V. 1. EARLY PROTOTYPE AND PILOT SCHEME DIESEL-ELECTRICS pdf

1: The V-1 Flying Bomb

British Rail Fleet Survey 1: Early Prototype and Pilot Scheme Early Prototype and Pilot Scheme Diesel-Electrics. Covers all early BR diesel-electrics on a.

I have a complete collection of their spotters books from , the subject of my first book. I also enjoy restoring ABCs. I am an enthusiastic ebay buyer of old and damaged Ian Allan railway books. I started to sell restored copies in January I make no claims about their investment value although I hope they will come to be regarded as great value collectors items in their own right; items which are accessible to folks with a limited budget. I lovingly restore them. Quality restored editions are very pleasing to own and to handle without fear of spine damage and they come with the option to return them in a timely manner for a full refund. A series of laminated hardback publications wriiten by Kichenside and Williams which ran to four editions plus reprints. These were not abcs - they followed later. The abc logo appeared on the Modern Signalling Handbook series first published in and which had reached the fourth edition by Predates the abc books. Code appears on last text page. Reprinted in July Preserved steam locomotives were included intermittently in some early ABCs, but only four dedicated books were produced in the initial sequence from to This included diesel, electric and miniature locomotives. It was produced using a different block bound format not characteristic of either the normal larger Railways Restored format or the earlier staple bound editions. Top photo of Kerr Stuart. Bottom Photo of PT Railways Restored The first six editions were staple bound; since , they have been block bound. Pages reverted to Top photo of Kerr Stuart T. Non standard price and page number. Title reverted to single year for the first time since New standard spine design adopted. Heritage timetable now part of consolidated pages. Page number reverted to size Spine layour maintained but changed to non-serif bold font. The cover indcates in error that this is the 33rd Edition. A series which invites the question of whether these are abcs or not. The larger and later "Traction Recognition" titles carry the abc logo. Class 50 "Howe". Class 56 layout Class 20 layout Front Class unit. Class 3 car unit at Nursling closed. Front end Class 2 prototype. Front end Class Coaching Stock -1st Ed. Mk2f First Open No S Mk3a Sleeping car end detail. Mk3a FO under construction at Derby. Tinsley depot June with Classes 56,37,31 and 45 on show. Side elevation of Class 58 locomotive. Class unit No. Big reduction in pages from Big increase in price from El. Class 2 car MU No. Coaching Stock - 2nd Ed. Price increased by El. London Transport Railways - lstEdition. Class 50s - Ist Edition. Class 37s - lstEdition. Benelux - Ist Edition. A train of stock runs alongside a Dutch canal. The 13 digit ISBN is the same Signaling and Signal Boxes The former GN signalbox at Havenhouse. A Class unit passes signalling at Witham. Class Holyhead-Euston Super-Voyager. R BCA edition. Three aspect colour light signals - Leeds station.

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After early trials with prototype diesels BR ordered a number of "pilot scheme" diesels in the mids as part of its Modernisation Plan to eliminate steam. Twenty of these diesels were from what would become the Class 20 and in fact the first one built (D) was the very first diesel delivered to BR under this pilot scheme [1].

Railway enthusiasts fall into two categories: In recognition of its historical content, the site is being archived by the UK Web Archiving Consortium - very well deserved, if you ask me! Type 1 up to 1,hp Type 2 1,,hp Type 3 1,,hp Type 4 2,,hp and Type 5 3,hp upwards. As a result, the diesel classes became sub-divided by reasons of changes in power output, electrical equipment, and coupling systems variations as construction proceeded. The remaining locomotives were fitted with the more powerful Sulzer 6LDAB engine developing 1,hp and were classified as Class In , it was planned that 80 locomotives would go to the Eastern Region, 65 to the London Midland Region, and 29 was to be shared between the Southern and Western Regions. First, we take a look at the Type 1 and 2 pilot scheme diesel locomotives This gave the conglomerate the vast manufacturing capacity to deal with the first 20 pilot scheme Type 1 Bo-Bos Nos D in Although less glamorous than its larger EE Co relatives in the Type power range, the Type 1 was an attractive piece of industrial design. Painted in BR Brunswick Green livery for the main body, with a medium grey roof over the bonnet and cab, black undergear, red bufferbeams and polished handrails and trim. The first locomotive, No D, had already been formally handed over on June 3rd Here, with less than a year of revenue-earning service behind them, a pair of pilot scheme Type 1s Nos D and D is coupled as a 2,hp unit on August 16th Although the No 2 end of the single-cab locomotive was officially regarded as the rear, the practise of working nose-to-nose was adopted early on as it gave drivers improved visibility. Note the oval buffers and blue star code above the buffer beam. When the pilot scheme was abandoned, the BTH company received a contract for a further 34 locomotives. They were powered by the Paxman 16HXL engine, which proved unsatisfactory in service, requiring excessive maintenance, and the single-cab design gave drivers restricted forward vision along the bonnet and, to some extent, the rear. The driver of No D looks happy to pose for the official photographer at Rugby in the second shot. Established in , the company had absorbed several firms, notably Mirrlees and the industrial locomotive builders Bagnalls, which gave the Falcon works the capacity to build twenty locomotives in the Type 2 category; the specification being for a double-cab mixed traffic locomotive fitted with train heating equipment and designated the diesel equivalent of the LNER B1s and LMS Black 5s. The Brush Type 2 A1A-A1A was largely modelled on the 25 locomotives built for the Ceylon Government Railways, although the six-wheeled bogies the inner pair were unpowered was altered to British standard gauge, combining a leaf and helical springing to improve suspension and ease the axle load. During construction of Nos D TOPS Class 30 additional orders were placed with the company that culminated in a production run of a total of locomotives Class 31 all built to the same basic design, but with the Mirrlees engine uprated to 1,hp, together with a change-over from the electro-magnetic multiple-unit coupling system to the standard electro-pneumatic Blue Star system making the class compatible with most other manufacturers designs at that time. A full-size timber mock-up of the cab was constructed at the works for scrutiny by footplatemen and shed staff, and to allow the designers to make the necessary modifications which inevitably followed evaluation of a new locomotive design by railmen. The BTC stipulated that gangway doors should be incorporated in the front end to allow for crew movement between locomotives when working in multiple, however the provision of doors intruded upon the windscreen area. A neat solution was found by using a 3-piece windscreen with angled edges picked out in eggshell blue off-white. The livery was standard BR Brunswick green with two bands of lining running the full length of the bodyside and around the front ends. The roof was mid-grey and the bogies black. The first, No D, is in the centre. The signs read - British Railway 20 Type 2 locomotives. Contract No , and target date for test. The bogie combined a leaf and helical springing to improve suspension and ease the axle load, which gave the locomotive the widest possible route availability throughout the BR network. The ER fitted brackets onto the lamp irons of their allocation to allow a named train headboard to be carried. Here the driver of No D awaits the right away with the D spent the

majority of its working life on the East Coast Main Line and its branch lines, and was also used on suburban services out of Kings Cross. The locomotive was purchased by George Littlejohn in , and subsequently moved to the Strathspey Railway. Above The World Wide Web is a major source of reference that draws thousands of enthusiasts every day, either to research a subject or to bring with them their own diverse interests and expertise; indeed the subject of trains and railways is extremely complex and so it is essential to get the facts right. Among the most prolific contributors to spot inaccuracies is ex-BR Fleet Engineer, Vic Smith, who was among the group of staff standing on strategically-placed wooden pallets above right to get the best view over the wall on 25th October When not at Technical College, Vic spent most lunchtimes during his apprenticeship waiting for the acceptance trial test trains to pass by from Derby. He never imagined that a couple of years later he would be riding by in the cabs of the new Brush 47s. Theoretically, a two-stroke engine is capable of producing a higher power at every revolution, because during the 2-stroke cycle, each cylinder generates power at every revolution of its crankshaft whereas the power from a 4-stroke engine is produced from alternative revolutions. Sadly, the Crossley engine was largely responsible for the Co-Bos inauspicious and very short careers, and the design was not perpetuated beyond the pilot scheme orders. Still in workshop primer and sporting an express passenger headlamp code on the front end No D heads past Wetherby West Junction on the return working to Teesside. Prior to its introduction, tests were carried out under controlled trial conditions, comprised of a dynometer coach and 25 short wheelbase vacuum braked flats. The test train is seen at Skipton. They had a distinctly box-shaped body mounted on an unusual Co-Bo wheel arrangement; the cabside doors were windowless, and those on the drivers side were located some distance behind the cab itself. The Metro-Vick fleet may have been undistinguished machines, but ER Morten still recorded their activities on the route. Peak Forest Summit ft is situated in a deep cutting culminating with the entrance to Dove Holes Tunnel. Above-Below Following refurbishment at the manufacturers works at Dukinfield, the fleet was eventually assigned to work secondary passenger and freight duties in the Furness and West Cumberland areas of the MR, all based at Barrow, but with a few sub-shedded to Workington operationally. D heads the morning Workington-Barrow train at Ravenglass in August Below The doyen of the class, D, heads a local train at Hest Bank. During steam days, a double-header a combination of steam locomotives coupled together was often used, but with the onset of dieselisation a pair of locomotives coupled together and worked by one driver became known as multiple workings, whereas diesels coupled together and driven independently were called tandem workings. Below For those mourning the demise of the Metro-Vicks are reconciled with the thought that at least one No D is still in existence and undergoing restoration. It spent many years as a carriage heating unit on the Western Region before finally being rescued for possible preservation. A lovely name and an idyllic setting, now the terminus of the Lakeside and Haverthwaite Railway. Above-Inset The original wrap-round windows were a neat detail design of the Co-Bos, but these were later replaced by a flat screen mounted in rubber mouldings to reduce maintenance costs. The modification can be seen in this view of No D awaiting departure from Workington with the At the same time, eleven of the ill-fated class awaited disposal: Following withdrawal in the first week of September , the locos were stored inside the old Kingmoor steam shed 12A, then moved to Carlisle New Yard in February , where they remained until departure for scrapping at J Cashmore of Great Bridge the following Autumn. For some reason No D did not go until November, then it too made its last journey for scrapping. Also stored at Carlisle was a large group of Clayton Type 1s in the D number series. Some of the Claytons were subsequently reinstated for further service in Scotland. Here, two classic examples of rail traction old and new: Below To evaluate the performance of the early diesels, the BTC carried out an extensive road test programme using three mobile test units which could absorb the power being developed while maintaining a selected speed. On June 23rd , it was the turn of pilot scheme Type 2 Bo-Bo No D, seen here passing the newly-opened Buxton depot before resuming trials over the Peak Forest route. With a ruling gradient of 1 in from Rowley to Peak Forest, the MR line was a favourite test route for new locomotives built at Derby. The diesel depot at Buxton closed on 12 October The ore was carried in special high-capacity hopper wagons run in trains of fixed length with automatic loading and unloading at terminals. The hoppers have air-operated doors, for which the Type 2s acquired an extra compressor and hose connection. Below With such large orders in prospect, Derby, Crewe, and Darlington works all shared in the

construction of the Type 2, together with the Beyer Peacock works at Gorton, Manchester. When the production was eventually completed in , no less than Type 2s had been built. In pouring rain, No D runs round the stock of the It will haul the stock to Heaton carriage sidings setting down any passengers at Walker Gate to continue their journey by DMU. Above With the onset of modernisation, the BTC was trumpeting facts on how diesel and electric traction would be immeasurably cleaner than steam, whereas in reality the diesels had to work in uncomfortably-close proximity with steam, therefore the fleet ended up just as filthy as its predecessors and maintenance problems arose from the lack of cleanliness. Many factors can contribute to the general discoloration of paintwork, notably the inorganic dust originating from brake shoes which can quickly spread itself as an even layer from rail level upwards. Another factor that caused the discolouration of paintwork was the amount of oil seepage from engine compartments which can attract dirt very quickly and eradicate any semblance of a locomotive livery. Nos DD later TOPS Class 24 were powered by the Sulzer 6LDA 1,hp engine whereas the production locomotives numbered from D upwards later TOPS Class 25 were fitted with the uprated 1, Sulzer engine, but externally retained the original bodystyle except for roof-mounted headcode boxes in place of the aged headcode disc system. Note the ScR hase fitted brackets onto the handrails either side of the gangway door to allow the named train headboard to be carried. The final, completely revised Type 2 design had the air intake grills re-sited at cant rail height and the removal of the draughty gangway doors enabled the centre windscreen to be revised. Still retaining its two-tone green livery but sporting full yellow ends, No D awaits its next turn of duty as banker on the 1-in Miles Platting bank out of Manchester Victoria in No D was photographed there on February 20th The class was painted in dark green with the cab window area picked out in off-white. The ScR modifications included the fitting of sliding cabside windows and a single line tablet catcher fitted into the recess of the cab, both modifications clearly seen in this view of a BRCW Type 2 in the bay platform at Georgemas Junction. The success of the design led to an order for Nos DD in the fleet, with their engines uprated to 1,hp, later TOPS Class 27, and externally they were fitted with roof-mounted four-digit route indicators in place of the aged marker discs. Below No D at Kittybrewster shed, Aberdeen. The availability of the class was marred by recurring failures of their Napier T9 29 power units. This photograph of D heading an engineers train at Hitchin on May 12 was taken by Rail Cameraman, Charlie Verrall - check out his page 38 on the left-hand menu; No D emerged from the EE Co works in May and became one of the earliest candidates for withdrawal in October Site visitor, Simon Harding, has kindly identified the location as Welwyn Garden City, his local station. His attention was instantly drawn to the gallows type signal which was a feature of the station up until resignalling of the ECML in the early s. The architecture of the shops on the station approach left of picture is also quite distinctive. The train is crossing from the up slow platform back on to the main. If you wish to discuss using the contents of this page the email address is below.

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3: Messerschmitt Bf (Me) - History and Pictures of German WW2 Fighter Plane

British rail fleet survey. [Brian Haresnape] v. 1. Early prototype and pilot scheme diesel-electrics Western Region diesel-hydraulics --v. 4. Production.

On 29 December , Vought was awarded a contract for three prototypes, with the initial "XF6U-1" prototype flying on 2 October The Pirate was an uninspired design, featuring a cigar-shaped fuselage with engine intakes under the wing roots and exhaust in the tail, fitted with straight wings mounted mid-body and straight tail surfaces. The aircraft had tricycle landing gear; four M3 millimeter cannon mounted under the nose; arresting gear; and optional wingtip tanks with a capacity of liters US gallons each. The aircraft featured unusual construction techniques, including "Metalite" skinning of balsa sandwiched between two thin sheets of aluminum, and "Fabrilite" skinning of balsa sandwiched between sheets of fiberglass for the tailfin and air intakes. That was only about half the empty weight of the aircraft, and so the prototype was painfully underpowered. The Pirate also had poor handling characteristics. Various changes were implemented during the flight test program in hopes of improving them -- most visibly the addition of small "finlets" near the ends of the tailplane. Despite the problems with the aircraft, the Navy continued to hope that the bugs could be worked out, and ordered 65 production "F6U-1" fighters. They were to be fitted with an afterburning JWEA engine, with dry thrust of The judgement from the evaluation was that the Pirate was unacceptable. One was fitted with cameras for the photo-reconnaissance role and designated "F6U-1P". Most US aircraft manufacturers were still trying to figure out what could be done with jet propulsion, and a few dead ends were no surprise. Vought tried harder on their second next jet fighter design, the "F7U Cutlass", but ended up suffering from being too ambitious. The Cutlass grew out of a US Navy requirement issued on 1 June for a high-performance shipboard jet fighter. Vought replied with a proposal designated "V", and the Navy awarded the company a contract for three "XF7U-1" prototypes on 25 June The first prototype Cutlass flew on 29 September Fourteen pre-production "F7U-1s" had been ordered on 29 July , with the first flying on 1 March Unlike the Pirate, the Cutlass at least appealing in appearance, incorporating exotic design ideas that had their roots in concepts dreamt up by the German Arado company before the end of the war. It was a "tailless" aircraft, with a rear-set narrow-chord wing featuring a leading-edge sweepback of 38 degrees. An extensible slat was fitted across the leading edge of each wing. Twin tailfins were fitted, one at the midpoint of each wing. The wings folded straight up outboard of the tailfins, giving the Cutlass a very compact "footprint" for carrier storage. The aircraft was armed with four millimeter cannon mounted in the bottom of the nose, had hydraulic flight controls, and a pressurized cockpit. All three prototypes were lost in crashes. In fact, two were said to have crashed even before delivery from the manufacturer. Two of the F7U-1s were provided for a short time to the Navy "Blue Angels" flight demonstration team, to be used for solo performances along with the Grumman F9F Panthers used by the rest of the team. According to a story, a Navy commander asked a Marine lieutenant colonel who had just test flown-one of the XF7U-1s: Is it any good? Vought submitted a proposal for the F7U-2 on 1 November and the Navy ordered 88, but due to engine development problems that variant never flew. Vought also pursued a complete redesign of the Cutlass, the "F7U-3", with the proposal also submitted on 1 November One particularly noticeable change was that the cockpit was raised to give the pilot a better field of view for carrier landing. The F7U-1 made its approach at a high angle of attack of 20 degrees, a characteristic that pilots disliked and which had led to accidents; Vought engineers hoped the revised cockpit would improve matters. Other changes included the addition of over a hundred new doors and access panels to improve serviceability, and repositioning of the four millimeter cannon in the upper lip of the intakes, instead of the nose. The F7U-3 could also carry kilograms a ton of external stores, including drop tanks. The first F7U-3 flew on 20 December Although the aircraft was supposed to be powered by Westinghouse J46 engines, delays in engine development meant that the first 16 F7U-3s were all powered by twin Allison JA turbojets. Carrier trials of the initial batch demonstrated that still more fixes were required, with the nose redesigned again to improve field of view. Ruggedized nose gear was added as well, with dual wheels instead of the single wheel of earlier F7Us, to reduce the rate of nose-gear failures. The 17th F7U-3 was full

production spec, featuring all these changes and as two Westinghouse JWE-8 afterburning engines with Twelve "F7U-3Ps" were also built, with a nose lengthened by 64 centimeters 25 inches to accommodate a suite of reconnaissance cameras. It appears the cannon were deleted. The service life of the F7U proved anything but distinguished. Although some sources say the Cutlass was very rugged and remarkably maneuverable, it was also underpowered, being nicknamed the "Gutless" by pilots. The Westinghouse J46 engines had been designed to provide Westinghouse manufactured household appliances at the time, and one disgusted test pilot later commented that "the Westinghouse J46 engines generated about as much heat as their toasters. It also suffered from nasty stall characteristics; a touchy center of gravity; and a tendency to suffer engine flame-outs when the cannons were fired. Even getting into or out of the thing appears to have been an adventure -- the nose gear was so long that when the aircraft was parked, the top of the cockpit was clearly higher than the tips of the tailfins. That was a very high loss rate for an aircraft with a short service life and that never saw combat -- which was just as well. The Navy began withdrawing the F7U-3 from service in , with most out of operation by the end of , though a few persisted until It was never remembered with any fondness. One pilot called it a "gutless, thirsty dog, with low performance and a miserable range. The Cutlass won Vought no respect from the Navy. The company would have suffered for it, except for the fact that even as Navy aviators were learning to hate the F7U, Vought was demonstrating they could do vastly better. Vought and seven other aircraft manufacturers submitted proposals. The V was revolutionary, a big step forward in the state of the art; the Navy was intrigued, awarding Vought a contract in May for mock-ups and wind-tunnel test models. The service also expressed interest in a photo-reconnaissance version, the "V". The Navy quickly followed up the initial contract with a second contract, awarded on 29 June, for two prototypes of the V, to be given the Navy designation of "XF8U-1". Konrad at the controls. The prototype broke Mach 1 during this initial flight, making it the first fighter designed for shipboard operation to fly faster than sound. The second prototype made its first flight on 12 June. By that time, the new aircraft had been given the name "Crusader". The overhead that carrier-deck operations imposes on an aircraft, including ruggedized landing gear, arresting hook, and folding wings, necessarily leads to a weight penalty, working against performance. Similarly, high flight performance tends to work against low landing speed, which is particularly important for landing on an aircraft carrier deck. The Vought engineers came up with a brilliant design to meet the requirement. The most unusual feature of the aircraft was its "variable-incidence" wing, which addressed the landing problems experienced by the Cutlass. The pilot used a locking handle to ensure that the wing stayed in place in flight, and a positioning handle to raise the wing once the locking handle was released. The wing-raising system had a pneumatic backup in case the hydraulic system failed. The variable-incidence wing scheme allowed the wing to assume a high angle of attack -- reducing the approach and take-off speed -- while keeping the fuselage level and giving the pilot a good forward field of view. Take-off and approach speed was further lowered through the use of a linkage that simultaneously lowered the ailerons and the leading-edge flaps -- which ran the entire leading edge of the wing -- by 25 degrees. That increased the effective curvature, or "camber", of the wing, providing more lift at low speed. The ends of the wings folded straight up hydraulically for storage. The inner portions of the wing had integral fuel tanks. The ailerons were hydraulically-powered, and were known as "flaperons" because of their additional droop on landing and take-off. There were small landing flaps inboard of the ailerons that extended about five more degrees than the flaperons. The Crusader was built primarily of aluminum alloy, but magnesium alloy was used for about a quarter of the fuselage and wing skins. Parts of the aircraft were made of titanium, particularly the rear fuselage around the afterburner, as well as much of the central structure. The fuselage was designed with the new "area ruling" scheme, in which transonic performance was improved by ensuring that the cross-sectional area of the aircraft changed as gradually as possible, resulting in a design with smooth and pleasing curves. The forward part of the fuselage contained the avionics bay, followed by the cockpit; then the armament bay, with a backward-retracting nose gear below; and finally a center section containing fuel tanks, all arranged around the engine inlet. The forward-retracting main gear was just forward of the engine. The main gear was surprisingly short and gave the otherwise elegant aircraft a squat appearance on the ground. All the gear assemblies had single wheels. The rear fuselage could be pulled off for engine access. The tailfin was large

and tall. The tailplane had a slight dihedral and was of "all-moving" configuration, that is, the entire control surface pivoting as a single piece. A stinger-type arrester hook retracted flush into the fuselage under the tail section. The armament section contained four millimeter Colt Mark 12 cannon with rounds per gun. There were two guns on either side of the nose. Behind the guns, on each side of the aircraft, was a launch rail for a single Sidewinder heatseeking AAM. There were no wing stores pylons, but the aircraft was fitted with a retractable rocket pack in the belly that stored thirty-two millimeter 2. In production aircraft, the rocket pack would rarely, if ever, be used, and was often sealed shut. All early versions of the aircraft had a large fuel capacity of 5, liters 1, US gallons , providing endurance of three hours. The Crusader would rarely fly with drop tanks through its entire career. The pilot sat on a new lightweight Vought-designed ejection seat under a clamshell canopy that hinged open on the rear. Other features of the aircraft included a dive brake on the belly, directly below the front of the wing, and an innovative Marquardt-built "ram air turbine RAT " that could be extended from the right side of the fuselage, directly behind the cannon, for emergency electrical and hydraulic power. The RAT would prove very useful in practice, allowing many pilots to bring home aircraft that would have otherwise been lost. Later versions of the aircraft would be variations on the pattern of the XF8U-1, adding new features or deleting obsolescent items, but the prototype configuration makes a good baseline for further discussion. The production F8U-1 was very similar to the initial prototype -- though after the delivery of the first 50 or so, the type was fitted with an inflight refueling probe that retracted into a blister on the left side of the aircraft, behind the cockpit. The 31st production aircraft would switch to the JP-4A, with Service deliveries for operational evaluation began in early

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4: The Other Series (continued) - Ian Allan Railway Books : Ian Allan Railway Books

British Rail Fleet Survey 1: Early Prototype and Pilot Scheme Diesel Electrics, by Brian Haresnape, published July , 80pp, ISBN , code: AXX/

It is featured in the original design series Mobile Suit Variations. The starting point of the RX series of mobile suits, the Prototype Gundam was designed differently from the original Project V mobile suits models in that it did not place its emphasis on raw firepower like the RX Guntank and RX Guncannon. It was also the first to feature several new technologies, including the energy cap-based beam rifle making the Gundam the first mobile suit to pack the firepower of a battleship a beam saber and a beam javelin for close quarters. They are ideal for shooting down small, lightly armored targets such as missiles, attack vehicles, etc. Beam Saber The Gundam was the first mobile suit to ever use a beam weapon made for melee combat. The pair of beam sabers use Minovsky particles held in place by an I-Field to form an effective cutting surface that can slice through nearly any material. One can be used as a reserve weapon, or both can be used simultaneously in a twin sword fashion. The beam sabers can also transform into the "beam javelin". Beam Javelin The beam javelin is an alternate form of the beam saber, with an extended handle and a three pronged beam at the end. The long reach of the weapon gives the RX an advantage in close quarters combat. Beam Rifle A revolutionary weapon for its time, the beam rifle is the primary weapon used by the RX Making use of E-cap or "energy capacitor" technology, the rifle uses charged concentrations of Minovsky particles as ammunition. As the Minovsky particles destroy matter on a molecular scale, the beam rifle can penetrate even the thickest armor and destroy its target with a single shot. A weakness of the beam rifle is that it could only be fired 16 times before depleting its energy and becoming useless. When not in use, the beam rifle could be stored on the right hip. Hyper Bazooka Technically a large rocket launcher, it could fire several mm missiles to attack targets at long range. While very powerful, it has a slow rate of fire and a fairly little amount of ammunition. Most oftenly used to take out slow, heavily armored targets. Gundam Hammer The Gundam Hammer was essentially a large spiked ball attached to a chain. It was used to give the MS using it a ranged melee weapon. The MS could either throw or swing the Hammer around itself in order to impact and damage its target through the sheer mass of the hammer. It is a shell firing gun that does not require energy to be used, however its effectiveness against heavy armor is very limited. This model used a round drum magazine. Also used to great effect in close quarters battle with enemy mobile suits. Has a view port than can be sealed off with an internal blast plate. This core block can eject in case of emergency and unfold into a small Core Fighter. Hardpoints An attachment point for weapons, shields, spare ammunition, or optional mission-specific equipment. Hardpoints can also be used to store carried weapons when a mobile suit needs its manipulators free for other purposes. History Once the RX was tested and approved for continued development, designs were upgraded and enhanced, eventually producing the second - and most famous model of the RX series:

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5: LME02 Gun EZ Prototype

The first of the "Peaks", the Class 44 was the most powerful batch of diesels built in the post-Modernisation Plan pilot-scheme, though also the heaviest! [1].

This name was given to it by the Nazi Propaganda Ministry, but the original Air Ministry designation was Fi , after its airframe designer, the Fieseler company. Powered by a simple but noisy pulsejet that earned it the Allied nicknames of "buzz bomb" and "doodle bug," more than 20, were launched at British and continental targets, mostly London and Antwerp, from June to March It carried a one-ton, high-explosive warhead and had a range of about km miles but was very inaccurate. The Smithsonian acquired this V-1 on 1 May from the U. Collection Item Long Description: Powered by a simple but noisy pulsejet, thousands were launched on British and continental European targets from June to March This V-1 was acquired in from the U. Army Air Forces, and was officially transferred on 1 May by what was now the U. Construction The V-1 is a mid-wing monoplane constructed primarily of mild steel, although later long-range, lighter models had plywood wings on a tubular metal spar. Mounted on top of the rear of the fuselage is the pulsejet tube with recessed intake circular grill in front and open exhaust exit at the rear. The front of the tube has a larger diameter to accommodate the grill, internal flappers, and combustion chamber with fuel injectors and spark plug, while the rear gradually tapers down to the straight, elongated exhaust. Inside the missile, behind the wings, are two wire-wound compressed air spheres for the pneumatic control servos. However, the color scheme, borrowed from a V-1 displayed in a British museum, is not authentic, the yellow nose in particular being inaccurate. The operational colors were usually a camouflage pattern of greens and light blue. Moreover, this artifact also lacks the air-log propeller. The V-1 was not radio-controlled; it had a pre-set guidance system which included a magnetic compass monitoring an automatic pilot, which had at its heart a displacement gyro and two rate gyros. Pneumatic signals from the gyros created pressure differentials that were converted to mechanical forces, opening valves for high-pressure compressed air that moved the pistons in the actuators for the rudder and elevators. Roll control was done through the rudder, as there were no ailerons on the wings. Altitude was controlled by an aneroid pre-set in millibars of atmospheric pressure. Maximum altitude was about 10, ft, but most bombs flew at only a few thousand feet. When the propeller made a set number of revolutions, a counter fired a detonator in the tail that locked the elevator in a neutral position, cut off rudder control and deployed two hinged spoilers from the underside of the tailplane, causing the missile to a dive on its target. Theoretically, pulsejets develop thrust at zero velocity, but in practice the V-1 functioned efficiently only when it was boosted into the air. The V-1 was normally launched from a firing tube mounted on an inclined metal ramp feet long by 16 feet high. Pressurized hydrogen peroxide caused a piston on the ramp to thrust forward, hurling the missile into the air where the pulsejet would be activated once the missile had attained an initial operational speed of mph. During early test flights, before the development of the catapult, solid-fuel rocket boosters were used. The V-1 was also air-launched by modified Heinkel He aircraft. The usual flight time for the V-1, which used low grade aviation gasoline, was about half an hour at altitudes of between two and three thousand feet and speeds of up to mph. Among these was the "reactor pulse" concept of the Russian Victor de Karavodine who applied for a French patent on 9 April , which was granted as No. His idea was a kind of pulsejet with a low pressure supercharger and sparkplug igniter. The Belgian inventor Georges Marconet applied for a Belgian patent in for a similar idea meant to be applied to aircraft and was granted French patent No. Lorin, who claimed his work went back to , advocated the development of long-range missiles for bombarding objectives like Berlin. His designs consisted of both ram and pulsejet type devices. He conducted experiments at the Munich-Wiesenfeld airfield under support from the Research Division of the Ministry of Transportation. Schmidt was primarily interested in pulsejets for aircraft. He constructed a motor with a duct which produced a thrust of kg 1, lbs. From to , the Heereswaffenamt Army Weapons Office provided additional funds, with which Schmidt established a full-time research group at Munich, with Hans Lembcke as his chief assistant. By , Schmidt produced his SR model; by the following year it generated 1, lbs. There was no further cooperation between Schmidt and Argus, although by the V-1 pulsejet was called the

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Argus-Schmidtrohr, or Argus-Schmidt tube. The first successful Argus pulsejet produced a thrust of kg lbs. With modifications, including a fuel regulator, the thrust was increased to kg lbs. Beginning in April , flight tests were made on cargo gliders and other aircraft with an eye to using the pulsejet as aircraft propulsion, but ultimately the severe vibration it produced made it unusable for that purpose. In the meantime, Gosslau had been pursuing pilotless aircraft or what we would now call cruise missiles since , based on experiments that went back to World War I in Germany and the Allied powers. All earlier missiles had used reciprocating engines, although missiles using various forms of reaction propulsion had been discussed in Germany since at least In early , Gosslau proposed to designer Dr. Robert Lusser, who had left Heinkel aircraft and was looking for a job, that they work together on a pulsejet flying bomb, and although Lusser ultimately decided to go to Fieseler Flugzeugbau Fiesler Aircraft Construction Company of Kassel, this collaboration came to fruition soon thereafter as an Argus-Fieseler project. Two weeks later Argus and Fieseler presented a proposal for a project Erfurt P35, which closely resembled the latter Fi or V To insure secrecy, the missile was first designated the Kirschkern and then FZG 76, which signified a target or target-towing craft for anti-aircraft gunners. An additional reason for the high priority on the flying bomb was rivalry with the Army, which just at this time began test launches of its revolutionary, rocket-powered A-4 ballistic missile-the later V First flight tests with an unpowered prototype were made in October , when a Focke-Wulf Fw dropped a missile to test glide characteristics. On 10 December the first Fi flight test was made-an air launch from the Fw In later tests, ranges of miles was achieved with accuracies of a half a mile, but this came only after a long and difficult series of flight tests in which a number of technical problems with the pulsejet and the Askania guidance system manifested themselves. By late September or early October, , mass production of the FZG 76 was initiated at the Volkswagen factory at Fallersleben, though the bombing of Kassel interrupted operations affecting the FZG 76 at the Fiesler works, with deliveries held up and delayed testing of modifications. Some of the launch sites were built as bomb-proof concrete bunkers. However, the first type of launch sites, nicknamed "ski sites" by the Allies because of the shape of their ramps, had to be abandoned after repeated Allied attacks, delaying deployment further. A movable and more easily concealed launch ramp was hurriedly developed in its place. The V-1 campaign against Antwerp and other Belgian cities continued from launch sites in Germany and the Netherlands. After the V-1 sites in the Pas de Calais were overrun by Allied troops at the end of August , for many months the only way to attack Britain with V-1 was by air. At about 10 a. The casualties for the V-1 against the United were 6, killed in the London area and 17, seriously injured. Even V-1s that did get through were not very accurate. In all 8, V-1 were ground-launched and about 1, were air-launched against Britain. By one estimate, of the 7, which crossed the English Channel, 3, were destroyed and 2, reached the London area. Secondary targets were Southampton, and for air-launched missiles, Manchester and Gloucester. Almost 6, were killed in Britain as a result of the V The number of casualties inflicted by the V-1 on the Continent was 4, military and civilians killed plus 10, wounded. Of these, Antwerp sustained the most casulaties. Under Project Reichenberg, the Germans also built a piloted, suicide version of the V-1 which was tested by diminutive pilots, including the famous Hanna Reitsch, but the Re 4 model was never placed into action due to resistance in the Nazi leadership to an explicit suicide weapon. Before the war ended, the Americans began modifying and copying the V-1 from salvaged parts furnished to them by the British, and built more than 1, U. None of these missiles went into combat, although they did provide missile experience to both the Army Air Forces and the Navy. The air launches were made, one under each wing, from Boeing BG Flying Fortresses, with plans to use them from the B Superfortress. Following the war, due to the V-1, the pulsejet was also in vogue for several years as a low-cost powerplant for a variety of sub-sonic missiles and target drones in the U. For example, the French Arsenal ARS was a radio-controlled ground-to-air or air-to-air drone developed by and strongly resembled the original V These craft, however, were soon outmoded since they were not capable of operating at high altitudes and higher speeds. The other extant V-1s are at the following locations: The Doodlebugs Arrow Books: New York, , pp. Flying is My Life Putnam: Maxwell Air Force Base, Alabama, Sky Books Press, Originally written by Frank Winter; revised by Michael J.

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6: Highland Class 31 D - UK Prototype Questions - RMweb

2. British Rail fleet survey. 1, Early prototype and pilot scheme diesel-electrics: 2.

Updated July 6, Unwanted at its inception, the Bf became the most widely produced, the most respected, and the most varied Luftwaffe fighter. From its introduction in the Spanish Civil War, until the last Bf model retired from the Spanish! Air Force in , the served for thirty years. At one point, the Gestapo even called on Messerchmitt to question him about his contracts with the Romanian government. In , his luck changed, when the Luftwaffe invited BFW to design a sports plane for an upcoming international air race. Messerschmitt, under tight deadlines, based his new aircraft on the work he had done for the Romanian sports plane. The resulting Bf , the forerunner to the , flew in February, , with a top speed over MPH. By , though, Messerchmitt was granted a development contract, something of a gamble. As a development-only contract, it represented a gamble. Milch made it clear that no production contract would follow. Prototype The prototype Bf V-1 was ready in August, , Like its predecessor, the Bf , it was a low wing, all metal construction monoplane, with flush rivets, leading edge slats, and retractable landing gear. Its single-seat cockpit had a fully enclosed canopy. While none of the developments were revolutionary in , Messerschmitt first put them all together in the Bf At first, the Luftwaffe pilots, from Ernst Udet on down, distrusted the aircraft. It seemed frail; its enclosed canopy was disconcerting; it had a very high wing loading; and its narrow track landing gear was prone to failure. On this last point, their concerns were well founded. Landing gear troubles plagued the its entire career. But its speed and agility impressed the Luftwaffe skeptics; even Udet came around to support the plane. Even before the results of the competition were known, Messerschmitt pushed on with the second and third models. The V-3, the third prototype, was the first Bf to be armed, carrying two 7. Otherwise similar to the first two examples, its first flight was delayed until May , due to teething problems with the Jumo A engine. In front of Generalfeldmarschall Goering and other Luftwaffe brass, Udet intercepted four He 51s in a mock air battle, "destroyed" them, and then turned on a force of bombers and "destroyed" them as well. In November , the Bf V-4 flew. It mounted a third machine gun in the nose and otherwise resembled the V With production now guaranteed, BFW finished the prototyping with two more airplanes: Carrying the latest HP Jumo D engine, a wooden two-bladed prop, and only two cowling-mounted guns the engine-mounted gun had caused overheating , the B began to be delivered in February These too were promptly shipped to Spain. At low altitudes, the maneuverable Russian Polikarpov Is and Is danced around the s; the Condor Legion pilots quickly learned to stay at high altitudes. Back in Germany, both production and development of the design moved ahead. Significantly, the V-8 carried four 7. While still equipped with the relatively light rifle-caliber weapons, at this point the Bf began to resemble the heavily armed fighters of WW2. A V-9 variant carried 20mm cannons in the wings, but they proved unreliable. The Daimler Benz powerhouse engine, the DB , powered four later developmental models: The V equipped with the DB set the world speed record in November , at The C-1 added a pair of wing-mounted 7. Three more experimental models the C-2, C-3, and C-4 tested other, heavier gun configurations. Bf or Me ? Subsequent aircraft would be identified with the "Me" prefix; those already in production, the , would retain the "Bf" designator. Nonetheless, many people began referring to the "Me ," including the USAAF; contemporary air combat reports are filled with references to the "Me No dash, lower case "f," not "Me ," and including a space between "Bf" and " Try a web search on "Messerschmitt Me Not only was it powerful, but its fuel injection would not stall out during sharp aerial maneuvers, as carburetor systems could. About Doras were built, with subvariants identified with different armaments: D-1 tried the engine-mounted 20mm cannon with no more success than earlier models. D-2 reverted to four 7. D-3 substituted 20mm cannon in the wings. Moelders scored 14 kills in Spain, the top German ace of that conflict. Over German pilots flew with the Condor Legion, gaining precious combat experience that would serve them well in WW2. The Emil progressed through numerous subvariants. The Bf E-1, delivered in early , introduced a three-bladed, variable pitch propeller and twin underwing radiator intakes. It was very fast and arguably the best fighter in the world at that time. By later WWII standards, it was still lightly armed, with four rifle caliber machine guns, two in the cowling and two in the wings. The Brits

rushed the plane back to Britain for a complete evaluation; the aircraft was startlingly superior to the Hawker Hurricane under all conditions and superior to the Supermarine Spitfire at lower altitudes. With a top speed of miles per hour at altitude, the Bf E-3 took good advantage of the latest Daimler Benz motor, the horsepower DB Aa. It incorporated a stronger canopy and more cockpit armor. Interestingly, the E-3 weighed under 6, pounds, less than half the weight of an American P Needing a fighter-bomber, Jagdbomber or Jabo, the Luftwaffe fitted some Emils with bomb racks and they effectively struck Channel shipping and land targets. The airplane performed as required, but the distances from bases and the need to use the Messerschmitt in a bomber escort role took their toll. Downed German pilots who parachuted safely, nonetheless, were lost for the duration as POWs; British pilots who hit the silk promptly returned. By the end of October , the British had lost 1, airplanes, mostly fighters. The Luftwaffe lost almost 1, aircraft, one third of them Bf s. For the first time, Hitler had been checked and a few months later he turned East, with devastating consequences. The Bf E-8 and the Bf E-9 appeared late in Intended as a long-range fighter, the E-8 resembled the basic E-1 with a rack added for a drop tank. The E-9, another fighter-reconnaissance variant, incorporated many previous enhancements, notably the DB N engine. Both of these were built in small quantities, the last of 4, Emils. The "F" model was planned to include structural and aerodynamic changes and a higher performance powerplant, the horsepower DB E. By tucking the radiators more tightly into the wings, the designers reduced drag and improved lift. The cowling was streamlined, the spinner enlarged, the propeller blades widened and shortened, the wingtips rounded, and the tail plane bracing struts removed. Armament for the F standardized on two cowling mounted 7. The wing guns were eliminated, based on combat reports that the concentrated firepower of the fuselage guns was more effective than the converging bullet streams from the wings. Shortly the Luftwaffe test units reported losses, following violent vibrations and loss of control. The removal of the tail bracing struts had caused the problem, remedied by fitting reinforcing plates in the tail plane. While the F-3 was otherwise like the F-2, the F-4 carried a larger caliber MG 20mm cannon, self-sealing fuel tanks, and better pilot armor. The F-4 was the ultimate Friedrich; it weighed 6, pounds, made MPH at altitude, with a service ceiling of 39, feet. About 2, Friedrichs were built. Bf G - Gustav By , the Bf was getting long in the tooth; the Fw would equip the Luftwaffe top fighter squadrons. As a stopgap, the Gustav was designed around the latest Daimler Benz engine, in this case, the horsepower DB A. It also featured a pressurized cockpit for high altitude flight. The increased power and weight came at a price. The Bf , never easy to handle, in the "G" variant, became difficult for experts and hazardous for neophytes. The Bf G-1, which first rolled off the lines in March , was fitted with a pressurized cockpit, an engine-mounted 20mm Mauser MG cannon, a pair of cowling-mounted 7. These directly cooled the DB engine, which was prone to overheating. Overheating the DB caused oil to seep out and over the hot engine block, and catch fire. If in the air, the pilot had to bail out. With 24, Gustavs produced, the number of variants is truly bewildering, and complicated by Umruest-Bausatze factory and Ruestsaetze field modification kits. Various suffixes distinguished Gustavs equipped as long-range fighters, recon fighters, and bomber destroyers. The Luftwaffe armed them with ever larger, more numerous weapons: In the details of the Gustav variants, we can see the resource limitations of the Reich in The Bf G-2 differed from the G-1 only in its unpressurized cockpit. Tellingly, many more of them than the G-1 were built. Other modification kits substituted wood in the tail assembly for scarce aluminum. The Bf G-6, the most numerous of the Gustavs, was the first to mount large caliber 13mm machine guns, comparable to the 50 caliber Brownings found in most U. It also carried an engine-mounted 20mm cannon. Throughout the development of the Bf , Messerschmitt, unlike American designers, retained guns in the fuselage that fired through the propeller arc and were necessarily synchronized. Like the G-2 and G-1, the G-6 and G-5 were nearly identical, except that the G-6 and G-2 omitted cockpit pressurization, and were built in larger numbers than their pressurized counterparts. Bf K â€" Konrad Based on the G, the Bf K was another attempt to bring some order to the chaos of variants, sub-variants, and modification kits which was disrupting supply and maintenance. The Konrad wielded the same weapons as its forerunner, two 13mm machine guns and a 20mm cannon, and only offered some minor changes to the canopy, tail wheel, tail plane, cowling, and spinner.

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7: V-1 flying bomb - Wikipedia

David N Clough's "Diesel Pioneers" has good chapters on /1, , , Deltic, /2/3, and the Modernisation Scheme pilot scheme diesels. It also covers later prototypes such as DP2, Falcon, Kestrel etc. Excellent book.

On 31 May, Rudolf Bree of the RLM commented that he saw no chance that the projectile could be deployed in combat conditions, as the proposed remote-control system was seen as a design weakness. Heinrich Koppenberg, the director of Argus, met with Ernst Udet on 6 January to try to convince him that the development should be continued, but Udet decided to cancel it. Despite this, Gosslau was convinced that the basic idea was sound and proceeded to simplify the design. As an aircraft engine manufacturer, Argus lacked the capability to produce a fuselage for the project and Koppenberg sought the assistance of Robert Lusser , chief designer and technical director at Heinkel. On 22 January , Lusser took up a position with the Fieseler aircraft company. A final proposal for the project was submitted to the Technical Office of the RLM on 5 June and the project was renamed Fi , as Fieseler was to be the chief contractor. By 30 August, Fieseler had completed the first fuselage, and the first flight of the Fi V7 took place on 10 December , when it was airdropped by a Fw The simple, Argus-built pulsejet engine pulsed 50 times per second, [2] and the characteristic buzzing sound gave rise to the colloquial names "buzz bomb" or "doodlebug" a common name for a wide variety of flying insects. Three air nozzles in the front of the pulsejet were at the same time connected to an external high-pressure air source that was used to start the engine. Acetylene gas was typically used for starting the engine, and very often a panel of wood or similar material was held across the end of the tailpipe to prevent the fuel from diffusing and escaping before ignition. The V-1 was fuelled by litres US gallons of 75 octane gasoline. Rear view of V-1 in IWM Duxford showing launch ramp section The Argus As also known as a resonant jet could operate at zero airspeed because of the nature of its intake shutters and its acoustically tuned resonant combustion chamber. However, because of the low static thrust of the pulse jet engine and the very high stall speed of the small wings, the V-1 could not take off under its own power in a practically short distance, and thus needed to be ground-launched by aircraft catapult or air-launched from a modified bomber aircraft such as a Heinkel He The unsuccessful prototype was a version of a Sprengboot, in which a boat loaded with explosives was steered towards a target ship and the pilot would leap out of the back at the last moment. The Tornado was assembled from surplus seaplane hulls connected in catamaran fashion with a small pilot cabin on the crossbeams. The Tornado prototype was a noisy underperformer and was abandoned in favour of more conventional piston engined craft. The engine made its first flight aboard a Gotha Go on 30 April Operating power for the gyroscope platform and the flight-control actuators was provided by two large spherical compressed air tanks that also pressurized the fuel tank. With the counter determining how far the missile would fly, it was only necessary to launch the V-1 with the ramp pointing in the approximate direction, and the autopilot controlled the flight. There was a more sophisticated interaction between yaw , roll and other sensors: This interaction meant that rudder control was sufficient for steering and no banking mechanism was needed. An odometer driven by a vane anemometer on the nose determined when the target area had been reached, accurately enough for area bombing. Before launch, the counter was set to a value that would reach zero upon arrival at the target in the prevailing wind conditions. As the missile flew, the airflow turned the propeller, and every 30 rotations of the propeller counted down one number on the counter. Two spoilers on the elevator were released, the linkage between the elevator and servo was jammed and a guillotine device cut off the control hoses to the rudder servo, setting the rudder in neutral. These actions put the V-1 into a steep dive. The sudden silence after the buzzing alerted listeners of the impending impact. The fuel problem was quickly fixed, and when the last V-1s fell, the majority hit with power. Initially, V-1s landed within a circle 19 miles 31 kilometres in diameter, but by the end of the war, accuracy had been improved to about 7 miles, which was comparable to the V-2 rocket. Trialen fillings were identified by the warhead being painted red, although the assembled missiles were painted green or grey over this. Fuzing was by a triple fuze system. The main fuzes were an electrical impact fuze and a mechanical backup impact fuze. These were immediate action fuzes, the intention being to detonate the warhead on the first impact with the

surface, rather than allowing itself to become buried first. This was a major difference from the V-2, and a reason for the high lethality of the V Although they did not demolish buildings or deep structures as effectively as the air-dropped bombs, or the deep-burying V-2, their blast effects were almost all released at the surface and caused many casualties. The electrical fuze, ZLPM 76, was mounted at the front, immediately behind the compass and the air speed propeller. It connected to a central exploder tube through the warhead, containing the gaine and boosters. Two transverse fuze pockets, in typical German fashion, were placed in the upper surface of the warhead for the secondary fuzes, also connecting to this same tube. To avoid the risk of this secret weapon being examined by the British, there was a third time delay fuze. This was too short to be any sort of booby trap, just to destroy the weapon if a soft landing had not triggered the impact fuzes. These fuzing systems were very reliable and there were almost no dud V-1s recovered. The original design for launch sites included a number of hangars or storage garages as well as preparation and command buildings, as well as the launch ramp, all of which were easily identifiable from aerial photographs resulting in bombing attacks on the sites. Launching needed a steam generator. A light design utilising a small 7. Eight civilians were killed in the blast. The first complete V-1 airframe was delivered on 30 August , [10] and after the first complete As. Erich Heinemann was responsible for the operational use of V Overall, only about 25 per cent of the V-1s hit their targets, the majority being lost because of a combination of defensive measures, mechanical unreliability or guidance errors. With the capture or destruction of the launch facilities used to attack England, the V-1s were employed in attacks against strategic points in Belgium, primarily the port of Antwerp. Launches against Britain were met by a variety of countermeasures, including barrage balloons and aircraft including the Hawker Tempest and Gloster Meteor. These measures were so successful that by August about 80 per cent of V-1s were being destroyed [23] the Meteors, although fast enough to catch the V-1s, suffered frequent cannon failures, and accounted for only However, repeated failures of a barometric fuel-pressure regulator led to it being changed in May , halving the operational height, thereby bringing V-1s into range of the Bofors guns commonly used by Allied AA units. This version could carry FZG 76 V1 flying bombs, but only a few aircraft were produced in Some were used by bomb wing KG 3. The trial versions of the V-1 were air-launched. Apart from the obvious motive of permitting the bombardment campaign to continue after static ground sites on the French coast were lost, air-launching gave the Luftwaffe the opportunity to outflank the increasingly effective ground and air defences put up by the British against the missile. To minimise the associated risks primarily radar detection , the aircrews developed a tactic called "lo-hi-lo": When the launch point was neared, the bombers would swiftly ascend, fire their V-1s, and then rapidly descend again to the previous "wave-top" level for the return flight. Research after the war estimated a 40 per cent failure rate of air-launched V-1s, and the He s used in this role were vulnerable to night-fighter attack, as the launch lit up the area around the aircraft for several seconds. The combat potential of air-launched V-1s dwindled as progressed at about the same rate as that of the ground-launched missiles, as the British gradually took the measure of the weapon and developed increasingly effective defence tactics. V-1 Fieseler Fi in flight Late in the war, several air-launched piloted V-1s, known as Reichenbergs , were built, but these were never used in combat. Hanna Reitsch made some flights in the modified V-1 Fieseler Reichenberg when she was asked to find out why test pilots were unable to land it and had died as a result. She discovered, after simulated landing attempts at high altitude where there was air space to recover, that the craft had an extremely high stall speed and the previous pilots with little high-speed experience had attempted their approaches much too slowly. Her recommendation of much higher landing speeds was then introduced in training new Reichenberg volunteer pilots. The Reichenbergs were air-launched rather than fired from a catapult ramp as erroneously portrayed in the film Operation Crossbow. A somewhat less ambitious project undertaken was the adaptation of the missile as a "flying fuel tank" Deichselschlepp for the Messerschmitt Me jet fighter, which was initially test-towed behind an He A Greif bomber. The pulsejet, internal systems and warhead of the missile were removed, leaving only the wings and basic fuselage, now containing a single large fuel tank. A small cylindrical module, similar in shape to a finless dart, was placed atop the vertical stabilizer at the rear of the tank, acting as a centre of gravity balance and attachment point for a variety of equipment sets. A rigid tow-bar with a pitch pivot at the forward end connected the flying tank to the Me The operational procedure for this unusual

configuration saw the tank resting on a wheeled trolley for take-off. A number of test flights were conducted in with this set-up, but inflight "porpoising" of the tank, with the instability transferred to the fighter, meant the system was too unreliable to be used. An identical utilisation of the V-1 flying tank for the Ar bomber was also investigated, with the same conclusions reached. Some of the "flying fuel tanks" used in trials utilised a cumbersome fixed and spatted undercarriage arrangement, which along with being pointless merely increased the drag and stability problems already inherent in the design. The progressive loss of French launch sites as proceeded and the area of territory under German control shrank meant that soon the V-1 would lack the range to hit targets in England. Thus the F-1 version developed. Additionally, the nose-cones and wings of the F-1 models were made of wood, affording a considerable weight saving. With these modifications, the V-1 could be fired at London and nearby urban centres from prospective ground sites in the Netherlands. Frantic efforts were made to construct a sufficient number of F-1s in order to allow a large-scale bombardment campaign to coincide with the Ardennes Offensive , but numerous factors bombing of the factories producing the missiles, shortages of steel and rail transport, the chaotic tactical situation Germany was facing at this point in the war, etc. Beginning on 2 March , slightly more than three weeks before the V-1 campaign finally ended, several hundred F-1s were launched at Britain from Dutch sites under Operation "Zeppelin". Almost 30, V-1s were made; by March , they were each produced in hours including for the autopilot , at a cost of just 4 per cent of a V-2 , [1] which delivered a comparable payload. Approximately 10, were fired at England; 2, reached London, killing about 6, people and injuring 17, Antwerp , Belgium was hit by 2, V-1s from October to March However, they later considered other types of engine, and by the time German scientists had achieved the needed accuracy to deploy the V-1 as a weapon, British intelligence had a very accurate assessment of it. In September , a new linear defence line was formed on the coast of East Anglia , and finally in December there was a further layout along the Lincolnshire â€" Yorkshire coast. On the first night of sustained bombardment, the anti-aircraft crews around Croydon were jubilant â€" suddenly they were downing unprecedented numbers of German bombers; most of their targets burst into flames and fell when their engines cut out. There was great disappointment when the truth was announced. Anti-aircraft gunners soon found that such small fast-moving targets were, in fact, very difficult to hit. The altitude and speed were more than the rate of traverse of the standard British QF 3. The static version of the QF 3. The cost and delay of installing new permanent platforms for the guns was fortunately found to be unnecessary - a temporary platform built devised by the REME and made from railway sleepers and rails was found to be adequate for the static guns, making them considerably easier to re-deploy as the V-1 threat changed. In , Bell Labs started delivery of an anti-aircraft predictor fire-control system based on an analogue computer , just in time for the Allied invasion of Europe. These electronic aids arrived in quantity from June , just as the guns reached their firing positions on the coast. Seventeen per cent of all flying bombs entering the coastal "gun belt" were destroyed by guns in their first week on the coast. This rose to 60 per cent by 23 August and 74 per cent in the last week of the month, when on one day 82 per cent were shot down. The rate improved from one V-1 destroyed for every 2, shells fired initially, to one for every This still did not end the threat, and V-1 attacks continued until all launch sites were captured by ground forces. Observers at the coast post of Dymchurch identified the very first of these weapons and within seconds of their report the anti-aircraft defences were in action. This new weapon gave the ROC much additional work both at posts and operations rooms. The critics who had said that the Corps would be unable to handle the fast-flying jet aircraft were answered when these aircraft on their first operation were actually controlled entirely by using ROC information both on the coast and at inland.

8: British Diesels and Electrics: Class 44

Highland Class 31 D - posted in UK Prototype Questions: Just completing Looking back at Class 31 Locomotives for publication soon, and wondered just how far north of Inverness D did indeed make it when it was tested when new.

9: David Heys steam diesel photo collection - 15 - PILOT SCHEME DIESELS - 1

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English Electrics' Diesel Prototype 2 (following on from DP1, the Deltic prototype) used a basic bodyshell from the production Deltic series, modified to accomodate a single cylinder V form engine in place of the two deltic power units.

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