936, and their capacitors were specified for his 'All BBC' set a year later. JB advertisements of the time took full advantage of their association with the Scott Taggart name.



Fig 8 & 9 Scott-Taggart specified JB components in the design of the drive for the ST800 in 1936, and their capacitors were specified for his 'All BBC' set a year later.

The 1930s saw continuous development & rapid expansion of the JB product range. In 1933 they introduced their "full-vision tuning drive assembly" which had the dial-lamp moving with the cursor, together with a shortwave slow-motion dial giving 8:1 and 150:1 ratios. Three and four-band superhet capacitors with matching, calibrated, scales were announced too. The same year saw the 'Nu-gang' screened capacitor and the 'Dilecon' range of solid-dielectric capacitors that are still available today.



Fig 10. The Dilecon solid dielectric capacitors appeared in the 30's and are still in production today.

The 'JB Baby Gang' capacitor with a ball-bearing rotor appeared in 1935, along with an American style 'Airplane' dial and a range of two-colour tuning scales.

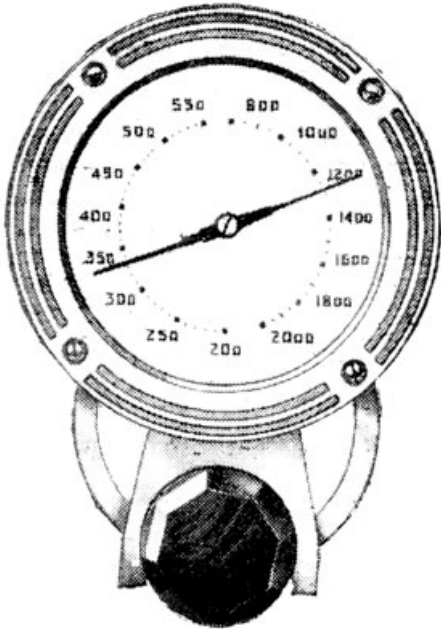


Fig 11. The JB 'Airplane Dial' of the 30's was available in chrome, oxidised silver, and bronze finish. It featured high legibility wavelength calibration, a dual lampholder, and a glass face in the escutcheon

1936 saw JB introduce midget TV tuning capacitors. Single gang and twin gang versions were available, with the option of a slow motion drive on each.

The range and quality of the products on the JB 1937 show stand prompted Popular Wireless Magazine to say "...this stand has one of the finest displays of well made, but competitively priced components in the whole show...", and by the following year they had launched an all-wave receiver kit of their own design.

The outbreak of WW2 saw the varied customer base of JB replaced by one single customer. The Govt. They were one of a number of companies that worked closely with the Govt to produce 'mil-spec' quality components, and the fact that many of those components are still around today is testament to how well they were made, although 'commonality' with other Govt suppliers can make identifying JB components tricky.

JB's factory was located close to London bridge station, and in 1941 their factory was totally destroyed in a huge fire started by incendiary bombs, but with the help of the MOD they were back up to full production from a new factory in Waddon within a few months. Unfortunately this new factory was by Croydon airfield and in 1944 a V1 flying bomb hit the factory right next to JB's and the resultant damage made it impossible to carry on working there.

The MOD were not so helpful, this time around in finding alternative accommodation. The Govt clearly felt that the war was all over bar the shouting and it fell to Fred Chaston (a man who became somewhat of a legend at JB) to find a suitable factory elsewhere in Croydon and then to persuade the govt officials that their suggested relocation to Newcastle was inappropriate. Just 1 year later Fred Chaston's view was vindicated. JB were able to move back into the rebuilt Waddon factory

This damage to the Waddon factory might have been a side-effect of the deception plan for the V1. The Double-Cross system was used to falsely report the points of impact of V1 impacts to the north of London at the times of actual impacts to the south of London. This deception apparently persuaded the Germans to reduce progressively the range setting on the V1. Saving an estimated 50% of civilian casualties. The Waddon factory was rebuilt and Jacksons moved back into it in 1945.



Fig 12. Fred Chaston (left) at his leaving party in 1976.

This remarkable man joined JB in 1925, straight from school, and was a stalwart & dedicated employee of the company for the next 51 years.

He was made general manager on the death of the founders, and his tireless efforts throughout his time with JB were a significant factor in their success and survival.

Aftermath of War

Reduction in size of variable capacitors had started immediately before WWII. but the trend was already accelerated by 1946. New B7G battery valves made much smaller portable radios possible. Reinstatement and expansion of television. coupled with the introduction of FM broadcasting brought VHF techniques into the consumer sector. With their experience of military applications during WWII Jacksons' were well-placed to meet the new demands. Meeting New Requirements Although taken very much for granted. variable capacitors critically affect the stability, efficiency, ease of tuning and resettability of radio equipment. Other critical properties are leakage, self-inductance, dielectric losses and rotor contact resistance. Variable capacitors of open construction must resist the effects of dirt and atmosphere. At least one of the banks of vanes (usually the fixed bank, or stator) must be isolated, as well as accurately supported mechanically. Operation at higher frequencies, requires stator and rotor connections to be of the lowest possible resistance and inductance (large area, short length). Dielectric and supporting insulating material must be of the lowest possible loss. Surfaces (where RF currents flow) must be of as low resistance as possible. These features are typified by the construction of Jacksons' C804 trimmers. still among the best in their class.



Fig 13. C804 trimmer

New plastics materials have had limited impact on variable capacitor design. Many low-loss plastics have thermal or mechanical limitations that preclude their use. Ceramics, although expensive to form, remain the best all-round insulators. Miniaturisation introduces further problems. Capacitance is proportional to plate area and inversely proportional to plate separation. Reducing the volume of a capacitor to one eighth reduces plate area to about one quarter. But air gap is only reduced by one half; not enough to maintain the capacitance value. A further reduction of one half - is needed to make up for the reduction in plate area. Susceptibility to dirt increases and working voltage is reduced. Plates cannot be too thin, or the unit will be microphonic and fragile. One solution to both problems (a solid-dielectric) whilst suitable for pre-set trimmers does not result in the mechanical performance of air-dielectric types.

Although lower voltages are associated with solid state circuitry, high working-voltages are still needed for power applications like transmitters and aerial matching units. Two of the design routes taken by Jackson's over the last thirty years or so are exemplified by their Dilemin miniature solid dielectric capacitor (built on the experience of their Diecon design) for medium and longwave transistor radios, and their C16 trimmers. Fortunately miniaturisation results in lower circuit strays. As a result, the capacitance swing required to tune a valved receiver across the medium waveband fell initially from 500pF to 365pF. This was the basis for the O Gang, whose air gap was reduced from about 0.012in to 0.0075in

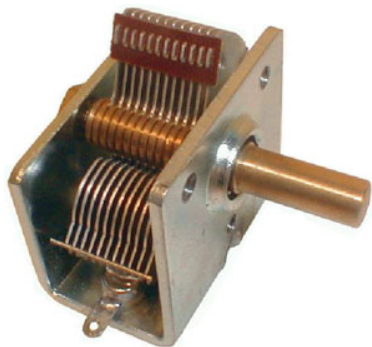


Fig 14. Jackson's 'O' type capacitors. Still available today in single or dual ganged versions. Currently only in a limited range of values because the tooling was lost in the fire, but they are hoping to extend the range soon.



Fig 15. An early 1950's photograph of the JB workforce at Waddon, with the Fillmore family.



Fig 16. The Croydon machine shop, circa 1951

Transistors

Transistor receiver manufacture was pioneered in the UK by Perdio Radio Ltd, whose products first appeared at the 1957 Radio Show, and for whom Jacksons developed their OO twin tuning capacitor. These first Perdio sets were very popular and so both companies benefitted from the co-operation.

Many thousands of C16 trimmers were used in Pye Radiotelephone equipment in the early '60s, which also prompted the development of the 'Tetfer' multi-turn trimmer.

By the beginning of the 1960's, Japanese competition was having a decisive effect on the UK radio industry. Perdio failed, and many other UK and Continental manufacturers went out of radio production altogether. The demand for variable capacitors for domestic receivers declined dramatically. Jackson Brothers countered this by shrinking their operation and designing more specialist capacitors. The demand was still very much there for capacitors in transmitting equipment and for specialist trimmer capacitors and they always had a very important range of reduction drives. Originally these were designed for fine tuning of variable capacitors, and as such were invaluable to the CB radios that were hugely popular in the USA in the seventies. As tuning went over to varicaps these drives could convert the performance of a cheap, carbon pot to that of an expensive multi-turn one.



Fig 17 & 18. Photos taken in Jackson's East Grinstead factory in the 60's.

Am I the only one who thinks the chap on the right looks like a very young John Travolta

A stroke of luck for home constructors occurred in 1967 when, almost by accident the Wavemaster range was added to Jackson's catalogue. 'Wavemaster capacitors were made as a sideline by a general light engineering company. When the owner retired he sold the company, but the buyer was uninterested in the Wavemaster production line. John Fillmore got to hear about it, went round, and did a deal there and then. Wavemaster capacitors are still in production today.



Fig 19. The Jackson 'Wavemaster'.

I'm pretty sure they used these in the 'HAC' one valve receiver kit. My very first short wave receiver.

Cheap, high quality, Japanese components posed enormous problems for the UK electronic components industry, besides eliminating many of their customers. An inevitable consequence of the quest for low cost by the Japanese has been less flexibility in the design and delivery schedule. The attendant quality management philosophies can equally well be applied to achieving quality with flexibility. at higher cost, if that is what the customer wants.) Jacksons also had the advantage of being close to their customers, and speaking the same language.

Although contraction of the UK domestic radio industry from the late 1960s onwards saw many fine names disappear. Jacksons survived well enough to absorb their long-time rivals, Wingrove and Rodgers. In doing so they took over production of the "Polar" range, which included the variable capacitors used in the 'Clansman' military radio.



Fig 20. Jacksons spent a lot of time and effort during the 50's and 60's experimenting with different logos.

A common practice at the time, but completely at odds to modern thinking where brand logos are very rarely changed, and fiercely defended against unauthorized use.

It is not just the need for precision that caused variable capacitor tuning to be replaced by solid-state synthesis. For large-scale productions the IC's and digital displays are cheaper than the mechanical components they replace. This trend will probably see the demise of the variable capacitor in domestic radio equipment.

However the limitations of wide band solid state radio front ends will ensure the retention of the variable capacitor for aerial and preselector tuning for the most demanding applications. Moreover home constructors still need the straightforward flexibility that only the mechanically variable capacitor can provide.

Under New management

John Fillmore sold Jacksons in 1989, ending almost 70 years of family control. The two individuals who purchased the company promised great things for the future, but sadly it was not to be. Rather than new products being introduced the firm was gradually stripped of its assets. Buildings were sold, and profits reinvested in other areas.

The new Directors clearly regarded Jacksons as a 'cash cow' and milked it ruthlessly.

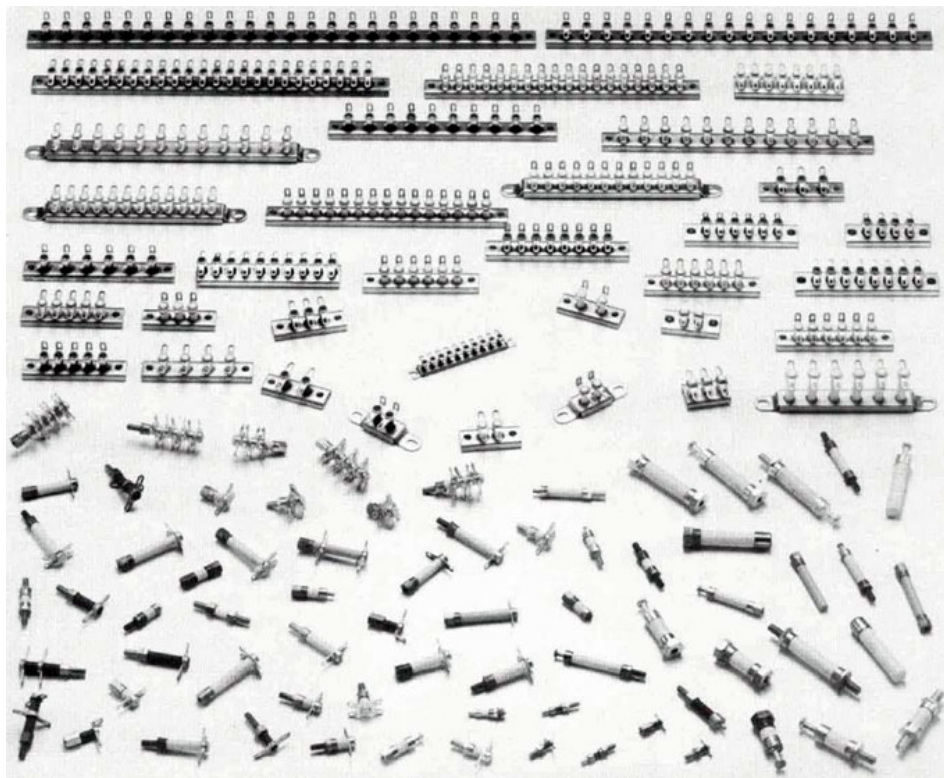


Fig 21. Jacksons still produce a *staggering* array of tagstrips and standoff insulators.

9 years later, in November 1998, Jackson Bros went into receivership. As one of their distributors Mainline Electronics was contacted by the official receiver, with a view to them buying the remaining stock.

They visited the premises and found total chaos. It was difficult to determine the exact course of events, but piecing the available facts together as best they could, Mainline believe the sequence of events immediately prior to their visit were as follows...

The bailiffs entered the building and took all of the mechanical equipment. The machines used for producing capacitor vanes, etc. The workshop had already been sold off for 'strategic reasons'. Most of the computers had been removed. Strangely enough anything that was worth any money had been sold off to another company within the group some weeks before, where also, by 'coincidence' the old Jackson staff had been moved to as well.

The bailiffs carefully sealed the building with new locks, but that night the locks were broken and all the brass & aluminium was stolen. The landlord also entered the premises and removed all the furniture. Emptying desk drawers and filing cabinets unceremoniously onto the floor.

Many Jackson products were stored in large rows of dexion racking, which had all been pulled over on their sides. The spindles, vanes, and rotors were scattered everywhere. There were photographs everywhere on the floor. The human side of this tragedy was 20 Jackson employees losing their jobs, many of whom had worked there for upwards of 40 years.

Jackson Bros was the last of its kind in the UK and through no fault of its own had been closed down. Mainline Electronics is committed to the sale & supply of radio parts and John Higgins saw the situation as a 'sin', so instead of buying a few parts he ended up buying the entire company.

Moving what remained was a logistic nightmare. Three huge lorries, countless council skips, and all within a 5 day deadline imposed by the landlord. Nevertheless they managed to salvage all of the drawings and parts that remained, plus 27 tonnes of tools and raw materials. Nobody knows how much was stolen but it must have been several tonnes of brass & aluminium. If it hadn't been for the determined

effort of John Higgins, most of this would have been sent for scrap and the JB product line would have been lost forever.

Mainline re-hired some of the original staff, including Jim Parker (the senior engineer on site) plus some assembly staff. New premises in the south of London were rented, and within 6 months of being written off Jackson Bros was again in profit. John Higgins (Mainline's MD) had not only managed to finance the rebirth of JB, but also had to deal with a lot of very angry customers who had been let down by the previous owners and get them back on board. A truly remarkable achievement by anyone's standards.

The current situation

I can think of no more fitting way to end this brief history than to use the exact words penned to me by Jim Parker. Currently Technical Manager at Mainline, and previously Senior Engineer at JB.

The last 10 years have been the most stable for Jacksons since 1989, the previous owners having relocated 5 times in a decade, including a move to and from Wrexham in just over a year. Products were reintroduced one at a time as tools and drawings were identified and brought to the assembly plant in Croydon.

Large stocks of finished goods and tools were stored at Mainline's warehouse & HQ in Leicester, but in 2005 this was destroyed in a large fire along with millions of components and ICs. This resulted in most of the capacitor lines being withdrawn, although fortunately most of the current production tooling was at subcontractors so it did not seriously affect production.

It is worth noting that all Jackson drives, capacitors, and insulator parts are assembled at Croydon from parts made entirely in England. The current range consists of 75% of the old JB catalogue, along with customer specified assemblies such as an autopilot gear & drive unit for navitron systems, together with ancillary anti-backlash gears & bushes. Modern style ball drive units are being produced as well as new insulators using ceramic and sapphire material.

The new management at Linear Amp UK have recently upgraded to Jackson capacitors for the ATU and linear amps that they produce.

The internet and website have transformed the way that JB products are marketed. Mainline Electronics has an E-bay shop which is a boon to overseas customers, especially for Radio Hams looking for one-off parts.

Jim Parker :Technical manager.
Mainline Electronics
<http://www.mainlinegroup.co.uk/>

My thanks to Jim Parker, for his help & encouragement while producing this article. The current Jackson Bros component catalogue can be found at...<http://www.mainlinegroup.co.uk/jacksonbrothers/index.htm> which for some reason cannot be reached via the main website.

David (G3ZPF)